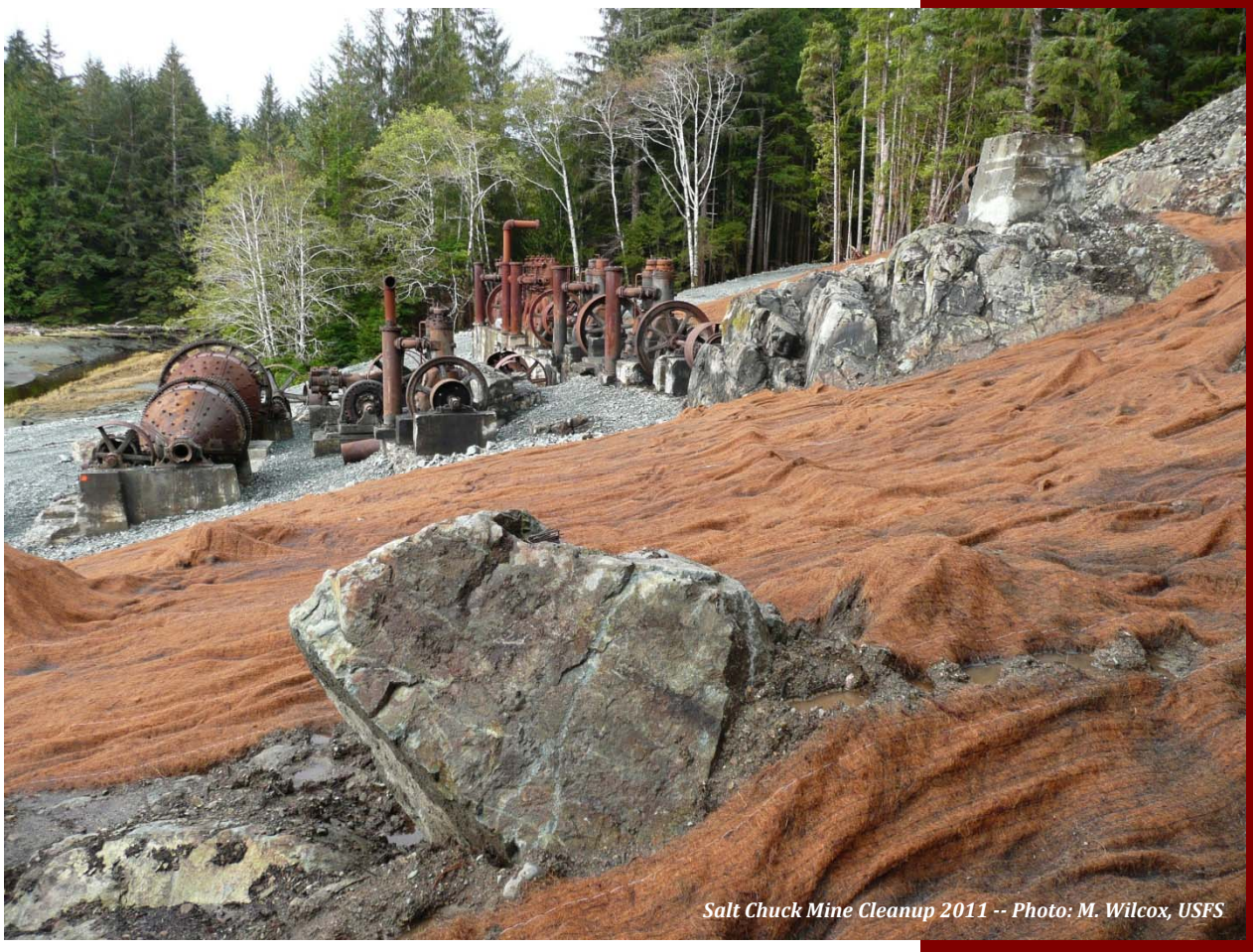
FY 2011

Contaminated Sites Program Annual Report

November 2011



Salt Chuck Mine Cleanup 2011 -- Photo: M. Wilcox, USFS

Alaska Department of Environmental Conservation
Division of Spill Prevention and Response
Annual Summary of Contaminated Sites
November 2011

Forward

This report is generally intended for use by the Contaminated Sites Program (CSP) staff of the Alaska Department of Environmental Conservation (DEC) as a tool for measuring accomplishments, reporting on projects and activities, planning future workloads and managing the program. As such, a working knowledge of the program is assumed and both detailed and general background information has been omitted.

Alaska Department of Environmental Conservation
Division of Spill Prevention and Response
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Executive Summary

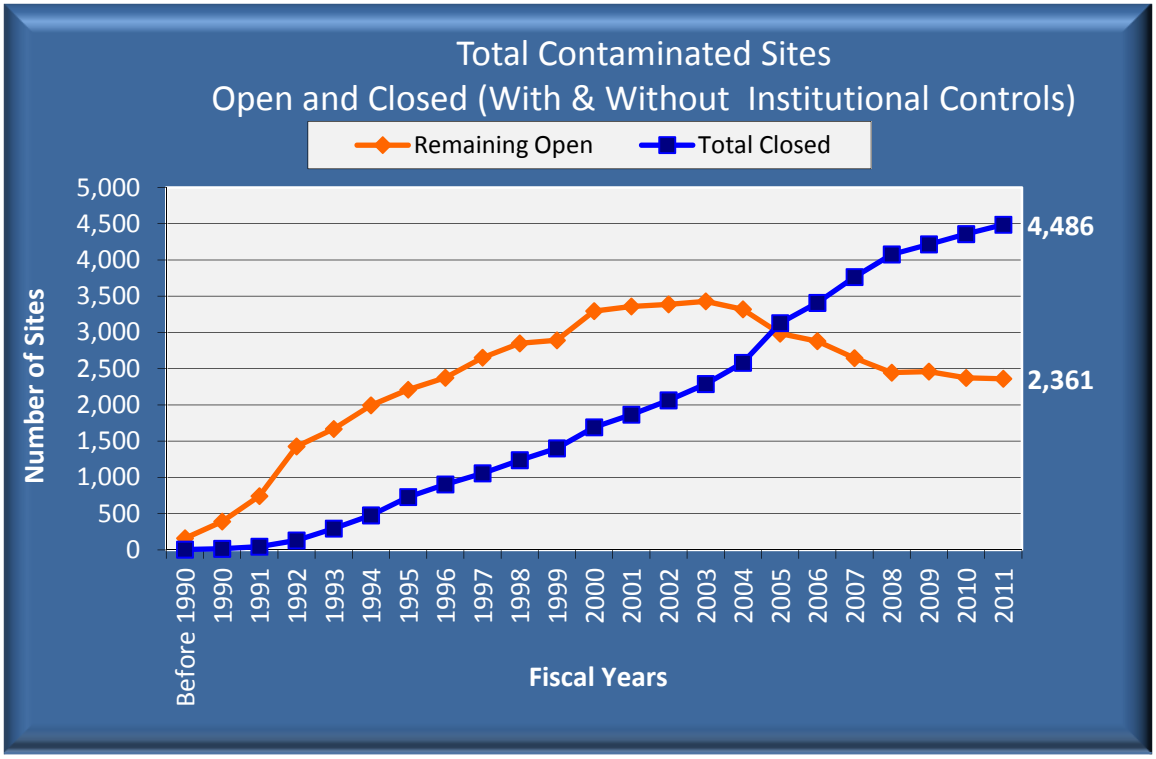
The Contaminated Sites Program made some important steps forward in the policy arena during FY 2011 (July 1, 2010 through June 30, 2011). In addition, the program continued to gain ground cleaning up Alaska's legacy contamination and reducing risk to public health and the environment. The program also expanded its outreach to Alaska Native villages and other rural communities, and beefed up its field presence overall with a greater number of site visits than in past years.

On the policy front, the Contaminated Sites Program (CSP) finalized guidance on applying a four-phase approach for evaluating risk at petroleum contaminated sites, using the web-based Hydrocarbon Risk Calculator developed by Geosphere, Inc. In addition, the program has joined federal agencies and states across the country in crafting a set of policy approaches and recommendations for incorporating greener and more sustainable remediation strategies into the contaminated site cleanup process. Venturing into natural resource damages (NRD), the program developed a white paper on NRD that will ultimately lead to the development of a groundwater injury model for legacy sites. Other policy activities included revisions to the program's guidance on Institutional Controls, and for the first time, making it available to the regulated community. Finally, an extensive draft guidance on field sampling was completed, one that will eventually replace the outdated UST Procedures Manual.

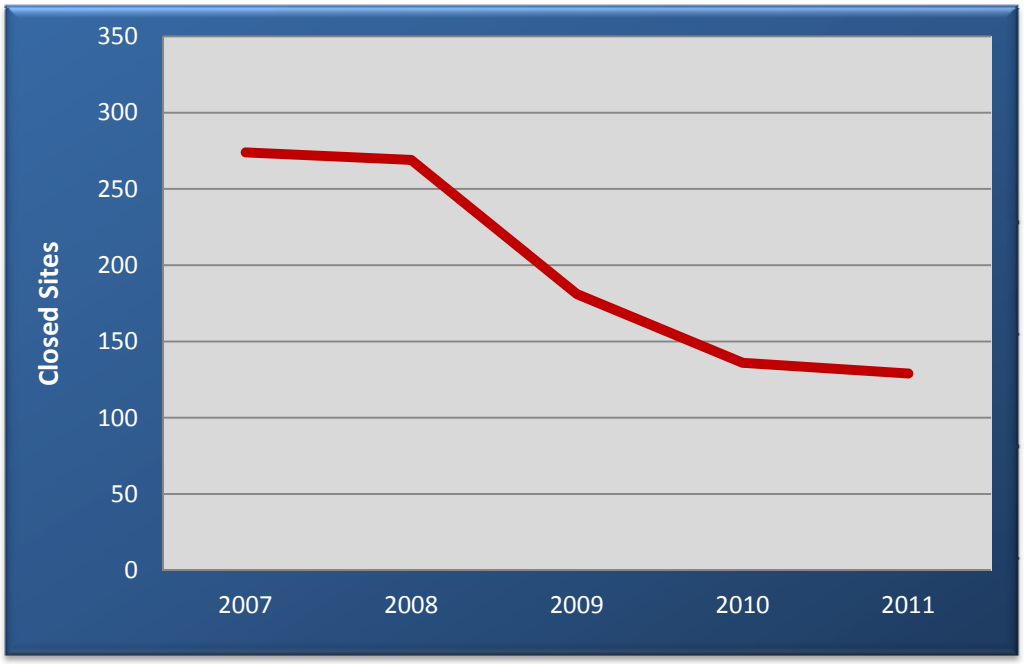
Now, a look at the numbers. Program-wide, substantive regulatory activity occurred at 811 sites in FY 2011--including but not limited to initial evaluation, full-scale site characterization, remedial action, risk assessment, ongoing monitoring and site closure.

The CSP increased its field presence in FY 2011 with 232 site visits and inspections, and many more community consultations and other outreach activities, including those through our state and tribal response program coordination efforts. Well over half of the program's site visits during the year were carried out in rural Alaska.

To date, 65% of contaminated sites documented in the database have either been closed or closed with institutional controls. Ten years ago there were more than 3,300 open sites inventoried; since then, 2,498 sites were added to the database and 3,298 sites were closed. As of June 30, 2011, there were 2,361 open sites.



Although the absolute number of open sites has decreased considerably in 10 years, the rate of site closure also continues to decrease. In FY 2011 the total number of sites closed was 129. The five-year average for fiscal years 2007 through 2011 is 198 site closures annually. The following graph illustrates this trend.

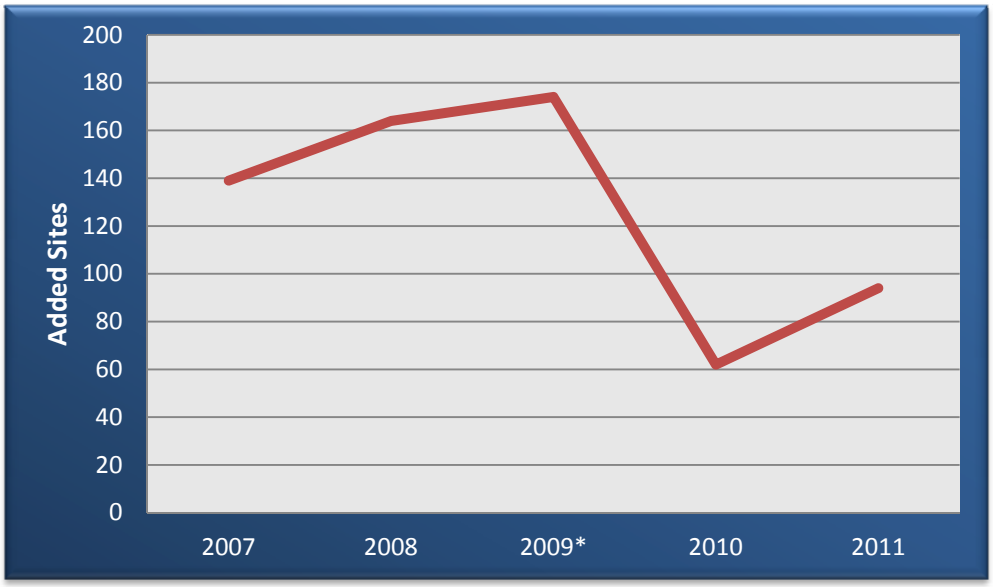


Five-Year Site Closure Trend (by Fiscal Year)
Includes sites closed with and without institutional controls

The decreasing site closure rate reflects the closures achieved for sites with relatively straightforward contamination issues – the "low-hanging fruit." Alaska is by no means unique in this challenge; closure rates, particularly for leaking underground storage tank (LUST) sites, which are tracked nationally by EPA, have dropped off significantly in states around the country. Remaining open sites in Alaska include large federal

facilities and other sites with complex contamination problems or convoluted liability issues that present significant challenges to closure. Other sites lack a responsive or viable party that can be pursued for assessment and cleanup work. The CSP is examining the underlying causes for the falling closure rate, and investigating ways to address the challenges. The program will look toward greater use of compliance and enforcement tools as one potential strategy, with the ultimate goal of meeting or exceeding our annual performance measures for closures.

Although fewer than in earlier years, the number of sites added to the CSP database was up for FY 2011 over 2010. A total of 94 sites were added by June 30, 2011. The increase in added sites through FY 2009 (seen in the graph below) was due in part to data corrections made during the September 2008 roll-out of the program's new database, which merged the former LUST and C-Sites databases into a single application.



Five-Year Added Site Trend

Progress toward Annual Performance Measures

The CSP achieved 86% of its total site closure performance measure in FY 2011 and 99% of its risk reduction performance measure. In addition, the CSP achieved 100% of its federal LUST Closure performance measure, which represents a standing 10% of the total inventory of open LUST sites. In FY 2011 there were 440 such sites.

Performance Measure	Goal	Number Achieved in FY 2011
Total Site Closures	150	129
Exposure Pathways Closed	700	697
LUST Closures	44	45

Discussion

In FY 2011, about 74% of the total site closures were at state and private sites and 26% were at federal facilities. As discussed earlier, sites are closed either with or without institutional controls. About 61% of the FY 2011 site closures were issued without institutional controls.

The FY 2011 number of closed exposure pathways was up by 172 over FY 2010. Exposure pathways are how contaminants reach human or ecological receptors. One example is drinking contaminated groundwater. A "closed" exposure pathway is a measure of risk reduction. Closing a pathway means response actions modified the relative risk of exposure – from current, high potential, low potential or future exposure – to either *de-minimis* contamination or residual contamination managed through the use of institutional controls.

A pathway may also be closed if it is determined to be "incomplete." That means there is no possibility of the receptor being exposed any longer as a result of response actions. Using the contaminated groundwater example, the groundwater ingestion pathway would be shown to be incomplete if concentrations are below regulatory cleanup levels.

TOP 10 PROGRAM ACCOMPLISHMENTS
FY 2011

1. **Flint Hills Refinery (FHR), North Pole --** Through the Technical Project Team established in March 2010, DEC has been collaborating with EPA, ATSDR, NTP, FHR, and UAF on identifying areas of uncertainty surrounding sulfolane. FHR is now providing alternative water for residents with detectable levels of sulfolane in their drinking water wells. In FY 2011, DEC and FHR reached an agreement on an accelerated timeline for investigating and remediating the groundwater contamination, with a project completion date slated for late calendar year 2012.

2. **Galena --** USAF and contractors are working to complete site characterization efforts at 33 different locations at Galena Airport at a cost of $40 million. Close to 1000 boreholes have been advanced as part of the effort. A large removal action, initiated this year, will clean up three areas of fuel contaminated soil currently affecting development and use at the former air base. A pilot study to clean up TCE contaminated ground water was initiated in 2010 and is now operational. Following the intensive 2010 and 2011 field efforts, a Record of Decision, additional remedial actions, land use controls, and monitoring will be specified to ensure protectiveness.

3. **Kincaid Park Former Biathlon Range --** Work to evaluate and cleanup visible lead and lead-contaminated soil at this prominent park in the Municipality of Anchorage began in May 2011. Approximately 575 cubic yards of contaminated soil were recovered and stockpiled on-site for treatment and disposal by the end of FY 2011. The Closure Plan objective is to remove all hazardous waste in accordance with EPA's federal hazardous waste regulations and to cleanup lead and antimony to the State of Alaska's cleanup levels so that the site will not require institutional controls that would require long-term groundwater monitoring or capping contaminated soils.

4. **Red Devil Mine --** CSP staff worked closely with the Bureau of Land Management and Environmental Protection Agency to design a comprehensive site characterization which investigated all areas of contamination appropriately. The site characterization was implemented in summer 2011. CSP staff participated in a series of tribal and public meetings in villages along the Kuskokwim River in spring 2011 to explain the cleanup process and solicit input on the site characterization.

5. **Hydrocarbon Risk Calculator --** After several years of development, CSP approved the Hydrocarbon Risk Calculator (HRC) as an alternative to the Method 3 online calculator for hydrocarbon contaminated sites under 18 AAC 75.

6. **Draft CSP Field Sampling Guidance** – The draft version of the field sampling manual was released to project managers and the regulated community in FY 2011. Feedback and recommendations will be consolidated with the goal of issuing the final version in late FY 2012.

7. **Increase Field Presence**-- The CSP is pleased to report that project management staff stepped up the program's field presence, increasing the number of site visits in FY 2011 by 23% over FY 2010. The total number of site visits for FY 2011 was 232, exceeding the projected goal of 210.

8. **Performance Measures --** Although the program fell short of the goal of 150 site closures by 21 sites in FY 2011, we essentially met our risk reduction performance measure, achieving 697 out of a goal of 700 closed pathways. This is an improvement over FY 2010.

9. **Capital Improvement Project Expenditures** – In FY 2011, CSP analyzed funds remaining in CIP appropriations for past fiscal years. Closer budget scrutiny enabled the program to successfully spend down the entire FY 2005 appropriation and make headway to eliminate remaining funds on the books for both FY 2010 and 2011. As a result of our analysis we did not submit an FY 2012 CIP request. We expect our FY 2013 request to have improved budget integrity, with fewer sites and more defensible cost estimates.

10. **Coastal Impact Assistance Program Grant** – The process to inventory and characterize numerous contaminated sites, landfills and dumps in Western and Arctic coastal areas started in FY 2011 and will continue into FY 2012 and beyond.

STATEWIDE DATA OVERVIEW
FY 2011

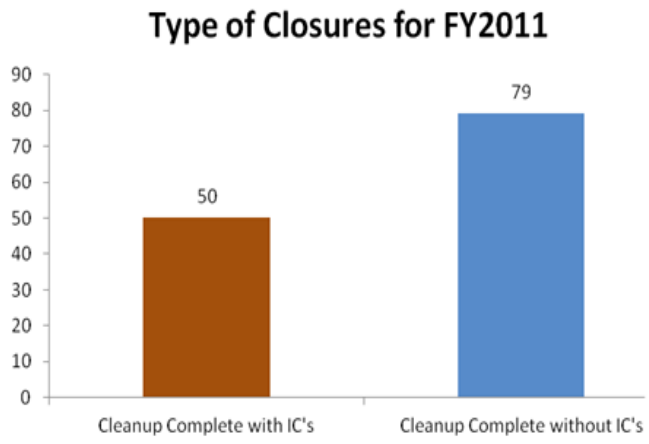
SITE CLOSURE STATISTICS

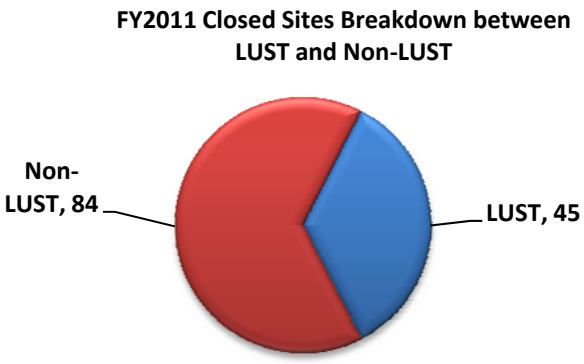
In FY 2011, 129 sites were closed. About 74% of these closures were at state and private sites and 26% were at federal facilities. About 61% of the sites were closed free of any formal institutional controls.

The following table and figures show the total number of open and closed sites at the end of FY 2011, the cumulative number of closed sites to date, and the breakdown between types of closures and which closures were LUST and non-LUST. In FY 2011, a total of 129 sites were closed. That means that the status of those sites changed from active to either cleanup complete or cleanup complete with institutional controls because remedial activity at the site is complete.

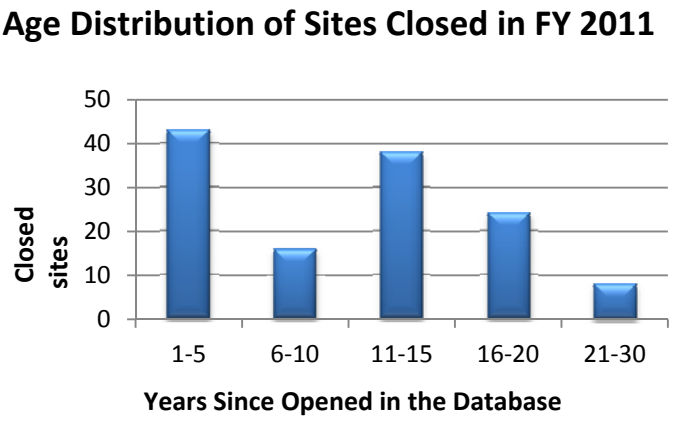
Cumulative Open and Closed Sites

Status	LUST	Non-Lust	Total
Open	422	1,939	2,361
Closed	1,606	1,636	3,242
Closed with institutional controls	314	980	1,294





The following graph depicts the age class of the contaminated sites that were closed in FY 2011. The age refers to the number of years since the date of release until the site was closed. For example, 38 of the sites closed in FY 2011 had been open in our database between 11 and 15 years.

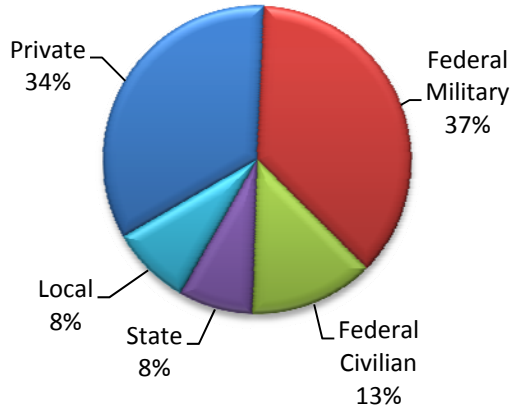


The table on the left (below) breaks down the tally of all open sites in our database by the 10 most common facility types, while the pie chart on the right provides a breakdown of open sites by responsible party type. About half of our sites have state, local and private responsible parties, while federal military and civilian agencies comprise the other half.

Open Sites: Top 10 Facility Types

Site Type	Number of Sites
Military installation	621
Airport/airfield	190
Bulk fuel storage	165
Maintenance yard/shop	150
Gas station	127
Residence	102
Commercial/Retail/Office	98
Landfill/dump	92
Oil exploration/production	76
Mining Operation	61
School	61

Open Sites by Responsible Party

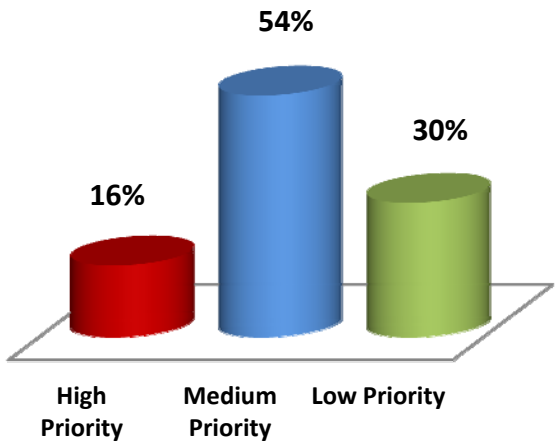


The table on the left (below) summarizes the number of open sites by the top ten most common contaminants. The chart on the right shows the distribution of open sites based on the severity of risk to human health and the environment, and other factors.

Top 10 Contaminants at Open Sites

Contaminant Type	Number of Sites
Petroleum – diesel	1684
Petroleum – gasoline	579
Petroleum – benzene	445
Petroleum – BTEX (benzene, toluene, ethylbenzene and xylenes combined)	270
Petroleum – heavy oil	239
Metals – lead	154
Chlorinated compounds – PCBs (polychlorinated biphenyls)	114
Chlorinated compounds – TCE (trichloroethene)	91
Chlorinated compounds – PCE (tetrachloroethene)	81
Unexploded ordinance	58

Distribution of Open Sites by Priority



Institutional Controls

Institutional controls (ICs) are required on sites where low level or inaccessible contamination remains. ICs consist of mechanisms (such as a deed notice or compliance order), specific conditions to ensure contaminant exposure does not occur (such as a groundwater use restriction), and periodic reporting to DEC (such as verifying that land use has not changed). Some sites require more than one IC mechanism to provide multiple layers of protection.

In 2010, the CSP established an IC unit to conduct a rigorous QA/QC review of the approximately 1300 sites that have been closed to date with ICs, and to verify that ICs are in place and any necessary actions are being performed by the RP. In addition, some sites were re-evaluated for complete closure and removal of the ICs where they were deemed no longer necessary. Through 2012, the approximately 900 state and private sites within the 1300 site inventory are being reviewed case-by-case for closure or complete transfer to the IC unit, based on file review and consultation with each CS project manager. Upon transfer, the IC unit verifies IC compliance, including filing deed notices if this has not occurred, requesting data from the RP, and conducting site inspections, among other actions. In FY 2011, all closed sites with ICs originally managed out of the Juneau and Fairbanks offices were reviewed and closed or transferred to the IC unit for follow-up reporting, site inspection, and/or communications with the RP. This effort will continue through the end of the 2012 calendar year with the remaining sites in the Soldotna and Anchorage offices.

When the state and private sites portion of this effort is complete, the IC unit will move on to the approximately 400 closed federal facilities sites carrying ICs. Because ICs are handled differently for federal properties, a separate approach for managing these sites is anticipated to be required.

IN-STATE MEETINGS AND EVENTS FY 2011

Annual Contaminated Sites Program Meeting: A two-day meeting was held in Anchorage on October 20-21, 2010. The two-day meeting consisted of an array of case studies for various sites, as presented by individual or teams of program staff.

State and Tribal Response Program Workshop: CSP's Reuse and Redevelopment staff hosted this third annual, capacity-building workshop for Alaska Tribal Response Programs in Fairbanks in December of 2010. Approximately 40 individuals participated in this instructive and networking opportunity, with representatives from nearly all tribes that have received EPA brownfield grants. The ADEC Solid Waste Program and staff from EPA and the ATSDR also presented.

CSP-SPONSORED TRAINING
FY 2011

Hydrocarbon Risk Calculator Training: Staff workshops were held in Fairbanks and Anchorage to present an overview of the Draft Hydrocarbon Risk Calculator and User Manual. The workshops included an overview of the site characterization techniques and tools that would be necessary to use the models included in the calculator. After approval of the HRC two public 3 day training sessions covering the same material were held in Anchorage, and one in Fairbanks. These training programs, a total of 11 days, were attended by more than 100 consultants, environmental professionals, DEC staff, and RP staff project managers responsible for cleaning up contaminated sites.

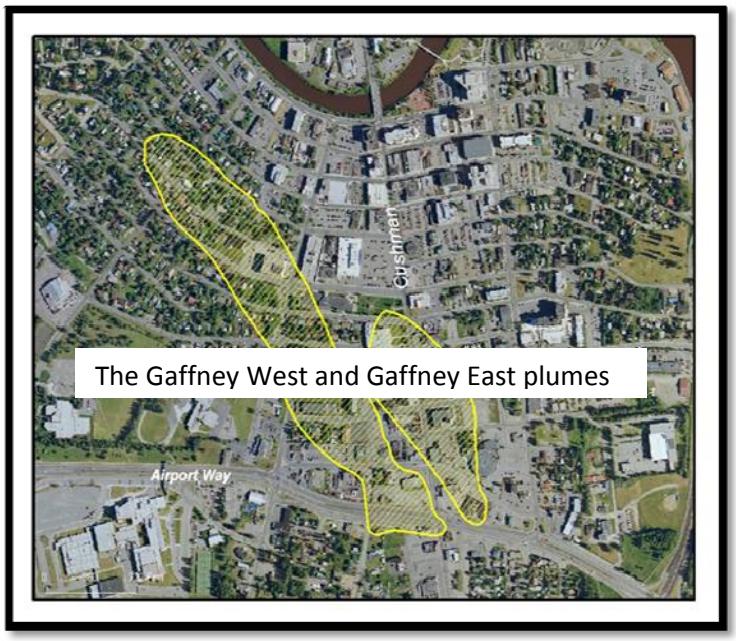
Meeting Facilitation Training: A one-day course on developing good meeting facilitation skills was held in Juneau. The highly interactive workshop provided both new and seasoned facilitators with the skills and tools necessary to run effective meetings of any size. The practice session at the end provided the opportunity for all participants to use the skills in a real-life context around a relevant, hot topic.

Staff-Led Sessions on Regulations, Policy and Technical Topics: About once a month, depending on staff schedules, CSP staff participate in and take turns leading 1 hour, statewide teleconference sessions on a range of topics that include regulations, case studies, peer reviews, guidance and policy documents, and high points of recent training courses. Sessions are open to anyone in the program who wants to attend. The goal is to encourage knowledge sharing among staff, and promote CS program consistency and excellence through a better understanding of the regulations and exchange of information and ideas. Below are the sessions held in FY 2011.

DATE	TOPIC	PRESENTER
8/10/2010	18 AAC 75.340 Soil Cleanup Levels General Requirements	Tamar Stephens
8/20/2010	18 AAC 75.341 Soil Cleanup Level Tables	Tamar Stephens
10/8/2010	Cumulative Risk	Marty Brewer
11/5/2010	Alaska Native Claims Settlement Act	Deb Williams
12/3/2010	18 AAC 75.350 Groundwater Use	Tamar Stephens
12/17/2010	Policies for Site Characterization and Setting Cleanup Levels: insights and discussion in light of the Sulfolane issues at Flint Hills Refinery	Ann Farris
1/14/2011	18 AAC 75.360 Cleanup Operations Requirements	Tamar Stephens
1/28/2011	18 AAC 75.365 Offsite or Portable Treatment Facilities	Robert Weimer / Bill O'Connell
2/25/2011	18 AAC 75.370 Soil Storage and Disposal	Tamar Stephens
3/11/2011	18 AAC 75.380 Final Reporting Requirements and Site Closure. Overview of Site Closure Guidance	Tamar Stephens and Bill Janes
3/25/2011	Gems from the Managers Meeting	Fred Vreeman
4/22/2011	Contaminant, Hazardous Substance, Hazardous Waste Definitions	Tamar Stephens

STATE AND PRIVATE CLEANUP PROGRAM ACCOMPLISHMENTS FY 2011

Gaffney Road Area-wide Groundwater Investigation, Fairbanks



The Gaffney West and Gaffney East plumes

This area in downtown Fairbanks has four known sources of chlorinated solvent releases that have contaminated the soil, created a mile-long plume, and produced vapors that are migrating into at least 7 surrounding buildings. In FY 2011, DEC initiated source removal and significantly lowered the risk at two (Gaffney West) of the four source areas through installation of a soil vapor extraction unit at the Good News Bible and Bookstore. Operation of the system reduced vapor concentrations in the bookstore to below risk-based levels within a week. Additionally the system is helping to treat the Park and Sell source area because of the proximity and radius of influence for each extraction well. Two other source areas (Gaffney East) were further delineated this year and vapor intrusion was investigated. Remediation alternatives were evaluated. Long-term groundwater monitoring continued from both groundwater plumes. Decreasing trends are expected in the near future because of source removal and increased efforts this season.

314 Wendell Ave. (formerly MC Commercial), Fairbanks

Former dry cleaning operations at this property released chlorinated solvents into the soil and sewer lines. The result of this release created an area-wide groundwater plume extending toward the Chena River and acute vapors in the building at 314 Wendell Avenue. In FY11, DEC implemented a sub-slab depressurization system for vapor mitigation within the former dry cleaner and installed a soil vapor extraction system for soil remediation. Evaluation of system performance included vapor intrusion analyses and soil gas sampling. Area-wide groundwater, pore water, and Chena River surface water were periodically sampled as part of the Chena River Monitoring Plan. Chlorinated solvents above


Wendell Avenue investigation

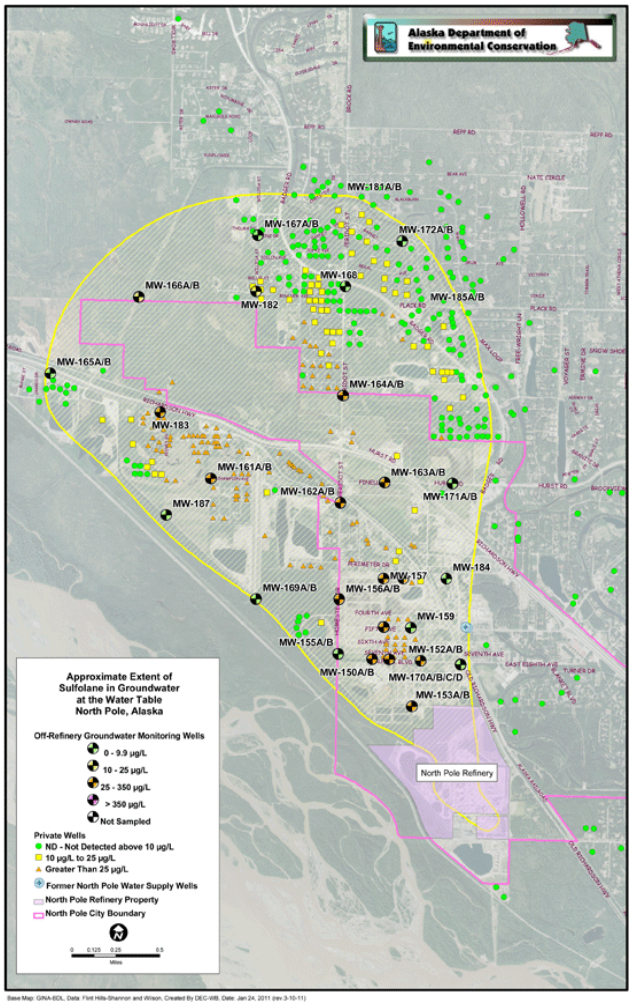
groundwater cleanup levels were detected in pore water samples, confirming contaminated groundwater discharge into a surface water body. Groundwater monitoring also indicated significant groundwater-surface water interactions during high river stage events (e.g., break-up during spring). Additional groundwater sampling is planned to refine groundwater remediation strategies.

Mile 6 Richardson Highway Area-wide Treatment/Monitoring, Fairbanks

An area-wide TCE groundwater plume was discovered in the Mile 6 Richardson Highway area in 1996. The plume is more than a mile in length, expanding up to 1,200 feet wide and 100 feet in depth, extending northwesterly from south of the New Richardson Highway to the Mile 6 village subdivision area. An annual long-term groundwater program, which was started in 1996, includes sampling from permanent monitoring wells and a selected number of residential wells. The data from the monitoring program indicate a decreasing trend in contaminant concentrations over time. All but four residential wells are now below the established cleanup level of 3.5 parts per billion for TCE.

Flint Hills Refinery, North Pole

Since 2009, Flint Hills Resources has worked with CSP staff, the Department of Health and Social Services' Division of Public Health and the City of North Pole on an environmental investigation of sulfolane, which was detected in the groundwater outside of the facility's property boundaries to the north and has impacted over 200 private drinking water wells. FHR has been providing alternative water for residents who have detectable levels of sulfolane in their drinking water wells. In 2011, DEC and FHR reached an agreement on an accelerated timeline for investigating and remediating the groundwater contamination and established a project completion date for late 2012.



Kincaid Park, Anchorage

The Kincaid Park Former Biathlon Range site is located within the Municipality of Anchorage's 1516-acre Kincaid Park. In early 2008, 52 cubic yards of hazardous waste and contaminated soil was estimated to be present at the range. Approximately 40% was excavated, stockpiled, and later shipped out of state for disposal as hazardous waste. It is believed that as much as 12,000 cubic yards of fill containing contaminated soil and spent ammunition remain on site and is distributed within the three-acre soccer field project area and at the south end of the former range in disturbed and undisturbed soil. Following a public notice and comment period by the U.S. Environmental Protection Agency (EPA) in March 2011, a proposed Closure Plan was approved in late April 2011 by the EPA and CSP under the respective regulations for

each agency. Work to evaluate and clean up visible lead and lead-contaminated soil began in May 2011. The Closure Plan objective is to remove all hazardous waste in accordance with EPA's federal hazardous waste regulations and to cleanup lead and antimony to the State of Alaska's cleanup levels so that the site will not require institutional controls that would require long-term groundwater monitoring or capping contaminated soils.

River Terrace RV Park, Soldotna

Groundwater monitoring performed in 2011 showed that the dry cleaning solvent, tetrachloroethylene (PCE), continued to degrade using enhanced natural attenuation through past and periodic injections of Hydrogen Release Compound (HRC). The River Terrace RV Park site continues to be monitored to determine the effectiveness of the groundwater treatment system. While contaminant levels have decreased in the upper contaminant plume area and in most areas of the lower contaminant plume, data shows that one pocket of elevated PCE remains in the lower contaminant plume area near monitoring well (MW) 47. HRC was last injected into selected areas of the site, including the area near MW47, in summer 2009.

ADOT&PF Knik River Rest Stop, Palmer

The Bureau of Land Management originally owned the Knik River Rest Stop contaminated site, which had been historically used as an informal shooting range and dump site. The Department of Natural Resources worked with the BLM to clean up the site. As a result of the cleanup effort, the site received a cleanup complete with institutional controls (ICs) determination in 2004. After the closure determination was issued, DNR received title of the property for the benefit of the Department of Fish and Game. Although the previous cleanup effort removed a significant amount of lead contamination from the former shooting areas the results from follow-up sampling by CSP identified several areas that exceeded lead cleanup levels. This site was then prioritized on the Capitol Improvement Projects so the extent of lead contamination could be further delineated and remedial alternatives implemented as necessary. CSP staff also coordinated with ADFG to implement ICs to control lead exposure to recreational users of the park. Investigation conducted in during FY 2011 successfully delineated the extent of lead impacts. The completion of the permitting process in winter 2010 allowed for the execution of the final phase of the CIP project in early June of 2011.

Chevron USA Refinery, Nikiski

Chevron undertook numerous corrective actions under Chevron's 2010 Implementation Plan. FY 2011 field activities include the excavation of approximately 250,000 cubic yards of clean overburden and the removal of approximately 8,700 cubic yards of impacted soil. A slurry wall has been installed to stop the migration of groundwater to Cook Inlet and two additional dewatering wells were installed to allow for capture of the groundwater plume.

Installation of the slurry wall

CAPITAL IMPROVEMENT PROJECTS- STATE-LEAD AND STATE-OWNED SITES

The CSP continued its efforts to investigate and clean up state-lead and state-owned contaminated sites. In FY 2011, Capital Improvement Project (CIP) funding was expended on state-owned and state-lead contaminated site assessment, cleanup and monitoring projects. The CIP spending strategy was developed and presented to management. It consists of a site prioritization structure, a cost estimation model, and specific funding-allocation recommendations for various stages of cleanup.

Funding was approved for CSP contractors to work on 13 state-lead sites and 23 state-owned sites in FY 2011. Due to factors such as fiscal year overlap and encumbered versus expended funds, it is important to note that there is not a direct relationship to the total amount expended in FY 2011 and the projects that received funding approval. Projects approved for CIP funding in FY 2011 are described briefly below.

State-Lead Sites

314 WENDELL AVENUE – Install a soil vapor extraction treatment system. Collect and analyze soil gas, groundwater, surface water, and sediment samples.

ALASKA REAL ESTATE PARKING LOT – Install soil borings, groundwater monitoring wells, and soil gas probes to further define the nature and extent of contamination.

COOK'S CORNER TESORO – Sterling - Collect groundwater samples and analyze for petroleum constituents.

ESKIMO CREEK – EDDIE'S FIREPLACE INN – Monitor and recover free phase petroleum from existing recovery wells and the interception trench.

FIRE LAKE FLYING CLUB -- Collect groundwater samples and soil confirmation samples for petroleum hydrocarbons.

GAFFNEY ROAD WEST (ROYAL MASTERS LAUNDERETTE) – Continue operation and maintenance of the soil vapor extraction system.

GAFFNEY ROAD EAST (COIN KING) – Conduct additional soil gas and groundwater sampling to define the northbound limit of the chlorinated solvent plume.

GAFFNEY ROAD AREAWIDE –Collect and analyze chlorinated solvent vapor intrusion samples at three different locations (University of Alaska project).

M&M ENTERPRISES – Remove the old cap; design and install a new cap for lead contamination.

MCGAHAN UTILITIES – Collect groundwater samples and analyze for chlorinated solvents.

RESIDENCE – 3573 ROSIE CREEK ROAD – Define the horizontal and vertical extent of soil contamination.

RIVER TERRACE RV PARK – Continue long-term groundwater monitoring; further assess soil and groundwater to define the extent of contamination.

SIX MILE RICHARDSON HIGHWAY GROUNDWATER INVESTIGATION – Continue long-term chlorinated solvent groundwater monitoring program, residential well sampling and treatment, and begin a soil gas investigation to determine if vapor intrusion is occurring.

TRAILSIDE GENERAL STORE - Collect groundwater samples and analyze for petroleum constituents.

State-Owned Sites

ALASKA COURT SYSTEM - DIMOND COURTHOUSE UST – JUNEAU – Collect groundwater samples and analyze for petroleum constituents.

DEED EEK OLD BIA SCHOOL AND TANKS – Complete an on-site visit and an assessment and cleanup plan.

DEED HUSLIA HUNTINGTON SCHOOL – Excavate near-surface soil contamination and treat on-site. Remove four underground storage tanks and associated piping.

DEED KALTAG – Deploy boom materials during spring break-up to capture surface run-off containing petroleum sheen. Conduct correlation study between screening and analytical procedures for 1-chloro-octdecane. Collect soil samples for DRO delineation.

DEED NAPASKIAK FORMER BIA SCHOOL DAY TANKS – Conduct site characterization to determine horizontal and vertical extent of petroleum contamination in soil.

DEED PEDRO BAY FORMER DENA'LNA SCHOOL – Treat petroleum-contaminated on-site; collect and analyze soil and groundwater samples.

DEED TOGIAK SCHOOL – Evaluate potential off-site migration of petroleum contamination through shallow groundwater. Evaluate potential vapor intrusion into remaining buildings.

DNR FORESTRY HEATING OIL Tank – Sample and decommission groundwater monitoring wells.

DNR TOK RIVER WAYSIDE – Install a new drinking water well.

DOT&PF ANIAK WHITE ALICE COMMUNICATION SITE – Conduct a feasibility study to evaluate groundwater and soil cleanup alternatives for chlorinated solvent contamination. Design a sub-slab depressurization system to stop chlorinated solvent vapors from migrating into the school building.

DOT&PF GIRDWOOD MAINTENANCE STATION – Collect groundwater samples and analyze for petroleum constituents.
DOT&PF GUSTAVUS TANK FARM – Collect groundwater samples and analyze for petroleum constituents.

DOT&PF HAINES MAINTENANCE STATION – Collect groundwater samples and analyze for petroleum constituents.

DOT&PF HOMER FACILITY - Collect groundwater samples and analyze for petroleum constituents.

DOT&PF JUNEAU COMMUNITY BUILDING - Collect groundwater samples and analyze for petroleum constituents.

DOT&PF KNIK RIVER REST STOP – Cap lead contamination with clean gravel to allow for re-development of a recreational area.

DOT&PF MAIN SHOP KETCHIKAN – Collect groundwater samples and analyze for petroleum constituents.

DOT&PF MARKAIR – KING SALMON – Collect groundwater samples and analyze for petroleum constituents.

DOT&PF NINILCHIK MAINTENANCE FACILITY - Collect groundwater samples and analyze for petroleum constituents.

DOT&PF – NOME MAINTENANCE FUELING STATION AND MARKAIR – NOME – Collect groundwater samples and analyze for petroleum constituents.

DOT&PF OLD QUINHAGAK AIRPORT – Excavate petroleum contaminated soil and construct a treatment stockpile on-site.

DOT&PF – REGIONAL COMPLEX – Collect groundwater samples and analyze for petroleum constituents.

DOT&PF YUTE AIR TERMINAL DILLINGHAM – Remove and treat a petroleum-contaminated soil stockpile generated during a spill response in 1993.

American Recovery and Reinvestment Act Projects

Alaska received $999,000 in American Recovery and Reinvestment Act (ARRA) funds in 2009 to address leaking underground storage tank (LUST) sites. The ZipMart store in Sterling, a major state-lead project, was the fourth and final project funded under ARRA.

In FY 2011, a CSP contractor designed and installed an Air Sparge (AS) and Soil Vapor Extraction (SVE) wells and/or modifications to the existing SVE system to effectively treat soil and groundwater at the ZipMart site source; continued operation, maintenance and monitoring of the remediation system; and monitored water quality by sampling groundwater and drinking water wells. The contractor also characterized soil and groundwater in the northeast plume front, and injected Oxygen Release Compound (ORC) solution into 56 boreholes aligned north to south along a transect in the eastern plume area to enhance natural attenuation of hydrocarbon contamination and mitigate further expansion of the groundwater plume. ORC was also injected at greater depths through 20 existing pilot study wells. Groundwater monitoring and operation of the remediation system is on-going.

FEDERAL FACILITIES RESTORATION PROGRAM ACCOMPLISHMENTS FY 2011

Wainwright Radio Relay Station

This project was conducted under an on-going effort to address eroding dumpsites at federal facilities throughout Alaska. CSP staff worked closely with the Air Force to prioritize, successfully remove, and properly dispose of wastes from an old dumpsite that was eroding into the Wainwright Lagoon at this former Distant Early Warning (DEW) Line site on the North Slope.

Amchitka Underground Nuclear Test Sites

During the 1960's and '70s three underground nuclear tests were conducted on Amchitka Island which included the largest ever conducted by the United States. CSP staff participated in a stakeholder workgroup with the Department of Energy, U.S. Fish and Wildlife Service, University of Alaska, and Aleutian Pribilof Islands Association to develop and implement work plans to check for potential radionuclide contaminated groundwater seepage into the marine environment from the underground nuclear test sites. In 2006 a

baseline monitoring event was conducted. In 2011, the first follow-on five-year monitoring event occurred with monitoring expected to continue on five-year intervals into the foreseeable future.

Port of Anchorage

Site characterization and cleanup work was completed on the former Defense Energy Support Center (DESC) fuel tank farm at the Port of Anchorage. CSP staff worked with the Army, DESC and Municipality of Anchorage to establish institutional controls and long term monitoring agreements, which facilitated successful transfer of the land from the Army to the Port of Anchorage.

Galena

USAF and contractors are working to complete site characterization efforts at 33 different locations at Galena Airport at a cost of $40 million. Close to 1000 boreholes have been advanced as part of the effort. CSP staff provided oversight and facilitated development of land use controls necessary to manage the site during remedial investigations and cleanup. A large removal action, initiated this year, will clean up three areas of fuel contaminated soil currently affecting development and use at the former air base. A pilot study to clean up TCE contaminated ground water was initiated in 2010 and is now operational. The goals are to stop the TCE migration onto private property and determine whether the remedial technology could be an effective method to treat the larger TCE contaminated area at the Airport. Following the intensive 2010 and 2011 field efforts a Record of Decision, additional remedial actions, land use controls, and monitoring will be specified to ensure protectiveness. Today, the former Air Base is used as a boarding school, state airport and for other community activities.

Ft Greely

Characterization work was initiated in 2010 and 2011 on most of the remaining areas of concern at Fort Greely and will be complete after the 2011 field season. During characterization many of the areas are being cleaned up with removal actions. Remediation systems using ozone injection were installed and further characterization work was performed at the two largest sites, one near the air field and one at a former tank farm near the missile field. These systems will operate through 2012 using ozone destruction to remove contamination that is migrating to groundwater. A comprehensive Record of Decision is being prepared in 2011.

National Guard Military Munitions Response Program Sites

CSP staff worked with the National Guard to plan, implement and approve site inspections at 24 facilities throughout Alaska under the Military Munitions Response Program and determined no further characterization or cleanup action was necessary. In addition, a site characterization work plan was approved and implemented to determine the extent of petroleum contamination that remained at 21 Federal Scout Armories. The results will be used to determine cleanup needs and action plans.

NE Cape

CSP staff provided oversight on the Army Corps of Engineers continued remediation efforts at the former Northeast Cape White Alice Communication Site located on St. Lawrence Island. During 2010, approximately 1,500 cubic yards of PCB-contaminated soil, 2,700 tons of petroleum contaminated soil, 17 tons of arsenic contaminated soil, and 38 tons of solid waste were removed. An old dumpsite was capped in place. A more thorough delineation of petroleum contaminated soil was completed at the main complex area; identifying

approximately 30,000 cubic yards of petroleum impacted soil. Plans to remove this soil along with additional PCB contaminated soil is anticipated to be completed during 2011.

Ft. Wainwright/Taku Gardens

This is a high profile housing development on the Army Base where construction has been delayed due to discovery of significant environmental contamination and buried solid wastes. CSP staff worked with the Army and EPA to complete the removal actions, finalize the remedial Investigation, and make significant progress on the Feasibility Study for the Taku Gardens Housing Area project. The agencies are working together to ensure the contamination is properly addressed prior to completing the construction project and moving personnel into the new homes.

Dutch Harbor

Staff provided oversight on completion of abandoned fuel pipeline cleaning and closure at the Rocky Point tank farm site. At CSP request, Chevron and Delta Western implemented a multi-year project to properly close abandoned pipelines. Over 36,500 linear feet (nearly 7 miles) of old abandoned lines were cleaned and removed or properly closed in place over three field seasons. More than 53,000 gallons of fuel were recovered from the pipeline system. Nine sections of abandoned pipelines remain to be addressed but have been determined to fall under the Corps of Engineers Formerly Used Defense Site Program responsibility. CSP staff requested the Corps properly close the remaining lines.

Pipeline Closure – Dutch Harbor (Stantec image)

Eielson AFB

CSP staff focused significant effort working with Air Force and EPA to bring the facility back into compliance with the Records of Decision (RODs) and Alaska Site Cleanup Rules. Approximately 80% of the groundwater monitoring wells had been abandoned or decommissioned and monitoring at all but one site was ceased in 2007 in spite of the fact that insufficient data had been collected to establish contaminant concentration trends. New monitoring wells will be installed and monitored in 2011 and 2012 and additional site characterization conducted in preparation for the 2013 Five Year ROD review. Additional cleanup alternatives will be considered and the RODs will need to be amended at two sites where the remedies were not considered to be effective or protective.

Salt Chuck Mine

CSP staff worked with the US Forest Service to plan an appropriate removal action on the US Forest Service-managed uplands at the site. The removal consisted of building a 0.75 mile access road, the excavation and off-site disposal of almost 6000 cubic yards of metals and/or petroleum contaminated soil and tailings, and the

backfilling of the excavation with clean soil. The removal action began in the spring of 2011 and was scheduled to be completed in the fall. Staff worked with EPA to plan a limited sampling event in the inter-tidal and sub-tidal areas as part of the site's Superfund designation to be implemented in September 2011 and the results will be used to design a comprehensive Remedial Investigation for 2012.

Red Devil Mine

Considerable effort was put forth by CSP staff working with the Bureau of Land Management and Environmental Protection Agency to design a comprehensive site characterization which investigated all areas of contamination appropriately. Contradictory views on multiple technical issues required significant discussion to resolve. The site characterization was implemented in summer 2011 in order for the site characterization and risk assessment reports to be completed in spring 2012 and cleanup alternatives to be discussed in late 2012. CSP staff participated in a series of tribal and public meetings in villages along the Kuskokwim River in spring 2011 to explain the cleanup process and solicit input on the site characterization. CSP management participated in a site visit with EPA management, BLM and DOI management, Office of Management and Budget staff, and tribal and village participants to familiarize themselves with BLM's responses to site issues in summer 2011.

Defense State Memorandum of Agreement

Alaska is one of eight states participating in the Defense State Memorandum of Agreement (DSMOA) Steering Committee that is working with the Department of Defense on ways to improve DSMOA policy. Joint execution plans have been streamlined and reporting requirements have been reduced. The team has made significant progress defining and expanding state oversight activities that are eligible for DSMOA funding. Alaska is the lead state working with Department of Defense staff on modifications to resolve the issues between State enforcement authority and DSMOA dispute resolution. Future work will focus on resolving the challenges with dispute resolution and improving coordination.

Munitions Response Forum

Alaska and three other states are leading the state-led Munitions Response Forum that includes federal agencies and land managers working on cleanup issues relating to military munitions. The group has written a state perspective report on the challenges of managing munitions sites and has presented the information to Environmental Council of the States for the development of a resolution supporting the states' recommendations. Additional projects in progress include a paper about underwater munitions issues, emergency response protocols and revisions to EPA's Munitions Hazard Assessment for Military Munitions.

U.S. Environmental Protection Agency National Federal Facility Dialogue

Alaska was invited to participate in a national dialogue on how to improve environmental cleanup activities at federal facilities. The meeting was attended by high level leadership from EPA, Department of Defense and various Service branches, Department of Energy, Department of Interior, Department of Agriculture, several community activists, and seven States. Discussion focused on how to improve coordination, making sure that cleanup decisions included state and community concerns and continued to be protective through time. Further discussion was held on how to improve DOI and DOA cleanup activities and process since those agency cleanup programs are not as mature as DOD or DOE's and are raising many challenges with states and the public.

Formerly Used Defense Sites (FUDS) Forum Planning Committee

Alaska was one of two states that assisted the Army Headquarters, Army Corps of Engineers, and US EPA to research, plan, and implement the first National FUDS Forum for States, EPA, Army, Corps of Engineers staff and managers that work on investigation and remediation of FUDS. This Forum was very successful with approximately 150 participants and over 40 states in attendance. Topics of concern to states were military munitions cleanups, improving coordination and communication, FUDS sites that are transferred to the Potentially Responsible Parties (PRP) classification, and improving the cleanup process between COE, states, and EPA.

POLICY, TECHNICAL SUPPORT & BROWNFIELDS PROGRAM ACCOMPLISHMENTS FY 2011

Reuse and Redevelopment (Brownfields)

- **Annual STRP Workshop** – R&R staff hosted the third Alaska STRP Brownfield Workshop in Fairbanks. Approximately 40 individuals participated with representatives from nearly all tribes that have received EPA brownfield grants.
- **Brownfield Handbook** – The Alaska State & Tribal Response Program Brownfields Handbook is now an accessible online tool for Alaska Tribes. The document has received national recognition and is expected to be a useful reference for tribes and for active and potential STRP grant recipients throughout Alaska and the rest of the country.
- **STRP Grant Increase** – the program continues to receive significant increases each year. Last year, the program received the largest percentage increase of any STRP recipient nationally.
- **Increased Brownfield Funding** – DEC helped to facilitate an increase in federal funding to communities and tribes for brownfield programs, assessments, and cleanups in Alaska, with an expected increase in funding to exceed $3 million in FY2012.
- **Community Garden Proposals** – In October 2010, R&R staff organized an exploratory meeting to discuss options to develop community gardens and sustainable agriculture projects, particularly on brownfields and land-reuse sites.
- **Project Coordination** – Managed more than 25 projects with a budget exceeding $750,000 in FY 2011.
- **DEC Brownfield Assessments** – Five assessments were completed during the 2010 field season using EPA STRP funding for non-state owned projects. All projects went through the application, review, and prioritization process developed by the R&R Program.

Draft Field Sampling Guidance

The draft version of the field sampling manual, completed in late FY 2010, was deployed to project managers and the regulated community in FY 2011. Feedback and recommendations for revisions and updates are being consolidated for a revision and updated version to be completed in late FY 2012.

Petroleum Cleanup Levels and the Hydrocarbon Risk Calculator

After several years of development, CSP approved the Hydrocarbon Risk Calculator (HRC) as an alternative under 18 AAC 75 to the Method 3 online calculator for hydrocarbon contaminated sites. It can also be used under Method 4 when following the ADEC Risk Assessment Procedures Manual. The HRC and manual were developed by Geosphere Inc. under contract to CH2M Hill and the Federal Aviation Administration, with input by members of the Statement of Cooperation (SOC) Working Group, including staff from the ADEC, FAA, U.S. Army, U.S. Army Corps of Engineers and Alaska Army National Guard. Peer reviews on the HRC were conducted by the University of Alaska Fairbanks and SLR Corporation. In conjunction with the HRC, CSP also developed a guidance document to facilitate the use and implementation of the HRC in the context of ADEC's regulatory framework. The guidance document, calculator, and accompanying user manual are now available for use and accessible from CSP's public website. Several RP's have or will be proposing to apply HRC-driven risk calculations for contaminated sites throughout Alaska.

Green Remediation

In early 2011, CSP completed the draft policy document, Incorporating Green Remediation Strategies at Alaska Contaminated sites. The paper defines green remediation within an Alaska context and conceptualizes various strategies for initiating greener remediation alternatives as part of contaminated site characterization and cleanup throughout Alaska. Among these strategies include setting a baseline for greener remediation at all contaminated sites; leading by example beginning with ADEC contracts; and developing one or more incentives to encourage responsible parties and consultants to deploy green methods as part of site remediation. The effort was executed under the Core Superfund grant work plan for FY 2011. Green remediation will be one of the CSP's priorities for FY2012 and beyond.

Quality Management Plan Implementation

The updated Quality Management Plan was finalized by CSP, submitted and approved by EPA and adopted in early FY 2011.

Natural Resources Damage Assessment

CSP took the lead in a joint effort with the Prevention and Emergency Response Program (PERP) to investigate the potential for a state program for natural resource damage assessment (NRDA). Staff conducted a wide-ranging review of published literature, key legal decisions that have shaped NRDA, as well as state NRD programs from around the country. The effort included looking at alternatives for carrying out NRDA for resource injuries generated by both spills and contaminated sites and also considered the legal context, program mechanics, assessment tools and processes, and other factors in a potential program design. The project culminated in a report titled, "Approaching NRDA in Alaska: Options and Alternatives." Development of a NRDA process for contaminated sites is one of the CSP's priorities going forward for FY2012.

Institutional Controls Management

Managing Institutional Controls (ICs) at sites to limit risk to public health and the environment is a major activity listed under the Department's Contaminated Sites Program Component. In early 2011, major revisions to the Institutional Control Guidance were completed, and the guidance was released to the public for the first time. As of the close of FY 2011, the IC Unit is part way through a major effort to evaluate all sites closed with ICs in order to monitor these sites and ensure the ICs are being adequately maintained. Thus far, CSP has reviewed 120 state/private sites both in Juneau and in Fairbanks, working one-on-one with project staff and hard files, on a site-by-site basis, identifying and following up with specific sites where IC compliance is needed. Some of the compliance verification strategies initiated include conducting a deed notice audit to ensure these notices have been filed with DNR; sending out notices for required post-closure groundwater monitoring; and conducting site visits to ensure that physical controls are being maintained. Next efforts will target the state and private sites managed out of Soldotna and Anchorage and that have been closed with IC's. When the state and private effort is complete, IC Unit staff will begin a review of Federal Facility sites. Managers and staff will be asked how best to support effective maintenance and monitoring of IC's at federal sites.

LOOKING AHEAD:
TOP 10 FY 2012 PRIORITIES
FOR THE CONTAMINATED SITES PROGRAM

1. **Make measureable progress on investigation and cleanup at the following high priority sites:**

   Kinkaid Park
   Flint Hills Refinery
   Sterling ZipMart
   Umiat FUDS/Foothills Road
   IHS/BIA Kotzebue
   Eielson Air Force Base
   Galena Air Station
   Red Devil Mine
   Salt Chuck Mine
   Northeast Cape (St. Lawrence Island) Formerly Used Defense Site
   Aniak White Alice Communications Site

2. **Aggressively pursue the cleanup of state-owned and state-lead sites (**See the section on Capital Improvement Projects for a complete list).

3. **Natural Resource Damage Assessment (NRDA):** Develop a simplified, state-led NRDA approach for contaminated groundwater.

4. **Regulations** – Update 18 AAC 75.341 Table B1 and 75.345 Table C. Adopt by reference the revised risk assessment procedures manual, unofficially in use for several years. Clarify section 75.350 (groundwater use determination).

5. **Site Discovery:** Explore options for possible development of a program for unidentified sites, rifle ranges, abandoned canneries, buried waste sites, mines, etc.; explore federal funding for site discovery and assessment.

6. **GIS:** Increase expertise and use among/by staff; develop ARC GIS Explorer-based platform for CS webmap.

7. **Institutional Controls:** Update IC guidance to include a new section on off-site properties; continue to transfer State and Private sites to IC Unit; evaluate federal property IC issues.

8. **Enforcement Policy:** Evaluate, clarify and update the CSP's policy on enforcement. Align program enforcement policy with SPAR Investigatory Approach through active participation in the SPAR Investigation Workgroup.

9. **Exposure Tracking Model:** Update embedded risk evaluation model in order to better prioritize site management and accomplish performance measures.

10. **Coastal Impact Assistance Program:** Under a 4-year project, the CSP is partnering with the DEC Solid Waste Program to identify contaminated sites and dump sites with erosion issues in Western and Arctic coastal areas, funded through a grant from the Department of Natural Resources. Project implementation will occur in FY 2012. Contaminated Sites staff will be identifying sites and landfills, with field assessment work to begin in the summer of 2012.