

2009 ANNUAL REPORT



Basin Environmental Improvement Project Commission

February 2010

Table of Contents

Executive Summary	2
BEIPC Overview	3 - 4
Program Management	4 - 5
Public Outreach and Citizen Involvement	5 - 8
Calendar Year 2009 Work Accomplishments	9 - 31
Part 1-Work Funded with Superfund or Other Cleanup Funding:	
Blood Lead Screening in Children	
Residential and Community Property Remediation	
Repository Development and Management	
Recreational Use Activities	
Upper Basin Remedies	
Lower Basin Remedies	
Basin Environmental Monitoring	
Part 2-Work Funded Through Clean Water Act Grants:	
FY 2003 Grant Project	
East Fork Pine Creek Revegetation	
FY 2004 Grant Projects	
Mica Bay Nutrient Reduction Project Phase 2	
Plummer Wastewater Treatment Pilot	
Plummer Creek Watershed Nutrient Load Assessment Modeling and Management Plan	
Pinehurst Flood Impact Study	
Silver Crescent Mine and Mill Complex Habitat Restoration	
Canyon Creek Treatability Study	
South Fork Sewer District Toxicity Reduction	
Coeur d'Alene Lake Response to Watershed Remediation Phase 2	
Sediment Transport and Bed Evolution Phase 2	
Assessment of the Economics and Effectiveness of Alluvium Sorting as a Mine Waste Removal Strategy	
Coeur d'Alene Lake Management Plan Implementation	
Part 3-Other BEIPC Activities and Responsibilities:	
Lake Management Activities	
Infrastructure and Funding Source Evaluation	
Communications and Public Involvement	
Natural Resource Damage Restoration	
Challenges Ahead	31 - 32

Executive Summary

The Basin Environmental Improvement Project Commission (BEIPC) is a locally based organization responsible for overseeing environmental cleanup to address heavy metal contamination, natural resource restoration and water quality in the Coeur d'Alene Basin (Basin). The BEIPC also participates in securing funding along with guiding and coordinating infrastructure upgrades and improvements to protect the environmental cleanup remedy and enhance living conditions in the communities of the Basin. The Basin is defined as the watersheds of the Coeur d'Alene River, Coeur d'Alene Lake and the Spokane River within the Counties of Shoshone, Kootenai, and Benewah, as well as the Coeur d'Alene Tribal Reservation within Idaho.

During Calendar Year 2009, the BEIPC continued implementation of an updated five-year operating plan; developed annual and updated five-year work plans for work funded through the Superfund, other cleanup appropriations, and Clean Water Act (CWA) grants; and monitored project accomplishments by various implementing entities. CWA work was managed by BEIPC staff from grants made by the U.S. Environmental Protection Agency (EPA) to the State of Idaho Department of Environmental Quality (IDEQ) acting as the BEIPC fiscal agent. The BEIPC completed a consolidated Upper Basin Drainage Control and Infrastructure Revitalization Plan to deal with potential damage to remediated areas and other infrastructure needs.



Coeur d'Alene River

BEIPC Overview

Authorization and Duties

The BEIPC was established by the Idaho State Legislature and implemented through a Memorandum of Agreement (MOA) among implementing parties to direct, and/or coordinate environmental remediation, natural resource restoration, and related measures to address water quality and heavy metal contamination in the Basin.

The Basin is considered to be Operable Unit 3 (OU-3) of the Bunker Hill Mining and Metallurgical Complex Superfund Facility, originally listed on the National Priorities List in 1983. Operable Units 1 and 2 (OU-1&2) are the populated, industrial, and undeveloped areas in what is known as the “Bunker Hill Box.” The EPA and IDEQ are the implementing agencies for OU-1&2.

The BEIPC’s primary purpose is to work with the EPA and IDEQ to implement the Record of Decision (ROD) for OU-3 designed to advance the cleanup of heavy metals contamination throughout the Basin. In addition, the BEIPC is involved in:

- Evaluating OU-2 and Upper Basin OU-3 ecological cleanup activities to develop a comprehensive cleanup plan for the Upper Basin;
- Coeur d’Alene Lake management planning and implementation;
- Heavy metal contamination cleanup efforts at mining sites in the North Fork of the Coeur d’Alene River;
- Development of a Drainage Control and Infrastructure Revitalization Plan for the Upper Basin; and
- Leading multi agency involvement in addressing potential flooding in the Pine Creek drainage and the South Fork of the CDA River.

Legislation creating the BEIPC authorized appointment of a seven-member board comprised of:

- Four members from Idaho, one representing the state, and one each representing the county commissions from Shoshone, Kootenai, and Benewah Counties, appointed by the Governor of Idaho;
- One representative of the state of Washington appointed by the Governor of Washington;
- One tribal council member of the Coeur d’Alene Tribe appointed by the council of the Coeur d’Alene Tribe; and
- One federal representative of the United States appointed by the President.

Implementing language directed the BEIPC to appoint an Executive Director to manage the activities of the BEIPC. The Executive Director is Terry Harwood.

Current BEIPC Membership

Name	Title	Representing
Jon Cantamessa, Chair	Shoshone County Commissioner	Shoshone County
Jack Buell	Benewah County Commissioner	Benewah County
Rick Currie, Vice Chair	Kootenai County Commissioner	Kootenai County
Chief Allan	Chairman, Tribal Council	Coeur d'Alene Tribe
Grant Pfeifer	Regional Director, Washington Department of Ecology	State of Washington
Toni Hardesty	Director, Idaho Department of Environmental Quality	State of Idaho
Michelle Pirzadeh	Acting Regional Administrator, R-10 EPA	Federal Government

Program Management

The BEIPC operates in accordance with the Idaho statute and the MOA between the governing entities. It is responsible for coordinating the activities of federal, tribal, state and local government agencies implementing the Record of Decision (ROD) for Operable Unit 3 (OU-3) and evaluating OU-2 and Upper Basin OU-3 ecological cleanup activities to develop a comprehensive cleanup plan for the Upper Basin. It is also involved in the coordination of efforts to protect the cleanup remedies, human health, and the environment from the release and migration of contaminants through the implementation of Institutional Controls in the Basin and implementation of a Drainage Control and Infrastructure Revitalization Plan for the Upper Basin communities. The BEIPC works with these agencies to establish annual work priorities and operating plans and provides project oversight and fiscal management for the Clean Water Act (CWA) research and demonstration project program through the office of its Executive Director and his staff. The office of the Executive Director is also involved in the development and implementation of a consolidated infrastructure inventory and revitalization plan for the Upper Basin communities and analysis of the potential for stormwater runoff damage to remediated areas as part of a program to protect and enhance the Superfund remedy in those communities. To assist the Executive Director in program management, planning, and implementation, volunteer staff “on loan” to the BEIPC from the states of Idaho and Washington, the EPA, and the Coeur d’Alene Tribe coordinate with the Executive Director and provide routine intergovernmental input on technical and policy issues. Other support groups include the Technical Leadership Group (TLG) and the Citizens Coordinating Council (CCC).

Technical Leadership Group (TLG)

The TLG with its Project Focus Teams (PFTs) is the BEIPC primary technical advisory group. It is comprised of federal, state, local and tribal representatives as well as interested private citizens on the PFTs who provide expertise in science, engineering, logistics, regulatory aspects, and land management in the Basin. The TLG

advises the BEIPC on work planning and implementation while striving toward consensus-based recommendations. In 2009, the PFTs and TLG developed the 2010-2014 Five-Year and Calendar Year 2010 draft work plans, reviewed and approved CWA project changes, final CWA project reports and deliverables, and studied and developed project and program proposals to implement the remedy in OU-2 and 3. The TLG is currently composed of representatives from 23 governmental entities.

Public Outreach and Citizen Involvement

Community Involvement

During Calendar Year 2009, the BEIPC held meetings and deliberations open to the public and maintained an up-to-date Basin website at: www.basincommission.com. Meetings were held at various locations within the Basin with locations and dates posted in local newspapers and at the BEIPC office in Kellogg, Idaho. In August, the BEIPC held a field tour and provided public transportation to various sites in the Upper Basin where agencies were performing environmental cleanup activities. EPA, IDEQ and the BEIPC held a number of community open houses to discuss the development of repositories. General public comment opportunities are scheduled at each meeting.

Citizens Coordinating Council (CCC)

The CCC serves as an information conduit to and from the BEIPC on citizen, community, and special interest issues, and on environmental cleanup and restoration concerns. It is comprised of politically and geographically diverse members and was established to provide local citizen review and input on Basin related work to the BEIPC.

CCC Meetings and Communication

CCC meetings were held in February, April, July, and October 2009. In addition to these regular quarterly meetings, the CCC also sponsored two community meetings to discuss the Upper Basin repository siting process in May and June 2009. All meetings were open to the public. A number of CCC members also participated in workshops in 2009 to learn more about effective public involvement, building trust, and resolving conflicts.

At the regular quarterly CCC meetings, members were updated on ongoing BEIPC and TLG activities and asked to provide input on a variety of issues such as repository siting, Upper Basin project prioritization, the Upper Basin ROD Amendment and BEIPC work plans. The CCC informed the BEIPC of its activities by providing meeting minutes and comments to Commissioners prior to BEIPC meetings and by making presentations at BEIPC meetings.

Once or twice a month, CCC members were provided with email and/or U.S. mail updates on relevant activities in the Basin. CCC members were also routinely provided notes from regular TLG conference calls.

In 2009, the CCC elected a new Chair, Jerry Boyd, and a new Vice-Chair, Bonnie Douglas.

The CCC's founding Chair, John Snider passed away in October 2009. Earlier in the year, the Basin

Commission paid tribute to John with a plaque and certificate, which read:

The Coeur d'Alene Basin Citizens Coordinating Council (CCC) and Basin Environmental Improvement Project Commission (BEIPC) would like to thank John Snider for his service as elected Chair of the CCC. Since the CCC's inception, John has volunteered his time to ensure that the citizens of the Basin have a forum for sharing their opinions and knowledge about the cleanup of the Coeur d'Alene Basin. He has been instrumental in making sure citizens have an important and consistent voice in the decisions of the Basin Commission. John's Chairmanship is only the latest chapter of his longstanding service to the Basin community, and his election as Chair of the CCC for three terms is only one testament to the respect and gratitude of the Basin's citizens. We thank John for his service and the legacy he has created for the CCC.

Chronology of Selected CCC Activities and Input to the BEIPC in 2009

In addition to receiving updates approximately every three weeks via email or regular mail about current BEIPC activities, CCC members were involved in the following activities in 2009.

January-February

- CCC members were invited to participate in a meeting on Upper Basin project prioritization and the ROD Amendment, which were frequent topics of discussion at CCC meetings over the course of 2009.

February

- The CCC held a regular quarterly meeting on February 4. Topics included updates on the ROD Amendment, the Lake Management Plan, repositories, and Lower Basin work planning.
- The CCC Vice-Chair presented the results of the February 4 CCC meeting at the February 25 BEIPC board meeting.

March

- Some CCC members participated in community involvement training on "Building Trust and Resolving Differences" in Coeur d'Alene on March 26. The training was provided by the EPA and BEIPC.
- CCC members participated in the election of a new CCC Chair and Vice Chair.

April

- The CCC held a regular quarterly meeting on April 29. Topics included CCC elections, the ROD Amendment, lake management, a repository update, an update on Lower Basin work planning, and a tribute to founding CCC Chair John Snider.
- CCC members reviewed and advised on proposed revisions to the CCC Operational Practices and Procedures.

May

- The CCC sponsored and chaired the first of two 2009 public meetings on the Upper Basin repository siting process on May 14.
- The CCC Chair presented the results of the April 29 CCC meeting at the May 20 BEIPC board meeting.

June

- The CCC sponsored and chaired the second of two 2009 public meetings on the Upper Basin repository siting process on June 24.

July

- The CCC held a regular quarterly meeting on July 29. Topics included CCC Organizational Practices and Procedures, construction and operations at East Mission Flats repository, the Upper Basin repository siting process, Upper Basin project prioritization, and the ROD Amendment.

August

- Some CCC members participated in an EPA-sponsored community involvement training conference held August 18-20.
- The CCC Chair presented the results of the July 29 CCC meeting at the August 19 BEIPC board meeting.
- Some CCC members participated in a BEIPC field tour of the Basin on August 19.

September

- CCC members were invited to participate in a Page Repository open house held on September 9.
- CCC members were invited to comment on the draft Lower Basin Conceptual Site Model.
- CCC members were kept informed about ongoing EPA reviews of the East Mission Flats Repository.

October

- The CCC held a regular quarterly meeting on October 28. Topics included the draft five-year and one-year BEIPC work plans, Lake Management Plan implementation, repository updates, Upper Basin project prioritization, the ROD Amendment, and the Lower Basin Conceptual Site Model.
- CCC members reviewed, discussed, and provided comments on the draft 2010-2014 BEIPC Five-Year Plan and the draft 2010 BEIPC Work Plan.
- CCC members were invited to participate in an East Mission Flats Repository monitoring plan open house on October 29.

November-December

- The CCC Chair presented the results of the October 28 CCC meeting at the November 18 BEIPC board meeting.
- Public education materials on lead awareness were shared with CCC members.



August BEIPC Tour at Little Pine Creek

Additional Outreach Activities

In addition to the activities of the CCC, the various governmental entities represented by the BEIPC continue to support the TLG and CCC by being involved in the activities of those groups. The governmental entities have been involved in outreach activities including meeting with citizen groups, giving technical presentations, participating in Basin events, holding tours of Basin project areas, maintaining information repositories throughout the Basin, and publishing various information documents to provide updates on Basin activities and to give answers to common environmental cleanup and improvement questions.

As part of the public outreach program, the BEIPC Executive Director continued to make numerous presentations to local business and community groups concerning activities of the BEIPC and planned cleanup actions and activities required to protect the remedy, human health, and the environment. The Executive Director also hosted a number of field reviews by the media and other interested parties.

Calendar Year 2009 Work Accomplishments

Work Funded Through Federal Superfund Or Other Cleanup Funding:

Blood Lead Screening in Children

Annual Basin blood lead testing was conducted in July 2009. One hundred seventy five children were tested as part of the program. This number is over twice the number of children tested in 2006, 2007, and 2008 when 69, 71, and 73 children were tested, respectively. Different from previous years, parents were offered a \$40 incentive for each child tested. This compared to a \$20 incentive in previous years. The \$40 incentive was a one time increase to encourage more parents to have their children tested. Results of the 2009 blood lead testing program will be presented to the BEIPC at the February 2010 meeting.

The Blood Lead Testing is part of the Panhandle Heath District's Health Intervention Program. Parents of children testing high are notified of the results and offered an in-home health consultation to identify ways to reduce exposures to lead. In 2006 and 2008, one child was identified with a blood lead level greater than 10 micrograms per deciliter, which is the level of concern identified by the Centers for Disease Control. In 2009, no children were found to have a blood lead level equal to or greater than 10 micrograms per deciliter.

Basin Property Remediation Program (BPRP)

This year 1,270 property equivalents were remediated as part of the BPRP. This compares to 524 and 543 equivalents in 2008 and 2007, respectively. Property equivalent is a calculated number based on a property address and area measured as acres or square feet. The purpose of creating the equivalent was to provide a number that can better be used to compare work accomplished from year to year. This was necessary because property address number alone is insufficient to measure productivity because properties vary in size. However, since the equivalents concept can be confusing, the discussion in this report uses addresses and area remediated to discuss work accomplished.

IDEQ remediated a total of 547 property addresses during the 2009 BPRP. Two hundred fifty four of this year's properties were remediated through a cooperative agreement funded by the EPA and the State of Idaho. The additional 293 properties were remediated through funding that was provided from the American Recovery and Reinvestment Act (ARRA). In July 2009, the State of Idaho received \$15,000,000 in additional funding through the ARRA to be used over a 2 to 3 year period for the BPRP. The addition of Stimulus funding to the project enabled the program to remediate additional properties including a number of larger properties that were not included in previous years due to funding constraints. Wellman Baseball and Sather Football Fields in Silverton were completed during the 2009 construction season along with a number of large commercial and residential properties in the Ninemile and Osburn areas.

Nearly 6.5 million square feet of property was remediated and the contaminated material disposed of in the Big Creek and the East Mission Flats Repositories. As a point of reference, the 2006, 2007 and 2008 BPRP programs remediated approximately 2.5 million square feet of property each year.

The 2009 program was able to perform a large amount of cut and fill within individual properties. The table on the next page shows that this activity resulted in an overall reduction in number of loads hauled to the

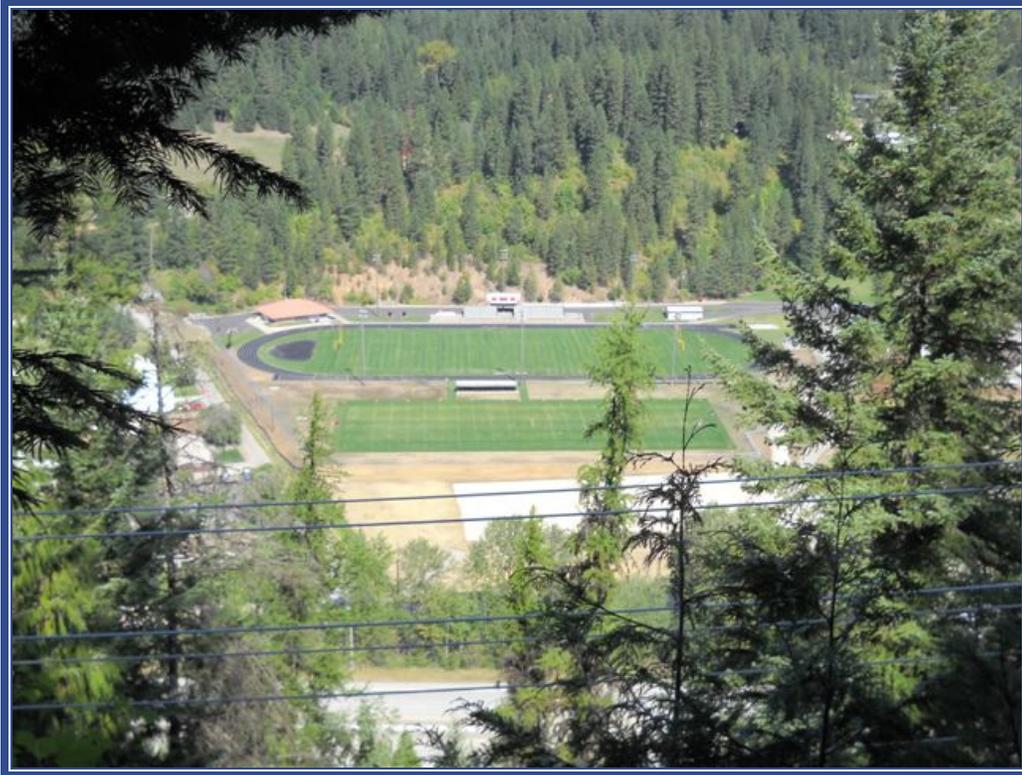
repositories. The combined 2007/2008 average loads per acre remediated was 148. During the 2009 remediation program, an average of 126 loads per acre remediated was hauled to the repositories. This resulted in an overall reduction of hauled material of nearly 3,300 loads or approximately 26,000 cubic yards of material that would have otherwise been placed in the repositories.

Year	Number Property Addresses	Area Remediated (Acres)	Waste From BPRP Disposed of to Repositories (Loads)	Loads Per Acre
2007	373	60	9,240	154
2008	352	57	8,129	143
2009	547	149	18,780	126

Forty eight (48) of the 2009 remediated sites were considered high risk properties where the exposure risk was elevated because of the presence of small children and/or pregnant women. The total cost of the 2009 program was approximately \$30 million. Each year, IDEQ consultants collect soil samples and send them in for analysis to determine which properties will require remediation in the future. This sampling is the basis for the following year BPRP remediation program.



Completed Remediation at Wellman Baseball Field in Silverton



Completed Remediation at Sather Football Field in Silverton

Repositories

Introduction

The repositories were heavily utilized this year as a result of the \$15 million ARRA Stimulus funding. Contaminated soil from the expanded cleanup effort was delivered to and disposed of at one of two operating repositories; the Big Creek Repository (BCR) near the community of Big Creek, or the East Mission Flats Repository (EMFR) near Cataldo. A summary of activity at each site is described in the following sections.

Big Creek Repository

This repository is being constructed on a reclaimed mine tailings pond near the confluence of Big Creek and the South Fork of the Coeur d'Alene River. While IDEQ and EPA collaboratively manage the site, IDEQ, with funds from EPA, continues to fill the lead role in daily management and construction activities. During 2009, the Big Creek Repository received 15,025 truck loads from the BPRP and 1,307 truck loads from the Institutional Controls Program (ICP). Final in-place, compacted volume from the truck loads was about 107,000 cubic yards. This material was placed and compacted in accordance with the fill plan outlined in the annual BCR Operations Plan. IDEQ's site management contractor oversaw these activities including operation of the decontamination facility. In 2009, the water quality monitoring program at the site found that it had not impacted adjacent surface or ground waters, some of which were previously impacted by historic mining. The ICP waste delivery area at BCR is accessible through a key-card enabled gate 24 hours per day/seven days a week to accept wastes generated from compliance with the ICP. The ICP users obtain a pass-card from the

Panhandle Health District (PHD) when they obtain their ICP permit, and bring the waste to the ICP receiving area on the south side of repository. When the ICP receiving area is filled, the material is moved to the repository for final disposition. Large volumes of ICP wastes generated from excavation projects associated with infrastructure or major property development were hauled directly to the BCR in coordination with IDEQ and the BPRP.

The BCR is nearly full. In an effort to maximize storage capacity at this site, the preliminary study to expand on the north side of BCR initiated in 2008 was re-visited in 2009. The proposed expansion will be analyzed in early 2010 to determine if it could provide safe storage of contaminated soils. If the analysis indicates that the expansion is viable, it could add 100,000 to 200,000 cubic yards to the capacity depending on design considerations. If viable, the goal then will be to have the north side expansion fill area ready to receive waste during the 2010 field season.

East Mission Flats Repository

The Final Design Report for the EMFR was completed in June 2009. EPA approved the site for use as a waste soil repository in August.

A significant amount of site preparation was completed at EMFR prior to the August opening. In order to receive waste two temporary access points were constructed: (1) a ramp from Exit 39 off Interstate 90 at the west end of the site; and (2) a “back door” road across the south side of the repository footprint linking the ICP entrance on the east side to the fill area on the west side adjacent to Exit 39. Most of the contaminated material in 2009 was hauled to the repository over this back door road. Since the access routes and truck dump areas were constructed of clean imported fill materials, no truck decontamination facilities were necessary this year.

A 103-foot concrete deck bridge was constructed off of Exit 39 at the west end of the site. The bridge construction operation included cranes, pile drivers and other heavy construction equipment that blocked the Exit 39 entrance to EMFR from mid-August to mid October. During this period the back door road proved to be critical for successful repository operations. The waste haul trucks used the back door road to transport contaminated soil from the ICP entrance to the fill area on the west side of the site.

The EMFR repository received 3,755 truck loads from the BPRP and 62 truck loads from the ICP that amounted to approximately 23,500 cubic yards of contaminated fill. Approximately 3,000 cubic yards of clean engineered fill were imported to create the east approach of the bridge. An additional three acres of ground within the final footprint of the repository were cleared in preparation to receive waste soil in the 2010 construction season. The timber from clearing operations was donated for use in a wood-fired boiler for space heating and the slash was burned at the site during the Open Burning season in late October.

The waste soil pile was stabilized to prevent erosion from rainfall, snowmelt and potential floods during the winter and spring months. The side-slopes completed to final grade were covered with filter material and rip rap. Side-slopes at temporary construction grade were shaped to a 3 horizontal to 1 vertical (3:1) slope and covered with a spray-on tackifier. Straw wattles were placed on the unfinished side-slopes to further retard soil erosion from the exposed soil faces.

The interior of the waste soil mass was compacted and graded to convey water to a central stormwater retention pond. The pond is located on the interior to the waste soil mass so that stormwater will be contained on-site. Once the final compaction and grading was complete the surface was sprayed with a tackifier to bind the soil

surface. Winter closure activities were completed in November.

The ICP entrance will be open on the east end of EMFR to receive ICP waste during the winter closure period. The ICP area will be observed by the IDEQ Project Manager and Operations Contractor at intervals during the winter closure period. All ICP waste deposited at EMFR will be transported to BCR during the winter closure period to minimize flood risk due to unstabilized contaminated soil exposure at the EMFR site.

Groundwater monitoring was conducted on a network of six wells on or near the EMFR property. Groundwater monitoring program results indicate that fill activities have not impacted groundwater beneath the site. One well located approximately 1,700 feet west and upgradient of the site reported exceedence of the EPA drinking water standard for arsenic in one of three groundwater monitoring events conducted prior to repository construction and operation.

Additional site development activities will be performed at EMFR over the winter and early spring. These activities will include: (1) drilling monitoring wells and a water supply well for the permanent decontamination (decon) facility; (2) constructing the concrete decon facility; (3) constructing the site office and pump house; (4) paving the bridge west approach and deck; and (5) final grading and surfacing of the decon area.

New Repositories

A new repository in the Upper Basin will be needed to store waste once BCR is full. A site selection process is underway to identify one or more sites for the Upper Basin area. A summary of the site selection tasks completed in 2009 includes:

- Two public meetings were conducted in Wallace, one in May and one in June. The purpose of the meetings was to receive citizen input on criteria for use in the site selection process. The outcome of these meetings was development of nine citizen siting criteria.
- The agencies screened a list of 94 Upper Basin candidate sites with two first-cut suitability criteria: (1) capacity in excess of 500,000 cy; and (2) the site must be currently inactive. The first-cut screening produced a short-list of eight sites for further evaluation.
- The citizen criteria were presented to the Repository PFT and local elected officials for relative weighting of each of the criteria.
- The weighted citizen criteria were applied to the eight short-listed sites. The resultant scoring yielded a priority listing of the eight sites in accordance with the weighted criteria evaluation.
- The agencies took the prioritized list and are currently conducting preliminary development cost analyses on the top two citizen criteria ranked sites. The top two sites are Osburn Ponds and Star Ponds.
- The agencies will make the decision on site selection after review of the cost analyses and further evaluation of the sites. This will likely occur in the first half of 2010.
- The public will be afforded an opportunity to comment on the proposed repository location(s) in accordance with the 2002 Bunker Hill Mining and Metallurgical Complex OU-3 Record of Decision (ROD) requirements.

The repository team was also active in coordination with the EPA ROD Amendment team to outline repository needs for the proposed mine and mill site remedial actions.



Start of Construction at West End of EMF



End of Construction Season at EMF Main Entrance off Exit 39

Recreational Use Areas

The work of the Recreation Area PFT was moved as a subcommittee under the Lower Basin PFT. This transfer came about since most of the existing and future potential recreation areas are within the Lower Basin. Work on Upper Basin sites will still be accomplished within this revised framework.

Efforts continue to restore the Gene Day Pond in Osburn, Idaho, into an urban fishery which would be managed by the Idaho Department of Fish and Game. The U.S. Army Corps of Engineers (USACE) conducted field sampling for metals in and around the Pond in late June/early July. In September 2009, representatives of local government and federal and State agencies met for a site tour and an initial project scoping meeting. In November, the USACE Real Estate Office completed one of the action items that resulted from this meeting; identification and delineation of property ownership surrounding the Pond. The next step is to develop a preliminary design and budget for the project.

Upper Basin Remedies

During 2009, EPA, IDEQ and others continued to work on changes to the cleanup plans for the Upper Basin. The change, called a ROD (Record of Decision) Amendment, will result in an updated cleanup plan for the Upper Basin to protect public health and the environment. The Upper Basin includes the South Fork of the Coeur d'Alene River and its tributaries downstream to where they combine with the North Fork. Also included is the 21-square mile Bunker Hill "Box" where EPA began its cleanup work in the 1980s. The goal of this effort is to set out a comprehensive cleanup approach across the Upper Basin to protect the environment, particularly water quality, and ensure that the human health remedy is protected for the long-term. EPA is doing this work to reflect improved knowledge of local conditions, as well as to address the recommendations of the National Academy of Sciences.

There were many meetings in 2009 regarding the cleanup plan. Technical meetings were held with the Upper Basin PFT to share the results of groundwater modeling, discuss cleanup alternatives, and gather input on development of the updated cleanup plan. The Upper Basin PFT includes TLG and community representatives. Updates were also provided at all TLG, CCC and Basin Commission meetings. Meetings to share information and gather input were held with mayors and other officials in the Upper Basin. Information about the cleanup plan changes has also been shared at various community group meetings.

2009 ROD Amendment efforts include the following:

Setting Cleanup Priorities: The cleanup plan will include actions at a large number of mine and mill sites in the Upper Basin, impacted streams, and areas within the Bunker Hill "Box" (Operable Unit 2) to remove or cap contaminants, or collect groundwater for treatment. In parallel with the ROD Amendment process, EPA is prioritizing the 350+ mine and mill sites in the Upper Basin. This process will identify those sites where actions should be taken first. These are typically the larger sites, high in the drainage, which contribute a significant amount of metals to surface water and groundwater that degrade stream water quality. This process considers such things as the volume of mining waste at a site, the potential to contribute metals, stream conditions, and other factors such as human health impacts.

As this process proceeds, priority sites within close proximity to each other will be grouped into "buckets" for cleanup. This will provide for greater efficiency during the cleanup process. Wherever possible, wastes will be

consolidated on-site within a given “bucket” of sites. In some cases on-site disposal may not be practicable or appropriate and wastes would then be transported to a local or regional repository. EPA is working through this priority setting process with input from the Upper Basin PFT. This group is also working closely with the repository siting team to ensure that these cleanups are in sync with the locations and sizes of future repositories.

ROD Amendment Repositories Will Be Needed: In addition to property cleanups, the upcoming ROD Amendment work is also driving the need for new repositories. Contaminated soils from old mine sites, for example, as well as other cleanups under the ROD Amendment, will need to be securely contained. This will prevent contaminants from being released to surface water, groundwater, or air in levels above state and/or federal standards. Without repositories, the cleanup cannot move forward and the public will continue to be exposed to high metals levels.

Large, centrally-located regional repositories are one option for storing ROD Amendment waste. However, for mine and mill site (“source area”) cleanups, EPA's first step will be to look for opportunities to safely consolidate and cap waste on-site or in the immediate vicinity of mine and mill sites in side canyon areas. EPA has done this successfully on many occasions, such as the Golconda, Rex and Constitution mine site cleanups. As a result, we have been able to reduce the volume of soils hauled to repositories. In general, we can reduce the size and number of repositories needed for cleanup by taking full advantage of the number of sites where we can safely consolidate contaminated soils. If waste cannot safely be contained on-site, it will be taken to a regional repository. IDEQ, EPA, and the Basin Commission are working together to find places for new repositories in the Upper Basin. There are many opportunities for community involvement in regional repository siting. At this time, it is not possible to estimate the number of repositories needed to contain wastes that will come from ROD Amendment work. The number of future repositories depends on the amount of waste, and the location and size of the repositories.

Protection of Existing Remedies: EPA’s top cleanup priority is to address human health risks. Among other things, this means keeping clean soil barriers in place and clean areas clean. As part of the ROD Amendment, EPA is working with IDEQ in the Upper Basin to better understand where barriers that protect people’s health may be at risk of recontamination. One main way recontamination can occur is by uncontrolled water flow from flooding and rain storms. Remedy protection planning will build on work already done by the BEIPC, local representatives and the agencies in developing the Upper Basin *Drainage Control Infrastructure Revitalization Plan* (DCIRP) which includes the *Box Infrastructure & Revitalization Plan* (IRP).

Tributary and precipitation flooding has been modeled in the populated areas of the Upper Basin. Areas of expected scouring and recontamination have been mapped. Upper Basin Mayors, Shoshone County Commissioners, and their Public Works and Streets Supervisors have provided input to the technical analysis. They have also given feedback on the resulting impact maps based on their on-the-ground experiences. In the ROD Amendment, EPA and IDEQ expect to propose projects to address tributary and precipitation flooding in localized areas to prevent damage to clean barriers.

EPA and IDEQ will be looking for ways to work with the entities that have jurisdiction to identify and implement projects. Any remedy protection projects to be done by EPA and IDEQ would need to protect human health. Projects could include:

- Re-routing local drainages,
- Installing/upgrading culverts, and

- Working on storm water management systems like curbs, gutters, and pipes.

Local Mayors and County Commissioners have raised concerns that some roads are deteriorating and they believe they may no longer be an adequate barrier. EPA and IDEQ agree that roads act as barriers and are important to the long-term success of the remedy. EPA and IDEQ will look for ways to collaborate with local, county, and state agencies that provide and maintain roads in their communities. This work will be done under the existing RODs and not as part of the ROD Amendment.

Upcoming in 2010: In 2010, there will be additional technical meetings updates to the TLG, CCC and Basin Commission, and other community meetings to share information about the cleanup plan development. EPA anticipates that the draft cleanup plan or “Proposed Plan” will be available for public comment in early summer 2010. During the comment period, a public meeting will be held in the Upper Basin. The ROD Amendment is expected to be issued in early fall 2010.

Learn More about the ROD Amendment: To learn more about the ROD Amendment, additional details are online. Technical memos, a map, materials from past meetings, and community involvement documents may be found at <http://yosemite.epa.gov/R10/CLEANUP.NSF/sites/bh+rod+amendment>

Lower Basin Remedies

The cleanup described in the OU-3 ROD for the Lower Basin includes actions for the wetlands and lateral lakes, the river banks, splay areas and river bed. The objectives of remediation in the Lower Basin focus on reducing human health risks, improving wildlife habitat and reducing particulate lead in the Coeur d’Alene River system.

In April 2006, EPA used Coeur d’Alene Basin Superfund settlement monies to purchase a 396-acre conservation easement with a willing private property owner. The agreement was established to help meet OU-3 ROD goals in establishing safe waterfowl feeding habitat in the Lower Basin as they pertain to metals of concern. Other parties participating in agreement negotiations included the U.S. Fish and Wildlife Service (USFWS) and Ducks Unlimited. Remedial action construction in ~300 acres of the easement started in September 2006 and was completed in 2007 using ASARCO Environmental Trust Fund moneys. EPA anticipates completion of the remedial action in the remaining ~90+ acres in 2009 with the final touches being finished in early 2010. The Coeur d’Alene Basin Natural Resource Trustees have begun wetland restoration within the easement. USFWS and Ducks Unlimited will conduct restoration activities, and USFWS will coordinate operation and maintenance of the site over the long-term under the Trustees’ 2007 Coeur d’Alene Basin Final Interim Restoration Plan. Restoration activities are being funded by Natural Resource Damage Assessment (NRDA) settlement funds. Through the Superfund remedial action and NRDA restoration activities, contamination is being addressed and this area is being made into perpetually protected, high quality feeding habitat for both migratory and resident swans, ducks, and other wetland species.

There are a significant number of data gaps and uncertainties with respect to the fate and transport of contaminants in the Lower Basin which must be addressed prior to commencement of remedial actions in this area. Additional data and sediment transport modeling is needed to better understand the system. During 2009, efforts have been underway by EPA to address some of these uncertainties as discussed below. In addition Clean Water Act (CWA) sub grants were approved by the BEIPC that will help provide site-specific information for remedial decisions. All of the BEIPC studies and demonstration projects are now completed.

In 2009, EPA began developing an Enhanced Conceptual Site Model (ECSM) for the Lower Basin. The ECSM will serve to refine the current working understanding of the Lower Basin with respect to river flows and sediment transport. In 2009, EPA's contractor performed a review of existing literature and predictive tools on this topic and generated a series of technical memorandums that displayed the refined understanding of topics pertinent to contaminated sediment transport and updating (enhancing) the Lower Basin Conceptual Site Model. Ultimately the ECSM will culminate in the selection of a computational model to assist in decision making and remedy implementation by better understanding contaminated sediment transport. The technical memorandums were made available to the Lower Basin PFT, the TLG and the CCC in September and October for review and comment. Comments were received from a range of stakeholders and are being considered by EPA. The list of the ECSM Technical Memoranda is as follows:

- ECSM Synopsis
- Executive Summary
- TM A Overview
- TM C Hydrology
- TM D Hydraulics and Sediment Transport
- TM E Fluvial Geomorphology
- TM F Geochemistry
- TM G Contaminant Sources
- TM H Simulation Modeling
- TM I Geospatial Data Management
- TM J Data Gaps and Other Uncertainties

The list of memoranda originally listed TM-B and TM-K, which were initially conceptualized for this ECSM effort. However, after subsequent consideration they were not necessary or germane to the effort.

Also, in 2009, IDEQ and Kootenai Shoshone Soil and Water Conservation District (KSSWCD) utilized some remaining CWA funds and conducted a project entitled: Estimating Riverbank Erosion on the Coeur d'Alene River. They worked jointly on this CWA project during the summer and fall of 2008, and in 2009 they provided a PowerPoint presentation on the work they conducted. The project objective was to start prioritizing bank stabilization projects from Cataldo to the mouth of the river by estimating annual bank erosion at representative sites. They also identified bank types and collected soil samples which were tested for arsenic, lead, zinc, and phosphorus.

In 2009, EPA presented results from the Lane Marsh Site Characterization, which utilized 2008 AETF funds. The goal was to gain additional understanding of Lower Basin wetlands by looking at water fowl use, collect soil samples that were tested for lead levels, and conduct a hydrologic assessment.

In 2009, The Lower Basin PFT identified a mission statement as follows: The Lower Basin PFT will dedicate itself to improve the human and ecological health of the Lower Coeur d'Alene River Basin (confluence to Harrison) by collaborating and coordinating planning actions affecting Operable Unit (OU)-3.

The above work that was conducted in 2009 will assist the Lower Basin PFT as they continue to identify potential project sites in the Lower Basin.

Despite the large extent of mining-related contamination, resulting ecological and human health risks

previously documented, and work described in the ROD, no additional remedial action Superfund money is currently designated for Lower Basin ecological remedies at this time. EPA Region 10 is receiving funding for human health remedies in OU-3, but not for Lower Basin ecological remedies. Some settlement monies received from the recent ASARCO bankruptcy settlement will be used to implement future cleanup projects in the Lower Basin after additional work planning has been conducted and contaminated sediment transport is better understood. In order to fully implement a comprehensive remedy in the Lower Basin, funding from the EPA Superfund program, ASARCO settlement monies, and other sources will be needed. The BEIPC will support EPA Region 10 in an effort to secure Superfund funding from EPA Headquarters.

Basin Environmental Monitoring

Basin Environmental Monitoring Plan

Monitoring in the Basin is required to obtain technical data for assessment of long-term project status and trends, evaluate overall effectiveness of the Selected Remedy and progress toward cleanup benchmarks and future CERCLA five-year reviews. Currently the Bunker Hill Superfund Site/Coer d'Alene (CDA) Basin has 3 primary monitoring plans which govern the long-term status and trends and remedial action effectiveness monitoring as required under the respective OU2/OU3 Record of Decisions (RODs). During 2009, EPA has been working with the Monitoring PFT and other interested parties to integrate the existing plans into a consolidated CDA Basin Environmental Monitoring Plan (BEMP) to (1) optimize the current monitoring under the various programs, and (2) enhance the overall program operation/effectiveness with respect to changes/adaptive management, laboratory coordination, field sampling, data management, and reporting efforts. This process will utilize existing quantitative and qualitative tools to evaluate and optimize the current program. In addition, the approach includes the opportunity for input and coordination with stakeholders on the approach, data, locations, and evaluation process. This overall effort is also consistent with the efforts underway to develop a Comprehensive Ecological Cleanup Plan as discussed in this Annual Report. As in the current BEMP, the monitoring will include sediments, surface water, groundwater, and biological monitoring at key locations in the Basin. The overall revised BEMP is expected to be completed in early 2010 for implementation in the spring of 2010.

EPA will continue to make analytical results from site surface water, soil and sediment sampling available on a web-accessible data management system. However, human health-related data will not be included in this database. For the last several years, EPA has made site environmental monitoring data available through a web page. Nationally, the STORET system is transitioning to the new WQX data management system and the site environmental monitoring data is accessible at a new website: www.bunkerhilldata.org. The biological monitoring data and annual monitoring reports are also accessible at EPA's web page under Technical Documents at <http://yosemite.epa.gov/R10/CLEANUP.NSF/sites/cda>. If needed, EPA will assist interested stake holders in accessing the information.

Work Funded Through CWA Grants:

Funding from the appropriations for Federal Fiscal Years (FY) 2002, 2003, and 2004 under the Clean Water Act (CWA) Section 104(b) (3) was made available for BEIPC project work. Under the CWA, these funds are to be used to demonstrate how *"federal, state, and local agencies can cooperatively conduct and promote the coordination and acceleration of research, investigation, experiments, training, demonstrations, surveys, and studies relating to the causes, effects, extent, prevention, reduction, and elimination of pollution."*

The FY 2002 and 2003 Grant work is complete and closed. Funding available for FY 2004, totaled \$1,988,200. A listing of completed project final reports along with a short summary of project purpose and conclusions and findings is posted on the BEIPC website. Copies of the final reports can be obtained at the office of the Executive Director. Following is a summary of work accomplished to date on the last 2003 project and the 2004 projects:

FY 2003 Grant Projects (Note, final remaining project completed in 2009)

East Fork Pine Creek Revegetation Pilot Project

Purpose of project - The project will help identify practical and cost-effective methods to accelerate natural revegetation processes. Vegetation is needed to ultimately stabilize many stream reaches within the CDA Basin. The project is intended to help identify and contrast the relative “bang for the buck” of several locally applicable revegetation methods.

Status of Project - All work complete and the final report will be presented to the BEIPC at the February 2010 meeting.

FY 2004 Grant Projects

Mica Bay Nutrient Reduction Project - Phase 2

Purpose of Work - The original work planned was intended to be a demonstration and training project for use by wetland delta landowners. It was intended to encourage them to consider altering management of unusable lands for the purpose of providing public benefits by lowering nutrient delivery to near shore areas of CDA Lake. The feasibility study resulting from the first phase of this project indicated that more land and considerable more funding was needed than originally anticipated to implement a meaningful project. IDEQ and the U.S. Fish and Wildlife Service (USFWS) were unsuccessful in their attempts to secure cooperation from enough landowners to implement the project as originally planned.

In August 2006, a willing landowner upstream from the Mica Creek Delta on the lower North Fork Mica Creek contacted the USFWS and IDEQ indicating interest in a streambank and bed stabilization project to control sediment and nutrient impacts to the Mica Creek Delta. Field investigation confirmed that there was significant and active streambank mass failure and erosion on sections of the North Fork Mica Creek located on the landowner’s property. IDEQ confirmed that a meaningful stream stabilization project could be completed with the funds available. IDEQ drafted an amended project proposal for Mica Creek that was presented to the BEIPC on November 29, 2006. The BEIPC approved the amended Mica Creek project. As amended, this project will serve as demonstration and training to acreage property owners within the CDA Lake Basin who have streams on their property, on the costs and effectiveness of various streambank and streambed rehabilitation methods to reduce fine sediment/nutrient erosion and export into CDA Lake.

Status of Project – All work complete.

Conclusions - The BEIPC and a group of cooperating agencies with a willing land owner have successfully completed a demonstration project to reduce sediment and nutrient loading to Mica Bay on Coeur d’Alene

Lake. The project had two purposes, to stabilize erosion damage on Mica Creek for the recovery of beneficial uses and to be a demonstration and training project to be used to work with landowners around the Lake and along streams feeding the Lake. It is intended to encourage landowners to consider land management activities to enhance their property while providing public benefits by lowering sediment and nutrient delivery to streams feeding the Lake and near shore areas.

Working with the landowners, the agencies implemented a stream bank and bed stabilization project on a number of areas along the creek to control sediment and nutrient impacts to the Mica Creek Delta. The various applications used were evaluated as to cost and effectiveness.

As part of the education and training portion of the project, a tour of the completed project was advertised and conducted. The tour was given by the involved agencies and the cooperating landowner. Tour components included: discussion on the impact of sediment and associated nutrients to streams and CDA Lake, photo display of pre-project conditions as compared to post-project conditions, costs per linear foot of the various methods used, discussion on the effectiveness of the various methods used, and discussion of the various cost-share programs available through the agencies involved in the project. Those agencies in addition to the Basin Commission and EPA included the Idaho Department of Environmental Quality, Kootenai/Shoshone Soil and Water Conservation District, Natural Resources Conservation Service, and the Idaho Soil Conservation Commission.

As an educational tool for a wider audience than local farmers and ranchers attending the tour and to serve as a long-term tool, a 10 minute DVD production of the project was produced utilizing filming segments conducted from start to finish. Copies of the DVD can be obtained from the Conservation District: ksswcd@icehouse.net.

Plummer Wastewater Treatment Pilot

Purpose of Project - The objective of this project is to show the viability of a wastewater infiltration treatment wetland in Plummer. A successful wetland would benefit water quality in Chatcolet Lake and CDA Lake by reducing nutrients that now flow into Plummer Creek from the Plummer Wastewater Treatment Facility.

Status of Project - All work complete.

Conclusions - At the onset of this project, the design flow rate was set at 3,000 gpm; however, it became apparent in December 2005 that this was unattainable. The flow rate was then set at 1,000 gpm and has remained constant since that time; the one exception being the time period January 6 and February 10, 2006 when flow had to be halted due to extraordinary high rainfall.

The pilot wetland sample data shows over the course of the study that it is, for the most part, effective at treating the influent levels of phosphorus and nitrate. However, due to the projected flows that will be involved in the full build-out, the 200 acres of land needed makes this a less than ideal treatment alternative for the City of Plummer.

Plummer Creek Watershed Nutrient Load Assessment, Modeling and Management Plan Development

Purpose of Project - The purpose of this project is to develop a Watershed Nutrient Management Plan which

will include appropriate and specific point nutrient source control efforts for the Plummer Creek watershed. To accomplish the project purpose, the specific objectives of the proposed project are:

- To characterize nutrient (nitrogen and phosphorus) and sediment concentrations and transport throughout the Plummer Creek watershed and into Chatcolet Lake through a two-year monitoring effort.
- To use the Generalized Watershed Loading Function (GWLF) or similar model to establish nutrient loadings from sources and land uses throughout the watershed.
- To review previously developed nutrient control project options and develop an updated set of recommended projects.
- To prepare a Watershed Nutrient Management Plan for use by the Tribe, the City of Plummer, Benewah County and other environmental resource agencies.

Status of Project – All work is complete and the final report was presented to the BEIPC at the November 2009 meeting. The final report will be published in early 2010.

Pinehurst Flood Impact Study

Purpose of Project - Develop hydrologic models for Pine Creek and Little Pine Creek to predict flood impacts to Pinehurst, including contamination of remediated properties. Construct selected drainage infrastructure improvements to a portion of Little Pine Creek to allow calibration of the models.

Status of Project – All work complete. Final results and a final report will be presented at the February 2010 BEIPC meeting.



Little Pine Creek Drainage Improvement

Silver Crescent Complex Habitat Restoration

Purpose of Project - This project is a demonstration project to study the feasibility and economics of watershed restoration in areas where the original stream type has been severely altered by mining and environmental cleanup activities. Innovative high-gradient stream restoration techniques were further adapted for the unique circumstances in the East Fork Moon Creek. Work that was implemented and studied includes actions converting stream types from unstable to more stable types while accounting for site features such as a large mine waste repository located in the floodplain. Various revegetation approaches on and adjacent to the waste repository as well as the re-establishment of wildlife and fish habitat through the use of constructed or installed structures will be applied.

Status of Project - All funds from the Basin Commission have been expended and construction is now complete. The USFS had successfully gained an additional partnership with the Silver Mountain Corporation on the project. Additional wetland creation and enhancement was accomplished using funding provided by Silver Mountain. This work in turn will satisfy Silver Mountain's mitigation requirements under their current 404 permit for new development at the ski area and village. The added wetland work will further enhance the overall restoration effort at the site. Additions to the design for the project were integrated into the USFS contract(s).

In 2009, the final project close-out presentation was given to the Basin Commission and in 2010 we will finish preparing the post construction report which will outline the entire project and any changes that were made. This report will include an evaluation of successes and a section dedicated to "lessons learned." Site maintenance and a 5-year monitoring effort are underway.

Canyon Creek Treatability Study

Purpose of Project - Develop an alkaline precipitation design as a low cost method of achieving a substantial improvement toward ROD goals and determine if the proposed water treatment technology is implementable in the South Fork of the CDA River.

Status of Project - All work complete.

Conclusions - A lime lagoon treatment system is a viable alternative for zinc removal at Canyon Creek. Similar systems have shown that lime lagoon technology can be successful and cost effective. Construction of a lime lagoon treatment system is estimated to cost approximately 52% of the \$8.8 million estimate in the OU-3 ROD. Annual operation of a lime lagoon system is estimated to cost approximately 55% of the \$600,000 estimate in the OU-3 ROD. A full scale treatment system would occupy about 25 acres in the Woodland Park floodplain.

To complete a detailed final design, a number of data needs such as detailed topography, detailed geotechnical soils characteristics, and detailed regulatory discharge standards will need to be obtained. The project created three documents:

- 1) 100% Conceptual Design for the Canyon Creek Pilot-Scale Lime Lagoon Treatment System;
- 2) Pilot-Scale Lime Lagoon Treatment System Operation, Maintenance, and Monitoring Plan; and
- 3) Conceptual Design for the Canyon Creek Full-Scale Lime Lagoon Treatment System.

South Fork Sewer District Toxicity Reduction

Purpose of Project - A Toxicity Reduction Evaluation (TRE) is a stepwise process or plan by which a wastewater treatment plant (WWTP) investigates and identifies agents of toxicity in its effluent, and evaluates the effectiveness of toxicity control options. The South Fork Sewer District (SFSD) Page WWTP has failed previous Whole Effluent Toxicity (WET) testing. The effluent characteristics of the Page WWTP are similar to effluents from other treatment plants with the exception of the high metals concentrations. As a result, it is believed that the metals in the influent stream are directly responsible for the effluent toxicity which impairs receiving water quality. As an example, *daphnia magna sp.* exhibits chronic effects from 0.15 µg/l of cadmium based on data from EPA's Quality Criteria for Water 1986 (EPA 440/5-86-001); while the Page WWTP has historically discharged 2.6 µg/l. Currently, limited data exist presenting the concentrations of metals, especially in combination, that are likely to cause chronic effects in *ceriodaphnia dubia sp.* This problem also impacts other discharges in the Basin including the active mining companies and inactive mining claims that will also have difficulty meeting the new limits. Understanding the impact of metals on chronic toxicity is of keen interest to all of the dischargers in the Upper Basin.

Status of Project – Tasks 1 and 2 of the Toxicity Reduction Evaluation (TRE) have been completed and metals identified as the primary toxicant. Based on these results, a draft TRE was issued for comment to the Basin Commission and the EPA in September 2009. The TRE identified three potential approaches to reduce metals in the Page Wastewater Treatment Plant (WWTP) effluent, including:

- Infiltration and inflow (I/I) reduction
- Metals treatment through chemical pH adjustment and filtration
- Land treatment

The first two methods have been evaluated in previous work through BEIPC CWA grants and are known to be effective but expensive. The third option, land treatment, has not been specifically evaluated in any detail for the Page facility. Based on required land areas, slow rate or other conventional land treatment systems are not considered viable. Wetlands treatment may, however, be a viable option. As a result, we will evaluate wetlands treatment with the land treatment component of the TRE. Specifically, we will accomplish the following steps:

Literature Review of Wetland Treatment for Metals Reduction and/or Removal:

- Physical/Chemical Removal Options: Review of metals removal mechanisms (e.g., soil adsorption and/or plant uptake of soluble metals).
- Operation and Maintenance Requirements: Management and disposal of removed metals in plant biomass and wetland substrate.
- Evaluation of Potential Wetland Conditions/Configurations, including:
 - Free water surface and subsurface flow types
 - Substrate options
 - Deep basins versus shallow flow
 - Evaluation of how existing large woody debris from repository could be used to improve metals removal substrate.

Results of this additional work will be documented in the final report. Presentation of the final results and conclusions will be made at a BEIPC meeting in May 2010.

Simulation Model to Evaluate CDA Lake Response to Watershed Remediation - Phase 2

Purpose of Project - Provide the entities responsible for management of CDA Lake with a sophisticated computer modeling system with which to simulate the lake's long-term responses to a wide range of remediation strategies to be implemented under the ROD and the Lake Management Plan.

Status of Project - All work complete.

Conclusions - Using the validated lake models, the processes controlling zinc fate and transport within CDA Lake were explored. Algae play a large role in zinc cycling throughout the lake. Roughly the same amount of dissolved zinc that is released from lakebed sediments into the overlying water column is incorporated into algal biomass in the euphotic zone (the sunlit zone above the summer thermocline), which is then redeposited on the lake bed as the algae dies and sinks to the lake bottom.

The validated models also were used to examine the response of the Lake to a range of long-term scenarios to provide insights into the effects of remedial actions. A combination of low phosphorus concentrations and zinc toxicity is currently keeping the Lake's algal biomass at an acceptable level. Efforts to reduce zinc loading from the CDA River are unlikely to result in a significant reduction in zinc toxicity to algal growth in the near term. The Kuwabara *et al* data (2006) suggest that even if zinc concentrations were reduced by an order of magnitude, continued loading from the watershed (although reduced) and also from the lakebed sediment will continue to cause toxicity to non-diatom species.

Decision makers should pay careful attention to nutrient loading to the Lake as it may respond significantly to increased phosphorus input – with or without zinc toxicity. The shallow southern portion of the Lake is already showing signs of this and if the phosphorus loading is not effectively managed, there is potential for the symptoms of eutrophication to progress farther into the deep northern body of the Lake. The model simulations suggest that increased phosphorus loading will either produce increased diatom biomass should zinc toxicity remain, or increased biomass of a mixed assemblage including more green and blue-green algal species should the zinc concentrations within the water decrease considerably. However, the overall algal biomass in the Lake should remain below 5 micrograms per liter of chlorophyll-a, if phosphorus loading is appropriately managed.

Lower River Sediment Transport Model and Bed Evolution - Phase 2

Purpose of Project - Develop a set of tools that can be used by resource managers for evaluating proposed projects designed to minimize the transport of metal contaminated sediments in the Lower CDA River. Objectives include the utilization of existing data and collection of additional data to develop and calibrate computer models of the river between Cataldo and CDA Lake. These models would be capable of simulating the hydraulic and sediment transport characteristics of the River over a wide range of stream flow and Lake elevation conditions. The models would be used to test proposed projects prior to implementation with the goal of improving their design and avoiding unanticipated and costly mistakes.

Status of Project - All work complete.

Conclusions - A computer sediment transport model, HEC-6 was used to simulate water surface and streambed elevations, erosion and deposition of the streambed, and sediment transport. The calibrated model was used to evaluate the feasibility and potential effects of management alternatives on the streambed. Four alternatives were simulated to understand the effects from dredging the streambed and reducing sediment discharge input. Management alternatives 1 and 3 used river discharge data from 2000, and 2 and 4 used data from 1997. Before start of the simulations, seven cross sections in the Dudley reach of the river were deepened 20 feet to simulate dredging about 296,000 cu. yd. of sediments. Simulations indicated that it would take between 24 to 45 years of various flows to fill up the dredged area. It may take many years or even decades for the river to reach equilibrium conditions after incoming total sediment discharge is decreased. Effects from extreme flood events on the channel and flood plain are unknown.

The FASTMECH computer model was used to increase understanding of the two-dimensional flow hydraulics as they vary across the channel and in river beds and simulated bed shear stresses covering a 5.3 mile reach near Dudley. The model showed that flow depths increased as river discharges increased except where high lake elevations cause water-surface elevations to be high due to backwater conditions. The model also showed several areas where reverse flow (back-eddies) occurred and that the potential of sediment mobility occurs when bed shear stress exceeds the critical shear stress of the particle. Simulated sediment mobility indicated the transport of very coarse sand to fine gravel in these simulations.

Assessment of Economics and Effectiveness of Alluvium Sorting as a Mine Waste Removal Strategy

Purpose of Project - The pilot work was implemented to answer a number of questions concerning the alluvium sorting approach to mine waste removal and disposal from watersheds in the Basin: 1) is the additional cost of sorting stream bed materials contaminated with mine wastes balanced by savings in transportation and repository volume costs; and 2) is there an added benefit because sorting results in a more homogeneous waste material that reacts to compaction better and ultimately results in lower permeability of compacted waste in the repository. The project also includes a monitoring component. Using a gravel quality monitoring approach, the amount of mine waste contamination will be assessed in the gravels of Prichard Creek at the removal sites pre- and post-project implementation.

Status of the Project - All work complete.

Conclusions - The economic and physical (density/permeability) consequences of sorting alluvium demonstrated that the sorting strategy for alluvium-tailings material resulted in a small savings in transportation costs and a large savings in repository construction costs. These savings far offset the added expense of sorting. Large cost savings were obtained despite some inefficiency in the project that could be rectified in subsequent projects. Having a commercial outlet for the oversize material would save additional funds, even if the material was donated. Disposal in the aggregate market will also remove a material from the floodplain that, if not handled properly, will negatively affect revegetation efforts. Sorted material compacted in the repository achieved significantly lower permeability (20 times) than the bulk material with equal compaction treatment. The result was a waste deposit less prone to groundwater percolation independent of the capping system employed.

CDA Lake Management Plan Implementation

Purpose of Project - Since the 1996 Coeur d'Alene Lake Management Plan (LMP) was adopted, new information has become available, legal and regulatory decisions have been made, basin-wide remedial actions have been taken, and some implementation has occurred, all of which have impacted the appropriateness and effectiveness of the 1996 LMP and proposed management actions. One of the conclusions of the review and update of the 1996 LMP was that the need exists for a process to routinely evaluate the effectiveness of management actions taken. Some of the biggest threats to lake water quality come from man caused activities adjacent to the nearshore areas surrounding the lake including stormwater runoff from construction and lakeshore development related activities. While the scope of this project proposal is to conduct an extensive evaluation of all activities within a 1 mile perimeter of the lake shore, initial emphasis will be place on development and construction activities.

Status of Project - All work complete.

Conclusions - The project was to conduct a survey of implementation of the existing 1996 Coeur d'Alene Lake Management Plan (LMP) (CLCC *et al.* 1996). The main focus of the 1996 LMP strategy was to minimize the release of metals to the water column from lakebed sediments through effective nutrient management and upstream metals load reductions.

A primary component of the 1996 LMP was Management Action Tables (MATs). These tables were developed by numerous individuals in the government, business, and private sectors working within Technical Advisory Groups for broad land use categories such as: forest practices, wastewater, and agriculture. Management action items within the tables were a compilation of current rules, regulations, recommendations, Best Management Practices (BMPs), and other actions that play a role in water quality management of Coeur d'Alene Lake and its tributaries. A column titled "Lead Group" identified government agencies and other entities who would take the lead for implementing individual action items.

During 2002, Idaho Department of Environmental Quality (IDEQ) and the Coeur d'Alene Tribe (Tribe), in consultation with governmental agencies and other stakeholder groups, conducted an evaluation of the 1996 LMP and its implementation. The evaluation took into account the development of new information and recent legal or regulatory decisions. Local, State, Tribal, and Federal governmental entities participated in this effort, along with industry, business, and environmental representatives. The result was a draft *Coeur d'Alene Lake Management Plan Addendum* (December, 2002) that offered conclusions and recommendations; however it was never finalized. During the development of the 2002 draft (MATs), there was a considerable amount of collaborative effort among stakeholders to revise the 1996 LMP. Thus, IDEQ and Tribal staff decided to utilize these 2002 MATs for the implementation survey.

The purpose of this Implementation Survey between IDEQ and the Tribe was to conduct a survey of measures taken by various agencies, organizations, and industries to fulfill the management actions recommended and specified in the 1996 and 2002 MATs. The survey was intended to evaluate what Best Management Practices (BMPs) are in place to protect water quality and determine the effectiveness of those being used. To initiate the project, IDEQ and Tribal staff created questionnaires tailored to individual stakeholders identified as Lead Groups assigned to MAT recommendations. Questionnaires were mailed out and face-to-face interviews were scheduled. A total of 43 interviews were conducted from June 2006 to May 2009.

During our interviews, we found that there were several common themes among the Lead Groups. They are as follows:

- The key to compliance of various codes requires an “in-the-field” presence of inspectors; additional staff is recommended.
- Across the board, agencies felt there is a real value in education efforts, but there is very little funding allocated. In-the-field inspectors provide one-on-one education.
- Monitoring of BMP effectiveness is not commonly done due to minimal budget allocations.
- There needs to be a better understanding of the current water quality conditions within Coeur d’Alene Lake and its’ tributaries.
- Better coordination of activities between basin wide stakeholders is needed.

The MATs include the following land use categories or activities that were evaluated during this survey: 1) Forest Practices, 2) Agricultural Practices, 3) Development and Stormwater, 4) Roads, 5) Wastewater, 6) South Lake and Rivers, and 7) Motorized Watercraft. In Section 2 of this report, each of these categories has a list of “issues of concern” in relation to the land use and potential impacts to water quality. These issues are too numerous to list in the Executive Summary, but below is a sample within in each category:

Forest Practices

- For all entities interviewed, there is a major emphasis on a lack of funding for road maintenance needs for example, managing legacy roads and replacing culverts.

Agricultural Practices

- There is limited participation in riparian buffer protection programs.

Development and Stormwater

- There remains some non-compliance among development projects, and often notice of noncompliance is dependent upon citizen complaints and random EPA inspections (larger developments). County and City fines for non-compliance do not always discourage violators.

Roads

- Private roads are often built without adequate sediment and stormwater BMPs. For example, a recognized problem involves the “weekend warriors”, or folks who use their heavy equipment for grading and digging without getting a permit or having plans approved. In general, private roads need improved stream crossing BMPs and larger culvert sizes (or bridges).

Wastewater

- There are a high number of individual subsurface sewage systems around the lake, and many systems were constructed prior to 1974. These systems did not require permits and some are sub-standard to current requirements. There is a PHD Repair Permit, where if a system has failed and the homeowner wants an upgrade, a PHD inspector goes for a “best fit” for upgrading to current standards. Many older lots cannot meet current standards when they upgrade.

South Lake and Rivers

- There are differing opinions among agencies and citizen representatives between bank stabilization techniques/designs; i.e. predominately hard treatment (aka. rip-rap) versus inclusion of soft treatment (vegetation features) and ecological impacts.

Motorized Watercraft

- The “Clean Marina” Program needs to be revitalized (a program to assist marina operators and boaters to reduce pollution in and around the lake). A draft “Clean Marina” Program was initiated by the Coeur d'Alene Tribe, IDEQ, Kootenai County Parks and Waterways, PHD, US Coast Guard Auxiliary, and IDL in the early 2000's. This program was never finalized or implemented.

Other BEIPC Activities and Responsibilities:

Lake Management Activities

The original Coeur d'Alene Lake Management Plan (LMP) was prepared by the CDA Tribe, Clean Lakes Coordinating Council and Idaho Division (Department) of Environmental Quality and accepted by the CDA Tribe, Kootenai and Shoshone Counties in 1996. In February 2004, the BEIPC voted to coordinate and be involved in implementing the LMP and any future modifications to the plan. The BEIPC funded a LMP Implementation Review under a Clean Water Act sub-grant in 2005 to determine how well the original LMP is being implemented and this study was completed in 2009 (see Coeur d'Alene Lake Management Plan Implementation section of this report). In addition to this work, the following work was accomplished during 2009 by the BEIPC and Clean Water Act sub-grant implementing agencies:

- Completed a project to perform a nutrient load assessment and modeling to develop a management plan for the Plummer Creek tributary to the Lake.

The OU-3 ROD anticipated the State and Tribe, coordinating with federal agencies and local governments would prepare and implement an updated LMP outside the Superfund process using separate regulatory authorities.

From January-March of 2009 the State and Tribe completed the final LMP (published in March 2009). Budgets were established and financing secured to begin the first year of LMP implementation starting in July 2009.

Infrastructure and Funding Source Evaluation

In 2006, the BEIPC began a process to address infrastructure deficiencies and revitalization needs to protect the environmental cleanup remedies, preserve public and private property, and revitalize local economies within the Upper Basin. That year, the BEIPC completed an inventory of Upper Basin community infrastructure including streets and roads, drinking water and waste water systems, and natural gas systems, and developed base maps including the inventoried information. The BEIPC also completed a flood control structure inventory and developed maps that indicate the potential for flood damage to remediated areas in the Basin upstream from Harrison, Idaho. This was the first phase of a four phase project to develop a Drainage Control and Infrastructure Revitalization Plan (DCIRP) for the Upper Basin.

During 2007, the second phase of the project was completed including flood and stormwater runoff drainage assessments and reports for Mullan, Osburn, Wallace, Woodland Park, and Silverton. In 2008, the infrastructure needs assessment and funding source evaluations were completed. The entire project was completed in August 2009 including the drainage control and infrastructure needs and priorities in the Box and rest of the Upper Basin. Copies of the plan and accompanying maps are available on CD from the office of the Executive Director.

Communications and Public Involvement

The BEIPC Communications PFT continued its efforts in 2009 to address issues concerning the strengthening of public involvement in BEIPC activities and communication between the Basin community and the BEIPC and CERCLA cleanup and natural resource restoration implementing agencies. The CCC was the focus organization to assist in implementing this process.

During the year, the Communications PFT worked on several activities:

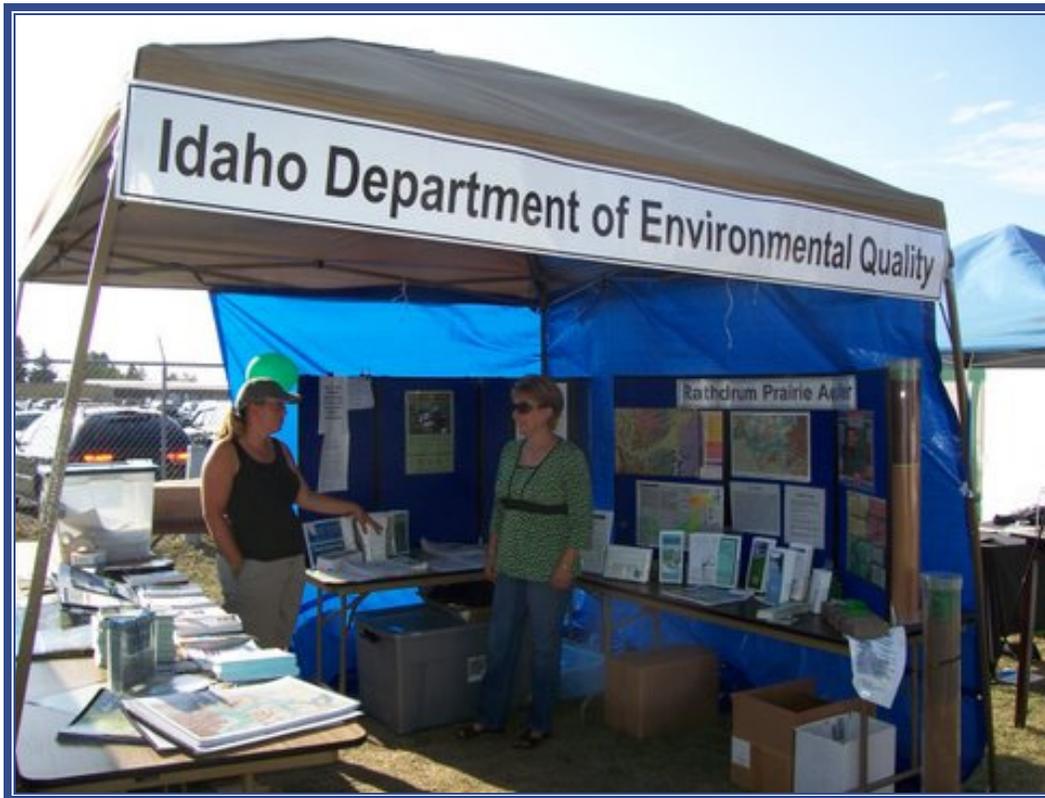
- *CCC revitalization and increasing participation within the CCC process;*
- *Updated information for the list of avenues for public outreach;*
- *Provided assistance when requested to BEIPC groups and staff who were making verbal or written public presentations on issues such as information sessions, Op-Eds, news articles, public releases, display ads, etc.*
- *Helped to sponsor a second session of free community involvement training provided by the EPA;*
- *Risk communications training was conducted for Communications PFT members by Cathy Cochran (Washington Dept. of Ecology);*
- *Updated the BEIPC informational brochure;*
- *Formed two subcommittees:*
 1. **Audience Analysis** - *To conduct an audience analysis to target new communication pieces; and*
 2. **Recreation Education** - *To strengthen communication and education about taking precautions and playing safe when visiting recreational areas where contamination may be a concern within the CDA Basin.*
- *Provided assistance for public education and outreach about the BEIPC to related groups at community open houses, North Idaho Fair booth, etc.*

Natural Resource Damage Restoration

The Coeur d'Alene Basin Natural Resource Damage Assessment and Restoration (NRDAR) Trustees have implemented several restoration projects within the Basin. The Trustees include the U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service, and the CDA Tribe. The purpose of the Trustees' restoration projects is to partially compensate for public losses associated with identified natural resource injuries due to the release of hazardous substances as a result of mining and mining related activities in the Basin. The Trustees have completed a number of project activities and presented a report to the BEIPC at the November meeting. Projects included work in Sherlock Creek, East Fork of Moon Creek, Pine Creek Basin, Wetland restoration in the Lower CDA River, and Hepton Lake. These projects were planned and authorized through the Coeur d'Alene Basin Interim Restoration Plan that was approved in 2007. The Trustees published a report titled *Coeur d'Alene Basin Natural Resource Damage Assessment and Restoration Accomplishments*. A

copy of the report can be obtained at:

<http://www.fws.gov/Pacific/ecoservices/envicon/nrda/pdf/CDAnrdaReport111009.pdf>



Joint Display and Info Booth at Kootenai County Fair

Challenges Ahead

As in the past, the cleanup effort in 2009 was mostly focused on human health risks resulting from contaminated residential and commercial properties. More than 5,700 properties have been remediated and IDEQ expects to complete most of the property cleanup in the Basin from Harrison to Mullan over the next 3 to 4 years with acceleration of work using the stimulus funding made available in 2009. While human health remains a priority, EPA has begun efforts on cleanup work in fish and wildlife habitat areas, surface and ground water, and old mine and mill sites, working with the BEIPC, IDEQ, other cooperating agencies and stakeholders. To accomplish this work, the Superfund Records-of-Decision (RODs) for the Upper Basin and the remaining work in OU-2 of the Bunker Hill Box are being addressed with the ROD amendment work started in 2009 and planned to be completed in 2010.

Besides the ROD amendment work for the Upper Basin, the Lower Basin (Cataldo to Harrison) PFT is continuing work on Lower Basin ecological issues and project planning. Because the Coeur d'Alene River system contains millions of tons of contaminated sediments, a portion of which is moving downstream every year, recontamination from annual flooding is a major focus for the PFT.

Other major challenges include: managing the Institutional Controls Program (ICP); locating and developing additional waste repositories for disposal of remedial action and ICP wastes; implementing the ROD amendment for the Upper Basin; assisting the community in implementing an infrastructure revitalization and stormwater drainage control program; developing an approach to major flooding issues in Pine Creek and the South Fork of the CDA River; and continued coordination with the CDA Tribe and State's efforts to implement the 2009 Lake Management Plan.

Finally, with the recent ASARCO bankruptcy settlement, a large amount of funding is available for environmental remediation and natural resource restoration actions. Careful action through the implementation of the Upper Basin ROD Amendment and diligent work on the part of the Natural Resource Trustees is necessary to ensure that the available funds are expended in a judicious manner. Although the settlement includes a large amount of funding for cleanup and restoration work, it still falls far short of the amount needed to complete all necessary actions in the entire Basin. A continuing stream of funding is fundamental to the success of the BEIPC process as well as the environmental remediation and restoration efforts. Securing long-term federal and state funding is necessary to ensure implementation of the remedy objectives for the entire Basin. EPA cannot provide funding for natural resource damage restoration work which is the responsibility of the Natural Resource Trustees. Assuring sustainable funding intended to advance cleanup as planned in the RODs and amendments, along with operation and maintenance of the implemented remedies and restoration of damaged natural resources still represents a significant challenge.