2007 ANNUAL REPORT

BEIPC

Basin Environmental Improvement Project Commission

February 2008

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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 2007, 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) the State of Idaho Department of Environmental Quality (IDEQ) acting as the BEIPC fiscal agent. The BEIPC continued with development of a consolidated Upper Basin stormwater drainage control and infrastructure revitalization plan to deal with potential damage to remediated areas.

Spring Flooding - CDA 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. This report also contains some information for OU-2 concerning activities in the water treatment section.

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:

- Implementing Phase II of the OU-2 remedy;
- 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; and
- Development of a Stormwater Drainage Control and Infrastructure Revitalization Plan for the Upper Basin.

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
Jay Manning	Director, Washington Department of Ecology	State of Washington
Toni Hardesty	Director, Idaho Department of Environmental Quality	State of Idaho
Elin Miller	Regional Administrator, R-10 EPA	Federal Government

Program Management

The BEIPC operates in accordance with the Idaho statute and 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 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 development of an Infrastructure Revitalization Program and Flood Control Program for the 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 of a consolidated infrastructure inventory and revitalization plan for the 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 2007, the PFTs and TLG developed the 2007-2011 five-year and Calendar Year 2008

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 government entities.

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 diverse political and geographical representatives and was established to provide local citizen review and input on Basin related work to the BEIPC. In 2007, the CCC sponsored a public meeting concerning the East Mission Flats Repository design in addition to its normal meeting process.

Community Involvement

During Calendar Year 2007, the BEIPC held meetings and deliberations open to the public and maintained an up-to-date Basin web site 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 November, the BEIPC hosted a public discussion and feedback session to provide input into the future activities of the BEIPC and to assist in developing future work plans.

Public Outreach and Citizen Involvement

To encourage public participation in Basin improvement projects, the BEIPC issues news releases and posts announcements of its upcoming meetings to its web site. The public is invited to BEIPC and CCC meetings. General public comment opportunities are scheduled at each meeting.

Citizens Coordinating Council Meetings and Communication

Citizens Coordinating Council (CCC) meetings were held quarterly, in February, May, August and October 2007. All meetings were open to the public. At the CCC meetings, members were updated on ongoing Basin Environmental Improvement Project Commission (BEIPC) and Technical Leadership Group (TLG) activities and asked to provide input on a variety of issues. 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. When appropriate, CCC comments were also provided to the TLG.

Approximately 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.

Chronology of Selected Citizen Input through the Citizens Coordinating Council to the Technical Leadership Group and the BEIPC in 2007

January-February

- CCC members reviewed, discussed, and provided comments to the BEIPC on the "Assessment Report on Prospects for Mediated Negotiation of a Lake Management Plan for Lake Coeur d'Alene," and the process for stakeholder involvement in Lake Management Plan development.

March

- The CCC Chair presented the results of the February CCC meeting to the BEIPC Board.

May

- CCC members reviewed, discussed, and provided comments on the draft BEIPC 2007-2011 Five-Year Plan and sections of the 2007 BEIPC Workplan.
- The CCC Chair presented the results of the May CCC meeting to the BEIPC Board.

August

- CCC members discussed and provided comments on the work of the Human Health Project Focus Team (PFT), the Lake Management Plan Implementation audit, and the East Mission Flats Repository design and status.
- The CCC Chair presented the results of the August CCC meeting to the BEIPC Board.

October

- At its regularly quarterly meeting, the CCC sponsored a community discussion of the East Mission Flats Repository. CCC members and other interested individuals asked questions and provided observations about the repository that were summarized for the BEIPC Board.

November

- The CCC Chair presented the results of the October CCC meeting to the BEIPC.
- CCC members expressed an interest in joining a PFT to address the East Mission Flats Repository design.

Additional Outreach Activities

In addition to the activities of the CCC, the various government entities represented by the BEIPC continue to support the TLG and CCC by being involved in the activities of those groups. The government 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 and Commissioners have made 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 Congressional staff and other interested parties.

Calendar Year 2007 Work Accomplishments

Work Funded Through Federal Superfund Or Other Cleanup Funding:

Evaluation of Pre-ROD OU-3 Removal Actions

Various parties have performed CERCLA removal actions in Basin sub-watersheds including Canyon, Ninemile, Pine, Moon, and Grouse Creeks and along the Upper South Fork and Lower Main Coeur d'Alene River to clean up contamination, protect human health and restore ecological systems. During late 2007, the Mine and Mill Site PFT began work on this issue. In 2008, existing information for these sites will be collected and incorporated into the database developed for prioritizing the mine and mill site work. This will facilitate the review of existing information and prioritization of further data collection in order to evaluate the status of these sites in the context of the OU-3 ROD and if warranted, incorporation into the OU-3 remedial action program.

Repositories

Big Creek Repository

Disposal of wastes for the Basin cleanup continued during 2007 at the Big Creek Repository (BCR). This repository is being developed on a reclaimed 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 2007, the Basin Property Remediation Program (BPRP) generated approximately 74,500 cubic yards of excavated contaminated materials from many sites. This material was placed and compacted at the BCR resulting in the use of about 56,000 cubic yards of repository capacity. IDEQ cleanup contractors hauling waste to the BCR are responsible for dumping their waste in designated areas and performing the appropriate decontamination on their haul vehicles. IDEQ's site management contractor oversees these activities. In 2007, 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 activities.

An Institutional Controls Program (ICP) waste delivery area was developed at the BCR site adjacent to Big Creek Road and the repository. This area is open 24 hours a day for seven days a week to accept wastes generated from compliance with the ICP. When that area is filled, it is emptied and the material is moved to the repository for final disposition. Large volumes of ICP wastes generated from excavation projects associated with major property development or infrastructure work can be hauled directly to the BCR in coordination with IDEQ and the BPRP.

It is anticipated that the BCR has roughly another 3-4 years of capacity to support the BPRP assuming a continued fill rate of approximately 50,000 cubic yards per year.

New Repositories

As summarized above, the BCR has limited capacity requiring a new facility to be available for use within the next 3-4 years. Therefore, the task of siting a new repository location has been a priority function of IDEQ and EPA. The agencies continue to update the Waste Management Strategy (WMS) as new information is generated from the BPRP sampling program. The WMS is used as a tool for siting and developing repositories throughout the Coeur d'Alene Basin. IDEQ has been funded through a cooperative agreement with EPA to complete the WMS and to identify additional viable repository sites.

The 30 percent design has been completed for the East Mission Flats Site (EMF). The design document was made available for public comment. IDEQ prepared a response to comments and the design was changed to reduce the height of the repository to address concerns about impacting the view from the Cataldo Mission. As part of the 30 percent design public process IDEQ and EPA held public meetings and posted information on the Basin Commission and IDEQ websites.

The EMF has undergone initial development to accept wastes for the ICP. It is anticipated that the facility will be ready to accept ICP wastes in the spring of 2008. No contaminated wastes have been accepted at this site to date. Groundwater wells have been installed for monitoring, and archeological and cultural resources have been evaluated.

Contaminant Management and Institutional Controls

Enforcement rules for a Basin Institutional Controls Program (ICP) administrative area from the confluence of the CDA River and CDA Lake to the headwaters of the South Fork CDA River in OU-3 were first approved by the BEIPC in 2006 with recommendations for enactment to the Idaho Legislature. Following testimony by the Panhandle Health District (PHD) Attorney and the BEIPC Executive Director, the Idaho Legislature approved of the rules in March 2007. The PHD negotiated a Memorandum of Agreement with the EPA and IDEQ to implement the Basin ICP and began implementation during the summer and fall of 2007.

The Contaminant Management Project Focus Team (PFT) completed the contaminant management issues study for Coeur d'Alene Lake and the slack water section of the Spokane River in Idaho and the Executive Director presented his finding and recommendations to the BEIPC at their August 2007 meeting. The BEIPC did not act on the findings and recommendations. The Executive Director and PFT are waiting for BEIPC direction before further action is taken on this issue.

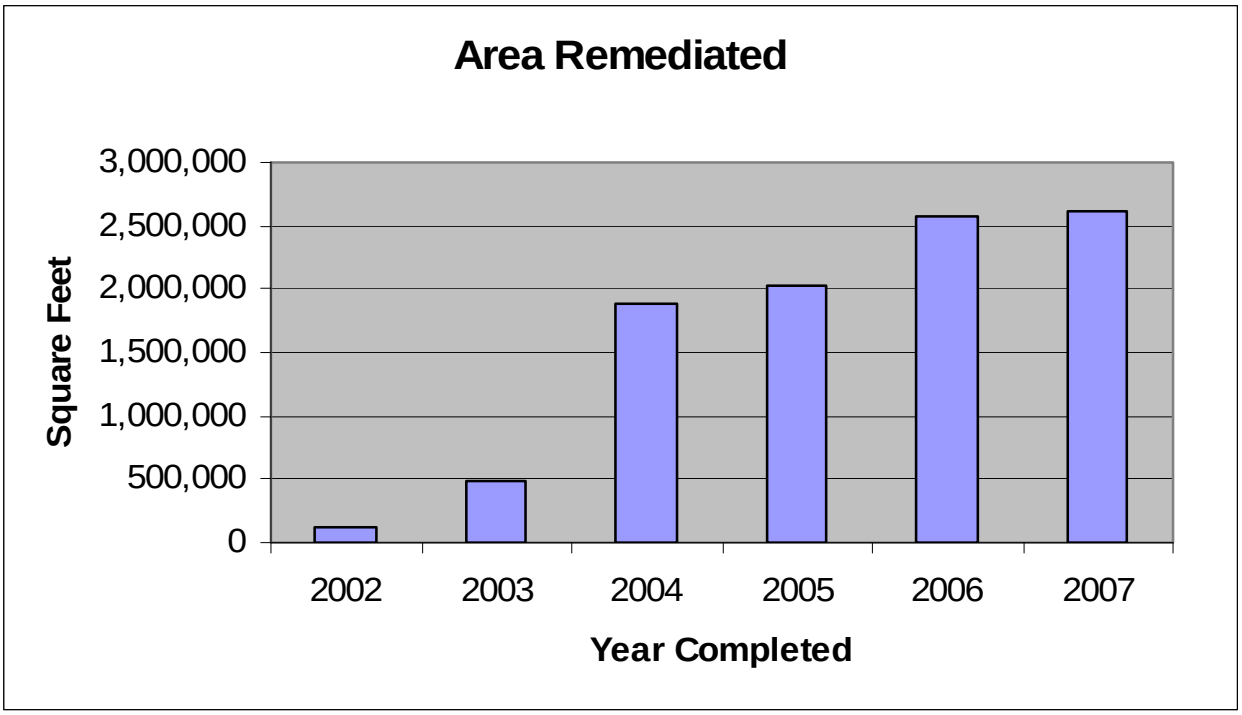
Basin Property Remediation Program

In 2007, IDEQ remediated 543 residential and commercial properties through a cooperative agreement funded by the EPA and the State of Idaho. This accomplishment is the second largest number of properties cleaned up (remediated) in any year since the Superfund Action in OU-3 began. 2006 was a larger year by 7 properties (550 properties) when only the number of properties is considered. However, from a construction standpoint 2007 was a more productive year. Regarding surface area reclaimed, 2007 exceeded the production of 2006 by 35,558 square feet. Also, in 2007 contractors excavated 76,291 cubic yards of waste soils and disposed them in the Big Creek Repository, exceeding the 2006 waste production of 71,889 cubic yards.

Year	Number Properties	Area Reclaimed (Acres)	Waste Excavated/Disposed (cubic yards)
2006	550	59.3	71,889
2007	543	60.1	76,291

Sixty-nine (69) of the 2007 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 2007 program was more than $14,000,000.



In addition to cleaning up properties 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 out-year property remediation program.

Property Remediation

Recreational Use Areas

The ROD for OU-3 states that developed recreational areas such as boat ramps, picnic areas, and campgrounds with surface soils containing elevated metals concentrations (lead > 700 mg/kg and arsenic > 100 mg/kg) will be remediated. The EPA can use its CERCLA funding to remediate state, county, or local government owned recreational properties. However, EPA CERCLA funding cannot be used for sites on federal land managed by the Forest Service and the BLM. The primary challenge for the Recreational Area Project Focus Team (PFT) is successful identification of properties on which EPA or the State can conduct remedial actions.

This PFT which was dormant for most of 2007 was re-invigorated in October. Work groups within the PFT have been formed to develop input for a recreation management plan which we are calling the Recreation Management Strategy and Guidelines. This document will serve as a guide for agencies and organizations that develop and manage recreational use facilities to better coordinate their activities by maximizing limited resources and avoiding duplication. The individual work groups are developing a comprehensive inventory of formally established and dispersed recreation areas, a trends analysis of recreation in the Lower Basin, and a communications and testing strategy to solicit feedback from all involved and interested parties.

Mine and Mill Sites

During 2007, the Mine and Mill Project Focus Team (PFT) focused on remediation of the following Upper Basin mine and mill sites:

- Golconda - South Fork CDA River
- Rex - East Fork Nine Mile Creek
- U.S. Bureau of Mines Site - Osburn

The OU-3 ROD identified at least 16 contaminated mine and mill sites with potential for human health exposures, primarily from recreational use. The above sites were selected from a screening process that incorporated a number of factors including site size, property ownership, complexity, and potential for human health exposures. Selected sites were incorporated into the BEIPC five-year work plan. During 2007, the following activities were conducted at the above sites:

Golconda Mine – This site is located along the South Fork Coeur d'Alene River near Wallace and is adjacent to the Trail of the Coeur d'Alenes. The remediation work at this site was conducted in two phases. During 2006, EPA completed the designs for both the Phase I and Phase II work. Construction of the Phase I surface water controls was implemented by IDEQ in the spring of 2006. The purpose of this work was to drain areas of the site to enhance drying in order to facilitate the Phase II work later in the summer. The Phase II design includes the following activities: Grading and capping of the tailings pond; armoring the base of the waste rock pile; excavation of the tailings in the mill area and re-location to upland capped disposal area; installation of erosion protection on the stream bank; and revegetation of the site. Construction of the Phase II work began in September 2006 with Army Corps of Engineers (COE) oversight. The majority of the remedial action work was completed prior to the onset of winter weather in December 2006. In the spring of 2007, the final grading and capping of the consolidated waste area was completed along with site-wide hydro-seeding.

Rex Mine – The Rex mine site is located near the East Fork of Nine Mile Creek and has historically been used for recreational purposes and ATV use. During 2006, EPA completed the design for the tailings dam toe buttress. The purpose of the buttress is to provide additional stability to the steep face of the tailings impoundment. Construction of the buttress was completed by the BLM in October 2006. The design for the remainder of the site was completed in 2007. This design included the following elements: Installation of a surface/groundwater collection pond; consolidation of all tailings on site; diversion of adit and surface water flow (Rex Creek) away from the tailings impoundment; removal of debris and burial of mine concentrates at the site; overall grading of the site; capping of tailings; and revegetation. Construction for this work was completed in the fall of 2007 with COE oversight.

USBM - This site is located along the South Fork of the Coeur d'Alene River near Osburn and was a demonstration site developed by the U.S. Bureau of Mines for disposal of tailings. It is currently an area actively used by ATV riders. Remedy design and construction are currently anticipated to be completed in 2008.

Existing USBM Site

Golconda - Pre-Remediation

Golconda - Post Remediation

Rex - Pre-Remediation

Rex - Post Remediation

Blood Lead Screening in Children

Screening of children for elevated blood lead levels was performed in the late summer of 2007, as it has been done annually in the CDA Basin since 1996.

The purpose of the screening is to identify children with elevated blood lead levels and provide follow-up from a public health professional to identify ways to reduce lead exposures. Testing is offered for free to every child and a $20 incentive per child is provided to encourage more children to come in for testing. The rate of participation over the years, approximately 10 to 15%, has remained relatively low compared to the total number of children who live in the CDA Basin. Efforts by the Human Health PFT to identify ways to increase participation were not successful because it became evident that any increase would be dependant on securing funding to increase incentives to the parents and those funding sources are unavailable. This information was presented to the BEIPC at its August meeting.

Upper Basin Ecological Remedies

Water Treatment

During 2007, the Water Treatment Project Focus Team (PFT) continued to focus on issues related to water treatment in the Canyon Creek drainage. The selected remedy in the ROD for Canyon Creek is to focus on cost-effective technologies for improving downstream water quality in the South Fork of the Coeur d'Alene River (SFCDR). The ROD also establishes a specific benchmark for improvement in water quality: To reduce dissolved metals load discharging from Canyon Creek into the SFCDR by at least 50 percent. The focus of recent investigations and pilot studies has been on achieving this goal through remediation of groundwater in Canyon Creek. The selected remedy also includes stabilization of dumps and stream banks that are sources of sediment and particulate metals in the Canyon Creek drainage.

To improve understanding of the hydrologic system within the Canyon Creek Drainage, a Hydrologic Study was conducted during 2006 and completed in 2007. This study consisted of monitoring well and stream stage gage installation, aquifer testing, groundwater sampling, development of a numerical groundwater flow model, and the evaluation of various remedial strategies to reduce the discharge of dissolved metals to Canyon Creek. Each of these activities is discussed briefly below.

Canyon Creek Hydrologic Study

Findings from this study confirm there are various point sources and distributed sources of metals loading to groundwater across the Canyon Creek drainage because of historical mining activities. The primary point sources near Woodland Park include the Silver Valley Natural Resource Trustees (SVNRT) tailings repository, the Hecla-Star ponds (primarily No. 6 which receives water from the Star mine adit), and the Gem portal 3 discharge. Additional metals loading is generated by the dispersed tailings mixed with floodplain sediments across the canyon floor. The hydrologic study used a numerical groundwater flow model to better define the amount and location of metals loading that each source represents. The groundwater modeling was also used to evaluate the reduction in metals loading to Canyon Creek that would be achieved by the implementation of various water management options as discussed in the remedial component screening report.

Remedial Component Screening

The remedial component screening consisted of a focused effort aimed at developing cost-effective remedial alternatives for reduction of the dissolved metals load in Canyon Creek. This screening builds upon the alternative evaluation conducted in the Basin Feasibility Study and the results from post-ROD studies, to provide a focused evaluation of only the most promising remedial options for Canyon Creek. Remedial components evaluated include: Source control options such as capping or moving the SVNRT repository; water collection and management such as active or passive groundwater collection; and various active and semi-passive water treatment options. Potential alternatives were screened based on cost, effectiveness, and implementability. A short list of alternatives recommended for further evaluation was completed. As funds become available these alternatives will receive further evaluation and screening and then be presented for public input.

South Fork Coeur d'Alene River

Preliminary Ecological Actions in Lower Basin

In the 2004 work plan, it was noted that a better understanding of the complex and dynamic system in the Lower Basin and sound answers to questions raised were necessary before a sequence of remedial actions

could be recommended. The ecological work described in the 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 improving wildlife habitat and reducing particulate lead in the Coeur d'Alene River. As indicated in the 2007–2011 Work Plan, EPA will be developing a cleanup level for riparian soils. The U.S. Fish and Wildlife Service (USFWS) completed data collection through an interagency funding agreement with EPA. During 2008, the EPA, USFWS and EPA's contractor will be developing a risk-based soil cleanup level that is protective of riparian ground-feeding songbirds.

Many other issues and uncertainties pertaining to the implementation of remedial actions in the Lower Basin have been raised. The lack of some data continues to exist pertaining to the complex ecology of the Lower Basin and the combined effects of mining related contamination. Clean Water Act (CWA) sub-grants were approved by the BEIPC to provide site-specific information required to make sound ecological remedial management decisions. In 2007, a number of these studies and demonstration projects were completed and monitoring of the effectiveness of previously completed CWA sub-grant projects continued.

EPA used Coeur d'Alene Basin Superfund settlement monies to purchase a conservation agreement with a willing private property owner in April 2006. 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 USFWS and Ducks Unlimited. Remedial actions on the property include the conversion of approximately 400 acres previously used for agriculture to wetland and upland habitat providing safe waterfowl feeding areas with mining-related metals concentrations below those shown to cause negative physiological effects in waterfowl. Natural resource restoration will be conducted on the property following remediation. Remedial action construction in the East Field component of the project started in September 2006 and was completed in 2007 using Asarco Trust settlement funds. EPA anticipates completion of the remedial action in the West Field component of the project in 2009.

Despite the large extent of mining-related contamination, resulting negative ecological effects previously documented, and work described in the ROD, no additional remedial action Superfund money is currently designated for Lower Basin ecological remedies. EPA Region 10 is receiving funding for human health remedies in OU-3, but not for Lower Basin ecological remedies. In order to fully implement the interim ROD, funding from the EPA Superfund program and other sources will be needed. The BEIPC will support EPA Region 10 in an effort to secure Superfund funding from EPA Headquarters and will have the Funding PFT working on outside source funding for ecological remedies.

Basin Environmental Monitoring

Basin Environmental Monitoring Plan

The Basin Environmental Monitoring Plan (BEMP) for OU-3 was issued in March 2004 with BEIPC approval. The monitoring program is required under the OU-3 ROD and is critical to the successful implementation and evaluation of the Selected Remedy. The BEMP is designed to obtain technical data for assessment of long-term project status and trends, evaluate overall effectiveness of the Selected Remedy, evaluate progress toward cleanup benchmarks, and future CERCLA five-year reviews.

The BEMP implements the environmental monitoring program established as part of the ecological component of the OU-3 Selected Remedy. The environmental media of focus in the BEMP are surface water,

soil/sediment, and biological resources. The major goal of the BEMP is to monitor and evaluate the progress of the remedy in terms of improving ecosystem conditions. Consistent with that goal, the BEMP provides data relative to the following Basin-wide monitoring objectives:

- Assess long-term status and trends of surface water, soil, sediment, and biological resource conditions in the Basin;
- Evaluate the effectiveness of the Selected Remedy;
- Evaluate progress toward cleanup benchmarks;
- Provide data for CERCLA required five-year reviews of the progress on remedy implementation; and
- Improve understanding of Basin processes and variability to improve the effectiveness and efficiency of subsequent remedial action implementation.

BEMP monitoring activities were initiated in CY 2004 and continued in 2007. The U.S. Geological Survey conducted surface water sampling and the U.S. Fish and Wildlife Service implemented the biological resource monitoring under Interagency Agreements with EPA. EPA's contractor, CH2M Hill, conducted the sediment sampling in 2007. Biological resource monitoring activities conducted during 2007 included waterfowl population surveys, avian productivity and survivability monitoring and a waterfowl mortality survey.

Results from surface water, soil and sediment sampling are included on EPA's web-based environmental data repository for the site at: www.storet.org. Biological resource sampling results are available separately on EPA's web page at: http://yosemite.epa.gov/r10/cleanup.nsf/sites/cda.

Remedial Action Effectiveness Monitoring

Remedial action effectiveness monitoring focuses on areas that have been addressed by remedial actions to assess the success and effect of a given remedial action. By comparison, the BEMP will address Basin-wide status and trends by monitoring a limited number of strategic locations. Both the remedial action effectiveness and long-term monitoring plans will be integrated by coordinating monitoring to generate comparable data (same timeframe or synoptic) and using common sampling locations where possible. Effectiveness monitoring, while not detailed in the BEMP, will incorporate similar monitoring hypotheses as those included in the BEMP. The adaptive management approach will maximize the utility of effectiveness monitoring data through comparison of results to expectations.

Remedial action effectiveness monitoring is being included in the designs and implementation plans for OU-3 ecological related remedial actions. In 2007, remedial action effectiveness monitoring plans were established for several mine and mill sites including Golconda, Rex and Constitution. In addition, a monitoring plan was established for the Canyon Creek water treatment project and the Success mine which includes the treatment system. The remedial action effectiveness monitoring will continue at the human health related remedial actions recently implemented at the East of Rose Lake Boat Launch and Highway 3/Trail of the Coeur d'Alenes Crossing site.

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) has been 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."

Funding available for FY 2002 projects totaled $2,000,000; FY 2003, $1,788,300; and FY 2004, $1,988,200. Following is a summary of work accomplished to date on these projects:

FY 2002 Grant Projects

Lake Monitoring Water Quality Studies

Portion (a)

Purpose of Project – Conduct monitoring of lake water quality to assess nutrient, sediment, and metal loading, and status of and potential trends in lake water quality; to assess improvements/impacts from upstream environmental clean-up projects; and assess impacts from further development projects along the lakeshore.

Status of Project – Project work complete, final report available March 2008.

Conclusions – The year-round sampling program is complete however interpretation of data will not be available until 2008. The year-round sampling program has successfully tracked the annual cycle of lake productivity in relation to inputs and outputs of nutrients and metals. These projects will provide (in a USGS report) a characterization of current water quality conditions and trends, a comparison with conditions found in the early 1990's studies, and a strategy for efficiently and effectively monitoring lake water status and trends over the long-term.

Portion (b)

Purpose of Project – Ecological monitoring of CDA Lake was designed to identify baseline conditions for ecological receptors in the Lake. This information is necessary to determine present conditions and future changes in the ecological condition of the Lake. These studies include: (1) an evaluation of bull trout health based on water quality parameters collected by other parties from the lake; (2) an evaluation of waterfowl health through an assessment of lead (Pb) concentrations in waterfowl blood and sediment Pb concentrations in waterfowl feeding areas; and (3) an evaluation of metal residues in whole fish as a baseline of metal bioavailability.

Status of Project – All work complete.

Conclusions - Lead concentrations in palustrine and lacustrine sediment from several CDA Lake bays were higher than those in other Lake reference areas, and were also higher than Bunker Hill Superfund Site target action levels and suggested site-specific toxicity thresholds for swans. Mean blood lead from mallard and wood ducks sampled from bays were within lead toxicity ranges for waterfowl associated with clinical and severe clinical lead poisoning. Based on correlations between blood lead and the sediment ingestion index, waterfowl using CDA Lake appeared to be exposed to lead by ingesting contaminated lake sediment.

Mean lead and zinc concentrations observed at all fish sampling locations were above 1971-1986 averages observed elsewhere in the Basin, as were mean cadmium in all locations except for Round Lake. Fish testing

results corroborated waterfowl data in concluding that mining-related metals from the Coeur d'Alene Basin have been transported to CDA Lake and are being accumulated by organisms associated with the Lake. The locations of Harrison Slough, Powderhorn Bay and Cottonwood Bay at the mouth of the CDA River, Beauty Bay, Mica Bay, and Blackwell Island and Cougar Bay near the Spokane River outflow of CDA Lake were the areas studied with the greatest concern for ecological receptor exposure to sediment contaminated with metals.

Streambank Stabilization

Purpose of Project - Construct and monitor the effectiveness of several techniques to protect the CDA River banks from the erosive forces of boat wakes.

Status of the Project – Stabilization treatments (5) that emphasize bioengineering approaches were installed along both banks of an 1800-foot-long river reach 1.5 miles upstream from Medimont, Idaho on privately-owned and State-owned land. Access to the project site for equipment mobilization, import and export of materials, and personnel transport was by boat or barge. The treatments constitute research into controlling sediment releases into the Coeur d'Alene River and Coeur d'Alene Lake while supporting wildlife goals. Factors affecting this performance include boat wake impacts; extent of revegetation; ability to adjust to changes in the river; and two flow regimes. The treatments have been monitored to assess their performance and impact on the environment. To date they are performing well. A final report will be released early 2008.

Lake Education and Outreach Program

Purpose of Project - This project seeks to improve water quality in CDA Lake by developing an information and education program that will educate the public on ways to reduce the amount of nutrients entering the Lake and its tributaries. Develop and present an educational powerpoint presentation that contains historical and current information on how communities established and flourished within the Basin as well as provide ways to ensure the water quality of the Lake, and produce and distribute an educational Lake map.

Status of Project – All work complete.

Conclusions - The Coeur d'Alene Tribe and Kootenai-Shoshone Soil and Water Conservation District (KSSWCD) prepared a brief summary of their perception of the effectiveness of this public education outreach. Additional funding was made available to print more copies of the Lake educational map. The Coeur d'Alene Area Chamber of Commerce has made a request to publish additional copies of the map and educational material as well.

Mullan Inflow and Infiltration Assessment

Purpose of Project - This project evaluated sources of metals loading to treatment facilities, investigated the potential reduction of metals loading to the South Fork Coeur d'Alene (SFCDA) River, determined the efficacy of infiltration and inflow (I/I) removal projects to reduce peak plant flows, and advanced the current state of knowledge with regard to the cause and effect of such efforts to reduce pollution, transaction costs, and community coordination.

Status of Project – All work complete.

Conclusions – The key to I/I removal is the ability to repair both main lines and service lines. In the past, service lines had been neglected and they often contribute a significant portion of the I/I. Targeting the worst areas for rehabilitation produced the greatest relative benefits. In addition to service lines, all main line connections were redone so that the system was tight which resulted in a significant reduction in flow. The construction methods employed were found to be equally effective at removing I/I from the system, provided the approach was followed through fully. Results to date show a flow reduction of 43% to 78%, with an average reduction of 58%.

The reduction in flows has made an impact on metals concentrations and loads in terms of averages and scatter. Complete removal of I/I from the collection system would not allow the SFSD to meet the limits proposed in the SFCDA River without implementing a metals removal process. The source of drinking water for Mullan is a tributary of the SFCDA River. The drinking water raw source and the potable water delivered to the City do not satisfy the discharge requirements imposed under the Total Maximum Daily Load (TMDL) for discharge at the Waste Water Treatment Plant (WWTP). Therefore, it is not believed that further I/I reduction will significantly reduce metals loading due to current drinking water contributions. The reduction in flows results in a positive net effect for the WWTP. Because the flows are lower and exhibit less scatter, metals loading on average appears lower and less variable. If a metals removal process is required; the smaller peak flows will result in smaller basins, related equipment and chemical usage, resulting in a lower capital and Operation and Maintenance (O&M) investment for the SFSD. Consequently, this project has been successful for the Mullan WWTP with regards to reducing its overall treatment requirements for metals.

For Mullan, it is recommended that further I/I reduction be pursued only to reduce capital improvement and O&M costs at the WWTP. It is not believed that further I/I reduction will significantly reduce metals loading due to the current drinking water contribution. The results of this study are applicable to other communities in the Upper Basin in construction approach, anticipated flow, and metals loading reductions. Metals levels for groundwater and drinking water should be reviewed in other communities that are considering implementing this approach to determine the potential for metals removal.

FY 2003 Grant Projects

Woodland Park Groundwater Quality Evaluation

Purpose of Project – Canyon Creek is a tributary to the SFCDA River. Based on probabilistic modeling, it is estimated that the Canyon Creek drainage contributes approximately 456 pounds per day of dissolved zinc to the SFCDA River. The ROD for OU-3 calls for treatment of up to 60 cubic feet per second of Canyon Creek water. In an effort to develop the most effective alternative for the Canyon Creek drainage, it is necessary to look at groundwater and surface water contributions. The Water Treatment Project Focus Team (PFT) requested that additional sampling be conducted to add groundwater data to the database in order to help facilitate treatment option decisions in the future. To address this, a quarterly monitoring program was implemented at selected groundwater sites in the Woodland Park area of the Canyon Creek Drainage.

Status of Project – All work complete.

Conclusions – The project successfully sampled groundwater. The data will provide valuable information needed to make responsible treatment option decisions.

Meyer Creek Flood Control

Purpose of Project – To assess the condition of the Meyer Creek diversion system and propose possible alternative remedial recommendations and order of magnitude cost estimates to prevent recontamination of the Superfund remedy in the City of Osburn during a flood event.

Status of Project – All work complete.

Conclusions - The results of this study show that that the risk of failure of the Meyer Creek pipe is moderate. Four possible solutions were evaluated. The preferred alternative consists of constructing a combination pipeline and open channel system, partly in the current alignment and partly in a new one. The open channel portions have the added benefit of creating opportunities for linear parks.

Upper East Fork Ninemile Creek Water Quality Evaluation

Purpose of Project – Success Mine Passive Water Treatment: 1) Reduce plugging in the Success Mine Apatite Barrier by making design modifications to the sediment chamber and injecting air into the Apatite to break up clogging in the media; 2) Perform a tracer study to determine hydraulic flow paths and residence times; 3) Analyze Apatite to determine forms of metals precipitates and where the reactions occur; and 4) Modify the East Reactor and add new media to the barrier

East Fork Ninemile Creek Monitoring: 1) Conduct monitoring of the East Fork of Ninemile Creek to assess where metal loadings occur; 2) Evaluate how seasonal flows affect metals loading; 3) Evaluate overall water chemistry; and 4) Determine forms of metal precipitates.

Status of Project – All work complete.

Conclusions - At the Success Mine and Mill site, a passive reactive barrier has been installed to treat contaminated groundwater passing through the mine and mill tailings. Since completing the system in 2000, the flow through the system continued to deteriorate. In 2004, the Idaho National Laboratory (INL) was contracted to determine if the flow could be increased by replacing the media or changing to a different media. The first step was to make modifications to the sediment chamber upstream of the reactive barrier. This was completed by modifying the current sediment chamber to allow the operators to visually inspect the sediment chamber for plugging. The second task involved injecting air into the Apatite to help breakup the compacted media and reduce preferential flow. This resulted in a temporary increase in flow through the reactive barrier. It was more successful in the west side of the reactive barrier where the media consists of only Apatite. The east side of the reactive barrier which is a mixture of Apatite and gravel did not respond as well to the air injection.
In November 2005, the old Apatite/gravel mixture was removed from the east side of the reactive barrier. Plastic packing rings were mixed with new Apatite media and placed in the east side of the reactive barrier. This has allowed significantly more water through the east side of the barrier than what has historically been observed. Currently, the system continues to treat water without experiencing water passing through the overflow. In addition, an alternative treatment approach was suggested by the IDEQ. The new approach involved injecting a carbon source (like molasses) into the groundwater to cause in situ precipitation of

inorganic contaminants. In order for this to be successful, groundwater flow rates and potential flow paths were investigated. A tracer study was performed in the groundwater up-stream of the reactive barrier. The tracer used in the study was potassium bromide. Both electrical conductivity probes and periodic water samples were used to monitor the flow of the tracer. Although tracer breakthrough was not detected in the monitoring wells using automated electrical conductivity probes, periodic water samples collected during the study did show tracer arrival at 4 of the 10 monitoring stations. Minimum groundwater velocity was estimated from these tracer arrival times at 1.16E-03 ft s-1. Golder Associates had previously estimated the hydraulic conductivity for the area to be 1.7E-3 ft s-1 which agrees closely to the estimate determined in this tracer study (Golder Associates 2000). The flux of water moving through the saturated zone up-stream of the Apatite barrier was estimated to be approximately 50 gpm, based on the minimum groundwater velocity, alluvium porosity, aquifer thickness, and an assumed aquifer width of 15 ft. in the test region. The test was conducted during low flow periods and is expected to be a minimum flow anticipated for the location. Seasonal hydrological changes will impact the groundwater flux and depth to groundwater; therefore, it is anticipated that the aquifer thickness will vary depending on seasonal conditions. The Apatite barrier has been treating about 3 to 5 gallons of water per minute (gpm) during the summer of 2004. When the system was first installed, it treated more than 30 gpm. Based on current tests, it is estimated the barrier is only treating about 1/10 of the water moving through the saturated zone.

This project also included a one-year monitoring project to evaluate the effects of Interstate and Success Mine and Mill sites on the East Fork of Ninemile Creek. The first quarter of monitoring began in November 2004 for the East Fork of Ninemile Creek. The data show that seasonal variations in flow do occur and are significant. The majority of the metal loading that occurs takes place during the spring runoff. Even though concentrations are lower during the runoff period, the overall metal loading is higher. The greatest increase in metal loading occurs near the Success Mine, but there is a detectable increase in metal loading around the Interstate Mine and Mill site also.

Metal & Nutrient Removal Pilot Page WWTP

Purpose of Project - Evaluate two emerging technologies for precipitation and/or adsorption for removal of heavy metals (lead, cadmium, zinc, and copper) and phosphorus from point source discharges in the Silver Valley, especially the Page WWTP. Determine if the results of this study can be extended to other dischargers in the Valley including the mining companies.

Status of Project – All work complete.

Conclusions – Many of the WWTP effluent samples collected prior to the two pilot plants studied under this project satisfied the NPDES Permit concentration based conditions. If not for the load based limits, a “Do Nothing” approach to the WWTP may be feasible. Abandonment of the load based limits is not likely. This may necessitate implementing additional treatment processes. Removal of heavy metals is attainable to Site Specific Criteria as defined in the Page WWTP NPDES permit. Removal to Gold Book Criteria is not consistently possible. Based on the results of the study, the membrane bio-reactor appears to be the most appropriate choice for use at this time. The probable cost of a full scale system installation in 2006 dollars is $14 million with annual operating and maintenance of 5% to 10% of the capital cost. The study resulted in the following recommendations:

- Investigate the ability to reduce capital expenses by attenuating peak flows at the WWTP by reducing infiltration/inflow to the collection system;
- Evaluate blending options to meet concentration and load based limits;
- Continue to explore methods of simultaneously meeting the metals and phosphorous removal targets;
- Determine an acceptable method for final disposal of the wastes generated from this facility and identify probable construction costs; and
- Revisit the permit conditions to develop more reasonable loading limits during peak flows such as a tiered permit based on actual stream flow.

The results of the study appear to be directly transferable to other dischargers in the Basin utilizing lagoon based wastewater treatment.

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 – Additional plantings within the project area in the spring of 2006 included trench planting of 500 nursery-grown cottonwood whips in order to evaluate effects of three types of backfill. Results will provide a comparison to the 2004 test plots using bare root cottonwood stock.

In addition, approximately 400 containerized dogwood and willow plants were planted with an excavator to evaluate success along a heavily compacted reach of the project area. Additional plantings and monitoring are planned for the spring and fall of 2007. A completion report will be prepared in 2008 and monitoring will continue through 2009.

Inventory & Evaluation of Private Lands for Potential Restoration of Wetland Habitats

Purpose of Project – The survey was designed to inventory private wetlands and associated agricultural lands within the Coeur d'Alene Basin to determine: 1) their value as wetland habitat; 2) what modifications may be necessary to restore areas to optimal wetland habitat; 3) landowner acceptance of wetland restoration on the property; and 4) level of mining-related metals contamination on the property. The survey will assist in guiding wetland remediation and agriculture-to-wetland conversion under the OU-3 Record of Decision for the protection of waterfowl, one of its remedial action objectives.

Status of Project – Private land inventories began in 2005. Ten target areas were identified as having a high potential for creation or enhancement of wetland habitat based on size, potential wetland attributes and available toxicity information. These landowners were surveyed first to determine interest in wetland creation or enhancement on their respective properties. Properties identified as potential remediation projects were assessed for their habitat quality and metals contamination. A few properties met requirements for habitat restoration and landowner interest. Personnel from Ducks Unlimited and USFWS further evaluated these properties and discussed remediation and/or restoration options with landowners. Subsequent landowner

interest surveys and discussions were expanded to include the entire lower Coeur d'Alene Basin and potential wetland areas along the shoreline of Coeur d'Alene Lake.

Landowner inventories under this project have been completed. Two presentations regarding updates on the project were made to the BEIPC at quarterly meetings. A final written report to the BEIPC is currently being drafted. The report will provide a comprehensive inventory that identifies private land that may be suitable for wetland remediation and restoration projects in the Coeur d'Alene Basin.

Monitoring Fish Responses to Bank Stabilization in the Coeur d'Alene River

Purpose of Project – Bank stabilization efforts will likely be proposed to treat more than 20 miles of the CDA River banks in coming years. Resource management agencies will be asked to evaluate the impact of several bank stabilization project proposals for the CDA River. The objectives of this monitoring effort are: 1) establish baseline fish community structures; 2) evaluate variability in fish community structures over time; 3) evaluate the effect of existing bank stabilization projects on fish communities; 4) determine appropriate monitoring strategies for future bank stabilization projects; and 5) recommend bank stabilization techniques that have positive effects or minimal adverse effects on fish communities.

Status of Project – Sampling has been completed, data evaluated, and a draft report has been prepared. The report from this project is Cathy Gidley's master's degree thesis at the University of Idaho, which will not be defended until early January. After her thesis defense, the thesis will be finalized and submitted to the BEIPC as the final report. Either the U.S. Fish and Wildlife Service or Idaho Department of Fish and Game may provide a supplemental position statement following receipt of the final report.

Computer Models to Assess Sediment Transport & Bed Evolution in the Lower Coeur d'Alene River – Phase 1

Purpose of Project – See narrative for Phase 2 funded in 2004

Simulation Model to Evaluate Coeur d'Alene Lake's Response to Watershed Remediation – Phase 1

Purpose of Project – See narrative for Phase 2 funded in 2004.

North Fork Coeur d'Alene River Hydrologic & Sediment Study

Purpose of Project - Provide a watershed assessment in document form that will effectively aid and support the future development of a Sediment TMDL Implementation Plan for the North Fork Coeur d'Alene River sub-basin (a plan that will be developed by a Watershed Advisory Group).

Status of Project - Work performed in calendar year 2007

Contract work by Watershed Professionals Network, LLC (WPN) was completed on this project in September 2007. A series of four final reports were completed and delivered to IDEQ: 1) *Hydrology Analysis – North Fork Coeur d'Alene River Subbasin;* 2) *Sediment Source Analysis – North Fork Coeur d'Alene River Subbasin;*

3) *Stream Channel Analysis – North Fork Coeur d'Alene River Subbasin;* and 4) *Watershed Overview & History – North Fork Coeur d'Alene River Subbasin*

As of December 2007, the IDEQ program manager for this project is still reviewing the four final reports, and upon completion will package the material for submittal to the BEIPC.

Mica Bay Nutrient Reduction Project – Phase 1

Purpose of Project – Demonstration and training project for wetland landowners to restore out-of-bank flows in tributary streams as they enter CDA Lake. Restoration of delta wetland functions will reduce nutrient loading to the Lake and encourage groundwater recharge. Nutrient loading to the Lake must be minimized to insure that metals remain bound to sediment particles rather than dissolving in the water column. A unique combination of conditions exists at the project site that, if overcome, will translate to success at most other sites around the Lake.

Status of Project – All work complete.

Conclusion - It was decided to conduct a feasibility study to answer some basic questions about the hydrology of the area, design alternatives and the expected benefits of the project. This study titled, *Mica Bay Design Alternatives* was completed and submitted to IDEQ on October 5, 2005. It was reviewed by the BEIPC Executive Director and TLG resulting in a recommended change in the project approach. The BEIPC considered the recommend change and the project was amended by vote of the BEIPC in November 2006. (See narrative of project funded in Phase 2.)

Lower Lakes Aquatic Vegetation Survey Project

Purpose of Project - The primary purpose of this study is to develop baseline data on submersed aquatic plant species distribution and biomass in Benewah, Chatcolet and Round Lakes. The secondary purpose is to estimate nutrient (primarily phosphorus) release from the existing plant beds into the water column of these lakes and subsequently into CDA Lake. The tertiary purpose is to inspect these lakes for the presence of invasive, noxious aquatic species.

Status of Project – All work complete.

Conclusions - The overall conclusion offered from this baseline assessment of submersed aquatic vegetation in the Lower Lakes area of Coeur d'Alene Lake is that this growth is healthy, very productive and reasonably diverse. The plants that were identified in the Lower Lakes transects and grid point sampling were all native species with the exception of *Myriophyllum spicatum* (Eurasian watermilfoil) which was found widely distributed throughout this area with limited dense growth areas in Chatcolet and Round Lakes. It is expected that this presence will increase significantly in the coming years, absent implementation of control measures. However, harvesting of aquatic vegetation as a means of controlling nutrient inputs to the lake must be further evaluated to determine its cost effectiveness. The loading of the nutrients from aquatic vegetation to the Coeur d'Alene Lake system was higher from the Lower Lakes area than from Coeur d'Alene proper, indicating the importance of these shallow water habitats.

Canyon Creek Groundwater Metals Source Characterization

Purpose of Project – This project is designed to determine how (in practical terms) zinc and other metals are distributed between different physical and chemical states in the Canyon Creek alluvium. This information will be used to help understand how natural processes can affect the movement of contaminant metals through Canyon Creek and how engineered processes can impact contaminant metal mobility or sequestration.

Status of Project – All work complete.

Conclusions - Based on the results of this preliminary study, several recommendations can be made with respect to estimating metal leaching from Canyon Creek alluvium, predicting the impact on metal concentrations and fluxes into Canyon Creek, and evaluating proposed mitigation approaches.

1. Determine the spatial variability of metal fractions in the alluvium.

   The cores in this study were obtained from a relatively small area of alluvium downstream of Woodland Park. Samples from a wider area are needed to establish that the results obtained in this study are representative of the quantity and distribution of metals in the alluvial sediments downstream of the Woodland Park area. To be cost effective, analyses of these additional samples should focus on the easily leachable fractions (fraction 1 + fraction 2).

2. Develop better measurements and models for groundwater/surface water interactions.

   Existing studies of Canyon Creek (Barton, 2002) have provided initial estimates of groundwater flow and metal fluxes into the stream under low-flow conditions. This study needs to be expanded to better understand the seasonal variations of these flows and how they impact stream quality and metal transport. In particular, information on metal fluxes under high-flow conditions is needed.

3. Establish a sound conceptual/quantitive model for the groundwater hydrology.

   A sound conceptual model should be established so that relevant hydrological processes can be estimated. Such a model would necessarily be based on data from tests and field measurements to obtain the necessary hydrological parameters. The groundwater model should provide an understanding of the groundwater flow paths and their response to seasonal variations in water input into the system. The model should be used to provide groundwater residence times that are needed to estimate the metal concentrations in the groundwater and the time scales for flushing the alluvial sediments. The model could then be used to identify hydrogeochemical zones that could be selectively targeted for specific mitigation activities.

Streambank Stabilization Addition

Status of the Project – All field work complete, see narrative for project construction in FY 2002 project listing.

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 has confirmed that there is significant and active streambank mass failure and erosion on sections of the North Fork Mica Creek located on the landowner's property. IDEQ has confirmed that a meaningful stream stabilization project can 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 Coeur d'Alene 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 Coeur d'Alene Lake.

Status of Project – 15% complete, work performed in calendar year 2007

1. A contract between IDEQ and KSSWCD was signed to administer and oversee the Mica Creek project.

2. Staff of KSSWCD, the Natural Resource Conservation Service (NRCS), and Idaho Soil Conservation Commission conducted surveys of the project property, and developed the designs, methods, and localities for the streambank and streambed stabilization projects.

3. Larry Mundt, one of the property owners of the project site, was selected as the primary contractor to install the streambank and streambed stabilization features.

4. All required permits for this project were obtained.

5. Stabilization at one selected site began in late October (it was not until then that approved permits were obtained). Cofferdams were constructed and installed to divert stream flow during streambank and streambed excavation activities.

6. The KSSWCD selected a contractor to produce the 10 minute DVD as an educational tool for ranchers within the Coeur d'Alene Lake Basin (Jere Mossier, Underwater Video Productions). In November, KSSWCD and the video contractor made the first visit to the project site, meeting with the landowners, starting to develop script for the DVD, and initial video-taping.

Additional Water Quality Sampling in Selected Near Shore Areas of Southern CDA Lake

Purpose of Project – See narrative for Lake Monitoring Water Quality Studies funded in 2002

Status of Project – All work complete.

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 and CDA Lakes by reducing nutrients that now flow into Plummer Creek from the Plummer Wastewater Treatment Facility.

Status of Project – All work complete, final report will be issued in February 2008. The project to date is successfully treating the influent flows. However, in balancing the wasteflow to the wetland with the available infiltration rate, the required area for the entire flow projected from the wastewater treatment facility for the City is very large. The pilot project is handling 1,000 gallons per day through a bottom area of about 10,000 square feet, and a total bermed facility area of approximately 20,000 square feet. The available net infiltration rate is approximately 0.05 gallons per square foot per day.

At this rate, to dispose of the projected flows of 400,000 gallons per day, the City would require 8,000,000 square feet, or approximately 200 acres of land to dispose of its effluent using the wetland infiltration method. The City currently controls 27 acres for its permitted seasonal land application of wastewater. An additional 173 acres at the recent price of $5,000 per acre would cost the City approximately $856,000 for the land alone, and approximately an additional $4,000,000 to develop it into a usable system, based on accelerating and scaling up the cost of the pilot project construction.

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 - Final planning for the field work was conducted by the Project Leads, and a Quality Assurance Project Plan (QAPP) was prepared covering field data collection, laboratory analyses and modeling.

The QAPP was approved by IDEQ and EPA. The two years of field data collection has been completed and data has been tabulated. Work is currently about 50% complete.

Findings: Field and laboratory data was tabulated as it was collected; data interpretation will be performed following completion of the monitoring effort. Due to the hiring of a PhD Limnologist by the Tribe's Lake Management Department, a determination will be made as to whether the planned modeling work can be done using in-house staff, as opposed to an outside consultant.

Pinehurst Flood Impact Study

Purpose of Project – Develop a hydrologic model for Pine Creek and Little Pine Creek to predict flood impacts to Pinehurst, including contamination of remediated properties, and construct selected drainage infrastructure improvements to test the model.

Status of Project – Data was collected to create the model and infrastructure improvement designs. A bridge was constructed on Fairview Avenue to replace a badly undersized culvert and the toe of the General Mine waste rock dump was armored. Project is currently 40% complete and will be completed in 2008.

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 will be further adapted for the unique circumstances in the East Fork Moon Creek. Work to be implemented and studied includes actions converting stream types from unstable to more stable types while accounting for site features such as a large repository located in floodplain. Various revegetation approaches on and adjacent to the waste repository as well as the reestablishment of wildlife and fish habitat through the use of constructed or installed structures will also be applied.

Status of Project - Final design and contract package preparation was accomplished in early 2006. Additionally, the QAPP was approved by EPA. Construction started in September 2006 with an update mailed to local residents and delivery of materials such as topsoil to the site. The Forest Service has successfully gained an additional partnership with Silver Mountain Corporation on the project. Additional wetland creation and enhancement will be accomplished at the project site 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. This added wetland work will further enhance the overall restoration effort at the site. Additions to the design for the project have been integrated into the Forest Service contract(s).

A primary construction contract award and implementation start is planned for early 2007. Stream channel construction with wildlife and fish habitat structure installation will encompass the bulk of the construction phase at the site. Comprehensive native vegetative restoration at the site which will include treatment for noxious weeds will follow, possibly utilizing a second contract in 2007 or 2008. A post construction report 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 will start at the close of the construction phase.

Silver Crescent Repository

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 SFCDA 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 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 c*eriodaphnia 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 – Page WWTP performance and typical effluent characteristics have been compared against typical potential toxicant levels. Two additional WET tests have been completed in 2007 to compare to those completed in 2006. Both 2007 WET tests showed lower toxicity than what is defined in the South Fork Sewer District's discharge permit; however, sufficient toxicity was observed in the April 2007 test to move forward with Phase I of the TRE. The Phase I TRE indicated the likely group of toxicants in the Page WWTP effluent is cationic metals, or more specifically, zinc, nickel and/or lead. Based on the observed results from the Phase I test, a Phase III, mock effluent test was completed for zinc. The results for the mock effluent test proved to be very similar to the results observed in the WET test with similar zinc concentrations, implying that zinc may be the sole toxicant. Draft TRE documents were prepared and submitted for agency review in November 2007. The current schedule for the next year is to address any comments that come out of the agency reviews, after which source evaluation and control options will be explored.

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 - Calibration and development of the models is complete and the results were presented to the BEIPC at their August 2007 meeting. The final report is complete and waiting final approval of USGS staff. It should be available in January 2008.

Chain Lakes - Lower Basin

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 – As a joint project between IDEQ and the Coeur d'Alene Tribe, conduct a survey audit of measures taken by various agencies, organizations, and industries to fulfill the management actions recommended and specified in the 1996 Coeur d'Alene Lake Management Plan (LMP). IDEQ and the Coeur d'Alene Tribe are in the process of conducting an extensive evaluation of all activities within the Coeur d'Alene Lake Basin that relate to water quality, and more extensively within one mile of the Lake shore to evaluate what Best Management Practices (BMPs) are in place, how effective they are, what BMPs are required but not in place, and to establish specific BMP audit procedures.

Status of Project- Work performed in calendar year 2007

1. Work continued on conducting interviews with respective jurisdictions throughout the Coeur d'Alene Basin on how agency programs relate to water quality issues within the Coeur d'Alene Lake Basin.

2. For 2007, the following agencies or groups have been interviewed, (this has completed Phase 2 of interviews):
   - Coeur d'Alene Tribe Forestry, Planning, and Lake Management Departments
   - US Army Corps of Engineers
   - City of Plummer Waste Water Treatment Plant and Street Department
   - Clarkia Waste Water Treatment Plant
   - Santa/Fernwood Waste Water Treatment Plant
   - South Fork Coeur d'Alene River Waste Water Treatment Plant
   - City of Harrison Waste Water Treatment Plant and Street Department
   - City of Coeur d'Alene Stormwater Utility and Streets Department
   - Worley Highway District
   - Plummer-Gateway Highway District
   - Forest Capital
   - Potlatch
   - Intermountain Forest Industry Association
   - Harrison Dock Builders
   - Forest Service - St. Maries office

   Other related work:
   - Kootenai County Planning and Zoning Commission (numerous public hearings on Comprehensive Plan development and inclusion of water quality projection strategies being incorporated within the Comprehensive Plan)
   - Coordinated with Kootenai County Planning staff on Site Disturbance Ordinance 25' setback modification (no further action estimated until Comprehensive Plan is finalized in 2008)
   - Participated in Panhandle Health District Septic System Design Negotiated Rule making process

- Participated in Idaho Department of Lands Navigable Waters Negotiated Rule making process
- Tour and participation in BLM Blue Creek Bay site planning for public use
- Continued participation in Panhandle Stormwater and Erosion Education Program (SEEP)
- Coeur d'Alene Tribe staff attended 2007 StormCon conference in Phoenix, AZ. BMP performance standards and compliance workshops were main focus for Coeur d'Alene LMP audit

3. Created a map/photo documentation of new shoreline construction projects and the degree in which BMPs were installed and maintained. Other sites throughout the Basin where water quality protection measures were taken were also documented and entered into database. Final project reporting and presentations will include this map and photos.

4. Sub-grantees drafted a first round of recommended changes/revisions to LMP management action tables and provided to stakeholders in the Basin.

5. As per request, gave update presentations to the CCC, TLG, WCAC, BEIPC, local environmental groups, and the Coeur d'Alene Chamber of Commerce Natural Resources Committee.

6. Project completion and reporting slated for June 2008.

Coeur d'Alene Lake

Other BEIPC Activities and Responsibilities:

Implementation of the Phase II Component of OU-2 Remedy

As part of the State Superfund Contract (SSC) for OU-2, a Comprehensive Cleanup Plan (CCP) was developed to define a path forward for remedy implementation in OU-2. The CCP calls for a phased approach to implementing the OU-2 remedy. In Phase I, the focus is on remedial actions aimed at removing and consolidating extensive contamination from various site areas, demolition of structures, development and implementation of an ICP for OU-1 and OU-2, future land use development, and public health response actions. Phase I work also includes support studies for long-term water quality improvement and evaluation of Phase I remedial action effectiveness.

Phase II of the OU-2 remedy will be implemented following completion of source control, removal activities and evaluation of the effectiveness of these activities in meeting water quality improvement objectives. Phase II will consider any shortcomings encountered in implementing Phase I and will specifically address long-term water quality, ecological and environmental management issues. Both ROD and State Superfund contract (SSC) amendments will be required prior to implementation of any Phase II remedial actions. EPA and IDEQ are the responsible parties for modifying the ROD and negotiating a SSC.

The BEIPC will participate in Phase II activities in OU-2 by providing technical input into the remedy alternative development and selection (including evaluation of technical reports, pilot studies, and feasibility study documents), providing input into the public processes associated with ROD modifications and educating the community and legislative bodies of the need for funding for this work.

The following provides a brief overview of EPA and IDEQ's concept for how the agencies will jointly move forward in conjunction with the BEIPC to set the stage for evaluation and potential implementation of an OU-2 Phase II remedy.

In 2006, EPA and IDEQ completed the following documents that are supportive of the evaluation of the OU-2 Phase I remedy:

- Revised OU-2 Conceptual Site Model,
- Statistical Trend Analysis of Groundwater and Surface Water Evaluation
- Phase I Remedial Action Characterization, and a
- Revised OU-2 Environmental Monitoring Plan.

These documents have been provided to the OU-2 Phase II Water Quality PFT and placed in the site information repositories. In addition, a briefing was provided to the Basin Commissioners in February 2006. These documents were developed to refine our understanding of the OU-2 environmental system and facilitate Phase II remedy implementation.

An assessment focusing on the effectiveness of the OU-2 Phase I remedial actions on surface water and groundwater quality was completed by EPA and IDEQ in October 2007. This document also includes an updated surface water and groundwater quality analysis. The document assesses impacts of Phase I remedial actions on water quality within OU-2. The assessment relies on the recently completed Five-Year Review

Report for the Bunker Hill site, the Phase I Remedial Action characterization report and the findings of the updated water quality statistical analysis. The assessment includes all remedial actions completed under OU-2 Phase I, but emphasizes those areas or actions believed to have the most substantial impact on the water quality. The OU-2 Phase I Remedial Action Assessment report and an overview presentation were provided to the Water Quality PFT. An overview presentation was also provided to the Basin Commission at their November 2007 meeting.

OU-2 Phase II Remedy Consideration

Following the above evaluation of Phase I remedial actions in OU-2, the next step is to further set the stage for consideration of Phase II remedy alternatives and potential implementation. The following evaluations will facilitate definition of OU-2 Phase II:

Identification of OU-2 Source Areas of Concern
Based on the results of the Phase I evaluation, source areas within OU-2 will be identified and ranked based upon a set of criteria to be established. The criteria will include a relative contaminant metal loading, impacts on environmental receptors and other factors to be determined. Data gaps that need to be filled to confirm and quantify source areas and their resultant impact on the environmental system may be identified and addressed.

Identification and Evaluation of Potential OU-2 Phase II Remedial Actions
Based on the results of the identification and relative ranking of source areas identified within OU-2, conceptual remedial actions (RAs) will be developed to address the sources and evaluated based on overall protectiveness of human health and the environment, compliance with applicable or relevant and appropriate requirements, implementability, effectiveness, and cost of supplemental remedial actions and other relevant considerations.

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 three phase project to develop an Infrastructure Revitalization Plan (IRP) 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, and additional infrastructure work including:

- Preparation and presentation of the Basin IRP kickoff workshop to introduce the basis of the IRP to community, utility, and agency leaders.

- Holding meetings with communities and utilities to discuss funding public works projects, infrastructure needs, and priorities; to mark up a set of the base maps to show the high priority projects and infrastructure issues; and to develop an infrastructure report card for the communities and utility districts. The report card provides a qualitative assessment of the Upper Basin infrastructure.

These efforts are being combined with the efforts of the Funding PFT to evaluate funding sources and present an assessment of funding availability. In 2008, the project will be completed including the final infrastructure revitalization assessment and plan with funding strategies.

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 will be completed in 2008. In addition to this work, the following work was accomplished during 2007 by the BEIPC and Clean Water Act sub-grant implementing agencies:

- Completed monitoring of a pilot CDA River bank stabilization project to reduce the introduction of lead-bearing sediment into the Lake;
- Presented an educational program at the Kootenai County Fair to improve public awareness of the Lake and its needs for continued protection;
- Completed the development of computer models to assess sediment transport and bed evolution in the lower CDA River;
- Presented training in the use of a simulation model to evaluate the Lake's response to watershed remediation;
- Implemented construction of a pilot project to reduce nutrients entering the Lake from Mica Bay;
- Completed a project to survey aquatic vegetation in Benewah, Chatcolet and Round Lakes, tributaries to the Lake; and their potential impacts on the vegetation in the Lake;
- Completed the wastewater treatment plant pilot study for the City of Plummer to reduce nutrient loading to Plummer Creek and the Lake; and
- Implemented 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 anticipates that the State and Tribe, coordinating with federal agencies and local governments, will prepare and implement an updated LMP outside the Superfund process using separate regulatory authorities.

During 2007, the State and Tribe were involved in a two phase mediation process. The first phase has been completed and entailed assessing the global issues surrounding the current impasses to develop an updated joint LMP. The report on this assessment was finalized in January 2007. The second phase will attempt to mediate the impasses and develop a joint Tribe and State LMP that includes stakeholder involvement consistent with agreements between the State and Tribe and the State and Counties. If the second phase is successful the State and Tribe anticipate approving the LMP and coordinating the implementation with other stakeholders, including local governments and the BEIPC.

Chatcolet Lake

Challenges Ahead

The BEIPC process has matured as it has guided environmental cleanup and restoration activities in the CDA Basin and there has been a great deal of success. It is now at a point where some of its activities may need to be directed into other supporting efforts. This is understandable, especially as we coordinate a huge project that requires adaptive management as we move through the process. In addition to cleanup and restoration, the BEIPC is now involved in developing a program to protect remediated areas from stormwater runoff and local drainage problems as well as an infrastructure revitalization program for the communities in the Upper Basin. Although there has been a great deal of progress in cleanup and restoration, the added activities along with a number of ongoing issues will continue to challenge the BEIPC process.

Fundamental to the success of the BEIPC process as well as the environmental remediation and restoration efforts is a continuing stream of funding from a number of sources. Secure long-term federal and state funding is necessary to ensure implementation of the ROD's remedy objectives for OU-2 Phase 2 and OU-3. The EPA funding stream for human health related remedies is a priority and has been steady, but there is growing concern about funding ecological cleanup and remedies. 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 along with operation and maintenance of the implemented

remedies and restoration of damaged natural resources represents a significant challenge. Other major challenges include: Implementing the Basin Institutional Controls Program (ICP) begun in 2007; locating and developing waste repositories for disposal of remedial action and ICP wastes; implementing methods to deal with contaminated groundwater; implementing an infrastructure revitalization and stormwater drainage control program in the Box (OU-1&2) and Basin (OU-3) to ensure protection of the remedy; and continued coordination of BEIPC Lake related projects with the CDA Tribe and State's efforts to develop and implement an updated Lake Management Plan.

Idaho Governor Otter Addresses a BEIPC Meeting

Appendix A: 2007 Work Plan

Table 1-1 Summary of Activities Proposed for Implementation of the ROD for CY 2007

Proposed Activity	Scope	CY 2007 Objective	Lead Agency
Evaluation of PRE ROD OU-3 Removal Actions (see EPA 5-year Review Report)	Various parties have performed CERCLA removal actions. Results of these activities need to be evaluated and if warranted, incorporated into the OU-3 remedial action program.	Continue evaluation of these sites in context of the ROD and its schedule and incorporate into remedial action program as warranted.	EPA, IDEQ, BLM, USDA Forest Service, CDA Tribe
Repositories	Develop, as needed, repositories to support remediation and Institutional Controls Program (ICP). Plan, secure properties and be ready for remediation and ICP waste in Upper and Lower Basin anticipated in the next 5-10 years.	Utilize Big Creek for Basin remediation and ICP waste. Complete East Mission Flats (EMF) 30% design memo and evaluate short-term geographical repository needs to determine next siting activities. Complete ICP Waste Transfer Station Feasibility Study and Analysis.	IDEQ and EPA
Basin Contaminant Management and Institutional Controls Program (ICP)	Develop a program to manage activities in OU-3 to protect remediated areas from recontamination and to protect human health and the environment in areas requiring cleanup actions where no remedy is yet in place.	Present the ICP Rule to the Legislature for approval and implement the ICP in the CDA River Watershed portion of OU-3. Contaminant Management PFT to develop final recommendations for additional management of contaminants in CDA Lake and Spokane River portions of OU-3 by March 31.	IDEQ, PHD, CDA Tribe

Proposed Activity	Scope	CY 2007 Objective	Lead Agency
Residential and Commercial Area Sampling and Remediation	Protect human health by continuing property sampling and property remediation program.	Complete sampling on approximately 1000 properties and remediate 300-400 properties in CY 2007.	IDEQ
Drinking Water Supply	Protect human health by providing adequate drinking water supplies by continuing the sampling and remediation program.	For properties sampled in CY 2007 with private drinking water supplies, sample water supplies and implement remediation actions if necessary.	IDEQ
Recreational Areas	Continue to identify contaminated recreation use areas along the CDA River and remediate areas or develop substitute clean areas. Develop a Lower Basin recreational management plan.	Update contaminated recreation use area inventory. Begin the Lower Basin recreational management planning process. Complete work noted in Table 1-2 for CY 2007.	EPA with state and federal land manage-ment agencies
Mine & Mill Sites	Cleanup priority sites that contribute to human health risks, are currently utilized for recreation activities, and contribute to water quality impacts. Continue to evaluate and prioritize additional mine and mill sites identified in OU-3 ROD and begin designs so remedial actions can be initiated as funds become available.	Complete Phase 2 remedial actions at Golconda site and remedial actions at Rex Site. Complete design and begin remedial action at USBM site and prepare priority list for remaining sites noted in the ROD.	EPA, IDEQ. With BLM in Pine & Ninemile Creeks.

Proposed Activity	Scope	CY 2007 Objective	Lead Agency
Phase II Component of overall OU2 remedy	The effectiveness evaluation of the Phase I source control and removal activities to meet water quality improvement objectives for the OU-2 ROD will be used to determine appropriate Phase II implementation strategies and actions. Implementation of future Phase II remedial action may require a ROD amendment and a State Superfund Contract (SSC) between EPA and IDEQ.	In early 2007, the updated water quality analysis and OU2 Phase I Remedial Action Assessment report will be available.	EPA, IDEQ
Blood Lead Screening in Children	The Human Health PFT will explore alternative approaches to integrating universally available blood lead testing into the regular health care services received by Basin children aged 1-4 years with a part of the work being to identify an education outreach program. Such exploration will include examining alternative methods for implementing an integrated blood lead testing approach as reflected in those present in other states elsewhere in the nation. The goal will be to craft a two-year pilot program for the delivery of blood lead testing via this new approach. This goal may be modified as the Human Health PFT works on this issue.	The Human Health PFT will build on its work of 2006 to increase the number of children participating in the blood lead screening program. The work will include improving outreach and recruitment efforts to families with small children, exploring options for working with Medicaid to increase physician testing for blood lead, and identifying alternative testing methods to increase the efficiency of testing. The Human Health PFT will provide a proposed two-year work plan to the BEIPC in early 2007 to increase participation in the child blood lead screening program. As part of that proposal, the Human Health PFT will request that community leaders and elected officials encourage participation in the screening program.	IDEQ PHD

Proposed Activity	Scope	CY 2007 Objective	Lead Agency
Upper Basin Ecological Remedies	Continue to evaluate approaches and technologies for water treatment in Canyon Creek that include pilot projects to develop design criteria and operational information. Remediate mine wastes along Denver Creek tributary to Pine Creek. Monitor previous remediation in East Fork of Ninemile, and water treatment pilot projects. Monitor existing growth media plots, assess biostabilization methods and develop media for capping waste material. Plan and prioritize remedial actions for other source areas.	Finalize development of water treatment approaches for surface and groundwater in Canyon Creek. Coordinate work with study performed under the CWA Grant Program. Continue to monitor completed remediation actions in Pine Creek. Complete Golconda and Rex site remediation and other projects noted under the Mine/Mill program for human health remedies. Complete investigation design work for the USBM site. Prepare for remediation in future planning periods.	EPA and IDEQ. With BLM in Pine & Ninemile Creeks. EPA and USFWS have lead in soil cleanup standard.
Lower Basin Ecological Remedies	Develop a pilot project for conversion of agriculture land into waterfowl habitat. Complete a pilot project on soil amendment to reduce bioavailability of lead. Design wetland remediation approach. Perform numerical modeling of River processes and sediment. Collect data on river bank conditions and metal concentrations. Monitor bank stabilization pilot projects and evaluate effectiveness. Develop lead cleanup level for riparian soil. Incorporate findings from AVISTA studies into remediation strategies. Develop lead cleanup level for riparian soil.	Continue to implement the Lower Basin CWA sub-grant projects and monitor the results to have a better understanding of the complex and dynamic system in the Lower Basin. Complete development of the lead cleanup level for riparian soils. Continue EPA and USFWS collaboration on perpetual protection, conversion and remediation of agricultural land, followed by restoration to wetland habitat ecologically safe for use by waterfowl.	EPA, IDEQ, USFWS and Coeur d'Alene Tribe

Proposed Activity	Scope	CY 2007 Objective	Lead Agency
Basin Environmental Monitoring	Continue to implement long-term monitoring and make results available via www.storet.org. Implement remedial action effectiveness monitoring as appropriate.	Assess the effectiveness of remedial actions and trends in overall ecological improvement due to remediation and natural attenuation. Public outreach needed to assist in data access.	EPA working with other agencies including IDEQ, USFWS, and USGS

Table 2-1 Summary of Activities Funded by CWA

Proposed Activity	Scope	CY 2007 Objective	Lead Agency
Lake Monitoring Water Quality Studies	Conduct monitoring of lake water quality to assess nutrient, sediment, and metal loading and trends in lake water quality; to assess improvements/impacts from upstream environmental improvements projects; and assess impacts from further development projects along the lakeshore.	Publish 2006 water year data. Compile and evaluate data and publish evaluation of limnological data and riverine inflow/outflow data and physical, chemical, and biological interactions.	CDA Tribe, USGS
Ecological Monitoring of Coeur d'Alene Lake	Identify baseline conditions for ecological receptors in CDA Lake in order to determine future changes in the ecological condition of the lake. This information may be used in the future to determine if actions implemented under the OU-3 ROD and management actions implemented under the Lake Management Plan are effective.	All work complete.	USFWS

Proposed Activity	Scope	CY 2007 Objective	Lead Agency
Stream Bank Stabilization	Construct and monitor the effectiveness of several techniques to protect the Coeur d'Alene River banks from boat wake erosive forces.	Continue monitoring cross-sections, bathymetry, erosion pins, and photo points.	IDEQ
Lake Education and Outreach Program	Develop and implement a public information and education plan. The objective of such a plan is to provide the public with information to help them better understand the ecology of the Lake and ways they can better protect the Lake while they enjoy it.	All work complete.	CDA Tribe, KSSWCD
Mullan Inflow and Infiltration Groundwater Metal Loading Study/Demonstration Project	Evaluate sources of metals loadings to wastewater treatment facilities, investigate the potential reduction of metals loadings to the South Fork Coeur d'Alene River, determined the efficacy of wastewater collection system infiltration and inflow (I/I) reduction projects to reduce peak plant flows, and advance the current state of knowledge with regard to the cause and effect of such efforts to reduce pollution while considering transaction costs and community coordination.	All work complete.	South Fork Sewer District
Woodland Park Groundwater Quality Monitoring	Monitor water quality in this shallow alluvial groundwater system in Woodland Park area of Canyon Creek. Gain a better understanding of the metal concentrations and potential loading from groundwater to the Canyon Creek surface water system.	All work complete.	IDEQ

Proposed Activity	Scope	CY 2007 Objective	Lead Agency
Meyer Creek Flood Control	Assess the condition of the Meyer Creek diversion system and propose possible alternative remedial recommendations and order of magnitude cost estimates to prevent recontamination of the Superfund remedy in the City of Osburn during a flood event.	All work complete.	IDEQ
Upper East Fork Ninemile Creek Water Quality Evaluation	Success Mine Passive Water Treatment – 1) Reduce plugging in the Success Mine Apatite Barrier by making design modifications to the sediment chamber and injecting air into the Apatite to break up clogging in the media; 2) Perform a tracer study to determine hydraulic flow paths and residence times; 3) Analyze Apatite to determine forms of metal precipitates and where the reactions occur; and 4) Evaluate nutrient addition in the groundwater to determine if in situ metal precipitation is a viable option. East Fork Ninemile Creek Monitoring – Conduct monitoring of the East Fork of Ninemile Creek to assess where metal loadings occur, how seasonal flows affect metal loadings, evaluate overall water chemistry, and determine forms of metal precipitates.	Prepare final report and present it to BEIPC.	INL

Proposed Activity	Scope	CY 2007 Objective	Lead Agency
Metals and Nutrient Removal Pilot at Page Plant	Evaluate two emerging technologies for precipitation and/or adsorption for removal of heavy metals (lead, cadmium, zinc, and copper) and phosphorus from point source discharges in the Silver Valley, especially the Page wastewater treatment plant.	All work complete.	South Fork Sewer District
East Fork Pine Creek Revegetation Pilot Project	Identify practical and cost-effective methods to accelerate natural revegetation processes. Vegetation is needed to ultimately stabilize many stream reaches within the Basin. Identify and contrast the relative "bang for the buck" of several locally applicable revegetation methods.	Additional planting resumed in the fall of 2006. Monitoring of plant growth and survival rates will continue throughout the growing season. Any changes to planting site conditions, including average depth to seasonal low water table, effects of floods or channel shifting will also be monitored.	BLM
Inventory and Evaluation of Private Lands for Potential Restoration of Wetland Habitats	Provide a comprehensive inventory that identifies private land that may be suitable for wetland remediation and restoration projects in the Basin. This inventory would be useful for identifying agricultural and wetland habitats that could be remediated or restored as part of the ROD. Landowners will be surveyed to determine interest in wetland creation or enhancement on their respective properties. Properties identified as potential remediation/restoration projects will be assessed for their habitat quality.	Landownership, potential project location and toxicological surveys will continue through 2009 based on need and project status.	USFWS

Proposed Activity	Scope	CY 2007 Objective	Lead Agency
Monitoring Fish Responses to Bank Stabilization in the Coeur d'Alene River	Assess the short- and long-term affects of bank stabilization treatments on fish community structure in the lower Coeur d'Alene River. Provide recommendations for bank stabilization project designs with the least adverse impacts and most positive benefits to overall fish community structure. Provide recommendations on what project-specific monitoring that would be required for individual bank stabilization projects.	Sampling will continue in the spring of 2007 at the same sites as in 2005 and 2006.	USFWS U of I
Sediment Transport Model	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. 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 streamflow 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.	Complete final report and present results to the BEIPC.	USGS

Proposed Activity	Scope	CY 2007 Objective	Lead Agency
Lake Response Simulation Model	Provide the entities responsible for management of Coeur d'Alene 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.	Complete final report and present results to BEIPC. Complete Peer review by June.	USGS
North Fork Coeur d'Alene River Hydrologic and Sediment Study	Characterize and determine the existing hydrologic and in-stream conditions within the North Fork Coeur d'Alene River sub-basin stream system, and attempt to determine the impact of past and current management actions on the observed stream function and ecological conditions. In turn, the above scientific assessment would lead to specific identification of restoration projects, BMPs, and land use policy changes aimed to restore proper hydrologic functions and the impaired cold water aquatic life beneficial use (i.e., salmonid populations).	Complete watershed assessment using survey information collected during the 2006 field season. Produce a final report and present results to the BEIPC.	IDEQ
Mica Bay Nutrient Reduction Project	Demonstrate for training and education purposes a means of reducing nutrient and sediment contamination to Coeur d'Alene Lake in accordance with the implementation of the Lake Management Plan. Project will also accomplish some TMDL implementation goals for the recovery of beneficial uses in Mica Creek.	Preliminary study complete. Complete construction and conduct educational activities.	IDEQ

Proposed Activity	Scope	CY 2007 Objective	Lead Agency
Lower Lakes Aquatic Vegetation Survey	Develop baseline data on submersed aquatic plant species distribution and biomass in Benewah, Chatcolet and Round Lakes. Estimate nutrient (primarily phosphorus) release from the existing plant beds into the water column of these lakes and, subsequently into Coeur d'Alene Lake. Inspect these lakes for the presence of invasive, noxious aquatic species.	Prepare project report and present it to BEIPC.	CDA Tribe
Canyon Creek Groundwater Metal Source Characterization	Determine how, in practical terms, zinc and other metals are distributed between different physical and chemical states in the Canyon Creek alluvium. This information will be used to help understand how natural processes can affect the movement of contaminant metals through Canyon Creek and how engineered processes can impact contaminant metal mobility or sequestration.	Complete studies and prepare final report and present it to the BEIPC.	INL
Plummer Wastewater Treatment Plant Pilot	Construct a pilot scale demonstration of a cascading wetland treatment for use in the City of Plummer waste water treatment plant upgrade.	Construction project complete. Monitoring and testing were completed on a monthly basis through September, 2006. Prepare final report and make presentation to BEIPC.	City of Plummer

Proposed Activity	Scope	CY 2007 Objective	Lead Agency
Plummer Creek Watershed Nutrient Load Assessment, Modeling, and Management Plan Development	Characterize nutrient concentrations and transport through the Plummer Creek watershed and into Chatcolet Lake. Develop a Watershed Nutrient Management Plan which will include appropriate and specific point nutrient source control efforts for the Plummer Creek watershed.	Field water quality and constituent concentration data will be collected at key points, including potential pollutant sources in the Plummer Creek watershed.	CDA Tribe
Pinehurst Flood Impact Study	Develop stream channel and drainage infrastructure techniques to control and mitigate water pollution and protect property from recontamination and flood impacts.	Prepare design report for pilot project. Design project improvements and prepare bid package. Implement construction project.	IDEQ
Silver Crescent Mine and Mill Complex Habitat Restoration	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.	Construction start fall 2006. Stream channel construction with wildlife and fish habitat structure installation will encompass the bulk of the construction phase at the site in 2007.	USDA-Forest Service
Canyon Creek Treatability Study	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 So. Fork CDA River.	Complete the conceptual design for construction of an alkaline precipitation treatment pilot plant study. Prepare final report and present results to BEIPC.	IDEQ

Proposed Activity	Scope	CY 2007 Objective	Lead Agency
South Fork Sewer District Toxicity Reduction	Identify sources of toxicity in Basin community wastewater treatment plant effluent to develop options for removal of toxicants; perform bench testing to verify removals; and develop capital and O&M cost projections.	Toxicity control evaluation (TCE) – November 2006 through May 2007.	South Fork Sewer District
Assessment of the Economics and Effectiveness of Alluvium Sorting as Mine Waste Removal Strategy at the Project Implementation Level	Establish, at a removal project level, the costs of a simple screening of removed contaminated alluvium, and assess the beneficial value of the removal strategy by assessing the change in the metals content of the three-quarter inch minus fraction of the bed load sediment downstream.	Bank full discharge occurred in Prichard Creek. Stream bed load sediment will be re-sampled for its metals content for comparison to pre-tailings removals content. The project has allotted four seasons (2006-2009) to attain at least two bank full discharge events and assess the effectiveness of the project in removal of contaminated sediments from Prichard Creek.	IDEQ
Coeur d'Alene Lake Management Plan Implementation	Conduct an extensive evaluation of all activities within one mile of the Lake shore to evaluate what BMPs are in place, how effective they are, what BMPs are required but not in place, and to establish specific BMP audit procedures.	Complete the survey and effectiveness audit. Estimate programmatic costs for nutrient management activities and prepare final report. Report results to BEIPC.	IDEQ, CDA Tribe