

MINUTES

**MONTANA HOUSE OF REPRESENTATIVES
52nd LEGISLATURE - REGULAR SESSION**

SUBCOMMITTEE ON LONG-RANGE PLANNING

Call to Order: By CHAIR MARY ELLEN CONNELLY, on February 15, 1991, at 7:30 a.m.

ROLL CALL

Members Present:

Rep. Mary Ellen Connelly, Chair (D)
Sen. Bob Hockett, Vice Chairman (D)
Rep. Francis Bardanoue (D)
Sen. Ethel Harding (R)
Sen. J.D. Lynch (D)
Rep. Bob Thoft (D)

Staff Present: Jim Haubein, Principal Fiscal Analyst (LFA)
Jane Hamman, Senior Budget Analyst (OBPP)
Claudia Montagne, Secretary

Please Note: These are summary minutes. Testimony and discussion are paraphrased and condensed.

EXECUTIVE ACTION DEPARTMENT OF HIGHWAYS

Tape No. 1:A:010

Jim Haubein reminded the committee that Executive Action on Highways had been deferred because of the difference between the highway gas tax fund balance between the LFA and OBPP. The revenue estimates of the Executive were \$13,000,000 higher than those of the LFA, and therefore, the LFA fund balance projection shows that the highway gas tax account would be negative in the 1995 biennium. He reviewed the action pending on the Department of Highways. **EXHIBIT 1**

Bill Salisbury, Administrator, Centralized Services Division, said the difference in revenue estimates was minor. The approximate \$11,000,000 difference in fund balance was over a three year period, and that over \$300,000,000 was collected during this time. The LFA based its revenue estimates on the past three months activity, which was flatter than the past five years. The LFA and the OBPP did not differ on expenditures nor on beginning balances; regardless of the differences with the revenue estimates, the department would still end up with a \$30,000,000 balance at the end of the 1993 biennium (using LFA numbers).

Motion/Vote: REP. THOFT moved to approve the Department of Highways Maintenance Projects Statewide, Executive Priority 48, and Construction and Expansion of Maintenance and Equipment Buildings, Executive Priorities 49 and 50, for a total of \$1,977,525. Motion **CARRIED** unanimously.

EXECUTIVE ACTION ON DEPARTMENT OF FISH, WILDLIFE AND PARKS

Tape No. 1:A:175

Jim Haubein said that committee action had been postponed because the fund balance projection showed the General License Account would be at a deficit at the end of this biennium based on revenue estimates and the expenditures proposed in the Executive Budget. He reviewed pending committee action. **EXHIBIT 1**

Don Hyyppa said they had some funding hopes, some pieces of legislation pending, introduced on behalf of the State Parks Futures Committee. He distributed and reviewed a sheet briefly describing these bills, none of which were included in the Executive Budget. **EXHIBIT 2** Mr. Hyyppa added that the operations portion of the department's budget had been heard and approved in subcommittee; the Executive Budget included \$750,000 General Fund augmentation to the department's budget. This however did not solve the \$2,900,000 hole in the Capital Budget before Long Range Planning Subcommittee. He said the parks improvement portion amounted to \$4,900,000; \$2,900,000 is not supported by solid funding.

REP. THOFT questioned the items needing approval, **EXHIBIT 1**, and K.L. Cool, Director, Department of Fish, Wildlife and Parks, said the shortfall in revenues would be \$2,900,000 relating to the parks issues. There would be no shortfall in revenues to provide authority for construction and development of all of the other issues. REP. THOFT asked if this was based on increased fees, or if those projects could be constructed within the current fee structure. Mr. Cool said the funds required for the Fish and Wildlife portions amounted to \$600,000 per year, most of which is matchable. Those would be handled as a priority regardless of the fee increase. If a shortfall were experienced, the department would look at all of the operations and capital programs and reduce appropriately.

REP. THOFT commented that the Department would be in the Senate with its pending legislation regarding Parks funding and fee increases, and would know more in the future than they did now.

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SEN. HARDING introduced a proposal, which she said originated with Arnold Olsen, Administrator, Field Services Division, to divert a portion of the Coal Trust Fund to fund the Parks Program directly through 1995. **EXHIBIT 3** She reviewed the exhibit, which indicated 2/3 of the amount going to the Parks Program, and 1/3 going to the Cultural and Aesthetics Grant Fund. Both **SEN.**

LYNCH and **REP. THOFT** asked for more information. **SEN. HARDING** explained that this was a proposal for using the money going into the Coal Trust Fund for the Parks Program and the Cultural and Aesthetics Grant Program for the time period FY92 through FY95. She had asked David Nelson, Director, Montana Arts Council, to comment on this change, and said the Parks Division was amenable. She asked for the committee's support for the idea.

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REP. THOFT commented that this was substantive change in law, requiring a committee bill, and that it would take money away from C & A. **SEN. HARDING** disagreed regarding the reduction in funds from C & A. **K.L. Cool** said he had no ability to speak to the issue for the Department. He said the idea had not gone through the Budget Office, and had not been cleared with the Governor's Office. He said it appeared to have merit and potential, but could not support such a move.

SEN. HARDING said that if it had not gone through the proper channels, she would withdraw the proposal.

SEN. HOCKETT commented that if the Department did not have the money, it should not be spent. **REP. THOFT** commented that he did not want to create a situation in which one committee approves expenditures which forces another committee and the Legislature to approve a revenue increase to cover it. He asked if the rest of the budget, exclusive of the Parks shortfall, was sound. **Mr. Haubein** said there was a \$827,000 in their funding for capital projects that came from their General License Account, the account that has a projected deficit. He said there is a bill pending to increase License Fees; the Department would have to make decisions on paring back operating costs or capital project costs if the \$827,000 goes in. He said it was his opinion that the Natural Resources Subcommittee's approval of the budget including the Capital Projects money of \$827,000, would place the General License Account in the negative. **REP. THOFT** commented that the Department was then in the position of scaling back projects if it did not get the revenue.

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Motion: **REP. THOFT** moved to not approve the pending expenditures in the Department of Fish, Wildlife and Parks budget until the subcommittee knows more about other avenues of funding.

Discussion: **REP. THOFT** said he understood they were in a shortfall for all of it and not just part. **Mr. Haubein** pointed out that projects 42 through 47, **EXHIBIT 1**, had solid funding. **REP. BARDANOUE** said it was too early in the session to make some final conclusions on this budget because of the "ifs" on the revenue side. There was a lot of time, and a variety of proposals for raising more revenues. **REP. THOFT** asked if there was any action on the acquisition bill to put more money into maintenance. **Mr. Cool** said there was a bill, SB 252, still in Senate Fish and Game, which would put approximately \$300,000 per annum into the Maintenance and Development Fund. This would

provide a form of relief in the License Account. **REP. THOFT** asked if this would reduce the \$4,000,000 acquisition money. **Mr. Cool** said the money would not reduce the acquisition money, but would come out of the Trust Fund, a similar suggestion to the solid proposal put forth by Sen. Harding. **Mr. Cool** said that if the committee was uncomfortable with these expenditures because of the funding questions, the Department had no problem with waiting until the decisions are made.

Vote: Motion **CARRIED** unanimously.

HEARING ON RECLAMATION AND DEVELOPMENT GRANTS

Tape No. 1:A:1030

John Tubbs, DNRC, introduced the two staff members who work on these projects day to day. **Greg Mills**, who has been with the program since its inception in 1986, and has worked in the area of mine reclamation for over 12 years. **Diedre Richards** is a staff person with the RDG program 1/2 time with previous experience in flood plain management. He reviewed the program as described in the book, Reclamation and Development Grants Program: Project Evaluations and Recommendations for the 1992-1993 Biennium and Status Report for Previously Funded Projects.

EXHIBIT 4

1:B:000

SEN. LYNCH asked how many Montana State employees were paid with RIT money. **Karen Barclay, Director, DNRC**, reminded the committee of the presentation she made earlier. The RIT money comes to the Department in all three grant categories. It funds a portion of the Water Rights Bureau, new permitting in the water area, the Conservation and Resource Development Bureau, and \$1 million to the Conservation Districts in the form of DNRC FTEs and financial assistance to the districts. The amount this session is not an increase in this biennium over the previous three biennia.

Butte-Silver Bow Government: WASTE C

Jack Lynch, Chief Executive, Butte-Silver Bow Government, testified for the project RDG 1. **EXHIBIT 5**

Mike Tuck, Vice President, Mountain States Energy, Inc., testified in support of the project and addressed the technical aspects of the project. They operate the Department of Energy (DOE) Test Facility. The RDG funds, over the two year period, would be used: to identify and characterize the waste stream with an analysis of the feed stock; to screen existing and new technology; to select candidate technologies for testing in a pilot project at the Test Facility; to initiate permit application to establish the facility as a testing and evaluation center under EPA criteria; to establish a training and education program; and to develop a technology transfer model to move technology out of the center into other federal agencies and the

private sector. There is a potential to leverage another \$120 million in federal dollars during FY91 through FY96. Currently in hand, they have \$3.5 million for the establishment of the center plus an additional \$3 million this year for project funds. Three technologies are being tested at the present time at the test facility in Butte. It would be the first center of this type west of the Mississippi. He submitted letters in support of the project from Pat Williams and Conrad Burns, U.S. Senators from Montana. **EXHIBIT 6 & 7**

REP. FRITZ DAILY, HD 69, Butte, spoke in support of the project, which allows Butte people to work on the problem. He noted that Silver Bow Creek is at the headwaters of the Columbia River, and that if the contaminated water from the Berkeley Pit and mine flooding gets into that creek, the problem would no longer be limited to Butte, but would include the Northwest portion of the United States.

SEN. JUDY JACOBSON, SD 36, Butte, supported the grant application, saying this is a bright spot in all Butte has had to go through with the Superfund issue.

REP. DAVE BROWN, HD 72, Butte-Silver Bow, supported the project. There is a potential for a 40 to 50 to 1 match with this application, working with both the DOE, the Hazardous Waste Division, and the EPA in concert. He mentioned the PATH Program, located in Butte at the present time, where hazardous waste is burned at a high temperature producing a solid, insoluble rock. Technologies such as these would be tested.

SEN. J.D. LYNCH, SD 36, Silver Bow, identified himself as a proponent for the project.

Questions from Subcommittee Members:

REP. THOFT said he agreed that this is the biggest disaster in Montana. He asked Rep. Daily for an accounting for the \$100 million that EPA had spent to date in the area, and if the return on this money would be greater than that. **REP. DAILY** guaranteed that something would get done with this project. The people of Butte want to solve this problem, not just make money. ARCO and EPA have taken a cavalier attitude towards the problem of the mine water reaching the level of the alluvial aquifer. Don Peoples would be the lead person in the WASTEC project. He guaranteed that he would do something with this money.

Ms. Barclay said the Department stipulated that this money would only become available if it were matched with a minimum of \$1 million in federal grant monies. Already, \$3.5 million had been received to date.

SEN. HOCKETT asked why the state funding was being sought, since it was said to be non essential. **Mr. Lynch** said it was critical that Butte-Silver Bow and Montana have a say in the process.

This money would be used to prioritize the work and the manner in which the work would be done, and to assist in the development of the permitting process. To date, the State's commitment to the Superfund cleanup has not developed to the extent they would like. SEN. DAILY went on to describe the efforts to date, and the need for the state to have a say. They may come back for additional money next biennium if they are successful in achieving positive results and leverage of federal dollars.

SEN. HOCKETT asked how many dollars would be contributed by the companies who solved the problems. REP. DAILY said they were helping, and cited the example of ARCO and an \$80 to \$120 million expense for cleanup of the Colorado tailings. The total expense charged to responsible parties could reach in excess of \$1 billion.

Ms. Barclay said there is a State action against the responsible party through a Natural Resource Damage litigation, so the Department would be keeping track of State contributions. There may be an opportunity to recover these fees as part of the court settlement.

Dr. Huang, Montana School of Mines and Technology, Butte, said Montana Tech had been asking ARCO for samples of water from the pit. ARCO promises but does not follow through. However, there is access to the pit for sampling.

2:A:065

Montana Bureau of Mines and Geology: Downhole Geophysical Logging Techniques for Well Completion

John Wheaton, Montana Bureau of Mines and Geology, testified in support of the project, RDG 12. EXHIBIT 8

Diana Cutler, Program Specialist, Board of Water Well Contractors, spoke in support of the project. EXHIBIT 9

Mark Shapley, Senior Hydrogeologist, Water Management Bureau, DNRC, testified in support of the project. EXHIBIT 10

Nicholas Bugash, Hydrogeologist, PRC Environmental Management, testified in support of the project as a private citizen. EXHIBIT 11 & 12

Questions from Subcommittee Members:

REP. THOFT asked if requirements for drilling of water wells had changed. Mr. Wheaton said the completion technology is regulated by the State, and does require a seal be placed in the well between the casing and the edge of the bore hole.

SEN. HOCKETT suggested this test be used to complete the certification process in order to take care of a problem before it begins. Mr. Wheaton said he did not envision that except in

cases of suspected problems.

REP. THOFT said his problem was with the Water Well Licensing Bureau. He asked if the drillers were doing any of this right. **Ms. Cutler** said she had been out on the drill sites. The problem is when she is there, they do it right. She has to notify them ahead of time because otherwise, she would not be able to find them.

SEN. HOCKETT suggested a requirement of filing pre-drilling plans. **Mr. Bugosh** said even if an inspector is standing there, there are no guarantees that a well seal will work. This test would be akin to x-ray eyes under the ground to see what is happening. This could be a preventative tool to check what a driller has done, since once he has smoothed the surface, there is no way to check his technique at this time.

Butte-Silver Bow Government: Upper Clark Fork River Basin Coordinator

Judy Tillman, Butte-Silver Bow, testified in support of the project, RDG 23, and urged reconsideration of refunding for the position. She cited the critical need for the position, and responded to a comment by the Department review that there were a great number of scientists and engineers in the area and on the Local Citizens Task Force. However, local governments cannot rely on citizens or scientists with a special interest in a project to give them the advice they need. Such a complex and important issue needs to be dealt with in a comprehensive and professional manner. **EXHIBIT 13**

REP. FRITZ DAILY, HD 69, Butte, testified in support of the project. The Superfund process is frustrating and complicated, necessitating a coordinator position. He had sponsored this position last session, and believed it valuable for the community and the area. It has been a worthwhile position, and he asked continuation of the funding. Currently, a group of people from White Resources are working as the Clark Fork Coordinator. He responded to the reasons the project was not recommended for funding. In response to the comment that Butte-Silver Bow should pay for this, he said they pay thousands of dollars per year on Superfund projects. Regarding the comment that EPA is in Butte, and this is therefore not necessary, **REP. DAILY** said there was only one person from EPA in Butte; the rest were in Helena.

An accomplishment of the Coordinator impacted the engineering evaluation and cost analysis being done on the Colorado tailings. Hopefully some construction would take place this year. The Coordinator brought all the people together, ARCO, DHES, EPA, and all the various agencies, who received input from the Citizens Committee on the front end. He noted that they had applied for funding to the EPA for a Technical Assistance Grant, but were denied because everyone in Butte is a Potential Responsible

Party, because the Local Government is a PRP.

Jack Lynch, Chief Executive, Butte-Silver Bow Government, testified in support of the project. He noted that the only representative on site is the man funded by this project, the coordinator. He would address critical and complex issues: the recent naming of Butte as a responsible party, PRP, due to the fact that mine wastes are diffused to lower areas of Butte-Silver Bow through the storm sewers. Technical expertise is needed to voice the community's concerns and views. He spoke of the need for local coordination of priorities and projects, giving the example of the cleanup at the Colorado Tailings and the Montana Pole Plant and the need for their coordination. He asked for continuation of funding the position.

SEN. J.D. LYNCH, SD 34, Butte, spoke in favor of the project. He said there would be far reaching impacts of this position in relation to the relatively small amount of money coming from the proper fund. It would benefit all of Montana.

Creighton Berry, Superfund Coordinator, Butte/Anaconda, summarized the project. Once a Superfund gets to the stage where there is a study, the input from that study goes into a design or solution phase, where there is input from EPA, the State, and the PRP. All of these parties have money except the public, which has a vital input into this process as well. This position would be a rallying point for citizens, local governments and the Legislature to voice concerns with the backing of technical expertise.

Questions from Subcommittee Members:

REP. THOFT told Rep. Daily that Sen. Jacobson has a source of funding, and told him to talk with her.

Montana Tech: Pilot Plan Treatment of Contaminated Water from Pit

H.H. Huang, Montana Tech, testified on the project, RDG 24.
EXHIBIT 14

REP. THOFT said he saw more value in this than in the WASTEC project. He asked why some federal dollars could not be funnelled into a project such as this.

SEN. JUDY JACOBSON, SD 36, Butte, said she could not answer the question. However, WASTEC would be directed by the Federal Government, and without State money, the State would not have input at a local level. Even though this is an important project and perhaps could be tied in, there was a need for public input into the solution. Moreover, time was running short.

REP. THOFT asked if WASTEC could fund this project. **Greg Mills,**

DNRC, described the decision making process for choosing the preferred alternative. He said this particular technique may not be the alternative preferred by the EPA, and the money would be wasted. REP. THOFT countered that they were not willing to take a chance on an active project.

Dr. Huang said they had done this research for over two years. This may not be the best project, but it is a start.

CHAIR CONNELLY asked if there was a market for these metals recovered from this person. Dr. Huang did not know of markets; the figures he was quoting were based on what they are selling for now.

Montana Tech: Construction of Artificial Bogs and Wetlands

Elmer Gless, Professor, Montana Tech, testified in support of his project, RDG 27. He is a Biologist, who has a grant to work on the precursor to this project and has worked on water quality in Jefferson County for the past 20 years. He proposes to build a demonstration project at 8,000 feet, constructing concrete lined artificial bogs and wetlands to treat acid mine drainage. He described the project, which would use microbes to detoxify the water, and said he would use graduate students to provide training in environmental engineering, expertise which would mitigate future problems and enhance mining in the State of Montana. He addressed the need of acting soon. He said the degraded area, Cataract Creek, was ranked number two behind the Berkeley Pit in impact.

3:A:000

Montana Tech: Detoxification of Acid Mine Drainage from Pit

Don Beuerman, Chemistry Department, Montana Tech, testified in support of the project, RDG 27. He has been involved in the process since 1971, and has academic and industrial research experience in extractive chemistry, particularly copper. The process, separation of metal ions by solvent extraction, is a commercial method of separating metals from acid waters. This proposal is a modification of that process; it is more chromatography. The process has been tested on a laboratory scale and is feasible.

Dr. Richard Hammond, Teacher of Chromatic Chemistry, described the process, chelation chromatography, which started at CAL Tech. It is a result of collaborative efforts and has been funded by a variety of groups. It is a proven technology brought to a level of practicality. He distributed a handout and showed slides outlining the process. EXHIBIT 15 Included are projection of the laboratory results and costs. Contaminated water would be pumped through tubes. Molecular "fish hooks" grab the metal ions, and the water exiting is decontaminated. He would like to take the process from the small lab/drinking water scale to a

pilot scale where they can get some real engineering numbers. The demonstration unit would be used to sell the technology to other companies. The metal is removed as a concentrate, which could be marketed after electroplating.

Questions from Subcommittee Members:

Ms. Hamman noted that the EPA has to select the appropriate technology. What is EPA doing to fund the various demonstration technologies so that they can select the appropriate technology. **Dr. Hammond** said there was confusion in the program nationally. They had a proposal in to EPA, but he was not sure that the process of choosing technology would be EPA driven. They are appealing to the commercial sector. There is a long list of candidate technologies, of which this process is one.

Dr. Beuerman said this project and that of Dr. Huang were geared to pit water, but were applicable to other mine drainages as well.

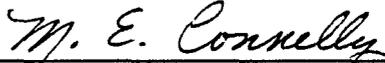
SEN. HARDING asked how this fit in with Dr. Huang's proposal. **Dr. Hammond** said there was overlap in technology and the purposes were the same. They are competing for the same money, but they are coordinating. Neither one of these would alone solve the problem.

John Tubbs said WASTEC would be a clearinghouse for the evaluation for all cleanup technologies, and it would be from there that EPA approval for technologies would be sought. **Dr. Hammond** said much EPA money is spent on finding the smoking gun and trying to set up litigation. This would be a chance for the state to actually advance some technology and lead instead of being a litigator.

SEN. HARDING asked about the Hot Springs project, since they were not there. **Mr. Mills** overviewed the project, the rehabilitation of the hot springs at Camas, with the ultimate goal of rejuvenating the economy.

ADJOURNMENT

Adjournment: 11:20 a.m.



MARY ELLEN CONNELLY, Chair



CLAUDIA MONTAGNE, Secretary

MEC/cm

HOUSE OF REPRESENTATIVES
LONG-RANGE PLANNING SUBCOMMITTEE

ROLL CALL

DATE 2-15-91

NAME	PRESENT	ABSENT	EXCUSED
REP. FRANCIS BARDANOUVE	✓		
SEN. ETHEL HARDING	✓		
SEN. BOB HOCKETT, VICE-CHAIRMAN	✓		
SEN. J.D. LYNCH	✓		
REP. BOB THOFT	✓		
REP. MARY ELLEN CONNELLY, CHAIR	✓		

HR:1991
CS10DLRLCALONGRP.MAN

Agency	A&E Priority	Capital Projects Fund	State Special Revenue	Federal Special Revenue	Other Revenue	LRBF Bond Proceeds	Total
Highways							
Maintenance Projects - Statewide	48		\$693,500				\$693,500
Construct & Expand Maint. & Equipment Buildings	49 & 50		1,167,600	115,925			1,283,525
Total Highways		\$0	\$1,861,100	\$115,925	\$0	\$0	\$1,977,025
Fish, Wildlife, & Parks							
Remove Underground Storage Tanks	35		150,000				150,000
Headquarters Maint. & Improvements	36		85,000				85,000
Property Development	37		360,000				360,000
State Parks Development & Improve.	38		3,798,500	1,124,500			4,923,000
Fish Hatchery Maintenance	39		37,500	112,500			150,000
Fishing Access Site Improvements	40		286,000	858,000			1,144,000
Motorboat Access Site Facilities	41		67,000	201,000			268,000
River Restoration	42		261,000				261,000
Fishing Access Site Acquisition	43		881,000				881,000
Wildlife Habitat Maintenance	44		304,000				304,000
Wildlife Habitat Acquisition	45		4,923,356				4,923,356
Waterfowl Habitat Enhancement	46		399,500				399,500
Bighorn Sheep Habitat Acquisition	47		48,500				48,500
Total Fish, Wildlife, & Parks		\$0	\$11,601,356	\$2,296,000	\$0	\$0	\$13,897,356

DEPARTMENT OF HIGHWAYS

There was no action taken on the Department of Highways Long Range Building request because of the question of availability of funding. LFA projects the Highway Gas Tax Account will be negative in the 1995 Biennium and will require a significant fuels tax increase to remain solvent. The Executive revenue projection is \$13 million higher than the LFA and therefore they are supporting these requests.

DEPARTMENT OF FISH, WILDLIFE, AND PARKS

The committee did not take action on the proposed projects for FW&P again because of the uncertainty of funding. The Executive Budget is projecting a negative cash position in the FW&P General License Account. In addition there was \$2.9 million in the parks project for which the department had not yet determined the funding.

EXHIBIT 2

DATE 2-15-91

HB DFWP

Long Range Planning

POTENTIAL PARKS FUNDING

BILL	TITLE	SPONSOR	ANNUAL AMOUNT (Fis. Note)	SOURCE
HB 386	Gas tax for parks roads	Schye	\$5,700,000	Gas tax
HB 526	Vehicle reg. for parks	Schye	\$530,000	50 cent vehicle fee
HB 550	Rental car tax	Grady	\$1,200,000	6% rental car tax
SB 318	Camper decals	Weeding	\$3,800	Camper decal
Draft	RV sticker	Vaughn		Special RV fee
Draft	Pop tax	Bardanouve		Tax on soda pop

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EXHIBIT

DATE 2-15-91

HBDFWP Long Range Planning

	Parks Trust	Cumulative	Interest Lost	One Third C&A Grants	Two-Thirds Parks
1992	\$733,150	\$733,150	\$34,751	\$11,584	\$23,283
1993	\$729,962	\$1,463,112	\$105,530	\$35,177	\$70,705
1994	\$975,214	\$2,438,326	\$187,464	\$62,488	\$125,601
1995	\$987,356	\$3,425,682	\$281,766	\$93,922	\$188,783
	<u>\$3,425,682</u>			<u>\$203,170</u>	<u>\$408,373</u>

Exhibit 4 consists of a 149-page study. The original is available at the Montana Historical Society, 225 N. Roberts, Helena, MT. 59601. (Phone 406-444-4775)

Exhibit 4

2-15-91

HB 8 Long Range
Planning

RECLAMATION
AND
DEVELOPMENT
GRANTS PROGRAM

Project Evaluations and Recommendations
for 1992-1993 Biennium

and

Status Report for
Previously Funded Projects

January 1991

Montana Department of Natural
Resources and Conservation

H158
~~SB~~
EXHIBIT 5
DATE 2.15.91
HB RDG 1
Long Range Planning

WASTEC TESTIMONY

- o MADAM CHAIR . . MEMBERS OF THE COMMITTEE
 - o IT IS MY PLEASURE TO PRESENT THE WASTEC PROJECT, BUTTE-SILVER BOW'S RECLAMATION AND DEVELOPMENT GRANT APPLICATION, THAT WILL ENABLE BUTTE-SILVER BOW AND THE STATE OF MONTANA TO FORM A PARTNERSHIP WITH THE FEDERAL GOVERNMENT TO DEVELOP A TESTING AND EVALUATION CENTER FOR INNOVATIVE ENVIRONMENTAL TECHNOLOGIES.
 - o THIS PROJECT, REFERRED TO AS WASTEC -- WATER AIR SOIL TESTING AND EVALUATION CENTER -- WILL BE A COOPERATIVE EFFORT BETWEEN THE STATE OF MONTANA, BUTTE-SILVER BOW, THE DEPARTMENT OF ENERGY AND THE ENVIRONMENTAL PROTECTION AGENCY TO ESTABLISH A NATIONAL NON-RADIOACTIVE HAZARDOUS WASTE TECHNOLOGY DEVELOPMENT CENTER AT THE D.O.E. SITE IN BUTTE.
 - o WE ARE ESPECIALLY EXCITED ABOUT THIS PROJECT, NOT ONLY BECAUSE OF THE ECONOMIC DEVELOPMENT POTENTIAL IT AFFORDS, (50-75 CONSTRUCTION JOBS, 100-150 DIRECT PERMANENT JOBS), BUT MORE IMPORTANTLY BECAUSE IT PROVIDES THE OPPORTUNITY TO DEVELOP STATE-OF-THE-ART TECHNOLOGY THAT WILL HELP SOLVE MONTANA'S ENVIRONMENTAL PROBLEMS, ESPECIALLY THOSE ASSOCIATED WITH MINERAL DEVELOPMENT.
 - o THE FIRST PRIORITY WILL BE TO DEVELOP

EFFECTIVE, COST EFFICIENT TECHNOLOGY TO ADDRESS THE CLEANUP OF THE SILVER BOW/BUTTE AREA SUPERFUND SITE INCLUDING THE BERKELEY PIT WATER. THE BERKELEY PIT HOLDS ~~OVER 11~~ BILLION^S GALLONS OF CONTAMINATED WATER AND POSES A VERY REAL THREAT TO THE CLARK FORK RIVER BASIN. AS I'M SURE YOU KNOW, THE BUTTE SUPERFUND SITE IS THE LARGEST IN THE U.S. AND THE STUDY AREA EXTENDS DOWNSTREAM TO THE MILLTOWN DAM NEAR MISSOULA. 110 YEARS OF MINING HAVE RESULTED IN SOIL AND WATER CONTAMINATION. THE ENVIRONMENTAL PROBLEMS ASSOCIATED WITH THE SUPERFUND SITE THREATEN GROUND AND SURFACE WATER AND THE HEALTH OF MONTANA CITIZENS AND NEW COMPLEX PROBLEMS CONTINUE TO SURFACE.

- o THE DEVELOPMENT OF TECHNOLOGY TO TREAT PROBLEMS IN THE SUPERFUND AREA WILL BENEFICIALLY AFFECT THE CLARK FORK RIVER BASIN AND WESTERN MONTANA. IN FACT, EFFECTIVE CLEAN-UP WILL HAVE A POSITIVE IMPACT ON THE ENTIRE COLUMBIA RIVER SYSTEM.
- o I MIGHT POINT OUT THAT THE SUPERFUND SITE ENCOMPASSES A CONTAMINANT FEEDSTOCK THAT EMULATES ALMOST EVERY WASTE MATERIAL FOUND IN THE U.S. WHICH IS THE PRIMARY REASON DOE AND EPA ARE INTERESTED IN ESTABLISHING A NATIONAL WASTE TECHNOLOGY AND EVALUATION CENTER IN BUTTE.

5
2-15-91
RDG-1
Long Range Planning

o THE TECHNOLOGY DEVELOPED THROUGH THE WASTEC PROJECT CAN BE TRANSFERRED TO ADDRESS OTHER ENVIRONMENTAL PROBLEMS ESPECIALLY THOSE ASSOCIATED WITH MINERAL DEVELOPMENT ELSEWHERE IN MONTANA AND THE NATION. THE POTENTIAL IS UNLIMITED.

BEFORE TURNING THE PRESENTATION OVER TO MIKE TUCK, VICE-PRESIDENT OF MSE, WHO WILL ADDRESS THE MORE TECHNICAL ASPECTS OF THE PROJECT, I'D LIKE TO TOUCH ON A FEW OTHER BENEFITS OF THE PROJECT FOR THE STATE.

1. WASTEC WILL ENSURE THAT MONTANA ADDRESSES ITS ENVIRONMENTAL PROBLEMS WITH A LONG-TERM, COMPREHENSIVE APPROACH USING THE MOST COST EFFECTIVE SOLUTIONS. WE ALL WORRY ABOUT MAINTAINING THE QUALITY OF LIFE IN MONTANA WHILE PROMOTING ECONOMIC DEVELOPMENT. THIS PROJECT DOES BOTH.
2. IT WILL PROVIDE FOR THE EXPANSION OF MONTANA'S TECHNICAL BASE AND WORK FORCE THUS COMPLEMENTING EFFORTS OF THE MONTANA UNIVERSITY SYSTEM, THEIR ASSOCIATED CENTERS OF EXCELLENCE AND THE MONTANA SCIENCE AND TECHNOLOGY ALLIANCE.
3. WE EXPECT TO SEE THE CREATION OF NEW TECHNICAL BUSINESSES AS A RESULT OF TECHNOLOGIES DEVELOPED, TESTED AND

CERTIFIED BY THE CENTER.

4. IN THE FIRST YEAR ALONE, THIS PROJECT WILL BRING OVER \$3.5 MILL IN FEDERAL MONEY INTO THE STATE FOR A NATIONAL TECHNOLOGY CENTER TO DEAL WITH THE NATION'S GROWING ENVIRONMENTAL PROBLEMS. IN THE YEARS AHEAD, THESE FUNDS WILL GROW EXPONENTIALLY. (EMPHASIZE)

5. THE TIME TO START DEALING WITH MONTANA AND THE NATION'S ENVIRONMENTAL PROBLEMS IS TODAY -- NOT TOMORROW AND BUTTE IS EAGER TO BE PART OF THE SOLUTION.

IT'S THE OPPORTUNITY TO NOT ONLY SECURE A NATIONAL CENTER BUT PARTICIPATE IN AND HAVE AN IMPACT ON ITS DEVELOPMENT TO ENSURE THAT IT ADDRESSES MONTANA'S PROBLEMS FIRST.

o INTRODUCE MIKE.

MAJORITY DEPUTY WHIP
 COMMITTEES:
 STEERING AND POLICY
 EDUCATION AND LABOR
 CHAIRMAN
 POSTSECONDARY EDUCATION
 SUBCOMMITTEES
 ELEMENTARY, SECONDARY AND
 VOCATIONAL EDUCATION
 EMPLOYMENT OPPORTUNITIES
 LABOR STANDARDS
 INTERIOR
 SUBCOMMITTEE
 NATIONAL PARKS AND PUBLIC LANDS

PAT WILLIAMS
 MONTANA, WESTERN DISTRICT



Congress of the United States
House of Representatives
 Washington, DC 20515

EXHIBIT 6

DATE 2-15-91

HB 8, RDG 1

Long Range Planning

3457 RAVEREN BLDG
 WASHINGTON, DC 20515
 (202) 226-3211

DISTRICT OFFICES:

BUTTE
 (406) 723-4404
 FINLEN COMPLEX
 59701

HELENA
 (406) 443-7878
 32 N. LAST CHANCE GULCH
 59601

MISSOULA
 (406) 848-8800
 302 W. BROADWAY
 59602

February 14, 1991

The Honorable Mary Ellen Connolly
 Chairperson
 Long Range Building Subcommittee
 Capitol Station
 Helena, Montana 59624

Dear Mary Ellen:

I would like to lend my support for Butte Silver Bow's application to the Department of Natural Resources for Reclamation and Development Grant program funds for the establishment of the Waste Technology Center.

It is critical to have a financial commitment from the state in order to have continued assurance of federal participation.

Best regards.

Sincerely,

Pat Williams

United States Senate

WASHINGTON, DC 20510-2803

EXHIBIT 7
DATE 2-15-91
HB 8 RDG 1
Long Range Planning

February 14, 1991

Mrs. Mary Ellen Connelly
Chairwoman
Long Range Building Committee
Capitol
Helena, Montana 59620

Dear Mary Ellen:

I would like to lend my support to House Bill 8 for Butte-Silver Bow's application for Reclamation and Development Grant funds for the establishment of the Water, Air, and Soil Technology Evaluation Center (WASTECC) in Butte.

It is extremely important to have state financial participation as a good faith match for significant federal funding.

With best wishes,

Sincerely,



Conrad Burns
United States Senator

CRB/rtf

EXHIBIT 8

DATE 2-15-91

HB 8 RDG 12

Long Range Planning

PROJECT FACT SHEET



MONTANA BUREAU OF MINES AND GEOLOGY
MONTANA COLLEGE OF MINERAL SCIENCE AND TECHNOLOGY
BUTTE, MONTANA 59701
(406) 496-4180

TITLE: Down-Hole Geophysical Logging Techniques Applied to Cased Water Well or Monitor Well Completion.

PURPOSE: The intent of this project is to develop post-construction techniques to define the adequacy of well completions. Improper completion is a major source of well problems. Poorly placed perforations or inadequate seals allow water to migrate between aquifers, or to the surface, or allow surface waters to penetrate into deeper aquifers. These conditions can render a well unfit for use and can create environmental hazards. A good aquifer may be contaminated by water from a less desirable one, or by surface runoff, or may be depleted needlessly.

There are no methods for knowing whether a well is properly completed. Completions are assumed to be proper, unless, or until, a problem develops with a well or with data from the well. Diagnosing the problem and choosing remedial measures are difficult. In many cases the problem remains undefined, and the well is simply abandoned, perhaps leaving a permanent conduit for contaminants.

The purpose of this work is to develop a "cookbook" approach for the application of conventional down-hole geophysical logging techniques to evaluate cased-well completions in monitor wells and water wells. Of primary importance is developing methods of using tools that are readily available and economically feasible.

TECHNICAL: The primary focus of the project is on three methods commonly utilized for down-hole logging, because these are readily available and relatively inexpensive. These are: 1. high-resolution density (to define the densities of casing material and sealants); 2. natural gamma-ray (to further resolve presence or absence of sealants); 3. resistivity logs (to detect perforated zones or breaks in the casing).

The project will consist of two phases. A laboratory phase will test some basic hypotheses and develop accurate calibration curves. A field phase will involve the drilling, logging and completion of shallow test wells to confirm the techniques developed in the lab. A final report will evaluate the selected techniques and their cost-effectiveness.

BENEFITS: Standards for completion of water wells and monitor wells have been developed by the State to protect groundwater resources and groundwater users. State agencies, private industry and landowners are often stymied, however, in evaluating problems in already-cased wells.

This project is important because aquifer protection is critical. If successful, MBMG will have developed a reliable, cost-effective approach for verifying or evaluating well completion. The Board of Water Well Contractors, the Water Quality Bureau of the Department of Health and Environmental Sciences, and the Coal and Uranium Bureau of the Department of State Lands strongly support this study.

THE BUREAU OF MINES AND GEOLOGY WAS ESTABLISHED BY LAW IN 1919 AS A DEPARTMENT OF MONTANA COLLEGE OF MINERAL SCIENCE AND TECHNOLOGY TO PROMOTE EFFICIENT DEVELOPMENT OF MONTANA'S MINERAL RESOURCES BY GATHERING AND PUBLISHING INFORMATION ON THE GEOLOGY, TOPOGRAPHY AND MINERAL DEPOSITS OF THE STATE, INCLUDING METALS, NON-METALS, COAL, OIL, GAS, AND UNDERGROUND WATER SUPPLY.

EXHIBIT 7
DATE 2.15.91
HB 8 RDG-12
Long Range Planning

TESTIMONY BEFORE THE LONG-RANGE PLANNING JOINT SUBCOMMITTEE,
2/15/91

Madame Chairperson, Members of the Committee:

My name is Diana Cutler. I'm Program Specialist for the Board of Water Well Contractors. I am here to speak in favor of the Montana Bureau of Mines and Geology's Reclamation and Development grant proposal entitled "Down-Hole Geophysical Logging Techniques Applied to Cased Water Well or Monitoring Well Completion".

The Board of Water Well Contractors feels there is a definite need for this project and is in support of it. If the techniques work, this method would be very helpful for the Board in investigating complaints and questionable well completions. Currently, when a well is completed it is difficult to know the depth of the grout or where perforations actually are in the pipe.

DATE 2-15-91

HB 8 RDG 12

TESTIMONY BEFORE THE LONG-RANGE PLANNING JOINT SUBCOMMITTEE, 2/15/91 *Long Range Plan.*

Madame Chairperson, Members of the Committee:

My name is Mark Shapley. I am the senior hydrogeologist for the Department of Natural Resources and Conservation's Water Management Bureau, and I'm here to speak in support of the Montana Bureau of Mines and Geology's Reclamation and Development grant proposal titled "Downhole Geophysical Logging Techniques Applied to Cased Water Wells and Monitoring Wells".

One of the tasks of the Water Management Bureau is to help evaluate technical aspects of water well complaints brought before the Board of Water Well Contractors. These complaints typically involve financial claims between well owners and well drillers, and frequently involve potential or actual aquifer contamination problems also.

More often than not, the resolution of these complaints hinges on disputed details of subsurface well construction that can be very difficult or impossible to verify after the fact. If this project is successful in its objective of developing useful geophysical techniques for resolving these kinds of questions, we will have a new and valuable tool for evaluating such problems. Well owners, drillers, and the integrity of ground water as a resource will all benefit.

Finally, through having worked with the project's principal investigator on a previous R and D (RIT) grant, I can say that I have every confidence that John Wheaton will carry out the project in a highly professional and efficient manner.

EXHIBIT 11

DATE 2-15-91

HB 8, RDG 12

Long Range Planning

Mr. Chairman, members of the committee,

My name is Nicholas Bugosh, I am a resident of Helena, Montana, I am a hydrogeologist employed by PRC Environmental Management, Inc., and I hold Montana monitoring well constructor's license #217. I am addressing you today as a private citizen to support the grant for the project on **Downhole Geophysical Logging Techniques Applied to Cased Water Well or Monitor Well Completion.**

This project offers many potential benefits for Montanans. It offers immediate health benefits in its application to drinking water wells. The Administrative Rules of Montana require a water well contractor to seal water wells so that surface contamination or contaminated or other poor quality water cannot enter a water well. There is presently no practical means to verify that this requirement has been met. It is possible that an adequate seal is not obtained for a variety of mechanical reasons and also from contractor negligence. The result is that the public can unknowingly consume unsuitable water for years. Pollutants may not be present in a concentration high enough to cause acute, or immediate effects, but may cause chronic effects, effects caused by exposure to low levels of contamination over a long period of time. Also, some pollutants, such as nitrate, may be present in a concentration that does not affect adults but causes immediate death to infants. The immediate health threat to the public from improperly sealed water wells is very real and presently there is no practical means to verify the adequacy of the seal. The proposed project offers a practical technique to solve this problem.

This project offers longer term benefits for Montanans, too. Monitoring wells are required at all kinds of projects in Montana: landfills, metal mines, coal mines, petroleum bulk plants, irrigation projects, the Superfund site in Butte, the Burlington Northern site in Livingston, the list goes on and on. Monitoring wells are very different from water wells. The purpose of a water well is to provide a usable quantity of potable water; the purpose of a monitoring well is to provide information. A ground water scientist (hydrogeologist) designs a monitoring well to provide specific information about conditions underground. The effectiveness of the well seal is critical in obtaining accurate information. These monitoring wells typically cost thousands of dollars each and the sampling and laboratory analysis will cost additional thousands of dollars. All of that effort and money is wasted if the well completion is not correct. Decisions, such as, whether a proposed mine project should go ahead, who is responsible for a multi-million dollar cleanup, if contaminated water has been cleaned up, and does irrigation in one location impact another user, all depend on reliable information from monitoring wells. But presently there is no practical means to verify monitoring well completion, and we do know that wells are not always completed correctly (see handout). The proposed project offers a practical technique to solve this problem.

The problem of verifying well completions is not unique to Montana. The same problem exists all over the world. A successful solution to the problem by a Montana institution would also bring international notoriety and prestige to Montana.

I believe this proposal offers promise of a practical technique to solve this problem. If you consider all the very real short and long term benefits to so many, I think you will agree that this proposal is a real bargain. I strongly urge you to support the grant for this project.

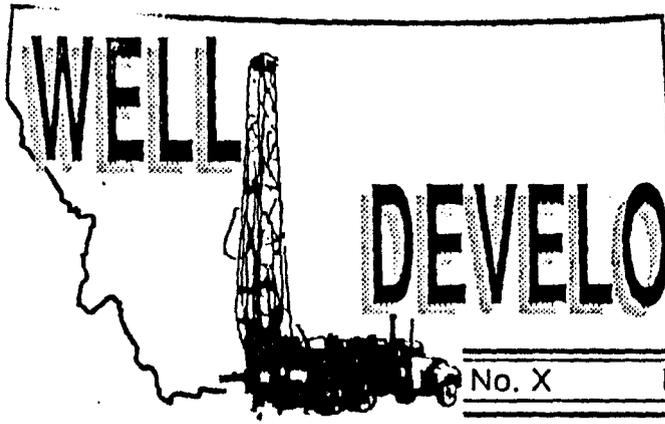


EXHIBIT 12

DATE 2-15-91

HB 8 RDG 12

Long Range Planning

DEVELOPMENTS

No. X Board of Water Well Contractors September 1990

GROUNDWATER HEAT PUMPS

Discussion

The question of jurisdiction over groundwater heat pumps has been discussed by the Board of Water Well Contractors. The following is the legal opinion issued by the board's attorney, Fred Robinson. If you have any questions concerning this opinion, please contact the board office in Helena.

Issue

Does the board have jurisdiction over wells drilled for the installation of groundwater heat pump systems?

Facts

Groundwater heat pump wells involve drilling holes to the groundwater. Usually, a pump is installed, and groundwater is pumped to the surface and run through a heat exchanger. The used water is then discharged wherever law and practicality dictate. However, there is a less common system that does not draw water from the earth. With these systems, fluid is circulated through a closed loop that extends down into a capped well. Heat is exchanged between the fluid in the loop and the water in the well.

Applicable Statutes

37-43-302. License Required. . . it is unlawful for any water well contractor, water well driller, or monitoring well constructor as defined in this chapter, to construct, alter, or rehabilitate a water well or a monitoring well without first having obtained a valid license

37-43-102. Definitions. . . .

(7) "Water well" means an excavation that is drilled, cored, bored, washed, driven, dug, jetted, or otherwise constructed and intended for the location, diversion, artificial recharge, or acquisition of groundwater. . . .

Conclusion

The board has jurisdiction over the drilling of wells for groundwater heat pump systems.

Generally, groundwater heat pump wells do not differ significantly from common water wells. Therefore, the board's jurisdiction over this type of well is clear. The issue is less clear with the closed loop system because groundwater is not withdrawn from the well. However, the definition of "water well" does not require that water be withdrawn from the well. Rather, the definition only requires that the well be intended for the "location, diversion, artificial recharge, or acquisition of groundwater." The board can interpret drilling a well into the groundwater for the purpose of exchanging heat with the water in the well as fitting this definition.

REQUIRED TRAINING

On August 17, 1990, ARM 36.21.413A REQUIRED TRAINING became effective.

On June 15, 1990, a public hearing was held in Helena on the board's proposed rule to make training mandatory for license renewal for water well contractors, drillers, and monitoring well constructors. The rule was adopted by the board as proposed, and all licensees must have a minimum of four hours per year of approved training. This requirement will be effective for the 1991 renewals.

Any training proposal requires prior board approval. Forms for reporting training attendance will be available within the next month from the board office. In the meantime, if you have a training program you wish to attend, please contact the board office in Helena for approval. You will need to list the course instructor, content of the training, and dates. If you have a copy of the program, please submit it also.

Attending the Northern Rocky Mountain Water Congress, which will be held in Butte September 30 through October 5, 1990, will count as approved credit toward the training. Sessions attended must total four hours to fully meet the training requirement. You will need to have the session moderators verify the sessions you attend. The forms to be signed should also be available by the end of September. In addition, Diana Cutler, program specialist for the Board of Water Well Contractors, will be at the congress and can answer any questions you may have regarding the credit.

CLARK FORK COORDINATOR TESTIMONY

MADAM CHAIR -- MEMBERS OF THE COMMITTEE

- o I REALIZE THE CLARK FORK COORDINATOR POSITION IS NOT RECOMMENDED FOR FUNDING AND I'VE READ THE TECHNICAL ASSESSMENT, BUT I WOULD LIKE TO URGE YOU IF AT ALL POSSIBLE TO FUND THE PROJECT.
- o OVER THE NEXT FOUR-FIVE YEARS IMPORTANT ENVIRONMENT REMEDIATION DECISIONS WILL BE MADE AFFECTING THE HEALTH AND WELFARE OF CITIZENS THROUGHOUT THE CLARK FORK RIVER BASIN.
- o BUTTE-SILVER BOW AND OTHER AFFECTED LOCAL GOVERNMENTS WILL NEED THE TECHNICAL EXPERTISE THAT ONLY PROFESSIONALS CAN PROVIDE.
- o THE ISSUES ARE EXTREMELY COMPLEX AND LOCAL GOVERNMENT CAN NOT BE EXPECTED TO HIRE PERSONS KNOWLEDGEABLE ON ALL ASPECTS OF SOIL AND WATER CONTAMINATION, REMEDIATION AND STATE AND FEDERAL REGULATIONS. WE ARE JUST GETTING INTO THE AREA OF INSTITUTIONAL CONTROLS AND I CAN TELL YOU ITS PRETTY SCARY. WE NEED OBJECTIVE EXPERTS TO ADVISE US.
- o LOCAL GOVERNMENT CAN NOT RELY ON WELL MEANING CITIZENS OR EVEN THE LOCAL SCIENTISTS AND ENGINEERS WHO MAY HAVE A SPECIAL INTEREST TO PROVIDE UNBIASED TECHNICAL INFORMATION AND REPRESENTATION.
- o WHILE THE CITIZENS TECHNICAL ENVIRONMENTAL COMMITTEE IS A GREAT FORUM FOR EXPRESSING PUBLIC

CONCERN AND ESTABLISHING COOPERATIVE EFFORTS, ITS ONLY ONE PLACE FOR THE GOVERNMENT TO OBTAIN INPUT AND SHOULD NOT BE CONSIDERED THE TECHNICAL ADVISORY GROUP FOR LOCAL GOVERNMENT DECISION MAKING.

- THE SUPERFUND ISSUES ARE TOO IMPORTANT AND FAR REACHING TO BE DEALT WITH IN ANYTHING LESS THAN A COMPREHENSIVE PROFESSIONAL MANNER.
- YOU HAVE TO REALIZE THAT THE REMEDIATION DECISIONS AND THE DECISIONS ON INSTITUTIONAL CONTROLS MADE IN THE UPPER CLARK FORK BASIN TODAY AFFECT THE LIVES OF PEOPLE THROUGHOUT THE BASIN.
- IF WE MAKE UNINFORMED OR MISINFORMED DECISIONS THE CONSEQUENCES WILL NOT BE FELT SO MUCH BY US AS BY OUR CHILDREN AND FUTURE GENERATIONS.
- I WOULD URGE THAT IF THERE IS ANY FUNDING AVAILABLE, YOU GIVE THIS PROJECT EVERY CONSIDERATION.

EXHIBIT 17
DATE 2-15-91
HB 8 RDG 24
Long Range Planning

Department of Natural Resources and Conservation
Reclamation and Development Grants Program

SECTION I
GRANT APPLICATION SUMMARY

I. APPLICANT INFORMATION

A. Applicant Name Center of Excellence, Montana Tech

B. Mailing Address W. Park Street

C. City, State, Zip Butte, MT 59701

D. Telephone Number(s): 406-496-4341 or 406-496-4102

E. Contact Person Hsin-Hsiung Haung or
Dave Tahija

1. Address (if different from applicant) _____

2. Telephone 406-496-4341

F. This grant is requested by a(n) (Check One)

_____ State government unit _____ Irrigation district

_____ City, town, or county _____ Conservation district

_____ County water or sewer district _____ Tribal government

_____ Rural improvement district _____ Other (specify)

University System, Montana

II. PROJECT INFORMATION

A. Project Title Pilot Plant Treatment of Contaminated Water from
the Berkeley Pit

B. Brief Project Description Construction and operation of pilot
plant to perfect methods of treating acidic mine water and recover
valuable metals.

Outline of Testimony regarding Proposal to Department of Natural Resources and Conservation Reclamation and Development Grant Program

Prepared by H.H. Haung, Montana Tech, 406-496-4139

1. Problems Associated with Berkeley Pit water

A. Large Volume of Water:

Daily Flow: 7,600,000 Gallons/day

Total Accumulation: 17,000,000,000 gallons

Reach Underground Water Table in 5 to 10 years

B. High Levels of Pollutants:

Metal	Concentration ppm	Federal Discharge Standards ppm
Aluminum	193	1
Arsenic	1.15	0.5
Cadimum	1.87	0.05
Copper	203	0.15
Iron	1020	1
Manganese	162	2
Lead	0.522	0.3
Zinc	497	0.75
Sulfate (Sulfur)	6760	250

C. Water will be continuously polluted (for probably hundreds of years)

Pollutants come when minerals come in contact with air.

Minerals are present in:

Tailings Pond, Waste Rock Dump and Underground mines.

2. See Map of Berkeley Pit

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2-15-91
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Long Range Planning

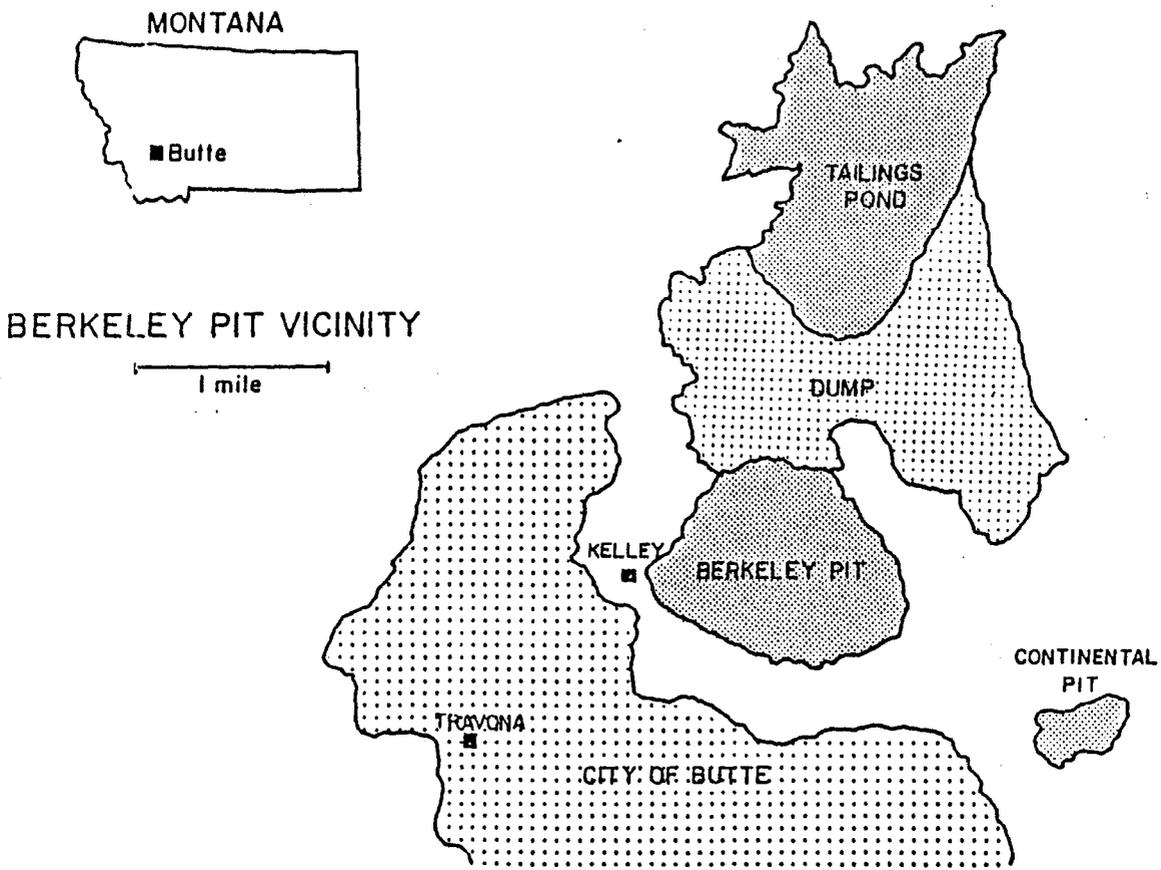


Figure 1

3. Our Research Experience Related to Berkeley Pit Water

Research: Sponsored by U.S. Bureau of Mines
Evaluating Treatment Plans for Berkeley Pit Water (1989-1991).

Acomplishments from Laboratory Research

- Identified sources of pollutants.
- Understand the chemistry of the water.
- Evaluated several water treatment techniques.
- Developed a simple, low cost treatment plans.

Publications:

1. "Characteristics and Treatment Problems of Surface and Underground Waters in Abandoned Mines at Butte Montana", Western Regional Symposium on Mining and Mineral Processing Waste, Berkeley, California, May 1990.
2. "On the Nature of Berkeley Pit Water", Northern Rocky Mountain Water Congress, Butte, Montana, October 1990.
3. "On the Treatment of Berkeley Pit Water", Northern Rocky Mountain Water Congress, Butte, Montana, October 1990.

4. Purpose of the Proposal: Build a pilot plant to identify the design criteria for a full-scale treatment plant:

- Size of plant, reactors, pumps, pipes etc.,
- Quantity of chemicals, reagents, temperature, etc.,
- Start-up and shut-down precedures
- Operation technique associated with each step, and
- Other trivial problems.

5. Example Case (Arbitor Plant): Poor Pilot Plant Testing

Arbitor Process: An innovative process for making copper metal without smelting.

Laboratory and pilot plant tests were done in Tucson Arizona.

Plant was built in Anancona, Montana

- Two years to build
- Two years to correct problems (poor engineering design)
no insulation, wrong size of pumps and pipes etc.
- Resulting in a completely shut down

6. Estimated Time Schedule to Build the Berkeley Pit Water Treatment Plant.

- Half an year to build a pilot plant,
 - One year to run the pilot plant,
 - Two years to design and build the treatment plant,
 - Two years to start the plant and correct problems, and
- (Time is short. The plant must be built soon.)

7. Process Selection Criteria: Berkeley pit contains probably the most polluted acid mine water in the entire nation.

- High Volume of Water (7 million gallons per day)
- High Concentrations of Metals
- High Degree of Saturation
- High Acid: pH = 3
- High Oxidation Potential: Eh = 500 mV
- High Sulfate ions Concentration = 7,000 mg/L
- Large Tonnage of Solid Waste

Example: 7 million gallons of water per day
will produce 180 tons of sulfate

8. Alternative Processes for Treating the Pit Water

1. Membrane (reverse osmosis) or Ion Exchange Technique
2. Biotechnology (Sulfate Reducing Bacteria SRB)
3. Conventional Lime Neutralization

9. Membrane and Ion Exchange Technique
(High Tech Process)

Technical Concerns (Problems):

- Limited Reaction Interface,
- High Degree of Saturation,
- Large Volumes of Water,
- High Levels of Pollutants, and

- High Cost of Reagents.

One Day's supply of IX reagent: \$87,000,000

10. Biotechnology (Sulfate Reducing Bacteria SRB)

Technical Concerns (Problems):

- Lack of Engineering Information
 - High Levels of Bactericide in the Water
 - Large Volume of Reaction Tank
 - Large Amount of Organic Nutrients

 - High Cost of Reagents
- One Day's Supply of organic (food): \$1,600,000

11. Conventional Lime Neutralization

Advantages:

- Proven Technique
- Simple
- Low Cost

One Day's Supply of Lime: \$4,000

Disadvantages:

- Cannot Remove all of Sulfur
- Cannot Remove Manganese
- Cannot Recover Metal Values

Metal Values per day (in 7,600,000 gallons of water):

- Copper: \$12,000
- Zinc: \$16,000
- Manganese: \$9,000

12. Our Developed Process (Chemical Precipitation)

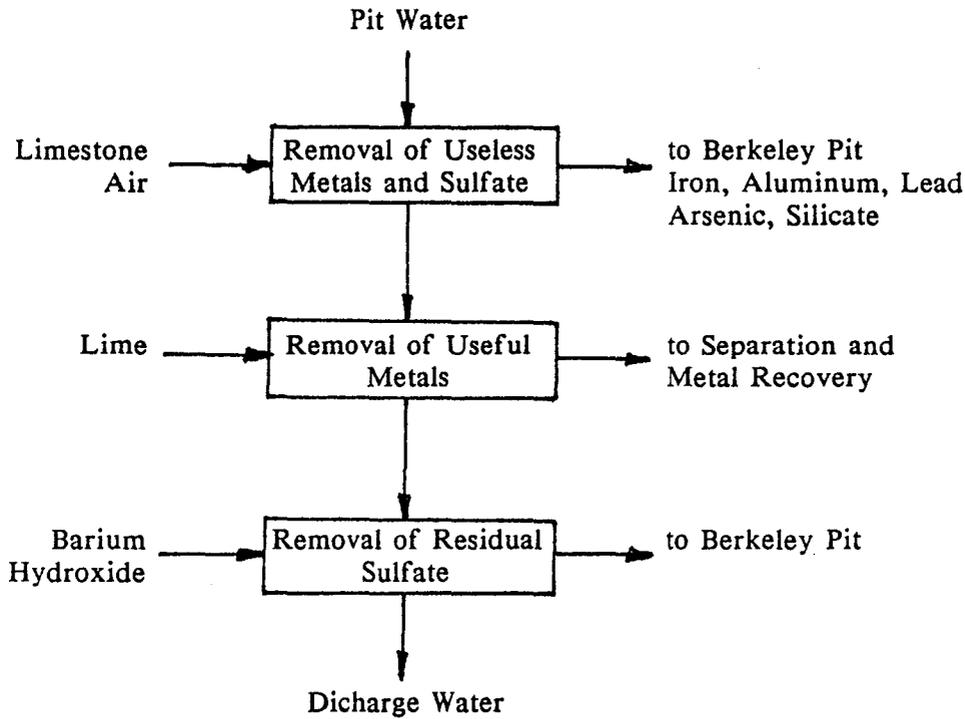
Goal of the Treatment Process

- Produce a clean water to meet discharge standards
- Low capital and operation cost
- Recovery of valuable metals
Copper, Zinc and Manganese

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Long Range Planning



13. The Success of this chemical process:

- Simple and effective
- Most steps are proven Techniques - no Surprises
- Fast reaction (approximately two hours)
- Separation of useful metals from others
- Unusable sludge can be stored in the pit
- Discharge Water will meet all the Discharge Standards.
- Inexpensive: Chemical Cost: \$20,000 per day.
- All chemicals are available in the state of Montana

14. Summary of the Proposal

- Total budget: \$299,879.88.
- Test laboratory results in pilot plant.
- Find design criteria for building the treatment plant.
- Develop techniques to operate the plant.

15. Highlights of the Pilot Plant (see the original proposal)

- 10 gallons per minute (0.2% of actual plant),
- Plant layout,
- Technical and engineering description of each step,
- Equipment and instrumentation,
- Cost estimation,
- Operation and schedule, and
- Budget

16. Accomplishments to Achieve

- Provide engineering and design information to build the actual treatment plant,
- Optimize the water treatment process for low capital cost and low operation cost,
- Provide technical and chemical information to ensure the quality of the discharge water.
- Provide technical and operation information to ensure the smooth operation of the plant.

Remediation Technologies

- Chemical Treatment
- Ion Exchange
- Solvent Extraction
- Reverse Osmosis
- Combined

EXHIBIT 15
DATE 2-15-91
HB 8, RDG-27
Long Range Planning

Projected Economics

Treatment of Berkeley Mine Water

Item	HPCC	Chemical
Silica	\$5.53	
Chemical Costs		\$8.75
Electric Power	\$1.29	\$0.91
Sludge Disposal	\$0.66	\$1.38
Labor	\$0.25	\$0.50
Depreciation	\$0.63	\$1.27
Total Costs	\$8.35	\$12.82

Costs per 1,000 gallons treated

Costs Per 1000 gallons

Recovery of Berkeley Mine Water

Item HPCC Chemical

Costs (\$8.35) (\$12.82)

Credits

Water \$1.00 \$1.00

Metals* \$4.18

Total Costs (\$3.17) (\$11.82)

*Metal concentrate at 50% value

Sheet 15
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Long Range Planning

Annual Treatment Economics

Treatment of Berkeley Mine Water

Item	HPCC	Chemical
Silica	\$8,713,064	
Chemical Costs		\$13,797,000
Electric Power	\$2,029,120	\$1,441,179
Sludge Disposal	\$1,033,598	\$2,183,274
Labor	\$394,200	\$788,400
Depreciation	\$1,000,000	\$2,000,000
Interest	\$585,809	\$1,171,618
Total Costs	\$13,755,791	\$21,381,478

3,000 gallons/min treated

Annual Treatment Economics

Treatment of 3000 gpm

Item	HPCC	Chemical
Costs	(\$13,755,791)	(\$21,381,478)
Credits		
Water	\$1,576,800	\$1,576,800
Metals*	\$6,588,018	
Total Costs	(\$5,590,974)	(\$19,804,671)

15
215-91
H3long Range Plan.

*Metal concentrate at 50% value

HOUSE OF REPRESENTATIVES
VISITOR REGISTER

Land Use Planning SUBCOMMITTEE

DATE 2-15-91

DEPARTMENT (S) DNEC Highway
RDG Program 'FWP

DIVISION _____

PLEASE PRINT

PLEASE PRINT

NAME	REPRESENTING	
<i>Jack Lynch</i>	<i>Butte - Silver Bow</i>	<i>HB 8</i>
<i>Judie Tilsman</i>	<i>Butte Silver Bow</i>	
<i>Mike Tuck</i>	<i>MSE, Inc Butte, MT</i>	
<i>ELMER E. GLESS</i>	<i>MONTANA TECH BUTTE</i>	
<i>MARK SHIPLEY</i>	<i>DNRC</i>	
<i>MARY JO SMITH</i>	<i>Yellowstone County</i>	
<i>Martin R. Miller</i>	<i>MBMG - MT Tech.</i>	
<i>Annal Cutter</i>	<i>Bd of Water Well Cont</i>	
<i>John J. Heaton</i>	<i>MBMG - MT Tech</i>	
<i>Richard Hammen</i>	<i>Chromat. Chem.</i>	
<i>R. G. Beerman</i>	<i>chem dept Mont. Tech.</i>	
<i>Alan Logan</i>	<i>Yellowstone Co.</i>	

PLEASE LEAVE PREPARED TESTIMONY WITH SECRETARY. WITNESS STATEMENT FORMS ARE AVAILABLE IF YOU CARE TO SUBMIT WRITTEN TESTIMONY.