STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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IN THE MATTER OF THE PERMIT RENEWAL FOR THE CO-OP MINING COMPANY'S BEAR CANYON MINE, EMERY COUNTY, UTAH	:	ORDER
	:	INFORMAL HEARING CAUSE NO. ACT/015/025
	:	

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On February 5, 1991, the Division held an Informal Hearing regarding the above-captioned matter in Castle Dale, Utah. The hearing was transcribed. The following individuals were present and participated in the informal hearing.

Presiding:

Dianne R. Nielson, Director
Division of Oil, Gas and Mining

For the Protestants:

Darrel Leamaster, District Manager
Castle Valley Special Service District

Menco Copinga, President
North Emery Water Users Association

Jeffrey Appel, Esq.
Haley and Stolebarger
Attorney for North Emery Water Users Association

Mrs. Varden Willson
(on behalf of Varden Willson)
Huntington-Cleveland Irrigation Company

Scott Johansen, Esq.
Attorney for Huntington City

S. Bryce Montgomery
Consultant for Castle Valley Special Service District

For the Respondent:	Kimberley C. Mangum Consultant for Co-op Mining Company
	Bill Stoddard Co-op Mining Company
	Carl E. Kingston, Esq. Attorney for Company
	Wendell Owen Co-op Mining Company
For the Division of Oil, Gas and Mining:	Thomas A. Mitchell, Esq. Assistant Attorney General
	Pamela Grubaugh-Littig Permit Supervisor
	Thomas Munson Reclamation Hydrologist
Other Appearances:	Grant Wilson Huntington City

In accordance with arrangements made by the Protestants following the hearing, Jeffrey W. Appel was designated the representative of all the Protestants for the purposes of notice and response regarding this matter.

NOW THEREFORE, the Division of Oil, Gas and Mining (Division) having fully considered the protests and responses of the parties, as filed prior to and as part of the hearing, and the supplements to the record, as well as the actions of the Division as represented in Division records, now makes and enters its Order as follows:

FINDINGS OF FACT

1. The Informal Hearing was properly scheduled and noticed

in accordance with the Utah Administrative Procedures Act (Utah Code Ann. § 63-46b-1 et seq.) and the Utah Coal Mining and Reclamation Act (Utah Code Ann. § 40-10-1 et seq.).

2. Additional extensions provided for the purpose of supplementing the record in the Informal Hearing were properly noticed and granted.

3. Inspection and enforcement records for the duration of mining operations at the Bear Canyon Mine indicate that Co-op Mining Company (Co-op) has been cited with Notices of Violation (NOV), Cessation Orders (CO), and Failure to Abate Cessation Orders (FTA CO). However, Co-op Mining Company has abated or is within the designated timeframes for abating enforcement actions. Co-op Mining Company has not established a pattern of willful and knowing violations. Co-op Mining Company is not subject to permit revocation or denial at this time.

4. Geologic and hydrologic evidence provided by the parties suggests that the potentiometric surface of the Blackhawk-Star Point aquifer is below the level of current mining in the Bear Canyon Mine.

5. The necessary information is available for evaluation of the hydrology within the existing Bear Canyon Mine workings.

6. There is no evidence that mining within the presently permitted coal seam in the Bear Canyon Mine will impact the potentiometric surface of the Blackhawk-Star Point aquifer. There is evidence that piping of water, as described below in Paragraph 7, may have influenced the quantity of flow from

outcroppings at or near Big Bear or Birch Springs in the recent past.

7. Within the Bear Canyon Mine, water has been piped from a seep at the north end of the mine workings to the mine entrance, where it discharged in accordance with the permit. However, in the past, excess flow in that line was pumped or allowed to flow into abandoned mine workings located at the south end of the mine, directly north of Big Bear Spring and Birch Spring. Co-op has replaced a portion of that pipe with larger diameter pipe to enable the line to better accommodate flow from the mine. Co-op has also installed a meter on the line which will measure any overflow into the abandoned workings. There is some evidence that this past diversion of flow into the old workings may have influenced the quantity of water seeping from outcrops above Big Bear and Birch Springs.

8. There is insufficient geologic and hydrologic evidence available to determine the impacts of mining, in the proposed Bear Canyon Lease Extension (Lease Extension) to the north of the existing Bear Canyon Mine, on the quantity and quality of water in Big Bear Spring and Birch Spring.

9. There is insufficient evidence to know the location of the potentiometric surface of the Blackhawk-Star Point aquifer to the north of the existing Bear Canyon Mine workings.

10. There are other mining operations on the northern extensions of the fracture and fault systems which may control surface water and groundwater flow from the springs below the

permit area. However, evidence to determine specific impacts of those operations on groundwater feeding these springs is inconclusive.

11. In order to evaluate the current probable hydrologic impact of mining adjacent to and in the proposed Lease Extension to the north of the currently permitted Bear Canyon Mine, additional monitoring wells must be drilled and sampled to evaluate the location, quantity, and quality of the Blackhawk-Star Point aquifer.

12. Sampling of Big Bear Spring and Birch Spring is necessary to evaluate the current probable hydrologic impact of mining adjacent to and in the proposed Lease Extension north of the presently permitted Bear Canyon Mine, as well as to provide complete monitoring data from existing operations in the Bear Canyon Mine. Sampling should include both quantity and quality of spring flow including sampling at times when the spring is not overflowing the lock box. This will necessitate establishing arrangements to allow Co-op Mining Company or a third party to unlock the box at regular intervals for sampling purposes.

13. Evidence concerning the increased sulfate content in Big Bear Spring does not indicate the cause of the increase.

14. Evidence of the impact of drought conditions over the last five years, as well as the impacts of earthquakes in the vicinity of the Bear Canyon Mine, have not been fully evaluated by the parties in terms of the potential effect on the past and current quantity of water from Big Bear and Birch Springs.

15. Technical information and arguments support the extension of geologic structures which may control groundwater flow north of and within the Bear Canyon Mine. However, the hydrologic evidence is conflicting and insufficient to support the "reasonable likelihood" of adverse impacts of mining on water quantity and quality at Big Bear and Birch Springs.

CONCLUSIONS OF LAW

EXISTING PERMIT AREA

16. Pursuant to Utah Admin. R. 614-300-154, as to those lands specifically designated as the permit area within the permittee's original permit application, and approved in accordance with R. 614-300-151, the permittee has a right of successive renewal.

17. The right to successive renewal is granted pursuant to Utah Code Ann. § 40-10-9(4)(a). The terms of this statutory right are included and made a part of R. 614-303-230.

18. Both by statute and by rule the burden of proof rests upon the opponent to permit renewal to demonstrate the specific exceptions set forth by statute and rule for denying permit renewal.

19. Protestants have set forth factual contentions to support their allegations that four of the five statutory exemptions to renewal are present. The Division concludes that protestants have failed to support these allegations.

NEW PERMIT AREA

20. Pursuant to Utah Code Ann. § 40-10-9(4)(b) an extension of a permit area as a portion of the application for renewal of a valid permit is subject to the full standards applicable to new applications under the statute. Pursuant to Utah Code Ann. § 40-10-11(1) the applicant for a permit, or revision of a permit, shall have the burden of establishing that his application is in compliance with all the requirements of the code.

21. The Division concludes that Co-op has not met its burden of proof with regard to demonstrating the probable hydrological impact of any extension beyond its present permit boundaries.

ORDER

22. The Permit for Co-op Mining Company's existing mining operation at the Bear Canyon Mine (ACT/015/025) is hereby renewed for a period of five years from the date of expiration of the prior permit. This permit renewal provides for operations of the Bear Canyon Mine to continue to the extent that those operations are conducted within the existing permit area and the disturbed areas as they existed under the prior permit. These operations will be in accordance with the statute and rules, and subject to orders or other actions of the Division governing the operations under this permit.

23. The proposed permit application to enter and mine an adjacent Federal Coal lease to the north of the existing mine

(Lease Extension) is denied.

24. No additional coal mining and reclamation operations at the Bear Canyon Mine beyond those currently approved in the permit will be considered for approval by the Division until the Probable Hydrologic Impact (PHC) analysis has been revised, based on additional drilling and monitoring of groundwater and surface water flow, quantity, and quality. This limitation in terms of mining and reclamation operations includes but is not limited to any mining in coal seams above or below the currently-approved mine workings within the permit area, as well as any mining outside the current permit area.

25. Any future proposal to mine beyond the existing permit area or in coal seams above and below the current workings will be treated as a request for permit revision, with the opportunity for public comment.

26. The requirements for additional drilling and monitoring of the surface and subsurface hydrology will be determined by the Division. At a minimum, this will include drilling and monitoring 3 wells, located within and adjacent to the current permit area, for the purpose of evaluating the hydrologic gradient and water quality. Drilling of monitoring wells will be the requirement of and at the expense of Co-op Mining Company. The existing monitoring program for Big Bear and Birch Springs will be revised to include water quantity and quality measurements from lock boxes. Data will be provided to the Division and the appropriate water user associations. Such

monitoring will be at the expense of Co-op Mining Company and may be conducted by Co-op or by a third party, as agreed upon by the Protestants and Co-op Mining Company, in order to ensure access to the lock boxes at the Big Bear and Birch Springs.

27. Drainage or pumping of in-mine water to the old mine working north of the Big Bear and Birch Springs will be controlled and monitored as stipulated by the Division, with revisions of that procedure only as directed by the Division and with the prior approval of the Division.

28. The requirements of this Order which are applicable to the present permit are included and made a part of the permit terms at issuance of the renewed permit for the Bear Canyon Mine.

29. Prior to any approval of coal mining and reclamation operations beyond the existing authorized operations, Co-op Mining Company must demonstrate and the Division must find that said operations have been designed to prevent material damage to the hydrologic balance outside of the permit area, in accordance with Utah Code Ann. § 40-10-10(2)(c) and Utah Admin. R. 614-300-133.400.

ORDERED and issued this 20th day of May, 1991.

STATE OF UTAH
DIVISION OF OIL, GAS AND MINING

Dianne R. Nielson
Director

CERTIFICATE OF SERVICE

I hereby certify that I caused a true and correct copy of the foregoing ORDER to be mailed first class, postage prepaid, this 20th day of May, 1991, to the following:

Mr. Darrel V. Leamaster
Castle Valley Special Service District
P.O. Box 877
Castle Dale, Utah 84513

Mr. Menco Copinga
North Emery Water Users Association
Box 418
Elmo, Utah 84521

Mr. Varden Willson
Huntington-Cleveland Irrigation Company
55 North Main
Huntington, Utah 84528

Mr. Carl Kingston, Esq.
53 West Angelo Avenue
P.O. Box 15809
Salt Lake City, Utah 84115

Mr. Scott Johansen, Esq.
Huntington City Attorney
P.O. Box 1099
Castle Dale, Utah 84513

Mr. Jeffrey Appel, Esq.
Haley & Stolebarger
10th Floor Walker Center
175 South Main
Salt Lake City, Utah 84111-1956

Lynda Jenson

BEFORE THE DIVISION OF OIL, GAS AND MINING
DEPARTMENT OF NATURAL RESOURCES
STATE OF UTAH

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IN THE MATTER OF THE PERMIT RENEWAL FOR THE CO-OP MINING COMPANY'S BEAR CANYON MINE, EMERY COUNTY, UTAH	:	SECOND EXTENSION OF TIME FOR SUPPLEMENTING THE RECORD IN THE INFORMAL HEARING CAUSE NO. ACT/015/025

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On February 5, 1991, the Division held an informal hearing regarding the above-captioned matter. At the conclusion of that hearing, the Director provided additional time for the parties to supplement the record and respond, such that all supplemental information would be filed by 5 p.m., February 15, 1991, and any response to new information would be filed by 5 p.m., February 25, 1991. On February 13, 1991, in response to a request from Darrel Leamaster and with the concurrence of the other parties, the final day for supplementing the record was extended to February 25, 1991, and the response deadline was extended to March 7, 1991.

The Division was informed on February 21, 1991, that Co-op was requesting an extension to provide sufficient time to complete its technical studies. Jeffrey Appel, attorney for Castle Valley Special Service District and North Emery Water Users Association, notified the Director of their concurrence with the extension.

THEREFORE, the schedule for filing of supplemental information by the parties is extended until 5 p.m., March 11, 1991, with an extension for response to new information until 5 p.m., March 21, 1991. All documents will be filed with the Division at its Salt

Lake City Office, with copies provided by the respondent to all parties.

ISSUED this 22nd day of February, 1991.

Dianne R. Nielson

Dianne R. Nielson, Director
Division of Oil, Gas and Mining

BEFORE THE DIVISION OF OIL, GAS AND MINING
DEPARTMENT OF NATURAL RESOURCES
STATE OF UTAH

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IN THE MATTER OF THE PERMIT RENEWAL FOR THE CO-OP MINING COMPANY'S BEAR CANYON MINE, EMERY COUNTY, UTAH	: : :	EXTENSION OF TIME FOR SUPPLEMENTING THE RECORD IN THE INFORMAL HEARING CAUSE NO. ACT/015/025

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On February 5, 1991, the Division held an informal hearing regarding the above-captioned matter. At the conclusion of that hearing, the Director provided additional time for the parties to supplement the record and respond, such that all supplemental information would be filed by 5 p.m., February 15, 1991, and any response to new information would be filed by 5 p.m., February 25, 1991.

Darrel Leamaster, Castle Valley Special Service District, contacted the Director on February 8, 1991 requesting that the date for submitting supplemental information be extended ten (10) days due to schedule conflicts and insufficient time for preparation of filings. Carl Kingston, Co-op Mining Company, when contacted, supported the time extension in order to conduct technical work. Menco Copinga, North Emery Water Users Association, also supported the request for extension.

THEREFORE, the schedule for filing of supplemental information by the parties is extended until 5 p.m., February 25, 1991, with an extension for response to new information until 5 p.m., March 7, 1991. All documents will be filed with the Division at its Salt

Lake City Office, with copies provided by the respondent to all parties.

ISSUED this 13th day of February, 1991.

Dianne R. Nielson

Dianne R. Nielson, Director
Division of Oil, Gas and Mining

CERTIFICATE OF SERVICE

I hereby certify that I caused a true and correct copy of the foregoing EXTENSION OF TIME FOR SUPPLEMENTING THE RECORD IN THE INFORMAL HEARING to be mailed first class, postage prepaid, this 13th day of February, 1991, to the following:

Mr. Darrel V. Leamaster
Castle Valley Special Service District
P.O. Box 877
Castle Dale, Utah 84513

Mr. Menco Copinga
North Emery Water Users Association
Box 418
Elmo, Utah 84521

Mr. Varden Willson
Huntington - Cleveland Irrigation Company
55 North Main
Huntington, Utah 84528

Mr. Carl Kingston
Attorney for Co-op Mining Company
53 West Angelo Avenue
P.O. Box 15809
Salt Lake City, Utah 84115

Mr. Scott Johansen
Huntington City Attorney
P.O. Box 1099
Castle Dale, Utah 84513

Lynda S. Jenson

ORIGINAL

BEFORE THE DIVISION OF OIL, GAS AND MINING
DEPARTMENT OF NATURAL RESOURCES
STATE OF UTAH

In the Matter of the Permit Renewal for the Co-Op Mining Company's Bear Canyon Mine, Emery County, Utah.	)))))	TRANSCRIPT OF INFORMAL HEARING Cause No. Act/015/025

BE IT REMEMBERED that the above-entitled matter came on for informal hearing before the Division of Oil, Gas and Mining on Tuesday, February 5, 1991, at 6:30 p.m., at the Emery County Courthouse, Second Floor, 95 East Main, Castle Dale, Utah. The informal hearing conducted by Dianne R. Nielson, Director, Division of Oil Gas and Mining, and was reported by John F. Greenig, Registered Professional Reporter and Notary Public in and for the State of Utah.

Notice was given to the State of Utah and all parties interested in the above-entitled matter.

APPEARANCES

Division of Oil, Gas and Mining	Dianne R. Nielson, Director Pamela Grubaugh-Littig, Permit Supervisor Thomas A. Mitchell, Assistant Attorney General Thomas Munson, Reclamation Hydrologist Vicky Bailey, Secretary

P R O C E E D I N G S

MS. NIELSON: I realize there are still a few people coming in, but I would like to get this started. I'm Dianne Nielson. I'm Director of the State Division of Oil, Gas and Mining for the State of Utah. The hearing this evening is an informal hearing -- an informal Division hearing. And it's being conducted with regard to the matter of the renewal of the coal mining permit for the Bear Canyon Mine in Emery County.

As part of the hearing tonight, the proceedings will be reported. And I'll provide information in just a minute as to how you might obtain information regarding the hearing.

For the record, I'm going to read in the Notice that was published on this hearing. "In the matter of the permit renewal for the Co-Op Mining Company's Bear Canyon Mine, Emery County, Utah; Notice of Informal Division Hearing. The Cause Number: ACT/015/025. The Notice is hereby given and found to be sufficient that the Division of Oil, Gas and Mining will conduct an informal hearing on Tuesday, February 5, 1991, commencing at 6:30 p.m. at the Emery County Courthouse, Second Floor, 95 East Main, Castle Dale, Utah. "The informal hearing will be conducted in accordance with Utah Code Annotated, Section

40-10-13 (1953 as amended) and Utah Administrative Code Rules R614-300-122 and 123 (1990).

"The permittee, Co-Op Mining Company, is currently operating the Bear Canyon Mine, an underground coal mine in Emery County, Utah. Permittee has applied for renewal of the permit and also revision of the permit to include additional land for mining. Objections including, but not limited to, issues of water rights and impact of mining on the quality and quantity of Big Bear Canyon Spring, Birch Springs, and related surface and subsurface hydrology have been raised during the public comment period."

This hearing provides an opportunity for the entities that have raised objections during that public comment period to state their case, and it also provides an opportunity, as time is available, for other individuals hearing this evening to make comments.

The three objectors at this -- to the Permit are Castle Valley Special Service District in Castle Dale, Utah; North Emery Water Users Association in Elmo, Utah; and Huntington-Cleveland Irrigation Company in Huntington, Utah.

As I indicated earlier, the proceedings will be transcribed this evening. Mr. John F. Greenig is going to act as the court reporter. If you are interested in a transcription of the hearing, they are available from

Mr. Greenig through the Carbon County Court Complex in Price, Utah. There will also be a copy of the transcript available in the public records of the Division of Oil, Gas and Mining in Salt Lake City.

As a basis for the review and decision that the Division will make on this matter, the record will include all public records of the Division of Oil, Gas and Mining that now exist and are available for the public in Salt Lake, including documents and reviews conducted by the Division staff as part of the reviews for Permit renewal and revision of the Permit.

The objections that have been filed, and the response to the public comment period by the objectors will be considered, and all information presented this evening, as part of the informal hearing.

I would stress that this is an informal hearing. There will not be sworn testimony. The purpose of the record is to ensure that we have a complete and accurate notation of information that's presented tonight.

On the basis of the comments tonight and the foregoing information I mentioned, the Division will consider the objections that are raised with respect to the issuance of the Permit and status of the revisions that have been applied for.

At this time I would like to provide an opportunity

for introduction. Tonight representing the Division will be Pamela Grubaugh-Littig, who is the Permit Supervision responsible for the Bear Canyon Permit; Tom A. Mitchell, who is an Assistant Attorney General for the State of Utah and representing the Division of Oil, Gas and Mining; Tom Munson, who is a hydrologist with the Division and knowledgeable in terms of the Bear Canyon Permit; Vicky Bailey, who is in the back of the room, is responsible for the sign-in's tonight.

And I would encourage you, if you have not signed in, to please do so this evening and particularly if you are not with one of the objectors and you wish to make additional comments this evening.

Is there someone here representing Castle Valley Water Users' Association?

MR. LEAMASTER: (Indicating)

MS. NIELSON: Would you stand and identify yourself, please, for the record?

MR. LEAMASTER: I'm Darrel Leamaster. I'm District Manager of the District.

MS. NIELSON: All right. For North Emery Water Users' Association?

MR. COPINGA: Menco Copinga, the president of the company.

MS. NIELSON: Okay.

MR. APPEL: And I'm Jeffrey Appel, representing this company.

MS. NIELSON: And for Huntington-Cleveland Irrigation Company?

MS. WILSON: I'm -- Dale Wilson was not able to be here tonight, so I'm representing the company for him.

MS. NIELSON: All right. Co-Op Mining Company?

MR. OWEN: Wendell Owen, Co-Op Mining.

MR. KINGSTON: Carl Kingston. I represent Co-Op Mining Company.

MS NIELSON: Thank you. As we go forward and present information and you ask your questions, in order to make sure that we can accurately hear them and record them, I've asked you to come forward and use the microphone here on the podium. According to the sheet I have, there are -- let's see -- Scott Johansen will be representing Castle Valley?

MR. JOHANSEN: Huntington City.

MS. NIELSON: Huntington City. Okay.

MR. MANGUM: I'm a consultant for Co-Op Mining.

MS. NIELSON: Okay. Mr. Stoddard, Co-Op Mining also?

MR. STODDARD: Yes.

MS. NIELSON: Okay. At this point, except for those names that I've mentioned and the individuals who

have introduced themselves, I'm not aware that any other party wishes to make comment.

I would suggest the procedure --

MR. MANGUM: (Indicating)

MS. NIELSON: Excuse me.

MR. MANGUM: Dianne, as part of the comments I would make, we're also going to have Bryce Montgomery, consulting geologist.

MS. NIELSON: Thank you. And I appreciate that. As part of the procedure, I guess I'd suggest that we allow the three objectors to go first and present their information; provide an opportunity for Co-Op Mining to do the same. And then I would like to open the session to questions of all of those parties. And then if time allows and there are other individuals who want to make additional comment, we would take them after -- after those presentations and questions.

I'm not certain -- Mr. Leamaster, do you want to go first, or --

MR. LEAMASTER: (Indicating affirmatively.)

MS. NIELSON: Okay. And if you would like to introduce anyone else also, you can do that -- that will be presenting comments on behalf of --

MR. LEAMASTER: Can I state my name?

MS. NIELSON: Please do.

MR. LEAMASTER: My name is Darrel Leamaster. I'm a resident of Huntington, Utah. I'm a registered professional civil engineer in the State of Utah. I'm employed as the District Manager for the Castle Valley Special Service District in Castle Dale.

I would like to acquaint you for just a moment with the Castle Valley Special Service District so that you'll be able to recognize our relationship to the Spring and to Huntington City and Cleveland and Elmo. Our District is regionalized or consolidated type district that handles water -- culinary water, pressurized irrigation water, sewer and roads for seven communities in the western half of Emery County. We provide water services for the towns of Huntington, Cleveland and Elmo. We basically have intergovernmental agreements with those communities that allow us to do the operation and maintenance on their systems. So, that is the way that we're tied in with Huntington, Cleveland and Elmo. We actually operate and maintain the systems for them under their guidance and direction.

I would like to mention that we are working jointly with the North Emery Water Users in regards to this hearing. We have met and feel that we have common concerns and common interests. And we are working together with them. We have together hired a consultant, a geologist,

who later will be addressing us, and his name is Bryce Montgomery.

The way that we would like to proceed tonight, I would like to talk for a little while. Then following my remarks, I would like to have Menco Copinga speak; and then Bryce Montgomery; and then Scott Johansen, who is an attorney with us in Huntington City; and then Jeff Appel, who is an attorney for North Emery Water Users.

MS. NIELSON: Mr. Leamaster, could I also request that you and the speakers that follow, to the extent that you're addressing specific objections in the letter that you filed with us, could you identify those so that we can follow along with the testimony?

MR. LEAMASTER: I'll try. I really wasn't prepared to handle it that way, but I'll attempt to do that.

MS. NIELSON: Okay.

MR. LEAMASTER: To begin with, I would like to speak quite bluntly and to the point about why we raised objections and about why we requested this hearing.

First of all, let me say that our District and North Emery Water Users has, as our goal, the goal of providing safe drinking water in abundant supply of good quality and taste to all of our customers. And we regard that as no light matter. We're talking about four or five thousand people who depend upon us for their drinking water.

And let me suggest that there's no product that comes into our home that is more closely related to our health and our well-being than our drinking water. We not only drink it, but bathe with it; we brush our teeth with it; we wash our dishes, we cook our food with it. We're in very close contact with it in everything that we do in our homes. So anything that happens to that drinking water source to contaminate it or to ruin its quality, is really of significant impact upon our customers. And we really stress that, and we pay a lot of attention to it.

There are some tremendous liabilities that are placed upon us as water purveyors in providing a safe drinking water supply. Those liabilities come upon us through federal and state regulations and through common life. We have to provide safe drinking water.

We would like to stress that those same liabilities also fall upon the Co-Op Mine; that they, too, do not contaminate our water supply and cause harm to the public health and to our customers. We're concerned that in the work that they've done, they have not placed adequate importance on that safety impact.

Now, in a minute, I'm going to talk about -- a little bit about how our systems work. But we are very vulnerable to contamination to those springs. The water from those springs is never exposed. It comes out of the

mountain into our pipelines and then is delivered into our system. There is no way that we can effectively monitor day-in and day-out exactly what those springs are doing.

We do monitor, as required by the State Health Department, all of the inorganic chemicals, the coliform tests and so forth that are required. Those tests are done, as far as coliform, on a monthly basis and the other things on a yearly or three-year basis. It doesn't assure us that we will always catch contamination that is coming into the system, and we are very vulnerable to that.

And so we are extremely concerned about anything that the Co-Op Mine does that might effect those springs. We believe that in the mine application, particularly in Chapter 7 that deals with hydrology, that there are many things that were not adequately addressed, and there are some conflicting statements in there that leaves us with a lot of questions as to the results. They talk in some places about water going from the stumps into cracks and fractures that will end up in our springs. And yet in other places in that same Chapter, they say they will not do anything at all to effect our springs.

Throughout that Chapter, they have not adequately addressed what will happen should they interfere with

either the quantity or the quality of that spring flow. We believe that you should require them to go back and to rework that Chapter and more adequately address those concerns. We don't think what is there now is adequate.

We believe that in some respects the Co-Op Mine has already interfered with both our Big Bear Spring and with the Birch Spring. And we did refer to that in our letter requesting this hearing. We feel that in our case, with the Big Bear Spring, that we have suffered decline in flow. And the most recent inorganic chemical tests that we have taken have shown a sharp rise in the sulphate content in the dissolved solid's content which we think they're also attributed to actions that they are taking in the mine.

We are concerned that the past ground water monitoring that they have done has been inadequate. They have not done those things that they were to do in the first granting of their application. We have never been contacted about them sampling from our spring sources; of getting permission to get into those. They are padlocked and closed, and we don't know of any time that they have been into our springs to sample them. We have never been the recipients of any of the information of their sampling and monitoring tests. They only information that we have ever seen is that that was published in the

application report. We feel that we should be directly involved in receiving that information back on a timely basis so that we can see what's going on.

We feel very strongly about the monitoring requirements, and we feel that until we can have been assurance that they will monitor the way that they talk about in the application and the way that they're required to by the regulations, that you should deny the Permit and prevent them from proceeding until we have assurance that that monitoring will be done.

In the report in the--I mean Chapter 7 in Hydrology -- in several places they state that they will not have any effect on our springs. We disagree quite strongly with that statement. We do like to raise the question of what they would do if, in fact, they do interfere either with quality or quantity of the spring. What assurance do we have that that water will be replaced; that we can have a safe supply to provide to our customers? And what assurance do we have, as far as financially, that they will be able to meet those demands and provide that source of water? We could point out that this area is very poor, from a standpoint of quantity of water for other sources that they can obtain and use to put into our system. Between us and North Emery, we have used up about all the available sources that are in the area. So

if a source is lost, it's going to be a difficult problem to replace it. And we would like to have them address how that will be done, if they do effect it.

I would like to now acquaint you more with our water system and how we provide water in these communities. I have some handouts here; probably not enough for everyone, but at least enough for you (indicating). I have on the screen a partial slide of the top sheet that you have there. This is a general overlay of the area. Notice in the middle on the right side, the darkened area is the community of Elmo. Down from it and farther to the left is the community of Cleveland, and then the larger area of Huntington.

MS. NIELSON: Mr. Leamaster, excuse me. Could we -- just for purposes of the record, maybe number these 1, 2, 3, 4 as we go along?

MR. LEAMASTER: That will be fine.

MS. NIELSON: And we'll refer to this one as Exhibit 1?

MR. LEAMASTER: That will be fine.

MS. NIELSON: Okay.

MR. LEAMASTER: I would have done that, but I didn't really know if that's what you wanted.

MS. NIELSON: That's fine. We'll just handle it that way.

MR. LEAMASTER: These three communities are all served on a consolidated or common system. They were put together about, what, four or five years ago. Before that Huntington alone was served by water out of Bear Canyon Spring. At this time all three communities are served by the water from that spring.

Bryce, would you slide that over now so we can see the rest of it?

MR. MONTGOMERY: (Indicating)

MR. LEAMASTER: That's upside down.

MR. MONTGOMERY: (Indicating)

MR. LEAMASTER: I might also point out that those areas outside those communities that are not within the boundaries of the communities are served by North Emery Water Users. We have basically parallel systems that come down Huntington Canyon.

Bryce, can you slide that a little bit more? I would like to see those other two springs on there. Will it come down towards me a little more?

MR. MONTGOMERY: (Indicating)

MR. MUNSON: Could we have somebody hit some more lights there in the back?

SPECTATOR: (Indicating)

MR. LEAMASTER: Oh, that's better.

MS. NIELSON: Can you see okay?

MR. LEAMASTER: Yes, that's fine.

MS. NIELSON: Okay.

MR. LEAMASTER: On the upper part you will see a reference to Tie Fork Canyon Spring. That spring is located about fourteen-and-a-half miles away from Huntington. And we are piped from that point down to the State highway, which is near the point where you see the sign that says Little Bear Spring. We are then piped from that Little Bear Spring paralleling the State highway, which is Highway 31, down through the canyon. You'll see about in the middle the Bear Canyon Spring. That is piped from the spring down again to the highway, where it joins in with the transmission line from those other two springs. The line then continues down the canyon past the Utah Power & Light generating plant down through the area where you see the water treatment plant location. At that point we have a million gallon storage reservoir. The water is then piped from there in two separate lines: one directly to Huntington and the other directly to Cleveland and to Elmo. Those three springs make up the bulk of our water supply.

That water treatment plant has not been used for about eight years, and it has some problems with its use that's probably not pertinent to this hearing. But let us just say that it is a single path system. By that we

mean it has one percolator, one filter, one flash mixer. Everything is single. The Health Department has rated that plant based upon our spring. Because it is a single path plant, if anything breaks down, we have to rely on the spring. And so any expansion of that plant would have to require essentially doubling the plant size, which would be extremely costly.

May I have the next slide now, Bryce, please?

MR. MONTGOMERY: (Indicating)

MS. NIELSON: And we'll call this Exhibit 2.

MR. LEAMASTER: Okay. This is a fairly simple slide. All I've done is indicated here the number of water connections that we serve in Huntington and in Cleveland and Elmo, and the population -- the approximate population that we're serving. We have about a thousand and fifty-one connections and approximately three thousand people who are being served by our system. We expect shortly to receive a new census number, so we'll have a better handle on those populations. But those are our best estimates.

Again, let me stress the importance that we put on providing safe drinking water to those three thousand people. I live there. My wife and my children live there. My close friends and my family are all there. And we are really concerned about providing safe drinking water to

these three thousand people.

Would you go on to the next one now, please, Bryce?

MR. MONTGOMERY: (Indicating)

MS. NIELSON: This will be Exhibit 3.

MR. LEAMASTER: Yes. This will be Exhibit 3. This exhibit shows the flows that we have reported from the Big Bear Spring since 1983. Now, we do have additional flow data that is very good, but to the year 1980. Prior to the year 1980, we have only sketchy information. We installed meters in about 1980 and read those meters on the 15th of the month and the 31st of the month. And we have consistently done that since 1980. So we have very excellent flow data from that point forward.

I've only indicated from 1983 forward here, because in late 1982 the Tie Fork Springs were added into the system. You'll notice the second column there is the total spring flow from all of our springs. And the last column is the percentage of the total flow that is coming from Big Bear.

Now, there are a couple of significant things that I would like to point out. As you look down the column of the flow from Big Bear Springs, '83, '84, '85 and '86 were all quite high. And the flow has dropped in '87, '88, '89 and in '90. Now, in those four years we have experienced a drought in this area, and our precipitation

has been below normal. That's complicated the problem of trying to determine whether their operation has affected our spring flow in the past. We unfortunately don't have any data from 1977, which was the last year of severe drought in the area.

If you'll look over into the last column on the percentage of flow, you'll notice in those first few years Big Bear was providing approximately 33 percent or a third of our total flow. Beginning in 1987, that percentage has begun to drop. And it dropped down to a point now where less than a fourth of our flow is coming from Big Bear Spring. Now, all through these springs are fairly closely -- fairly close as far as distance between them. And we don't feel that the recharge areas are that much different. So what I'm suggesting here is something has happened to us beginning in 1987 to affect the flow out of Big Bear Spring; because its percentage has dropped in relationship to the flow of our other spring. I'll refer to that again on another exhibit.

Let's have the next one, Bryce.

MR. MONTGOMERY: (Indicating)

MR. LEAMASTER: Now, in your pack you will have two exhibits that I'm not going to put on the board. One of them is the precipitation, and the other is the April 1 snowfall accumulations.

MS. NIELSON: Do you want those both considered, though?

MR. LEAMASTER: Let's number those and consider them as exhibits.

MS. NIELSON: Okay. We'll call those Exhibits 4 and 5.

MR. LEAMASTER: Okay. I would mention that the information from these comes from three of the sites that are monitored by the Soil Conservation Service. They're the three that are closest to our spring: the Red Pine Ridge, the Mammoth Cottonwood -- and those two are Snow Tell sites -- They started snow tell automatic readouts in 1982. Before that they were manually read. And then the third site is at the Stewart Ranger Station, which is manually read. The numbers on the first one are the total yearly precipitation figures. And on the Exhibit 5 are the April 1 snow/water equivalent at those stations.

Now, the next exhibit, which I guess is 6, if I'm right --

MS. NIELSON: That's correct.

MR. LEAMASTER: (Continuing) -- is on the board. This is a chart that we've plotted up comparing the yearly precipitation to the spring flow. And, unfortunately, you can't see the other column -- the other side of this right now. The two are not related, as far

as the lines across. We plotted with the dotted line the precipitation and with the solid line the flow from our springs. What we're looking for here is a correlation between the precipitation and the spring flow. We feel like we have a good correlation until we get over to the year starting in about 1987 and '88, where the precipitation levels off and goes basically straight across. But you'll notice the shape of our flow curve continues to drop straight off and has continued to drop until just the last few weeks when it has come back up slightly.

We believe there is some significance in that break. And again, it's pointing to around 1987 and 1988. And we feel that something has happened to change those flow patterns out of the spring.

Now, Bryce, if you could put on the next one?

MR. MONTGOMERY: (Indicating)

MR. LEAMASTER: This curve is very similar, except rather than the total yearly precipitation figures, this is the April 1 snow/water equivalent at those stations. And again, as you look at the curve, we have a good correlation with the snow/water equivalent and the spring flows until we get over to the area of 1987 and '88, where the spring flows continue to drop and the precipitation levels off. We feel that we have had an impact from the mining operation during that point in time; and

that our curve should have leveled off more in line with the snow/water equivalent and the precipitation curve.

That's all the slides I have. If I could have the lights back on, please?

MS. NIELSON: And we'll refer to that last graph as Exhibit 7.

MR. LEAMASTER: I'm just about ready to wind up.

(Whereupon, an off-the-record discussion was had.)

MR. LEAMASTER: Just in summary, let me say that we already believe that our Big Bear Spring has been affected. Our recent inorganic chemical tests, as I've indicated, are showing a marked increase in sulphates and TDS. The flows in the last month have jumped from 115 gallons a minute up to around 129 gallons a minute. We have no explanation for that. We think that it may be related to where they're moving and storing water within the mine. We believe that even if they ceased their mining operation right now, that we have already had some impacts from the mining operation. And we really don't know how those are going to effect us over the long run.

So in conclusion, what I guess we're saying is we would like you to hold off and not approve this application until such time as this can be more thoroughly

investigated; have a better Chapter 7 on the hydrology to more adequately answer our concerns.

And I thank you for your time and now turn the mike over to Menco Copinga.

MR. COPINGA: My name is Menco Copinga. I'm the president of North Emery Water Users. It's a non-profitable organization, and there's about -- there's seven Board members. And there's two from each location: two from Elmo area, two from Cleveland area, two from Lawrence, and one at large.

Like I say, we are a nonprofitable organization, and we are a small company. We have about 417 connections; roughly around a thousand people that are on our system.

The spring at Birch Creek is really important to us. We have at this time about 150 gallons of water coming down the mountain. Of that 150 gallons, we've got 33 gallons coming out of Birch Springs, which is roughly about 20 percent of our water system. We're concerned that if we lose this 20 percent, that we won't be able to supply our demand for water in our area. We have still other springs up the canyon. We have a couple springs up in Rilda Canyon and several down the canyon, which is about, oh, roughly 20 percent from Birch, 50 percent from Rilda, and the rest of them is from the other springs down the canyon. We really can't afford to lose this

particular spring.

Also, last year we had a problem with the spring. This spring at the time was roughly flowing about 40 gallons per minute; and in just several days, it went up to almost 300 gallons per minute. The water was dirty. We had it checked, and it had coliforms in it, and it also had oil in it. We contacted DOGM, and they sent somebody down. We looked the situation over, and they couldn't find anything on the outside where they might have been some -- There might have been some water dumped someplace else, but we couldn't find any there. And over a few months, it just kind of decreasing back down again to where it has been going down ever since then. And like I said, it's about 33 gallons per minute at this time.

There are a lot of concerns, as Darrel mentioned, that are ours also, so I won't go into that. And we are concerned, and we would like to have something done about these springs.

MR. MITCHELL: Just so the record is clear, the increase of flow occurred when?

MR. COPINGA: It was -- The chart right here -- It was about January of '89; is that right?

MR. LEAMASTER: October.

MR. COPINGA: October of '89.

MR. LEAMASTER: It jumped up.

MR. COPINGA: It jumped up. And it went --

MR. LEAMASTER: To January.

MR. COPINGA: To January. And it started going back down in January. And from January, it went down from roughly 225 gallons to about 75 gallons in this one month. Okay. Thank you.

MR. MONTGOMERY: My name is Bryce Montgomery. I'm a consulting geologist. And I have made a study of the area at the request of the two Districts. And it's difficult to present here in brief all that is in the report, which will be presented to the Oil and Gas Division here as an exhibit. This is a chart of the rock formations present in the area, as reported by Danielson and others, who are with the U.S. Geological Survey. They did quite an extensive study of the area some time ago in the early 80's.

But I would like to just familiarize you with some of the names here, because we'll be talking about them, and give you some idea of the relationship of these rock formations, as we're talking about these springs and the mine and the coal and so forth.

We might liken these rock strata to the layers such as you would see in a sandwich or a layer cake. And the rock strata in the area are nearly horizontal. They do

have a very moderate dip of only a couple degrees to the south-southeast. And what we find in the area right in the bottom of the canyon, as you go up Huntington Canyon, the gray, prominent shales, which all of you, I'm sure, are familiar with, and I refer to as Mancos Shale Formation. Those are the shales in the bottom of the canyon that are quite impervious to infiltration movement of ground water.

Above the gray shales we have the Star Point sandstone, which is about 400 feet thick. And there's a gradation boundary here between the two. And it's the Star Point sandstone that the Birch Spring and the Big Bear Spring discharge from. So that's important to remember that.

Above the Star Point sandstone we have the Blackhawk Formation, which is approximately 700 feet thick. And it's the Blackhawk Formation that is made up of several sandstone beds embedded with thin shales and prominent coal beds which are mined. So the coals that are mined in the area come from the Blackhawk Formation: one near the base of the formation referred to as the Hiawatha, and then one up higher in the section that some refer to as the Blind Canyon, others as the Bear Canyon. The Castlegate sandstone overlies that section, and its prominent ledge up high on the ridge line that you see

near the top, and it's about 200 feet thick.

Above that is a sequence of sandstones and shales known as the Price River Formation, approximately 600 to 700 feet thick. And then the capping formation on the high area north of the mine; and that mine -- or high above the mine. And then to the north is the North Horn Formation, which is about 800 feet thick and is composed of embedded shales and sandstones.

The Flagstaff Limestone is found further west than south and north, but she wrote it off in the area that we have of concern here. There is a limestone bed, though, in the north part that resembles the Flagstaff, and some have called that the Flagstaff in the area.

It's important to keep in mind that these formations all have sandstone beds within them that are easily fractured, due to the structural forces incurred in the earth. And it's through these fractures and faults that the water is able to infiltrate from the precipitation on the high areas and move downward to permeable formations that become aquifers.

Let me put another slide here (indicating).

MS. NIELSON: Could we refer to this as Exhibit 8?

MR. MONTGOMERY: That would be fine.

MS. NIELSON: All right. And the next one will

be Exhibit 9.

MR. MITCHELL: Would you identify the source of these?

MR. MONTGOMERY: Yes. This is from Brown and others, who did some mapping for the U.S. Geological Survey. And the exact reference is in the report that you'll get a copy of. But this is one of the measured sections. Well, there are several measured sections taken right on the point in the vicinity of both springs and both the Trail Canyon Mine and the Bear Canyon Mine that is presently operating. It's an enlarged section merely showing the top of the Star Point Sandstone, then going up into the Blackhawk Formation. The reason I wanted you to see this is that this is the basal coal, the Hiawatha coal. This is the coal they're mining now presently in the Bear Canyon. And there was earlier a lower bed, which they also have referred to as the Hiawatha. But these geologists have shown it's not exactly parallel with it, although it's at the base of the Blackhawk Formation. But this scale gives you an idea. This is about ten feet on here, so it gives you an idea of the relationship of these coal beds.

So the Hiawatha coal bed is about 50 to 80 feet below the Bear Canyon coal bed, which is being mined at the present time. This bed was mined off in -- (indicat-

ing) -- in Trial Canyon Mine in earlier times, which closed about 1982. And I'll show a map here as to where that's located (indicating). This is a map by -- The base map is actually by Brown and others from U.S. Geological Survey, on which it showed the topographic contours of the area, the configuration of the present day land surface. And they have also shown in a heavy line here the contact between the Star Point Sandstone and the Blackhawk Formation. That's this heavy line (indicating). And that -- Those measured sections that I just had on display are from this area, which is the location of the Bear Canyon Mine, around this point (indicating), over to the Trail Canyon Mine, which is in this area (indicating) -- Co-Op Mine here (indicating).

MS. NIELSON: Are those sections actually marked on the map for reference, the locations?

MR. MONTGOMERY: Yes. They're numbered right here (indicating).

MS. NIELSON: Okay. Thank you. And we'll refer to this map as Exhibit 10.

MR. MONTGOMERY: All right. So what we have here is Bear Canyon coming down through here (indicating), and then the main Huntington Canyon going up through here (indicating). And this is the highway (indicating). And as I say, these background lines are

topographic lines which show the configuration of the surface.

So we have a big, long ridge extending from here northward (indicating). This is the south end of it. The highway cuts across here. Bear Canyon Road going up here (indicating). And superimposed on that topography we have geology, not in utmost detail, because it would clutter it even more than it is, and I have to acknowledge its pretty cluttered as it is. But what the U.S. Geological Survey geologists have found is that there's actually working within the rock strata -- this line up here with the arrows is an anticline, and then a syncline here (indicating). So, there is actually warping within the rock strata, even though there's generally dipping back this way to the southeast a couple of degrees. But since that warping took place in the rock strata, which helped to fracture the sandstone beds and create secondary permeability and porosity in them for the water to get into and move through and be stored in, we had later faulting -- normal faulting occurred -- which all of you heard of the Joe's Valley Fault? Well, these faults are associated with that, but just a little father east -- very prominent fault going right up through Huntington Canyon, which is known as the Pleasant Valley Fault. This is a fracture in the earth's crust wherein this side

-- the west side was moved up approximately 150 feet relative to the east side, which was dropped down.

We have a similar situation on this side, going up Bear Canyon. It's a very prominent fault. And we have the upthrown side on the east this time and the down-thrown side on the west. And that's about 150 feet of offset or displacement. So what we have is a unique situation with the gentle warping that I mentioned. We have what's known as a graben or a down-drop section of the earth's crust between here and here (indicating). And so even though this is a ridge and a high area going back to the north on Gentry Mountain, this is actually a down-drop section of the earth's crust between these two faults -- a graben. And it's interesting. It extends a long distance to the south and -- across Huntington Canyon into the coal mining area to the south, and then it extends much farther north.

And if I could shift the map here? Maybe if you wouldn't mind doing that for me, Darrel? That will save me stepping up there. If you could just shift that map?

MR. LEAMASTER: (Indicating)

MR. MONTGOMERY: Yea. Just like that. Uh-huh. Thank you. As you can see, I have only mapped up to just the Tie Fork Spring that already you've been acquainted with.

But you can see between these two prominent faults, we have many other faults that parallel them. And the offsets on these faults are anywhere from perhaps ten feet up to a hundred feet. They vary. In other words, with one side being dropped down or the other side being dropped up. And that's indicated by the symbols here (indicating). But, you see, this graben area, which extends northward up on the Gentry Mountain, is a very unique area that is very broken up. Besides the faults here, the little dotted lines indicate very prominent joints. So, there's many joints that parallel these faults. The precipitation on the high mountain area, which is about 11,000 feet up on Gentry Mountain, part of it infiltrates into the fractures.

Now, obviously, as water goes down through the fractures, if there's a permeable formation, some of it will move into it like a sandstone bed. These prominent faults, though, they tend to transact both the sandstone and the shale beds and carry water even down through the shale beds to a deeper depth. The aquifer that we're concerned about down here at the springs, is actually made up of the sandstone; not only of the Star Point Formation, but of the lower part of the Blackhawk Formation. And water from this high area precipitation is able to infiltrate and eventually get down to those

prominent beds.

If I could have you shift that back up again now, Darrel?

MR. LEAMASTER: (Indicating)

MR. MONTGOMERY: Thank you. Just a little bit more. That's fine. Thank you.

You see, then these faults act as a -- conduits for the water to move southward down. And that is illustrated by these purple dash-hyphen dotted lines. Those lines represent the dynamic surface of the Blackhawk-Star Point Formation aquifer. And they represent -- They're known as potentiometric contours or the potentiometric surface. That's the elevation to which the ground water will rise in those aquifers--or in those formations. I'm combining them as one aquifer because they're closely related. The water, then, is moving normal to those contours -- moving like this (indicating) to the south and southwest from the north.

And as you can see between these two major faults, the effect is to kind of enclose, like a large trough, the ground water moving from the north to the south.

Now, this is the location of the Bear Canyon Spring right here (indicating). This is the location of the Birch Spring (indicating). Birch Spring is located directly on one of these faults that has approximately

twenty feet of offset. This fault goes northward and branches into several other faults which go clear northward into the high area of precipitation.

Bear Canyon comes out along three prominent joints which have no appreciable offset on them. But it is very close to this fault here (indicating). And as is shown, these springs are within this graben area between these two prominent faults: the Bear Canyon Fault and the Pleasant Valley Fault.

So the waters from the area of infiltration is southward to recharge these formations and is moving directly through the mining area. This heavy black line is the present boundary or permit area for the Bear Canyon Mine. And the jagged black line is the area that has been mined or is under mining operations. So for the old Trail Canyon Mine, which is abandoned and pillars have been pulled and there's actually subsidence taking place within the mine -- that's this area right here -- the present day mine is here (indicating). And they have a permit back to mine in this area (indicating). The proposed area that they're wanting to expand is the heavy dotted line here (indicating) and also an 80-acre tract down here (indicating). So you can see, the mine area is between the spring discharge points and the recharge area to the north. And these very prominent joints and faults

are the avenues for this water to move to the springs. And some of the water that's being encountered in the mines that normally would move downward toward these springs has been intercepted in their mining operations and either has been poorly used or diverted away from the natural fracture system that would allow it to continue on its journey, as it naturally did to recharge these springs.

Now, as was pointed out to you, in the Fall of 1989 Birch Spring experienced an unusual abnormal situation. If you would compare the -- which I could do again. I could put the charts on to compare the precipitation to the spring discharge. This high rise that was mentioned in the Fall of '89 into January of '90 was very abnormal and also a release of about 90-acre feet of water out of this area into this fault system. And once that storage and high head had flushed through this area, it dropped back down again. But it carried with it not only a high amount of sediment, but also oil residues and coliform bacteria -- carried it down into this area (indicating).

Now, this mine is collapsed now, but it provides a very easy storage area for ground water that's coming from the north to collect in this area (indicating).

And under an increased head of storage in this old caved area, it's very easy to understand how water could

be held up in storage and a rise in head until enough pressure was created to cause a break through along the fault system and discharge up to the spring. And then once the temporary storage is diminished in this area, then the flows dropped back down to normal again. And that's my interpretation as to what happened there.

Now, while I got this map here, I would like to point out that in this area along the face of these cliffs, there is this water discharging now, spilling to the surface, that appears to be out of the ordinary. In fact, there's no sustained vegetation there to indicate that spring water has been flowing for a long time in the past. And yet there's been an appreciable amount of water. And I'll show some pictures illustrating that. It's discharging out of the cliff near the base of the mining operations, spilling down the face of the cliff over the shales and forming large icicly deposits in this vicinity (indicating). And even some of this water now apparently is able to get back into some of the fracture zones. Because the recent analysis in January of 1991 showed that the sulphates have doubled in the spring from what they have been over the past. And the total dissolved mineral solids have gone up better than 25 percent in that spring.

So, it's quite obvious that the mining operation in

this area has had an effect on these springs. And as it was pointed out by Darrel, these springs have gone down in their rate of flow.

I would like to show a cross section now that will be from the Tie Fork Spring down through this area and through the Bear Canyon Spring and to this point (indicating). Can you turn it around?

MR. LEAMASTER: (Indicating)

MR. MONTGOMERY: Yea, thank you. This is northwest up here (indicating). And, by the way, this is the true scale on the other map. So the relationships here are not abnormal, so far as the vertical scale, which is often done on cross sections. If you're to take a slice down through the earth's section in this area, this is what it would look like. This is the profile of the topography here at the top. The different letters designate those different rock formations that I mentioned earlier. Here is Tie Fork Spring and Tie Fork here (indicating). The water there is discharging from a drill hole that was drilled down into the Star Point Sandstone and comes up to the ground level. This heavy dot-dash purple line here represents that potentiometric surface of the Star Point-Blackhawk aquifer. And as you can see, it has a gradient higher here and moving down this way (indicating). Now, of course, as it cuts across

faults, there will be some adjustment in it, and I can't show that detail because I don't know exactly how much it is. But, in general, it stays approximately on this line; and as it crosses the faults, there are some irregularities. But we do have a drill hole that was drilled up on the high mountain area by Savage Energy Services -- drill hole T-4, which did penetrate these units. Besides we have mines and drill holes, but further north in the recharge area west of Hiawatha that gives us further control on what the elevation is on that surface.

Here it was fifteen hundred feet from the surface. And then as we move further south -- if you wouldn't mind now slipping that down for me, Darrel?

MR. LEAMASTER: (Indicating)

MR. MONTGOMERY: That's fine. Thank you. As we move farther south, you can see that gradient just dropping and to where -- Here is the discharge point of Bear Canyon Spring (indicating). That's the top of that gradient (indicating). Here is the mine operation from here -- this line here to here (indicating). And the proposed operation would extend it farther over to here (indicating). And as you can see, this heavy black line here represents the Bear Canyon coal that is presently being removed in the Bear Canyon Mine. Now, the gradient for this major aquifer is down below that surface,

1 although we do have some water through these sandstones
2 working its way down and they have intercepted some of
3 that water. Now, especially in the north end of their
4 mine, they've encountered about a hundred gallons per
5 minute reported in this area (indicating). And they are
6 intercepting and using that water or -- and some of it is
7 being used out of the mine down for other uses, both
8 inside and outside the mine.

9 So you can see, that water that they are intercept-
10 ing and -- that's not able to get back into the fracture
11 system; is not able to get back into this recharge area
12 and contribute to the springs. This applies both to the
13 Birch Spring and the Big Bear Spring. Even though this
14 line goes through the Big Bear Spring, it applies equally
15 to the Birch Spring. In fact, the Birch Spring has higher
16 permeability delivering water to it than does the Big
17 Bear, because of the faulting.

18 But you'll notice that if they continue to move up-
19 dip to the north, which is only about 2 degrees, compared
20 to the slope of this potentiometric surface, which is
21 much steeper, they're going to come near intersecting
22 that main aquifer. In fact, if they go in on the lower
23 coal, the Hiawatha coal, which is about on this line
24 (indicating), they will intersect it sooner; in fact, it
25 will have a greater impact than the mining of the upper

coal.

But this gives you an understanding; a relationship of how the coal bed is relative to this potentiometric surface, this spring elevation and the boundaries of the existing mine and the proposed mine.

It's very obvious to me that as this operation moves further north, more water will be encountered. If that water is intersected and not allowed to get back into its natural conduit system to contribute to both springs, it will subtract from their supply. Furthermore, if contaminants in the mining operation get in to these faults and fractures, they will carry those contaminates down towards the springs.

Could I have the next sheet on there, Darrel?

MS. NIELSON: Mr. Montgomery, can we refer to that cross section as Exhibit 11?

MR. MONTGOMERY: Sure.

MS. NIELSON: And I believe that was AA Prime?

MR. MONTGOMERY: That's correct. You're right.

MS. NIELSON: Thank you. And this one will be Exhibit 12.

MR. MONTGOMERY: Okay. And as I mentioned, Dianne, we'll provide the full report to you which will have all of these in it, and you'll have that.

MS. NIELSON: Fine. Thank you.

MR. MONTGOMERY: This shows a close-up of the Big Bear Spring issuing from prominent joints -- three very prominent joints here, and these are the discharge points that are collected into this box (indicating). This is the Star Point Sandstone; the lower section of it. Mancos Shale is concealed by alluvium here (indicating), unconsolidated fill in the valley. But it would be below here (indicating). And so you see, the water comes down, and since it can't go deeper, it is reflected outward, and the erosion has intersected these joints and made it very easy for it to come to the surface. In fact, some of this water has come out a little bit higher than here (indicating).

If I could have the next one, please?

MR. LEAMASTER: (Indicating)

MR. MONTGOMERY: Now, this is a view looking at that same sandstone bed, the spring area in this area; and looking back up higher. And this shows, then, the approximate contact of the Star Point Sandstone in this area relative to the Blackhawk Formation above. And the coal beds are in this vicinity (indicating). In this area right here (indicating), there's an appreciable amount of water spilling to the surface now that appears to be abnormal. Possibly some may have spilled naturally in the past, but it appears to be much more than has

occurred in the past.

If I could have the next one, please?

MR. LEAMASTER: (Indicating)

MR. MONTGOMERY: We're looking northwest there.

MS. NIELSON: This photo will be 13, and the next one will be 14.

MR. MONTGOMERY: This is a little closer now and a little higher. And this is Big Bear Canyon here (indicating). This white or these icicles build up (indicating). It doesn't show all the area, but there's some here. There's some out here. There's some down below. These are mainly shale sections here, and this is sandstone, the upper part of the Star Point; and this is up in the Blackhawk (indicating). And there's an appreciable amount of water spilling out and freezing in the form of icicles here (indicating). Some of this water is meeting, running down over these shelves and then eventually gets into a bench area here and some back into the fractures of the spring directly below. I believe that part of the sulphates, at least, some, perhaps, is coming from in the mine, but part of it is probably just coming from leaching these shales as it spills down over them.

If I could have the next one, it will be a closer view, please.

MR. LEAMASTER: (Indicating)

MR. MONTGOMERY: Now, this is a closer view of those sandstone beds, water spilling out of them, and then shale beds interbedded sandstone here (indicating). This is an appreciable amount of water. It's hard to say how much water it is. I made a rough estimate of 50 gallons per minute for the total of the whole area. And that's just a rough estimate. But it is an appreciable amount of water that's spilling out of the base of the Blackhawk into the top of the Star Point; and then where it hits shales, it's spilling out to the surface.

Now, if there was faults right in this area (indicating), some of this water would go down the faults lower down. There is a fault right to the right, or east here, which does not show on the photo.

If I could have the next one, please?

MS. NIELSON: That photo will be 15, and the next one 16.

MR. LEAMASTER: (Indicating)

MR. MONTGOMERY: Already you've been introduced to the hydrograph here of the flows of the Big Bear Spring over the years. I've added a few years onto this graph that was prepared earlier. But that's compared with the snow-water equivalent, the average snow-water equivalent by this purple line. You can see that the highs in the flows from this spring and the actual water

1 from snow melt, there's about a three-month lag or delay
2 between those peaks. Now, that's for these earlier years.
3 Once you get down to about 1987 to the present, you'll
4 notice the peak has dropped off. And it's true, as is
5 pointed out by this graph, this is the precipitation here
6 (indicating). After you get to '87, it dropped down to --
7 it flattened out here. But notice that the hump pretty
8 much has been removed. These lower lines here represent
9 from that 1987 to 1990. And so you can see that the --
10 besides the impact of the lower precipitation on the
11 area, there still appears to be an additional impact
12 occurring to the spring.
13 The next one, please?
14 MR. LEAMASTER: (Indicating)
15 MR. MONTGOMERY: This is the Birch Spring, and
16 they only have a short record on those. There's, unfor-
17 tunately, '89 and '90. But this shows what was pointed
18 out earlier by the president of the District; that this
19 has been the flow just under a hundred (indicating) --
20 between 50 and 100 gallons a minute. And then in October
21 of 1989, this thing jumped up -- clear up 230 gallons a
22 minute and held up at that flow clear through January.
23 If you can look at this like a cycle, then the next
24 year's flow is this different symbol here (indicating) --
25 turning in here (indicating). And then it just goes

right back off like it had been heretofore. Very abnormal situation.

Let's see. There's that -- There's one more, Tie Fork Spring, please.

MR. LEAMASTER: (Indicating)

MS. NIELSON: Okay. And we'll refer to the Birch Spring graph as Exhibit 17 and Tie Fork as 18.

MR. MONTGOMERY: Okay. Here's the Tie Fork Spring. And there is mining going on just north of the Tie Fork Spring beyond the Co-Op Mine. And these curves tend to parallel each other from '83 to '89, except this one in 1988. There was a high jump in it, and then it dropped back down again. And I think that's probably influenced by mining operations to the north. And the reason I put this on here is I would like to emphasize that everything in the area, especially within that graben, has an influence on the recharge to the Birch Spring and the Big Bear Spring.

The coal mining operations to the north also have an effect. And any water that they pull out in their operations, which has been reported by Danielson--that they're pulling some water out and putting into Cedar Creek back to the east -- it flows away from the ground water system and cannot get back into it. And, therefore, it subtracts from the recharge to those springs to the south

and has partial impact on them as does the Co-Op Mining operation.

I think -- And I'd just like to conclude for you that my study has shown that both the Trail Canyon Mine and the Bear Canyon Mine have impacted both of these springs. I think the impact to the Big Bear Spring is less than it is to the Birch Spring, and it is hard to quantify, especially with the lack of data back during the years when they were not mining and because of the drought that's occurred since '77. But that's my conclusion: that there has been an impact and -- but it is difficult to quantify. Thank you.

Perhaps later on, if there are questions, I'd be glad to try to answer them.

MS. NIELSON: Mr. Montgomery, could I clarify?

MR. MONTGOMERY: Yes.

MS. NIELSON: You indicated there will be a copy of this Report for the Division. Is there also a copy for Co-Op Mine, or could one be made? It would be helpful to them.

MR. MONTGOMERY: It would be up to these Districts. I don't know why they wouldn't want to supply a copy to them, and certainly a copy could be made, as far as I'm concerned -- made available to them.

MS. NIELSON: Okay. I would ask that the

1 counsel for Castle Valley and the other service districts
2 make that report available to Co-Op Mine.
3 MR. LEAMASTER: Yes, sir.
4 MS. NIELSON: Thank you.
5 (Whereupon, an off-the-record
6 discussion was had.)
7 MR. JOHANSEN: My name is Scott Johansen. I'm
8 the City Attorney for Huntington. And I just want to
9 briefly present the Council and Mayor from Huntington
10 City. They have asked me to appear and underscore some
11 of what we think are the major issues here.
12 The first one is that it is important to us in the
13 City that we be able, in this area, to develop our
14 mineral resources. And if there is a way to do that, we
15 don't wish to discourage that. It's good for our economy.
16 This County depends upon the coal being mined. And if
17 there is any way to accomplish that, we wish to accommo-
18 date it.
19 There is one concern which overrides the development
20 of our natural resources by far, and that is the preser-
21 vation of our culinary water supply. And that is so very
22 important to all of us here. And if the choice had to be
23 made between protecting the culinary water supply for
24 some four thousand people out of eleven thousand that
25 reside in the County, that we would have to opt in favor

1 of discontinuing the development of the mineral resources
2 and preserve the water supply.
3 The purpose of the mining acts, and particularly
4 Section 40-10-2, states that we are to assure that there
5 is no mining where reclamation is not feasible. And based
6 upon the data that you have been presented tonight, we
7 are very concerned that further mining in this area by
8 the Co-Op Mine would be of such irreparable effect to
9 both of the two springs involved, that reclamation would
10 not be feasible, and we would not be able to withstand
11 the impact of that continued mining activity.
12 If that destruction of our culinary water source
13 cannot be replaced, if it cannot be mitigated, then the
14 survival of Huntington City and, indeed, of Cleveland and
15 Elmo and also the North Emery Water User customers --
16 which is the entire north end of Emery County -- is at
17 stake. And we believe this is a very serious health,
18 safety and welfare issue which should be addressed by the
19 Division.
20 The second point that the Mayor has asked me to
21 underscore is that the potential legal liability to the
22 Co-Op Mining people is just tremendous. If these poten-
23 tial effects are not considered and dealt with upon the
24 front end of any resource development, the possibility of
25 liability to downstream users and the legal liability and

damages that would flow from that are just phenomenal. And it's somewhat amazing to me that these potential liabilities have not been dealt with in a more thorough way in the mine plan application.

We might take a less activist view of this mine application, if the application were not set against the backdrop of the Co-Op Mine's history of noncompliance in the past. And that's the third point I wish to emphasize. From a standpoint of the State Engineer, from the standpoint of the Forest Service, from the standpoint of Division of Oil, Gas and Mining, County zoning; almost every regulatory agency which Co-Op has dealt with over the past, has a long history of disinclination on the part of the Co-Op to be very seriously interested in compliance. And I would refer, as a basis for that, to the public records that are already on file with the Division.

Based on that, the City has asked me to request some eight points of relief, which correspond somewhat to the letter which was written by the Service District. And those relief -- these items of relief which I'm about to mention, I believe are all authorized by Section 40-10-6 of the Utah Code.

The first one is that we would request that the Division not renew the mine plan with respect to the

ongoing operations until the Co-Op Mine does be compliant, which it should have been doing all along with respect to monitoring water flow and complying with the other requirements of the Division. That corresponds with Item Number 6 in the Service District's letter to the Division.

Secondly, we are requesting that the revision of the mine plan to add a new area to the north be denied altogether. It is apparent, from a hydrological study, that any mining further to the north could have disastrous effect on our water table as it intersects the water plane. That corresponds to Item Number 2 in the Service District's letter.

Thirdly, we are asking that if the mine plan is reauthorized, or if the revision is authorized to add the new area to the north, that the Division require the Co-Op to engage in adequate testing and monitoring of the water situation at the Co-Op's expense; and that that request apply, even if operations cease. It is apparent from the Birch Spring flow data that even after the Co-Op ceased operation on the Trail Canyon side, that their mining operations had significant effect on the Birch Spring.

Fourth, we would ask that Huntington City be copied on all water flow data and other water data that is

supplied to the Division from the Co-Op Mine.

Fifth, we believe that it is essential to understanding of water flow in this area, in this graben, that the Co-Op be required to drill test holes north of the proposed mine site so that we can monitor the water flow through the earth north of where the mine area is. That corresponds to Item Number 6 in the Service District's letter.

Number six, we are requesting that any water which is intersected -- intercepted in the mine area be piped down to where it can be put back into the City's system, which is most likely the Big Bear Canyon Spring area. That corresponds with Number 1 in the Service District's letter.

Seventh, we are asking that under Section 10-8-14 of the Utah Code, that the Division require the Co-Op to bond for any potential loss of water that -- or provide other sufficient surety for any potential loss of water either to North Emery or to the towns of Cleveland and Elmo or to the city of Huntington.

And, lastly, we are asking that any permit that the Division does see fit to grant, would be limited to five years under Section 40-10-9, because of the serious, serious potential effects of the interruption of the water supply; that no extensions beyond the five-year

period be granted.

The only other request I would make is that the City be granted an extra few days, after the conclusion of this hearing, to submit a written response to what occurs here. And with that, I would -- with your permission -- I would turn the time over to Jeff Appel, who represents North Emery Water Users.

MR. APPEL: Thank you. My name is Jeffery Appel. And as Mr. Johansen indicated, I represent the North Emery Water Users' Association. As an initial issue, I'm somewhat concerned about the burden of proof. I understand we're proceeding first. I think there's probably a two-prong focus here with respect to that burden of proof under your own rules, I believe.

The revision area -- the new areas, the Applicant would bear the burden of proof. I understand that the rules may indicate that we would bear the burden of proof on the existing area. Whereas, due to some of the past problems and the noncompliance with respect to the particular permit, I'm not so sure that should be the case. And I'll get into those right now.

These are all in your files. I've been through portions of them -- not all of them. But as recently as November 27, 1990, there's a permit deficiency letter in there in which the Co-Op is cited for 18 violations. And

I won't bother to enumerate those. You're all familiar with them. But many of them were water related. One of the most important, based upon Mr. Montgomery's testimony, was that we were required to restore the natural drainage pattern. Well, the natural drainage pattern isn't what it used to be, and they've done nothing that we can see to restore it. And we suffered some significant problems as a result of that failure.

I think Mr. Montgomery's testimony is quite clear on that. There's a connection between those activities and -- more clearly with the Birch Spring -- and I believe his opinion is that it also effects the Bear Canyon Spring. Those problems have to be dealt with, as these are culinary water supplies for a number of people down here; in fact, most of the people down here (indicating).

Some of the other problems that are recited in your files were Co-Op's failure to maintain proper diversions, culverts and sediment ponds; to install environmental control, measures; to avoid plugging of erosion inlets and outlets; to properly monitor surface and ground water sources; to maintain diversion ditches; to pass disturbed surface drainage to a treatment facility before release; to create and submit current maps of sufficient details to determine if Co-Op is abiding by the state and federal regulations for protection of water.

Now, this gets back to the burden of proof problem. I can understand the staying of burden of proof on someone or giving them that benefit if they had been complying. These people have been out of compliance, from what I can tell of the file, nearly the whole time that they have been in operation. And we've had a significant event at Birch Springs that our expert indicates is a direct result of the mine activities and their failure to comply with their drainage plan.

Now, it's interesting. I have some quotations from that plan, and I won't belabor this, either. But this is what they said in Section 3.5.3.1: "No significant impacts to the ground water system are expected from mining operations. The ground water monitoring plan discussed in Chapter 7 will provide a means to follow the possible effect of the mining activities on the ground water system." Further on, "If necessary, mechanical devices will be installed to remove grease and oil that might be present in the water before it is used for dust suppression." Further on, "In the unlikely event that mining adversely effects a water source, Co-Op will select an alternative, after considering all possibilities of each specific circumstance."

Well, that's interesting, because the people who caught the event were my clients. There have been a

total of two monitoring reports submitted on Birch Spring. I'm not sure quite what has happened on Bear Spring, although I'll be happy to put that together in my supplementation, or perhaps Mr. Johansen will do that.

But the testimony shows that the problem evented in Birch Spring was mine caused. And I don't think it's a question of if the injury may occur to these people; it's a matter of when. And we're lucky that something significant hasn't happened to date.

We concur with the requests that Mr. Johansen has set forth previously, and I won't belabor those. But I will make the following statements: I think that they should have to meet, for once, the specific requirements for this entire area, including the effect in the adjacent area. And this is with respect to both the new areas and the old areas; the old area being that for which they're asking for renewal. I think the initial permit was granted without adequate description of premining hydrologic resources. For instance, the Birch Spring was not shown on some of the maps. They didn't deal with it. The record is fairly ripe with omissions in that regard. And we need to go back and figure out what they should have been doing with respect to the initial permit and then move forward, if we move forward.

So, we'd request that the permit be suspended, or

1 the renewal stayed and the permit not granted, until a
2 thorough inventory is done by the numbers; meaning in
3 accordance with the complete Code, before any renewal or
4 addition to the permit is had. We also think that we
5 have a need for immediate intensive monitoring, at Co-
6 Op's expense, of all water sources and hydrologic
7 resources to prevent something horrible happening that
8 could effect all these people in this valley. We could
9 have another event at any time. And I think it would be
10 prudent for them to begin looking immediately for alter-
11 native sources or some means to protect the existing
12 sources, whether it's treatment or otherwise. I under-
13 stand that's contemplated within the studies, but we need
14 to start now before something horrible happens.
15 You've heard the problems that were quite well arti-
16 culated by Mr. Montgomery and the people who represent
17 the companies as their officers. There are also numerous
18 violations on behalf of Co-Op. I don't think that this
19 initial permit should have occurred in the fashion it
20 has. We have the opportunity now to rectify that. I
21 think we should take that opportunity at this particular
22 point in time. We need to gather further data and ensure
23 that some sort of tragic event really doesn't occur.
24 Now, once again, they have the right to mine, I
25 think, under the regulations, if they take care of these

1 particular sources; being sure if they -- They can con-
2 tinue to mine if they provide for alternative sources.
3 We don't have any firm grasp -- I don't think anybody has
4 a firm grasp of what is really going to happen up there
5 if mining continues, except if they were to stop right
6 now, there could be further problems with the springs,
7 based upon what Mr. Montgomery has told us tonight.
8 And I, too, would ask for ten days from today to
9 supplement my testimony in writing, at which time I'll
10 provide further details. Thank you.
11 MS. NIELSON: Thank you. Did you have anything
12 else to say, Mr. Leamaster?
13 MR. LEAMASTER: No. One thought I failed to
14 mention, Big Bear Spring was the firs t--
15 MS. NIELSON: Could you maybe step up to the
16 microphone?
17 MR. LEAMASTER: This maybe isn't too signifi-
18 cant, but I think I wanted to express the importance of
19 Big Bear Spring again. Big Bear Spring was the first
20 spring that was ever developed as a water source for
21 Huntington City. And we have not been able to exactly
22 pinpoint the date that it was first used, but we found
23 some maps from UDOT that showed water lines in that area
24 as early as 1920. We know for sure that it was in their
25 system as early as 1930. So for at least 60 years, that

has been the main source of water for Huntington City. And as I mentioned, in the last four or five years we've also put Cleveland and Elmo on that spring source.

MS. NIELSON: Thank you.

MR. LEAMASTER: That's all we have.

MS. NIELSON: All right. I suggest we take a 15-minute break and resume at 8:15. Thank you.

(Whereupon, a short recess was taken.)

MS. NIELSON: We'll go back on the record. Mr. Leamaster?

MR. LEAMASTER: Could I just let him --

MS. NIELSON: Excuse me.

MR. MONTGOMERY: Bryce Montgomery. I just wanted to emphasize that in the cross section I presented and in the report, the main concern is expressed relative to the upper coal seam that's being currently mined in the Bear Canyon Mine -- the Bear Canyon coal seam. And my remarks with regard to what may happen as that seam is extended further north under the proposed permit area, that seam is somewhat higher than the Hiawatha coal seam. And the permit, as I understand it -- the new permit is requesting not only the right to mine that seam, but also to go back down and mine on the Hiawatha seam. Since that seam is at a lower elevation, as they extend it up-dip

northward, it will intersect the potentiometric surface of the Blackhawk-Star Point aquifer much more sooner -- quicker than would the upper seam mining. I just wanted to emphasize that. So the impact would be much greater.

MS. NIELSON: Okay. Is that clear in the report?

MR. MONTGOMERY: I think the report emphasizes the upper seam. That's why I wanted to emphasize this now, so that -- because the understanding I had at the time I made the report was it was more directed toward the extension of the present mining; the mining of the upper seam of Bear Canyon, rather than going down and picking up this Hiawatha seam. But I understand that the permit is requesting both, so I wanted to emphasize that.

MS. NIELSON: Thank you. The Division recognizes that we've received a report dated January 28, 1991 to Mr. Darrel V. Leamaster and Mr. Menco Copinga from S. Bryce Montgomery entitled "Hydrologic investigation and report of Big Bear Spring and Birch Spring relative to Co-Op Mining Company, past, present and proposed coal mining, Township 15-16 South, Range 7 East, Salt Lake Base & Meridian, Emery County, Utah." We will receive that as Exhibit 19, recognizing that the exhibits which Mr. Montgomery presented in his testimony are included within this report.

Mrs. Wilson, did you wish to make any comments on behalf of Huntington-Cleveland Irrigation Company?

MRS. WILSON: Yes. I have just a statement I can leave, or do you want me to read it?

MS. NIELSON: Whichever you would prefer.

MRS. WILSON: Okay. He's got -- made a statement. He wasn't able to be here tonight.

MS. NIELSON: Would you identify yourself for the record, please?

MRS. WILSON: I'm Lucille Wilson. I'm Ardeth Wilson's wife. He's unable to be here tonight. And I'm representing Huntington-Cleveland Irrigation Company for him. He made a statement that he said I could just read, and it says, "The Huntington-Cleveland Irrigation Company is concerned about the mining operations of the Co-Op Mine. Water intercepted by the mining operations, taken inside the mine, is taking water from the streams and springs in the mountain top. Huntington-Cleveland Irrigation Company has the first water filings in the Huntington Creek Drainage. Water intercepted by the Co-Op Mine's mining process is taking water that is covered under the Huntington-Cleveland Irrigation Company filings. The Board of Directors of the Huntington-Cleveland Irrigation Company want to go on file this 5th day of February, 1991, showing our concerns about the mining

operation at the Co-Op Mine, and the monitoring and measuring of this water."

MS. NIELSON: Thank you. We'll accept this letter dated February 5, 1991 as Exhibit 20. Are there any other comments that North Emery Water Users' Association want to make?

All right. At this time I would like to ask Co-Op Mining if they would like to present their case and make any comments. And would you step to the podium and state your name and affiliation again for the record?

MR. OWEN: I'm Wendell Owen with the Co-Op Mining Company. As far as any technical information or technical data, I'm going to leave that to our consultant, Mr. Kim Mangum. Of course, any legal answers or legal questions we'll leave up to our attorney, Carl Kingston.

The main thing I want to do is say that we are also concerned about the water in the area. We have tried in the past to cooperate. We do presently have an agreement with Huntington City in regards to the spring. And I believe that agreement is a matter of record in the permit also. That agreement was reached here a number of years ago, I think when we first went into the area.

SPECTATOR: 1976, Wendell.

MR. OWEN: Yes, uh-huh -- and is still in

effect. And there were certain limitations as to what would trigger the agreement -- the terms of the agreement. And those limitations have never been breached. In other words, there has not been a sudden drop to the extent that would trigger the conditions of that agreement.

And like I say, we want to continue to cooperate. We are concerned. We want to take whatever measures we need to to ensure the water supply of the people of Emery County. We feel like there can be measures taken and agreements, or whatever, made that can ensure that water supply for the people of the County, and at the same time allow us to continue mining, which, of course, we are very anxious to do.

Now, like I say, I'm going to leave most of the technical part of it to these other people. But a couple of questions I would -- or a couple of answers I would like to give, or remarks, to some of the things that were brought out.

There's been several references to our water monitoring and to our lack of compliance. We do monitor the water. That has been one of the requirements of the Division of Oil, Gas & Mining. We keep those monitoring records. We make them available to the Division and to their representatives when they come on-site. As far as

And that oil and grease which appeared in some samples could have easily have come from there.

The alternative is that the oil and grease was carried through the aquifer out the ledges and back down in. That oil and grease would be expected to continue, if that was the case. Where it went in and came off from the hinges, it was because the flow at that point was reaching the hinges. And as it typically reached the hinges, it was during the normal flow period.

There's also -- It was stated that testing on Big Bear Spring was done for coliform, I think monthly, for organic-inorganic matters. It was stated that it was done once a year or up to every three years. So, we would need baseline data in order to establish any realistic increases in those values.

It was stated a few times of noncompliance and a history of noncompliance with Co-Op Mining Company. My experience with Co-Op Mining Company has been that they are willing to comply; that they have rapidly complied with all requirements that have been given to them. As far as water monitoring data, it was stated that was done improperly or it hasn't been done routinely. There is a recent history that I'm aware of that it has been done routinely. Monitoring of Birch Spring has typically been dry. That is on record. It was measured quarterly when

Huntington Spring, we have not had access, since they keep it locked to the spring itself. As far as water quality, we have monitored the overflow. There is always a little bit overflows that I guess we're catching there. I wouldn't say an "overflow;" probably from small rivulets that come at different places in that area. We have monitored the quality in those places. As far as the quantity, I was of the understanding of our previous agreement that they were going to monitor the quantity and send us the information, which they have. Annually they've sent us the quantity and monitored all the springs, so we didn't feel like we were failing in our monitoring, as far as the monitoring of the spring or of the other water in the areas.

Now, in regards to the showing of ice on the ledges, as long as I can remember there has been seepage indication in the summertime and ice in the wintertime. Now, I'm not enough of an expert or hydrologist to try to determine how much there is or as to what extent the problem is.

Incidentally, I have, in walking farther up Bear Canyon to the north, noticed there are similar accumulations of ice on the ledges to the east; the side that we are not mining. So apparently, it is not necessarily a peculiarity of that particular area of a mining -- part

of a mining operation.

Now, one other thing that I would like to bring to the attention of this Division: like I say, we have tried to cooperate. Any who have requested returning to the mine, we have taken them and tried to do all we can there.

Now, Mr. Montgomery did make a tour through our mine. In his statement he mentioned that water was probably traveling down through the fault zones into the lower strata to reach the spring. And I can understand now why he's -- one of his main interests in making that tour through the mine was to visit the faulted areas. He told me he crossed the fault in the mine -- which we did in our tour -- both of those areas that he requested that we go to. And at those places, we found little or no water in any of those fault areas that we visited.

Now, we do -- in mining operations, we do, as we mine, encounter a certain amount of water. It's fairly normal. Any mine I've been in does it. It dries up behind us. It's not always encountered -- a little water. Some places more than others. As was pointed out by Mr. Montgomery, as you're in there -- as you get in your various dips and rolls in the seams there -- and, of course, it will drift down into the bottom of the row. And at that point, why, the water will drip out faster.

And in -- At those points, why, usually there's no water standing on the row.

But aside from that, I cannot see that we have done anything any different in our mining operation than we have always done. And I don't know that there has been any appreciable change in anything in the way of unaccounting that brings to my mind.

So, like I say, aside from that, I'll leave the technical part of it to Mr. Mangum. I would like to express again that we do want to work with these water agencies. We want to do everything that we can to cooperate and to make them feel they are not in danger. But we do feel like we can mine coal and continue to mine coal without depriving Emery County of their water. Thank you.

Would it be all right, then, if Mr. Mangum --

MS. NIELSON: Please. And would you identify yourself for the record?

MR. MANGUM: My name is Kimberly C. Mangum. I'm a registered professional engineer in the State of Utah -- civil engineer. I'm a consultant for Co-Op Mining Company. I have been working for them for the last few years. I appreciate some information that's been brought forth this evening and Mr. Montgomery's expertise. However, much of the information which has been brought out

is new to us and needs to be addressed specifically. So, we reserve a request of that opportunity to review the report and some of the other information which has been brought forth, as well as any written information which is introduced in the next few days. We request an opportunity to review that and deal with each item on as specific basis.

In regards to some of the information which was brought forth, I have here a graph which was sent to me by Mr. --

THE REPORTER: Can you speak up a little bit? It's a little bit hard to hear you?

MS. NIELSON: Maybe you can turn the microphone up just a little bit more.

MR. MANGUM: (Indicating)

MS. NIELSON: That will help.

MR. MANGUM: I have a graph here that was sent to me by Mr. Leamaster, where he had plotted the flow of Big Bear Springs and shown -- shows the precipitation also on the same graph. Also, there is -- There is also a line which shows the flow of Little Bear Springs, which is outside of what was referred to as a graben area by Mr. Montgomery. We feel that they could quite correctly follow the precipitation that is given on the graph. If you cannot see it from here, it is a green line that

1 flows -- starts here during the high rain period, which
2 we are all aware we had and --
3 MS. NIELSON: Can we ask you, maybe, to hold it
4 up to show it a little bit so we can see all of it?
5 MR. MANGUM: That's okay. We're not dealing
6 with the exact numbers; just curves here. As you can see
7 here (indicating), this is Tie Fork Spring along the
8 bottom. This particular increase in flow was pointed out
9 by Mr. Montgomery. It occurred in late 1988, which is
10 approximately one year from when the increase in flow
11 occurred at Birch Spring. The explanation which Mr.
12 Montgomery gave was that it would be related, or possibly
13 related, to mining activity to the north. But there is
14 a time period between events that occur to the north and
15 what would occur to the south. And there's a possibility
16 of a connection with these two events of Tie Fork and at
17 Birch Spring in increase in flow.
18 There is also an increase in flow on the Little Bear
19 Spring at approximately the same time as the increase in
20 flow at Birch Spring. There is no geological connection,
21 according to what Mr. Montgomery showed us. They are not
22 in the same graben or fault valley.
23 MS. NIELSON: Could you clarify the time frame
24 of that increase, if you could read off the graph itself?
25 MR. MANGUM: It occurred September-October --

1 September-October of 1989, which is the same time period
2 as the increase in flow in Birch Spring.
3 MS. NIELSON: Thank you.
4 MR. MANGUM: Also, I'm sure, because of space
5 on the graph -- but if we look at the one behind here --
6 Can you drop that one down? The precipitation comes down
7 -- It shows the flow rate back until 1982. All of the
8 graphs that were shown previously do not go back that
9 far. If you notice, the rainfall crosses at different
10 points as it crossed in latter years during the drought.
11 One of the key points -- thank you -- that I would like
12 to state was it is very likely and most probable, in my
13 opinion, is that the event which instigated this hearing
14 was -- is the low flow.
15 And we are all aware of the correlation -- the dir-
16 ect correlation we have with precipitation. And that is
17 quite clear. Mr. Montgomery, in his -- when he was up
18 here, said that he felt there was a connection also with
19 mining. He said, according to the graph, that -- where
20 he said there were no more increases during the years, he
21 said that he felt that would be attributable to mining
22 activity. He did not show a direct correlation of why
23 that would be attributable to mining activity; an aquifer
24 lower to the fault zone. It is not an aquifer, as he
25 also stated. Water would, at a low flow, would not have

1 the same direct increases as it does during a higher flow
2 year. The flow from a spring would be more level in low
3 precipitation years because of the lag of the water
4 before it gets into the spring.
5 So, I don't feel that there is an attributable cor-
6 relation that can be shown there.
7 MS. NIELSON: Mr. Mangum, could I clarify? Are
8 these exhibits equivalent to the ones that were shown
9 earlier by Mr. Montgomery, or do you have additional
10 copies of those that we could include for the record?
11 MR. MANGUM: We will have to make copies of
12 those. I received that information directly from Mr. --
13 from Darrel Leamaster. So, that information would be the
14 same, unless he has changed in between -- the same infor-
15 mation. But it includes more -- additional information
16 from what was presented in his; specifically, the Little
17 Bear and other things.
18 MS. NIELSON: Okay. If you could provide
19 copies of those, and we'll designate them as Exhibits A
20 and B.
21 MR. LEAMASTER: Maybe I could clarify. The
22 exhibits I had were the same information. Those are long-
23 time period and are basically the same information. I
24 just presented them a little differently.
25 MS. NIELSON: Okay. We recognize they're

similar. If it is possible to provide us with copies, I would appreciate it. And we'll designate those Exhibits A and B.

MR. MANGUM: That would be fine.

MS. NIELSON: Thank you.

MR. MANGUM: There has been much talk about the effect of mining on the water. The water that is intercepted in the mine has--is left almost exclusively within the mine. Where it goes in, it is taken into sumps. It does not disappear. It's not evaporated into the area. It stays in the ground. The mine is above the line, which is referred to as the aquifer, which would be the top of that bed in which the water flows. And there is no reason to believe that because that water is -- must stay in the mine, that it is really not entering into that same bed.

As far as the contamination which was purportedly done to Birch Spring, the -- When the increase in flow occurred, there was seep-out from the canyon. And that water flowed over and into the inlet where the water was taken from. There are -- There were deer droppings, there were birds on the hills. And that coliform increase would -- is easily directed or could be blamed on that surface source. It is also noted in -- during inspections when this testing was done, that the lock or the hinges on the box where the water went in has been oiled.

it was not dry; that samples were taken, and the parameters that were dictated by the mine plan were tested.

And as Mr. Owen stated, overflow from Big Bear -- I mean from Big Bear Spring is also routinely monitored. A base line was taken and is now monitored quarterly.

One other statement that I -- At this point I would like to draw to the attention of the Hearing Board that in November 12, 1990, Ardeth Wilson, secretary of Huntington-Cleveland Irrigation Company, withdrew his formal protest.

I feel like all these problems can be resolved; that the -- and I understand the Co-Op is willing to deal with these entities to resolve them. I again state that we would like to review, on a point by point basis, some of the points that are made in the report and in the requests that have been made.

That's all I have to say.

MR. STODDARD: My name is Bill Stoddard, and I'm president of the Co-Op Mining Company. And my concern would be at this time to let everybody know of the Division and everybody here that we do want to cooperate, and that our concern is the same as your concern. We don't want to pollute the water or tap into it in any way so that it isn't made available. So I just want to make mention that that would be my concern and our concern:

to be able to cooperate and let you know that our concerns are the same.

One other item that I would like to make mention: that it was made mentioned that we -- One of the things that Mr. Johansen brought up was any extension in our mining area should be denied because we might run into that water. It's also been made mention that there are mines north of us, so I don't feel that that impact would be -- because of that, that our impact would be that much on mining farther north.

And, thirdly, on behalf of the Co-Op Mine, I would like to ask maybe the Division permission that we might be able to meet with each of these concerns -- meet with them and talk with them and see if we can't work these things out and come to an agreement so that we can work with you and they can work with us and come up with an agreement. I would like to ask that we might be given permission for that time period. That's all I have to say.

MS. NIELSON: Mr. Kingston, did you want to make a comment?

MR. KINGSTON: If I might.

MS. NIELSON: Could you identify yourself for the record?

MR. KINGSTON: Carl Kingston, attorney for

Co-Op Mining Company. Each one of these items that were raised, I think we could spend probably a half an hour or forty-five minutes on rebutting. I think the suggestion of Kimberly Mangum is proper; that we be allowed to address each one of these in writing, since tonight is the first time we were apprised of some of these things.

But I think it should be evidence from the people that have spoken that it is the concern of Co-Op Mining Company to work with these people. We are concerned about the water rights that exist in the area. In fact, I represent some of the stockholders in Huntington-Cleveland Irrigation District, so I'm personally concerned, and I can represent that each one of the management personnel at Co-Op Mining Company are also concerned. I think you do have sufficient information that you can review and probably evaluate some of the concerns, particularly with regard to the alleged decrease in the water flow of the springs that are supposedly directly affected by Co-Op Mining activity. But if you correlate those and compare those with springs that are not in this same graben and aquifer, you'll find that they go along the same exact parallel line, based upon the precipitation within that particular time period.

Also, I do want to emphasize that the concern about mining north is really not that legitimate concern,

because there is a mine existing to the north. And Co-Op Mining Company has been mining in Bear Canyon for ten years now, and they've been mining in Trail Canyon since before 1940. And I don't believe there is any documented evidence that exists that can show that during that time period there's been any adverse effect on anybody's water rights.

Now, certainly that potential exists; and whether that potential is great, as the objectors have proposed tonight, or whether that's minimal, as Co-Op Mining's position will be, that potential does exist, and it ought to be dealt with, and Co-Op Mining Company is willing to deal with that.

It seems that the answer would be a monitoring program. I believe the Co-Op Mining Company had monitored, pursuant to the requirements of the plan. If there's additional monitoring that needs to be done, I think Co-Op Mining Company is willing to do that.

One of the problems, I think, has been that the area the objectors propose we do monitor, we can't get to because of the locked gates. And I suppose that would be an easy enough problem to resolve; simply by allowing us access at different times. But another suggestion was made that we perhaps could work one-on-one with these people and arrive at some agreement. And that also is

something I wouldn't want the Board to foreclose us from doing.

But simply to restate our position, we do want to have the time to address both the information that we received for the first time tonight, plus any additional comments that might be submitted in writing by the opponents. And we are concerned. We want to work with the Division. We want to work with the objectors. We want to continue to mine. We don't want to effect anybody's water rights. We want to conduct an operation that's sincerely concerned and addresses the objections that have been raised. Thank you.

MS. NIELSON: I would like to provide now for an opportunity first to Castle Valley Special Service District, North Emery Water Users' Association, the attorney for Huntington City, and the attorney for Castle Valley. If you have any questions with regard to the information that's been presented by Co-Op that you want to address at this point --

MR. JOHANSEN: I don't.

MR. APPEL: I don't have any questions either. Thank you.

MR. LEAMASTER: I don't have a question, but there's one point of clarification that I should make on those graphs.

MS. NIELSON: Why don't you do that now, Mr. Leamaster. And we're referring to graph Exhibits A and B. And I believe this is Exhibit A (indicating).

MR. LEAMASTER: The point I just wanted to clarify, we talked about these peaks that occurred. They indicated they were in 1988. They were actually in -- Excuse me. They said they were in 1989, which coincides with the time they got the peaks of Birch Spring. The peaks actually occurred in 1988. That's this peak and this peak (indicating). Now, it may be relevant. We have thought it was. In August of 1988 there was an earthquake that occurred just slightly south and east of us here. It was about a 5.2 or 3; something of that magnitude. We felt that had an effect on those two springs and increased the flow. The increase in flow that they saw at Birch Spring was in late 1989 and early '90, so it was separated by at least a year with these peaks.

MS. NIELSON: And was not related to --

MR. LEAMASTER: None that I know of.

MS. NIELSON: Okay. Thank you.

MR. LEAMASTER: He's indicated to me that there's a peak he was discussing --

MS. NIELSON: "He" being Mr. Mangum?

MR. LEAMASTER: Mr. Mangum. Was this peak on Little Bear Springs that occurred in -- looks like August

or September of '89. I'd suggest that is a pretty common thing that we've had all the way along. Because as you can see, we peaked in July and August in almost every year on that spring. So, I don't see this peak occurring anything different or unusual from what we've had on the whole history of the spring.

MS. NIELSON: For the record, then, does the Co-Op have any other question they wanted to address at this point?

(Participants indicating negatively.)

MS. NIELSON: There are a couple that I would like to ask for some clarification on. While I appreciate it's somewhat cumbersome, whoever chooses to respond to these could come to the mike so we can facilitate that comment.

First of all, I'm wondering how much -- and I think I'm addressing this question to you, Mr. Montgomery, but if other's want to comment, I'd appreciate that also. Is it possible, in your study, to be able to distinguish how much of the impact that you're defining is related to Co-Op's operation at Bear Canyon as opposed to other mining or exploration operations that are going on within and north of the graben you defined?

MR. MONTGOMERY: With the present information

that was made available to me, that would be very difficult to separate out and define; that this mine has caused this amount of decrease in flow. The problem, and one of the great needs, is to have a baseline or a monitoring well north of the mining operation so that we can see what's happening to the aquifer before the water gets to the mine, and then compare those water levels with changes that occur in the springs. It would have been ideal to have had this before any mining had taken place. Even though there were a couple of test wells drilled up there that I used information from the logs, I was unable to get access because it was high in the snow when I was there. But if those have been maintained, I don't know about it. But, really, there ought to be a monitoring -- at least one; more than one would be preferable -- north of the proposed mining or existing mining so we can see what's happening in that aquifer under normal conditions. And that's really what's needed to better define or answer your question. But with the present information, as I have it available, that would be difficult to answer.

MS. NIELSON: Okay. You've been underground -- I have one more question.

MR. MONTGOMERY: All right.

MS. NIELSON: You've been underground in the Bear Canyon Mine?

MR. MONTGOMERY: Yes, right.

MS. NIELSON: Can you identify the fractures that you indicated on your exhibits of the structure maps; can you identify those structures underground within the mine?

MR. MONTGOMERY: Yes, we can. They're very pronounced. And the faults that I show on the map, you can see them underground pretty well. And the coal bed is offset very conspicuously. There are many joints that parallel the faults that are hard to identify, because with no offset on them, and because they do spray the inside of the mine coated with lime dust, that it's hard to know where they are, because it's almost like you've painted over them. That's what's happened. But if water is working presently to those, and it's obvious there are places where water is coming down through-- The main flow I was able to see in the mine is up in the north end. And that is where the mining company has fenced off the area and put -- installed a pump. And they're pumping out of that water yielding area -- I understand from there maps that over a hundred gallons per minute was reported in that area. I don't know exactly the quantity of water they're pumping out of there for dust suppression; part of which water goes outside of the mine on supply uses outside of the mine. There is a pipeline that was pointed

1 out to us coming from the mine, so some of the water is
2 used out of the mine. But the main flow -- appreciable
3 flow is coming in the north end from the present mining
4 operations.
5 And as was pointed out by Wendell, there are other
6 flows in several other areas, but they are very small.
7 And I think one of the problems in a mining operation,
8 some joints, or even faults that's -- before the mining
9 operations were open and allowed the free movement of
10 water through them -- Once you instigate mining opera-
11 tions, you got coal dust; you got other kinds of dust,
12 debris that tends to plug those in the floor of the mine.
13 And not that they can't be freed at times, maybe under
14 higher head of water or some other means, but not all of
15 the water you see in the mine would necessarily have to
16 have been recharged to the springs. Some of it may never
17 have reached the springs. It may have spilled out as
18 natural seeps, as Wendell pointed out.
19 The concern is that it appears that more is coming
20 out to the surface than was heretofore. And that amount
21 of water, part of it would have gotten into the recharge
22 of the springs below. It's hard to define exactly how
23 much of it got down. The joints in the sandstone tend to
24 be sealed off at the shale beds. But along the faults,
25 water tends to move on through the shale beds and go on

down. So, all of the joints do not transmit the water downward. The shale beds tend to deflect the water, and it comes to the surface, as was shown. But it's a hard thing to quantify, and especially once the mine has been coated inside to see exactly all the openings. But those faults are very obvious. The joints are hard to tell all of them, unless water is coming through them.

MS. NIELSON: When you were in the mine and you noticed the hundred gallons per minute close in the north end --

MR. MONTGOMERY: Yes.

MS. NIELSON: (Continuing)-- do you recall when that was?

MR. MONTGOMERY: Yes. That was in the first part of January that we were in the mine.

MS. NIELSON: Of '91?

MR. MONTGOMERY: Yes, '91. And that's the flow that they're presently using. It would be well, I think, for Wendell or one of the people from the mine to say exactly how much water they're pumping from that source area. It would be helpful.

MS. NIELSON: Mr. Owen?

MR. OWEN: We don't know exactly how much we're pumping from there. We pump from there, as he brought out, to other places to where we're mining. It takes a

certain amount of water. You have to spray the coal as you mine it; you have to have water on the belts; you have to have dust control; you have to have dust control on the surface. The only meter we have is on a line that leaves the mine to the surface. We have a culinary tank. And, of course, because of the variation in the use of bathhouse water and so on, it, at times, overflows. We have an overflow that is in our mine plan, and that is -- as has been documented by Oil, Gas and Mining.

Now, as far as the hundred gallon a minute, when that water survey was made, I asked the people doing that how they came up to a hundred gallon per minute. The reason I was concerned is that water -- I don't know how many of you -- probably a lot of you around here in this country are familiar with mines -- and that comes from maybe a thousand drips in the ceiling. And I don't know how in the world you'd ever tell that there was a hundred gallon a minute there. And I pose that question. And that was that they said, "Well, we come to as close an estimate as we could," because there's no way to get enough buckets under each one of those drips to time how long it will take to fill five gallon a minute. But I wanted to bring out that the hundred gallon a minute figure is not really a set, hard and guide figure.

MS. NIELSON: Mr. Owen, if I could ask a

question?

MR. OWEN: Yes.

MS. NIELSON: And if you wanted to put it to someone else, it's my understanding that right now Co-Op is pumping water from sumps in the mine for culinary use outside the mine; is that correct?

MR. OWEN: Yes, that's correct.

MS. NIELSON: Do you meter that use?

MR. OWEN: We meter what has left, yes. There is a meter where it leaves the mine and goes to the surface.

MS. NIELSON: Have there been variations in the amount of water that has been withdrawn from the mine for culinary purposes over the period of time that we're discussing?

MR. OWEN: Only, oh, short-term. Like I say, depending on being-- When we have holiday weeks, we don't have the bathhouse in use. Just short-term variations. Some seasons we have to use dust control more than we do others. Dry seasons we use dust control.

MS. NIELSON: But the dust control would be within the mine, again?

MR. OWEN: Dust control on the surface as well.

MS. NIELSON: Okay. So the water is used for culinary purposes after dust control within the mine?

MR. OWEN: That's correct. And like I say, there wouldn't be a lot of variation. It would be minor variations.

MS. NIELSON: How do you define "minor?" What sort of order of magnitude are we talking about? Is that less than 10% of the totals of constant variation; less than 10%, or --

MR. OWEN: I would imagine probably less than 10%, uh-huh. Like I say, as far as especially if you take it over a period of a month. In other words, on a dry day we're using more water for dust control. You get a wet spell, and you're not.

MS. NIELSON: Is there any other discharge from the mine?

MR. OWEN: Like I say, it -- the culinary has, at times, overflowed, so that there has been more discharge at times than what has actually been used. We do have an overflow on the culinary tank. And there is times that it overflows.

MS. NIELSON: But that would have been metered coming out of the mine before it went into the culinary tank?

MR. OWEN: Yes.

MS. NIELSON: Okay. Thank you.

MR. OWEN: Is that all?

MS. NIELSON: (Indicating affirmatively.)

MR. MANGUM: Can I make a comment?

MS. NIELSON: Certainly, Mr. Mangum.

MR. MANGUM: Yes. Just a comment about putting a drill hole north of the mine. It has been commented previously about drill holes, because this is not an exact aquifer; that the water may flow six feet away from where you put the hole and not where you put the hole, and also could disrupt that particular crack that the water was flowing in. So, there is some concern, even, about putting in a drill hole in its accuracy or in its possible disruption of the existing aquifer or crack.

MS. NIELSON: I have a question that I think perhaps, Mr. Leamaster, you can address or tell me who might be able to address it.

I understand that there are concerns about monitoring and the request for monitoring by Co-Op. It's my understanding that there is an existing monitoring program, but that there is not access to boxes that are locked. Has there been, in the past, some arrangement for Co-Op to be able to gain access to those to monitor, or is it possible to work out an arrangement where there could be monitoring of those locked points?

MR. LEAMASTER: Yes. All of our collection boxes and our spring outlets are locked, obviously to

keep any vandals or anyone else out of the springs. I don't think we have any major objections to making those available to them for monitoring. To my knowledge, they've never requested that from us. And I think that some arrangement could be worked out. I think Mr. Owen indicated that on our Big Bear Spring they've been sampling from some of the -- it's not really an overflow. It's a small trickle that escapes our collection system and runs by us. And apparently, that's what they've been sampling there.

One of our problems there is we don't feel like we've ever had access to the information that they have collected -- you know, whatever they collected. And we would really like to have some kind of access to that; to know what's going on and how it's collected and when it's collected and what the results were.

MS. NIELSON: Thank you. Does the Division have other questions?

MR. MUNSON: Mr. Montgomery, when you were in the mine, I believe we saw, as well as when I was in the mine -- and where the water occurred in the north part of the mine -- I was just curious if you could ascertain that that was fault-related versus potentially a channel sand, which I don't know if you're familiar with that occurrence, but that is a very common occurrence in these

mining operations where there's been an actual -- a channel has been laid out you know, past connate water-type scenario? Would you address that?

MR. MONTGOMERY: Certainly. We did not get beyond the fence. The area is fenced off. And so I could not look right up close to it, and the water was deeper there. So we didn't get right up and look at it closely. From the mapping that I've done, which I might state verbally, but it's in the report, I utilized two sets of aerial photography besides what field work I did. And there is a fault north of there that you can trace southward; but then it terminates, as far as what you can see on the surface from aerial photography. And I could not correlate that spring or the discharge point that they're getting their water out of with any particular fault. I can't, from the information I have on hand. It could easily be coming, as you say, through a channel in the sandstone. But it's dynamic water. It's moving. It isn't stagnant, and they are using from it. So, it's refreshing itself. So, it's being recharged, and I suspect it's being recharged by either faults or prominent joints. That's the likely recharge to it. But it certainly could be discharging out of a channel sandstone that's being fed from fractures.

So as far as looking closer than about, oh, probably

sixty or seventy feet, something like that, that's the closest gaze I got at it.

MR. MUNSON: Thank you.

MR. MITCHELL: This isn't so much a question, as much as a clarification of where we are right now, without taking anything away from the chairman. This is new information, to a large extent. The Co-Op and the Division would like the opportunity to review, particularly the geologist's report. To that end, I think you can all understand that this will need to be supplemented, and probably will be supplemented in writing, although I think we'd be interested in hearing from any of the parties whether they think they want an opportunity after they've examined it to then ask for their follow-up questions verbally, particularly the expert witnesses.

MR. COPINGA: (Indicating)

MS. NIELSON: Mr. Copinga?

MR. COPINGA: I'm stating the fact that -- talking about access to our springs. We've never been contacted to get to our springs. And as we know right now, they've only tested our springs twice over the years.

MS. NIELSON: Okay. There's been a few issues raised, as Mr. Mitchell just indicated, that I would like

to provide some direction on. First of all, relative to supplementing the record, I would propose and hope that if there's a concern with this time frame that you've indicated at this point, that the Division provide ten days until close of business on the 15th of February to allow the parties who have presented information this evening to supplement the record and would ask that they also provide copies of that information to the other parties. And I'll discuss those with you in just a moment. But if there is any new information that is provided in those supplements to the record, that the parties will be allowed ten additional days to respond to that new information in writing. And at any time during this period, if one or more parties desires to hold a hearing again to discuss information with witnesses or other parties, we would consider that.

The purposes of being able to supply comments and, thus, expediting this supplemental response period, for Castle Valley--Mr. Leamaster, would you serve as contact?

MR. LEAMASTER: Yes.

MS. NIELSON: North Emery Water Users', Mr. Menco Copinga?

MR. APPEL: Actually, I will do it.

MS. NIELSON: You will. Okay. Mrs. Wilson, does Huntington-Cleveland wish to be in receipt of

additional comments with an opportunity to respond?

MRS. WILSON: I think so.

MS. NIELSON: Okay. Do you want to be contact on that?

MRS. WILSON: No. Make it to Ardeth Wilson.

MS. NIELSON: Okay. For Co-Op Mining, Wendell Owen?

MR. OWEN: Maybe to the engineer or to --

MS. NIELSON: To Mr. Kingston?

MR. KINGSTON: Yes.

MS. NIELSON: And Huntington City, Mr. Johansen?

MR. JOHANSEN: That would be fine.

MS. NIELSON: So I would ask the parties, if you don't have addresses or contact of those individuals, would you please ensure that you get them, and the Division would be happy to provide them. Again, the point being that as you provide that information to the Division by the 15th of February, that it would also be provided to the other parties by that date. And if any of the parties, being that there is new information -- and I stress new information that they feel they need to comment on -- that they will notify the Division and will be allowed ten additional days to respond to that.

There was a request raised by Co-Op that there be an

1 opportunity or that we not foreclose the opportunity for
2 the parties to meet and to work out the problems or the
3 issues of concern here. And I would like to stress that
4 that's an opportunity at any point. We're certainly not
5 in the process of trying to reach some solution in our
6 action, meaning to foreclose any opportunities for the
7 parties to do that independently. If that's appropriate,
8 I would encourage you to do that. The Division would be
9 happy to assist in any way we can in terms of helping
10 that sort of meeting to go forward. And to the extent
11 that there is a feeling by the parties that that sort of
12 meeting is fruitful and likely to carry into some sort of
13 agreement that will resolve any of these difficulties, I
14 would encourage you to let the Division know so that we
15 could consider that as we move forward on our action.
16 This is an informal hearing, and so those contacts
17 are certainly appropriate, especially if they can help to
18 resolve any of the problems. If it is appropriate and
19 the parties don't object, the Division would like very
20 much to be a party to those discussions. But we would
21 leave that to your discretion, at least to the extent
22 that you would provide us with that information as well.
23 MR. MITCHELL: Let me just address this to
24 counsel; two things. In the first instance, when you
25 make your submissions and you provide copies to other

1 partes, would you please -- it will be second nature, I
2 think to the lawyers, but those of you that do things
3 that aren't lawyers, would you just put something on the
4 back and sign to the effect when you mailed it or when
5 you caused it to get into the hands of somebody else and
6 how you went about doing that so we have some way of
7 determining that?
8 With regard to the lawyers, I think it would be very
9 helpful, when you make your written submissions, when you
10 finish supplementing your record, I'm sure you have your
11 own opinions on both sides as to who has what burden of
12 proof at what point. Mr. Appel made reference to that
13 when he spoke. I assure you that we would appreciate
14 having your feedback about that up front. And so any
15 sort of legal memorandum you would like to file would be
16 encouraged; and that if you can make reference to what
17 evidence you believe is presently in the record, which
18 you believe either meets your burden or where you believe
19 the burden has not been met, and some sort of analysis of
20 that from your party.
21 MS. NIELSON: Okay. And the clarification, am
22 I correct in understanding that Co-Op has a copy of the
23 January 20th report from Mr. Montgomery?
24 MR. LEAMASTER: I provided them one tonight.
25 MS. NIELSON: You did. Okay. And that was

Exhibit 19. And you are in receipt of that?

MR. OWEN: Yes.

MS. NIELSON: Are there any issues which I've failed to address that we need to provide for the clarification?

MR. GRANT WILSON: (Indicating)

MS. NIELSON: Yes, sir. Would you step forward and identify yourself, please?

MR. GRANT WILSON: I am Grant Wilson, representing Huntington City, but not as a spokesman. Mr. Owen had reference to a couple of points that I would like to make sure is on the record. Number one, he mentioned that there were, in effect, a bond or -- or shares to cover any loss or damage to the spring. I was party to that agreement, Mr. Owen, at the time, if you remember me. I was on the City Council at that time. And one of the reasons for Huntington City having to go to the Little Bear Canyon Spring, which he mentioned on the -- upper canyon spring, was the loss of water from the Bear Canyon Spring at that time when they were mining from Trail Canyon over into the Bear Canyon area before the opening of their Bear Canyon Mining program. And, number three, is that the cause for the large coliform count at that time, which I was monitoring weekly, and the ice -- three ice programs that you showed there are parts of the

boxed-in springs that we had to delete from our water system at that time when we applied for the loan to get the water on down the line. So, just for the record. Thank you.

MS. NIELSON: Mr. Wilson, could you clarify the last statement concerning the sampling of coliform bacteria? What you're saying is --

MR. GRANT WILSON: Excuse me for interrupting you, ma'am.

MS. NIELSON: Surely.

MR. GRANT WILSON: I'm saying that I was the Huntington City Councilman over the water before the Special Service District came into being.

MS. NIELSON: Okay.

MR. GRANT WILSON: And it was my responsibility to collect the water samples that was sent into the State for approval or rejection. And it was because of those contaminations of those three springs that was left -- or surface areas of water that was left as surface water and had to be deleted from the collection box system, that we were able to have icicles hanging down the walls on that side. And also, for information, the break-through from Hiawatha -- when they broke through in the 1950's and early 60's, is when the icicles started to show up on the east side of the canyon. And Mr. Wilson, from both the

canal company and the North Emery Water -- remembers that break-through. He was with them.

MR. MITCHELL: Just for clarification, the period of time in which you were making those collections was prior to the Special Service District?

MR. GRANT WILSON: 1976 to 1978.

MR. MITCHELL: Okay. And the springs which you say have the coliform problem were springs which appeared on the surface but which were subsequently spread across the surface, rather than being collected at the Bear Spring box?

MR. GRANT WILSON: They were a group of springs. And that's what we have at the Bear Canyon collection system. They're a group of springs that comes out. And they're all cemented in and put into a pipe that goes out into one large box and is funneled into the main line pipe going downstream.

MR. MITCHELL: And the three that do not go into that box come across the surface?

MR. GRANT WILSON: Yes.

MR. MITCHELL: And the reason they don't is because of coliform problems?

MR. GRANT WILSON: Right.

MR. MITCHELL: And then your last point had to do with the activity of the 1950's in the Hiawatha Mine?

MR. GRANT WILSON: This Hiawatha Mine, when they broke through back in that area.

MR. MITCHELL: And the icicles you're referring to --

MR. GRANT WILSON: And it caused a tremendous drop in the Big Bear Spring -- what we call the Big Bear Spring. And we had to go on up-canyon at that time and put in the Little Bear Spring for additional water supplies for Huntington City.

MR. MITCHELL: Okay. And the icicles you're referring to on the east side of the canyon, you're referring to the east side of Bear Creek Canyon?

MR. GRANT WILSON: That Mr. Owen referred to saying that he had walked Bear Canyon and seen icicles all up the canyon and didn't see where they had any reference. I think they had a lot of reference.

MR. MITCHELL: And you're saying those first appeared back in the 1950's?

MR. GRANT WILSON: Yes. 50's and -- I've not walked up there since the 60's. I lost my leg in Korea at that time.

MR. MITCHELL: Thank you. That helps.

MS. NIELSON: Are there any other comments or questions of anyone in the audience that would like to address at this time? Are there any other issues to come

before this informal hearing? Being none, we stand adjourned. Thank you very much.

(Whereupon, this concludes the reporting of this hearing.)

CERTIFICATE

STATE OF UTAH)
)ss.
COUNTY OF CARBON)

I, John F. Greenig, do hereby certify that I am a Registered Professional Reporter and Notary Public in and for the State of Utah;

That as such reporter, I attended the hearing of the foregoing matter and thereat reported in Stenotype all of the testimony and proceedings had and caused said notes to be transcribed into typewriting; and the foregoing pages numbered 2 to 98 constitute a full, true and correct report of the same.

DATED at Price, Utah this 9th day of April, 1991.

John F. Greenig

John F. Greenig, RPR

My Commission Expires:
Jan. 18, 1993

Castle Valley Special Service District

Exhibit 1
ACT/015/025

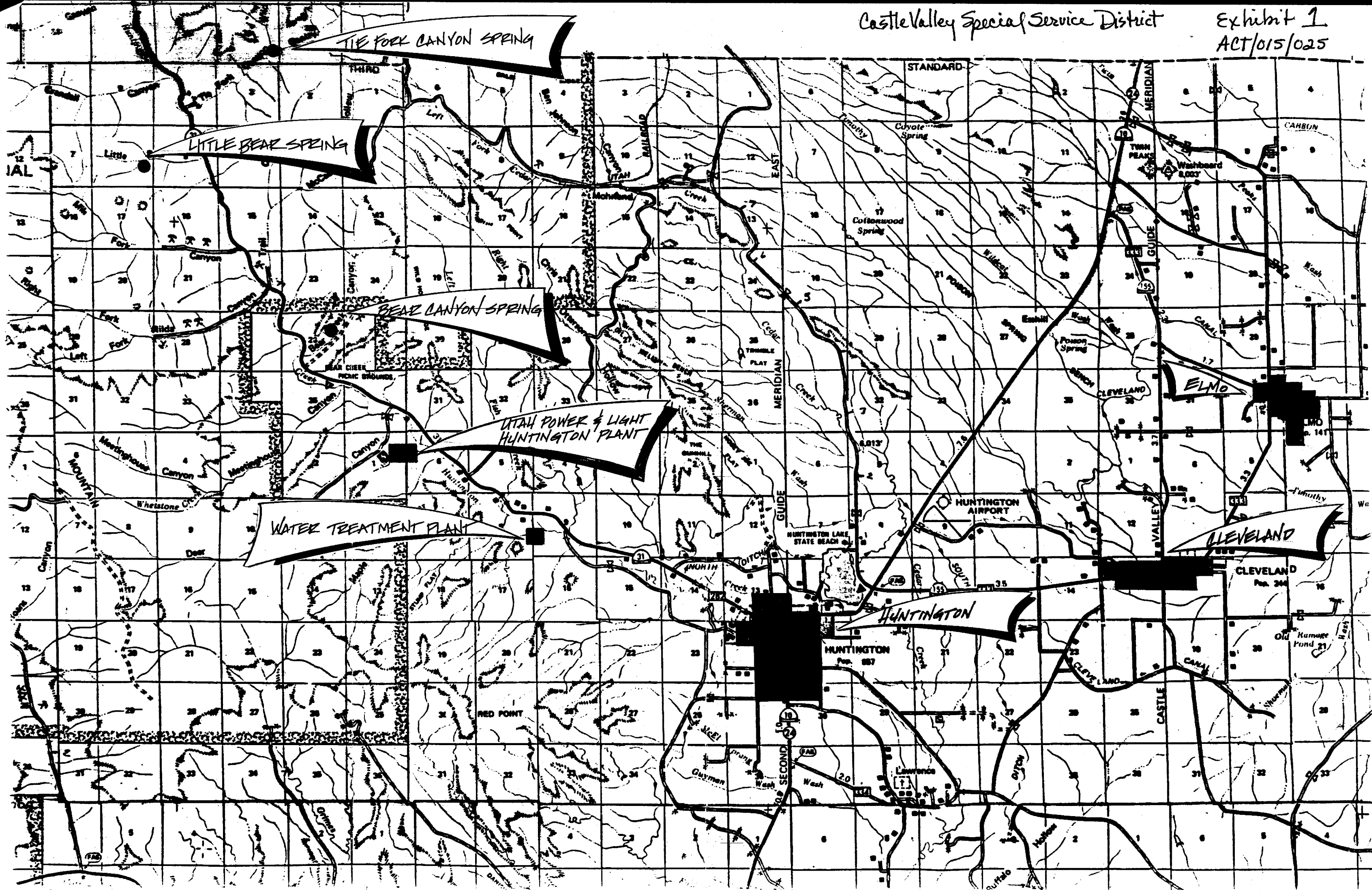


Exhibit 2

HUNTINGTON WATER SYSTEM

Provides Water for Huntington, Cleveland and Elmo

Town	Number Connections	Population
Huntington	770	2,200
Cleveland & Elmo	281	880
Totals	1,051	3,080

Exhibit 3

BIG BEAR SPRINGS
FLOW CONTIBUTION

Year	Big Bear Spring Flow (M.C.)	Total Flow All Springs (M.G.)	%Flow From Big Bear
1983	118.33	345.21	34.3
1984	121.79	352.13	34.6
1985	119.91	343.57	34.9
1986	113.67	338.84	33.5
1987	92.03	314.94	29.2
1988	79.20	300.86	26.3
1989	66.05	293.01	22.5
1990	57.03	253.22	22.5

Exhibits 4

YEARLY PRECIPITATION DATA

Year	Stuart Ranger Sta.	Red Pine Ridge	Mammoth Cottonwood	Average of 3 Stations
1976	19.70	26.75	26.15	24.20
1977	13.10	21.65	20.17	18.31
1978	21.10	35.36	40.09	32.18
1979	20.18	29.95	30.54	26.89
1980	25.76	35.36	40.89	34.00
1981	18.89	27.78	27.10	24.59
1982	26.84	43.43	35.40	35.22
1983	25.28	36.66	37.50	33.14
1984	32.77	46.40	36.20	38.46
1985	24.70	37.94	30.90	31.18
1986	26.42	38.30	34.90	33.21
1987	21.45	25.60	22.30	23.12
1988	22.23	23.30	21.60	22.38
1989	16.85	26.50	25.20	22.85
1990	20.27	26.20	22.40	22.96
Average from 1961-1985	26.02	37.10	31.60	31.57

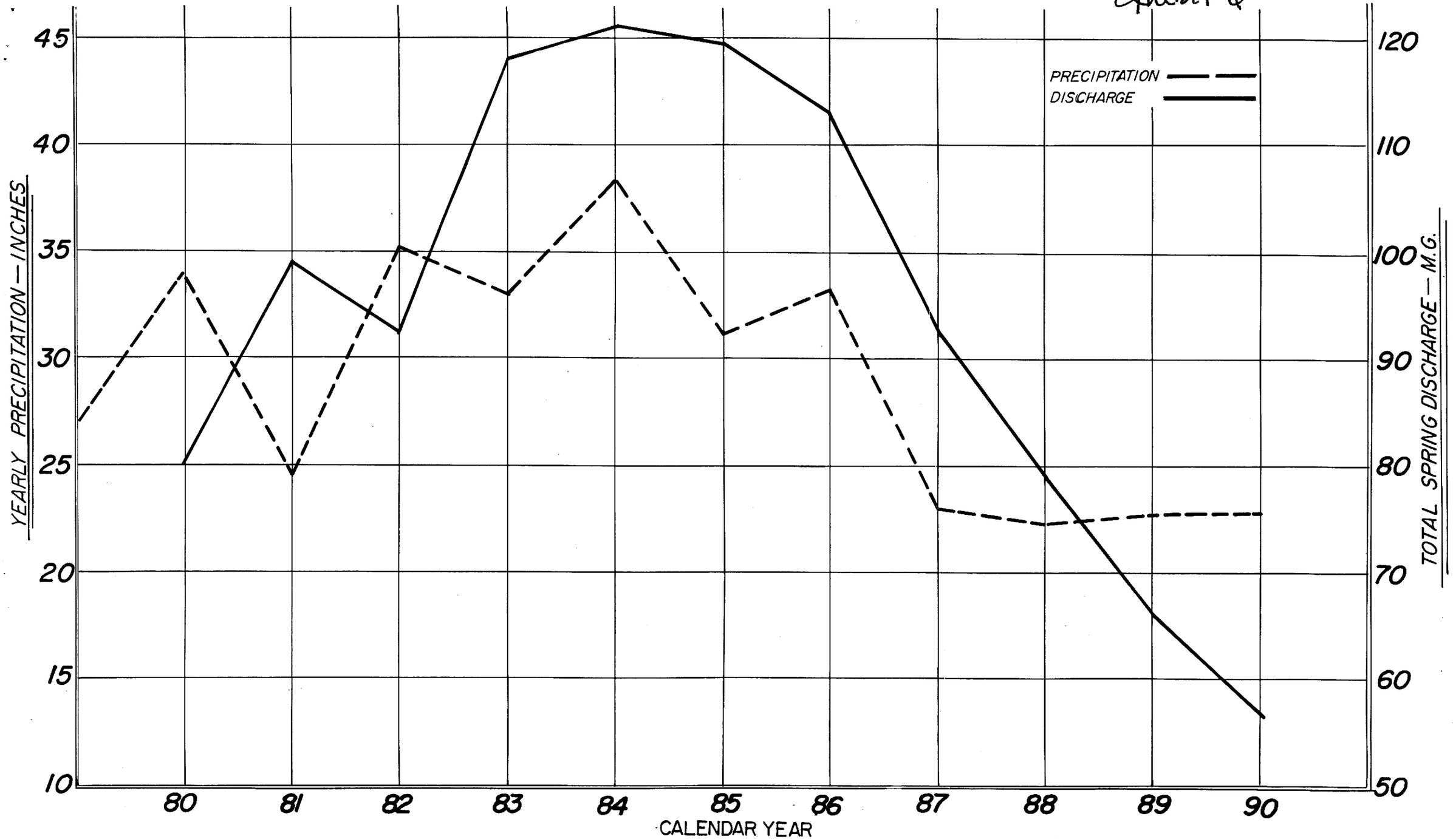
Source of Data Soil Conservation Service

Exhibit 5

APRIL 1 SNOW WATER EQUIVELENT

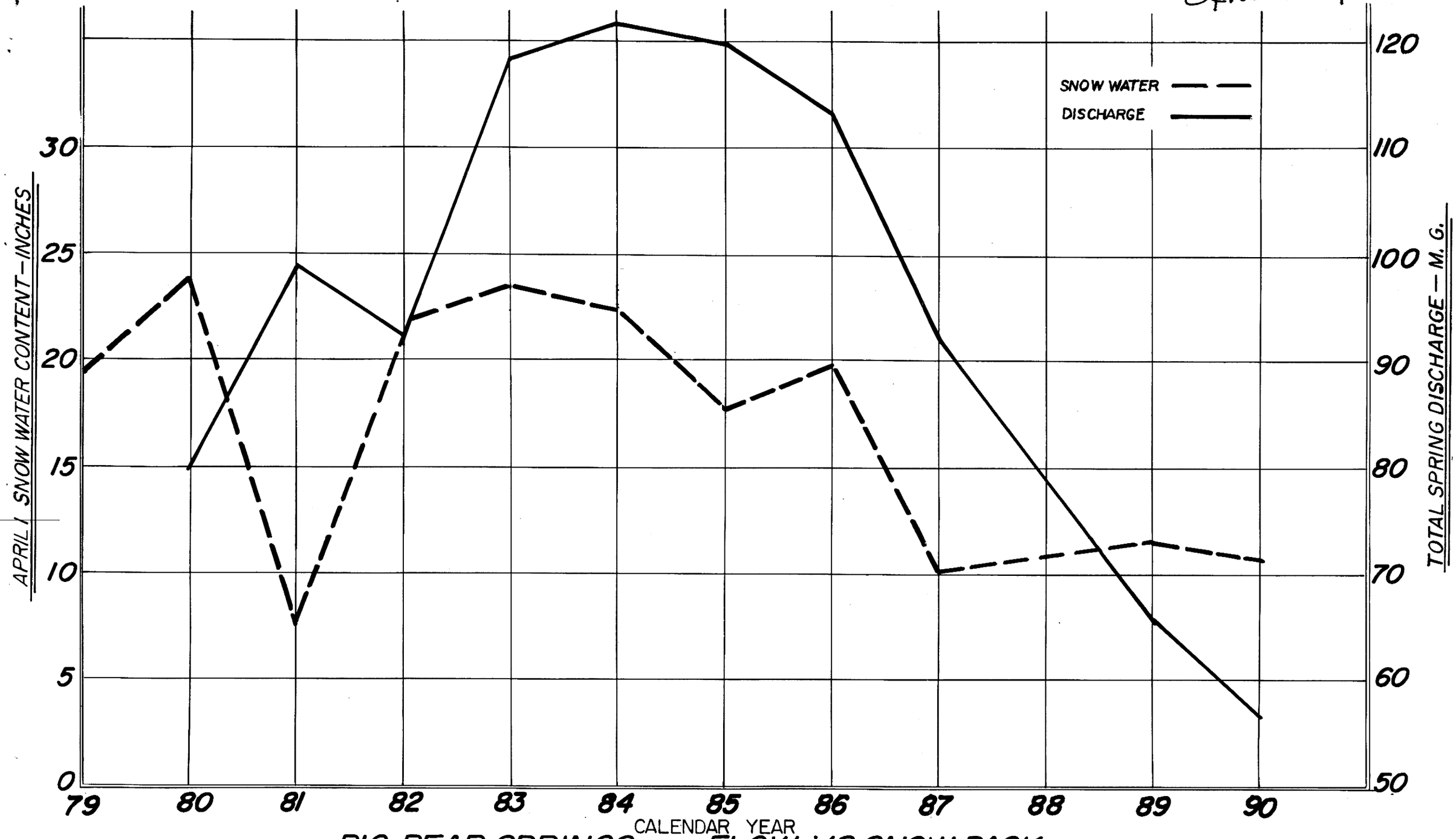
Year	Red Pine Ridge	Stewart Ranger Station	Mammoth Cottonwood	Total	Average
1979	20.3	11.3	27.0	58.6	19.5
1980	24.2	16.8	30.6	71.6	23.9
1981	9.1	1.1	12.9	23.1	7.7
1982	23.6	13.2	28.8	65.6	21.9
1983	27.1	13.2	30.7	71.0	23.7
1984	27.7	13.1	32.6	70.5	23.5
1985	21.1	8.0	24.3	53.4	17.8
1986	18.3	10.8	30.5	59.6	19.9
1987	5.9	12.5	12.2	30.6	10.2
1988	13.0	2.4	17.0	32.4	10.8
1989	13.8	2.3	18.5	34.6	11.5
1990	13.8	0.07	16.5	31.0	10.3

Exhibit 6



BIG BEAR SPRINGS FLOW VS PRECIPITATION DATA

Exhibit 7



BIG BEAR SPRINGS — FLOW VS SNOW PACK

Exhibit #8

Table 1.—Stratigraphic relationships, thicknesses, lithologies, and water-bearing characteristics of geologic units in the upper drainages of Huntington and Cottonwood Creeks (adapted from Stokes, 1964)

System	Series	Formations and members	Thickness (feet)	Lithology and water-bearing characteristics
Quaternary	Holocene and Pleistocene		0-100	Alluvium and colluvium; clay, silt, sand, gravel, and boulders; yields water to springs that may cease to flow in late summer.
Tertiary	Eocene and Paleocene	Flagstaff Limestone	10-300	Light-gray, dense, cherty, lacustrine limestone with some interbedded thin gray and green-gray shale; light-red or pink calcareous siltstone at base in some places; yields water to springs in upland areas. (See table 9.)
	Paleocene	North Horn Formation	800±	Variegated shale and mudstone with interbeds of tan-to-gray sandstone; all of fluvial and lacustrine origin; yields water to springs. (See table 9.)
Cretaceous	Upper Cretaceous	Price River Formation	600-700	Gray-to-brown, fine-to-coarse, and conglomeratic fluvial sandstone with thin beds of gray shale; yields water to springs locally.
		Castlegate Sandstone	150-250	Tan-to-brown fluvial sandstone and conglomerate; forms cliffs in most exposures; yields water to springs locally.
		Blackhawk Formation	600-700	Tan-to-gray discontinuous sandstone and gray carbonaceous shales with coal beds; all of marginal marine and paludal origin; locally scour-and-fill deposits of fluvial sandstone within less permeable sediments; yields water to springs and coal mines, mainly where fractured or jointed.
		Star Point Sandstone	350-450	Light-gray, white, massive, and thin-bedded sandstone, grading downward from a massive cliff-forming unit at the top to thin interbedded sandstone and shale at the base; all of marginal marine and marine origin; yields water to springs and mines where fractured and jointed.
		Masuk Member Mancos Shale	600-800	Dark-gray marine shale with thin, discontinuous layers of gray limestone and sandstone; yields water to springs locally.

Copied from Danielson, T. W., and et al (1981), U. S. Geological Survey Water-Resources Investigations, Open-File Report 81-539

Exhibit #9

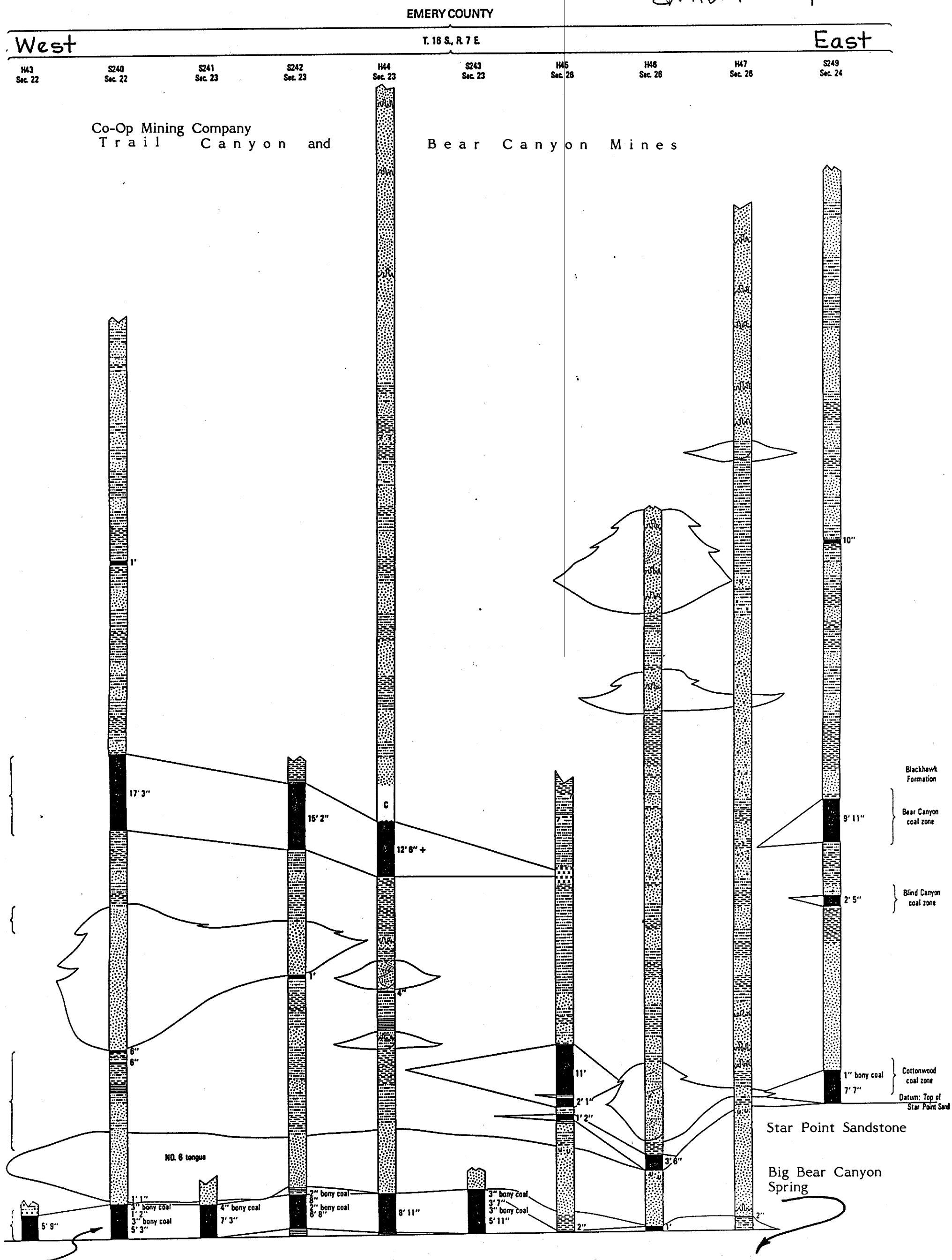


Figure 9.—TRAIL AND BEAR CREEK CANYONS STRATIGRAPHIC SECTION

from Brown, T. L., and et al (1987), U. S. Geological Survey Map C-94-D

Vertical Scale: 1 inch = 20 feet No horizontal scale

Explanation for -

HYDROGEOLOGIC MAP OF GENTRY MOUNTAIN-TIE FORK SPRING, BIRCH SPRING, AND BIG BEAR CANYON SPRING AREA

Scale: 1 inch = 2000 feet Topographic contour interval = 80 feet

Base map from part of Brown, and et al, 1987, U. S. G. S. Map C-94-D

S. Bryce Montgomery, Geologist January 1991

LEGEND:

For base map-

MAP EXPLANATION from Brown, et al (1987) USGS Map C-94-D

CONTACT—Between the Star Point Sandstone and overlying Blackhawk Formation. Chevrons enclose zone of intertonguing

U/D FAULT—Dashed where approximately located; short dashed where inferred. U, upthrown side; D, downthrown side

ANTICLINE—Showing direction of plunge

—7500— STRUCTURE CONTOURS—Drawn on top of Star Point Sandstone. Dashed where approximately located or projected. Contour interval 100 feet

USGS-1 8043 DRILL HOLE—Drilled by U.S. Geological Survey (USGS), Three States Natural Gas Co. (TSN), Utah Geological and Mineral Survey (UGMS), and U.S. Fuels Co. (F). Elevation of top of Star Point Sandstone shown in feet

H28 MEASURED SECTION—S, from Spieker (1931); H, from authors

Other-

U/D 20' Fault discerned from aerial photograph and/or field examination; U on upthrown side; and approximate displacement in feet, observed or reported by others.

Prominent joint trend.

—7200— Groundwater potentiometric surface contours, Blackhawk-Star Point aquifer.

Anticlinal axis.

Synclinal axis.

Existing Bear Canyon Mine permit area.

Proposed Bear Canyon Mine permit area.

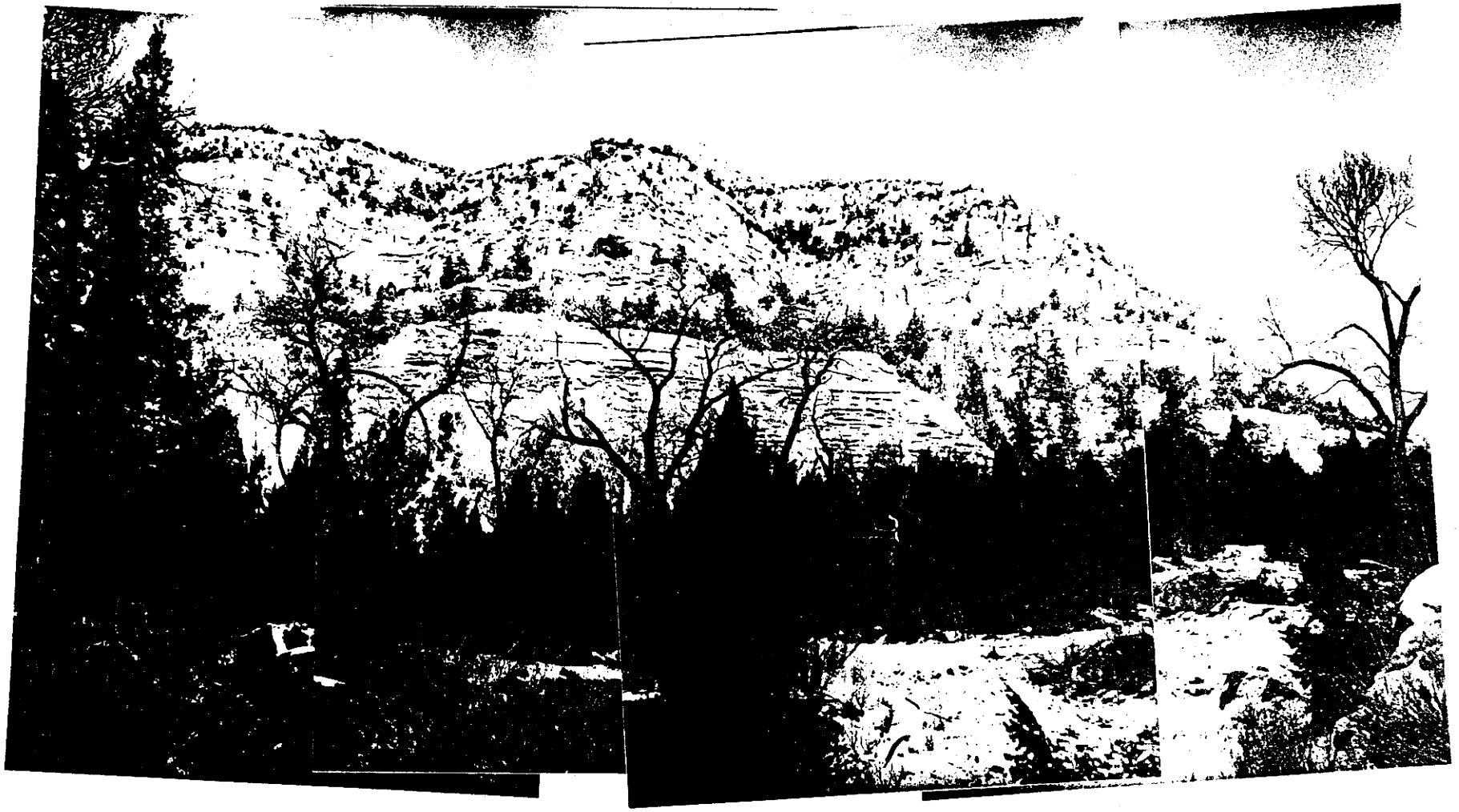
Approximate extent of coal-mined area.

T-5 DH3 Approximate location of test drill holes, reported.

BIG BEAR CANYON SPRING

View is to northwest showing three circled areas of discharge.

S. Bryce Montgomery, Geologist 1991



BIG BEAR CANYON SPRING GENERAL AREA

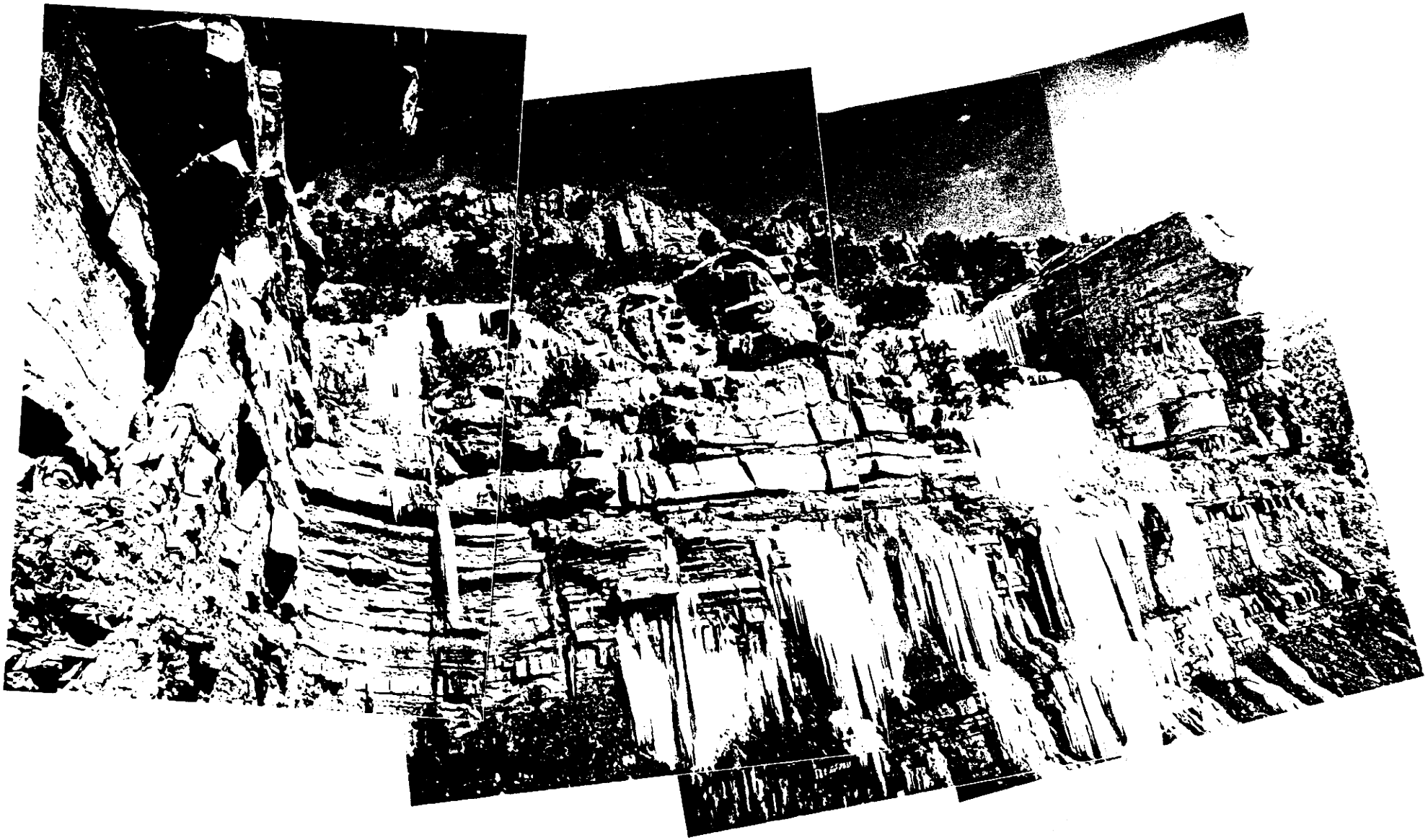
View is northwest and spring area is circled.

S. Bryce Montgomery, Geologist January 1991

GROUNDWATER SPILLAGE AREA ABOVE BIG BEAR CANYON SPRING

View is northward and discharge area with icicles in basal Blackhawk - upper Star Point Formations is circled.

S. Bryce Montgomery, Geologist January 1991



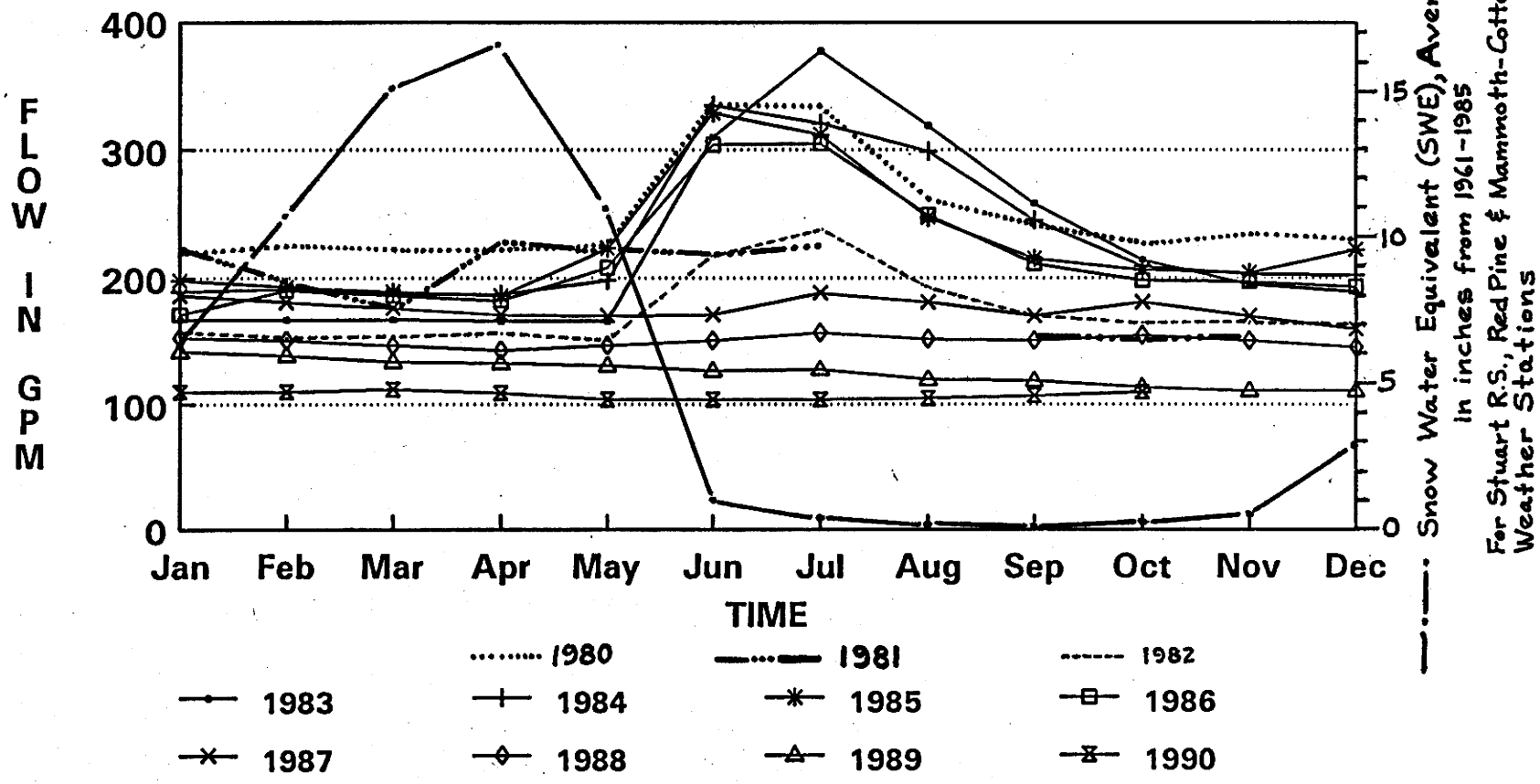
CLOSE-UP OF GROUNDWATER SPILLAGE AREA ABOVE BIG BEAR CANYON SPRING

View is northward showing icicle formations at discharge areas in basal Blackhawk-upper Star Point Formations.

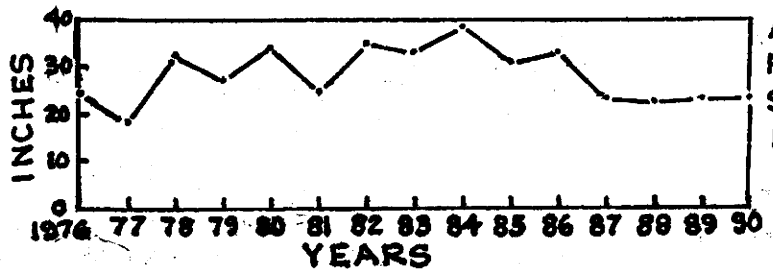
S. Bryce Montgomery, Geologist January 1991

Huntington Spring Flow

Big Bear Spring

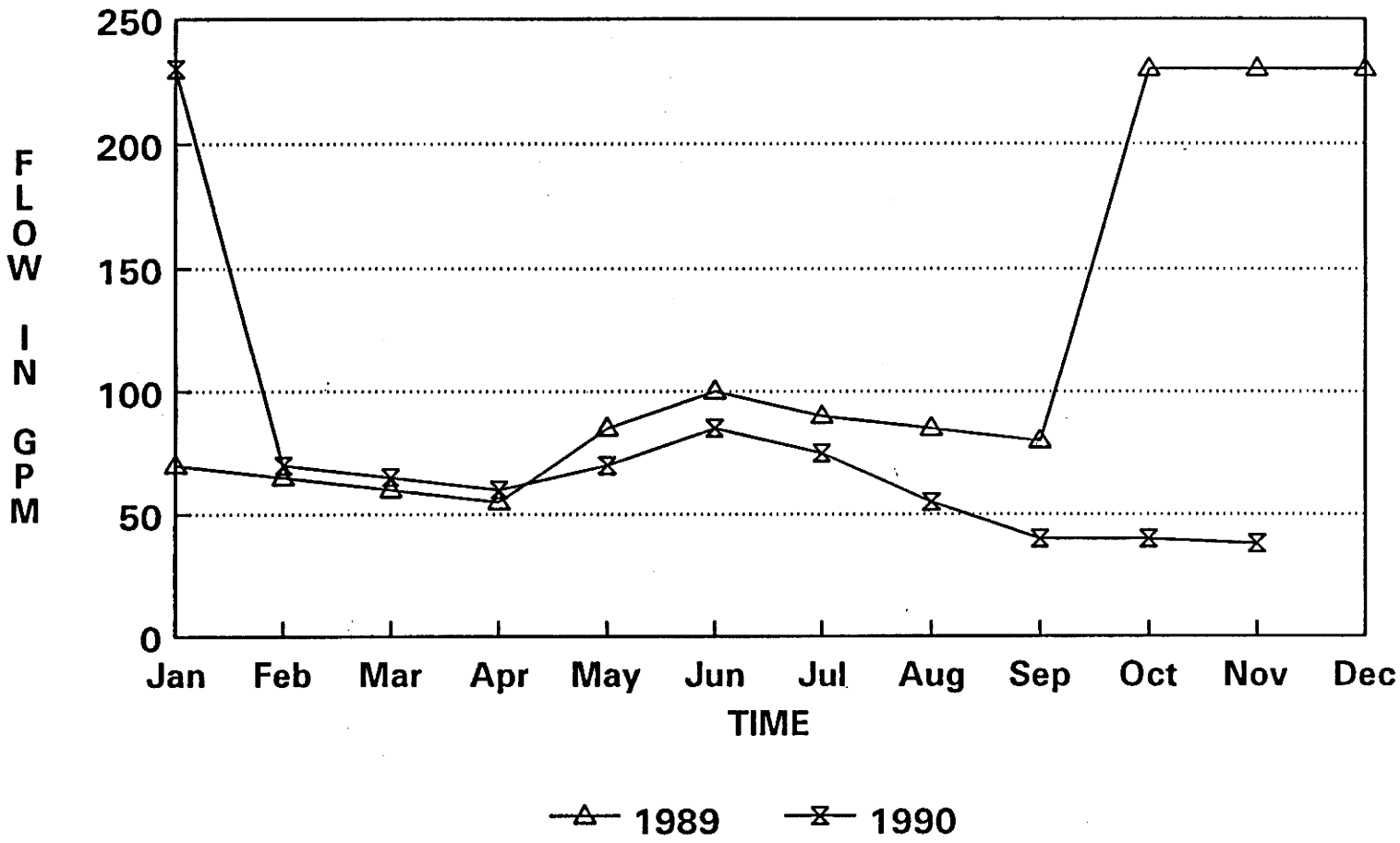


Data From Castle Valley Special Service District



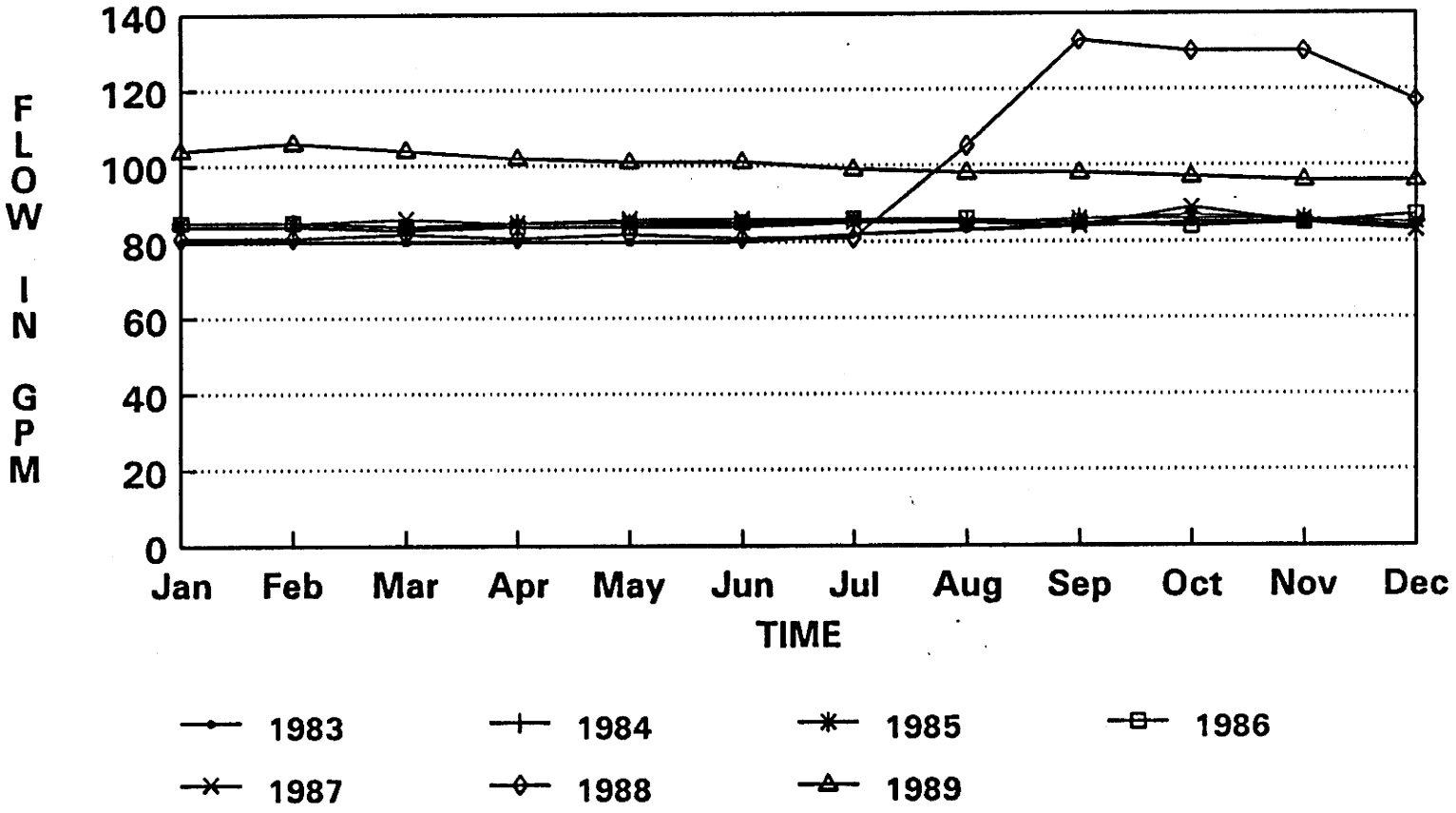
AVERAGE ANNUAL PRECIPITATION FOR THE THREE WEATHER STATIONS OF STUART R.S., RED PINE AND MAMMOTH - COTTONWOOD YEARS 1976-1990

NEWUA Spring Flow
Birch Spring



Huntington Spring Flow

Tie Fork Spring



Data From Castle Valley
Special Service District

Exhibit 19
ACT/015/025

January 28, 1991

Mr. Darrel V. Leamaster, P. E.
District Manager
Castle Valley Special Service District
P. O. Box 877
Castle Dale, Utah 84513

Mr. Menco Copinga, President
Board of Directors
North Emery Water Users Association
Box 418
Elmo, Utah 84521

Gentlemen:

Re: Hydrologic investigation and report of Big Bear Spring and Birch Spring relative to Co-Op Mining Company past, present, and proposed coal mining, T 15-16 S, R 7 E, SLB & M, Emery Co., Utah

In response to your request of December 18, 1990, and confirmed December 20, 1990, I have made a study of the above referenced and submit the following report.

Acknowledgement and appreciation is expressed for various materials and information provided to me by yourselves, Ben Grimes, and others from your organizations, relative to the matter. Reference has also been made of the following publications:

Brown, T. L., and et al, 1987, Stratigraphic Framework and Coal Resouces of the Upper Cretaceous Blackhawk Formation in the Wasatch Plateau Coal Field, Manti 30'x60' Quadrangle, Emery, Carbon, and Sanpete Counties, Utah: U. S. Geological Survey Map C-94-D;

Danielson, T. W., and et al, 1981, Hydrology of the Coal-Resources Areas in the Upper Drainages of Huntington and Cottonwood Creeks, Central Utah: U. S. Geological Survey in cooperation with the Utah Dept. of Nat. Reources and Energy, Div. of Oil, Gas, and Mining, Water-Resources Investigations Open-File Report 81-539;

Fisher, D. J., and et al, 1960, Cretaceous and Tertiary Formations of the Book Cliffs, Carbon, Emery, and Grand Counties, Utah, and Garfield and Mesa Counties, Colorado: U. S. Geological Survey Prof. Paper 332;

Fouch, T. D., 1976, Revision of the Lower Part of the Tertiary System in the Central and Western Uinta Basin, Utah: U. S. Geological Survey Bulletin 1405-C;

Hintze, L. F. and Stokes, W. L., 1964, compilers, Geologic Map of Southeastern Utah: B. Y. University and Univ. of Utah with Utah State Land Board;

Malencik, B., 1989, Birch Spring Citizen Complaint, unpublished Memorandum Report to Rick Smith, Permit Supervisor: Utah Div. of Oil, Gas and Mining, Dept. of Nat. Resources;

Sanchez, D. D. and Brown, T. L., 1986, Stratigraphic Framework and Coal Resources of the Upper Cretaceous Blackhawk Formation in the Trail Mountain and East Mountain Areas of the Wasatch Plateau Coal Field, Manti 30'x60' Quadrangle, Emery County, Utah: U. S. Geological Survey Map C-94-C;

Spieker, E. M., 1931, The Wasatch Plateau coal field, Utah: U. S. Geological Survey Bulletin 819;

Stokes, W. L. and Cohenour, R. E., 1956, Geologic Atlas of Utah, Emery County: Utah Geol. and Min. Survey Bulletin 52; and

Sumsion, C. T., 1979, Selected Coal-Related Ground-Water Data, Wasatch Plateau-Book Cliffs Area, Utah: U. S. Geological Survey Open-File Report 79-915, prepared in cooperation with the U. S. Bureau of Land Management.

Your attention is directed to the attached hydrologic map which I have prepared on top of the base map of part of Map C-94-D by Brown and others (1987), previously listed.

The faults and prominent joint trends which I have superimposed on this map have been discerned from a combination of personal observations in the field and the study of stereoscopic pairs of aerial photographs obtained from the U. S. Department of Agriculture, being at a scale of approximately 1 inch = 2000 feet, dated 9/23/52, and 1 inch = 5000 feet, dated 9/5/86.

Hydrologic data upon which the potentiometric groundwater contours are plotted are from a combination of drill holes, springs, and observations from within the Bear Canyon Mine. From the cooperation of Wendell Owen of the Co-Op Mining Company, a tour was provided through the existing Bear Canyon Mine along with an explanation from him of past and present conditions within the mine, expecially with regard to water encountered, diverted and used. Also, additional data of the Bear Creek Mine was obtained from viewing a current mining map at the mine, and from the study of maps of the mine dated December 1, 1989, and updated March 7, 1990, submitted to the Emery County office by Co-Op Mining Company. It is my understanding that mining commenced in the Bear Canyon Mine in the year 1982 and ended in the Trail Canyon Mine at about the same time.

The base map which I have used, by Brown and others (1987) illustrates the contact between the Star Point Sandstone and the overlying Blackhawk Formation. The mining coal beds exist within the Blackhawk Formation. Attached to this report is a stratigraphic section of the rock formations present in the area, copied from Danielson and others (1981), Table 1, which illustrates the relationship and description of these rock units. The Birch Spring and Big Bear Canyon Spring of concern discharge from the lower sandstone units of the Star Point Sandstone of upper Cretaceous age, and their locations are shown on the attached map, being within the west and east halfs Section 26, T 16 S, R 7 E. The Star Point Sandstone thickens at and in the vicinity of Big Bear Canyon Spring as shown on the attached Figure 9, Trail and Bear Creek Canyons Stratigraphic Section, from Brown and others (1987). Big Bear Spring discharges downslope from their measured section H47, within the basal, thick sandstone unit of the Star Point Sandstone.

As shown on the attached stratigraphic description of Table 1, the Star Point Sandstone Formation consists of cliff-forming, fine-medium grained sandstone beds that are thin to thick-massive and interbedded gray shale. It is about 400 feet thick and grades downward into the Masuk Member of the gray Mancos Shale which is about 700 feet thick. This thick shale serves as a barrier to downward-moving ground water.

The upper unit of the Star Point Sandstone is medium-thick bedded, well jointed and is presently spilling ground water through the joints and bedding planes, where it overlies a thick section of gray shale containing thin beds of sandstone. This spilling water because of cold weather, has mainly frozen into prominent icicles on the face of the cliffs, upslope from the Big Bear Canyon Spring.

The Blackhawk Formation which overlys the Star Point Sandstone contains the various coal beds that are mined in the area. It is mainly comprised of lenticular, discontinuous sandstone beds, interbedded with gray and tan shales with coals. It is about 650 feet thick.

Conformably above the Blackhawk Formation is the Castlegate Sandstone approximately 200 feet thick, consisting of light brown stream-deposited sandstone and conglomerate. It forms prominent cliffs and is well jointed.

The Castlegate Sandstone is overlain by the North Horn Formation which is both Cretaceous and Tertiary in age. Its total thickness is reported to be about 800 feet, and it consists mainly of vari-colored shale and mudstone interbedded with sandstone and some limestone, being deposited by both streams and lake. It caps the higher mountain ridges and tops of this area, and has been differentially eroded to a lessor thickness.

All of the above described formations are exposed at the surface in the region at varying altitudes from 6800-10,000 feet. Average annual precipitation on Gentry Ridge and Mountain to the north reaches 20-30 inches. Danielson and others (1981) concluded that of this precipitation, groundwater recharge was derived from the snow part of it, and that because of differences in surface relief, water content of the snowpack, and variable rock permeability, the groundwater recharge from this precipitation varies in the area. They observed that the surface relief on the tops of Trail and Gentry Mountains is low because there is not an extensive outcrop of Flagstaff Limestone (the formation immediately above the North Horn Formation), and concluded that groundwater recharge to Trail and Gentry Mountains probably is intermediate to the recharge that occurs on east Mountain and on the steep slopes of Seeley Mountain. They further concluded that the amount of recharge to Trail and Gentry Mountains is probably reflected in the number of springs in these two areas, most of which discharge from the North Horn Formation.

Danielson and others (1981) further reported that recharge to the Star Point -Blackhawk aquifer from direct infiltration of snowmelt on areas of outcrop is probably small in comparison to direct recharge to the Flagstaff Limestone. In the southern part of their study area which included Cottonwood Creek, they observed that outcrop areas of the Blackhawk Formation and Star Point Sandstone usually are less than a mile wide and are usually on steep slopes. They concluded that most of the recharge to the aquifer in the southern part of the area is probably from downward percolation of water, mainly along faults and fractures

from overlying water-bearing zones. In the northern part of their study area, which included the upper drainage of Huntington Canyon, they concluded that the Blackhawk and Star Point formations are exposed over a much greater and wetter area than in the southern part, and that more springs issue from the Blackhawk and Star Point in the northern part of the area, generally reflecting the greater amount of recharge on their outcrops.

Structurally, the subject area, including Gentry Ridge and Mountain to the north and the Meetinghouse Canyon area to the south of Huntington Creek, is unique in being a broad (1½-2 miles wide) graben (a down-dropped area of the earth's crust). This graben extends from the Pleasant Valley Fault on the west which extends northerly through Secs. 22, 27 and 34, T 15 S, R 7 E; Secs. 3, 20, 15, 22, 27 and 34, T 16 S, R 7 E; and Secs. 3 and 10, T 17 S, R 7 E; and the Bear Canyon Fault on the east which extends northerly through Secs. 24, 25, 36, T 15 S, R 7 E; Secs. 1, 12, 13, 24, 25 and 35, T 16 S, R 7 E; and Secs. 2, 11, 14 and 23, T 17 S, R 7 E. Reported maximum displacements on these major faults are 140 feet on the Pleasant Valley Fault and 150 feet on the Bear Canyon fault. Many other northerly-trending, near-vertical faults and prominent joint trends exist between the stated major faults, as shown on the attached hydrogeologic map. Less prominent but plentiful are near-vertical cross-joints in the bedrock which trend N 60°W and N 65-68°E.

Regionally the rock strata in the area dip 2-3 degrees from horizontal to the southeast, but locally within the various fault wedges near the fault planes, the beds may be tilted otherwise. The base map (Brown, et al 1987) used in constructing the attached hydrogeologic map contains structure contours drawn on top of the Star Point Sandstone at an interval of 100 feet. However, this contouring was not extended by them into the graben area between the Pleasant Valley and Bear Canyon Faults. But, their structure contouring a few miles west and a few miles east of the general graben area shows a gently, broad, northeasterly-trending anticline with its axis projecting through Gentry Mountain, and an associated synclinal axis projecting north-northeast of the Bear Canyon Fault. Thus, this warping of the rock strata along with the faults and joints formed within them have created a secondary porosity and permeability therein which has facilitated and enhanced the infiltration, storage and transmission of ground water, forming both perched and general groundwater aquifers, and spillage avenues for spring water. Contouring drawn on the floor of the Bear Canyon Mine, as shown by their engineer, on revised mine map of March 1, 1990, reflects the structure of the rock strata there. It shows local, warping of the rock strata into a small, shallow dome within the center of the E/2 E/2 Sec. 23, T 16 S, R 7 E, which is apparently related to movement along the west side of the Bear Canyon Fault.

Ground water is also stored and conveyed through the intergranular porosity and permeability that exists between the individual sand grains of the many and various sandstone beds present in the area. This is small compared to the secondary porosity and permeability formed from joints, fractures and faults. In addition, greater than the intergranular permeability but less than the secondary permeability of joints and faults, is porosity and permeability along the bedding planes. Because shales are composed mainly of clay, when this clay becomes wetted both the fracture and bedding permeability within the shales are reduced or made nil, as the clays swell and heal, unless the water pressure is sufficient to erode and maintain the water conveyance channels.

Thus, the principal recharge area to the Birch and Big Bear Canyon Springs is Gentry Ridge and Mountain. The principle infiltration and conveyance channels for groundwater feeding the subject springs are the faults and joint systems shown on the stated map, with bedding planes and intergranular porosity being important but more restricted to specific rock units and aquifers. The faults transect all of the rock formations and units, including the shale beds, which allow the infiltration of water directly from the land surface and the spilling of one aquifer to another, up or down depending upon the groundwater pressures involved.

On the attached hydrogeologic map I have drawn potentiometric contours for the ground water in the Blackhawk-Star Point aquifer. The movement of ground water is normal to these potentiometric contours, which is to the southwest and south. Faults and some joints locally interupt and change the groundwater potentiometric surfaces of the various aquifers. The Blackhawk-Star Point aquifer potentiometric surface is also plotted on the attached Hydrogeologic Section (A-A') from Tie Fork Spring through Gentry Mountain to the Big Bear Canyon Spring, and its relationship to the various formations and position of the coal beds in the Bear Canyon Co-Op Mine, can be observed.

Any of the various sandstone or coal units are potential aquifers at any position below the land surface. Where shale beds overlie sandstone or coal units which do not have exposure to the surface, groundwater recharge likely enters them via fault conduits. Thus, aquifers varying from perched, unconfined, and confined may exist and probably do. The perched and unconfined aquifers within bedrock are likely of relatively small storage and yield, and at some elevations contribute to water that recharges confined aquifers.

The ground water being produced from the Bear Canyon Coal bed is apparently perched and unconfined, resting on an underlying siltstone and shale bed. Since this flow has been interupted by the coal mining operations, the underground flow path of some of this ground water has been changed. Since the potentiometric surface of the Blackhawk-Star Point aquifer, from which both the Birch Spring and Big Bear Canyon Spring issue, is at a lower elevation here, some of this in-mine ground water originally contributed some recharge to the Blackhawk-Star Point aquifer along and through faults. How much this original recharge amounted to is not known and could only be quantified by a comparison of accurate spring -flow measurements over a period of at least two years prior to the coal mining, with similar spring measurements over at least two years since coal mining, with an adjustment for changes in precipitation and transmission lag through the measuring periods. Since the recharge to the Big Bear Canyon Spring involves the complete area to the north, including the west Hiawatha mining area, and several fault conduits, the total effects of mining with change in groundwater flows contribute to changes in the Big Bear Spring flow. Thus, in all of the mining operations, ground water that is shifted out of its original flow paths, especially that part of the ground water which did not naturally discharge to the surface as springs or base-flow to streams, is subtracting from the total groundwater system. Danielson, and et al (1981) report that dewatering of the King Mine in the Hiawatha area to the north, probably diverts ground water into the drainage of Cedar Creek, which flows away from the Huntington Canyon area.

Similarly, at the Co-Op Bear Canyon Mine, the ground water which is diverted for mine uses both inside and outside of the mine (estimated to be between 50 -100 gpm), is spilling away from original recharge into existing faults bounding the coal mine. Apparently, some of this water is now spilling through sandstone units at a lower elevation than the coal, which outcrop as cliffs above shale beds, on the south-facing slopes above the Big Bear Canyon Spring. Although some of this spilling water may have occurred originally before any mining operations, much of the present flow appears to be new because of the lack of sustained, water loving vegetation in or near the flow-paths of this water that has surfaced. Because this water is discharging at several places in varying amounts, it would be difficult to measure. It is estimated that at the present time it is approximately 50 gpm. See attached photographs of this area where the discharging water is inpart freezing as large icicles at the land surface.

From available data, as illustrated on the attached hydrogeologic section A-A', the existing faulting through the area from Tie Fork to Big Bear Canyon Spring never completely offsets the Star Point Sandstone against impervious shale beds. Thus, the 350-450 feet thick Star Point Sandstone and overlying basal sandstone units of the Blackhawk Formation, which form the Blackhawk-Star Point aquifer, remain continuous from the main area of recharge to the Big Bear Canyon Spring and to Birch Spring. This provides for a large inter-connected groundwater storage to sustain the continuous existence of the subject springs. The rate of yield to the springs is influenced by the cumulative hydraulic head, of the total, infiltrating groundwater recharge. When some of this recharge is diminished, it will adversely affect the flow rate of the springs.

From the courtesy of Darrel Leamaster and Ben Grimes, discharge records of Big Bear Canyon Spring, Birch Spring, and Tie Fork Spring, and precipitation records have been provided to me. I have combined the flow data for Big Bear Canyon Spring onto one graph for the years 1980-1990, with the inclusion of the average snow melt equivalent in inches of water for the years 1961-1985. This shows that since the year 1987 to the present, there has been a substanial, steady reduction in spring flow from that of the previous years measured and recorded, back through 1980, although the year 1982 was somewhat lower than the other years, but higher than the years since 1987. The average snow water equivalent for the years 1961-1985 in comparison with the peak flow periods of the spring show that there is a three month lag in transmission time for the movement of the recharge water to the spring discharge.

In comparing this graph to that of a graph of average annual precipitation for the three weather stations at Stuart Ranger Station, Red Pine, and Mammoth -Cottonwood, which are all in the close proximity, the average annual precipitation of the area has also dropped for the years 1987-90. Thus, it complicates the quantifying of how much of the reduced spring flow is actually the result of mining operations.

In comparing the flows of the Big Bear Spring with those of Tie Fork Spring (see attached graph from the Castle Valley Special Service District), for the years of 1983-1989, they tend to conform except for the latter part of 1988 when the Tie Fork Spring jumped by about 70 percent. Although there is general inter-connection of the recharge to both springs, Tie Fork Spring is possibly being influenced by mining operations in the west Hiawatha area.

A study of the chemical analyses performed on water samples collected from the Big Bear Canyon Spring from 1977 to January 14, 1991, do not show any significant change until the 1991 analysis. Until 1991, the total dissolved mineral solids have been at or close to 300 mg/l and sulfate content 29 to 48 mg/l. The January 14, 1991, record showed a 27 percent rise in TDS to 382 mg/l. Also, the sulfate content had a jump of 114 percent to 103 mg/l over the highest past analysis of 48 mg/l on a sample collected September 9, 1990. This change in 1991 is significant and indicates some abnormal injection into the recharge system to the spring of sulfates. I believe that these sulfates are being leached from shale beds in the upper Star Point formation, immediately below and by the ground water that is spilling from sandstone beds previously referred to and shown in the attached photographs. A part of this spilling ground water is likely infiltrating into the joints that are exposed immediately downslope from which the Big Bear Spring is discharging.

It is therefore my conclusion that the affect of the Co-Op Bear Creek Mine and possibly the Trail Creek Mine operations have been relatively small in adversing the rights in the Big Bear Canyon Spring, both as to flow rate and contamination. The affect of a small reduction in recharge to the Springs is estimated to be considerably less than the 25 percent allowance provided in paragraph 3, page 1 of the agreement between Co-Op Mining Company and Huntington City, dated January 27, 1982. However, the proposed expansion of the Bear Canyon Mine operations northward another 3/4 mile to the north line of Section 14 will extend the mined area to approximately 75 feet higher in elevation, up-dip than at present (75+7580=7655 feet), which will be near intersecting the potentiometric surface of the Blackhawk-Star Point aquifer. See attached hydrogeologic map and section. Thus, in faults that cut through confining shale beds between the aquifer and mined coal, and within interconnecting cross-joints to these faults, considerable ground water may be encountered, and if diverted away from getting back into the natural conduit system, it would subtract from recharge to the Big Bear Canyon Spring. Also, any contamination generated in the mine workings that could possibly infiltrate into the natural recharge conduit system to the spring, may further adverse spring water quality.

If the groundwater spillage remains as high or increases at the cliff faces upslope from the Big Bear Canyon Spring, there will be a further increase in sulfate content of the spring water, which is undesirable.

With regard to Birch Spring belonging to the North Emery Water users Association, the general hydrologic conditions stated for the Big Bear Canyon Spring also apply here. However, Birch Spring is discharging from a prominent, normal fault having about 20 feet of displacement down on the west, whereas Big Bear Canyon Spring is discharging from three prominent joints along which no obvious displacement has occurrred. Both springs discharge from the lower sandstone unit of the Star Point Sandstone, and the thick, underlying Mancos shale serves as a barrier and deflector to the downward movement of ground water.

The fault from which the Birch Spring issues splays and intersects with other faults which all extend through the mined area of the Co-Op Trail Canyon Coal Mine, as shown on the attached hydrogeologic map. And since the Trail Canyon removed its coal from the Hiawatha seam near the base of the Blackhawk Formation and near the top of the Star Point Sandstone, its total impact on the Birch

Spring is appreciably greater than the impact of the Bear Canyon Mine on Big Bear Canyon springs. Most any ground water encountered in the mine and diverted away from its natural and original conduits would have subtracted from likely recharge supply, through faults, to the Birch Spring. Because of the obvious, open space within the fractured sandstone within the fault zone, that is 12 feet wide at the Birch Spring, any contaminants within the Trail Creek Mine would have easy access into the Blackhawk-Star Point aquifer.

The Trail Canyon Mine which has now had its pillars removed, and since about the year 1982 has been experiencing caving. Such caving to one degree or another has facilitated the rock permeability within and above the mine. Past mining may have partially plugged fault and fracture openings in the mine floor, which original openings may have extended into the underlying Blackhawk-Star Point aquifer. How the encountered groundwater flow has adjusted in its flow pattern within the closed Trail Creek Mine is unknown to me. The potentiometric surface of the Blackhawk-Star Point aquifer could possibly have been encountered within the north-end workings of the Trail Canyon Mine as indicated by the projected contours on the attached hydrogeologic map.

In comparing the attached flow graph of the Birch Spring with flow graphs of Tie Fork Spring and Big Bear Canyon Spring, along with graphs of annual precipitation and average snow water equivalent, the anomalous jump in Birch Spring flow (80 gpm to 230 gpm) from October 1989 through January 1990 is obviously unatural. Furthermore, from the descriptions provided me of this occurrence, I conclude that it is definitely associated with mining activity, and most probably within the caving Trail Canyon Mine. The visual and chemical analysis which showed "oil and grease" with large quantities of suspended sediment in a water sample collected from the spring in October 1989, along with the jump in total dissolved mineral solids (674 mg/l) double of what was analyzed of the spring water in September 1980 (360 mg/l) evidences that contaminated water held in temporary storage within the mine was released suddenly and entered into the fault conduit system that recharges Birch Spring. This sudden entry into the fault conduit was likely due to a build-up in water storage and head within the caved mine to create sufficent water pressure to break through and flush a previously plugged section of the fault. The fact that this anomalous high flow (approximately 0.5 cubic-foot/second) continued for a period of nearly three months evidences that considerable ground water was held in temporary storage. This would amount to approximately 90 acre-feet or about 29,000,000 gallons of water.

Also, the fact that no coliform bacteria was analysed in water samples collected from Birch Spring on August 1, 1986, and December 2, 1986, but in a sample collected October 19, 1989, it showed 16 coliforms present, further shows that the anomalous flow either carried or flushed coliform containing material into the recharge of the spring. A part of this material may have been from packrat and bat dung which I observed to be plentiful within large fractures of the sandstone, in the exposed 12-foot wide fault zone, immediately north and up-gradient from Birch Spring.

Thus, I conclude that continued caving within the Trail Canyon Mine will create additional affects on the Birch Spring, some of which could be beneficial by providing for increased infiltration of snow-melt to create greater recharge to the spring, and some may be adverse such as occurred in late 1989.

The proposed extension of coal mining within the 80 acre tract of the E/2 NW/4 Section 26, immediately east of Birch Spring could possibly adversely affect the spring. This is because cross-jointing in this area intersects the northerly trending fault which is the recharge conduit to the Birch Spring. Any recharge water now coming to the spring through these less prominent cross-joints, out of the Blackhawk Formation, that would be intercepted and diverted away by the coal mining would diminish the spring flow. However, the most prominent groundwater transmission system in the area is the north-trending faults and joints, and most of the recharge to Birch Springs comes from the north through this system. Thus, the proposed northerly extension of the Bear Creek Mine into the N/2 of Sec. 14, T 16 S, R 7 E, could also cause a reduction in recharge to the Birch Springs by the intersection and diverting of ground water away from its natural conduit system.

Respectfully submitted,

S. Bryce Montgomery

Attachments

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HYDROGEOLOGIC EVALUATION OF THE BEAR CANYON MINE PERMIT AND PROPOSED EXPANSION AREAS

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Salt Lake City, Utah

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March 11, 1991

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11 Mar 1991

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HYDROGEOLOGIC EVALUATION OF THE BEAR CANYON MINE PERMIT AND PROPOSED EXPANSION AREAS

1.0 INTRODUCTION

1.1 Scope

This report presents an evaluation of the potential impact of the existing Bear Canyon Mine on Birch and Big Bear Springs. It also addresses revisions to the Bear Canyon permit area to allow incorporation of new Federal Coal leases (U-024316 and U-024318).

The scope of work for the spring evaluation included:

1) Conducting a review of the technical literature from the U.S.G.S., the Utah Division of Water Resources, and permits on file with the Utah Division of Oil, Gas, and Mining.

2) Conducting a field trip to the mine site to include: an evaluation of the springs; collection of historical flow data for the springs; tour of the accessible underground workings to allow evaluation of the groundwater inflows; discussions with Wendell Owen regarding the historic groundwater inflows to the mines and operations history of the mines; and a preliminary water quality assessment (pH, temperature, and conductivity) of all accessible water sources.

3) Analysis of monthly precipitation and spring flow data. The evaluation compared the flows of Birch, Big Bear, Tie Fork, and Little Bear Springs.

The report is divided into five sections. This introduction presents a brief description of the location and history of mining operations in the area. Following the introduction, a

description of the hydrogeologic setting of the area is presented. The third section is a description of the data analyses to determine the potential for impact of mining on the springs. Fourth, is the conclusions and recommendations section of the report. Last, the references section is presented. Appendices are presented following the references.

1.2 Background Information

The Bear Canyon Mine is located along the eastern margin of the Wasatch Plateau Coal Field in Bear Creek Canyon, which is a tributary to the Huntington Creek Canyon (see Figure 1-1). The mine is located approximately 9.5 miles west of Huntington, Utah. Within the permit area, elevations range from approximately 6,500 to over 9,000 feet.

Mining in the region of the study area has been essentially continuous since the early 1900's. Mining operations have been or are being conducted by U.S. Fuel at Hiawatha, by Plateau Resources at Wattis, and by Co-Op Mining Company in the Trail Canyon and the Bear Creek Canyon. All of these operations have intersected faults which the Big Bear and Birch Springs are associated with. The operations closest to the springs include the Trail Canyon and Bear Canyon Mines, both by the Co-Op Mining Company. The Trail Canyon Mine discontinued operations in late 1982 and has since been sealed. The Bear Canyon Mine commenced operations in 1982 and has been continuous since then.

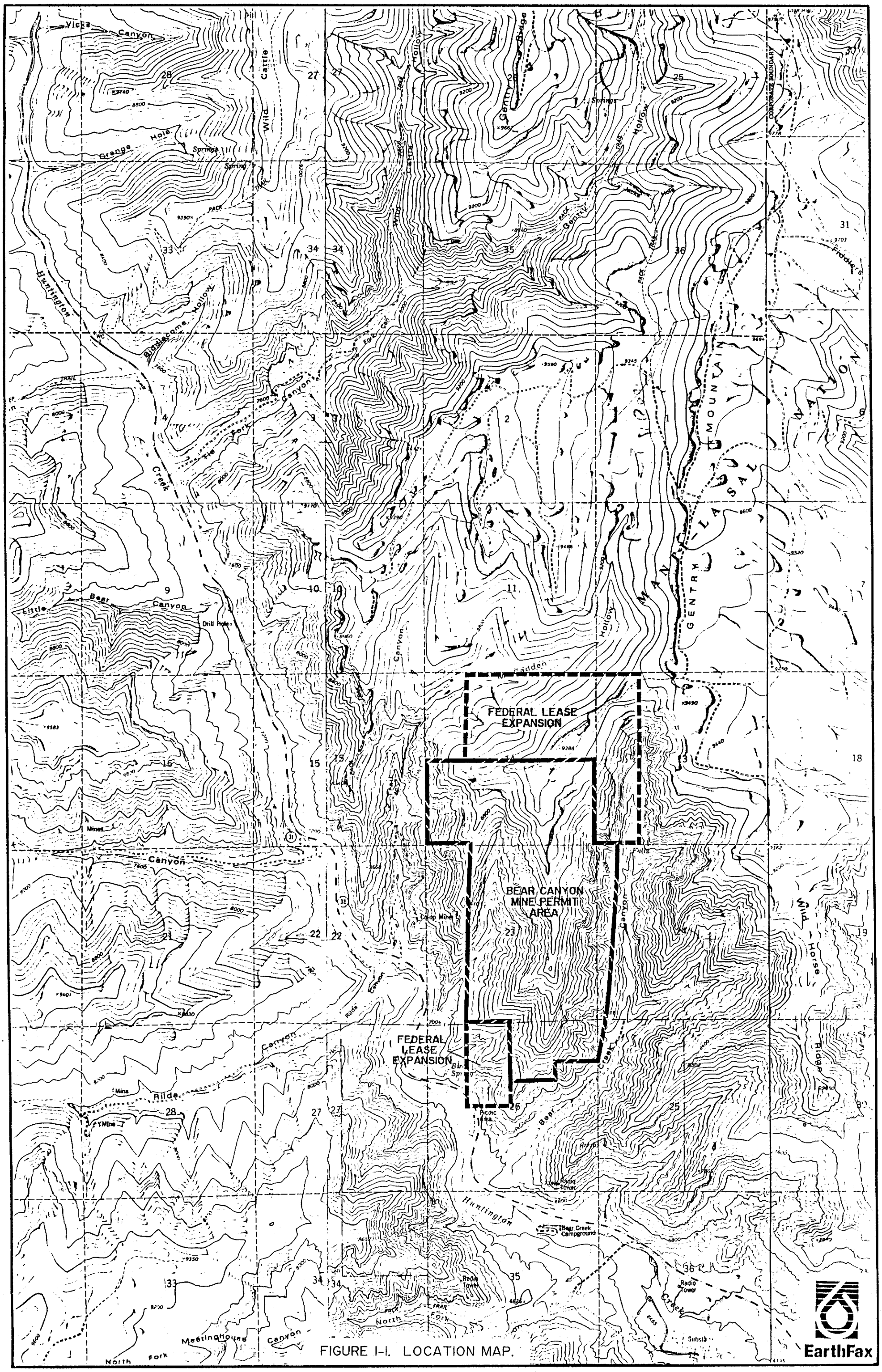

FIGURE I-I. LOCATION MAP.

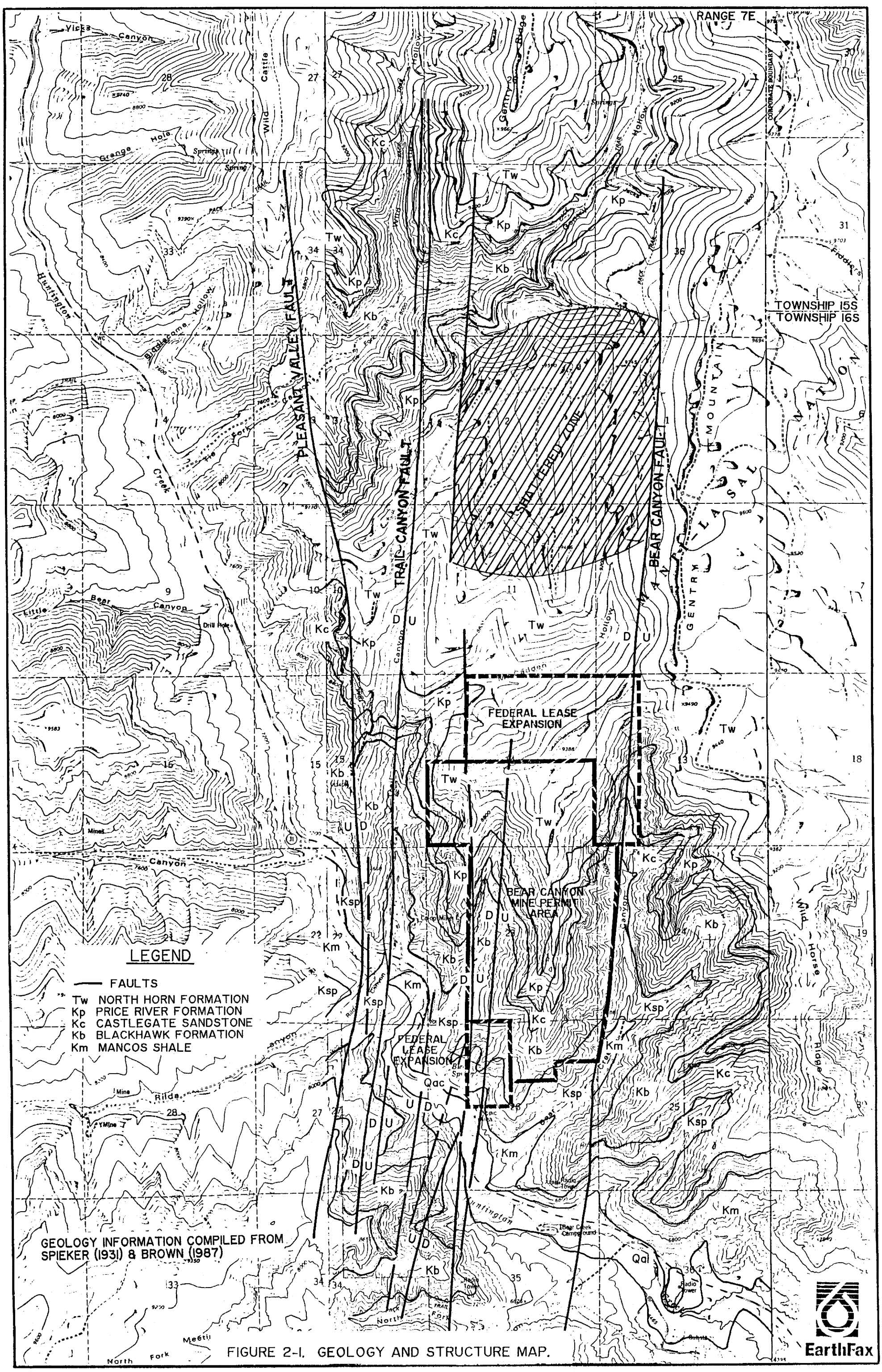

FIGURE 2-1. GEOLOGY AND STRUCTURE MAP.

2.0 HYDROGEOLOGIC SETTING

2.1 Climate

The Bear Canyon Mine permit and adjacent area (the study area) are located on the eastern face of the Wasatch Plateau. The elevation over the study area ranges from approximately 6,500 to over 9,000 feet. This elevation range results in a significant range in average annual precipitation depths. At the higher elevations of the Wasatch Plateau, the average annual precipitation exceeds 40 inches. In the area of Hiawatha, at an elevation of 7,280, the annual precipitation is 12.89 inches. To provide an estimate of the precipitation in the study area, data for five surrounding precipitation recording stations were averaged. The stations used in the average were the NOAA weather stations at Hiawatha and Electric Lake and the SCS SNOWTEL stations at Stuart Ranger Station, Red Pine Ridge, and Cottonwood-Mammoth. The monthly precipitation data for each of the stations, as well as the five-station monthly average are presented in Appendix A.

2.2 Geology

Table 2-1 presents the stratigraphic relationships of the geologic units in the study area. The depositional environments of the formations reflects an overall regressive sequence. This is seen in the sequence of marine shale (Mancos Shale) through littoral and lagoonal, interbedded silt/mudstone and sandstone (Blackhawk Formation) to fluvial (Castlegate Sandstone, Price River Formation, and North Horn Formation) and lacustrine (Flagstaff Limestone) deposits. The interbedded nature of the Blackhawk Formation is mainly due to an oscillating depositional environment within the overall regressive trend.

Figure 2-1 presents the location of the surface outcrops of the described formations and geologic structures within the study area. Regionally, the rock strata in the study area dip to the southeast at an angle of two to three degrees (Brown, et.al., 1987). As shown on Figure 2-1, the Bear Canyon and Trail Canyon Mines are located in a graben bounded by the Pleasant Valley Fault on the west and the Bear Canyon Fault on the east. Both faults are

Table 2-1

Stratigraphic relationships, thicknesses, lithologies, and water-bearing characteristics of geologic units in the upper drainages of Huntington and Cottonwood Creeks (adapted from Stokes, 1964)

System	Series	Formations and members	Thickness (feet)	Lithology and water-bearing characteristics
Quaternary	Holocene and Pleistocene		0-100	Alluvium and colluvium; clay, silt, sand, gravel, and boulders; yields water to springs that may cease to flow in late summer.
Tertiary	Eocene and Paleocene	Flagstaff Limestone	10-300	Light-gray, dense, cherty, lacustrine limestone with some interbedded thin gray and green-gray shale; light-red or pink calcareous siltstone at base in some places; yields water to springs in upland areas. (See table 9.)
	Paleocene	North Horn Formation	800±	Variegated shale and mudstone with interbeds of tan-to-gray sandstone; all of fluvial and lacustrine origin; yields water to springs. (See table 9.)
Cretaceous	Upper Cretaceous	Price River Formation	600-700	Gray-to-brown, fine-to-coarse, and conglomeratic fluvial sandstone with thin beds of gray shale; yields water to springs locally.
		Castlegate Sandstone	150-250	Tan-to-brown fluvial sandstone and conglomerate; forms cliffs in most exposures; yields water to springs locally.
		Blackhawk Formation	600-700	Tan-to-gray discontinuous sandstone and gray carbonaceous shales with coal beds; all of marginal marine and paludal origin; locally scour-and-fill deposits of fluvial sandstone within less permeable sediments; yields water to springs and coal mines, mainly where fractured or jointed.
		Star Point Sandstone	350-450	Light-gray, white, massive, and thin-bedded sandstone, grading downward from a massive cliff-forming unit at the top to thin interbedded sandstone and shale at the base; all of marginal marine and marine origin; yields water to springs and mines where fractured and jointed.
		Masuk Member Mancos Shale	600-800	Dark-gray marine shale with thin, discontinuous layers of gray limestone and sandstone; yields water to springs locally.

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down-dropped approximately 100-150 feet. Brown, et.al. (1987) described a shattered zone within the graben, approximately two miles to the north of the northern extent of the Bear Canyon Mine. This zone is described as being broken by many faults and fractures. Within the graben, in the permit area, only some minor faulting has been identified.

The major coal-bearing unit within the Wasatch Plateau Coal Field is the Blackhawk Formation. Mining, in the Bear Canyon and Trail Canyon mines, are conducted in two coal seams: the upper Blind Canyon Seam and the lower Hiawatha Seam (Co-Op Mining Company, 1990). Throughout the permit area, the Blind Canyon Seam is continuous, while the Hiawatha seam thins and pinches out. A local warping of the over and underlying strata results in a small dome, within the center of the east half of Section 23, Township 16 South, Range 7 East, which affects the Hiawatha Seam. This warping may have resulted from movement along the west side of the Bear Canyon Fault.

2.3 Surface Water

Most of the study area is drained by two main canyons, Trail Canyon to the west and Bear Canyon to the east. Several small canyons drain the remaining southeast portion of Bear Canyon permit area. The Trail Canyon and Bear Canyon drainages hold intermittent streams, while the small drainages from the southeast portion of the permit area contain ephemeral streams. These streams discharge to Huntington Creek, which is the major drainage in the area.

The streams mainly flow during the snowmelt period. According to Danielson, et.al. (1981), about 65 to 80 percent of the annual discharge at the Huntington Creek gaging station, located near Huntington, Utah at the Utah Power and Light diversion for the Deer Creek Power Plant occurs during the snowmelt period, from April through July. Flow records for the period from 1981 through 1983 and 1985 were obtained from Utah Power & Light. The water year 1984-1985 data were not available. The flow records for 1986 through 1988 were obtained from the U.S. Geological Survey, Water Resources Division. These data are presented in Appendix B.

Danielson, et.al. (1981) conducted surface water sampling of flows from selected streams in the study area. The waters sampled at the Huntington Creek gaging station were predominantly a calcium-bicarbonate water type. Waters sampled from the tributaries of Huntington Creek were predominantly a calcium-, magnesium-bicarbonate water type. During periods of low flow, the concentrations of sulfate in the tributaries were significantly higher than in Huntington Creek itself.

2.4 Groundwater

The groundwater system in the study area has been studied by Danielson, et.al. (1981), Co-Op Mining Company (1986), and Montgomery (1991). The recharge, movement, and discharge of water within the groundwater system is dependent on climatic and geologic conditions in the study area. Danielson, et. al. (1981) indicate that groundwater occurs in all of the geologic units listed in Table 2-1, however, none of the units are saturated everywhere.

2.4.1 Occurrence of Groundwater

The formations in the study area have been identified as having a combination of perched and regional water tables. Perched water tables occur where water is held up by a perching bed whose permeability is so low that water cannot readily percolate downward. In most of the study area, perched zones exist in the North Horn, Price River, Castlegate Sandstone and upper Blackhawk Formations. Danielson, et. al. (1981) indicate that a regional water table exists in the Star Point Sandstone and, in places, the lower portion of the Blackhawk Formation. This aquifer is referred to as the Star Point-Blackhawk aquifer.

A total of 16 boreholes have been drilled in the area of the Bear Canyon Mine. Co-Op Mining Company drilled twelve of the boreholes within the permit area for the purpose of evaluating coal quality and geologic conditions and four holes were drilled approximately 1.5 miles north of the present permit area for the purpose of coal exploration, by Nevada Power and Light. The deepest Co-Op borehole, located adjacent to the mine portal, was drilled to the top of the Mancos Shale. No groundwater was encountered in this hole (Co-Op Mining

Company, 1990). The remaining 11 holes, drilled by Co-Op, within and adjacent to the permit area penetrated various units below the coal seams and also did not encounter any water during the drilling activities (Co-Op Mining Company, 1990). This indicates that the Trail Canyon and Bear Canyon Mines are located above the regional water table.

The coal exploration holes, by Nevada Power and Light, to the north of the existing permit area were drilled to the top of the Star Point Sandstone (Co-Op Mining Company, 1990). These holes are thought to have encounter water during the drilling activities. However, the logs do not indicate whether the fluid level reported is a static water level or the level of drilling fluid in the hole at the time of logging. No information is available regarding how the holes were drilled, how long after drilling before holes were logged, or other information to determine the suitability of these holes for use as piezometers or the data as being representative of the actual groundwater surface. The holes were abandoned immediately following the geophysical logging activities and are not available for additional monitoring.

To assist in understanding the potential impacts of the mining operations on the surrounding water resources, a search of the Utah State Water Rights records was conducted. The computer records were scanned for all water rights, surface and groundwater, which occurred in the area of Sections 10 through 15 and 22 through 27 of Township 16 South, Range 7 East. This provides a search of an area between one half and one mile beyond the permit boundary. The water rights which were identified are located on Figure 2-2 and presented in Appendix C.

Within the permit and proposed expansion areas three surface water rights are identified. No springs with water rights were identified above the coal seams within the permit or proposed expansion areas. In the adjacent area, 30 surface water rights and 29 groundwater rights were identified. Fifteen of the groundwater rights were associated with the flow from Big Bear and Birch Springs. The remaining rights were associated with either the mines or small stockwatering springs to the north of the permit area.

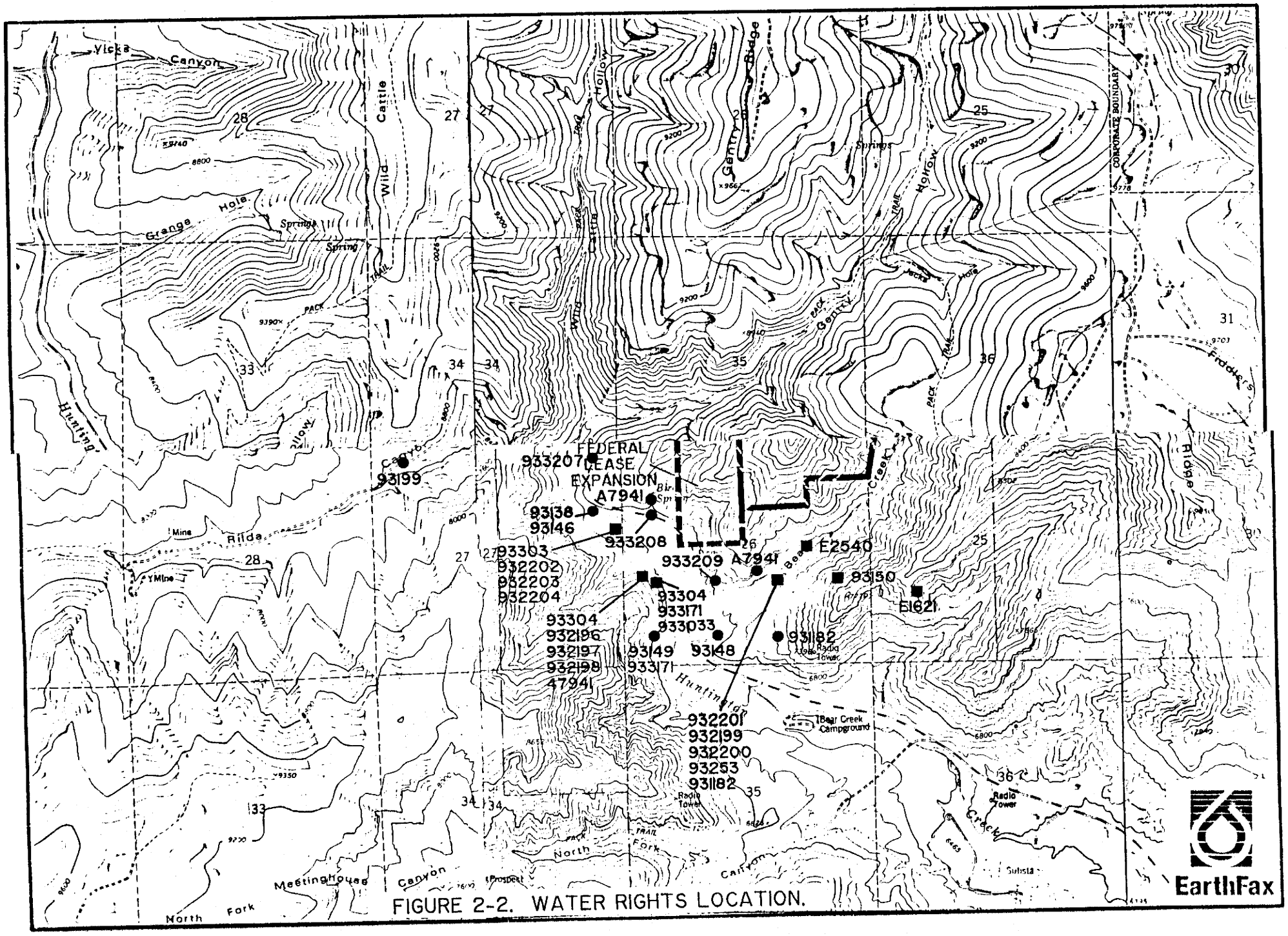

FIGURE 2-2. WATER RIGHTS LOCATION.

2.4.2 Recharge

Snow at the higher elevations provides the greatest source of groundwater recharge. Danielson, et.al. (1981) showed by radio-isotope sampling that most, if not all, groundwater is derived from snow. The percentage of water derived from snow which recharges the groundwater system versus that which runs off to stream flow is controlled by the surface relief, permeability of overlying strata, depth of the snowpack, and the rate of snowmelt. The highest recharge occurs in areas of low surface relief and on formations which have high permeability from fractures and/or solution openings.

In the study area, the criteria which encourage recharge from snowmelt are typical of the areas of exposed North Horn and upper Price River Formations. The main recharge area to the groundwater system in the area of the Bear Canyon Mine is expected to be the shattered zone identified by Brown, et. al. (1987) in Section 1, 2, and the north half of 11, in Township 16 South, Range 7 East (see Figure 2-1). An additional area of recharge could also be expected in the southern half of Section 11 and the northern half of Section 14, due to the surface exposure of North Horn Formation (see Figure 2-1). However, this area is not as fractured as the area to the north.

Most of the exposed outcrops within the permit area are Price River, Castlegate Sandstone, Blackhawk, and Star Point Formations. Danielson, et. al. (1981) indicated that recharge to the Star Point-Blackhawk aquifer from direct infiltration of snowmelt on areas of the formations which outcrop below the North Horn Formation is small in comparison to recharge through the low relief surfaces of the North Horn Formation. In the study area, the exposure of formations below the North Horn Formation and above the coal outcrops is limited due to the steep canyons. Therefore, the potential for recharge through these formations to the regional groundwater system within the permit area is limited.

This limited recharge is reflected in the number of springs and seeps which occur within the permit area. Co-Op Mining Company has conducted spring and seep surveys of the permit and adjacent area and has identified three springs and two seeps which occur

above the coal seam. These water sources are located in the northern part of the permit and adjacent area. As shown on the water rights map, Figure 2-2, no groundwater rights are found on the ridge overlying the Bear Canyon Mine. The only groundwater sources identified in the southern portion of the permit and adjacent area are the Big Bear and Birch Springs. These springs are located below the mine and coal seam elevation. The limited number of springs which occur from the area overlying the mine area indicate that only limited recharge occurs in the Bear Canyon permit area.

2.4.3 Movement

The movement of groundwater in the study area is strongly controlled by the geologic structure, such as faulting and the dip of bedding in the strata. Most of the water movement in the study area is through fractures, faults, and openings between the beds (Danielson, et. al., 1981). According to Danielson, et.al. (1981), a portion of the snowmelt recharge water is discharged close to the original recharge source, where the downward movement of water is impeded by impermeable beds of shale or mudstone. If lateral movement occurs close to the canyon edge, this movement continues until the land surface is encountered and discharge occurs as a perched spring. If the movement occurs on the interior of the mountain, the lateral movement continues until other vertically permeable lithologies or zones of fracturing are encountered that allow further vertical flow.

In areas of fracturing, due to increased rock permeability, water is able to pass vertically through strata which would normally impede such flows. Depending on the degree of interconnection in the fractures, the groundwater flow can be limited to a small area or it can reach the regional water table (see Figure 2-3). Lines (1985) indicated that for the hydrogeologically similar area of Trail Mountain, located to the south of the study area, even with the large quantity of rock with negligible permeability, some hydraulic connection exists between the perched aquifers and the regional aquifer. Most of the exchange of water occurs as downward unsaturated flow from perching beds to the regional aquifer along the fractures and faults.

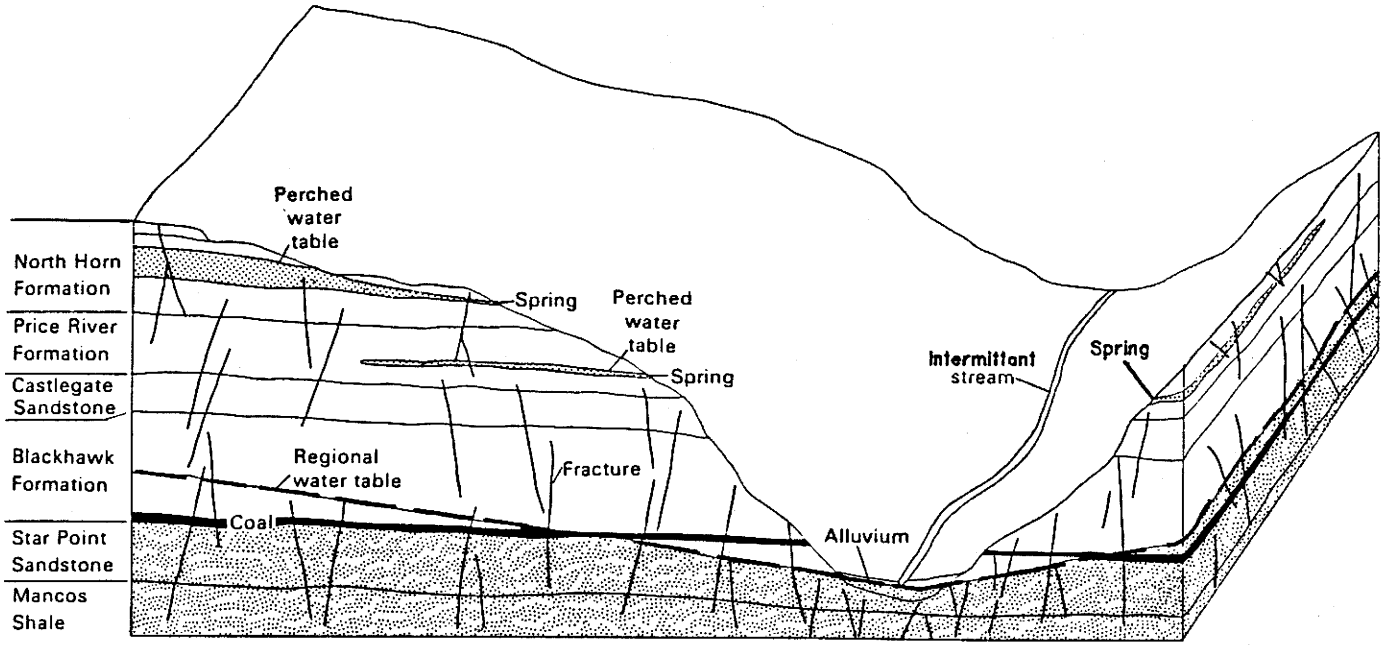

FIGURE 2-3. GENERALIZED BLOCK DIAGRAM SHOWING OCCURRENCE OF GROUND WATER.

EarthFax

2.4.4 Discharge

Groundwater naturally discharges through springs, seeps, and by evapotranspiration. Some discharge from the groundwater system in the mine area may occur either by flow in the faults and fractures out of the Huntington Creek drainage or as subsurface flow to the alluvial fills of the canyons. These flows can not be quantified. The major source of water discharge which can be quantified is from springs. Within the area of the mine, two major springs have been identified, the Big Bear Spring and the Birch Spring. In the adjacent area, outside the effect of the Bear Canyon Mine, two additional springs are identified. These are Tie Fork and Little Bear Springs.

Big Bear Spring, maintained by the Castle Valley Special Services District, discharges from three prominent joints. Birch Spring, maintained by the North Emery Water Users Association, discharges from a normal fault having approximately 20 feet of displacement. Both springs occur in the lower sandstone unit of the Star Point Sandstone, where the Mancos Shale serves as a barrier to downward movement of groundwater (Montgomery, 1991). Tie Fork is really not a spring, but two flowing geophysical boreholes which have been developed by Castle Valley Special Services District. Little Bear Spring is a spring from faults which is also maintained by Castle Valley Special Services District. Flow records for these springs have been collected from the water companies and are presented in Appendix D. Big Bear Spring has a 9 year period of record, from 1981 to present. Birch Spring has only a 2 year period of record, from 1989 to present. Tie Fork has a 6 year period of record, 1984 to the present. Little Bear Spring has a 8 year period of record, 1982 to the present.

3.0 DATA ANALYSIS

This section presents a discussion of the data analysis and field work conducted for this study. First, a discussion of the field investigation is presented. This is followed by a comparison of the spring flows, monthly precipitation, and stream flows. Third, an evaluation of the potentiometric surface for the study area is discussed. Last, a discussion of the comments made by North Emery and Castle Valley is presented.

3.1 Field Investigation

On February 18 and 19, 1991, a field investigation was conducted to:

- evaluate the geology and water inflows to the Bear Canyon Mine;
- evaluate the geology and water flow of Big Bear and Birch Springs and the surrounding areas;
- obtain spring flow records for Big Bear and Birch Springs and surrounding springs; and
- obtain descriptions of spring development from the water companies.

3.1.1 Bear Canyon Mine

According to Wendell Owen, the Bear Canyon Mine had an initial mine water inflow in the old abandoned workings prior to the start of operations by Co-Op Mining Company. During the development of the East Bleeders, water was encountered in two small step faults to the Bear Canyon Fault. This flow was essentially the same volume as flowed to the abandoned workings. Within a short period of this interception, the inflow to the abandoned workings dried up.

The East Bleeder inflow remained constant until the summer of 1989, when water was encountered at the northern end of the North Main entries. According to Wendell Owen, the mine intercepted a flow of about 110 gpm. This flow occurred mainly from fractures and roof

bolt holes in the roof and has essentially remained constant since it was first encountered. The coordination of inflows being intercepted and stopping between these three areas indicates a high degree of hydraulic connection between these areas. It also indicates that this fracture system directs flows, within either the coal seam or the overlying strata, to the southeast along the dip of the beds.

The underground tour and survey indicated a limited number of continuous flow sources. The major water source in the mine was located at the north end of the North Main entries. The North Main entries in the area of the inflow are acting as a sump for this water. The water is being pumped to the East Bleeder sumps where some of the water is used for in-mine use. The remainder of the water is pumped to the surface and used for culinary supplies or discharged to Bear Creek.

The remaining water inflows to the mine are small inflows from diffuse sources. Only one small roof dripper was found during the underground tour with sufficient flow (0.1 gallon per minute) to be sampled. The results of the pH, temperature, and conductivity readings taken are presented in Table 3-1. Most other inflows occurred as isolated dripping over a wide area. Wendell Owen indicated that several of the areas surveyed had previously been much wetter; however, only limited water inflows were found during the survey.

This condition, of mine inflows drying up in short periods, is similar to the inflow patterns found in other mines (i.e., Deer Creek, Plateau, and others) in the Wasatch Plateau Danielson, et.al., 1981). In areas which do not intersect faults upon initial mining, a moderate water inflow occurs from diffuse sources, mainly from roof bolts. These sources are generally limited in flow rate to less than one to two gallons per minute. After a short period, generally one to two months, the rate of inflow decreases and eventually dries up.

This is caused by the draining of the localized areas of more permeable strata. Typically, the roof bolt intersects and provides a drain for a localized perched aquifer, often consisting of a sandstone lense, which stores a limited amount of water. Once the stored

TABLE 3-1

Field Parameter Results

Sample I.D.	pH (Units)	Temperature (°C)	Conductivity (μmhos/cm)
Big Bear Overflow	6.9	10.9	460
Seepage Above Big Bear Spring	8.1	12.4	2000
Roof dripper in 3rd West Entries	7.7	14.2	510

water is drained, the recharge to the perched zone is not sufficient to maintain the previous flow and the inflow drys up or is reduced.

3.1.2 Springs

Big Bear and Birch Springs were visited during the site survey to evaluate the geology of the spring locations and to collect a sample of discharge water, if available. No surface flow was occurring at the Birch Spring and the collection system was locked. At Big Bear Spring, a sample was taken from the spring overflow from the northern most joint. The flow from the overflow was less than 1 gallon per minute.

A second sample was taken of seepage flow which occurs from the slope above the Big Bear Spring. The seepage originates from the cliffs at the contact between the Star Point Sandstone and Blackhawk Formation. The flow occurs in two areas approximately 100 yards apart. The seepage in each area appears to be occurring along the bedding planes of the formation contact. Seepage in each area occurs along approximately 100 to 150 feet of the outcrop. The flow is difficult to quantify at this point, but it is concentrated at several bedrock ledges. The combined flow was estimated to be approximately 10 gallons per minute. The eastern-most seep occurs at a location that is in shade most of the day at the base of the cliffs. Considerable accumulations of ice where found at this seep, due to the discharge continually freezing. This may have been the flow and ice accumulations which were observed by Montgomery (1991). The pH, temperature, and conductivity values for these samples are presented in Table 3-1.

As indicated in Table 3-1, the water made within the mine is similar in conductivity to the water found in the Big Bear Spring. The flow from the cliff seepage above the spring is considerably different, with a conductivity approximately four times that which occurs in the other samples. Due to the quality differences of the inflow to the mine and seepage from the cliff face, these two sources do not appear to be the same water.

3.2 Spring Flow Analysis

The monthly flows from the Big Bear, Birch, Little Bear, and Tie Fork springs were analyzed. Little Bear and Tie Fork springs were included in the analysis be cause of their period of record and their proximity to the area. The spring flows were compared to five-station average monthly precipitation (see Appendix A) and stream flow for Huntington Creek gauging station above the Deer Creek Diversion (see Appendix B) plotted against time. These three plots were superimposed on a single graph to allow a direct comparison. For readability, the graph durations were limited to one year per sheet for each spring analyzed. An example graph is presented in Figure 3-1. All graphs are presented in Appendix E.

3.2.1 Little Bear Spring

Flows from Little Bear Spring for the period of 1982 through 1985 show that spring flows peak one month behind the stream flow in Huntington Creek. In 1986 the peaks occur in the same month, possibly indicating an early snowmelt. In 1987, the peak from Little Bear Spring was delayed by two months.

In the period from 1988 through 1990, no significant spring peak flow is identified. There is a gradual rise in the spring flow in the fall of 1988 and a gradual decline in early 1989. This is not characteristic of the prior flow of the spring.

3.2.2 Tie Fork Wells

The flows from Tie Fork wells show no seasonal variation, except for a period starting in July through November of 1988. By December, the flow had returned to approximately the previous level and flows through 1989 and 1990 have been essentially constant. This flow fluctuation corresponds, time wise, to the flow increase in the Little Bear Spring, though the fluctuation of Little Bear was over a longer period.

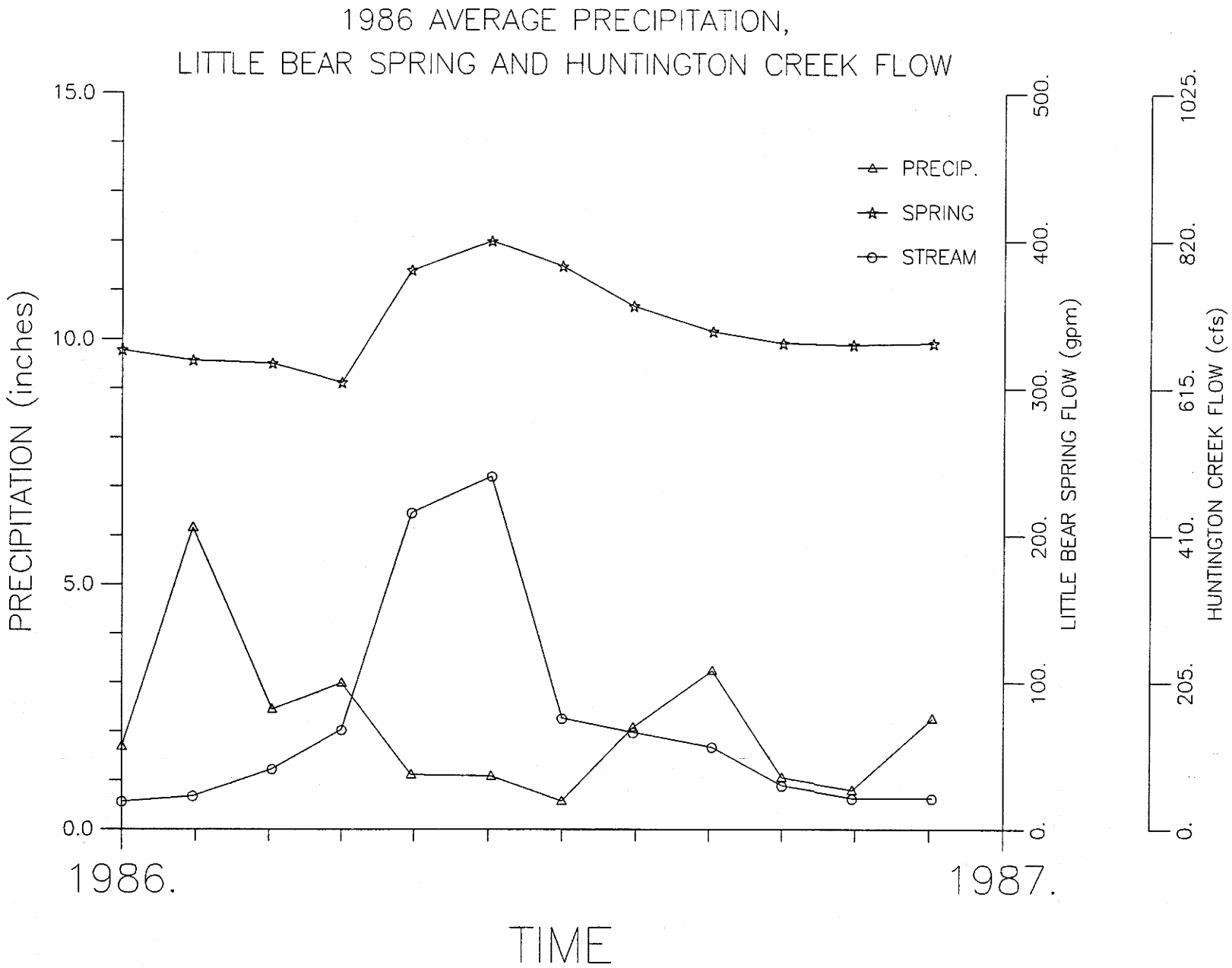

FIGURE 3-I. SAMPLE SPRING FLOW GRAPH.

3.2.3 Big Bear Spring

The plots show that the spring flow during the period of 1980 through 1986 peaks about one month later than the stream peak flow at the Huntington gauging station above the Deer Creek Mine access road. In the 1987-1988 water year, the lag period between peaks in the stream and spring discharge is approximately two months. This increase in lag time is due to a combination of lower precipitation accumulations (28.4 inches average annual precipitation 1980-1986 versus 19.75 inches 1987-1990, see Appendix A) and shorter melt period.

Comparison of the flow recessions for the spring for the years of 1980 through 1986 show very similar patterns. The slope line of the spring flow decline and the base flow level for the spring are generally the same from year to year. This indicates that the snowmelt recharge is greater than the volume required to recharge the groundwater system storage and the excess water is being discharged from the system at the spring. It also indicates that no outside influences (i.e., mining) are affecting or changing the groundwater system.

For the period from 1988 to 1990, no snowmelt peak could be identified for the spring flow. Also, a comparison of spring flow from years 1987 through 1990 indicates a general decline in flow. This is also felt to be due to the lower precipitation which occurred during this period. The snowmelt recharge is not sufficient to either:

- completely fill the depleted storage in the system, as in the periods where subsequent years base flow is lower than the previous year, or
- the system storage is filled by the recharge, but there is no excess water to provide a spring flush.

Under the first condition, the groundwater system is being drained and a new base flow condition will eventually be established provided precipitation inputs are stabilized. Once the groundwater system stabilizes, the second condition will operate until the precipitation

increases to fill the excess storage capacity in the groundwater system. It appears that the first condition is what occurred at the Big Bear Spring during the period of 1987 to 1990.

During the period of 1984 through 1989, the Bear Canyon Mine intercepted inflows at the abandoned workings, the East Bleeders, and the North Main entries. No significant flow reductions at the Big Bear Spring were reported for this period. Therefore, the water intercepted within the mine did not contribute to the Big Bear Spring flow.

3.2.4 Birch Spring

Birch Spring has a very limited period of record. The published stream flow data for Huntington Creek do not include the period of record for Birch Spring; therefore no comparison to stream flow can be made.

The flows from Birch Spring show some seasonal fluctuation; however, two years of data do not provide sufficient information to identify the general flow characteristics. The data in Appendix E indicate that the flow of the spring gradually diminished in 1990, a situation that was noted in verbal communication by North Emery Water User Association.

The declining flow at Birch Spring is considered a result of the reduced precipitation which the area has experienced in the last four to five years. The Big Bear and Little Bear Springs, which are located in the local area, are also experiencing similar flow reductions. As discussed for Big Bear Spring, when the recharge to the groundwater system is reduced below the amount required to fill the storage volume depleted by the prior years base flow discharge, the discharge from the system at the various discharge locations is adjusted to balance the change in storage of the system.

3.3 Potentiometric Surface

An attempt was made to develop a potentiometric surface for the mine area, however insufficient data were available to allow development of the surface. The data reviewed

included the geophysical boreholes by Savage Energy Services for Nevada Power and Light, boreholes drilled by Co-Op Mining Company described in Section 2.4.1 of this report, and Birch and Big Bear spring occurrence elevations.

The geophysical hole data were discounted as not being representative. As indicated in Section 2.4.1, it is unknown if the fluid levels reported by Savage Energy Services for the geophysical holes were water levels or drilling fluid levels. Additionally, no other information regarding the drilling of the holes was available.

A question of extrapolating the surface through the mine area and across McCadden Hollow without any verification was also raised. The distance between the boreholes and the springs is over two and a half miles. This distance is too great to extend a water surface across a major drainage structure without intervening data. The only data that are currently available in this area are the data from the dry monitoring well at the mine portal and the dry geologic holes drilled within the permit area. The monitoring well is located on the other side of the Bear Canyon Fault from the existing mine workings, and therefore is not considered representative of groundwater information beneath the mine.

Based on these concerns it was determined that no currently available data should be used to develop a potentiometric surface.

3.4 Water Company Comments

Comments were submitted to the Division regarding the Co-Op Mining company permit application. These comments addressed:

- The groundwater monitoring program and water quality impacts;
- A complete water rights survey;
- Probable Hydrologic Consequences and potential flow impacts; and
- Water supply fluctuations.

3.4.1 Water Monitoring and Water Quality Impacts

Both Big Bear and Birch Springs are included in the monitoring program. The program, described in section 7.1.7 of the MRP, indicates that both springs will be sampled quarterly. The Big Bear spring sample can be taken from the spring overflow. No easy sampling point is available for the Birch Spring. Therefore, samples are currently taken only when surface flow occurs. Co-Op should consider a sampling arrangement with North Emery Water Users Association to allow access to a sampling port.

The potential water-quality impacts resulting from an underground coal mine are elevated concentrations of inorganic constituents and acid-mine drainage. However, no such impacts have been documented in the mine water discharge from the Co-Op mines (Co-Op Mining Company, 1990).

3.4.2 Water Rights

A complete search of the Utah Division of Water Rights records for the area within one-half mile of the existing and proposed permit area of the Co-Op Mining operations was conducted. The data are presented in Appendix C.

3.4.3 Probable Hydrologic Consequences

The information collected and reviewed for this study, supports the Co-Op PHC and DOGM CHIA descriptions regarding the occurrence of springs and seeps in the groundwater system of the permit area. As described in section 2.4.1, the mining operations are being conducted above the regional water table, which is the source for water to the water supply springs. The potential for recharge within the permit area and proposed expansion areas is relatively low compared to the recharge potential to the north of these areas. Therefore, it is felt that minimal impact to the flow to the springs has occurred as a result of the mining operations. Even though the exact nature of the potentiometric surface is not known, it is assumed that its elevation does rise to the north from approximately the elevation of Birch and

Big Bear Springs. Thus, an impact may occur to the north; however, it is not possible to predict where or if it will occur.

Where the mining operations on both sides of the faults associated with the springs occur above the regional water table, the potential to affect the spring flow is rather minimal. As indicated in section 2.4, for a contribution to be of long term importance to the water supply, it needs to have an extensive and continuous water source. To date, no such inflow has been identified in the mine, except for the flows which occurred over time in the abandoned mine workings, the East Bleeders, and the North Mains. If such a source were present, in the area above the mine workings, it would be expected that springs and seeps would be exhibited in the area. As indicated in Section 2.4.1, no springs are found above the coal seams in the southern area of the permit area.

Some very minor impact could occur as a result of dewatering of small isolated sandstone lenses which could contribute small flows, like what is intercepted from roof bolting (1-2 gpm). However, these areas do not have sufficient long term recharge capacity to be of significant concern for a water supply.

3.4.4 Spring Flow Fluctuations

The Birch Spring flow increased by almost 300 percent for a three month period and a reduction in water quality in the fall of 1989 (North Emery Water Users Association, 1991). The reason for this fluctuation is unknown. This is shortly after the Bear Canyon mine intercepted an inflow of about 110 gpm in the North Mains, though the response of the spring if this were a mine related impact would be a reduction in flow rather than an increase. Montgomery (1991) attributed this flow rise to a release of collected water in the abandoned Trail Canyon Mine. This is highly unlikely as both the Trail Canyon and Bear Canyon Mines are above the regional water table, as discussed in Section 2.4.1. Additionally, a sustained discharge of 230 gallons per minute for 90 days would result in a cumulative flow volume of approximately 30 million gallons (92 ac-ft) of water. This would require a significant storage volume. Assuming that four entries each 12 foot wide and 8 foot high were filled with water,

they would need to be 2 miles long to be able to store the required volume of water to sustain this flow during a low flow period of the year. Given the contention that the area is extensively faulted and the faults and fractures are interconnected, the possibility of storing this volume of water as a perched water table above a large extent of the mine, without discharge occurring in other locations, is very unlikely.

An alternative source of the surge in flow could be the opening or connection of saturated fractures which previously did not convey water to Birch Spring. These fractures could have contained a significant volume of water which had built up over a long period of time. As these fractures drained, the flow contributed to the Birch Spring was sufficient to raise the water level in the fractures to a level which previously had not conveyed water. This would result in a flush of sediment and dissolved constituents, as reported by North Emery Water User Association, which had accumulated over time. Once the excess water in the fractures had drained the flow in the spring and the water quality returned to normal levels.

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusions

Based on this study the following conclusions are made:

- The groundwater system in the area of the Trail Canyon and Bear Canyon mines in mainly controlled by geologic structures (faults and fractures) and lithology.

- In the area of present development, the regional water table is located below both the Blind Canyon and Hiawatha seams in both the Trail Canyon and Bear Canyon mines as indicated by downhole drilling.

- Water intercepted within the mine workings of the Bear Canyon mine have not had any identifiable impact on the spring flows of Big Bear or Birch Springs.

- No evidence is available to show a mine-related impact on the spring flows of the Big Bear or Birch Springs. The recent reduction in spring flows appear to be caused by the significant reduction of precipitation over the last four to five years.

- Insufficient data are available to determine if further development of the mine to the north will impact the regional water table.

4.2 Recommendations

The following recommendations are presented to assist in addressing some of the concerns of the water companies and the Utah Division of Oil, Gas, and Mining:

- Co-Op should arrange with the water companies to allow coordinated monitoring of the springs for flow and water quality. This will ensure an acceptable data base for future investigation of potential impacts to the spring flows.

- Co-Op should install a minimum of four monitoring wells within the Bear Canyon Mine to allow determination of a defendable potentiometric surface of the regional water surface within the present permit area. This information can then be projected into the new lease area.

  - The wells should be located in areas which will have long term access for the life of the mine.

  - Construction of the monitoring wells should include a 2-inch PVC casing and slotted screen in a 4-inch borehole, with a sand pack and bentonite seal. This will allow the wells to be sampled and hydraulically tested. The wells should be completed with a flush grade cap, be located close to the coal rib within the entry, and the location should be indicated with paint on the rib adjacent to the well or a marker hung from the roof.

  - Figure 4-1 presents proposed locations for monitoring wells which may be considered.

  - Wells will need to permitted with the Utah Division of Water Resources and the Utah Division of Oil, Gas, and Mining.

- Co-Op Mining Company should revise the PHC associated with the mining operation based on the data collected from the new monitoring wells.

Appendix A
Precipitation Data

TABLE A-1

MONTHLY PRECIPITATION DATA SUMMARY

YEAR	MONTH	ELECTRIC LAKE PRECIP.	HIAWATHA PRECIP.	STUART RANGER PRECIP.	RED PINE RIDGE PRECIP.	MAMMOTH-COTTONWOOD PRECIP.	AVERAGE PRECIP.
1980	March	3.34	1.88	2.31	5.42	3.20	3.23
1980	April	1.27	0.76	3.15	3.26	2.10	2.11
1980	May	3.09	2.78	2.72	3.15	4.00	3.15
1980	June	0.12	0	0.52	0	0.10	0.15
1980	July	0.37	0.30	0	0	0.30	0.19
1980	August	0.38	0.82	0	0	0.70	0.38
1980	September	1.80	2.53	3.35	3.40	2.30	2.68
1980	October	1.45	2.07	0	0	2.10	1.12
1980	November	0.98	0.36	0	0	1.70	0.61
1980	December	0.32	0	2.35	4.45	0.30	1.48
	TOTAL	13.12	18.68	25.39	34.21	28.90	24.06

TABLE A-1

MONTHLY PRECIPITATION DATA SUMMARY (CONTINUED)

YEAR	MONTH	ELECTRIC LAKE PRECIP.	HIAWATHA PRECIP.	STUART RANGER STATION PRECIP.	RED PINE RIDGE PRECIP.	MAMMOTH-COTTONWOOD PRECIP.	AVERAGE PRECIP.
1981	January	1.30	0.29	0.25	0.72	1.00	0.71
1981	February	1.04	0.30	1.45	3.54	2.10	1.67
1981	March	3.20	2.82	3.15	4.90	3.50	3.51
1981	April	1.45	0.84	1.84	3.45	1.20	1.76
1981	May	3.06	2.40	3.04	3.80	3.70	3.20
1981	June	0.39	0.20	0	1.27	1.00	0.57
1981	July	1.61	1.49	0	0	0	0.62
1981	August	2.73	2.64	0	0	1.90	1.45
1981	September	1.44	2.29	6.81	5.65	2.80	3.80
1981	October	4.18	3.71	0	0	0	1.58
1981	November	1.44	0.43	0	0	0	0.37
1981	December	4.79	1.21	0	17.10	9.40	6.50
	TOTAL	26.63	18.62	16.54	40.43	26.60	25.76

TABLE A-1

MONTHLY PRECIPITATION DATA SUMMARY (CONTINUED)

YEAR	MONTH	ELECTRIC LAKE PRECIP	HIAWATHA PRECIP.	STUART RANGER STATION PRECIP.	RED PINE RIDGE PRECIP.	MAMMOTH-COTTONWOOD PRECIP.	AVERAGE PRECIP.
1982	January	5.26	3.08	11.82	4.32	4.80	5.86
1982	February	1.66	0.36	1.36	3.34	2.30	1.80
1982	March	5.06	1.56	3.48	4.91	4.20	3.84
1982	April	1.11	1.11	0.45	1.52	2.50	1.34
1982	May	1.40	1.40	1.07	1.63	1.80	1.46
1982	June	0.59	0.59	0.26	0.81	1.00	0.65
1982	July	1.26	1.26	0	0	0	0.50
1982	August	2.29	2.29	0	0	0	0.92
1982	September	4.49	4.49	8.40	9.80	9.40	7.32
1982	October	1.88	1.88	0	0	0	0.75
1982	November	3.68	3.68	0	0	0	1.47
1982	December	2.76	2.76	5.58	12.1	10.50	6.74
	TOTAL	31.44	24.46	32.42	38.43	36.50	32.65

TABLE A-1

MONTHLY PRECIPITATION DATA SUMMARY (CONTINUED)

YEAR	MONTH	ELECTRIC LAKE PRECIP.	HIAWATHA PRECIP.	STUART RANGER STATION PRECIP.	RED PINE RIDGE PRECIP.	MAMMOTH-COTTONWOOD PRECIP.	AVERAGE PRECIP.
1983	January	2.41	0.96	1.12	2.30	1.80	1.72
1983	February	4.00	1.23	2.29	3.60	4.60	3.14
1983	March	4.30	2.04	4.94	6.18	4.30	4.35
1983	April	2.35	1.66	1.59	2.58	2.80	2.20
1983	May	2.81	1.04	2.50	2.70	3.60	2.53
1983	June	1.35	1.25	0	0.18	1.80	0.92
1983	July	1.34	2.74	0	0	0	0.82
1983	August	1.5	1.67	0	0	0	0.63
1983	September	2.88	2.15	7.26	7.02	8.10	5.48
1983	October	2.15	1.57	0	0	0	0.74
1983	November	4.81	2.98	0	0	5.00	2.56
1983	December	7.43	2.55	14.23	21	7.10	10.46
	TOTAL	37.33	21.84	33.93	45.56	39.10	35.55

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TABLE A-1

MONTHLY PRECIPITATION DATA SUMMARY (CONTINUED)

YEAR	MONTH	ELECTRIC LAKE PRECIP.	HIAWATHA PRECIP.	STUART RANGER STATION PRECIP.	RED PINE RIDGE PRECIP.	MAMMOTH-COTTONWOOD PRECIP.	AVERAGE PRECIP.
1984	January	1.27	0.22	0.40	0.80	0.90	0.72
1984	February	1.56	0.50	2.60	0.93	1.80	1.48
1984	March	2.77	0.69	1.06	2.73	2.70	1.99
1984	April	3.23	1.37	2.81	5.00	3.50	3.18
1984	May	1.73	0.66	2.37	3.38	1.30	1.89
1984	June	3.41	1.50	4.53	4.50	4.50	3.69
1984	July	2.55	2.56	0	0	2.40	1.50
1984	August	2.26	3.27	0	0	1.50	1.41
1984	September	1.47	0.76	6	5.90	2.70	3.37
1984	October	2.92	3.80	0	5.51	0	2.45
1984	November	2.63	0.79	0	0	5.40	1.76
1984	December	3.24	1.70	9.12	9.45	2.60	5.22
	TOTAL	29.04	17.82	28.89	38.20	29.30	28.65

TABLE A-1

MONTHLY PRECIPITATION DATA SUMMARY (CONTINUED)

YEAR	MONTH	ELECTRIC LAKE PRECIP.	HIAWATHA PRECIP.	STUART RANGER STATION PRECIP.	RED PINE RIDGE PRECIP.	MAMMOTH-COTTONWOOD PRECIP.	AVERAGE PRECIP.
1985	January	1.54	0.41	0.63	1.15	2.10	1.17
1985	February	1.09	0.55	1.54	2.67	1.90	1.55
1985	March	3.54	1.13	2.60	4.16	2.40	2.77
1985	April	1.95	1.59	2.56	3.40	2.70	2.44
1985	May	1.19	2.18	1.51	3.16	1.90	2.00
1985	June	0.89	0.68	1.04	1.59	1.60	1.16
1985	July	3.04	4.02	0	4.11	3.00	2.83
1985	August	0.03	0	0	0	0.50	0.11
1985	September	2.24	2.79	5.70	2.74	2.40	3.17
1985	October	0	1.28	0	5.51	2.70	1.90
1985	November	6.62	2.05	0	0	6.30	2.99
1985	December	1.99	0.30	7.64	11.74	2.30	4.79
	TOTAL	24.12	16.98	23.22	40.23	29.80	26.87

TABLE A-1

MONTHLY PRECIPITATION DATA SUMMARY (CONTINUED)

YEAR	MONTH	ELECTRIC LAKE PRECIP.	HIAWATHA PRECIP.	STUART RANGER STATION PRECIP.	RED PINE RIDGE PRECIP.	MAMMOTH-COTTONWOOD PRECIP.	AVERAGE PRECIP.
1986	January	1.81	0.13	2.02	3.10	1.40	1.69
1986	February	8.54	2.39	7.43	5.86	6.60	6.16
1986	March	2.48	1.36	1.88	3.41	3.10	2.45
1986	April	3.79	1.27	2.11	3.89	3.90	2.99
1986	May	1.62	0.38	0	1.90	1.70	1.12
1986	June	0.26	0.33	2.47	2.37	0	1.09
1986	July	1.01	1.28	0	0	0.60	0.58
1986	August	1.68	1.66	4.15	0	2.90	2.08
1986	September	2.73	2.22	1.75	6.10	3.40	3.24
1986	October	1.86	1.64	0	0	1.80	1.06
1986	November	1.98	0.22	0	0	1.80	0.80
1986	December	0.55	0.07	4.19	5.68	0.80	2.26
	TOTAL	28.31	12.95	26.00	32.31	28.00	25.51

TABLE A-1

MONTHLY PRECIPITATION DATA SUMMARY (CONTINUED)

YEAR	MONTH	ELECTRIC LAKE PRECIP.	HIAWATHA PRECIP.	STUART RANGER STATION PRECIP.	RED PINE RIDGE PRECIP.	MAMMOTH-COTTONWOOD PRECIP.	AVERAGE PRECIP.
1987	January	2.14	1.1	0	0	1.70	0.99
1987	February	2.07	0.97	3.97	6.80	2.50	3.26
1987	March	2.47	1.57	2.03	3.01	2.20	2.26
1987	April	1.03	1.31	1.40	2.41	1.60	1.55
1987	May	2.93	2.59	0	2.90	3.40	2.36
1987	June	0.79	0.52	4.73	4.37	1.90	2.46
1987	July	2.12	2.9	0	0	1.90	1.38
1987	August	1.22	1.54	0	0	1.40	0.83
1987	September	0.49	0.09	5.80	6.10	1.30	2.76
1987	October	1.39	2.34	2.00	3.02	0.90	1.93
1987	November	1.68	1.59	1.66	2.52	2.80	2.05
1987	December	3.50	0.92	1.99	3.03	2.50	2.39
	TOTAL	21.83	17.44	23.58	34.16	24.10	24.22

TABLE A-1

MONTHLY PRECIPITATION DATA SUMMARY (CONTINUED)

YEAR	MONTH	ELECTRIC LAKE PRECIP.	HIAWATHA PRECIP.	STUART RANGER STATION PRECIP.	RED PINE RIDGE PRECIP.	MAMMOTH-COTTONWOOD PRECIP.	AVERAGE PRECIP.
1988	January	3.06	2.60	2.21	2.92	3.10	2.78
1988	February	0.72	0.06	2.08	3.40	0.60	1.37
1988	March	3.32	0.99	3.29	4.45	3.70	3.15
1988	April	2.14	1.73	2.79	4.15	2.00	2.56
1988	May	1.60	0.68	1.24	1.28	2.30	1.42
1988	June	0.86	1.38	0.77	1.33	0.60	0.99
1988	July	1.04	0.65	1.15	0.94	0.70	0.90
1988	August	2.23	1.08	1.50	2.08	1.50	1.68
1988	September	1.16	1.10	1.55	2.17	0.90	1.38
1988	October	1.20	0.84	1.78	1.20	1.00	1.20
1988	November	2.68	0.34	1.48	4.30	3.40	2.44
1988	December	1.91	1.44	1.77	3.70	2.70	2.30
	TOTAL	21.92	12.89	21.61	31.92	22.50	22.17

TABLE A-1

MONTHLY PRECIPITATION DATA SUMMARY (CONTINUED)

YEAR	MONTH	ELECTRIC LAKE PRECIP.	HIAWATHA PRECIP.	STUART RANGER STATION PRECIP.	RED PINE RIDGE PRECIP.	MAMMOTH-COTTONWOOD PRECIP.	AVERAGE PRECIP.
1989	January	1.52	0.55	1.57	2.30	1.7	1.53
1989	February	1.99	0.44	1.48	1.90	2	1.56
1989	March	3.55	0.96	2.96	4.00	3.7	3.03
1989	April	0.35	0.40	1.18	1.70	1	0.93
1989	May	0.06	0.71	0.38	0.90	1	0.61
1989	June	1.54	0.78	0.24	1.20	1.8	1.11
1989	July	1.43	1.11	1.40	1.50	1.2	1.33
1989	August	1.37	2.21	1.28	1.60	3	1.89
1989	September	1.19	1.17	1.33	2.20	2.7	1.72
1989	October	1.21	0.32	0	1.80	2.1	1.09
1989	November	1.88	0.44	0	2.30	2.2	1.36
1989	December	0.70	0.07	0	1.90	1.2	0.77
	TOTAL	16.79	9.16	11.82	23.30	23.6	16.93

TABLE A-1

MONTHLY PRECIPITATION DATA SUMMARY (CONTINUED)

YEAR	MONTH	ELECTRIC LAKE PRECIP.	HIAWATHA PRECIP.	STUART RANGER STATION PRECIP.	RED PINE RIDGE PRECIP.	MAMMOTH-COTTONWOOD PRECIP.	AVERAGE PRECIP.
1990	January	2.00	0.55	*	2.00	1.70	1.25
1990	February	4.06	1.80	*	4.00	3.90	2.75
1990	March	2.30	1.36	*	3.00	1.70	1.67
1990	April	2.00	0.92	*	3.10	2.30	1.66
1990	May	0.81	0.57	*	0.50	0.40	0.46
1990	June	1.87	0.81	*	2.00	2.60	1.46
1990	July	1.08	0.61	*	2.00	0.90	0.92
1990	August	0.62	1.06	*	0.70	1.50	0.78
1990	September	1.87	2.20	*	2.90	1.80	1.75
1990	October	1.32	0.57	*	0	0	0.38
1990	November	0	0	*	0	0	0
1990	December	0	0	*	0	0	0
	TOTAL	17.93	10.45	*	20.20	16.80	16.34

* No Data Reported

Appendix B

Streamflow Data

TABLE B-1

HUNTINGTON CREEK AVERAGE MONTHLY FLOW (cfs)

YEAR	JAN AVG FLOW	FEB AVG FLOW	MAR AVG FLOW	APR AVG FLOW	MAY AVG FLOW	JUNE AVG FLOW	JULY AVG FLOW	AUG AVG FLOW	SEPT AVG FLOW	OCT AVG FLOW	NOV AVG FLOW	DEC AVG FLOW
1981	26.9	28.9	28.1	61.9	100.0	85.5	135.0	87.8	56.8	34.5	19.3	0.0
1982	20.5	21.4	27.7	42.9	270.0	374.0	173.0	97.5	92.8	95.1	70.9	0.0
1983	45.5	26.3	39.4	55.0	315.0	1003.0	324.0	138.0	105.0	85.7	72.7	52.2
1984	54.0	60.5	65.0	143.0	853.0	823.0	292.0	173.0	175.0	*	*	*
1985	*	*	*	*	*	*	*	*	*	61.1	36.0	35.3
1986	39.1	46.6	84.2	139.0	442.0	493.0	155.0	135.0	115.0	61.1	43.3	43.4
1987	43.4	48.6	45.8	97.2	171.0	125.0	85.6	73.6	82.5	69.4	46.3	40.4
1988	29.9	28.3	26.1	47.5	157.0	149.0	98.2	73.1	62.4	*	*	*

* Data not available.

Appendix C

Water Rights Data

Appendix D

Spring Flow Data

TABLE D-1

BIG BEAR SPRING AVERAGE MONTHLY FLOW (gpm)

YEAR	JAN AVG FLOW	FEB AVG FLOW	MAR AVG FLOW	APR AVG FLOW	MAY AVG FLOW	JUNE AVG FLOW	JULY AVG FLOW	AUG AVG FLOW	SEPT AVG FLOW	OCT AVG FLOW	NOV AVG FLOW	DEC AVG FLOW
1980	223.0	228.0	226.0	225.0	228.0	340.0	365.0	304.0	245.0	230.0	239.0	233.0
1981	225.0	198.0	175.0	228.0	224.0	220.0	226.0	0.0	155.0	152.0	156.0	0.0
1982	161.0	159.0	155.0	152.0	154.0	213.0	243.0	198.0	174.0	168.0	167.0	0.0
1983	167.0	167.0	167.0	166.0	166.0	310.0	378.0	319.0	258.0	214.0	195.0	189.0
1984	189.0	191.0	187.0	187.0	198.0	335.0	321.0	299.0	245.0	209.0	203.0	202.0
1985	198.0	193.0	189.0	186.0	233.0	329.0	312.0	247.0	215.0	206.0	204.0	222.0
1986	171.0	190.0	186.0	182.0	208.0	304.0	305.0	249.0	211.0	198.0	197.0	193.0
1987	186.0	181.0	176.0	171.0	170.0	171.0	188.0	181.0	170.0	181.0	170.0	160.0
1988	153.0	151.0	147.0	143.0	147.0	151.0	157.0	152.0	151.0	155.0	151.0	146.0
1989	142.0	139.0	134.0	133.0	131.0	127.0	128.0	120.0	119.0	114.0	111.0	111.0
1990	110.0	110.0	112.0	109.0	104.0	104.0	104.0	105.0	107.0	110.0	108.0	125.0

TABLE D-2

LITTLE BEAR SPRING AVERAGE MONTHLY FLOW (gpm)

YEAR	JAN AVG FLOW	FEB AVG FLOW	MAR AVG FLOW	APR AVG FLOW	MAY AVG FLOW	JUNE AVG FLOW	JULY AVG FLOW	AUG AVG FLOW	SEPT AVG FLOW	OCT AVG FLOW	NOV AVG FLOW	DEC AVG FLOW
1982	296.0	291.0	286.0	283.0	321.0	435.0	438.0	409.0	356.0	337.0	330.0	325.0
1983	320.0	316.0	316.0	311.0	325.0	424.0	430.0	395.0	358.0	339.0	330.0	326.0
1984	325.0	326.0	322.0	324.0	368.0	423.0	409.0	377.0	352.0	340.0	335.0	332.0
1985	332.0	329.0	324.0	227.0	379.0	379.0	357.0	341.0	341.0	331.0	327.0	322.0
1986	326.0	319.0	317.0	304.0	380.0	400.0	383.0	356.0	339.0	331.0	330.0	331.0
1987	326.0	322.0	321.0	315.0	320.0	380.0	388.0	364.0	345.0	345.0	328.0	321.0
1988	313.0	311.0	309.0	314.0	318.0	327.0	340.0	327.0	345.0	366.0	366.0	285.0
1989	256.0	356.0	363.0	363.0	341.0	333.0	332.0	330.0	340.0	334.0	326.0	319.0
1990	308.0	302.0	295.0	282.0	278.0	271.0	270.0	275.0	280.0	277.0	272.0	265.0

TABLE D-3

TIE FORK SPRING AVERAGE MONTHLY FLOW (gpm)

YEAR	JAN AVG FLOW	FEB AVG FLOW	MAR AVG FLOW	APR AVG FLOW	MAY AVG FLOW	JUNE AVG FLOW	JULY AVG FLOW	AUG AVG FLOW	SEPT AVG FLOW	OCT AVG FLOW	NOV AVG FLOW	DEC AVG FLOW
1984	84.0	84.0	83.0	84.0	84.0	84.0	85.0	85.0	86.0	86.0	86.0	85.0
1985	85.0	85.0	84.0	85.0	85.0	85.0	85.0	85.0	86.0	87.0	86.0	85.0
1986	85.0	85.0	84.0	84.0	84.0	85.0	86.0	86.0	85.0	84.0	85.0	87.0
1987	85.0	85.0	86.0	85.0	86.0	86.0	86.0	85.0	84.0	89.0	85.0	83.0
1988	81.0	81.0	82.0	81.0	82.0	81.0	81.0	105.0	133.0	130.0	130.0	84.0
1989	104.0	106.0	104.0	102.0	101.0	101.0	99.0	98.0	98.0	97.0	96.0	96.0
1990	94.0	94.0	94.0	93.0	94.0	93.0	91.0	90.0	89.0	86.0	88.0	89.0

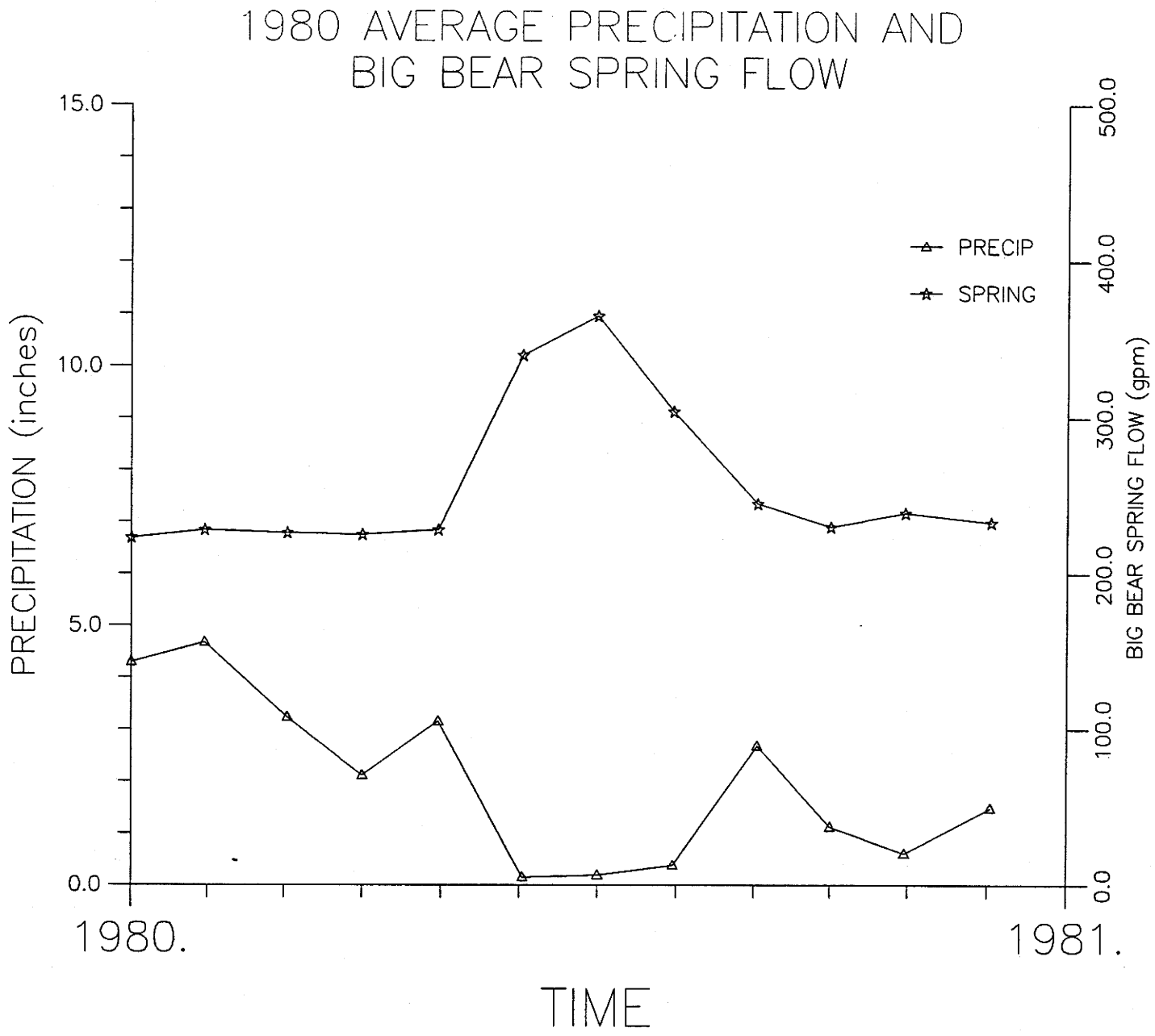
TABLE D-4

BIRCH SPRING AVERAGE MONTHLY FLOW (gpm)

YEAR	JAN AVG FLOW	FEB AVG FLOW	MAR AVG FLOW	APR AVG FLOW	MAY AVG FLOW	JUNE AVG FLOW	JULY AVG FLOW	AUG AVG FLOW	SEPT AVG FLOW	OCT AVG FLOW	NOV AVG FLOW	DEC AVG FLOW
1989	70.0	65.0	60.0	55.0	85.0	100.0	90.0	85.0	80.0	230.0	230.0	230.0
1990	230.0	70.0	65.0	60.0	70.0	85.0	75.0	55.0	40.0	40.0	38.0	37.0
1991	35.0	33.0										

Appendix E

Spring Flow Plots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BIG BEAR SPRING FLOW
PRECIPITATION (inches)
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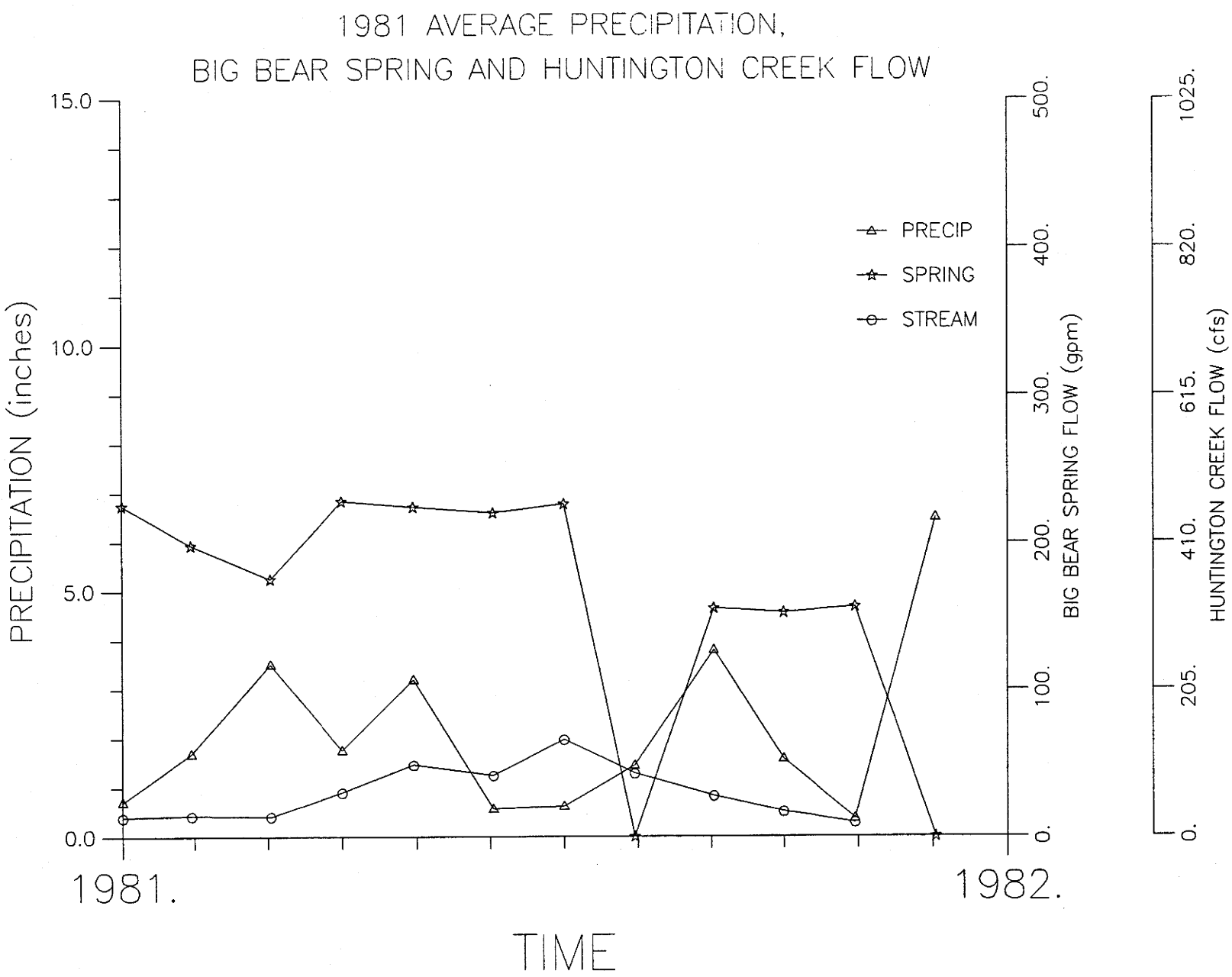
10.0
5.0
0.0
BIG BEAR SPRING FLOW (gpm)
500.0
400.0
300.0
200.0
100.0
0.0
PRECIP
SPRING
1980.
1981.
TIME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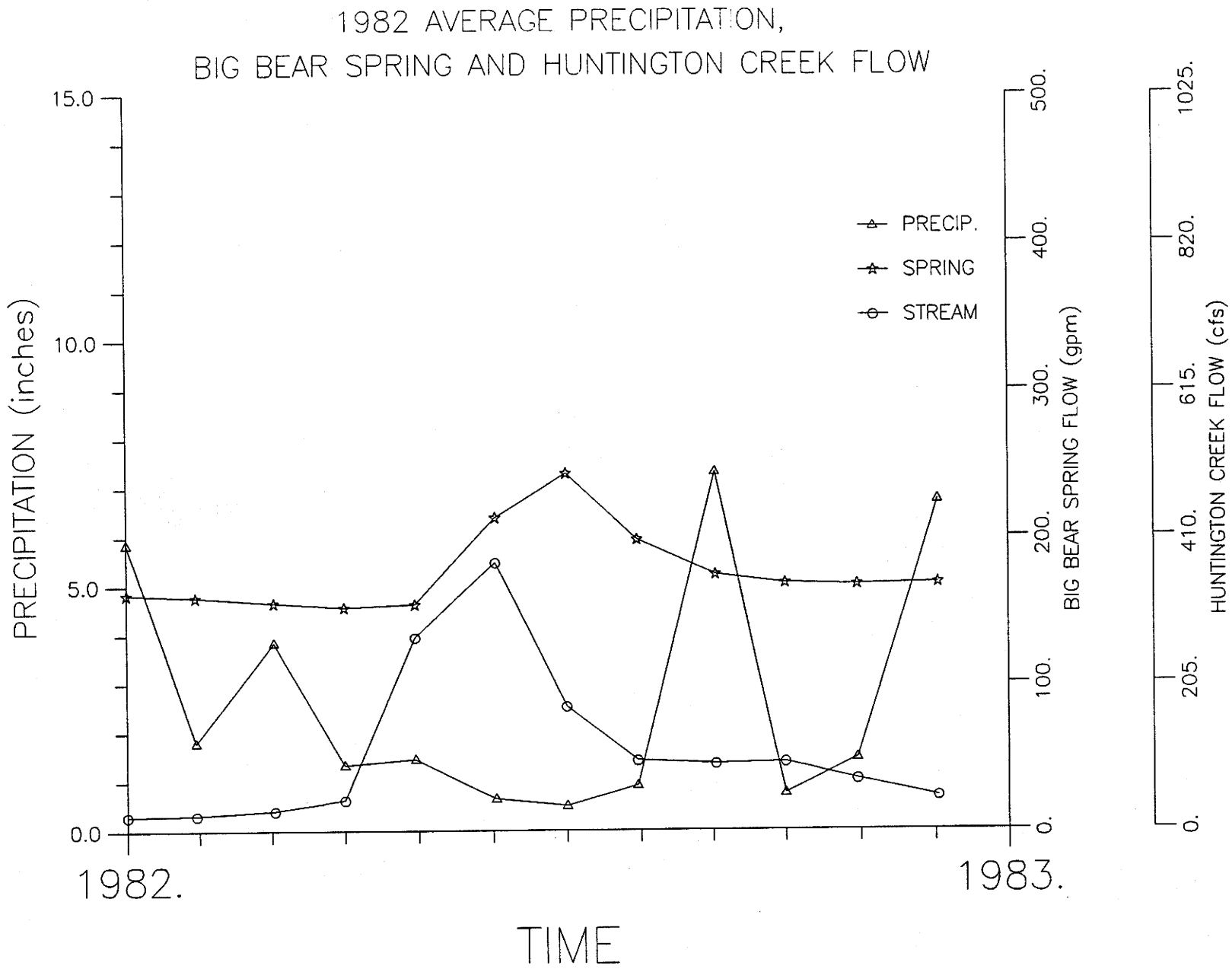
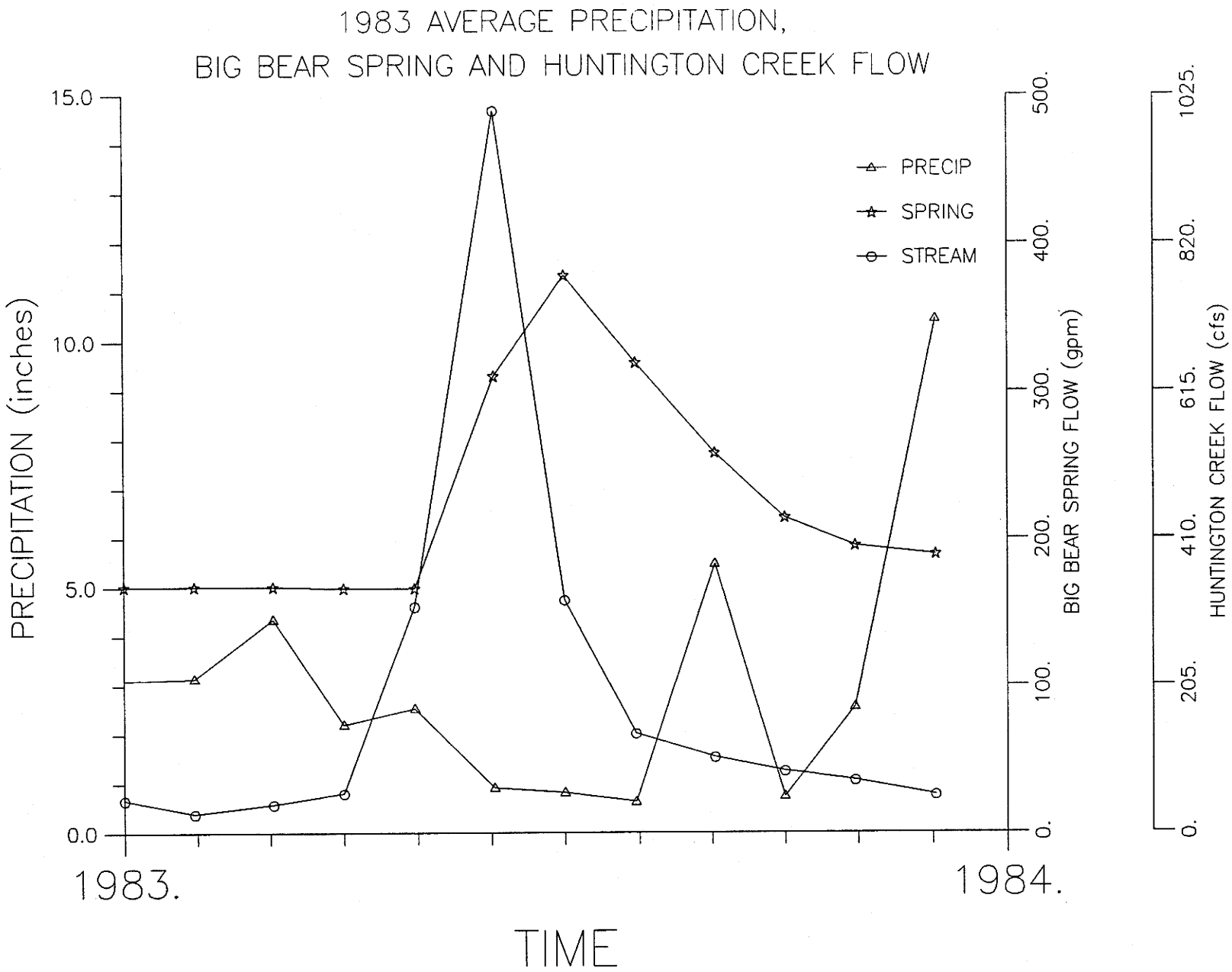
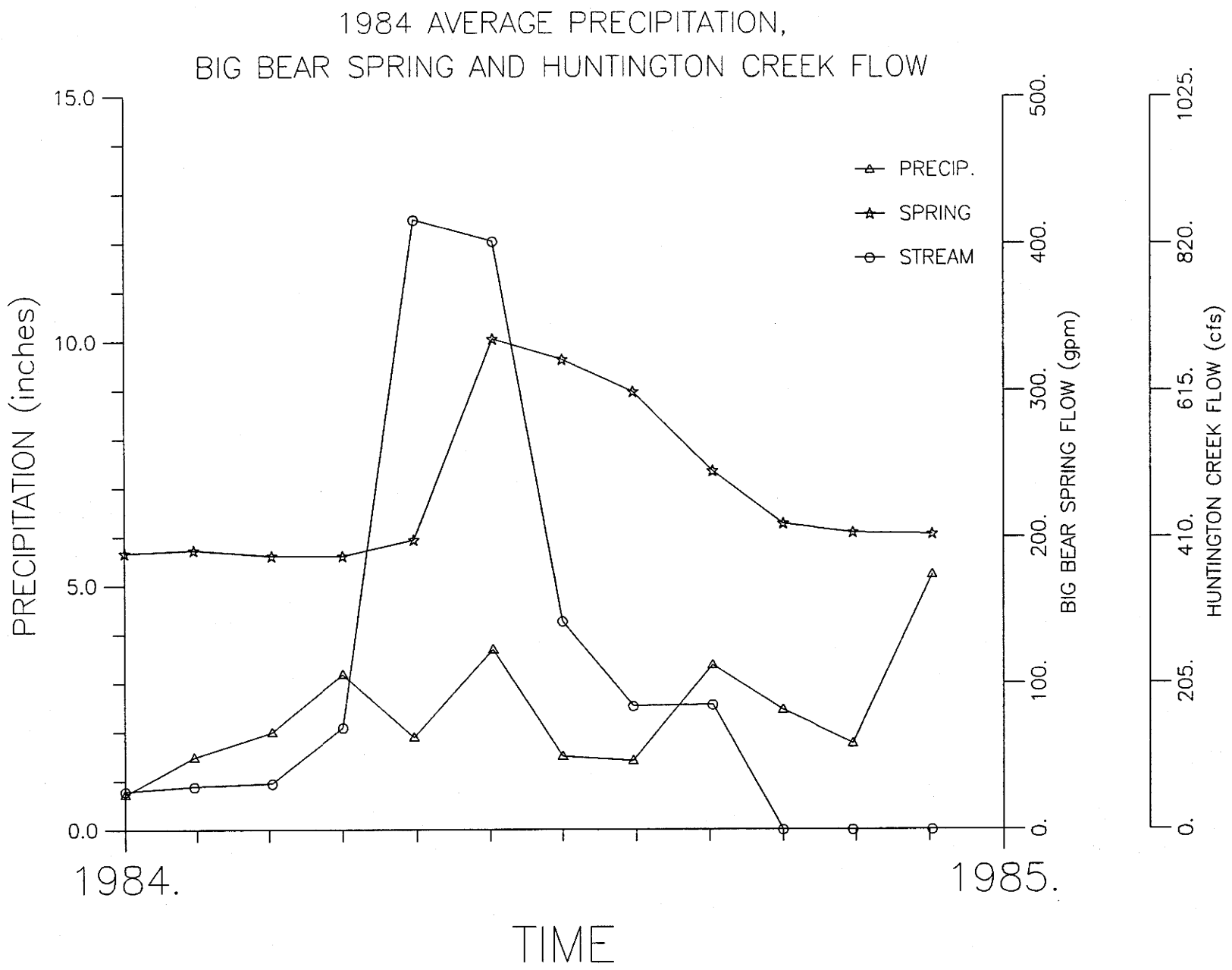
BIG BEAR SPRING AND HUNTINGTON CREEK FLOW
PRECIPITATION (inches)
15.0
10.0
5.0
0.0
BIG BEAR SPRING FLOW (gpm)
500.
400.
300.
200.
100.
0.
HUNTINGTON CREEK FLOW (cfs)
1025.
820.
615.
410.
205.
0.
PRECIP
SPRING
STREAM
1981.
1982.
TIME


1982 AVERAGE PRECIPITATION,
BIG BEAR SPRING AND HUNTINGTON CREEK FLOW
PRECIPITATION (inches)
15.0
10.0
5.0
0.0
BIG BEAR SPRING FLOW (gpm)
500.
400.
300.
200.
100.
0.
HUNTINGTON CREEK FLOW (cfs)
1025.
820.
615.
410.
205.
0.
PRECIP.
SPRING
STREAM
1982.
1983.
TIME


1983 AVERAGE PRECIPITATION,
BIG BEAR SPRING AND HUNTINGTON CREEK FLOW
PRECIPITATION (inches)
15.0
10.0
5.0
0.0
BIG BEAR SPRING FLOW (gpm)
500.
400.
300.
200.
100.
0.
HUNTINGTON CREEK FLOW (cfs)
1025.
820.
615.
410.
205.
0.
PRECIP
SPRING
STREAM
1983.
1984.
TIME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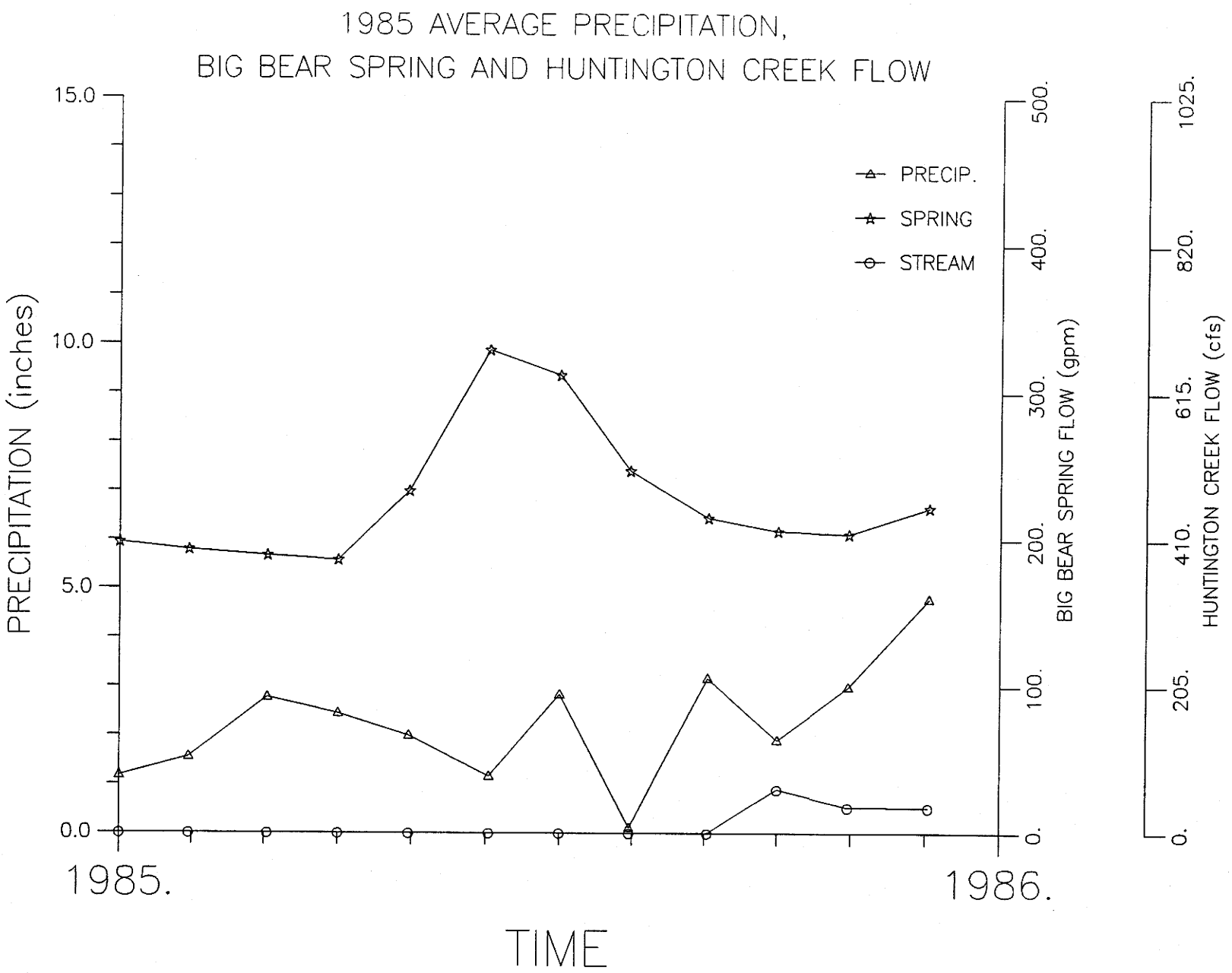
BIG BEAR SPRING AND HUNTINGTON CREEK FLOW
PRECIPITATION (inches)
15.0
10.0
5.0
0.0
PRECIP.
SPRING
STREAM
BIG BEAR SPRING FLOW (gpm)
500.
400.
300.
200.
100.
0.
HUNTINGTON CREEK FLOW (cfs)
1025.
820.
615.
410.
205.
0.
1984.
1985.
TIME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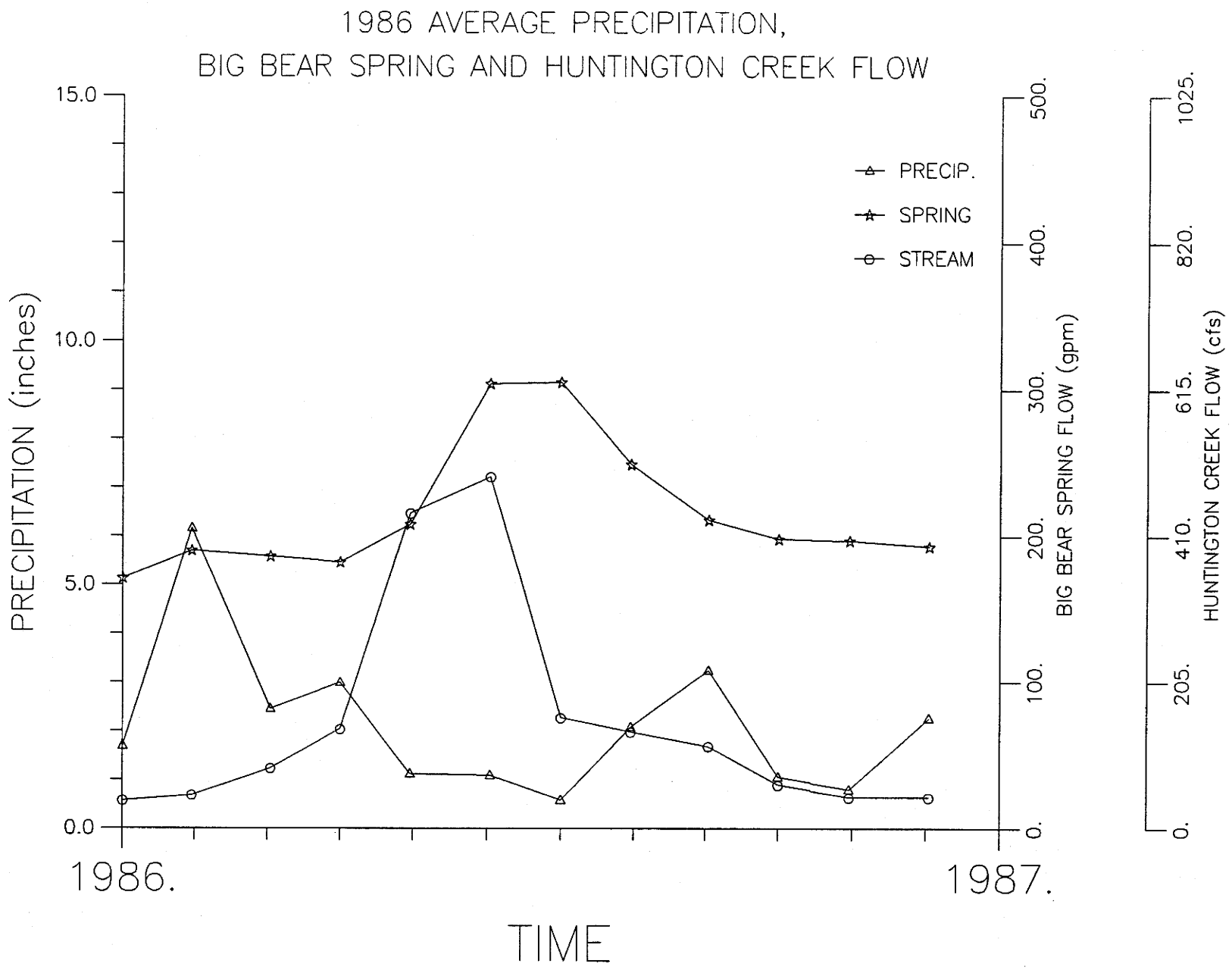
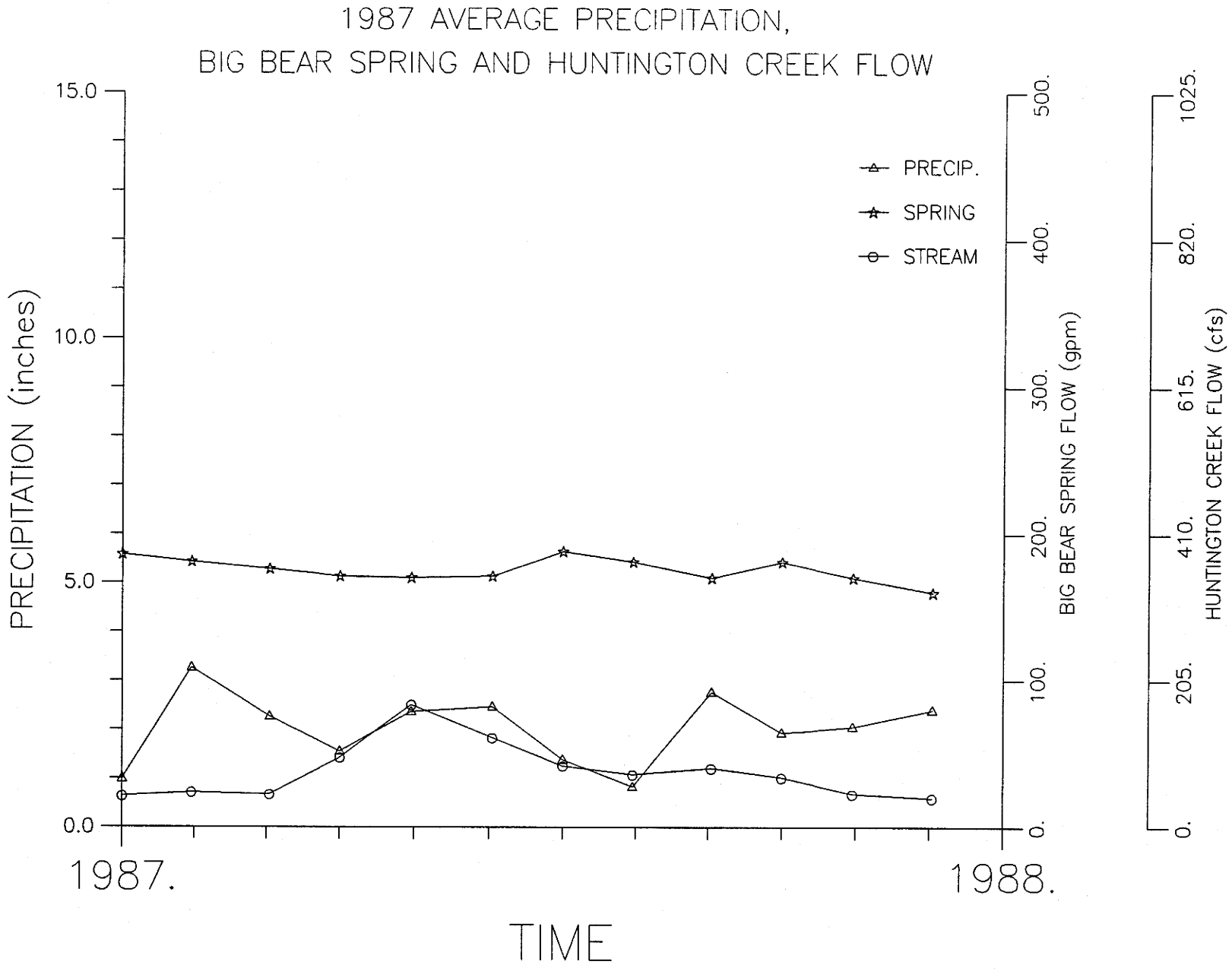
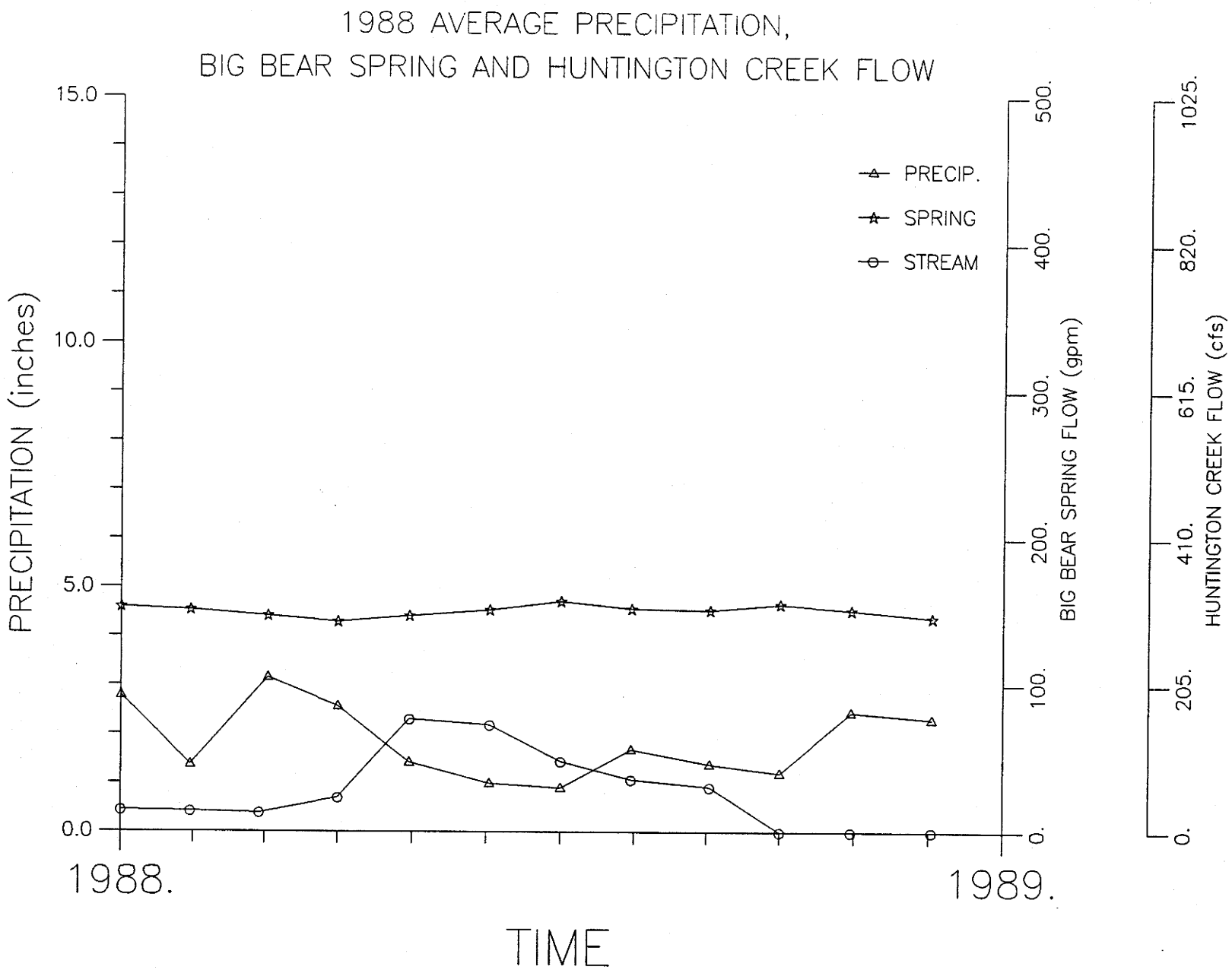
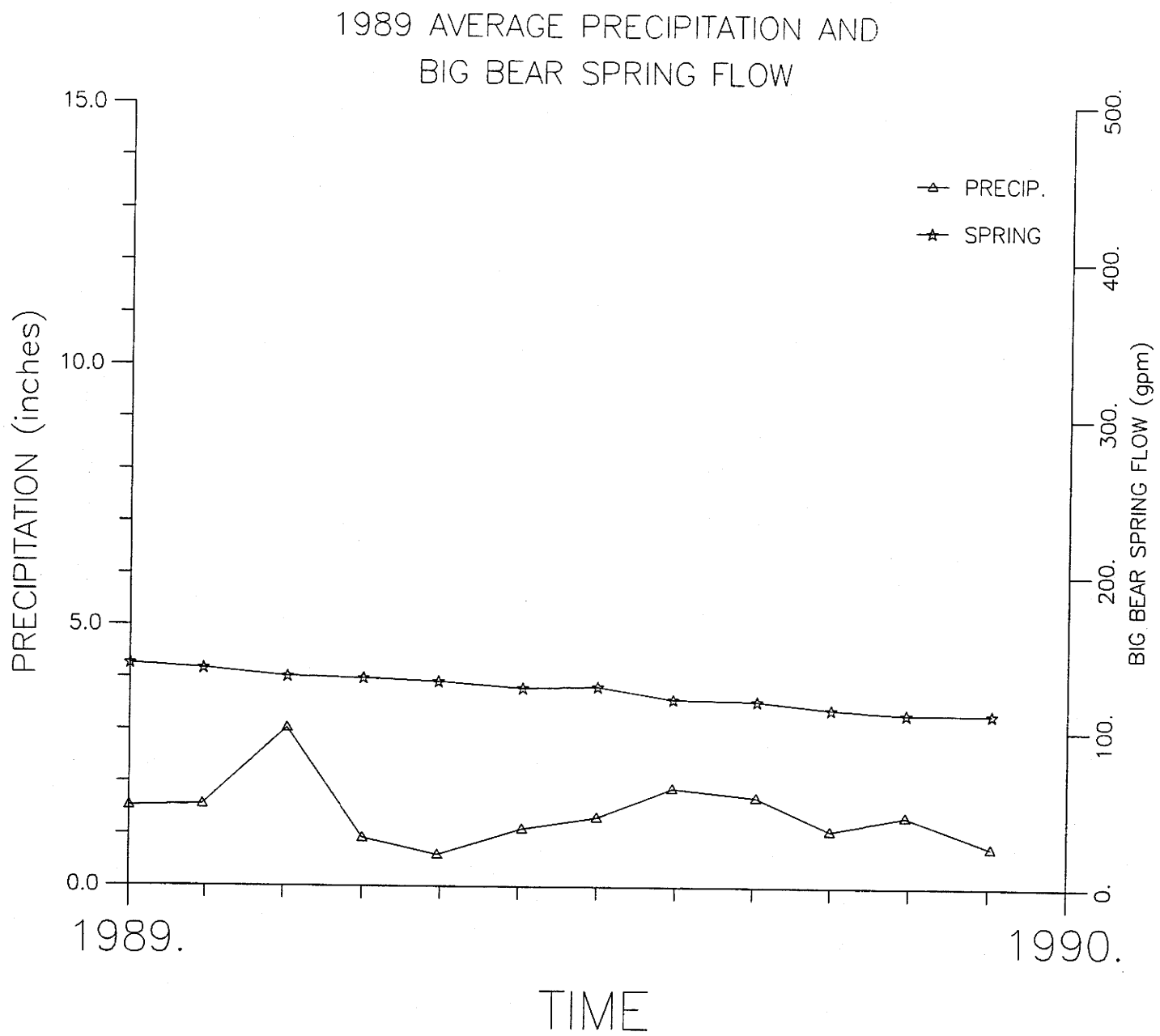
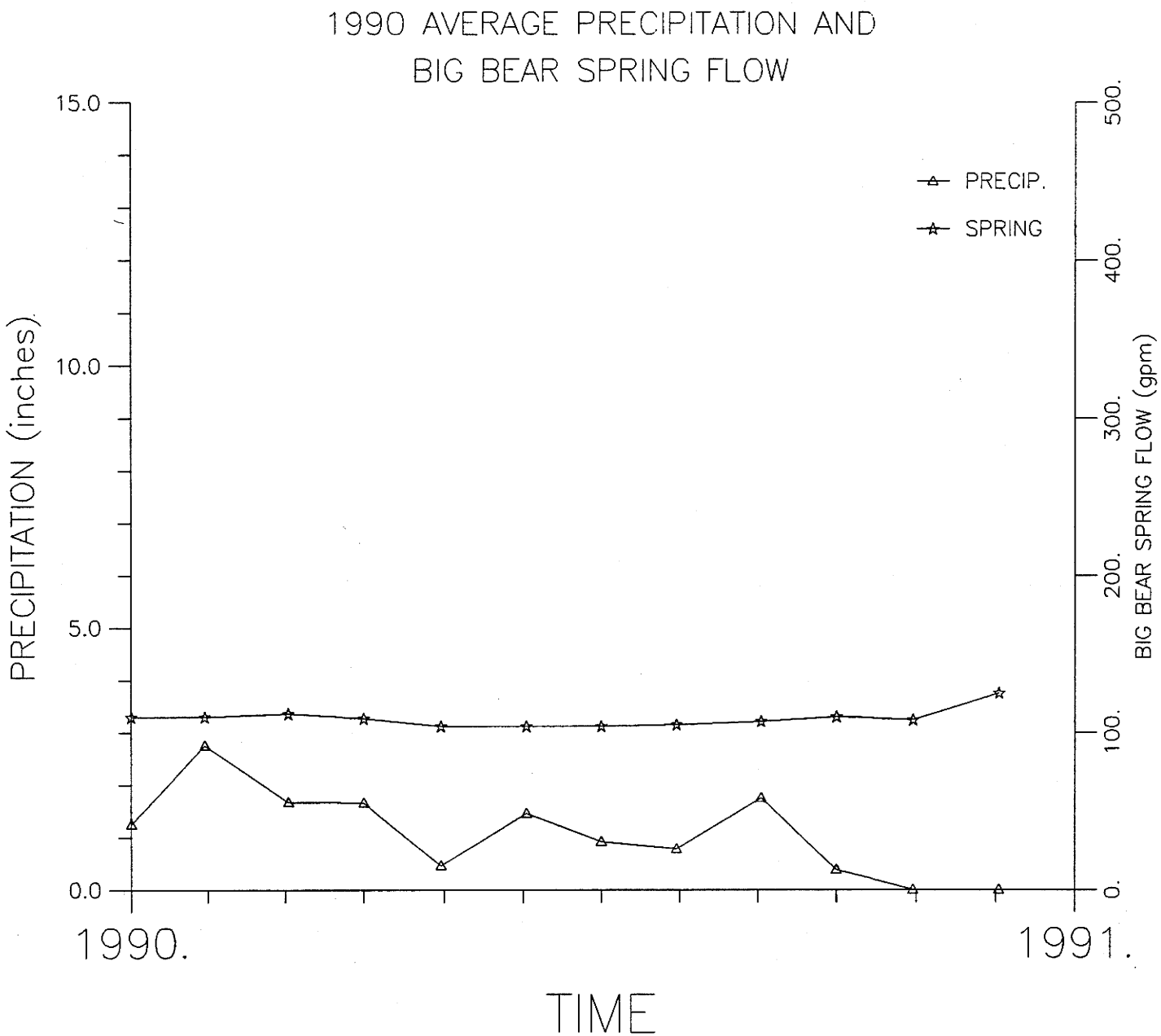
BIG BEAR SPRING AND HUNTINGTON CREEK FLOW
PRECIPITATION (inches)
15.0
10.0
5.0
0.0
PRECIP.
SPRING
STREAM
BIG BEAR SPRING FLOW (gpm)
500.
400.
300.
200.
100.
0.
HUNTINGTON CREEK FLOW (cfs)
1025.
820.
615.
410.
205.
0.
1985.
1986.
TIME

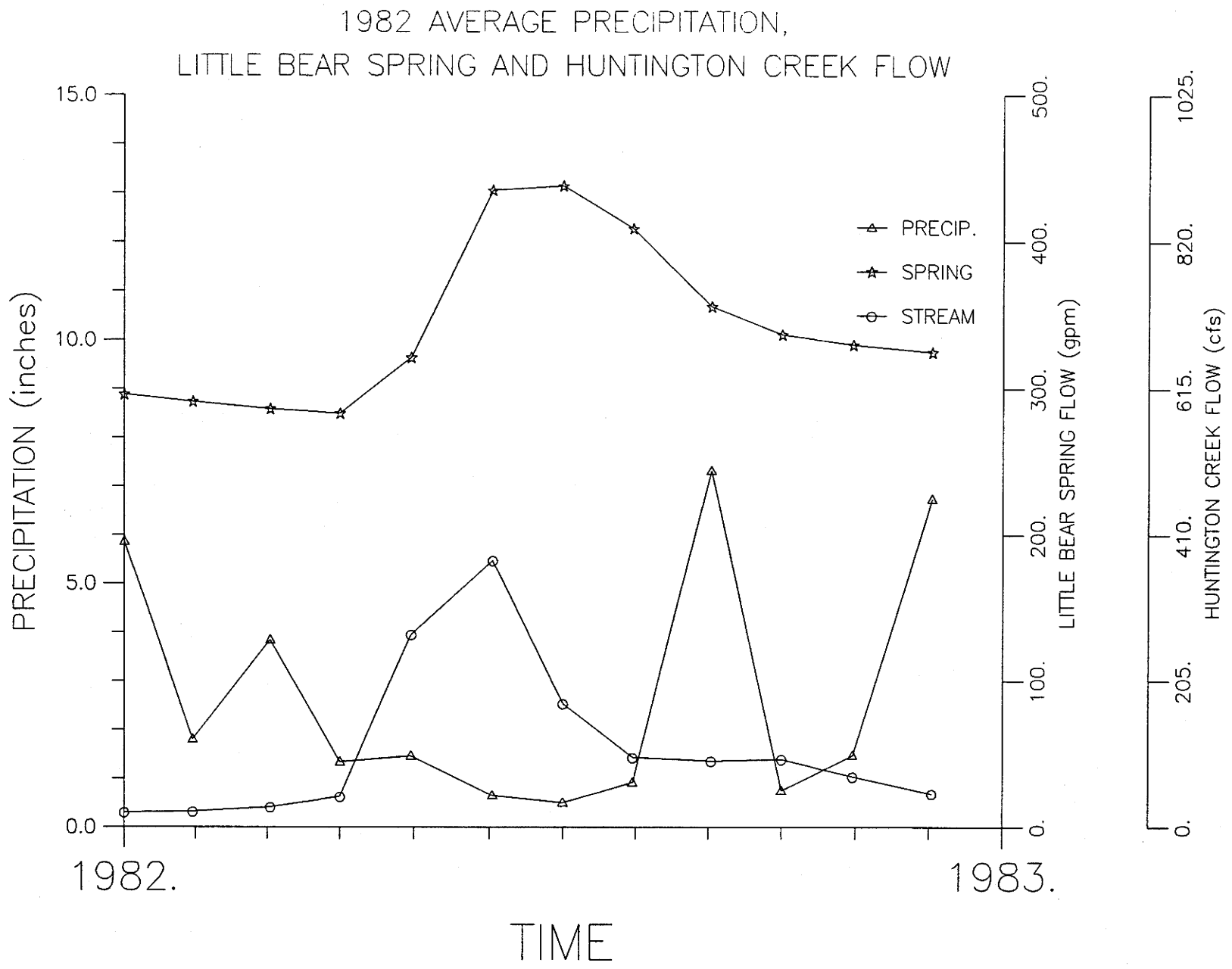

1986 AVERAGE PRECIPITATION,
BIG BEAR SPRING AND HUNTINGTON CREEK FLOW
PRECIPITATION (inches)
15.0
10.0
5.0
0.0
PRECIP.
SPRING
STREAM
BIG BEAR SPRING FLOW (gpm)
500.
400.
300.
200.
100.
0.
HUNTINGTON CREEK FLOW (cfs)
1025.
820.
615.
410.
205.
0.
1986.
1987.
TIME

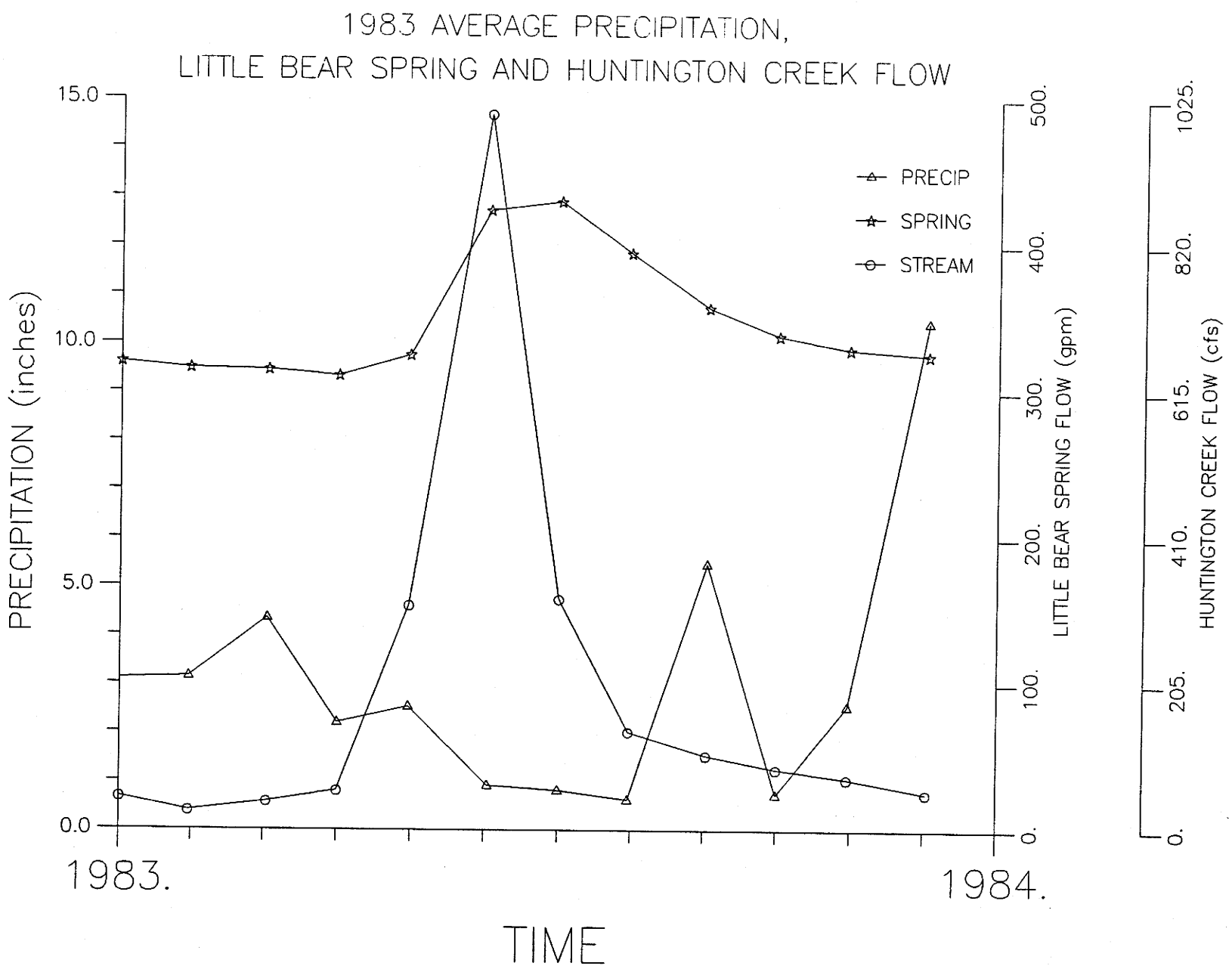

1987 AVERAGE PRECIPITATION,
BIG BEAR SPRING AND HUNTINGTON CREEK FLOW
PRECIPITATION (inches)
15.0
10.0
5.0
0.0
PRECIP.
SPRING
STREAM
BIG BEAR SPRING FLOW (gpm)
500.
400.
300.
200.
100.
0.
HUNTINGTON CREEK FLOW (cfs)
1025.
820.
615.
410.
205.
0.
1987.
1988.
TIME

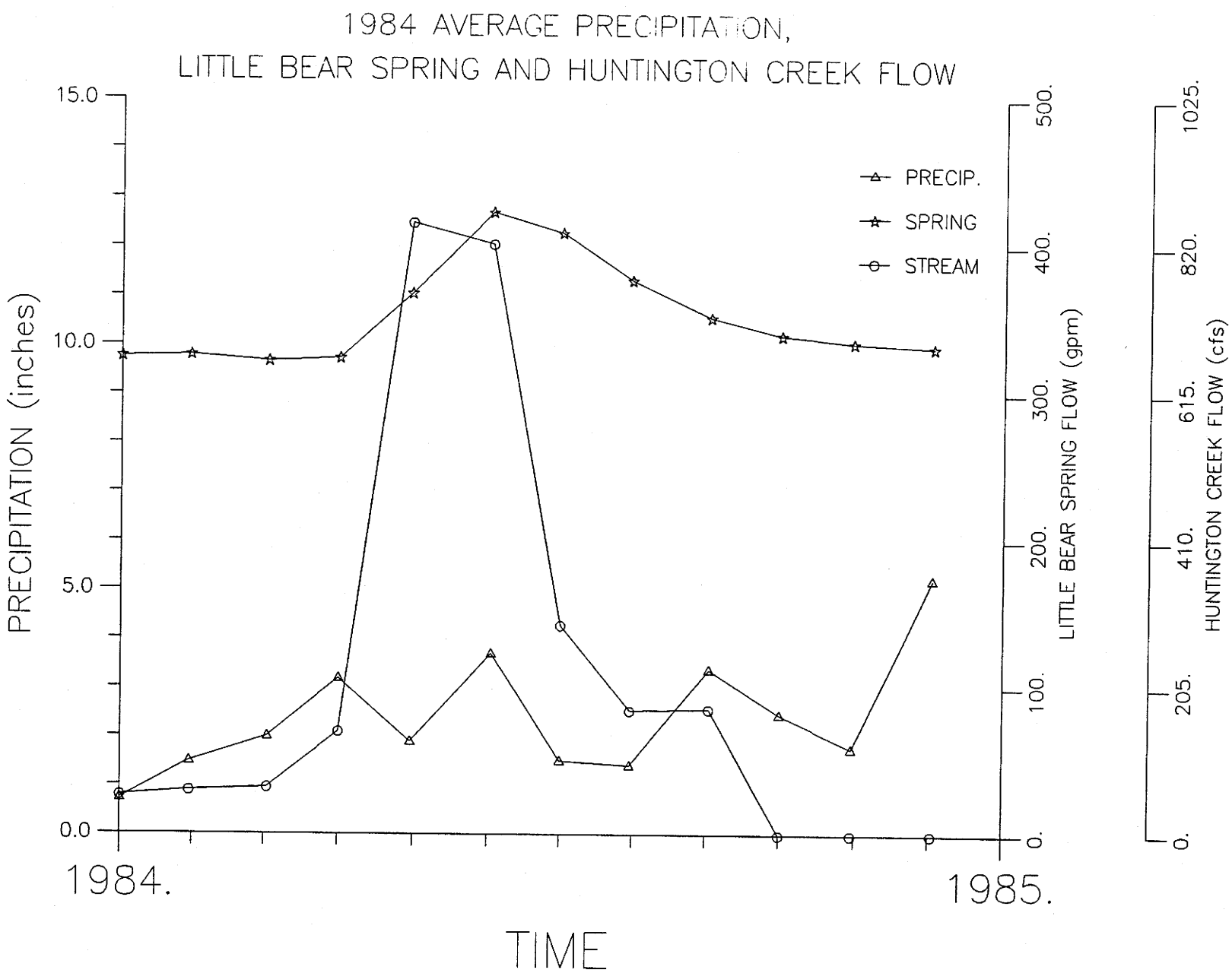

1988 AVERAGE PRECIPITATION,
BIG BEAR SPRING AND HUNTINGTON CREEK FLOW
PRECIPITATION (inches)
15.0
10.0
5.0
0.0
PRECIP.
SPRING
STREAM
BIG BEAR SPRING FLOW (gpm)
500.
400.
300.
200.
100.
0.
HUNTINGTON CREEK FLOW (cfs)
1025.
820.
615.
410.
205.
0.
1988.
1989.
TIME

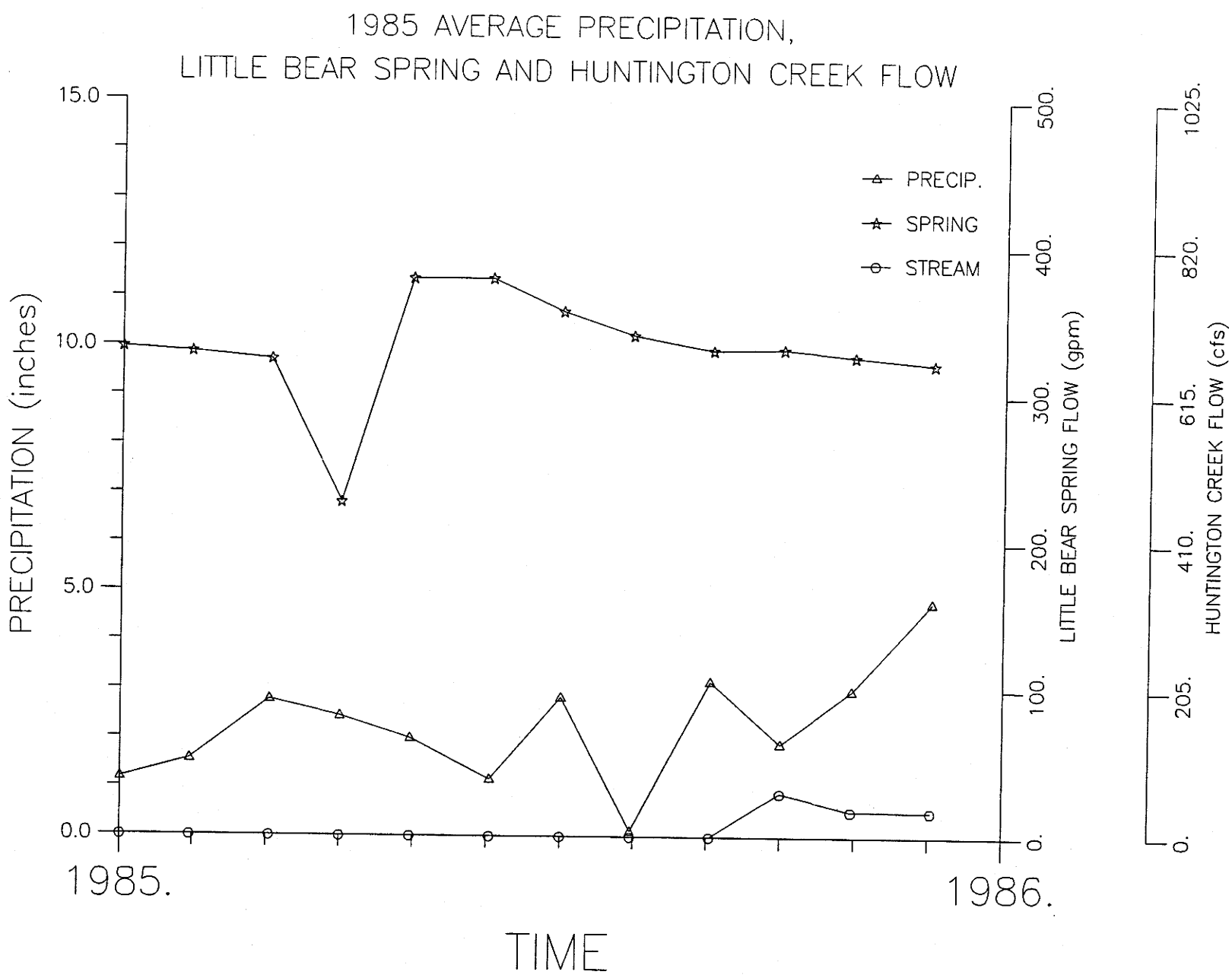

1989 AVERAGE PRECIPITATION AND
BIG BEAR SPRING FLOW
PRECIPITATION (inches)
15.0
10.0
5.0
0.0
BIG BEAR SPRING FLOW (gpm)
500.
400.
300.
200.
100.
0.
PRECIP.
SPRING
1989.
1990.
TIME

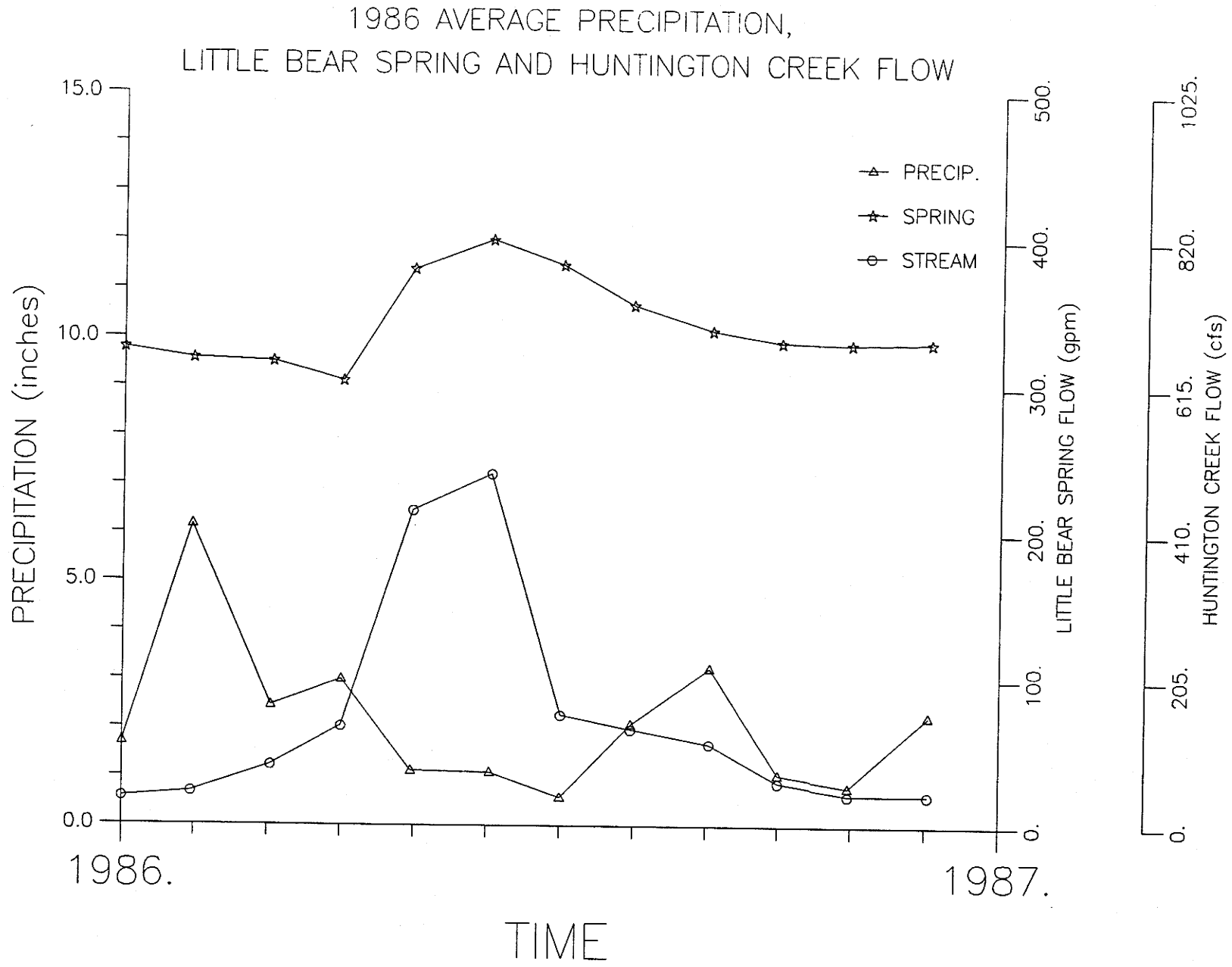

1990 AVERAGE PRECIPITATION AND
BIG BEAR SPRING FLOW
PRECIPITATION (inches)
15.0
10.0
5.0
0.0
BIG BEAR SPRING FLOW (gpm)
500.
400.
300.
200.
100.
0.
PRECIP.
SPRING
1990.
1991.
TIME

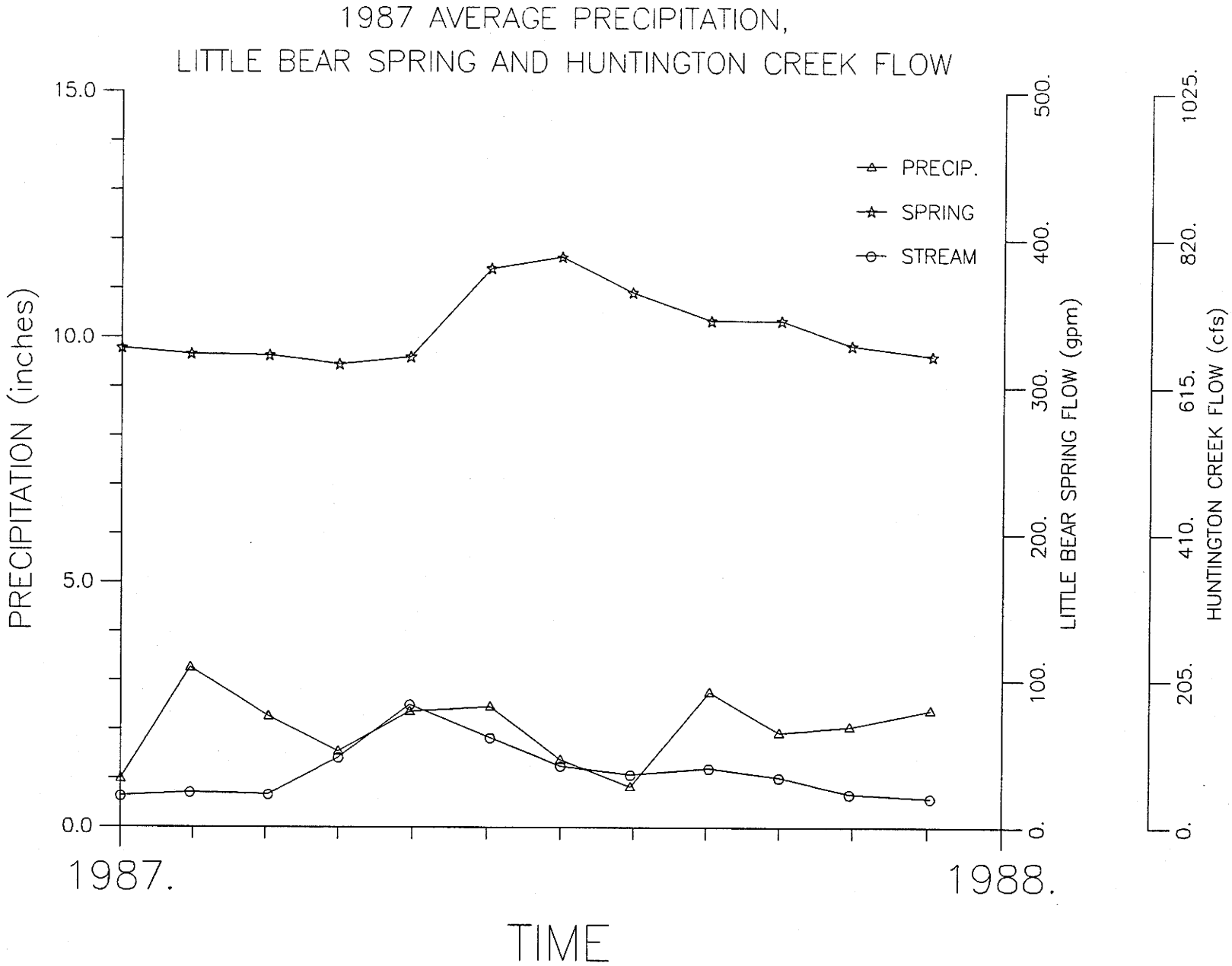

1982 AVERAGE PRECIPITATION,
LITTLE BEAR SPRING AND HUNTINGTON CREEK FLOW
PRECIPITATION (inches)
15.0
10.0
5.0
0.0
PRECIP.
SPRING
STREAM
LITTLE BEAR SPRING FLOW (gpm)
500.
400.
300.
200.
100.
0.
HUNTINGTON CREEK FLOW (cfs)
1025.
820.
615.
410.
205.
0.
1982.
1983.
TIME

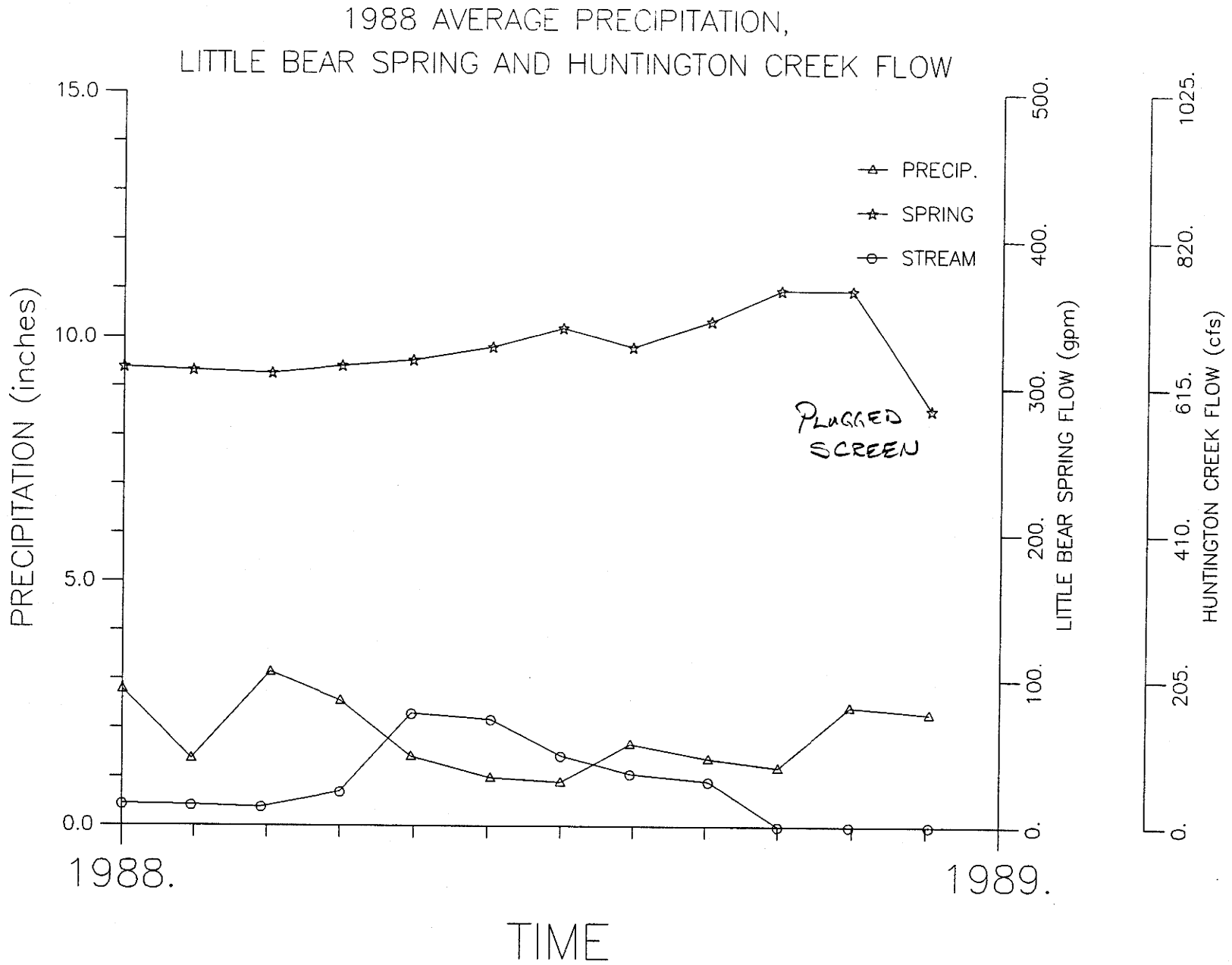

1983 AVERAGE PRECIPITATION,
LITTLE BEAR SPRING AND HUNTINGTON CREEK FLOW
PRECIPITATION (inches)
15.0
10.0
5.0
0.0
PRECIP
SPRING
STREAM
LITTLE BEAR SPRING FLOW (gpm)
500.
400.
300.
200.
100.
0.
HUNTINGTON CREEK FLOW (cfs)
1025.
820.
615.
410.
205.
0.
1983.
1984.
TIME

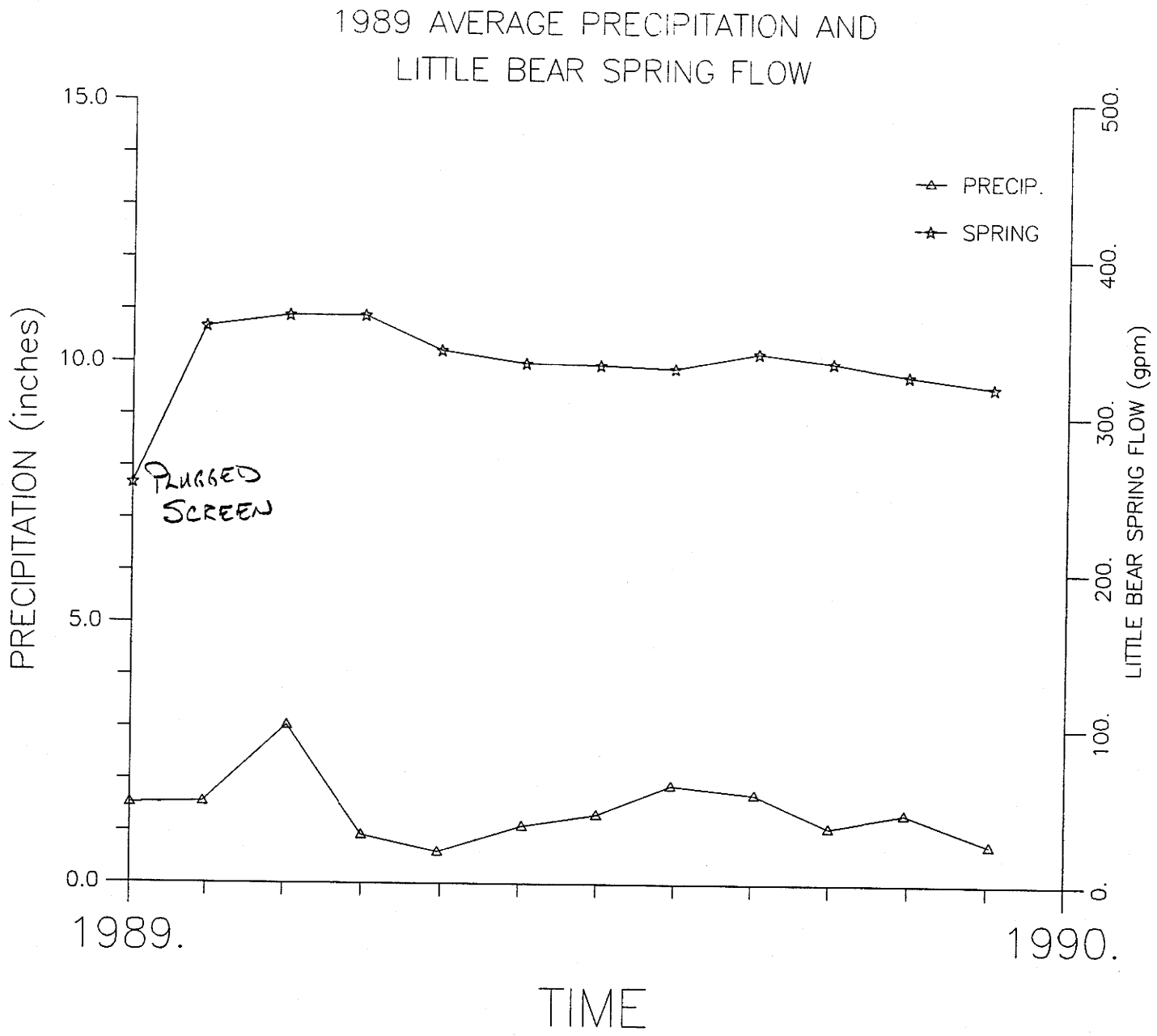

1984 AVERAGE PRECIPITATION,
LITTLE BEAR SPRING AND HUNTINGTON CREEK FLOW
PRECIPITATION (inches)
15.0
10.0
5.0
0.0
PRECIP.
SPRING
STREAM
LITTLE BEAR SPRING FLOW (gpm)
500.
400.
300.
200.
100.
0.
HUNTINGTON CREEK FLOW (cfs)
1025.
820.
615.
410.
205.
0.
1984.
1985.
TIME

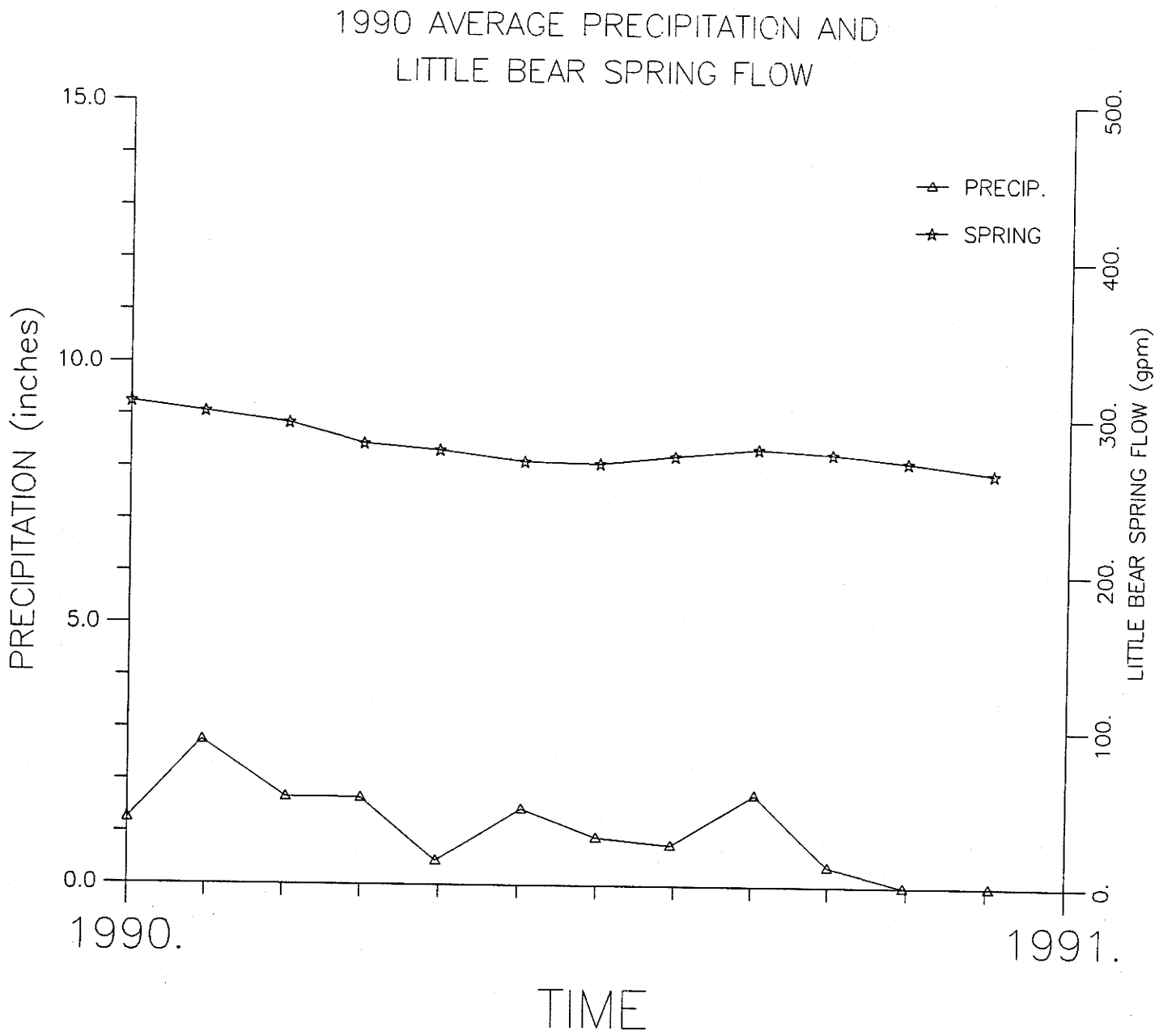

1985 AVERAGE PRECIPITATION,
LITTLE BEAR SPRING AND HUNTINGTON CREEK FLOW
PRECIPITATION (inches)
15.0
10.0
5.0
0.0
PRECIP.
SPRING
STREAM
LITTLE BEAR SPRING FLOW (gpm)
500.
400.
300.
200.
100.
0.
HUNTINGTON CREEK FLOW (cfs)
1025.
820.
615.
410.
205.
0.
1985.
1986.
TIME

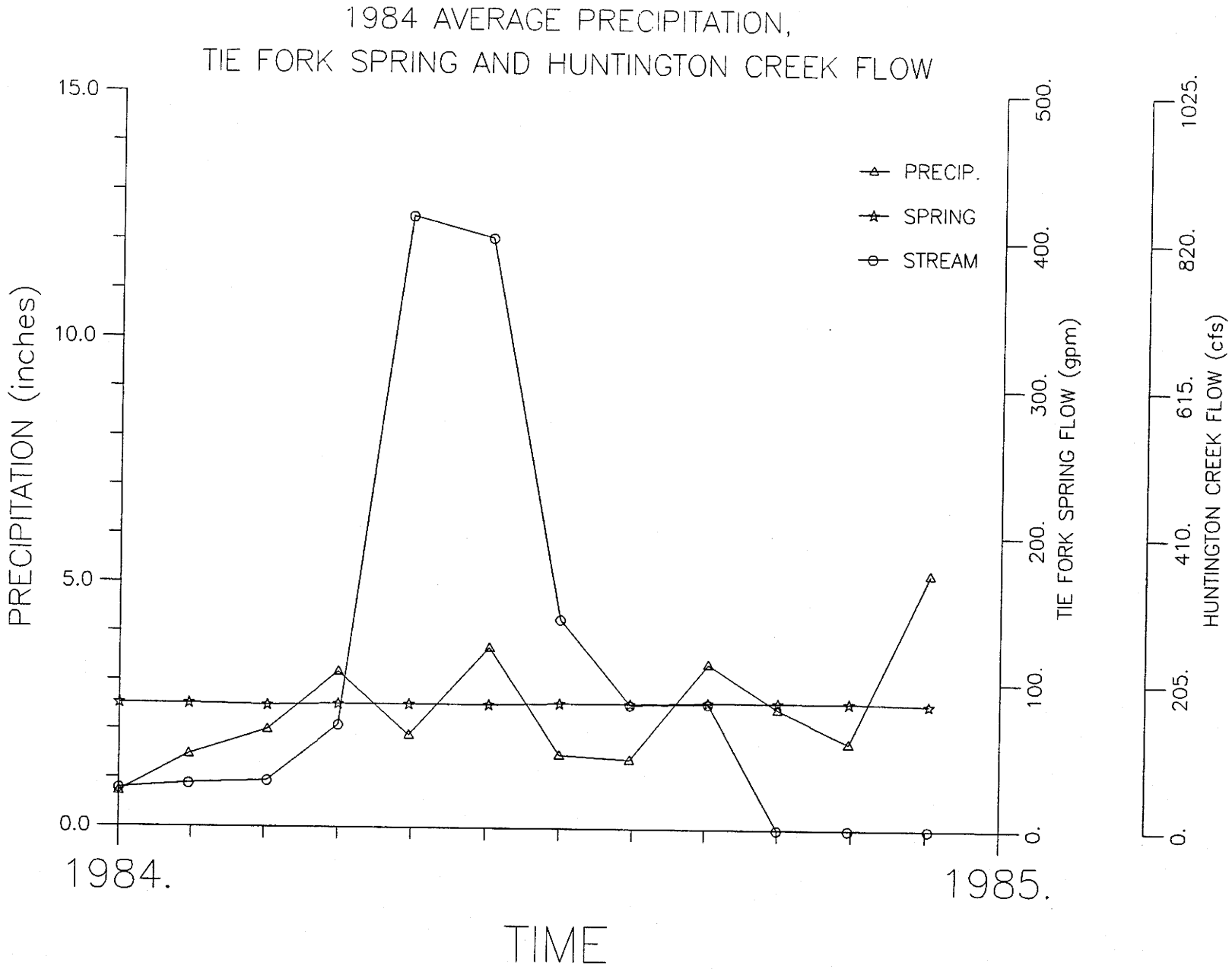

1986 AVERAGE PRECIPITATION,
LITTLE BEAR SPRING AND HUNTINGTON CREEK FLOW
PRECIPITATION (inches)
15.0
10.0
5.0
0.0
PRECIP.
SPRING
STREAM
LITTLE BEAR SPRING FLOW (gpm)
500.
400.
300.
200.
100.
0.
HUNTINGTON CREEK FLOW (cfs)
1025.
820.
615.
410.
205.
0.
1986.
1987.
TIME

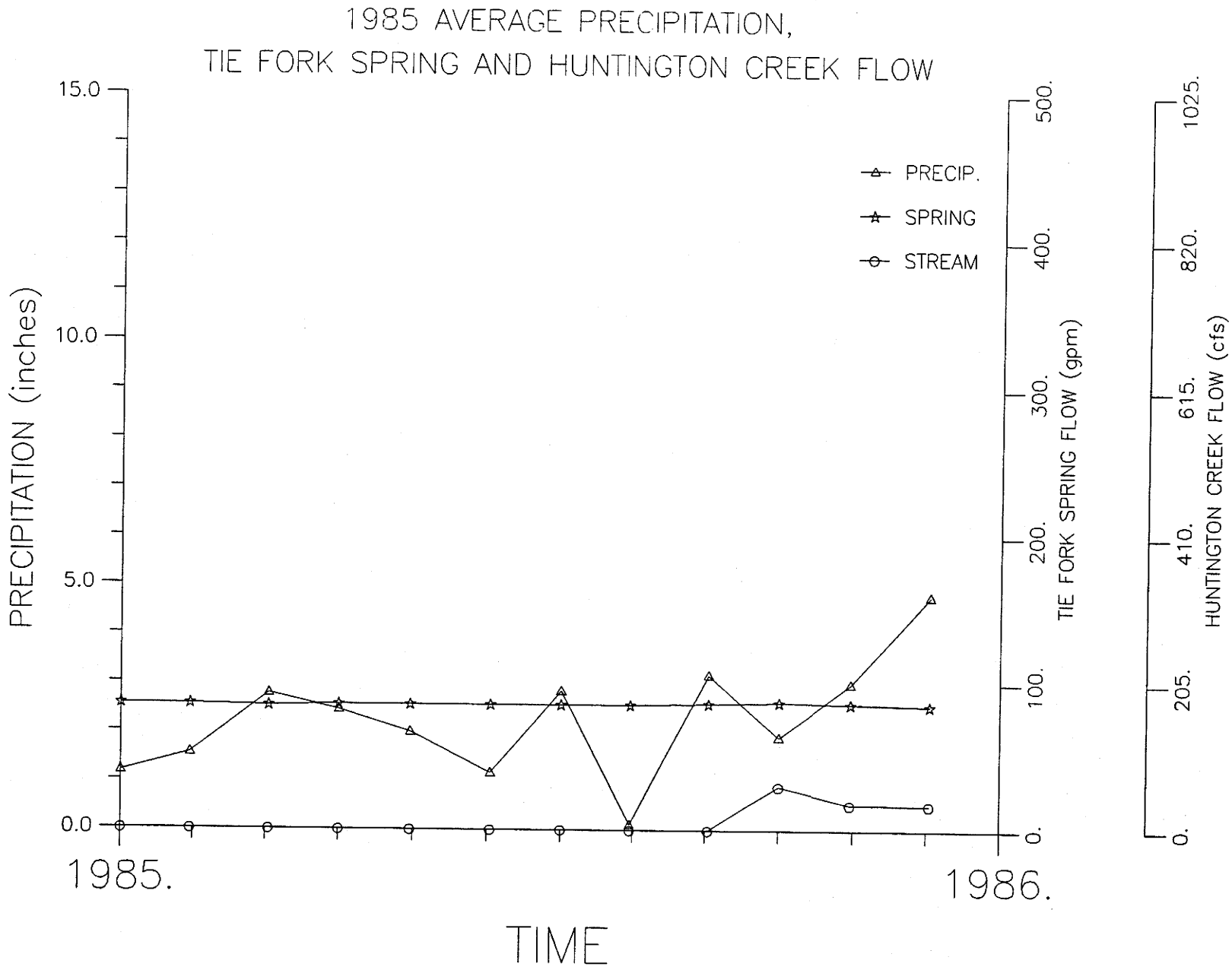

1987 AVERAGE PRECIPITATION,
LITTLE BEAR SPRING AND HUNTINGTON CREEK FLOW
PRECIPITATION (inches)
15.0
10.0
5.0
0.0
PRECIP.
SPRING
STREAM
LITTLE BEAR SPRING FLOW (gpm)
500.
400.
300.
200.
100.
0.
HUNTINGTON CREEK FLOW (cfs)
1025.
820.
615.
410.
205.
0.
1987.
1988.
TIME

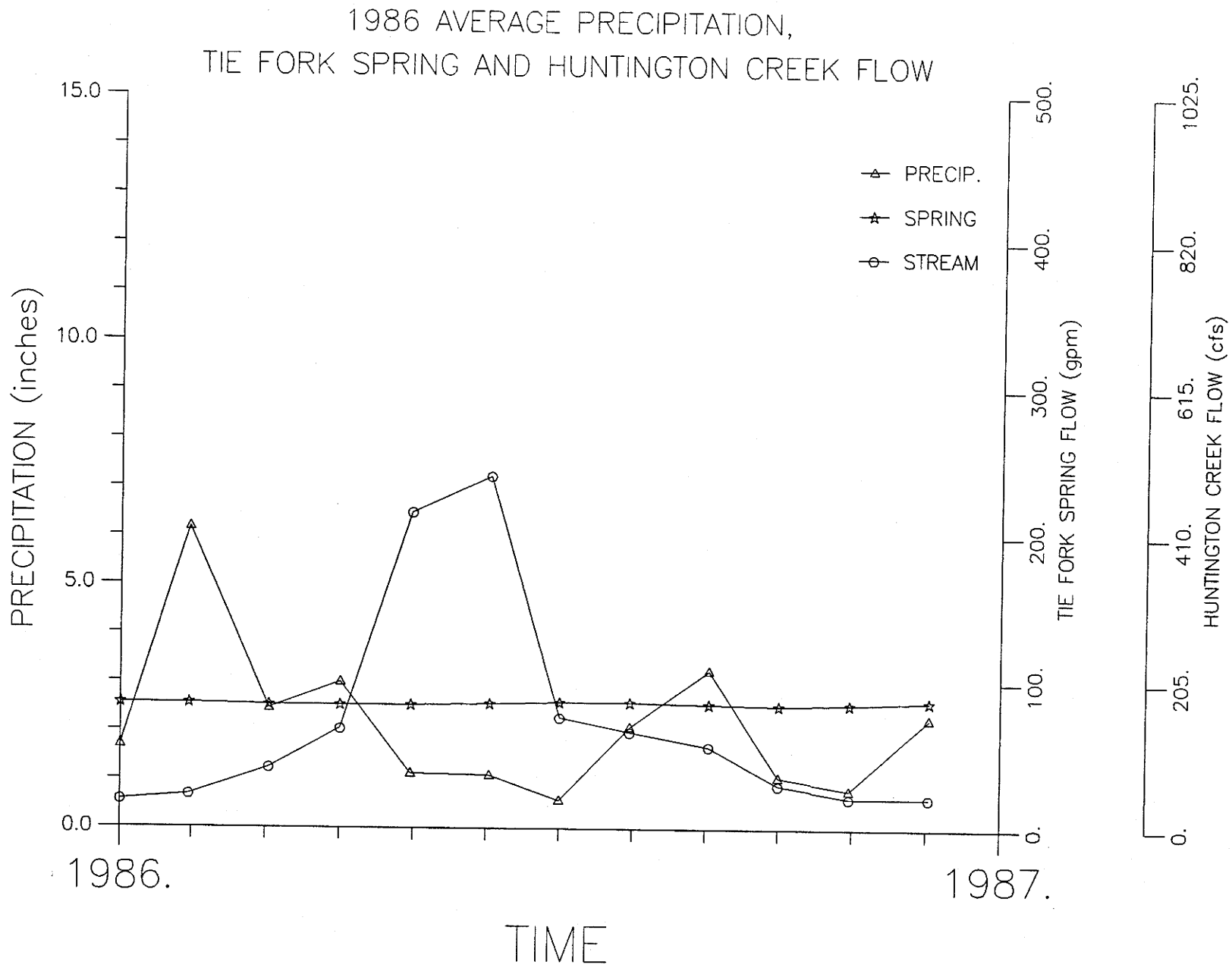

1988 AVERAGE PRECIPITATION,
LITTLE BEAR SPRING AND HUNTINGTON CREEK FLOW
PRECIPITATION (inches)
15.0
10.0
5.0
0.0
PRECIP.
SPRING
STREAM
PLUGGED SCREEN
LITTLE BEAR SPRING FLOW (gpm)
500.
400.
300.
200.
100.
0.
HUNTINGTON CREEK FLOW (cfs)
1025.
820.
615.
410.
205.
0.
1988.
1989.
TIME

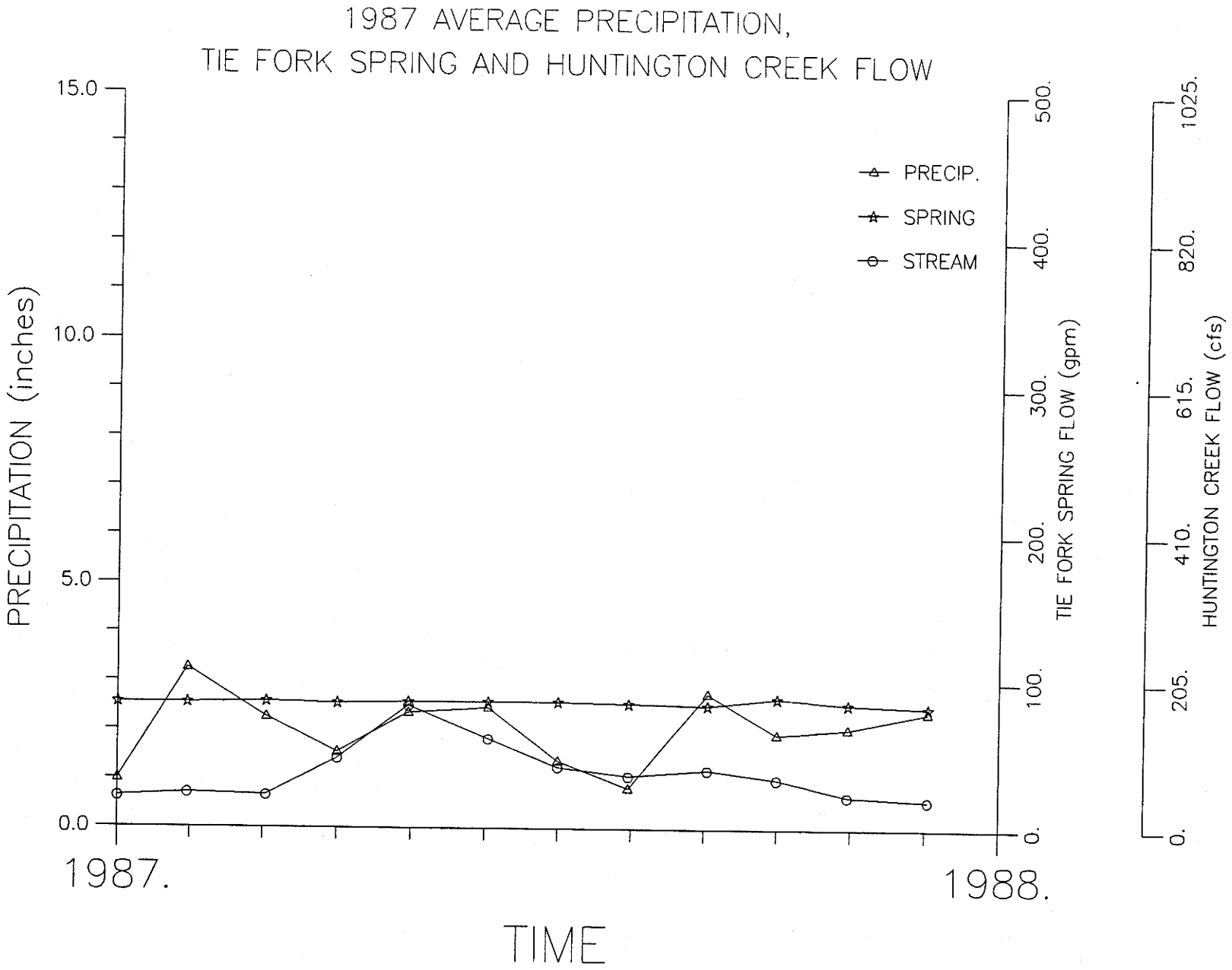

1989 AVERAGE PRECIPITATION AND
LITTLE BEAR SPRING FLOW
PRECIPITATION (inches)
15.0
10.0
5.0
0.0
LITTLE BEAR SPRING FLOW (gpm)
500.
400.
300.
200.
100.
0.
PRECIP.
SPRING
PLUGGED
SCREEN
1989.
1990.
TIME

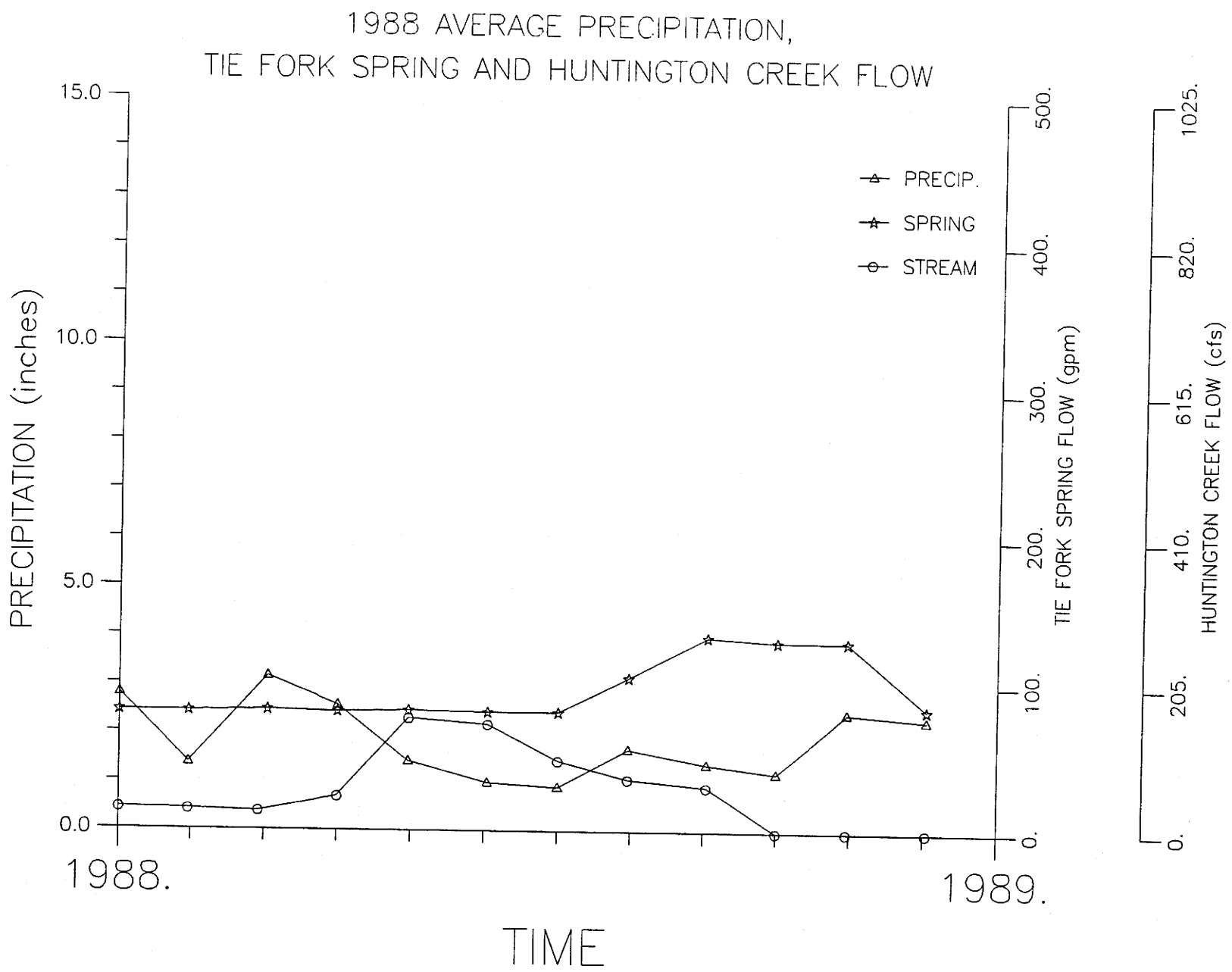

1990 AVERAGE PRECIPITATION AND
LITTLE BEAR SPRING FLOW
PRECIPITATION (inches)
15.0
10.0
5.0
0.0
LITTLE BEAR SPRING FLOW (gpm)
500.
400.
300.
200.
100.
0.
PRECIP.
SPRING
1990.
1991.
TIME

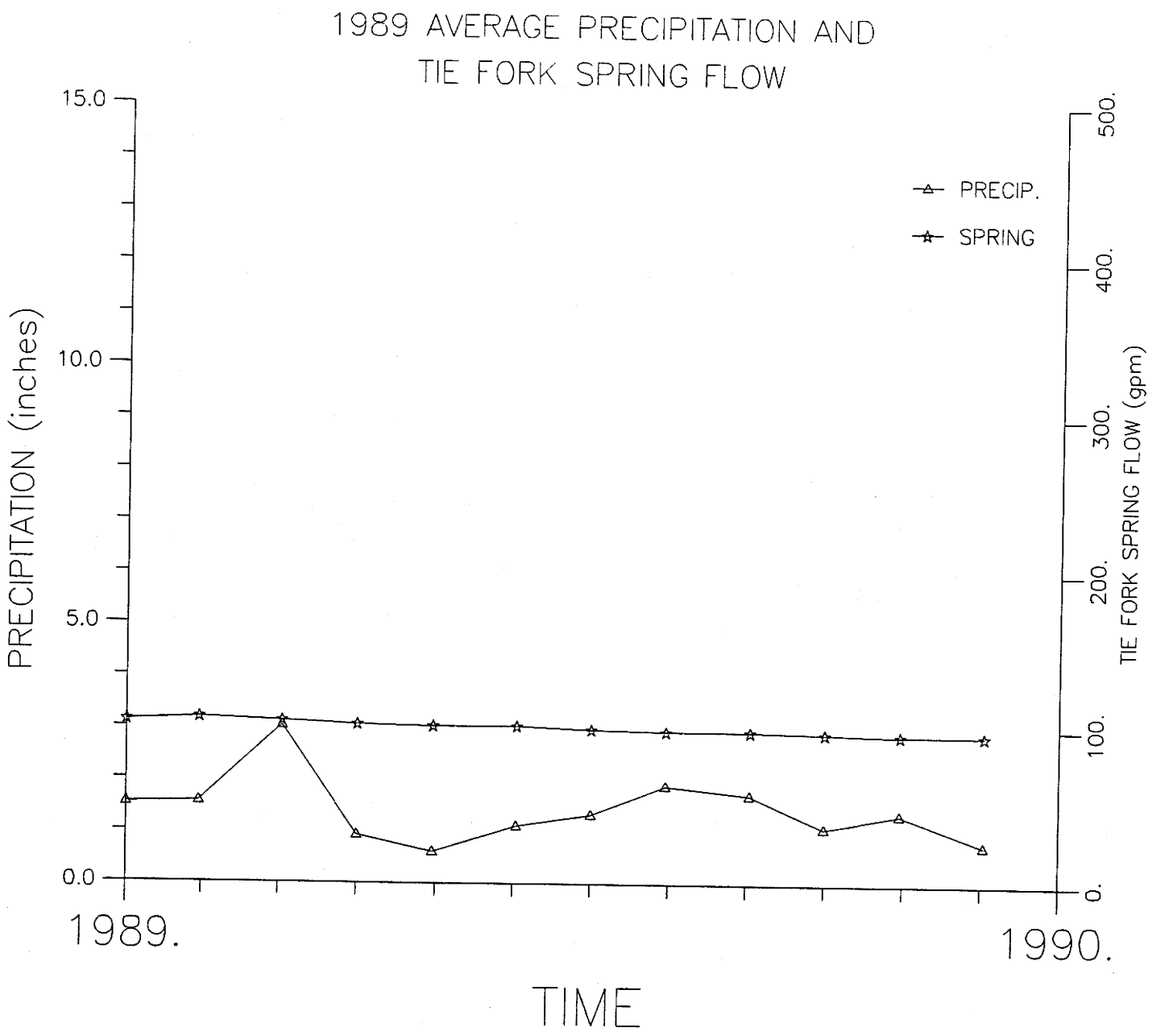

1984 AVERAGE PRECIPITATION,
TIE FORK SPRING AND HUNTINGTON CREEK FLOW
PRECIPITATION (inches)
15.0
10.0
5.0
0.0
PRECIP.
SPRING
STREAM
TIE FORK SPRING FLOW (gpm)
500.
400.
300.
200.
100.
0.
HUNTINGTON CREEK FLOW (cfs)
1025.
820.
615.
410.
205.
0.
1984.
1985.
TIME

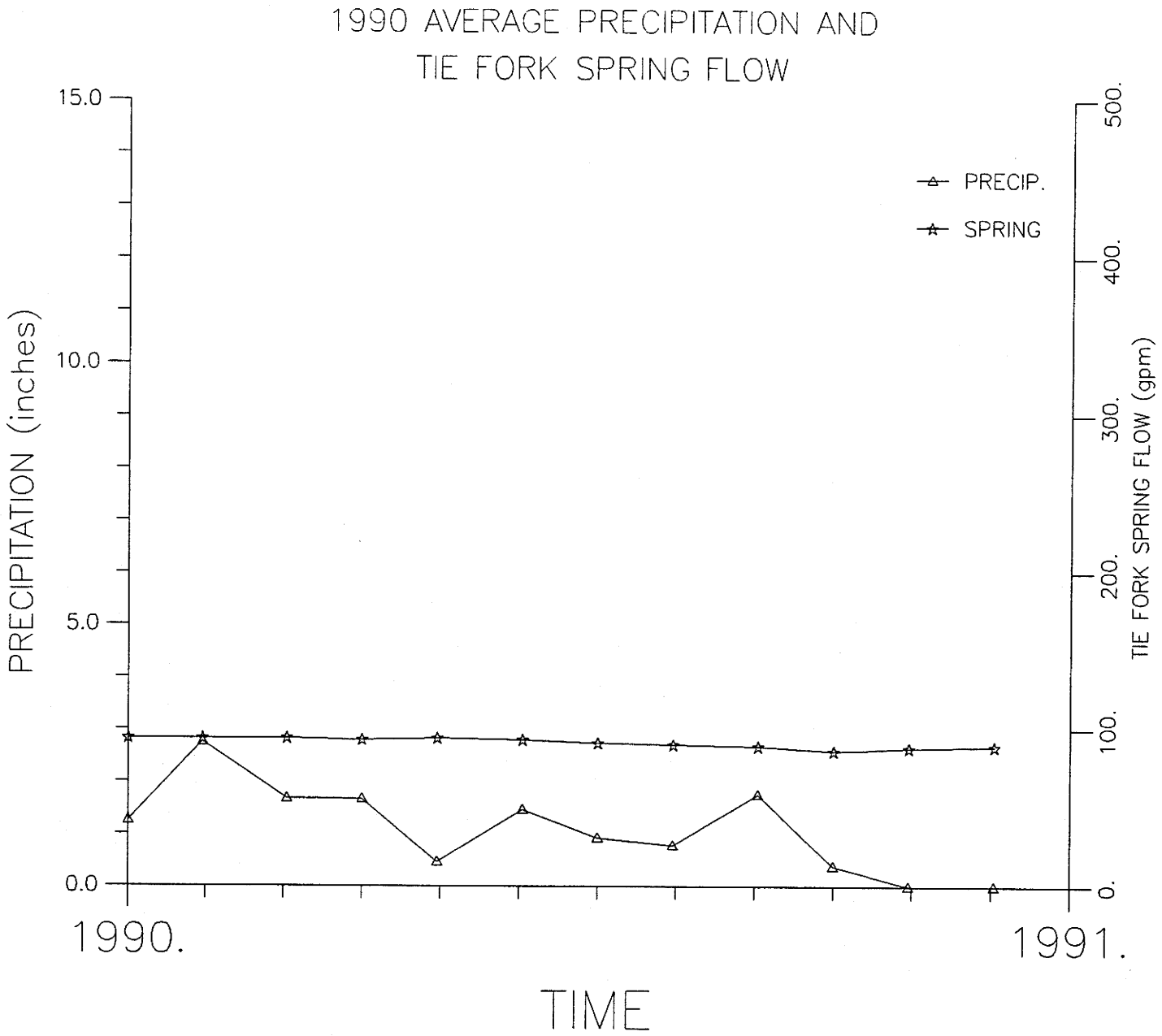

1985 AVERAGE PRECIPITATION,
TIE FORK SPRING AND HUNTINGTON CREEK FLOW
PRECIPITATION (inches)
15.0
10.0
5.0
0.0
PRECIP.
SPRING
STREAM
TIE FORK SPRING FLOW (gpm)
500.
400.
300.
200.
100.
0.
HUNTINGTON CREEK FLOW (cfs)
1025.
820.
615.
410.
205.
0.
1985.
1986.
TIME

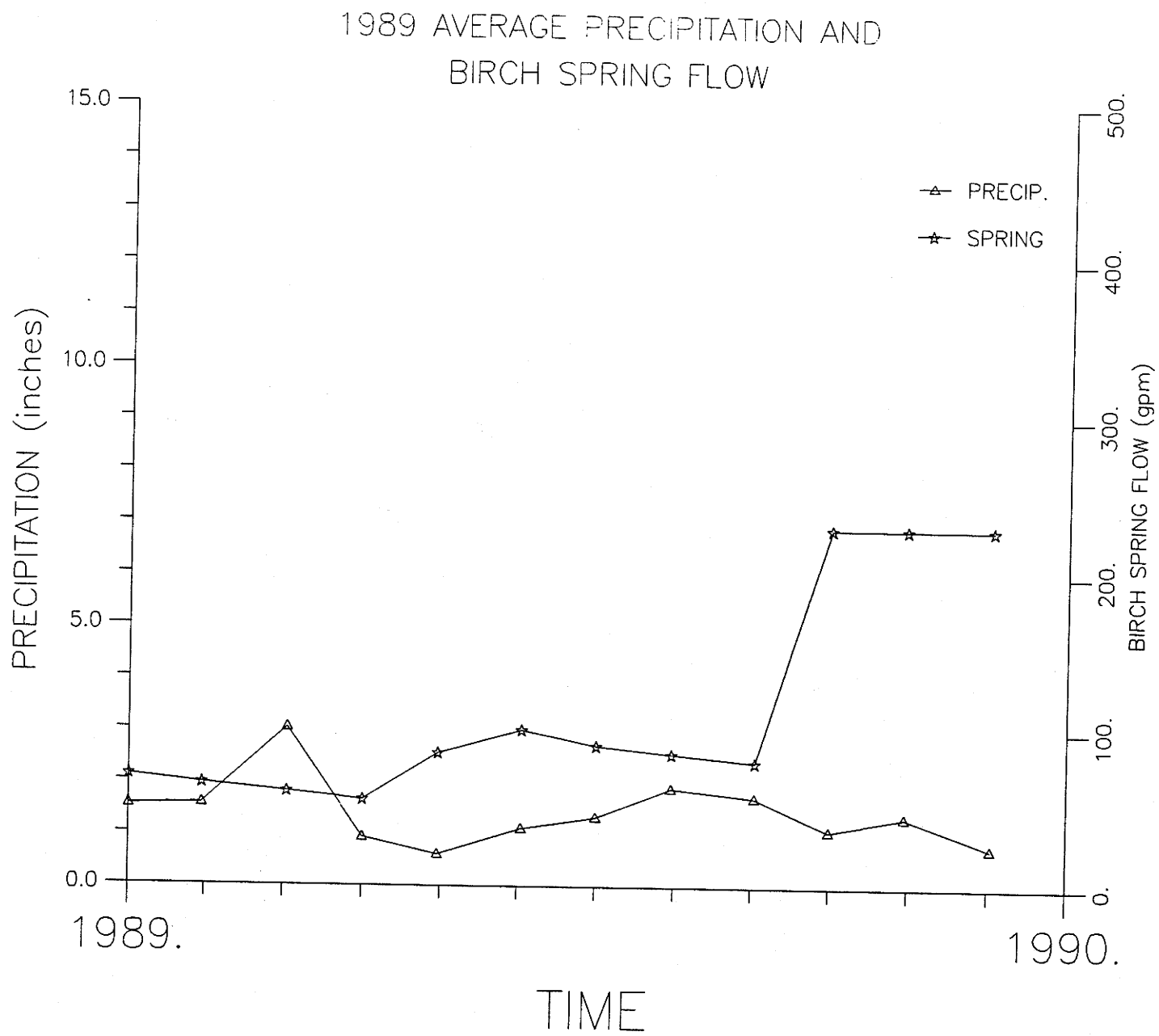

1986 AVERAGE PRECIPITATION,
TIE FORK SPRING AND HUNTINGTON CREEK FLOW
PRECIPITATION (inches)
15.0
10.0
5.0
0.0
PRECIP.
SPRING
STREAM
TIE FORK SPRING FLOW (gpm)
500.
400.
300.
200.
100.
0.
HUNTINGTON CREEK FLOW (cfs)
1025.
820.
615.
410.
205.
0.
1986.
1987.
TIME

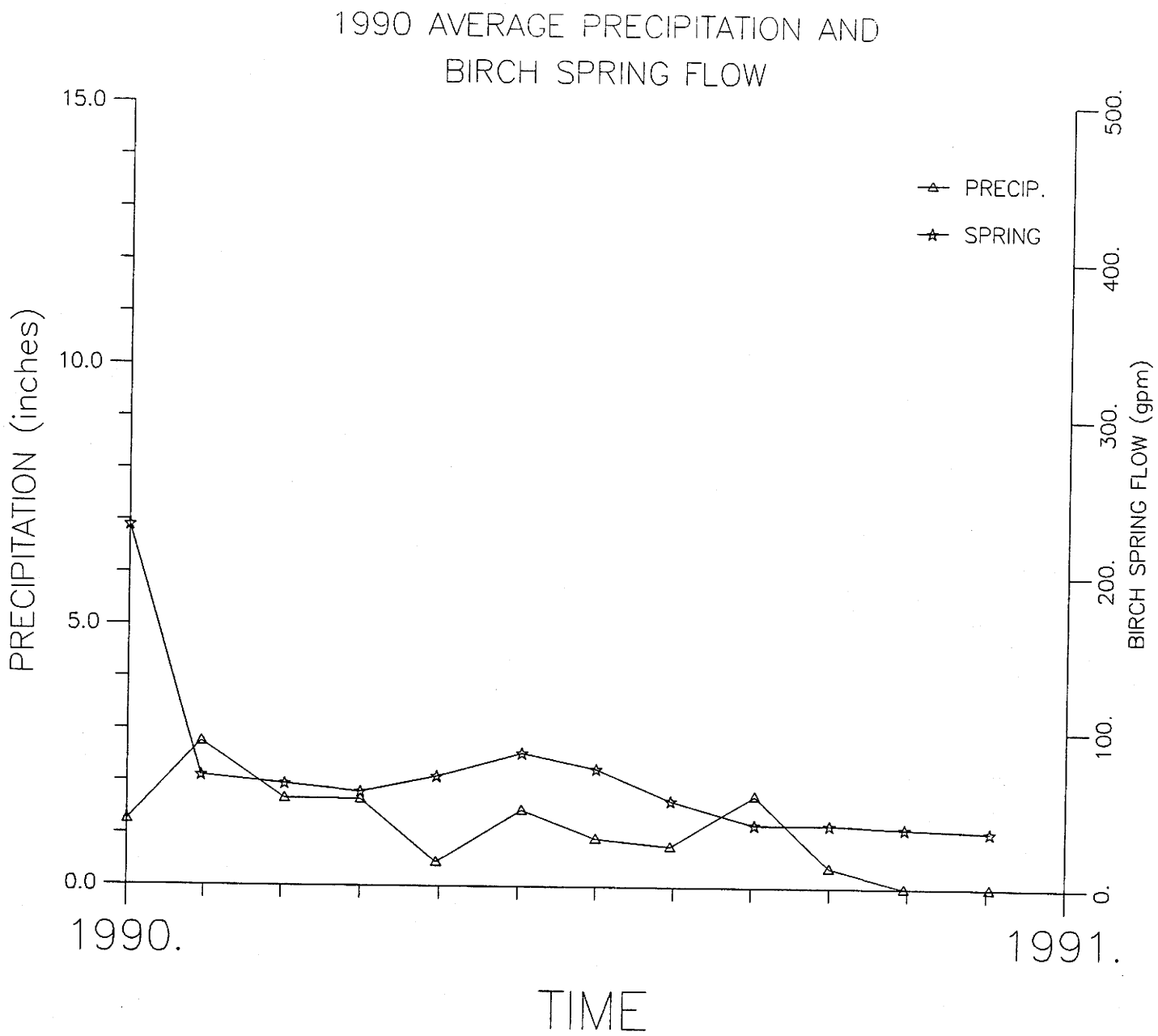

1987 AVERAGE PRECIPITATION,
TIE FORK SPRING AND HUNTINGTON CREEK FLOW
PRECIPITATION (inches)
15.0
10.0
5.0
0.0
PRECIP.
SPRING
STREAM
TIE FORK SPRING FLOW (gpm)
500.
400.
300.
200.
100.
0.
HUNTINGTON CREEK FLOW (cfs)
1025.
820.
615.
410.
205.
0.
1987.
1988.
TIME


1988 AVERAGE PRECIPITATION,
TIE FORK SPRING AND HUNTINGTON CREEK FLOW
PRECIPITATION (inches)
15.0
10.0
5.0
0.0
PRECIP.
SPRING
STREAM
TIE FORK SPRING FLOW (gpm)
500.
400.
300.
200.
100.
0.
HUNTINGTON CREEK FLOW (cfs)
1025.
820.
615.
410.
205.
0.
1988.
1989.
TIME


1989 AVERAGE PRECIPITATION AND
TIE FORK SPRING FLOW
PRECIPITATION (inches)
15.0
10.0
5.0
0.0
TIE FORK SPRING FLOW (gpm)
500.
400.
300.
200.
100.
0.
PRECIP.
SPRING
1989.
1990.
TIME


1990 AVERAGE PRECIPITATION AND
TIE FORK SPRING FLOW
PRECIPITATION (inches)
15.0
10.0
5.0
0.0
TIE FORK SPRING FLOW (gpm)
500.
400.
300.
200.
100.
0.
PRECIP.
SPRING
1990.
1991.
TIME


1989 AVERAGE PRECIPITATION AND
BIRCH SPRING FLOW
PRECIPITATION (inches)
15.0
10.0
5.0
0.0
BIRCH SPRING FLOW (gpm)
500.
400.
300.
200.
100.
0.
PRECIP.
SPRING
1989.
1990.
TIME


1990 AVERAGE PRECIPITATION AND
BIRCH SPRING FLOW
PRECIPITATION (inches)
15.0
10.0
5.0
0.0
BIRCH SPRING FLOW (gpm)
500.
400.
300.
200.
100.
0.
PRECIP.
SPRING
1990.
1991.
TIME

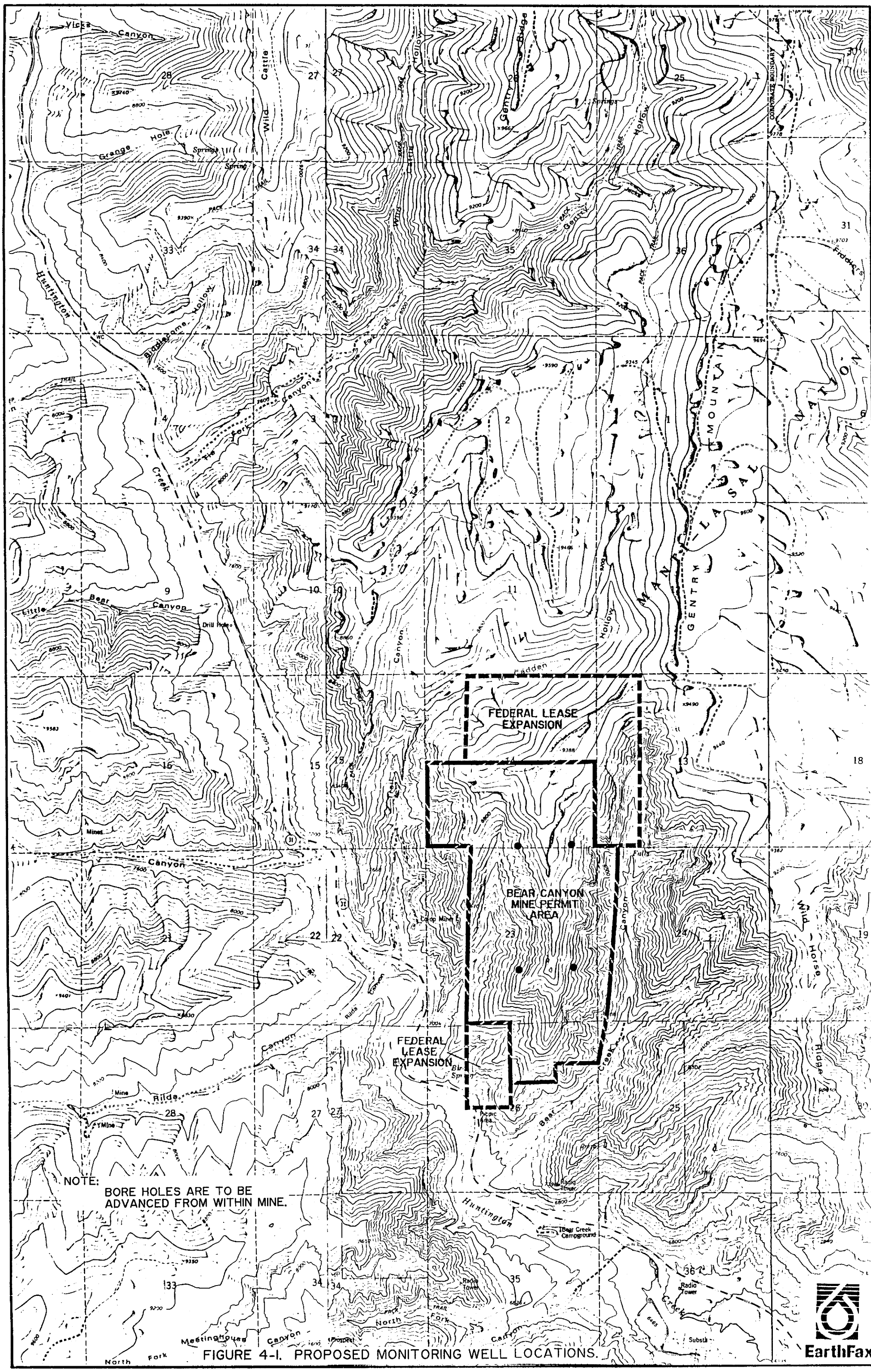


FIGURE 4-I. PROPOSED MONITORING WELL LOCATIONS.

CERTIFICATE OF SERVICE

I hereby certify that I caused a true and correct copy of the foregoing SECOND EXTENSION OF TIME FOR SUPPLEMENTING THE RECORD IN THE INFORMAL HEARING to be mailed first class, postage prepaid, this 22nd day of February, 1991, to the following:

Mr. Darrel V. Leamaster
Castle Valley Special Service District
P.O. Box 877
Castle Dale, Utah 84513

Mr. Menco Copinga
North Emery Water Users Association
Box 418
Elmo, Utah 84521

Mr. Varden Willson
Huntington - Cleveland Irrigation Company
55 North Main
Huntington, Utah 84528

Mr. Carl Kingston, Esq.
53 West Angelo Avenue
P.O. Box 15809
Salt Lake City, Utah 84115

Mr. Scott Johansen, Esq.
Huntington City Attorney
P.O. Box 1099
Castle Dale, Utah 84513

Mr. Jeffrey Appel, Esq.
Haley & Stolebarger
10th Floor Walker Center
175 South Main
Salt Lake City, 84111-1956

Lynda Jenson

BEFORE THE DIVISION OF OIL, GAS AND MINING
DEPARTMENT OF NATURAL RESOURCES
STATE OF UTAH

---ooOoo---

IN THE MATTER OF THE PERMIT RENEWAL FOR THE CO-OP MINING COMPANY'S BEAR CANYON MINE, EMERY COUNTY, UTAH	:	NOTICE OF INFORMAL HEARING
	:	CAUSE NO. ACT/015/025

---ooOoo---

THE STATE OF UTAH TO ALL PERSONS INTERESTED IN THE ABOVE ENTITLED MATTER.

Notice is hereby given that the Division of Oil, Gas and Mining will conduct an informal hearing on Tuesday, February 5, 1991 at 6:30 p.m. at the Emery County Courthouse, Second Floor, 95 East Main, Castle Dale, Utah.

The informal hearing will be conducted in accordance with Utah Code Ann. § 40-10-13 (1953, as amended) and Utah Administrative R.R. R614-300-122 and 123 (1990).

The permittee, Co-Op Mining Company, is currently operating the Bear Canyon Mine, an underground coal mine in Emery County, Utah. Permittee has applied for renewal of the permit and also revision of the permit to include additional land for mining. Objections including, but not limited to, issues of water rights and impact of mining on the quality and quantity of Big Bear Canyon Spring, Birch Springs, and related surface/subsurface hydrology have been raised during the public comment period.

Persons interested in this matter may participate pursuant to Rule R614-300-123. The permit, repermit application, subsequent public comments, and request for informal hearing may be inspected in the office of the undersigned, 3 Triad Center, Suite 350, 355 West North Temple, Salt Lake City, Utah, (801) 538-5340.

DATED this 8th day of January, 1991.

STATE OF UTAH
DIVISION OF OIL, GAS AND MINING

Dianne R. Nielson

Dianne R. Nielson
Director

INFORMAL HEARING

ACT/015/025

FEBRUARY 5, 1991
EMERY COUNTY COURTHOUSE

PUBLICATION OF NOTICE

Newspaper Agency Corporation
Emery County Progress
Emery County Courthouse - Posted

CERTIFIED NOTICE SENT TO THE FOLLOWING:

Darrel V. Leamaster, P.E. P 540 714 076
District Manager
Castle Valley Special Service District
P. O. Box 877
Castle Dale, Utah 84513 381-5333

Ben Grimes, Environmental Coordinator P 540 714 077
Plateau Mining Company
P. O. Drawer PMC
Price, Utah 84501 637-2875 (263)

Menco Copinga, President P 540 714 078
North Emery Water Users Association
Box 418
Elmo, Utah 84521 653-2649

Wendell Owen P 540 714 079
Co-Op Mining Company
P. O. Box 1245
Huntington, Utah 84528 381-2450

Sherrel Ward P 540 714 080
Board of Directors
Huntington-Cleveland Irrigation Company
Box 395
Cleveland, Utah 84518 687-2453

Varden Willson, Secretary P 540 714 -081
Huntington-Cleveland Irrigation Company
55 North Main
Huntington, Utah 84528 687-2505

Joseph O. Kingston, President P 540 714 082
C.O.P. Coal Development Company, Inc.
53 West Angelo Avenue
Salt Lake City, Utah 84115 486-1458

Elden Kingston P 540 714 083
Mountain Coin Machine Dist.
3753 South State Street
Salt Lake City, Utah 84115 262-5493

Kimly C. Mangum, P.E. P 540 714 084
Mangum Engineering Consultants
388 East Boynton Road
Kaysville, Utah 84037 544-3641

COPIES OF NOTICE SENT TO:

John R. Greenig
Official Court Reporter
Carbon County Court Complex
Price, Utah 84501 637-0180

Leslie Bolinder
Commissioner's Office
P. O. Box 629
Castle Dale, Utah 84513 381-2119

Gregory P. Williams, Chairman
Board of Oil, Gas and Mining
VanCott, Bagley, Cornwall & McCarthy
50 South Main Street
Suite 1600
Salt Lake City, Utah 84144

Don Ostler - Bureau of Water Pollution Control, Department of Health

Bob Morgan - Water Rights/Salt Lake office

Mark Page, Area Engineer
Division of Water Rights
P. O. Box 718
Price, Utah 84501

Timothy H. Provan, Director, Wildlife Resources/Salt Lake office

Brent Stettler
Wildlife Resources
455 West Railroad Avenue
Price, Utah 84501

Larry Anderson - Water Resources/Salt Lake Office

Robert H. Hagen, Director
Albuquerque Field Office
Office of Surface Mining
  Reclamation and Enforcement
Suite 310, Silver Square
625 Silver Avenue, SW
Albuquerque, New Mexico 87102

Gene Nodine, District Manager
Bureau of Land Management
82 East Dogwood
P. O. Box 970
Moab, Utah 84532

Jim Dryden, Area Manager
Bureau of Land Management
San Rafael Resource Area
900 North 700 East
Price, Utah 84501

George Morris
Forest Supervisor
U. S. Forest Service
Manti-LaSal National Forest
599 West Price River Road
Price, Utah 84501

INFORMAL HEARING
CO-OP MINING COMPANY
BEAR CANYON MINE - ACT/015/025

February 5, 1991

NAME	ADDRESS	REPRESENTING	PERSONS WANTING TO MAKE COMMENTS: YES	NO
				☒
Ben Grimes	PO Drawer PMC Price	CPMC		
Wendell Cann	Box 1245 Huntington	Co-op Mining	☒ ✓	
Paul F Kingston	53 West Angelo Ave SLC, Ut.	Co-op Mine MFC	☒ ✓	
Kenneth C Mangum	388 E. Boynton PO Kaysville UT 84037		☒ ✓	
Bill Stoddard	P.O. Box 300 Huntington	Co-op Mine	☒ ✓	
Paul Kingston	53 West Angelo Ave SLC	Coop Mine		☒
Glen Jenkins	SLC Ut			
Lucille Wilson	Huntington Cleveland Irrg. Co.		☒ ✓	
Ellen Kingston	SLC Ut			☒
Dennis Kelly	Price Ut	Forest Service		☒
Becky Hammond	"	"		☒
Shirley Tullen	Elmo Ut	NEWUA		☒
Paul Kimball	Ferron, Utah	CVSSD		☒
Jeffrey Appel	SLC	NEWUA	☒ ✓	

INFORMAL HEARING
CO-OP MINING COMPANY
BEAR CANYON MINE - ACT/015/025

February 5, 1991

NAME	ADDRESS	REPRESENTING	PERSONS WANTING TO MAKE COMMENTS: YES	NO
Darrel Leamaster	Huntington	Castle Valley	☒ ✓	☐
Willis K Wilson	"	NEWU	☐	☒
PAMELA GRUBAUGH-LITTIG	DOGM		☐	☐
Tom Munson	DOGM		☐	☐
Bevank Wilson	NEWU-Board		☐	☐
Kay Jensen	NEWUA-Board		☐	☐
FloAnn Wilson	Huntington		☐	☐
Letahna Wilson	Huntington Utah		☐	☒
Scott Johansen	(Huntington City Attorney) Box 1099 CASTLE DALE 84513		☒ ✓	☐
Eric Klotz	SLC	Div. of Water Resources	☐	☒
LaRen Lafley	Elmo Utah	NEWUA	☐	☒
Craig Johansen	Castle Dale	J&T Eng.	☐	☒
David Ariotti	Env. Health		☐	☐
Marvin Thayn	Elmo Town		☐	☐
Memo Cupings	NEWU		☒ ✓	☐

INFORMAL HEARING
CO-OP MINING COMPANY
BEAR CANYON MINE - ACT/015/025

February 5, 1991

NAME	ADDRESS	REPRESENTING	PERSONS WANTING TO MAKE COMMENTS YES	NO
Jack Stoyanoff	Huntington	NEWUA		✓
Eugene Johnson	C Dale	Special Service		✓
Grant Wilson	Huntington	City		✓
Doyle Jensen	ELMO	TOWN		✓
Bill Wakmack	Price	Div. Water Rights		✓
Mark Page	Price	Div Water Rights		✓
Ronald Van Wagoner	Cleveland, Ut			✓
Peggy Foote	Huntington			

INFORMAL HEARING
CO-OP MINING COMPANY
BEAR CANYON MINE - ACT/015/025

February 5, 1991

NAME	ADDRESS	REPRESENTING	PERSONS WANTING TO MAKE COMMENTS YES	NO
Dixie Thompson	Box 574 Orangeville	County Commission		X

ORIGINAL

RECEIVED
MAR 1 1 1991
DIVISION OF
OIL GAS & MINING

BEFORE THE DIVISION OF OIL, GAS AND MINING
DEPARTMENT OF NATURAL RESOURCES
STATE OF UTAH

IN THE MATTER OF THE PERMIT RENEWAL FOR THE CO-OP MINING COMPANY'S BEAR CANYON MINE, EMERY COUNTY, UTAH	*	RESPONSE TO OBJECTIONS TO PERMIT RENEWAL
	*	CAUSE NO. ACT/015/025

Co-op Mining Company ("Co-op") has applied for a renewal of its mining and reclamation permit and in addition, has asked that its present permit area be expanded. Written objections to Co-op's application were filed by Castle Valley Special Services District, North Emery Water Users Association and Huntington-Cleveland Irrigation Company. By letter dated November 12, 1990, Huntington-Cleveland Irrigation District withdrew its protest.

An informal hearing was conducted by the Division of Oil, Gas & Mining on February 5, 1991, in Castle Dale, Utah, where interested parties were invited to comment concerning Co-op's application. In addition to the parties who had filed written protests, Huntington City appeared through its attorney and voiced objections and Huntington-Cleveland Irrigation District appeared through a representative and expressed concern about Co-op's proposed mining activities, notwithstanding that the District had withdrawn its protest.

At the conclusion of the hearing, the Director stated

that interested parties would have until 5:00 p.m. on February 15. 1991, in which to supplement the record and respond to the points presented at the hearing. The response time was subsequently extended to February 25, 1991, and then to March 11, 1991.

§40-10-9(4((a) U.C.A., 1953, as amended, provides:

> Any valid permit issued pursuant to this chapter shall carry with it the right of successive renewal upon expiration with respect to areas within the boundaries of the existing permit. The holders of the permit may apply for renewal <u>and the renewal shall be issued</u> (but on application for renewal the burden shall be upon the opponents of renewal), subsequent to fulfillment of the public notice requirements of Sections 40-10-13 and 40-10-14 <u>unless it is established that and written findings by the division are made that:</u>
>
> > (i) The terms and conditions of the existing permit are not being satisfactorily met;
> >
> > (ii) The present surface coal mining and reclamation operation is not in compliance with the approved plan;
> >
> > (iii) The renewal requested substantially jeopardizes the operator's continuing responsibility on existing permit areas;
> >
> > (iv) The operator has not provided evidence that the performance bond in effect for the operation will continued in full force and effect for any renewal requested in the application as well as ny additional bond the division might require pursuant to Section 40-10-15; or
> >
> > (v) Any additional revised or updated information required by the division has not been provided.

Although assertions were made at the hearing by representatives for North Emery Water Users and Huntington City

to the effect that Co-op has been cited for certain violations by the Division's inspectors, no documentation was provided. Co-op will agree that it has been cited in the past for certain violations of the Division's reclamation and operating regulations, but Co-op has performed diligently in abating all such violations and will continue to do so. Except for the references made to the violations, none of the objections contended that any of the five grounds cited in §40-10-9(4)(a) applied in the case of Co-op's application. Accordingly, as to the existing permit area, Co-op's permit should be renewed.

The review criteria respecting Co-op's application to increase its present permit area is somewhat different. §40-10-9(4)9b) provides:

> If an application for renewal of a valid permit includes a proposal to extend the mining operation beyond the boundaries authorized in the existing permit, the portion of the application for renewal of a valid permit which addresses any new land areas shall be subject to the full standards applicable to a new application under this chapter;...

Accordingly, Co-op's application regarding the proposed expanded permit area is subject to the requirements of §§40-10-10, 40-10-11, et seq. Co-op's application for renewal contains the necessary information required by those statutes, and in fact, Co-op has retained the services of an additional professional engineering firm (EarthFax Engineering, Inc.) and has committed to add to, modify and expand upon the information provided, in order to meet any legitimate objections or questions

raised by any of the opponents or the Division to Co-op's submittal.

The thrust of the objections raised by those appearing at the hearing concerned the hydrologic consequences of Co-op's proposed mining activities. The objections can be grouped into two general categories: (1) That Co-op's past and current mining activities have had some impact on Big Bear Spring and Birch Spring, and (2) That Co-op's proposal to mine farther north has a potential for greater impact on the two springs.

These objections are addressed more fully in the report of EarthFax Engineering, Inc., which is submitted herewith, but generally, it should be noted that the claimed impact from Co-op's past and present mining activities is simply not supported by the evidence presented. The general conclusion of Mr. Bryce Montgomery, Geologist hired by Castle Valley Special Service District and North Emery Water Users Association, as stated on page 7 of his report is

> It is therefore my conclusion that the affect of the Co-op Bear Creek Mine and possibly the Trail Creek Mine operations have been relatively small in adversing the rights in the Big Bear Canyon Spring, both as to flow rate and contamination. The affect of a small reduction in recharge to the springs is estimated to be considerably less than the 25 percent allowance provided in paragraph 3, page 1 of the agreement between Co-op Mining Company and Huntington City, dated January 27, 1982.

In fact, Co-op would submit that the evidence shows that the effect of Co-op's mining on the spring flow has been

practically non-existent. Although the spring flow has decreased over the past few years while the precipitation has remained relatively constant, the precipitation has continued to be below "normal" levels, which in itself would account for the continued decrease in flow of the springs as the normal recharge areas for the springs continue to decrease because of the below normal precipitation. A comparison of flow rates of the Big Bear Spring and Birch Spring with other springs in the area which could not be affected by Co-op's mining activities will show generally the same pattern of decline, in relation to the same precipitation events.

Mr. Montgomery concluded that the three month abnormal increase in the flow of Birch Spring was "definitely associated with mining activity, and most probably within the caving Trail Canyon Mine" (page 8 of Montgomery report). Mr. Montgomery's conclusion is disputed in the report filed with the Division by Bill Malencik, dated November 1, 1989, and it appears to be a conclusion subject to serious unanswered questions. For instance, it seems highly unlikely that the flow could result from the mine that was caved and pillared over eight years previous to the increased flow. It seems unlikely that the flow would abruptly end and return to precisely normal after three months if an underground water flow were trapped in a reservoir and suddenly broke through, because the break, if there were one, would still be there and would allow continued flow, although in

a greatly diminished quantity. Also, if the water were from a trapped area in the old Trail Canyon mine, and if it contained oil and grease, as reported, the oil and grease would continue to show for the entire three months. The samples taken from Birch Spring showed oil and grease contaminants for only the first sample, likely a result of oil used to oil the lock on the gate securing the spring. Further, if the water were from the old workings, the filtration of the water through the ground to the spring would take out such impurities. In any event, the spring returned to normal after three months, both in quantity and quality of water and there is nothing but conjecture that the event will ever be repeated. Even if the event were to reoccur, there is no reason why reasonable steps could not be taken to make the water quality suitable for the users' needs and increase the availability of this badly needed resource, if the source can be identified.

With respect to Co-op's application to increase the permit area to allow for mining to the north, Mr. Montgomery concludes on page 9 of his report:

> The proposed extension of coal mining within the 80 acre tract of the E/2 NW/4 Section 26, immediately east of Birch Spring <u>could possibly</u> adversely affect the spring...However, the most prominent groundwater transmission system in the area is the north-trending faults and joints, and most of the recharge to Birch Springs comes from the north through this system. Thus, the proposed northerly extension of the Bear Creek Mine into the N/2 of Sec. 14, T 16 S, R 7 E, <u>could</u> also cause a reduction in recharge to the Birch Springs by the intersection and diverting of ground

water away from its natural conduit system."

It must be emphasized that Mr. Montgomery's conclusions are qualified by the words "could possibly" and "could". Even these qualified conclusions are not supported by the report of Earthfax submitted herewith. I would submit that the Earthfax report appears to be based upon more extensive research and a more thorough analysis of all available information, and accordingly, is more credible. The Earthfax conclusion, that additional data is needed to arrive at any certainties, but that mining further north would in all liklihood have no significant impact upon the water quantity or quality of springs in the area, is also born out by the fact that mining in the area to date, has not impacted the springs. Mr. Montgomery suggests that there is a Blackhawk-Star Point aquifer underlying the coal seam being mined by Co-op, and the potentiometric surface of this aquifer "up dips" at a greater angle towards the north than does the coal seam. Thus, he concludes, the farther north the seam is mined, the greater the threat of intercepting this aquifer by mining activity. As concluded in the EarthFax study, if the aquifer does indeed exist, it would appear that it is well below not only the upper seam currently being mined, it is also well below the lower seam of coal, and the possibility of intercepting the aquifer by mining clear to the north of the proposed new area, would be almost non-existent in the upper seam, and extremely remote in the lower seam. The fact that Plateau Mining Co. is

mining the same seam as Co-op, in the same graben area, further north than the proposed expanded boundaries of Co-op's permit areas, without any apparent affect on Birch Spring or Big Bear Spring, certainly supports the conclusion of EarthFax and contradicts the conclusion of Mr. Montgomery in this regard.

The technical objections of North Emery Water Users Association and Castle Valley Special Service District, dealing with the lack of information in Co-op's plan and the lack of water monitoring, may have some merit, and Co-op's position is and always has been, that it will take all reasonable steps to assure that its mining operations will not interfere with or adversely affect the interests of its neighbors. If the Division deems that it would be appropriate to modify the maps, plates and other information submitted in its plan to provide more detail regarding Birch Spring and/or Big Bear Spring, Co-op Will agree to make such revisions. In fact, Co-op has retained the services of EarthFax to provide additional information regarding the hydrology and geology in the affected area, and will provide additional information if the Division deems that additional information is needed.

Co-op's opponents have also objected to the lack of monitoring of Birch Spring. Co-op has monitored Birch Spring as required by the Division, pursuant to its existing Plan. If the Division deems that additional monitoring would be appropriate, Co-op will agree to conduct additional monitoring. The primary

hindrance to such additional monitoring, is that the springs in question are fully enclosed and are accessibly only through a locked gate. Co-op has never been given access to these springs which would allow for any additional monitoring. Co-op appreciates the need for the water users to protect the cleanliness and integrity of its water sources and understands the need to restrict access to the springs. The best solution to the concerns of the water users, may be to provide that the water users themselves provide what additional monitoring the Division deems appropriate, where Co-op shares the cost of such additional monitoring, and where Co-op would have the right to challenge or re-sample the water if a negative impact is claimed by the users. In this way, the users would be able to maintain control over and access to their springs and would be the first to know if any impact were to occur.

Co-op is not adverse to meeting the objections of those filing objections. The report of EarthFax indicates that any negative impact from Co-op's proposed mining plan on the rights of those objecting is highly unlikely and proposes certain monitoring and testing procedures that would assure that the legitimate objections are met. Co-op is willing to take all reasonable steps to satisfy the Division and the users that its mining activities will not adversely effect the existing rights of others, and Co-op submits that the information and reports before the Division indicate that the mining which Co-op proposes

to do can be done without any adverse affect. Accordingly, Co-op's application to extend its permit and expand its permit area ought to be granted.

Respectfully submitted,

Carl E. Kingston
Attorney for Co-op Mining

CERTIFICATE OF MAILING

I hereby certify that I mailed copies of the foregoing Response to Objections to Permit Renewal and copies of the Hydrogeologic Evaluation report prepared by Earthfax Engineering, Inc., to the following, this 11 day of March, 1991, postage prepaid:

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OIL GAS & MINING

Attorneys for North Emery Water Users' Association, Castle Valley Special Service District, and Huntington City, Utah

IN AND BEFORE THE UTAH STATE DIVISION

OF OIL, GAS, AND MINING

In the Matter of the Renewal Application and New Application of Co-Op Mining Company, ACT/015/025	Memorandum of Law filed by North Emery Water User's Association, Castle Valley Special Service District and Huntington City, Utah, in Opposition to the Granting of Co-Op's Applications

Pursuant to the request of the Division of Oil, Gas, and Mining's (DOGM) at the February 5, 1991, informal hearing in Castle Dale, Utah, North Emery Water Users' Association ("NEWUA"), Castle Valley Special Service District ("CVSSD"), and Huntington City, Utah ("Huntington"), hereinafter collectively referred to as "Protestants," by and through its counsel, Jeffrey W. Appel of Haley & Stolebarger, hereby submit the following Memorandum of Law.

BACKGROUND

1. As far back as August 13, 1979, CVSSD wrote a letter to the DOGM on behalf of Huntington protesting Co-Op's coal mining application and expressing its concern that Co-Op's proposed mining activities in the Bear Creek Canyon Portal Mine would contaminate

the City's major culinary water source.

2. In an effort to protect Big Bear Canyon Springs from contamination by Co-Op mining operations, Huntington entered into an agreement with Co-Op on January 27, 1982. In exchange for Huntington's agreement to forgo its protest to Co-Op's proposed mining application, Co-Op agreed to allow the City to monitor the impact of its mining activities on Huntington's water sources.

3. By an October 19, 1989, letter to the DOGM, Menco Copinga, President of NEWUA expressed his concern about water flow and water quality changes in Birch Springs, a primary source of water for the Water Users' Association located below the Co-Op Mine:

> As discussed in our telephone conversation of October 19, 1989, we are very concerned about changes in our BIRCH SPRING. Tuesday, October 17, after complaints to our office about dirty water by some of our water users, Jack Stoyanoff, System Operator discovered dirty water from the Birch Spring.
>
> The Spring flow has trippled (sic) and the water is full of sand and sediment. Water is running from the face of the cliff and over the ground surface. We have turned the Spring flow out of the water system.
>
> This is a dry year and it is extremely important that we can use this water source.
>
> The CO-OP MINE is located just above the Spring. We are concerned that mining activities may have caused these changes.

4. At the time, NEWUA served culinary water to 400 connections and about 1,500 people in rural Emery County, Utah.

5. On October 25, 1989, Bill Malencik, a DOGM Reclamation Specialist, made a field inspection of Birch Springs. Mr. Malencik noted a "five fold increase" in water flow since mid-October 1989, even though surrounding spring sources had a decreased flow due to

drought conditions. See Malencik's November 1, 1989 memorandum. Mr. Malencik further reported that a "significant amount of water is coming out of rock fractures on the cliffs. . . . The primary source together with some secondary sources are flowing over a solid and verticle (sic) rock formation and thence over the surface to a drainage channel. Previously, the spring surface or the groundwater surface above the collection was dry. Some water from the new primary source appears to be percolating between the rock/soil interface."

6. On October 30, 1989, Mr. Malencik and others toured the Bear Canyon Mine and identified possible mine water sources.

7. Mr. Malencik reported that before the October 1989 surge at Birch Springs, NEWUA was experiencing a severe water shortage.

8. Though Mr. Malencik did not come to any conclusions concerning the source of the problems at Birch Springs, he suggested extensive studies be conducted to determine whether or not the change in Birch Springs was related to the activities within the Co-Op mine.

9. On January 22, 1990, Lowell P. Braxton of the DOGM sent a letter to Mr. Copinga stating that the inordinate volume of water discharging through the cracks had stopped. He further stated that the cause of the Birch Springs situation was still unknown, but that the flow of Birch Springs had returned to normal.

10. On November 31, 1990, Co-Op's mining permit expired. Co-op is in the process of attempting to renew the permit, as well as seeking permission to expand its present mining area.

11. By a December 10, 1990, letter to the DOGM, Mr. Copinga commented on Co-Op's request for mining permits in accordance with R614-300-122.100. In the letter, Mr. Copinga expressed his concern that present Co-Op mining activities in the Bear Canyon Mine and past mining activities in Trail Canyon Mine had and/or were presently contaminating Birch Springs.

12. Concerned about the impacts of Co-Op's mining operations on its water sources, Protestants hired S. Bryce Montgomery, a noted geologist, to examine the Co-Op mine and surrounding area.

13. In his January 28, 1991, and February 8, 1991, reports, Mr. Montgomery expressed his concern over the impact of Co-Op's mining activities on Birch Springs and Big Bear Canyon Springs. (These reports are attached as Exhibit "A" and Exhibit "B," respectively, and incorporated herein by reference.)

14. According to Mr. Montgomery's January 28, 1991, report:

> Since the recharge to the Big Bear Canyon Spring involves the complete area to the north, including the west Hiawatha mining area, and several fault conduits, the total effects of mining with change in groundwater flows contribute to changes in the Big Bear Spring flow. Thus, in all of the mining operations, ground water that is shifted out of its original flow paths, especially that part of the ground water which did not naturally discharge to the surface as springs or base-flow to streams, is subtracting from the total groundwater system.

Exhibit "A" at 5.

15. Mr. Montgomery went on to say that there had been a significant change in water samples collected from Big Bear Canyon Springs beginning on January 14, 1991. "This change in 1991 is significant and indicates some abnormal injection into the recharge system to the spring of sulfates." See Exhibit "A" at 7.

16. In his February 8, 1991, report, Mr. Montgomery reported that he was concerned that Co-Op's practice of pumping water from a source in Trail Canyon into the abandoned Trail Canyon Mine could result in that water becoming part of the groundwater recharge system of Birch Springs and Big Bear Canyon Springs, leading to contamination of these water sources. See Exhibit "B" at 3.

17. On February 5, 1991, an informal hearing was held by the DOGM in Castle Dale, Utah. Representatives from all interested groups, including Protestants and representatives from the Co-Op mine attended the hearing and testified.

18. This memorandum seeks to clarify some of the issues raised at that February 5, 1991, hearing. Issues to be discussed in this memorandum are: the repose of the burden of proof on both renewal and new permit applications, the geologist's causation standard, the importance of preserving unpolluted surface and ground water in relation to importance of mining and a summary of violations of the current regulations by Co-Op in relation to its statutory duties to protect ground and surface water.

ARGUMENT

A. Burden of Proof

1. Renewal Permits

a. Since Co-op Has Failed to Abide by the Stated Terms of its Application and Has Otherwise Violated Applicable Mining Laws, it Has the Burden of Showing its Entitlement to a Renewal Permit

Pursuant to Utah Code Ann. §40-10-9(4)(a),

> . . . The holders of a permit may apply for renewal, and the renewal shall be issued (but on application for renewal the

burden shall be upon the opponents of renewal) . . . unless it is established that and written findings by the division are made that:

> (i) The terms and conditions of the existing permits are not being satisfactorily met;
>
> (ii) The present surface coal mining[1] and reclamation operation is not in compliance with the approved plan . . .
>
> (v) Any additional or revised or updated information required by the division has not been provided. (emphasis added).

The Surface Mining Control and Reclamation Act ("SMCRA"), 30 U.S.C.A. §1256(d)(1), which is also applicable to surface impacts of underground mining[2] similarly states that:

> . . . The holders of [a valid] permit may apply for renewal

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[1] Though this sentence references surface coal mining specifically, the legislative findings and the statement of purposes at the beginning of the chapter refer to coal mining generally. See e.g., Utah Code Ann. §40-10-1, §40-10-2. As with federal statutes, state regulations on surface mining apply to the surface effects of underground mining.

[2] Throughout this memorandum, Protestants draw upon analogous code sections relating to surface mining because statutes specific to underground mining are incomplete and the overlap of these regulations has been recognized. Pursuant to the treatise, American Law of Mining, 2nd Ed., §172.05[8],

> SMCRA regulates the surface impacts of underground coal mining operations. Moreover, underground mine operators must comply with a set of performance standards similar to those applicable to surface operations.
>
> The Secretary of the Interior is required to issue regulations for underground mines, giving due consideration to the differences between surface and underground coal mining. Underground mines must nevertheless also meet statutory standards, some of which are identical to those governing surface mines. . . .
>
> Underground mines, like surface mines, must also minimize disturbances to the hydrologic balance; the performance standard for underground mines is a truncated version of that applicable to surface mines. (citations omitted).

and such renewal shall be issued (provided that on application for renewal the burden shall be on the opponents of renewal) . . . unless it is established that and written findings by the regulatory authority are made that--

> (A) the terms and conditions of the existing permit are not being satisfactorily met;
>
> (B) the present surface coal mining and reclamation operation is not in compliance with the environmental protection standards of this chapter and the approved State plan or Federal program pursuant to this chapter . . .
>
> (E) any additional revised or updated information required by the regulatory authority has not been provided. Prior to the approval of any renewal of permit the regulatory authority shall provide notice to the appropriate public authorities. . . . (emphasis added).

Protestants believe that both the Utah and Federal statutes mean that on application for renewal, the burden shall be on the opponents of renewal unless the applicant has failed to meet the terms and conditions of the existing permit satisfactorily, has not complied with environmental protection standards, or has not provided the pertinent regulatory authority with additional revised or updated information. Because Co-Op has failed to comply with the statutory requirements and with the stated terms of its permit application, and has not provided the DOGM with all requested material, the burden is rightfully placed on Co-Op to prove that it is entitled to the renewal of its permit.

The findings and conclusions of Congress during the enactment of SMCRA[3] support the Protestants' position that the burden is on the applicant for renewal if it has failed to comply with

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[3] SMCRA is a useful guide in analyzing burden of proof since there is no such independent and detailed statute on underground mining. Pursuant to 30 U.S.C.A. 1266, SMCRA regulates the surface impacts of underground coal mining operations.

applicable law. In its discussion of burden of proof in SMCRA, Congress reached the following conclusions:

> Consistent with a number of modifications to section 505 designed to assure security of tenure of permit, the committee amendment deletes the words "or renewal" in subsection (a) to make it clear that the applicant does not have the burden of demonstrating compliance upon renewal of a permit for the same area already under permit. Rather, consistent with other provisions of the act, the permit carries with it the right of renewal for the same area if the operation is in compliance with law. (emphasis added)

Pub. L., 1977 Code Cong. & Ad., Section 510(a) "Burden on renewal," at 603.

Though this section states that the applicant generally does not have the burden of proof on renewal, the final sentence dictates that renewal is not automatic; it is contingent upon the applicant's current compliance with applicable mining regulations.

Under the circumstances currently before the DOGM, Co-Op has forfeited its right to automatic renewal. Due to its repeated violations of mining regulations, particularly with regards to protection of water resources and its failure to abide by the conditions of its permit, Co-Op has the burden to prove its entitlement to a renewal permit and that burden of proof may not be placed on Protestants.

b. In the Alternative, Once the Protestants Have Made a Prima Facie Showing That Co-Op Has Not Abided by the Mandates of its Application and Has Otherwise Violated Applicable Mining Laws, the Burden of Proof Shifts to Co-Op to Prove its Entitlement to a Renewal Permit

R614-1G UMC 788.16(b) governs the allocation of the burden of proof on a renewal permit application. See also, R614-2G SMC

788.16(b); 30 CFR §774.15(c)(2).[4]

Even if the DOGM determines that the initial burden is with Protestants (which Protestants urge is unwarranted), once Protestants make a prima facie showing that Co-Op has not abided by the stated terms of its application and has and continues to violate applicable mining regulations, the burden shifts to Co-Op to prove its entitlement to a renewal permit. This analysis is supported by federal administrative law decisions.

Decisions of the Interior Board of Land Appeals ("IBLA") support Protestants' alternative position that even if Protestants have the initial burden of proof, only a prima facie burden must be shown and then the burden shifts to Co-Op upon a showing that Co-Op is in violation of mining regulations. The administrative law cases detailed below are analogous to the present facts. In the IBLA cases, the Office of Surface Mining Reclamation and Enforcement ("OSMRE") has the burden to establish a prima facie case that a violation of a mining regulation has occurred. Once this showing is made, the burden shifts to the violator.

Innovative Development of Energy, Inc. v. Office of Surface Mining Reclamation and Enforcement, 110 IBLA 119, (August 8, 1989) supports Protestants' position. In that case, Innovative Development of Energy ("IDE") appealed its citations by the Tennessee Division of Surface Mining ("TDSM") for violating Tennessee's Surface Mining Act including: 1) failure to pass all

[4] This section refers to surface mining and the surface impacts of underground mining. There is no separate statutory provision for burden of proof in an underground mining context.

surface drainage through a sedimentation pond before leaving the permit area; 2) failure to maintain diversion structures; and 3) failure to keep reclamation current. 110 IBLA at 121. In analyzing the case, the IBLA allocated burdens between OSMRE and TDSM as follows:

> In a proceeding upon an application for review of an NOV [notice of violation], the burden of going forward to establish a prima facie case as to the validity of the NOV rests with the OSMRE. A prima facie case is presented if OSMRE presents essential facts from which it may be determined that a violation of pertinent requirements has occurred. If OSMRE meets it burden of establishing a prima facie case, the ultimate burden of persuasion rests with the applicant for review, and if OSMRE's evidence is not rebutted, the NOV will be affirmed. (citations omitted)

110 IBLA at 123.

The IBLA concluded that OSMRE had met its prima facie burden with the following evidence:

> When OSMRE submits evidence that water flowing from an area disturbed by surface mining operations has pH levels outside the regulatory standards at a point where the water leaves the permit area, a prima facie case that there has been a violation of 30 CFR 715.17(a) is established. Such evidence may be in the form of analytical tests of water, and the results of such a test are presumptively valid in the absence of rebuttal evidence that the test was not properly administered. Appellant submitted no evidence to support a finding that the tests conducted by OSMRE were invalid. Therefore, the evidence by the Hach test and laboratory test were sufficient to sustain a finding that a violation existed. (citations omitted)

110 IBLA at 123.

Similarly in <u>Turner Brothers, Inc. v. Office of Surface Mining Reclamation and Enforcement</u>, 103 IBLA 124 (July 19, 1988), Turner Brothers Inc. ("Turner") was cited for failure to pass all surface drainage through a sedimentation pond before leaving the permit area as required by Oklahoma Permanent Regulatory Program

Regulation section 816.42(a)(1). On appeal, Turner argued that it had complied with Oklahoma regulations and the OSMRE failed to present evidence necessary to establish a prima facie case as to the violations. IBLA disagreed with Turner's argument and stated that:

> . . . At a hearing OSMRE has the burden of going forward to establish a prima facie case as to the validity of an NOV by the submission of sufficient evidence to establish the essential facts of the violation. However, the ultimate burden of persuasion rests with the applicant for review. If OSMRE establishes a prima facie case and the evidence is not rebutted, the evidence will sustain the violation. (citations omitted)

103 IBLA at 129.

IBLA went on to say that:

> . . . Turner had the burden of producing evidence to rebut OSMRE's prima facie case, and we are surprised that, given the nature of the conflict, the company failed to present more definite evidence as to its area of operations at the time of the inspection, the location of the shale pit, and the presence of the spoil piles and berms which, according to Turner, controlled surface drainage in the area. Maps, photographs, company records, or other evidence relatively contemporaneous with the inspection could have been used to show error in the inspector's testimony and, thus, firmly establish the truth of Turner's assertions. Absent more definite evidence, we cannot conclude that the evidence presented was sufficient to overcome OSMRE's prima facie case.

103 IBLA 131.

These cases support Protestants' position that even if they have the initial burden to show violations by Co-Op, the burden shifts to Co-Op to prove their entitlement to a permit renewal after Protestants establish a prima facie case of Co-Op violations.

Protestants have previously submitted evidence that Co-Op's mining operations do not comport with the promises in its application. S. Bryce Montgomery, a noted geologist, has studied

the area for Protestants and has concluded that Co-Op's past, present and planned mining activities have in part and will continue to contaminate water sources in the area. See Exhibit "A" and Exhibit "B."

2. New Permits

The burden of proof on new permits rests upon the applicant. According to R614-1G UMC 788.14(b)(2), "[i]f a completed application for renewal of a permit includes a proposal to extend the mining and reclamation operation beyond the boundaries authorized in the existing permit, the portion of the complete application for renewal of a valid permit which addresses any new land shall be subject to the full standards applicable to new application under this Act, UMC 771, 782, 783, 784, 785, 786, 787, 788, and 789, subchapter J of this chapter and the regulatory program." See also, Utah Code Ann. §40-10-9(4)(b).

Pursuant to 30 C.F.R.§773.15(2),[5] "[t]he applicant for a permit or revision of a permit shall have the burden of establishing that his application is in compliance with all the requirements of the regulatory program." See also, R614-1G UMC 782.4, 783.4(a), 784.4(a) (the permit applicant must provide the DOGM with all information required under these sections.) Therefore, the burden for new areas Co-op seeks to mine is on Co-Op, not on Protestants.

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[5] These sections relate to surface mining, but are applicable to surface mining impacts of underground mining.

B. Geologist's Causation Standard

According to S. Bryce Montgomery, the geologist who examined and studied the impact of Co-Op mining operations on water sources in the area, including Birch Springs:

> . . . the anomalous jump in Birch Spring flow (80 gpm to 230 gpm) from October 1989 through January 1990 is obviously unatural (sic). Furthermore, from the descriptions provided me of this occurrence, I conclude that it is definitely associated with mining activity, and most probably within the caving Trail Canyon Mine. The visual and chemical analysis which showed "oil and grease" with large quantities of suspended sediment in a water sample collected from the spring in October 1989, along with the jump in total dissolved mineral solids (674 mg/l) double of what was analyzed of the spring water in September 1980 (360 mg/l) evidences that contaminated water held in temporary storage within the mine was released suddenly and entered into the fault conduit system that recharges Birch Spring. This sudden entry into the fault conduit was likely due to a build-up in water storage and head within the caved mine to create sufficient water pressure to break through and flush a previously plugged section of the fault. The fact that this anomalous high flow (approximately 0.5 cubic-foot/second) continued for a period of nearly three months evidences that considerable ground water was held in temporary storage. This would amount to approximately 90 acre-feet or about 29,000,000 gallons of water. (emphasis added).

Montgomery's January 28, 1991 report at 8.

Mr. Montgomery concludes that given the nature of the rock formations, the faults and the aquifers, Co-Op's mining activities have interrupted and reduced the underground flow of water in the area, have altered the paths of the flow, and have contaminated the water. This testimony is sufficient to support NEWUA' position that Co-Op's mining activities have adversely impacted their water source, Birch Springs, and to show that under present circumstances, Co-Op is not entitled to either a renewal or new permit.

Similarly, Mr. Montgomery's findings support CVSSD's and Huntington's position that Co-Op mining activities have contaminated Big Bear Canyon Springs. Mr. Montgomery's report further concludes that Co-Op's proposed expansion of its mining operations will adversely impact Big Bear Canyon Springs and Birch Springs.

Both the Utah Supreme Court and the federal administrative law cases have adopted the standard of "reasonable likelihood" in determining whether an expert's testimony is sufficient to support a claim that a water source has been polluted. In Branch v. Western Petroleum, 657 P. 2d 267 (Utah 1982), the Branches sued Western Petroleum for polluting their culinary water wells by percolation of oil well formation waters Western Petroleum had ponded on the Branches' property. The main issue in the case was whether Western's formation waters caused the pollution of the Branches' wells and if so, how. Id. at 271. Each side employed a geologist to testify on its behalf. The two experts agreed that formation water in the disposal pit was percolating into the subsurface waters, but disagreed on whether the polluted water had entered the shallow groundwater or whether they had percolated into the deeper Duchesne Formation. Id.

It was the position of Western Petroleum's expert that the formation water only entered the shallow groundwater. Id. It was the position of the Branches' expert that the waters from Western's disposal water percolated below the shallow groundwater and through natural joints and cracks into the deeper Duchesne Formation, where

it entered both of the Branches' wells and made them unfit for human use. Id. at 271-272. The jury found the Branches' expert more convincing and concluded that Western Petroleum's "'use of the evaporation pit for the dumping of formation water [was] a cause of the pollution of the water in [the Branches'] [wells]. . .'" Id. at 272.

In its analysis, the Utah Supreme Court concluded that "[e]ven if Western did not know that the formation water would enter the aquifer and cause damage to plaintiff's well, it could have determined the likelihood of that consequence." Id. at 275, fn. 6. In support of this statement, the Court quoted from Davis, Groundwater Pollution: Case Law Theories of Relief, 39 Mo.L. Rev. 117, 145-146 (1974):

> A polluter should not be absolved from liability just because he may not be able to anticipate the movement of the polluted groundwater he created. This defense should not be recognized for several reasons. First, the hydrology of groundwater movement is much better understood now than it was when many of the early groundwater pollution cases were decided. Even though precise mapping of groundwater movement in any particular location is still expensive, it is within the reach of any major waste producer which proposes to inject wastes underground. Disposal wells need porous formations for successful waste injection and the appropriate hydrologic tests would insure a successful injection well. Therefore, persons deliberately disposing of wastes underground ought to be required to act in accordance with the information gained by such testing regarding the movement of the injected wastes and their probable effects on neighboring groundwater uses. If they do not make such tests, they should be charged with the information they would have gained had they made them. Second, it is generally known now that liquids placed on the ground will seep into the soil and may enter the body of groundwater percolating beneath the surface. Persons causing groundwater pollution in ways, other than by deliberate underground disposal, should be charged with such knowledge and should not be insulated from liability for groundwater pollution movement. . . . Although a particular polluter might still legitimately claim he could not predict particular

> injurious consequences of his activity, he can no longer claim legitimately that the polluting material vanished from the earth once it seeped beneath the surface. He knows it will go somewhere. . . .
>
> Pollution of a groundwater aquifer may have pervasive effects both in terms of territorial extent and duration. With reliance on our groundwater supplies increasing, the old court-made rules concerning groundwater pollution are no longer adequate. (citations omitted).

657 P. 2d at 275, fn. 6.

Administrative law cases likewise do not require precise testimony by a geologist regarding adverse impacts of mining activities on groundwater. These courts only require that a reasonable likelihood test be met. The IBLA cases cited below involve establishment of violations of discharge and sediment pond controls through expert testimony and evidence.

In Turner Brothers v. Office of Surface Mining Reclamation & Enforcement, 102 IBLA 299 (May 31, 1988), the administrative law judge stated three elements of proof required to establish a violation for improper discharge of waste water from a mining facility: 1) the existence of surface drainage from areas disturbed in the course of mining and reclamation activity; 2) that such drainage was not passed through a sedimentation pond; and 3) that such drainage flowed off the permit area. Id. at 77. Although the inspector who testified in the case did not see any surface drainage from the disturbed areas at the time of his inspection nor did he find any evidence that any drainage had left the permit area, the court concluded that his testimony established for all three areas in question that there was a reasonable likelihood that there would be surface drainage from those areas. The inspector's

testimony was based on his observation of the slope of the discharge area and conclusion that waste water drainage would not pass through a sedimentation pond, and that it would leave the permit area unfiltered. Id. at 79. The mine operators did not rebut this testimony.

The administrative law judge upheld the lower court's conclusion that "there is a reasonable likelihood that there will be surface drainage from areas disturbed in the course of surface coal mining and reclamation operations, that it will not pass through a sedimentation pond or siltation structure, and that it will leave the permit area. . ." Such testimony was held to be sufficient to establish a prima facie case of a violation of the regulations. Id.

In Alpine Construction Corp. v. Office of Surface Mining Reclamation & Enforcement, 101 IBLA 128, 95 I.D. 16 (February 8, 1988), the administrative law judge similarly concluded that by requiring an OSMRE inspector to prove that surface drainage has, in fact, left the permit area, would amount to requiring him to wait until adverse impacts resulting from the absence of sedimentation ponds have taken place. 95 I.D. at 22. This was particularly relevant since the inspector had inspected the mine during the dry season. To invalidate the NOV on the basis that he did not see surface drainage leave the permit area would effectively require him to wait for a rain before conducting an inspection for sedimentation pond compliance. Id.

The administrative law judge in Turner Brothers v. Office of Surface Mining Reclamation & Enforcement, 103 IBLA 124, 132, supra, concluded that a prima facie case that surface drainage left the permit area may be established by evidence of present or past drainage from a disturbed area flowing off the permit area. Id. at 132. Alternatively, a prima facie case may be established by demonstrating that under the conditions existing at the minesite at the time of inspection, there is a reasonable likelihood that surface drainage from a disturbed area would leave the permit area without passing through a sedimentation pond. Id.

These standards comport with Mr. Montgomery's evidence. His report establishes that Co-Op's mine operations have adversely impacted Birch Springs and Big Bear Canyon Springs. In the alternative, his report establishes that given the conditions at the Co-Op minesite, there is, at a minimum, a reasonable likelihood that waste water drainage is seeping into ground and surface waters and thereby harming Birch Springs and Big Bear Canyon Springs. Mr. Montgomery's report also establishes, at a minimum, a reasonable likelihood that Co-Op's proposed mining expansion would adversely impact these water sources.

The case of Innovative Development of Energy, Inc. v. Office of Surface Mining Reclamation and Enforcement, 110 IBLA 119, supra, further supports Protestants' position that Co-Op's mining operations are the only logical source of the problems at Birch Springs and at Big Bear Canyon Springs. In the case, the administrative law judge concluded that allegations that

contamination of the water discharged from a sediment pond was from other than the disturbed area are of no benefit to appellant without a showing that the other area was the sole source of the contamination. Id. at 124. Water quality limitations apply to all discharges flowing from a disturbed area into a sedimentation pond. Id.

These cases taken together with Branch v. Western Petroleum, supra, lend credence to Mr. Montgomery's report and support Protestants' position that Co-Op mining operations have and will adversely impact Birch Springs, Big Bear Canyon Springs, and other water sources in the area.

C. Preservation of Unpolluted Surface and Ground Water More Important Than Mining Operations

"As Utah is one of the most arid states in the union, the protection of the purity of the water is of crucial importance, and the Legislature has enacted laws for the protection of both surface and subterranean waters." Branch, supra, 657 P.2d at 273. This statement is typical of the policies of both Utah and the federal government to protect ground and surface water. Pursuant to Utah Code Ann. §26-11-8(1), ". . . it is unlawful for any person to discharge a pollutant into the waters of the state or to cause pollution which constitutes a menace to public health and welfare, or is harmful to wildlife, fish or aquatic life, or impairs domestic, agricultural, industrial, recreational, or other beneficial uses of water, or to place or cause to be placed any wastes in a location where there is probable cause to believe they will cause pollution. Any such action is a public nuisance."

Utah law further provides that water for domestic uses is preferred over all other uses. According to Utah Code Ann. §73-3-21, ". . . in times of scarcity, while priority of appropriation shall give the better right as between those using water for the same purpose, the use for domestic purposes, without unnecessary waste, shall have preference over use for all other purposes, and use for agricultural purposes shall have preference over use for any other purpose except domestic use." According to this statute, use of water in Birch Springs and Big Bear Canyon Springs for domestic and agricultural uses is favored over all other purposes.

In addition, Utah statutes on underground mining are replete with safeguards for water rights. Pursuant to R614-1K UMC 810.2,

> The objective of this subchapter is to ensure that coal exploration and underground coal mining activities are conducted in manners which are compatible with the environmental, social, and esthetic needs of the state. Accordingly, the performance standards and design requirements in this subchapter will provide for . . . (g) [m]inimum disturbance to the prevailing hydrologic balance at the mine site and in associated offsite areas, and to the quality and quantity of water in surface and ground water systems. (emphasis added)

See also, R614-1K UMC 817.41 et seq. (hydrologic balance requirements for underground mining).

The legislative history of federal mining statutes lends further support for the position that mine operators and owners take affirmative steps to protect water resources or not be allowed to mine. In approving SMCRA, which applies to all coal surface mining and the surface impacts of underground mining and coal

processing[6], Congress recognized that both surface and underground coal mining posed hazards to the environment. Pub. L. 95-87, 1977 Code Cong. & Ad. News at 595-596. Referring to the devastating environmental impacts of all types of coal mining, Congress stated that:

> While coal in the past has contributed significantly to the industrial and economic growth of the United States, the environmental and social costs of coal extraction have been enormous. To this day coal mining in Appalachia too often results in a legacy of polluted streams below multilated (sic) mountain sides left treacherously unstable. In the arid West, permanent rehabilitation of mined areas is yet to be demonstrated. If not properly conducted, current and planned western coal development could leave behind barren wastelands susceptible to continual erosion and disrupted groundwater systems, significantly diminishing the productivity of agricultural areas. By imposing workable reclamation standards nationwide through the enactment of H.R. 2, the unnecessary degradation of land and water resources will be avoided as the country makes good use of its abundant coal supply.

Pub. 95-87, 1977 Code Cong. & Ad. News at 595.

In his testimony before the Senate subcommittee compiling coal mining regulations, Major General Ernest Graves of the U.S. Army Corps of Engineers gave information on the Corps' experiences with water contamination caused by siltation attributable to poorly reclaimed surface coal mining operations.

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[6] Pursuant to Pub.L. 95-87, 1977 Code Cong. & Ad. News, Section 516 at 706, entitled "Surface effects of underground coal mining operations," "[t]he surface impacts of underground coal mining operations are often intermingled with environmental impacts of strip mining. Further, a uniform set of environmental protection standards for surface impacts of underground mines are not existent. This section includes those minimum environmental standards for underground mining operations that will provide a similar level of protection as the standards in this act for strip mines."

> The most widespread damages resulting from the effect of mining upon the water resource are environmental in nature. Water users and developers incur significant economic and financial losses as well.
>
> Reduced recreational values, fishkills, reductions in normal waste assimilation capacity, impaired water supplies, metals and masonry corrosion and deterioration, increased flood frequencies and flood damages, reductions in designed water storage capacities at impoundments, and higher operating costs for commercial waterway users are some of the most obvious economic effects that stem from mining-related pollution and sedimentation. . . .

Pub. L. 95-87, 1977 Code Cong. & Ad. News at 597. See also, Pub. L. 95-87 at 642-643 (mining impact on hydrologic balance); Pub. L. 95-87 at 652 (monitoring hydrologic impact).

A similar analysis is applicable to the adverse environmental impacts of underground coal mining:

> Underground mining is the principal source of existing acid and mineral pollution from coal mining. Such acid and mineral pollution have already affected more than 10,500 miles of streams in the eight Appalachian coal States and nearly 6,000 miles of these streams are continuously polluted by acid mine drainage. In terms of the number of sources of acid mine drainage, underground mines account for 67 percent of the sources, yet produce 88 percent of acid drainage. Surface mines produce the rest. However, active underground mines are proportionately the greatest pollution source since they represent only 5 percent of all mines, yet produce 19 percent of overall acid drainage.
>
> Contrary to the situation in most industries, the discharge of water from many underground coal mines does not cease when the operation shuts down or is abandoned. Usually mine operators are not required to develop a mining operation in a manner designed to eliminate or minimize polluting discharges after mining. The standards included in the bill pertaining to minimizing the disturbances to the prevailing hydrologic balance both during and after coal mining operations, section 516(b)(9), are intended to meet the problem of continuing pollution discharges after mining has ceased.

Pub. L. 95-87, 1977 Code Cong. & Ad. News at 659.

Both federal and state mining statutes acknowledge the economic importance of mining, but not at the expense of water

resources. See e.g., 30 U.S.C.A. §102(a) (Congress promulgated SMCRA to establish a nationwide environmentally effective and administratively realistic program to protect society and the environment from the negative effects of surface coal mining operations.)

According to the Legislature's findings in Utah's Coal Mining and Reclamation Act, coal mining operations presently[7] contribute to the nations' energy requirements, and Utah's expansions of coal mining activities requires ". . . the urgent establishment of appropriate standards to minimize damage to the environment and to productivity of the soil and to protect the health and safety of the public." Utah Code Ann. §40-10-1(1),(2) (1979). The purpose of the Act is to insure that the rights of persons with a legal interest in the land or appurtenances are fully protected from the adverse impacts of the mining operations. Utah Code Ann. §40-10-2(2).

The objectives of the Utah Mined Land Reclamation Act, of which underground coal operations are a part, are "to minimize or prevent present and future on-site or off-site environmental degradation caused by mining operations to the ecologic and hydrologic regimes and to meet other pertinent state and federal regulations regarding air and water quality standards and health and safety criteria" and "to minimize or prevent future hazards to the public safety and welfare." Utah Code Ann. §40-8-12(2),(3).

It is important to note that both the federal and state

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[7] This statute was promulgated in 1979.

statutes regarding the significance of coal as an energy source were written in the 1970s when the nation was experiencing a gasoline shortage. Though coal remains an important energy source, the protection and preservation of water has come to the forefront since that time. Emery County, Utah, has experienced five years of drought with significant adverse impacts on the local environment and economy. The scarcity of water available to Protestants makes the protection of Birch Springs, Big Bear Canyon Springs, and other water sources in the area more significant today than when federal and state mining statutes were promulgated. Given the drought situation, there is less water to recharge the aquifers and to filter out impurities caused by Co-Op's mining operations. Neither federal nor state law allow a mine operator to be issued a new or renewal permit until it has taken appropriate and affirmative steps to protect water resources in the area.

D. Mandatory Obligations of Co-Op With Regard to Water

According to R614-1G UMC 786.27(a), "[e]xcept to the extent that the Division otherwise directs in the permit that specific actions be taken, the permittee shall conduct all underground coal mining activities as described in the complete application. . . . (emphasis added). In chapter seven of its application, entitled hydrology, and elsewhere in the application, Co-Op gives an exhaustive account of all the precautions it will take to protect surface and groundwater in the area. For example, in Chapter 3, section 5.3, Co-Op states that it "will conduct all mine site operations in such a way as to minimize potential impact on surface

and ground water quality." Co-Op states that no significant impacts to the groundwater system are expected from the mining operation, but that in the "unlikely event that mining adversely affects a water source, Co-Op will select an alternative after considering all possibilities of each site-specific circumstance." Chapter 3, section 5.3.1.

Co-Op has not lived up to these promises. On repeated occasions, Co-Op has been cited by the DOGM for violations, many of which have a direct bearing on water resources[8]. (A summary of Co-Op's violations and application deficiencies is attached as Exhibit "C" and incorporated herein by reference.) Protestants have also submitted strong evidence that the change in Birch Springs beginning in October 1989 and continuing for months thereafter was caused by Co-Op's careless mining activities and failure to protect the environment. As recently as January 14, 1991, there was a significant rise in contaminants found in Big Bear Canyon Springs due to an "abnormal injection into the recharge system to the spring of sulfates" which is likely attributable to Co-Op. See

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[8] 1) failure to maintain diversion, culvert below sediment pond and office; 2) failure to submit water sampling data for annual report; 3) failure to install environmental control measures; 4) failure to avoid plugging or collapse and erosion at inlets and outlets; 5) failure to collect required baseline water monitoring data for surface and ground monitoring; 6) mine water discharge from Hiawatha Portal; 7) drainage control plans required for Hiawatha sum; 8) failure to maintain diversions; 9) failure to maintain diversion ditch D-4D and culvert C-2D inlet; 10) failure to pass disturbed surface drainage to treatment facility; 11) failure to obtain a new conveyor before construction and failure to maintain on/off controls; 12) failure to maintain ditches and diversions. Appendix 2-A, Violation List, to Co-Op's application.

Exhibit "B" at 7. Protestants have also presented evidence that Co-Op's proposed expansion will harm these water sources.

On January 3, 1991, and January 4, 1991, Co-Op was given assessments for: 1) test plot implementation, and 2) maintenance of diversion and of pertinent structures violations, respectively. Co-Op also has an outstanding violation for failing to provide detailed maps requested by the DOGM. Co-Op has yet to supplement its application with maps meeting the requirements of R614-301 et seq. By a January 21, 1991, letter Co-Op requested an extension from the DOGM to submit updated maps, thus acknowledging its failure to meet these requirements.

R614-1G UMC 786.19,"Criteria for Permit Approval or Denial," states that no permit or revision application shall be approved unless the application affirmatively demonstrates and the Division finds that:

> (a) The permit application is accurate and complete and that all requirements of the Act, this chapter, and the regulatory program have been complied with.
>
> (b) The applicant has demonstrated that surface coal mining and reclamation activities . . . can be feasibly accomplished under the mining and reclamation activities plan contained in the application.
>
> (c) The assessment of probable cumulative impacts of all anticipated coal mining in the general area on the hydrologic balance, as described in UMC 784.14(c) has been made by [the DOGM] and the operations proposed under application have been designed to prevent damage to hydrologic balance outside proposed permit area. . . .
>
> (i) The applicant or operator has not controlled mining operations with a demonstrated pattern of willful violation of the Act of such nature, duration, and with such resulting irreparable damage to the environment as to indicate intent not to comply with the provisions of the Act.

Under the present circumstances, Co-Op cannot meet these requirements. The application is neither accurate nor complete and inadequately examines the impacts of mining on the hydrologic balance. Until these corrections are made and steps are taken to adequately protect Birch Springs, Big Bear Canyon Springs and other water sources in the area, Co-Op is not entitled to a mining permit.

R614-1G UMC 786.29 entitled "Conditions of Permits: Environment, Public Health and Safety" requires that each permit issued by DOGM shall ensure and contain specific provisions requiring that the:

> (a) Permittee shall take all possible steps to minimize any adverse impact on the environment or public health and safety resulting from noncompliance with any term or conditions of the permit . . .
>
> (b) The permittee shall dispose of solids, sludge, filter backwash, or pollutants removed in the course of treatment or control of waters or emissions to the air in the manner required by Subchapter K . . .
>
> (c) The permittee shall conduct its operations--
>
> > (1) In accordance with any measures specified in the permit as necessary to prevent significant, imminent environmental harm to the health or safety of the public.

Again, the evidence, including Co-Op's past history of violations, dictates that Co-Op is not presently entitled to a permit.

Pursuant to R614-1K UMC 817.41,

> (a) Underground coal mining activities shall be planned and conducted to minimize changes to the prevailing hydrologic balance in both the permit area and adjacent areas, in order to prevent long term adverse changes in that balance that could result from those activities. . . .
>
> (d) Operations shall be conducted to minimize water pollution

and, where necessary, treatment methods shall be used to control water pollution.

(1) Each person who conducts underground coal mining activities shall emphasize mining and reclamation practices that prevent or minimize water pollution. . . .

If the operator fails to take precautions to minimize or eliminate water pollution, the operator may be required to install and operate a water treatment facility until the problem has been remedied. R614-1K UMC 817.41(d)(3). It is Protestants' position that unless tighter restraints are placed on Co-Op to eliminate contamination to Birch Springs and Big Bear Canyon Springs, Co-Op should be required to install a water treatment facility.

Pursuant to R614-1K UMC 817.52(a),

(1) Ground water levels, infiltration rates, subsurface flow and storage characteristics, and the quality of the ground water shall be monitored in a manner approved by the Division, to determine the effects of underground coal mining activities on the quantity and quality of water in ground water systems in the permit area and adjacent areas. . . .

(2) When underground mining coal activities may affect the ground water systems which serve as aquifers which significantly ensure the hydrologic balance of water use either on or off the permit area, ground levels and ground water quality shall be periodically monitored. . . .

Co-Op has not adequately monitored the groundwater to ensure protection of Birch Springs and Big Bear Canyon Springs.

In addition to these general violations, Co-Op has failed to abide by the following coal mine permit application requirements:

1) <u>R614-301-721</u> requires that Co-Op describe the premining hydrologic resources within the permit and adjacent areas that may be affected or impacted by the mining activity.

> <u>Violation</u>: Co-Op has not described the hydrologic resource adequately. Birch Springs is not shown on all of the appropriate maps, and it is within the adjacent area.

2) R614-301-722 requires that the application include cross-sections and maps.

Violation: Co-Op has failed to provided adequate maps of its works so that compliance can be adequately judged. This remains an outstanding and unabated violation.

a. R614-301-722.100 requires that the cross-sections and maps show the extent of subsurface water within and adjacent to the mining operation. The cross-sections and maps must include areal and vertical distribution of aquifers, and portrayal of seasonal differences of head in different aquifers on cross-sections and contour maps.

Violation: Co-Op has failed to submit maps or cross-sections that adequately show subsurface water and geologic formations.

b. R614-301-722.200 requires that the application contain cross-sections and maps showing the location of springs within the permit and adjacent area.

Violation: Co-Op has failed to submit maps or cross-sections that adequately show springs locations.

c. R614-301-722.300 requires that the application contain cross-sections and maps showing the elevations and locations of monitoring stations used to gather water quality and quantity in preparation of the permit application.

Violation: Co-Op has failed to submit maps or cross-sections that adequately show elevations and locations of monitoring stations.

d. R614-301-722.400 requires that the application contain cross-sections and maps showing the location and depth of water wells in the permit area and adjacent area.

Violation: Co-Op has failed to submit maps or cross-sections that adequately show the location and depth of water wells in the permit areas.

3) R614-301-724 requires the following baseline hydrologic information:

a. R614-301-724.100--the location and ownership of springs in the permit, and adjacent area, and other ground water resources, seasonal quality and quantity of ground water, and its usage.

Violation: The location of Birch Springs is not shown on all Co-Op maps, nor is an adequate description of the ownership, usage, quality, and quantity provided.

According to DOGM records, Co-Op has only sampled Birch Springs two times, once in 1987 and once in 1989. No contact has been made by Co-Op with NEWUA to gain access to the springs for monitoring purposes.

4) R614-301-724.300 requires the following geologic information:

a. R614-301-724.310--a determination of the probable hydrologic consequences of the operation upon the quality and quantity of surface and ground water in the permit and adjacent areas.

Violation: Co-Op has insufficient geologic information to make an adequate probable hydrologic consequences determination.

b. R614-301-724.600--requires the applicant to provide a survey showing whether aquifers or areas for the recharge of aquifers exist within the permit and adjacent area and whether subsidence could cause material damage or diminution of reasonably foreseeable use of aquifers or areas for the recharge of aquifers.

Violation: Co-Op has not provided sufficient information on aquifers and recharge areas to determine the impact of mining on Birch Springs and on Big Bear Canyon Springs.

5) R614-301-725.300 states that a permit will not be approved until the necessary hydrologic and geologic information is available to allow a probable hydrologic consequences determination.

Violation: Co-Op has not met these requirements for its existing permit nor has it met its application promises.

6) R614-301-728 lists the Probable Hydrologic Consequences Determination (PHC) requirements:

a. R614-301-728.100 requires that the application contain a determination of the PHC for the proposed mining operation upon the quality and quantity of ground water under seasonal flow conditions for the permit and adjacent areas.

Violation: Co-Op has not provided adequate information relating to the impact of its mining operations on the quality and quantity of ground

water to determine the PHC.

b. R614-301-728.200 requires that the PHC determination be based on baseline hydrologic, geologic and other information collected for the permit application.

Violation: Co-Op has not provided adequate information to meet the requirements of this section.

c. R614-301-728.310 requires a determination as to whether adverse impacts may occur to the hydrologic balance.

Violation: Co-Op has not provided adequate information relating to the adverse impacts of its mining operations on the hydrologic balance.

d. R614-301-728.320 requires a determination as to whether acid-forming or toxic-forming materials are present that could result in the contamination of ground water supplies.

Violation: Co-Op has not provided adequate information to determine whether acid-forming or toxic-forming materials are contaminating groundwater supplies.

e. R614-301-728.332 requires a determination as to the impact of the mining operation on acidity, total and dissolved solids and other important water quality parameters.

Violation: Co-Op has not provided adequate information to determine whether its mine operations are contaminating water quality.

f. R614-301-728.334 requires a determination as to the impact of the mining operation on ground water availability.

Violation: Co-Op has not provided adequate information to determine the impact of it mine operations on ground water availability.

As stated in its January 21, 1991, letter to the DOGM, Co-Op is still in the process of completing its PHC violations and thus in violation of R614-301-728.

7) R614-301-731 requires that a plan show how the relevant regulations will be addressed to protect the ground water resources. The plan will include steps taken to minimize disturbance to the hydrologic balance, and to prevent material damage outside the permit area. A water monitoring plan is required to document any changes to the hydrologic balance.

Violation: Co-Op has not submitted a plan adequate to protect the hydrologic balance, particularly since there are two culinary water springs in such close proximity to the mining operation.

A comprehensive plan must be implemented if Protestants are to maintain Birch Springs and Big Bear Canyon Springs as a water source.

a. R614-301-731.211 requires that a permit application will include a ground water monitoring plan based upon the PHC and the analysis of all baseline hydrologic, geologic and other information in the permit application.

Violation: Co-Op has not provided adequate information to characterize its current monitoring plans.

8) R614-301-742.221.33 requires that sediment ponds contain or treat the ten year, twenty-four hour precipitation event.

Violation: The sediment design in Co-Op's application is inadequate to ensure compliance with this section. Co-Op must supply accurate maps, plans and designs to verify the capacity of the sediment pond to treat the ten year, twenty-four hour precipitation event for all applicable drainage.

9) R614-301-750 requires that mining will be conducted to minimize disturbance to the hydrologic balance within the permit and adjacent areas, to prevent material damage to the hydrologic balance outside the permit area and to support approved postmining land uses.

Violation: Co-Op has not included a plan to minimize the impacts to the hydrologic balance, nor has it included a plan to monitor the ground water for impacts. A plan to protect Birch Springs and Big Bear Canyon Springs and its recharge area or a plan to replace the water source must be implemented before Co-Op is entitled to any mining permits.

CONCLUSION

Co-Op has not complied with the promises of its original application to protect hydrologic resources. Under these circumstances, Co-Op should have the burden of showing that it is entitled to a renewal permit. In the alternative, the burden of

proof should shift to Co-Op once Protestants have made a showing that Co-Op has not met the requirements for a renewal permit. This has been accomplished through submission of the report of Mr. Montgomery. As for the new area Co-Op seeks to mine, the burden is upon Co-Op to meet the statutory requirements for a new permit.

The conclusions of Mr. Montgomery, who examined and studied the impact of Co-Op mining operations on water sources in the area including Birch Springs and Big Bear Canyon Springs, support Protestants' position that Co-Op's mining activities have adversely impacted Birch Springs and Big Bear Canyon Springs. Thus, until adequate protections are in place, Co-Op is not entitled a mining permit. Mr. Montgomery's conclusion that the jump in the flow of Birch Springs from October 1989 through January 1990 is . . . "definitely associated with mining activity" more than satisfies the reasonable likelihood test and adequately supports NEWUA's theory. Likewise, Mr. Montgomery's report supports CVSSD's and Huntington's position that there is a reasonable likelihood that Co-Op mining activities have in the past and will continue to contaminate Big Bear Canyon Springs. The recent contamination to Big Bear Springs is of great concern. Mr. Montgomery further concludes that Co-Op's proposed expansion will adversely impact both of these water sources.

Protestants' culinary rights in Birch Springs, Big Bear Canyon Springs, and other water sources in the area, are legitimate and protected rights that supersede the rights of Co-Op to continue mining activities until it has adequately addressed Protestants'

concerns. SMCRA and associated Utah mining laws were enacted in the 1970s when the nation was experiencing a gasoline shortage and was looking for alternative fuel sources. Even at that time, legislators recognized the importance of protecting ground and surface water resources. Today the need to protect water resources is more critical as the West is experiencing a severe drought. Unless Birch Springs, Big Bear Canyon Springs and other water sources in the area are adequately protected from contamination from Co-Op mining operations, the harm would be irreparable. The present drought situation has reduced the water table and thereby diminished the capacity of such groundwater sources to dilute impurities.

Co-Op's application states that the company "will conduct all mine site operations in such a way as to minimize potential impact on surface and ground water quality." Chapter 3, section 5.3. The history of Co-Op's violations, the October 1989 surge at Birch Springs, the January 1991 increase in contaminants in Big Bear Canyon Springs, and Co-Op's outstanding violations all suggest that Co-Op has not and is not conducting its mine operations so as to protect surface and ground water resources, particularly Birch Springs and Big Bear Canyon Springs. Protestants depend on Birch Springs and Big Bear Canyon Springs as a source for culinary and agricultural water for the people of rural Emery County, Utah. Unless and until drastic measures are taken to insure that Co-Op's mining activities do not contaminate Birch Springs and Big Bear Canyon Springs, the DOGM should not renew Co-Op's permit or allow

it to mine new areas. To do so would cause irreparable damage to Protestants and adversely affect water users in Emery County.

Respectfully submitted this 11th day of March, 1991.

Jeffrey W. Appel
Attorney for Protestants

CERTIFICATE OF HAND-DELIVERY

I hereby certify that on the 11th day of March, 1991 true and correct copies of the foregoing Memorandum of Law filed by North Emery Water User's Association, Castle Valley Special Service District and Huntington City, Utah, in Opposition to the Granting of Co-Op's Applications were hand-delivered to the following:

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DIVISION OF
OIL GAS & MINING

Attorneys for North Emery Water Users' Association, Castle Valley Special Service District, and Huntington City, Utah

IN AND BEFORE THE UTAH STATE DIVISION

OF OIL, GAS, AND MINING

In the Matter of the Renewal Application and New Application of Co-Op Mining Company, ACT/015/025	: Amended Memorandum of Law filed by North Emery Water User's Association, Castle Valley Special Service District and Huntington City, Utah, in Opposition to the Granting of Co-Op's Applications

Pursuant to the request of the Division of Oil, Gas, and Mining's (DOGM) at the February 5, 1991, informal hearing in Castle Dale, Utah, North Emery Water Users' Association ("NEWUA"), Castle Valley Special Service District ("CVSSD"), and Huntington City, Utah ("Huntington"), hereinafter collectively referred to as "Protestants," by and through its counsel, Jeffrey W. Appel of Haley & Stolebarger, hereby submit the following Amended Memorandum of Law.

BACKGROUND

1. As far back as August 13, 1979, CVSSD wrote a letter to the DOGM on behalf of Huntington protesting Co-Op's coal mining application and expressing its concern that Co-Op's proposed mining

activities in the Bear Creek Canyon Portal Mine would contaminate the City's major culinary water source.

2. In an effort to protect Big Bear Canyon Springs from contamination by Co-Op mining operations, Huntington entered into an agreement with Co-Op on January 27, 1982. In exchange for Huntington's agreement to forgo its protest to Co-Op's proposed mining application, Co-Op agreed to allow the City to monitor the impact of its mining activities on Huntington's water sources.

3. By an October 19, 1989, letter to the DOGM, Menco Copinga, President of NEWUA expressed his concern about water flow and water quality changes in Birch Springs, a primary source of water for the Water Users' Association located below the Co-Op Mine:

> As discussed in our telephone conversation of October 19, 1989, we are very concerned about changes in our BIRCH SPRING. Tuesday, October 17, after complaints to our office about dirty water by some of our water users, Jack Stoyanoff, System Operator discovered dirty water from the Birch Spring.
>
> The Spring flow has trippled (sic) and the water is full of sand and sediment. Water is running from the face of the cliff and over the ground surface. We have turned the Spring flow out of the water system.
>
> This is a dry year and it is extremely important that we can use this water source.
>
> The CO-OP MINE is located just above the Spring. We are concerned that mining activities may have caused these changes.

4. At the time, NEWUA served culinary water to 400 connections and about 1,500 people in rural Emery County, Utah.

5. On October 25, 1989, Bill Malencik, a DOGM Reclamation Specialist, made a field inspection of Birch Springs. Mr. Malencik noted a "five fold increase" in water flow since mid-October 1989, even though surrounding spring sources had a decreased flow due to

drought conditions. See Malencik's November 1, 1989 memorandum. Mr. Malencik further reported that a "significant amount of water is coming out of rock fractures on the cliffs. . . . The primary source together with some secondary sources are flowing over a solid and verticle (sic) rock formation and thence over the surface to a drainage channel. Previously, the spring surface or the groundwater surface above the collection was dry. Some water from the new primary source appears to be percolating between the rock/soil interface."

6. On October 30, 1989, Mr. Malencik and others toured the Bear Canyon Mine and identified possible mine water sources.

7. Mr. Malencik reported that before the October 1989 surge at Birch Springs, NEWUA was experiencing a severe water shortage.

8. Though Mr. Malencik did not come to any conclusions concerning the source of the problems at Birch Springs, he suggested extensive studies be conducted to determine whether or not the change in Birch Springs was related to the activities within the Co-Op mine.

9. On January 22, 1990, Lowell P. Braxton of the DOGM sent a letter to Mr. Copinga stating that the inordinate volume of water discharging through the cracks had stopped. He further stated that the cause of the Birch Springs situation was still unknown, but that the flow of Birch Springs had returned to normal.

10. On November 31, 1990, Co-Op's mining permit expired. Co-Op is in the process of attempting to renew the permit, as well as seeking permission to expand its present mining area.

11. By a December 10, 1990, letter to the DOGM, Mr. Copinga commented on Co-Op's request for mining permits in accordance with R614-300-122.100. In the letter, Mr. Copinga expressed his concern that present Co-Op mining activities in the Bear Canyon Mine and past mining activities in Trail Canyon Mine had and/or were presently contaminating Birch Springs.

12. Concerned about the impacts of Co-Op's mining operations on its water sources, Protestants hired S. Bryce Montgomery, a noted geologist, to examine the Co-Op mine and surrounding area.

13. In his January 28, 1991, and February 8, 1991, reports, Mr. Montgomery expressed his concern over the impact of Co-Op's mining activities on Birch Springs and on Big Bear Canyon Springs. (These reports are attached as Exhibit "A" and Exhibit "B," respectively, and incorporated herein by reference.)

14. According to Mr. Montgomery's January 28, 1991, report:

> Since the recharge to the Big Bear Canyon Spring involves the complete area to the north, including the west Hiawatha mining area, and several fault conduits, the total effects of mining with change in groundwater flows contribute to changes in the Big Bear Spring flow. Thus, in all of the mining operations, ground water that is shifted out of its original flow paths, especially that part of the ground water which did not naturally discharge to the surface as springs or base-flow to streams, is subtracting from the total groundwater system.

Exhibit "A" at 5.

15. Mr. Montgomery went on to say that there had been a significant change in water samples collected from Big Bear Canyon Springs beginning on January 14, 1991. "This change in 1991 is significant and indicates some abnormal injection into the recharge system to the spring of sulfates." See Exhibit "A" at 7.

16. In his February 8, 1991, report, Mr. Montgomery reported that he was concerned that Co-Op's practice of pumping water from a source in Trail Canyon into the abandoned Trail Canyon Mine could result in that water becoming part of the groundwater recharge system of Birch Springs and Big Bear Canyon Springs, leading to contamination of these water sources. See Exhibit "B" at 3.

17. On February 5, 1991, an informal hearing was held by the DOGM in Castle Dale, Utah. Representatives from all interested groups, including Protestants and representatives from the Co-Op mine attended the hearing and testified.

18. This memorandum seeks to clarify some of the issues raised at that February 5, 1991, hearing. Issues to be discussed in this memorandum are: the repose of the burden of proof on both renewal and new permit applications, the geologist's causation standard, the importance of preserving unpolluted surface and ground water in relation to importance of mining and a summary of violations of the current regulations by Co-Op in relation to its statutory duties to protect ground and surface water.

ARGUMENT

A. Burden of Proof

1. Renewal Permits

a. Since Co-Op Has Failed to Abide by the Stated Terms of its Application and Has Otherwise Violated Applicable Mining Laws, it Has the Burden of Showing its Entitlement to a Renewal Permit

Pursuant to Utah Code Ann. §40-10-9(4)(a),

> . . . The holders of a permit may apply for renewal, and the renewal shall be issued (but on application for renewal the

burden shall be upon the opponents of renewal) . . . unless it is established that and written findings by the division are made that:

> (i) The terms and conditions of the existing permits are not being satisfactorily met;
>
> (ii) The present surface coal mining[1] and reclamation operation is not in compliance with the approved plan . . .
>
> (v) Any additional or revised or updated information required by the division has not been provided. (emphasis added).

The Surface Mining Control and Reclamation Act ("SMCRA"), 30 U.S.C.A. §1256(d)(1), which is also applicable to surface impacts of underground mining[2] similarly states that:

---

[1] Though this sentence references surface coal mining specifically, the legislative findings and the statement of purpose at the beginning of the chapter refer to coal mining generally. See e.g., Utah Code Ann. §40-10-1, §40-10-2. As with federal statutes, state regulations on surface mining apply to the surface effects of underground mining.

[2] Throughout this memorandum, Protestants draw upon analogous code sections relating to surface mining because statutes specific to underground mining are incomplete and these regulations frequently overlap. Pursuant to the treatise, American Law of Mining, 2nd Ed., §172.05[8],

> SMCRA regulates the surface impacts of underground coal mining operations. Moreover, underground mine operators must comply with a set of performance standards similar to those applicable to surface operations.
>
> The Secretary of the Interior is required to issue regulations for underground mines, giving due consideration to the differences between surface and underground coal mining. Underground mines must nevertheless also meet statutory standards, some of which are identical to those governing surface mines. . . .
>
> Underground mines, like surface mines, must also minimize disturbances to the hydrologic balance; the performance standard for underground mines is a truncated version of that applicable to surface mines. (citations omitted).

> . . . The holders of [a valid] permit may apply for renewal and such renewal shall be issued (provided that on application for renewal the burden shall be on the opponents of renewal) . . . unless it is established that and written findings by the regulatory authority are made that--
>
> (A) the terms and conditions of the existing permit are not being satisfactorily met;
>
> (B) the present surface coal mining and reclamation operation is not in compliance with the environmental protection standards of this chapter and the approved State plan or Federal program pursuant to this chapter . . .
>
> (E) any additional revised or updated information required by the regulatory authority has not been provided. Prior to the approval of any renewal of permit the regulatory authority shall provide notice to the appropriate public authorities. . . . (emphasis added).

Protestants believe that both the Utah and Federal statutes mean that on application for renewal, the burden shall be on the opponents of renewal unless the applicant has failed to meet the terms and conditions of the existing permit satisfactorily, has not complied with environmental protection standards, or has not provided the pertinent regulatory authority with additional revised or updated information. Because Co-Op has failed to comply with the statutory requirements and with the stated terms of its permit application, and has not provided the DOGM with all requested material, the burden is rightfully placed on Co-Op to prove that it is entitled to the renewal of its permit.

The findings and conclusions of Congress during the enactment of SMCRA[3] support the Protestants' position that the burden is on

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[3] SMCRA is a useful guide in analyzing burden of proof since there is no such independent and detailed statute on underground mining. Pursuant to 30 U.S.C.A. 1266, SMCRA regulates the surface impacts of underground coal mining operations.

the applicant for renewal if it has failed to comply with applicable law. In its discussion of burden of proof in SMCRA, Congress reached the following conclusions:

> Consistent with a number of modifications to section 505 designed to assure security of tenure of permit, the committee amendment deletes the words "or renewal" in subsection (a) to make it clear that the applicant does not have the burden of demonstrating compliance upon renewal of a permit for the same area already under permit. Rather, consistent with other provisions of the act, the permit carries with it the right of renewal for the same area if the operation is in compliance with law. (emphasis added)

Pub. L., 1977 Code Cong. & Ad., Section 510(a) "Burden on renewal," at 603.

Though this section states that the applicant generally does not have the burden of proof on renewal, the final sentence dictates that renewal is not automatic; it is contingent upon the applicant's current compliance with applicable mining regulations.

Under the circumstances currently before the DOGM, Co-Op has forfeited its right to automatic renewal. Due to its repeated violations of mining regulations, particularly with regards to protection of water resources and its failure to abide by the conditions of its permit, Co-Op has the burden to prove its entitlement to a renewal permit and that burden of proof may not be placed on Protestants.

b. In the Alternative, Once the Protestants Have Made a Prima Facie Showing That Co-Op Has Not Abided by the Mandates of its Application and Has Otherwise Violated Applicable Mining Laws, the Burden of Proof Shifts to Co-Op to Prove its Entitlement to a Renewal Permit

R614-303-233.200 governs the allocation of the burden of proof on a renewal permit application. Even if the DOGM determines that

the initial burden is with Protestants (which Protestants urge is unwarranted), once Protestants make a prima facie showing that Co-Op has not abided by the stated terms of its application and has and continues to violate applicable mining regulations, the burden shifts to Co-Op to prove its entitlement to a renewal permit. This analysis is supported by federal administrative law decisions.

Decisions of the Interior Board of Land Appeals ("IBLA") support Protestants' alternative position that even if Protestants have the initial burden of proof, only a prima facie burden that Co-Op is in violation of mining regulations must be shown and then the burden shifts to Co-Op. The administrative law cases detailed below are analogous to the present facts. In the IBLA cases, the Office of Surface Mining Reclamation and Enforcement ("OSMRE") has the burden to establish a prima facie case that a violation of a mining regulation has occurred. Once this showing is made, the burden shifts to the violator.

Innovative Development of Energy, Inc. v. Office of Surface Mining Reclamation and Enforcement, 110 IBLA 119, (August 8, 1989) supports Protestants' position. In that case, Innovative Development of Energy ("IDE") appealed its citations by the Tennessee Division of Surface Mining ("TDSM") for violating Tennessee's Surface Mining Act including: 1) failure to pass all surface drainage through a sedimentation pond before leaving the permit area; 2) failure to maintain diversion structures; and 3) failure to keep reclamation current. 110 IBLA at 121. In analyzing the case, the IBLA allocated burdens between OSMRE and

TDSM as follows:

> In a proceeding upon an application for review of an NOV [notice of violation], the burden of going forward to establish a prima facie case as to the validity of the NOV rests with the OSMRE. A prima facie case is presented if OSMRE presents essential facts from which it may be determined that a violation of pertinent requirements has occurred. If OSMRE meets it burden of establishing a prima facie case, the ultimate burden of persuasion rests with the applicant for review, and if OSMRE's evidence is not rebutted, the NOV will be affirmed. (citations omitted)

110 IBLA at 123.

The IBLA concluded that OSMRE had met its prima facie burden with the following evidence:

> When OSMRE submits evidence that water flowing from an area disturbed by surface mining operations has pH levels outside the regulatory standards at a point where the water leaves the permit area, a prima facie case that there has been a violation of 30 CFR 715.17(a) is established. Such evidence may be in the form of analytical tests of water, and the results of such a test are presumptively valid in the absence of rebuttal evidence that the test was not properly administered. Appellant submitted no evidence to support a finding that the tests conducted by OSMRE were invalid. Therefore, the evidence by the Hach test and laboratory test were sufficient to sustain a finding that a violation existed. (citations omitted)

110 IBLA at 123.

Similarly in Turner Brothers, Inc. v. Office of Surface Mining Reclamation and Enforcement, 103 IBLA 124 (July 19, 1988), Turner Brothers Inc. ("Turner") was cited for failure to pass all surface drainage through a sedimentation pond before leaving the permit area as required by Oklahoma Permanent Regulatory Program Regulation section 816.42(a)(1). On appeal, Turner argued that it had complied with Oklahoma regulations and the OSMRE failed to present evidence necessary to establish a prima facie case as to the violations. IBLA disagreed with Turner's argument and stated

that:

> . . . At a hearing OSMRE has the burden of going forward to establish a prima facie case as to the validity of an NOV by the submission of sufficient evidence to establish the essential facts of the violation. However, the ultimate burden of persuasion rests with the applicant for review. If OSMRE establishes a prima facie case and the evidence is not rebutted, the evidence will sustain the violation. (citations omitted)

103 IBLA at 129.

IBLA went on to say that:

> . . . Turner had the burden of producing evidence to rebut OSMRE's prima facie case, and we are surprised that, given the nature of the conflict, the company failed to present more definite evidence as to its area of operations at the time of the inspection, the location of the shale pit, and the presence of the spoil piles and berms which, according to Turner, controlled surface drainage in the area. Maps, photographs, company records, or other evidence relatively contemporaneous with the inspection could have been used to show error in the inspector's testimony and, thus, firmly establish the truth of Turner's assertions. Absent more definite evidence, we cannot conclude that the evidence presented was sufficient to overcome OSMRE's prima facie case.

103 IBLA 131.

These cases support Protestants' position that even if they have the initial burden to show violations by Co-Op, the burden shifts to Co-Op to prove their entitlement to a permit renewal after Protestants establish a prima facie case of Co-Op violations.

Protestants have previously submitted evidence that Co-Op's mining operations do not comport with the promises in its application. S. Bryce Montgomery, a noted geologist, has studied the area for Protestants and has concluded that Co-Op's past, present and planned mining activities have in part and will continue to contaminate water sources in the area. See Exhibit "A" and Exhibit "B."

2. New Permits

Pursuant to R614-300-131.200, "[t]he applicant for a permit or permit change will have the burden of establishing that their application is in compliance with all the requirements of the State Program." See also, Utah Code Ann. §40-10-9(4)(b).

30 C.F.R.§773.15(2)[4] similarly states that: "[t]he applicant for a permit or revision of a permit shall have the burden of establishing that his application is in compliance with all the requirements of the regulatory program." See also, R614-301-111.200 ("It is the responsibility of the permit applicant to provide to the Division all of the information required by R614-301-100 [coal mining permit application requirements].") Therefore, the burden for new areas Co-op seeks to mine is on Co-Op, not on Protestants.

B. Geologist's Causation Standard

According to S. Bryce Montgomery, the geologist who examined and studied the impact of Co-Op mining operations on water sources in the area, including Birch Springs:

> . . . the anomalous jump in Birch Spring flow (80 gpm to 230 gpm) from October 1989 through January 1990 is obviously unatural (sic). Furthermore, from the descriptions provided me of this occurrence, I conclude that it is definitely associated with mining activity, and most probably within the caving Trail Canyon Mine. The visual and chemical analysis which showed "oil and grease" with large quantities of suspended sediment in a water sample collected from the spring in October 1989, along with the jump in total dissolved mineral solids (674 mg/l) double of what was analyzed of the spring water in September 1980 (360 mg/l) evidences that contaminated water held in temporary storage within the mine

[4] These sections relate to surface mining, but are applicable to surface mining impacts of underground mining.

> was released suddenly and entered into the fault conduit system that recharges Birch Spring. This sudden entry into the fault conduit was likely due to a build-up in water storage and head within the caved mine to create sufficient water pressure to break through and flush a previously plugged section of the fault. The fact that this anomalous high flow (approximately 0.5 cubic-foot/second) continued for a period of nearly three months evidences that considerable ground water was held in temporary storage. This would amount to approximately 90 acre-feet or about 29,000,000 gallons of water. (emphasis added).

Montgomery's January 28, 1991 report at 8.

Mr. Montgomery concludes that given the nature of the rock formations, the faults and the aquifers, Co-Op's mining activities have interrupted and reduced the underground flow of water in the area, have altered the paths of the flow, and have contaminated the water. This testimony is sufficient to support NEWUA's position that Co-Op's mining activities have adversely impacted their water source, Birch Springs, and to show that under present circumstances, Co-Op is not entitled to either a renewal or new permit.

Similarly, Mr. Montgomery's findings support CVSSD's and Huntington's position that Co-Op mining activities have contaminated Big Bear Canyon Springs. Mr. Montgomery's report further concludes that Co-Op's proposed expansion of its mining operations will adversely impact Big Bear Canyon Springs and Birch Springs.

Both the Utah Supreme Court and the federal administrative law cases have adopted the standard of "reasonable likelihood" in determining whether an expert's testimony is sufficient to support a claim that a water source has been polluted. In Branch v.

Western Petroleum, 657 P. 2d 267 (Utah 1982), the Branches sued Western Petroleum for polluting their culinary water wells by percolation of oil well formation waters Western Petroleum had ponded on the Branches' property. The main issue in the case was whether Western's formation waters caused the pollution of the Branches' wells and if so, how. Id. at 271. Each side employed a geologist to testify on its behalf. The two experts agreed that formation water in the disposal pit was percolating into the subsurface waters, but disagreed on whether the polluted water had entered the shallow groundwater or whether they had percolated into the deeper Duchesne Formation. Id.

It was the position of Western Petroleum's expert that the formation water only entered the shallow groundwater. Id. It was the position of the Branches' expert that the waters from Western's disposal water percolated below the shallow groundwater and through natural joints and cracks into the deeper Duchesne Formation, where it entered both of the Branches' wells and made them unfit for human use. Id. at 271-272. The jury found the Branches' expert more convincing and concluded that Western Petroleum's "'use of the evaporation pit for the dumping of formation water [was] a cause of the pollution of the water in [the Branches'] [wells]. . .'" Id. at 272.

In its analysis, the Utah Supreme Court concluded that "[e]ven if Western did not know that the formation water would enter the aquifer and cause damage to plaintiff's well, it could have determined the likelihood of that consequence." Id. at 275, fn. 6.

In support of this statement, the Court quoted from Davis, Groundwater Pollution: Case Law Theories of Relief, 39 Mo.L. Rev. 117, 145-146 (1974):

> A polluter should not be absolved from liability just because he may not be able to anticipate the movement of the polluted groundwater he created. This defense should not be recognized for several reasons. First, the hydrology of groundwater movement is much better understood now than it was when many of the early groundwater pollution cases were decided. Even though precise mapping of groundwater movement in any particular location is still expensive, it is within the reach of any major waste producer which proposes to inject wastes underground. Disposal wells need porous formations for successful waste injection and the appropriate hydrologic tests would insure a successful injection well. Therefore, persons deliberately disposing of wastes underground ought to be required to act in accordance with the information gained by such testing regarding the movement of the injected wastes and their probable effects on neighboring groundwater uses. If they do not make such tests, they should be charged with the information they would have gained had they made them. Second, it is generally known now that liquids placed on the ground will seep into the soil and may enter the body of groundwater percolating beneath the surface. Persons causing groundwater pollution in ways, other than by deliberate underground disposal, should be charged with such knowledge and should not be insulated from liability for groundwater pollution movement. . . . Although a particular polluter might still legitimately claim he could not predict particular injurious consequences of his activity, he can no longer claim legitimately that the polluting material vanished from the earth once it seeped beneath the surface. He knows it will go somewhere. . . .
>
> Pollution of a groundwater aquifer may have pervasive effects both in terms of territorial extent and duration. With reliance on our groundwater supplies increasing, the old court-made rules concerning groundwater pollution are no longer adequate. (citations omitted).

657 P. 2d at 275, fn. 6.

Administrative law cases likewise do not require precise testimony by a geologist regarding adverse impacts of mining activities on groundwater. These courts only require that a reasonable likelihood test be met. The IBLA cases cited below

involve establishment of violations of discharge and sediment pond controls through expert testimony and evidence.

In Turner Brothers v. Office of Surface Mining Reclamation & Enforcement, 102 IBLA 299 (May 31, 1988), the administrative law judge stated three elements of proof required to establish a violation for improper discharge of waste water from a mining facility: 1) the existence of surface drainage from areas disturbed in the course of mining and reclamation activity; 2) that such drainage was not passed through a sedimentation pond; and 3) that such drainage flowed off the permit area. Id. at 77. Although the inspector who testified in the case did not see any surface drainage from the disturbed areas at the time of his inspection nor did he find any evidence that any drainage had left the permit area, the court concluded that his testimony established for all three areas in question that there was a reasonable likelihood that there would be surface drainage from those areas. The inspector's testimony was based on his observation of the slope of the discharge area and his conclusion that waste water drainage would not pass through a sedimentation pond, and that it would leave the permit area unfiltered. Id. at 79. The mine operators did not rebut this testimony.

The administrative law judge upheld the lower court's conclusion that "there is a reasonable likelihood that there will be surface drainage from areas disturbed in the course of surface coal mining and reclamation operations, that it will not pass through a sedimentation pond or siltation structure, and that it

will leave the permit area. . ." Such testimony was held to be sufficient to establish a prima facie case of a violation of the regulations. Id.

In Alpine Construction Corp. v. Office of Surface Mining Reclamation & Enforcement, 101 IBLA 128, 95 I.D. 16 (February 8, 1988), the administrative law judge similarly concluded that by requiring an OSMRE inspector to prove that surface drainage has, in fact, left the permit area, would amount to requiring him to wait until adverse impacts resulting from the absence of sedimentation ponds have taken place. 95 I.D. at 22. This was particularly relevant since the inspection of the mine took place during the dry season. To invalidate the NOV on the basis that the inspector did not see surface drainage leave the permit area would effectively require him to wait for a rain before conducting an inspection for sedimentation pond compliance. Id.

The administrative law judge in Turner Brothers v. Office of Surface Mining Reclamation & Enforcement, 103 IBLA 124, 132, supra, concluded that a prima facie case that surface drainage left the permit area may be established by evidence of present or past drainage from a disturbed area flowing off the permit area. Id. at 132. Alternatively, a prima facie case may be established by demonstrating that under the conditions existing at the minesite at the time of inspection, there is a reasonable likelihood that surface drainage from a disturbed area would leave the permit area without passing through a sedimentation pond. Id.

These standards comport with Mr. Montgomery's evidence. His

report establishes that Co-Op's mine operations have adversely impacted Birch Springs and Big Bear Canyon Springs. In the alternative, his report establishes that given the conditions at the Co-Op minesite, there is, at a minimum, a reasonable likelihood that waste water drainage is seeping into ground and surface waters and thereby harming Birch Springs and Big Bear Canyon Springs. Mr. Montgomery's report also establishes, at a minimum, a reasonable likelihood that Co-Op's proposed mining expansion would adversely impact these water sources.

The case of Innovative Development of Energy, Inc. v. Office of Surface Mining Reclamation and Enforcement, 110 IBLA 119, supra, further supports Protestants' position that Co-Op's mining operations are the only logical source of the problems at Birch Springs and at Big Bear Canyon Springs. In the case, the administrative law judge concluded that allegations that contamination of the water discharged from a sediment pond was from other than the disturbed area are of no benefit to appellant without a showing that the other area was the sole source of the contamination. Id. at 124. Water quality limitations apply to all discharges flowing from a disturbed area into a sedimentation pond. Id.

These cases taken together with Branch v. Western Petroleum, supra, lend credence to Mr. Montgomery's report and support Protestants' position that Co-Op mining operations have and will adversely impact Birch Springs, Big Bear Canyon Springs, and other water sources in the area.

C. Preservation of Unpolluted Surface and Ground Water More Important Than Mining Operations

"As Utah is one of the most arid states in the union, the protection of the purity of the water is of crucial importance, and the Legislature has enacted laws for the protection of both surface and subterranean waters." Branch, supra, 657 P.2d at 273. This statement is typical of the policies of both Utah and the federal government to protect ground and surface water. Pursuant to Utah Code Ann. §26-11-8(1), ". . . it is unlawful for any person to discharge a pollutant into the waters of the state or to cause pollution which constitutes a menace to public health and welfare, or is harmful to wildlife, fish or aquatic life, or impairs domestic, agricultural, industrial, recreational, or other beneficial uses of water, or to place or cause to be placed any wastes in a location where there is probable cause to believe they will cause pollution. Any such action is a public nuisance."

Utah law further provides that water for domestic uses is preferred over all other uses. According to Utah Code Ann. §73-3-21, ". . . in times of scarcity, while priority of appropriation shall give the better right as between those using water for the same purpose, the use for domestic purposes, without unnecessary waste, shall have preference over use for all other purposes, and use for agricultural purposes shall have preference over use for any other purpose except domestic use." According to this statute, use of water in Birch Springs and Big Bear Canyon Springs for domestic and agricultural uses is favored over all other purposes.

In addition, Utah statutes on coal mining are replete with

safeguards for water rights. Pursuant to R614-300-133,

> No permit application or application for a permit change will be approved unless the application affirmatively demonstrates and the Division finds, in writing and on the basis of information set forth in the application or from information otherwise available that is documented in the approval, the following:
>
> > . . . 133.400. The Division has made an assessment of the probable cumulative impacts of all anticipated coal mining and reclamation operations on the hydrologic balance in the cumulative impact area and has determined that the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area. . .

See also, R614-301-700 et seq.

R614-301-525.244 allows the DOGM to limit the percentage of coal extracted under or adjacent to an aquifer or body of water "that serves as a significant water source for any public water supply system. . . " This statute places the importance of water over mining.

The legislative history of federal mining statutes lends further support to Protestants' position that mine operators and owners must take affirmative steps to protect water resources or not be allowed to mine. In approving SMCRA, which applies to all coal surface mining and the surface impacts of underground mining and coal processing[5], Congress recognized that both surface and

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[5] Pursuant to Pub.L. 95-87, 1977 Code Cong. & Ad. News, Section 516 at 706, entitled "Surface effects of underground coal mining operations," "[t]he surface impacts of underground coal mining operations are often intermingled with environmental impacts of strip mining. Further, a uniform set of environmental protection standards for surface impacts of underground mines are not existent. This section includes those minimum environmental standards for underground mining operations that will provide a similar level of protection as the standards in this act for strip mines."

underground coal mining posed hazards to the environment. Pub. L. 95-87, 1977 Code Cong. & Ad. News at 595-596. Referring to the devastating environmental impacts of all types of coal mining, Congress stated that:

> While coal in the past has contributed significantly to the industrial and economic growth of the United States, the environmental and social costs of coal extraction have been enormous. To this day coal mining in Appalachia too often results in a legacy of polluted streams below multilated (sic) mountain sides left treacherously unstable. In the arid West, permanent rehabilitation of mined areas is yet to be demonstrated. If not properly conducted, current and planned western coal development could leave behind barren wastelands susceptible to continual erosion and disrupted groundwater systems, significantly diminishing the productivity of agricultural areas. By imposing workable reclamation standards nationwide through the enactment of H.R. 2, the unnecessary degradation of land and water resources will be avoided as the country makes good use of its abundant coal supply.

Pub. 95-87, 1977 Code Cong. & Ad. News at 595.

In his testimony before the Senate subcommittee compiling coal mining regulations, Major General Ernest Graves of the U.S. Army Corps of Engineers gave information on the Corps' experiences with water contamination caused by siltation attributable to poorly reclaimed surface coal mining operations.

> The most widespread damages resulting from the effect of mining upon the water resource are environmental in nature. Water users and developers incur significant economic and financial losses as well.
>
> Reduced recreational values, fishkills, reductions in normal waste assimilation capacity, impaired water supplies, metals and masonry corrosion and deterioration, increased flood frequencies and flood damages, reductions in designed water storage capacities at impoundments, and higher operating costs for commercial waterway users are some of the most obvious economic effects that stem from mining-related pollution and sedimentation. . . .

Pub. L. 95-87, 1977 Code Cong. & Ad. News at 597. <u>See also</u>, Pub.

L. 95-87 at 642-643 (mining impact on hydrologic balance); Pub. L. 95-87 at 652 (monitoring hydrologic impact).

A similar analysis is applicable to the adverse environmental impacts of underground coal mining:

> Underground mining is the principal source of existing acid and mineral pollution from coal mining. Such acid and mineral pollution have already affected more than 10,500 miles of streams in the eight Appalachian coal States and nearly 6,000 miles of these streams are continuously polluted by acid mine drainage. In terms of the number of sources of acid mine drainage, underground mines account for 67 percent of the sources, yet produce 88 percent of acid drainage. Surface mines produce the rest. However, active underground mines are proportionately the greatest pollution source since they represent only 5 percent of all mines, yet produce 19 percent of overall acid drainage.
>
> Contrary to the situation in most industries, the discharge of water from many underground coal mines does not cease when the operation shuts down or is abandoned. Usually mine operators are not required to develop a mining operation in a manner designed to eliminate or minimize polluting discharges after mining. The standards included in the bill pertaining to minimizing the disturbances to the prevailing hydrologic balance both during and after coal mining operations, section 516(b)(9), are intended to meet the problem of continuing pollution discharges after mining has ceased.

Pub. L. 95-87, 1977 Code Cong. & Ad. News at 659.

Both federal and state mining statutes acknowledge the economic importance of mining, but not at the expense of water resources. See e.g., 30 U.S.C.A. §102(a) (Congress promulgated SMCRA to establish a nationwide environmentally effective and administratively realistic program to protect society and the environment from the negative effects of surface coal mining operations.)

According to the Legislature's findings in Utah's Coal Mining

and Reclamation Act, coal mining operations presently[6] contribute to the nations' energy requirements, and Utah's expansions of coal mining activities requires ". . . the urgent establishment of appropriate standards to minimize damage to the environment and to productivity of the soil and to protect the health and safety of the public." Utah Code Ann. §40-10-1(1),(2) (1979). The purpose of the Act is to insure that the rights of persons with a legal interest in the land or appurtenances are fully protected from the adverse impacts of the mining operations. Utah Code Ann. §40-10-2(2).

The objectives of the Utah Mined Land Reclamation Act, of which underground coal operations are a part, are "to minimize or prevent present and future on-site or off-site environmental degradation caused by mining operations to the ecologic and hydrologic regimes and to meet other pertinent state and federal regulations regarding air and water quality standards and health and safety criteria" and "to minimize or prevent future hazards to the public safety and welfare." Utah Code Ann. §40-8-12(2),(3).

It is important to note that both the federal and state statutes regarding the significance of coal as an energy source were written in the 1970s when the nation was experiencing a gasoline shortage. Though coal remains an important energy source, the protection and preservation of water has come to the forefront since that time. Emery County, Utah, has experienced five years of drought with significant adverse impacts on the local environment

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[6] This statute was promulgated in 1979.

and economy. The scarcity of water available to Protestants makes the protection of Birch Springs, Big Bear Canyon Springs, and other water sources in the area more significant today than when federal and state mining statutes were promulgated. Given the drought situation, there is less water to recharge the aquifers and to filter out impurities caused by Co-Op's mining operations. Neither federal nor state law allow a mine operator to be issued a new or a renewal permit until it has taken appropriate and affirmative steps to protect water resources in the area.

D. Mandatory Obligations of Co-Op With Regard to Water

According to R614-300-142, "[t]he permittee will conduct all coal mining and reclamation operations only as described in the approved application, except to the extent that the Division otherwise directs in the permit." (emphasis added). R614-300-143 further states that: "[t]he permittee will comply with the terms and conditions of the permit, all applicable performance standards and requirements of the State Program." In chapter seven of its application, entitled hydrology, and elsewhere in the application, Co-Op gives an exhaustive account of all the precautions it will take to protect surface and groundwater in the area. For example, in Chapter 3, section 5.3, Co-Op states that it "will conduct all mine site operations in such a way as to minimize potential impact on surface and ground water quality." Co-Op states that no significant impacts to the groundwater system are expected from the mining operation, but that in the "unlikely event that mining adversely affects a water source, Co-Op will select an alternative

after considering all possibilities of each site-specific circumstance." Chapter 3, section 5.3.1.

Co-Op has not lived up to these promises. On repeated occasions, Co-Op has been cited by the DOGM for violations, many of which have a direct bearing on water resources[7]. (A summary of Co-Op's violations and application deficiencies is attached as Exhibit "C" and incorporated herein by reference.) Protestants have also submitted strong evidence that the change in Birch Springs beginning in October 1989 and continuing for months thereafter was caused by Co-Op's careless mining activities and failure to protect the environment. As recently as January 14, 1991, there was a significant rise in contaminants found in Big Bear Canyon Springs due to an "abnormal injection into the recharge system to the spring of sulfates" which is likely attributable to Co-Op. See Exhibit "B" at 7. Protestants have also presented evidence that Co-Op's proposed expansion will harm these water sources.

R614-300-145 requires that "[t]he permittee will take all possible steps to minimize any adverse impact to the environment or

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[7] 1) failure to maintain diversion, culvert below sediment pond and office; 2) failure to submit water sampling data for annual report; 3) failure to install environmental control measures; 4) failure to avoid plugging or collapse and erosion at inlets and outlets; 5) failure to collect required baseline water monitoring data for surface and ground monitoring; 6) mine water discharge from Hiawatha Portal; 7) drainage control plans required for Hiawatha sum; 8) failure to maintain diversions; 9) failure to maintain diversion ditch D-4D and culvert C-2D inlet; 10) failure to pass disturbed surface drainage to treatment facility; 11) failure to obtain a new conveyor before construction and failure to maintain on/off controls; 12) failure to maintain ditches and diversions. Appendix 2-A, Violation List, to Co-Op's application.

public health and safety resulting from noncompliance with any term or condition of the permit . . ." Again, the evidence, including Co-Op's past history of violations, dictates that Co-Op is not presently entitled to a permit.

On January 3, 1991, and January 4, 1991, Co-Op was given assessments for: 1) test plot implementation, and 2) maintenance of diversion and of pertinent structures violations, respectively. Co-Op also has an outstanding violation for failing to provide detailed maps requested by the DOGM. Co-Op has yet to supplement its application with maps meeting the requirements of R614-301-100 et seq. By a January 21, 1991, letter Co-Op requested an extension from the DOGM to submit updated maps, thus acknowledging its failure to meet these requirements.

R614-303-233.100, "Criteria for approval," states that the DOGM will not approve a permit for renewal if it finds that:

> 233.110 The terms and conditions of the existing permit are not being satisfactorily met;
>
> 233.120 The present coal mining and reclamation operations are not in compliance with the environmental protection standards of the State Program;
>
> 233.130 The requested renewal substantially jeopardizes the operator's continuing ability to comply with the State Program on existing permit areas . . .
>
> 233.160 Additional, revised, or updated information required by the Division under R614-303-232.250 has not been provided by the applicant.

Under the present circumstances, Co-Op cannot meet these requirements. The terms and conditions of Co-Op's existing permit are not being met. The application is neither accurate nor complete and inadequately addresses the impacts of Co-Op's mining

activities on the hydrologic balance. Until these corrections are made and steps are taken to adequately protect Birch Springs, Big Bear Canyon Springs and other water sources in the area, Co-Op is not entitled to a mining permit.

Pursuant to R614-301-731, a plan must

> . . . be specific to the local hydrologic conditions. It will contain the steps to be taken during coal mining and reclamation operations through bond release to minimize disturbance to the hydrologic balance within the permit and adjacent areas; to prevent material damage outside the permit area; to support approved postmining land use in accordance with the terms and conditions of the approved permit and performance standards of R614-301-750; to comply with the Clear Water Act (33 U.S.C. 1252 et seq.); and to meet applicable federal and Utah water quality laws and regulations. The plan will include the measures to be taken to: avoid acid or toxic drainage; prevent to the extent possible using the best technology currently available, additional contributions of suspended solids to streamflow; <u>provide water treatment facilities when needed; and control drainage</u>. (emphasis added).

It is Protestants' position that unless tighter restraints are placed on Co-Op to eliminate contamination to Birch Springs and Big Bear Canyon Springs, Co-Op should be required to install a water treatment facility. In the alternative, Protestants request that the DOGM substantially limit Co-Op's mining activities in order to protect surrounding water sources. According to R614-301-525.244, "[i]f the Division determines that it is necessary in order to minimize the potential for material damage to . . . any aquifer or body of water that serves as a significant water source for any public water supply system, it may limit the percentage of coal extracted under or adjacent thereto."

Pursuant to R614-301-731.111,

Ground-water quality will be protected by handling earth

> materials and runoff in a manner that minimizes acidic, toxic or other harmful infiltration to ground-water systems and by managing excavations to and other disturbances to prevent or control the discharge of pollutants into the ground water...

R614-301-731.121, lists similar protections for surface water:

> Surface-water quality will be protected by handling earth materials, ground-water discharges and runoff in a manner that minimizes the formation of acidic or toxic drainage; prevents, to the extent possible using the best technology currently available, additional contributions of suspended solids to streamflow outside the permit area; and, otherwise prevent water pollution. If drainage control, restabilization and revegetation of disturbed areas, diversion of runoff, mulching or other reclamation or remedial practices are not adequate to meet the requirements of R614-301-731.100 through R614-301-731.522, R614-301-731.800 and R614-301-751, the operator will use and maintain the necessary water treatment facilities or water quality controls . . .

To ensure that an operator takes affirmative steps to protect ground and surface water, R614-301-731.210 and R614-301-731.220 outline the requirements for ground and surface water monitoring, respectively. Co-Op has neither taken precautions to protect ground or surface water impacted by its mining activities nor has it adequately monitored the groundwater or surface water to ensure the protection of Birch Springs and Big Bear Canyon Springs.

In addition to these violations, Co-Op has failed to abide by the following coal mine permit application requirements:

1) <u>R614-301-721</u> requires that Co-Op describe the premining hydrologic resources within the permit and adjacent areas that may be affected or impacted by the mining activity.

> <u>Violation</u>: Co-Op has not described the hydrologic resources adequately. Birch Springs is not shown on all of the appropriate maps, and it is within the adjacent area.

2) <u>R614-301-722</u> requires that the application include cross-sections and maps.

> <u>Violation</u>: Co-Op has failed to provided adequate maps of

its works so that compliance can be adequately judged. This remains an outstanding and unabated violation.

a. R614-301-722.100 requires that the cross-sections and maps show the extent of subsurface water within and adjacent to the mining operation. The cross-sections and maps must include areal and vertical distribution of aquifers, and portrayal of seasonal differences of head in different aquifers on cross-sections and contour maps.

Violation: Co-Op has failed to submit maps or cross-sections that adequately show subsurface water and geologic formations.

b. R614-301-722.200 requires that the application contain cross-sections and maps showing the location of springs within the permit and adjacent area.

Violation: Co-Op has failed to submit maps or cross-sections that adequately show locations of springs.

c. R614-301-722.300 requires that the application contain cross-sections and maps showing the elevations and locations of monitoring stations used to gather water quality and quantity in preparation of the permit application.

Violation: Co-Op has failed to submit maps or cross-sections that adequately show elevations and locations of monitoring stations.

d. R614-301-722.400 requires that the application contain cross-sections and maps showing the location and depth of water wells in the permit area and adjacent area.

Violation: Co-Op has failed to submit maps or cross-sections that adequately show the location and depth of water wells in the permit areas.

3) R614-301-724 requires the following baseline hydrologic information:

a. R614-301-724.100--the location and ownership of springs in the permit, and adjacent area, and other ground water resources, seasonal quality and quantity of ground water, and its usage.

Violation: The location of Birch Springs is not shown on all Co-Op maps, nor is an adequate description of the ownership, usage, quality, and quantity provided.

According to DOGM records, Co-Op has only sampled Birch Springs two times, once in 1987 and once in 1989. No contact has been made by Co-Op with NEWUA to gain access to the springs for monitoring purposes.

4) R614-301-724.300 requires the following geologic information:

a. R614-301-724.310--a determination of the probable hydrologic consequences of the operation upon the quality and quantity of surface and ground water in the permit and adjacent areas.

Violation: Co-Op has insufficient geologic information to make an adequate probable hydrologic consequences determination.

b. R614-301-724.600--requires the applicant to provide a survey showing whether aquifers or areas for the recharge of aquifers exist within the permit and adjacent area and whether subsidence could cause material damage or diminution of reasonably foreseeable use of aquifers or areas for the recharge of aquifers.

Violation: Co-Op has not provided sufficient information on aquifers and recharge areas to determine the impact of mining on Birch Springs and on Big Bear Canyon Springs.

5) R614-301-725.300 states that a permit will not be approved until the necessary hydrologic and geologic information is available to allow a probable hydrologic consequences determination.

Violation: Co-Op has not met these requirements for its existing permit nor has it met its application promises.

6) R614-301-728 lists the Probable Hydrologic Consequences Determination (PHC) requirements:

a. R614-301-728.100 requires that the application contain a determination of the PHC for the proposed mining operation upon the quality and quantity of ground water under seasonal flow conditions for the permit and adjacent areas.

Violation: Co-Op has not provided adequate information relating to the impact of its mining operations on the quality and quantity of ground water to determine the PHC.

b. R614-301-728.200 requires that the PHC determination be based on baseline hydrologic, geologic and other information

collected for the permit application.

Violation: Co-Op has not provided adequate information to meet the requirements of this section.

c. R614-301-728.310 requires a determination as to whether adverse impacts may occur to the hydrologic balance.

Violation: Co-Op has not provided adequate information relating to the adverse impacts of its mining operations on the hydrologic balance.

d. R614-301-728.320 requires a determination as to whether acid-forming or toxic-forming materials are present that could result in the contamination of ground water supplies.

Violation: Co-Op has not provided adequate information to determine whether acid-forming or toxic-forming materials are contaminating groundwater supplies.

e. R614-301-728.332 requires a determination as to the impact of the mining operation on acidity, total and dissolved solids and other important water quality parameters.

Violation: Co-Op has not provided adequate information to determine whether its mine operations are contaminating water quality.

f. R614-301-728.334 requires a determination as to the impact of the mining operation on ground water availability.

Violation: Co-Op has not provided adequate information to determine the impact of it mine operations on ground water availability.

As stated in its January 21, 1991, letter to the DOGM, Co-Op is still in the process of completing its PHC violations and thus in violation of R614-301-728 et seq.

7) R614-301-731 requires that a plan show how the relevant regulations will be addressed to protect the ground water resources. The plan will include steps taken to minimize disturbance to the hydrologic balance, and to prevent material damage outside the permit area. A water monitoring plan is required to document any changes to the hydrologic balance.

Violation: Co-Op has not submitted a plan adequate to protect the hydrologic balance, particularly since there are two culinary water springs in such close proximity to

the mining operation.

A comprehensive plan must be implemented if Protestants are to maintain Birch Springs and Big Bear Canyon Springs as a water source.

a. R614-301-731.211 requires that a permit application will include a ground water monitoring plan based upon the PHC and the analysis of all baseline hydrologic, geologic and other information in the permit application.

Violation: Co-Op has not provided adequate information to characterize its current monitoring plans.

8) R614-301-742.221.33 requires that sediment ponds be able to contain or treat the ten year, twenty-four hour precipitation event.

Violation: The sediment design in Co-Op's application is inadequate to ensure compliance with this section. Co-Op must supply accurate maps, plans and designs to verify the capacity of the sediment pond to treat the ten year, twenty-four hour precipitation event for all applicable drainage.

9) R614-301-750 requires that mining will be conducted to minimize disturbance to the hydrologic balance within the permit and adjacent areas, to prevent material damage to the hydrologic balance outside the permit area and to support approved postmining land uses.

Violation: Co-Op has not included a plan to minimize the impacts to the hydrologic balance, nor has it included a plan to monitor the ground water for impacts. A plan to protect Birch Springs and Big Bear Canyon Springs and its recharge area or a plan to replace the water source must be implemented before Co-Op is entitled to any mining permits.

CONCLUSION

Co-Op has not complied with the promises of its original application to protect hydrologic resources. Under these circumstances, Co-Op should have the burden of showing that it is entitled to a renewal permit. In the alternative, the burden of proof should shift to Co-Op once Protestants have made a showing

that Co-Op has not met the requirements for a renewal permit. This has been accomplished through submission of the report of Mr. Montgomery. As for the new area Co-Op seeks to mine, the burden is upon Co-Op to meet the statutory requirements for a new permit.

The conclusions of Mr. Montgomery, who examined and studied the impact of Co-Op mining operations on water sources in the area including Birch Springs and Big Bear Canyon Springs, support Protestants' position that Co-Op's mining activities have adversely impacted Birch Springs and Big Bear Canyon Springs. Thus, until adequate protections are in place, Co-Op is not entitled a mining permit. Mr. Montgomery's conclusion that the jump in the flow of Birch Springs from October 1989 through January 1990 is . . . "definitely associated with mining activity" more than satisfies the reasonable likelihood test and adequately supports NEWUA's theory. Likewise, Mr. Montgomery's report supports CVSSD's and Huntington's position that there is a reasonable likelihood that Co-Op mining activities have in the past and will continue to contaminate Big Bear Canyon Springs. The recent contamination to Big Bear Springs is of great concern. Mr. Montgomery further concludes that Co-Op's proposed expansion will adversely impact both of these water sources.

Protestants' culinary rights in Birch Springs, Big Bear Canyon Springs, and other water sources in the area, are legitimate and protected rights that supersede the rights of Co-Op to continue mining activities until it has adequately addressed Protestants' concerns. SMCRA and associated Utah mining laws were enacted in

the 1970s when the nation was experiencing a gasoline shortage and was looking for alternative fuel sources. Even at that time, legislators recognized the importance of protecting ground and surface water resources. Today the need to protect water resources is more critical as the West is experiencing a severe drought. Unless Birch Springs, Big Bear Canyon Springs and other water sources in the area are adequately protected from contamination from Co-Op mining operations, the harm would be irreparable. The present drought situation has reduced the water table and thereby diminished the capacity of such groundwater sources to dilute impurities.

Co-Op's application states that the company "will conduct all mine site operations in such a way as to minimize potential impact on surface and ground water quality." Chapter 3, section 5.3. The history of Co-Op's violations, the October 1989 surge at Birch Springs, the January 1991 increase in contaminants in Big Bear Canyon Springs, and Co-Op's outstanding violations all suggest that Co-Op has not and is not conducting its mine operations so as to protect surface and ground water resources, particularly Birch Springs and Big Bear Canyon Springs. Protestants depend on Birch Springs and Big Bear Canyon Springs as a source for culinary and agricultural water for the people of rural Emery County, Utah. Unless and until drastic measures are taken to insure that Co-Op's mining activities do not contaminate Birch Springs and Big Bear Canyon Springs, the DOGM should not renew Co-Op's permit or allow it to mine new areas. To do so would cause irreparable damage to

Protestants and adversely affect water users in Emery County.

Respectfully submitted this 13th day of March, 1991.

Jeffrey W. Appel
Attorney for Protestants

CERTIFICATE OF HAND-DELIVERY

I hereby certify that on the 13 day of March, 1991 true and correct copies of the foregoing Amended Memorandum of Law filed by North Emery Water User's Association, Castle Valley Special Service District and Huntington City, Utah, in Opposition to the Granting of Co-Op's Applications were hand-delivered to the following:

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RECEIVED
MAR 21 1991
DIVISION OF
OIL GAS & MINING

BEFORE THE DIVISION OF OIL, GAS AND MINING
DEPARTMENT OF NATURAL RESOURCES
STATE OF UTAH

IN THE MATTER OF THE PERMIT RENEWAL FOR THE CO-OP MINING COMPANY'S BEAR CANYON MINE, EMERY COUNTY, UTAH	*	RESPONSE TO AMENDED MEMORANDUM IN OPPOSITION TO THE GRANTING OF CO-OP'S APPLICATION CAUSE NO. ACT/015/025

The Division Director granted the parties ten days in which to respond to new information submitted to the Division by March 11, 1991. Accordingly, Co-op responds as follows:

The bulk of the arguments and material presented by the Protestants in their Memorandum of Law dated March 11, 1991, as amended March 13, 1991, was presented at the informal hearing held on February 5, 1991. Likewise, the major points raised in the Memorandum, i.e., that Co-op's mining activities have already affected Protestants' water quality and/or quantity, and that any increase in the permit area will likely have a greater impact on the water in question, are adequately addressed in the report prepared by Earthfax Engineering, Inc., filed by Co-op on March 11, 1991, and accordingly, will not be further discussed here.

Some specific points raised by the Protestants in the Memorandum, however, merit rebuttal and discussion, as follows:

1. In recounting the history of the Protestants' objections to Co-op's mining activities, Protestants correctly state that Co-op entered into an agreement with Huntington City

on January 27, 1982. The Division has a copy of this agreement. The agreement was drafted with the specific intent to cover the precise concerns that the Protestants now raise and provided that if Co-op's mining activities adversely affected Huntington City's water, within specified parameters, Co-op would be responsible for replacing the water, or otherwise remedying such adverse effects. The agreement has been in force for almost ten years and Co-op has been mining continuously throughout the time period. Not once has Huntington City expressed any concern to Co-op that Co-op's mining activity has had any adverse effect on Huntington City's water supply, and at no time has Huntington City alleged that Co-op is in breach of the agreement in any particular. Huntington City's source of water, is in part, the same water the Protestants now allege Co-op has adversely affected and will adversely affect in the future. These allegations of past adverse effects are simply not supported by the evidence.

2. Protestants argue that Co-op has failed to abide by the stated terms of its permit and has otherwise violated applicable mining laws and therefore has the burden of proof insofar as its application for renewal is concerned. In support of this position, Protestants cite cases dealing with the burden of proof in cases contesting Notices of Violation. Co-op does not dispute the reasoning or the holdings of these cases, but they simply don't have anything to do with permit renewals.

These cases deal with which party, the government or the operator, has the burden of proof where the sole issue is whether or not a violation of a performance or reclamation standard occurred. Co-op acknowledges that it has received notices of violation, but contends that such notices, even if upheld or paid without contest, do not deprive the operator of the right to renew its permit and have nothing to do with burden of proof in this type of proceeding, particularly if the violations are abated as required by the enforcing authority. Apparently, Protestants found no cases where notices of violation have ever been determined to deprive an operator of the right to mine if the violations are abated. It is important to note that each of the operators involved in the cases cited were permitted to continue its mining operations and presumably, their permits were renewed at each successive five year interval.

As the Division is well aware, a principal objective of the Utah Coal Mining and Reclamation Act is to set up an enforcing authority to continually monitor the environmental impact of mining operations within the State and to supervise reclamation activities associated with those mining activities. Division inspectors have this duty of continually monitoring mining operations and issuing notices of violations, if in their judgment, an operator is not complying with all applicable regulations. Many times, the precise requirements of the regulations are a matter of subjective interpretation. Many

times, a violation may occur through no fault of the operator. Many times, it is not economically justifiable to contest an inspector's judgment that a violation occurred. Many times, operators do make mistakes and though unintentional, violations do occur. All operators receive notices of violation. If an operator were refused a permit renewal because it had received notices of violation, there would be no renewals and soon there would be no operators.

3. Protestants cite specific violations on Co-op's record as justification for a shift in the burden of proof responsibility, and as sufficient cause to deny Co-op's application. As stated above, Protestants' reasoning in this regard is not sound. Each of the violations has been abated and none had any effect on Protestants' water quality or quantity. In addition, the circumstances surrounding each can be explained, and additional information was presented to the Division at the times the violations were at issue. For example, of the five violations and orders issued to Co-op on January 3 and 4, 1991, which Protestants cite as evidence of Co-op's lack of conformity to its plan of operation, four resulted from a single rain storm which Co-op contends was a rain event well in excess of the ten year 24 hour and 25 year 24 hour event which the regulations require control structures be designed to meet. Other mines in the area also suffered rain damage to their control structures from the same rain storm and were cited by Division inspectors

for violating the applicable regulations. These other mines raised the same defenses Co-op raised to the notices of violation. See Dan Guy letter attached as Exhibit "A". The fifth notice of violation in this group of five, cited Co-op for failure to re-seed a test plot of ground. In this case, Co-op hired a professional reclamation specialist to seed the plot, he billed Co-op for the work and Co-op paid the bill. The specialist sent a letter averring that the plot was seeded and Co-op personnel confirmed that the test plot had been staked by the Division inspector, that the stakes are still in place and that the test plot had in fact been seeded by the specialist as required by the Division. The Division inspector disputed Co-op's evidence and took the position that the area marked was a different area than that selected as the test plot and it didn't appear to have been seeded. Co-op, considering the economics of litigating the alleged violations, elected to settle each of the five violations for a substantially reduced assessment amount. Similar defenses were available to most, if not all, of the balance of the violations issued to Co-op.

4. In response to Protestants' specific claims of Co-op's violations of specific permit provisions set forth on pages 28-32 of the Memorandum, Co-op responds as follows:

1) R614-301-721 The regulations do not require that Birch Spring be shown on all maps. The spring is shown on those maps deemed necessary by Co-op. If the Division deems that

additional detail is required, the same can be provided.

2) R614-301-722 In the fall of 1990, it was determined that an increase in resolution of existing approved maps would facilitate review and verification for compliance. In coordination with the Division, Co-op contracted for aerial photographs to be taken and new base maps were generated from these aerials and submitted as required. A new seep and spring survey was completed for the new area proposed to be mined in 1990. Birch Spring was not identified in the new survey, because the old survey contained all relevant information on Birch Spring and it was deemed unnecessary to duplicate that information. Co-op believes that the information submitted adequately meets the requirements of the regulations.

3) R614-301-724 The regulations do not require that Birch Spring be shown on all maps. Birch Spring is adequately addressed in Co-op's MRP. If the Division deems that additional detail is required, the same can be provided. Co-op has sampled Birch Spring in accordance with its approved permit and has supplied all information regarding the samples to the Division. NEWUA has never offered to allow Co-op access to the spring and never objected to Co-op's sampling procedures until filing its objection to Co-op's application for renewal.

4) R614-301-724.300 The report of Earthfax Engineering, Inc., taken together with other material previously submitted to the Division, adequately meets this objection.

5) R614-301-725.300 The report of Earthfax Engineering, Inc., taken together with other material previously submitted to the Division, adequately meets this objection. Co-op is not aware of any of its application promises which have not been met.

6) R614-301-728 The report of Earthfax Engineering, Inc., taken together with other material previously submitted to the Division, adequately meets this objection. Co-op's PHC study was approved by the Division for the existing area being mined and Co-op has conducted and continues to conduct further investigation for the new area proposed to be mined. Co-op's water monitoring and coal sample testing program has indicated no potential acid or toxic forming materials are present to date, and Co-op's plan requires continual monitoring, which Co-op does.

7) R614-301-731 Co-op has submitted a plan to protect the hydrologic balance. The Division deemed Co-op's plan to be adequate and approved the same. Co-op has followed the plan as required. The report of Earthfax Engineering, Inc., taken together with other material previously submitted to the Division, provides adequate information to characterize its current monitoring plans.

8) R614-301-742.221.33 All sediment ponds were constructed in accordance with the applicable regulations and were approved by the Division. There has never been any

discharge from the sediment ponds. Co-op has used the best available technology to control all sediment impacts and is committed to continue to do so in the future.

9) R614-301-750 The required information is included within Co-op's MRP and Co-op's plan contains all necessary provisions.

In conclusion, the laws and regulations governing coal mining operations, are framed to encourage mining activity, recognizing the importance of the mining industry to the State's economy, but also recognizing that any adverse impact of the mining activity on the environment should be minimized by properly implemented control devices and affirmative action requirements imposed on the operator. Protestants' position is that the proper way to minimize any adverse impact is to prohibit all mining activity, period. Such a position is not supported by the statutes or the cases and the evidence presented to the Board dictates that the continued mining proposed to be done by Co-op can be done with minimal impact on the water rights of Protestants.

Co-op's application ought to be approved, with reasonable requirements of monitoring, testing and safeguarding the water rights of Protestants, imposed as the Board deems necessary.

Respectfully submitted,

Carl E. Kingston
Attorney for Co-op Mining Co.

CERTIFICATE OF MAILING

I hereby certify that I mailed a copy of the foregoing Response to Memorandum in Opposition to the Granting of Co-op's Applications to Jeffrey W. Appel, 175 South Main Street, 10th Floor, Walker Center, Salt Lake City, Utah 84111, this 21 day of March, 1991, postage prepaid.

Carl E. Kingston

BEAVER CREEK Coal Company
Post Office Box 1378
Price, Utah 84501
Telephone 801 637-5050

September 20, 1990

Mr. Joe Helfrich
Utah Division of Oil, Gas & Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

Re: N.O.V. N90-26-25-2
Huntington Canyon No. 4 Mine
INA/015/004
Emery County, Utah

Dear Mr. Helfrich:

In accordance with regulatory provisions, Beaver Creek Coal Company is herein submitting written information pertaining to the above referenced violations.

It is our position that the violations were written as a result of a storm event well beyond the "design event" for the site, and therefore, there were no violations. Furthermore, Beaver Creek is willing to take required remedial action, but believes the NOV should be vacated. We request this information be considered in your evaluation of the validity and/or assessment for the violations.

Respectfully,

Dan W. Guy
Mgr. Permitting/ Compliance

cc: Johnny Coffey
Dave Arnolds
File

Exhibit "A"

Beaver Creek Coal Company **Internal Correspondence**

Date: September 19, 1990

Subject: NO. 4 MINE INSPECTION/STORM/NOV'S

From/Location: Dan Guy

To/Location: File

GENERAL

A joint OSM/DOGM inspection was conducted on the Huntington Canyon No. 4 Mine on 9/6/90 and 9/7/90. The records inspection was completed 9/6 and no problems or T.D.N. items were noted. The site visit/inspection was conducted in the morning of 9/7. During the on-site, it was evident that a major rain event had hit the property, resulting in damage to or failure of some of the hydrology control structures. Items noted on the inspection were:

(1) 3 moderate to large gullies coming onto the upper reclaimed pad;

(2) Overtopping or failure of the silt fences on the upper pad, resulting in erosion on the outslopes;

(3) Significant erosion of the southern flowing section of the new diversion on the lower pad;

(4) Overtopping and subsequent failure of the silt fence below the lower pad;

(5) Erosion of emergency spillway between ponds;

(6) Washout of filter dike in lower pond;

(7) Minor overflow of lower pond embankment;

(8) Erosion on lower pond spillway;

(9) Near plugging and overtopping of culvert below lower pond spillway.

Part I of NOV N90-26-25-2 was written by DOGM on the sediment pond - items (5) through (9) above. Part 2 of the same NOV was written on the erosion, item (3) above.

Other items noted both on and off the site were:

(1) Vegetation held up well overall;

(2) The USFS culvert near the lower pad entrance was silted full and runoff had crossed the road in the area below the former pumphouse.

(3) Heavy runoff, silting and erosion were evident from the road to the lower portal - reclaimed by AMI.

(4) Some substantial gullies had formed from undisturbed runoff below the mine.

(5) The heaviest runoff appeared to come directly through the site. Areas 1/4 mile above or below the site show much less evidence of heavy, destructive runoff.

ADJACENT AREAS

A subsequent visit was made to the site and Rilda Canyon on 9/11/90 by D. Guy and M. Coonrod. Rilda Canyon also showed evidence of a large rain event. The road was littered with rubble from overflows of the ditches and some large gullies were cut (one 6' - 8' deep) where runoff left the road area and entered the stream. It was evident that the bulk of the storm runoff came from the north side of the canyon (toward Mill Fork Canyon). The runoff appeared to be more widespread and destructive in Rilda Canyon; however, this is probably due to the lack of culverts and other drainage controls along the road. Visual observation of flumes and high water marks in both Rilda and Mill Fork indicate that runoff was similar (heavy) in both canyons, overtopping the flumes, with Mill Fork probably being the higher. (It should be noted that a rainfall measurement was taken in Rilda Canyon during the major event by Mr. Chuck Semborski - U.P.&L. Geologist - he recorded 21/16" in less than 30 minutes between 1:30 p.m. and 2:00 p.m. on 9/5/90).

Discussions with Co-Op Mining personnel indicate that on that same day, 9/5/90, heavy storms also hit the Trail and Bean Canyon areas. No rain gauge readings were available from this site; however, some runoff damage was evident and noted by DOGM inspectors on the following day.

Genwal Coal Co. in Crandall Canyon, north of Mill Fork, also recorded heavy precipitation during the week of 9/3; however, their heaviest storm was 9/4.

Sizable precipitation values were also recorded at Trail Mountain, East Mountain and Joe's Valley during this same period.

RAINFALL MEASUREMENTS

A survey was conducted of all available weather stations and minesite rain gauges in the general area. The following is a summary of recorded precipitation values in and around the Mill Fork area during the week preceding the 9/7 inspection:

Station/Location	Precipitation				Remarks
	9/3	9/4	9/5	9/6	
Rilda Canyon (UP&L)	N/A	N/A	2.06"	N/A	Less than 30 min
Genwal (Crandall)	0.05"	1.00"	0.04"	N/A	Rain Gauge
Trail Mtn. (Cottonwood)	N/A	0.36"	0.00	0.06"	Rain Gauge
U.S.F.S. (Joe's Valley)	0.02"	0.05"	0.49"	0.10"	Weather Station
East Mtn. (UP&L)	N/A	0.00	0.00	0.25"	Rain Gauge

The above values are plotted on the attached map to show the relationship to the Mill Fork (No. 4 Mine) area. It is apparent that the week of 9/3/90 was one of numerous storms, and that the most intense storms occurred during the 2 days prior to the inspection at the No. 4 Mine.

RUNOFF MEASUREMENTS

The Huntington Canyon No. 4 Mine is a reclaimed site, and unless someone happened to be there doing an inspection or compliance work, during an event, no one would have even observed the event, much less taken actual flow measurements. It is possible, however, to reconstruct flow events using obvious high-water marks in the various channels, providing measurements are taken before the marks are obliterated.

Since no one was on site during the actual event, flows were estimated for the sediment pond outflow and Mill Fork Canyon flume using the following criteria:

(1) Cross-sectional measurements were taken at 3 points in the sediment pond outflow channel and at the Mill Fork flume, using the high-water mark still evident on the banks - the area of flow was calculated from these measurements;

(2) Flow velocities were calculated based on slope for the pond discharge and flow tables for the flume;

(3) The flow was then calculated from the formula Q=AV, where Q=flow in cubic feet per second, A=cross-sectional area, and V=velocity of flow.

The attached drawing shows the cross-sections measured at each of the locations described above. The following is a summary of the results of the calculations:

Location	Area (ft^2)	Velocity (fps)	Flow (cfs)	Remarks
Sed. Pond Outlet (#1)	8.25	*5.52	45.5	Middle
Sed. Pond Outlet (#2)	8.40	*5.52	46.4	Lower End
Sed. Pond Outlet (#3)***	7.50	*5.52	41.4	Upper End
Mill Fork Flume	13.00	5.00	**65.0	Main Canyon

* Based on approved M.R.P. design.
** The Mill Fork flume flow is based on the flume tables for 2' width with 1.5' head (15.0 cfs) + quantity calculated for area flowing over the depth of the flume (50.0 cfs) with a velocity of 5 fps.
*** Measurements by Tom Munson (DOGM) on 9/18/90.

The above flow summary helps support 2 main conclusions concerning this storm event:

(1) The majority of the runoff was channeled through the reclaimed minesite - approximately 70% of the total canyon flow;

(2) The runoff was far in excess of the sediment pond design of 10 year-24 hour for holding and 25 year-24 hour for discharge. The approved M.R.P. design discharge for this pond is 3.11 cfs - the actual flow was as much as 14 times the design.

NEW DIVERSION EROSION

The new diversion was installed in December 1988, to capture a side hill and small side canyon runoff and prevent further erosion on the reclaimed slopes below. The diversion was installed with a series of rock check dams and retention basins to control flow velocities and channel erosion. A commitment was made at that time, by BCCC, to visually monitor the diversion for erosion, and if it became apparent, to rip-rap the Diversion (copy attached). This inspection (and NOV) is the first instance where erosion has become apparent and the need for rip-rap is indicated.

SUMMARY

The storm event which hit the Huntington No. 4 Mine area between 9/4/90 and 9/6/90 caused a moderate degree of damage to temporary control structures, resulting in the issuance of 2 N.O.V.'s by DOGM.

An evaluation of the rainfall events in, and around, the area during that week showed numerous, high-intensity storms occurred from 9/4 through 9/6 - any one (or all) of which could have hit the Huntington No. 4 Mine site.

Flow calculations at the site and in the main Mill Fork Canyon indicate that the event which took place in Mill Fork was well beyond the 10 yr.-24 hr. and 25 yr.-24 hr. design range.

It should be noted that permanent control structures held up well overall.

The diversion erosion and partial failure of the sediment ponds were the direct result of the "above-design" event. Beaver Creek, with approval from DOGM, had only partially protected the diversion with rip-rap, with a commitment to add additional protection if necessary. The sediment ponds and outlet structures are temporary and were designed to handle runoff from a 10 year-24 hour event and discharge flow from a 25 year-24 hour event.

It is the position of BCCC that both of the NOV's should be vacated for the following reasons:

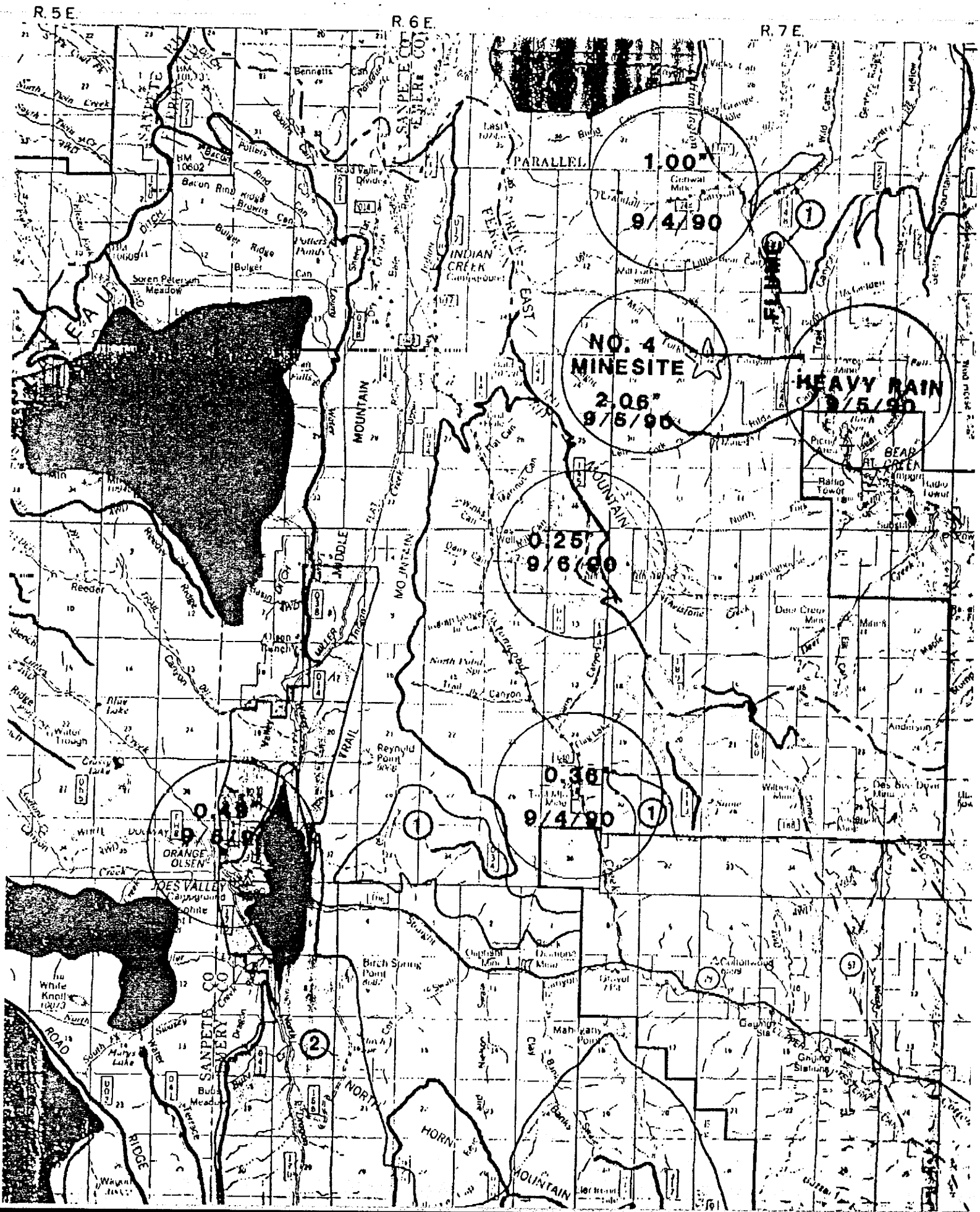
(1) Rainfall readings in and around the area indicate that the 10 year-24 hour amount of 2.3 inches was likely exceeded in a 24 hour period from 9/4 to 9/6;

(2) Flow calculations from the sediment pond overflow show flows as much as 14 times the design flow of 3.11 cfs - again indicating an "above-design" event;

(3) The rain events occurring from 9/3 to 9/5 likely had already partially filled the sediment ponds prior to the major event; thus reducing the capacity to store the entire event.

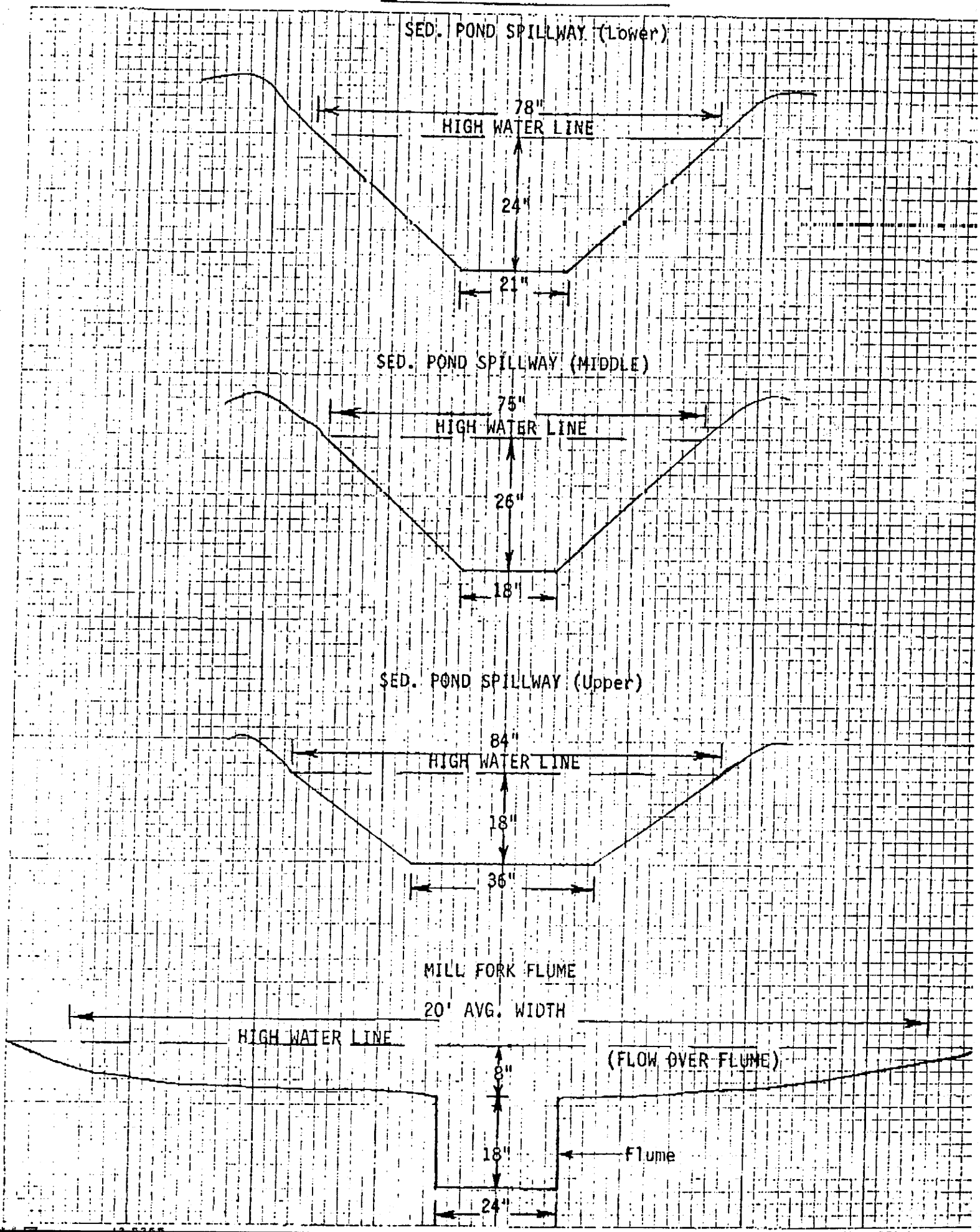
(4) The potential for erosion in the diversion was recognized during the permitting process, and Beaver Creek made a commitment to check on the diversion and add additional erosion protection if necessary - Beaver Creek is prepared to honor that commitment without the issuance of an NOV.

SIGNIFICANT RAIN EVENTS - 9/3/90 THROUGH 9/6/90
HUNTINGTON CANYON NO. 4 MINE AREA



HUNTINGTON CANYON NO. 4 MINE

FLOW CROSS - SECTIONS



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MAR 21 1991
DIVISION OF
OIL GAS & MINING

Attorneys for North Emery Water Users' Association, Castle Valley Special Service District, and Huntington City, Utah

IN AND BEFORE THE UTAH STATE DIVISION

OF OIL, GAS, AND MINING

In the Matter of the Renewal Application and New Application of Co-Op Mining Company	Reply of North Emery Water User's Association, Castle Valley Special Service District and Huntington City, Utah, to Co-Op Mining Company's Response to Objections to Permit Renewal ACT/015/025

North Emery Water Users' Association ("NEWUA"), Castle Valley Special Service District ("CVSSD"), and Huntington City, Utah ("Huntington"), hereinafter collectively referred to as "Protestants," by and through its counsel, Jeffrey W. Appel of Haley & Stolebarger, hereby submit the following Reply to Co-Op Mining Company's Response to Objections to Permit Renewal, hereinafter referred to as "Co-Op's Reply."

ARGUMENT

Big Bear Springs, controlled by CVSSD, and Birch Springs, controlled by NEWUA, are the sole source of drinking water for residents of rural Emery County, Utah. Both springs are in the proximity of Co-Op Mining Company's ("Co-Op") past, present and

proposed mining operations. Co-Op operated its Trail Canyon Mine until 1982 and commenced operations in its the Bear Canyon Mine that same year. Co-Op is currently seeking a renewal application for its mining operations in the Bear Canyon Mine and seeks a new permit to expand these operations.

Protestants oppose Co-Op's renewal and new permit applications for the primary reason that Co-Op has never met the statutory requirements necessary to justify the initial issuance of a mining permit, has repeatedly violated mining regulations and has not taken adequate measures to ensure the protection of Protestants' water sources--Big Bear Springs and Birch Springs--as required by law.

Contamination of Big Bear Springs and Birch Springs by Co-Op's mining operations jeopardizes the exclusive sources of culinary and agricultural water for an entire rural community. To grant Co-Op a renewal of its existing permit and a new permit for its future mining operations when it has failed to meet its statutory requirements to protect irreplaceable water resources could devastate an entire rural community. The culinary and agricultural interests of a long-standing rural community are more important, not only intuitively, but statutorily, than the commercial endeavors of a mining company and any balancing approach undertaken by the DOGM should reflect that approach.

A. <u>Renewal Permits</u>

Pursuant to Utah Code Ann. §40-10-9(4)(a),

> The holders of a permit may apply for renewal, and the renewal shall be issued (but on application for renewal the burden shall be upon the opponents of renewal) . . . <u>unless</u> it is established that and written findings by the division are made

that:

> (i) The terms and conditions of the existing permit are not being satisfactorily met;
>
> (ii) The present surface coal mining[1] and reclamation operation is not in compliance with the approved plan;
>
> (iii) The renewal requested substantially jeopardizes the operator's continuing responsibility on existing permit areas;
>
> (iv) The operator has not provided evidence that the performance bond in effect for the operation will continue in full force and effect for any renewal requested in the application as well as any additional bond the division might require pursuant to Section 40-10-15; or
>
> (v) Any additional revised or updated information required by the division has not been provided. (emphasis added).

See also, Utah Administrative Code, R614-303-233.100 et seq. In its Reply, Co-Op acknowledges that this statute applies to the present facts. Co-Op Reply at 2. Co-Op improperly contends that Protestants have not objected to its renewal permit on any of these five grounds. See Reply at 2. Protestants have consistently maintained that Co-Op has violated at least four of the five exceptions to renewal.

1. The Terms of the Existing Permit Are Not Being Satisfactorily Met

Pursuant to R614-300-143, "[t]he permittee will comply with the terms and conditions of the permit, all applicable performance standards and requirements of the State Program."

In Chapter Three, section 5.3, of its application, Co-Op

---

[1] These regulations on surface mining apply to the surface effects of underground mining.

states that it "will conduct all mine site operations in such a way as to minimize potential impact on surface and ground water quality." Co-Op has not lived up to these promises. On repeated occasions, Co-Op has been cited by the DOGM for violations, many of which have a direct bearing on water resources. See Protestants' Amended Memorandum of Law filed with the DOGM on March 13, 1991 at pp. 24-32, for a more detailed explanation of these violations.

2. The Present Surface Coal Mining[2] and Reclamation Operation is Not in Compliance With the Approved Plan

According to R614-300-142, "[t]he permittee will conduct all coal mining and reclamation operations only as described in the approved application, except to the extent that the Division otherwise directs in the permit." (emphasis added). The language of this section is mandatory, not discretionary. Co-Op's present mining operations and reclamation operations are not in compliance with its approved plan. Co-Op's approved plan states that it will take necessary precautions and abide by all applicable regulations to protect environmental resources in the area of its mining operations, particularly hydrologic resources. Co-Op has failed to do this. In October 1989, a surge of water and increased contaminants was found in Birch Springs; as recently as January of this year, increased contaminants were found in Big Bear Canyon

[2] Though this sentence references surface coal mining specifically, the legislative findings and the statement of purposes at the beginning of the chapter refer to coal mining generally. See e.g., Utah Code Ann. §40-10-1, §40-10-2. As with federal statutes, state regulations on surface mining apply to the surface effects of underground mining.

Springs.

Co-Op has repeatedly violated mining regulations and has been cited by the DOGM for such violations. As recently as February 27, 1991, Co-Op was given a Notice of Violation, No. 91-35-01-01, for "[f]ailure to conduct mining and reclamation activities in accordance with the approved plan. . . ." Id. at 2. Co-Op committed this violation while telling the DOGM and others that it was doing all it could do to abide by mining regulations. In spite of all this, Co-Op maintains that it has "performed diligently in abating all such violations and will continue to do so. . . ." Co-Op Reply at 3. The facts speak otherwise.

3. The Renewal Requested Substantially Jeopardizes the Operator's Continuing Responsibility on Existing Permit Areas

Throughout its Reply, Co-Op has maintained that it will take steps to ensure that Protestants' water sources are protected and acknowledges certain problems with its operations that it will correct. It is too late. Co-Op must show that it has taken steps to protect hydrologic resources in the area before it can apply for a mining permit. Since Co-Op has not met its obligations under its current permit, it should not be allowed a renewal or be granted a new permit to mine additional areas. Co-Op must concentrate on its current problems rather than being given a carte blanc to start new mining projects. Serious concerns have been raised and evidence gathered by Protestants that show the Trail Canyon Mine, abandoned by Co-Op nine years ago, is contaminating its water supplies. Co-Op's focus should be on protecting these water resources before it

is allowed to expand its commercial mining operations or proceed further with its current operations.

4. Co-Op Has Not Provided the DOGM With All Requested Revised Information

Co-Op is currently operating under a cessation order and has outstanding unabated violations of mining regulations. See February 27, 1991, Modification of Notice of Violation/Cessation Order. In particular, Co-Op has not provided the DOGM with adequate hydrologic information. According to the March 14, 1991, memorandum of Tom Munson, DOGM Senior Reclamation Hydrologist, "[t]he Earthfax Engineering report [provided by Co-Op] falls short of providing enough data to demonstrate a finding of no impact to the hydrologic balance. . . ." Munson's March 14, 1991, memorandum at 4. Said memorandum is attached as Exhibit "A" and incorporated herein by reference. Mr. Munson further states that Co-Op should revise its Probable Hydrologic Consequences ("PHC") analysis to include data collected from new monitoring wells. Exhibit "A" at 4. The DOGM has requested that Co-Op install new monitoring wells. Mr. Munson concludes that data from these new wells must be incorporated into Co-Op's application prior to its approval. Id.

On February 27, 1991, Co-Op was served with a Notice of Violation No. 91-35-01-01 for constructing a road without prior Division approval. In its Reply, however, Co-Op implies that it has abated all outstanding violations and deficiencies. "Co-Op will agree that it has been cited in the past for certain violations of the Division's reclamation and operating regulations, but Co-Op has performed diligently in abating all such violations

and will continue to do so." Co-Op's Reply at 3. This is not the case. Co-Op has outstanding unabated violations and is currently working under a cessation order. See February 27, 1991, Modification of Notice of Violation/Cessation Order for Cessation Order 90-26-1-1 extending abatement until April 15, 1991. Any other characterization of the facts is simply disingenuous.

B. New Permits

According to Utah Code Ann. §40-10-9(4)(b), "[i]f an application for renewal of a valid permit includes a proposal to extend the mining operation beyond the boundaries authorized in the existing permit, the portion of the application for renewal of a valid permit which addresses any new land areas shall be subject to the full standards applicable to new applications under this chapter . . ." Co-Op acknowledges that this code section is applicable to its request to expand its current mining activities and contends that it has met these statutory requirements. Co-Op's Reply at 3. Once again Co-Op's view of the facts bears no resemblance to reality.

Pursuant to Utah Code Ann. §40-10-10(2), which Co-Op admits is applicable, a permit application and reclamation plan must include, among other things:

> (b) an accurate map or plan, to an appropriate scale, clearly showing the land to be affected as of the date of the application . . .
>
> (c) a determination of the probable hydrologic consequences of the mining and reclamation operations, both on and off the mine site with respect to the hydrologic regime, quantity and quality of water in surface and groundwater systems, including the dissolved and suspended solids under seasonal flow conditions, and the collection of sufficient data for the mine

> site and surrounding areas so that an assessment can be made by the division of the probable cumulative impacts of all anticipated mining in the area upon the hydrology of the area and, particularly, upon water availability. . .

Co-Op has not met these requirements nor has it met all the requisites of Utah Administrative Code R614-301-700 et seq. Though Co-Op provided the DOGM with base maps on February 25, 1991, these and other maps provided by Co-Op do not adequately show the area to be impacted by its proposed mining operations. Co-Op still has not collected sufficient data to determine the hydrologic consequences of its proposed expansion on Big Bear Springs and Birch Springs. In fact, Co-Op has acknowledged that it has tested water in Birch Springs infrequently. Co-Op's Reply at 9. See also, EarthFax report at 3-10. The DOGM has requested that Co-Op update its PHC by including data from new monitoring wells that Co-Op has been requested to install. Exhibit "A" at 4.

In its Reply, Co-Op states that it has "retained the services of EarthFax to provide additional information regarding the hydrology and geology in the affected area, and will provide additional information if the Division deems that additional information is needed." Co-Op's Reply at 8. See also, Co-Op's Reply at 3-4. (". . . Co-Op has retained the services of an additional professional engineering firm (EarthFax Engineering, Inc.) and has committed to add to, modify and expand upon the information provided, in order to meet any legitimate objections or questions raised by any of the opponents or the Division to Co-Op's submittal.") By these statements, Co-Op concedes that it has not adequately investigated the hydrology and geology near its mine

operations. The statute concerning new permits does not say that an applicant may promise to review hydrology or to provide adequate maps in the future, it requires that an applicant shall study these issues and shall include them in its application. Co-Op is not entitled to a permit based upon its promises of future, speculative compliance. It must show present compliance with applicable law. Co-Op cannot demonstrate that compliance.

C. Co-Op Has Failed to Adequately Address Hydrologic Impacts of its Past, Present, and Proposed Mining Operations on Birch Springs or Big Bear Canyon Springs Through its Engineering Firm, EarthFax Engineering, Inc.

The bulk of Co-Op's Reply is dedicated to an attempt to discredit, without success, the theories and conclusions of S. Bryce S. Montgomery, the geologist hired by Protestants to review the impact of Co-Op's mining operations on its water sources. This attempt has failed for the following reasons.

1. Reasonable Likelihood Test

As more fully explained in Protestants' Amended Memorandum of Law submitted to the DOGM on March 13, 1991, the geologist's causation standard is one of "reasonable likelihood"--e.g. in this situation, is there a reasonable likelihood, given the evidence, that the mine operations have or will contaminate Birch Springs and/or Big Bear Canyon Springs. See Protestants' Amended Memorandum of Law at 13, et seq. Mr. Montgomery's January 31, 1991, report, his February 8, 1991, report and his March 14, 1991, report all adequately support Protestants' position that Co-Op's past, present and contemplated mining activities have and will

adversely impact Big Bear Canyon Springs and Birch Springs. These reports meet and exceed the requisites of the "reasonable likelihood" standard. Mr. Montgomery's March 14, 1991, report is attached as Exhibit "B" and incorporated herein by reference.

2. Big Bear Canyon Springs

On page four of its Reply, Co-Op cites Mr. Montgomery's January 28, 1991, report wherein he stated that the "affect of the Co-Op Bear Creek Mine and possibly the Trail Canyon Mine operations have been relatively small in adversing the rights in the Big Bear Canyon Spring . . ." Id. at 7. In citing to this section, however, Co-Op has taken the quote out of context and has failed to include Mr. Montgomery's later clarification of that statement:

> However, the proposed expansion of the Bear Canyon Mine operations northward another 3/4 mile to the north line of Section 14 will extend the mined area to approximately 75 feet higher in elevation, up-dip than at present (75+7580=7655 feet), which will be near intersecting the potentiometric surface of the Blackhawk-Star Point aquifer. . . . Thus, in faults that cut through confining shale beds between the aquifer and mined coal, and within interconnecting cross-joints to these faults, considerable ground water may be encountered, and if diverted away from getting back into the natural conduit system, it would subtract from recharge to the Big Bear Canyon Spring. Also, any contamination generated in the mine workings that could possibly infiltrate into the natural recharge conduit system to the spring, may further adverse spring water quality.

Montgomery's January 28, 1991, report at 7.

Thus, Co-Op has incorrectly stated that Mr. Montgomery found no adverse impact of its proposed mining operations on area water sources.

Co-Op further states that the affect of its mining operations on spring flow "has been practically non-existent." Co-Op Reply at

4-5. Mr. Montgomery's reports, EarthFax's report, Protestants' observations, Co-Op's admissions, and Tom Munson's March 14, 1991, memorandum all show otherwise. According to Mr. Munson, Co-Op's position that "[w]ater intercepted within the mine workings of the Bear Canyon Mine have not had any identifiable impact on the spring flows of Big Bear or Birch Springs" is "not supported by data and to the contrary, data exists which points to water quality changes attributed to the old workings of the Bear Canyon Mine. . . ." Exhibit "A" at 2, ¶3. (emphasis added).

Furthermore, Mr. Munson rejects Co-Op's contentions that changes in flow patterns in Big Bear Canyon Springs and Birch Springs are not mine-related, but rather drought related: "If flow is the issue then I cannot support this conclusion, as this has not been conclusively demonstrated. Recent data from Big Bear Springs shows an increase in flow in the winter months of 1990-1991, not typical of past data. Exhibit "A" at 2, ¶3. (emphasis added).

The impact of Co-Op's mining operations on flow patterns in both springs is of great concern to Protestants. At the February 5, 1991, DOGM hearing in Castle Dale, Utah, CVSSD presented evidence that the pattern between precipitation levels and spring flow began changing in 1989 and that the change was attributable to Co-Op mining activities. EarthFax's report supports this position: "The East Bleeder inflow remained constant until the summer of 1989, when water was encountered at the northern end of the North Main entries. According to Wendell Owen [of Co-Op], the mine intercepted a flow of 110 gpm. . . ." EarthFax Report at 3-1. All

this suggests that Co-Op's mining activities began significantly and adversely impacting spring flow levels in 1989 and that Co-Op's mining activities continue to adversely impact spring flows today.

3. Birch Springs

a. Surge in Birch Springs

Beginning in October 1989 and continuing for months thereafter there was a dramatic rise in the flow of Birch Springs. An October 1989 sample of water from Birch Springs revealed oil and grease and large quantities of suspended sediment as well as increased total dissolved solids which was double the amount found in a sample one month earlier. See Montgomery's January 28, 1991, report at 8. Mr. Montgomery attributes this surge in Birch Springs to an "unnatural cause" that is "definitely associated with mining activity, and most probably within the caving Trail Canyon Mine," used by Co-Op to store water. See Montgomery's January 28, 1991, report at 8; Montgomery's February 8, 1991, report at 3.

Co-Op disputes Mr. Montgomery's conclusion that the "three month abnormal increase in the flow of Birch Springs was 'definitely associated with mining activity, and most probably within the caving Trail Canyon Mine'" by citing to the November 1, 1989 report of Bill Malencik, a DOGM reclamation specialist. (citations omitted). Co-Op's Reply at 5. It is a mischaracterization for Co-Op to claim that Mr. Malencik's report contradicts Mr. Montgomery's conclusions.

On October 25, 1989, Mr. Malencik made a field inspection of Birch Springs and its surroundings. Malencik memorandum, November

1, 1989, at p.1. He observed a "significant amount of water . . . coming out of rock fractures on the cliffs." Id. at 2. On October 30, 1989, Mr. Malencik and others toured the Bear Canyon Mine. Id. at 3. Though Mr. Malencik did not have sufficient evidence at the time to determine whether the culinary water problems in Birch Springs were attributable to the Co-Op mines, he recommended that the DOGM seek assistance from persons with expertise in groundwater hydrology and geology. Id. at 6. Mr. Malencik does not possess expertise in those areas. From his limited observations, Mr. Malencik advanced two theories concerning how mine-related activities could have contaminated Birch Springs. Id. at 5. Mr. Malencik's first theory[3] was that pillars were pulled a quarter a mile from Birch Springs near the time of the surge and may have caused a change in the water source. Id. His second theory was that the mine water built-up in the Trail Canyon Mine over time accumulated next to the fault and followed the fault zone to Birch Springs. Id. The latter theory comports with that of Mr. Montgomery's concerning seepage from the Trail Canyon Mine to Birch Springs. According to Mr. Montgomery,

> Coal mining operations include the intentional coating of the walls with lime dust to suppress coal dust, and the floor of the mine is also mantled with fines from the mining operation. This tends to plug or restrict existing fracture and intergranular permeability. Thus, the result is a chamber generally lined with a thin coating of fine-grained materials. Eventually, this coating deteriorates in its effectiveness as a seal. However, for a considerable time the mined-out areas can and do serve as a groundwater storage space. In fact, Co-Op Mining Company is presently using a part of the abandoned

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[3] In both of these theories, Mr. Malencik noted his difficulties with the analysis.

> Trail Canyon Mine for such. Admittedly an alternative source of the surge in the Birch Spring flow could have been natural fracture openings, providing the groundwater storage, as proposed by White (1991) [EarthFax], <u>but the sudden release of the large volume of ground water containing oil-grease for a relatively short period, points to the abandoned Trail Canyon Mine as the principal storage for the flush supply of water experienced</u>.

Exhibit "B" at 2-3. <u>See also</u>, Montgomery's February 8, 1991, report[4] at 3.

Under the applicable "reasonable likelihood" test, Mr. Montgomery has provided evidence that the surge in Birch Springs in 1989 was attributable to the erosion of the seal of the Trail Canyon Mine and the seepage of this contaminated water into Birch Springs.

Co-Op then states that "[e]ven if the event [at Birch Springs] were to reoccur (sic), there is no reason why reasonable steps could not be taken to make the water quality suitable for the users' needs and increase the availability of this badly needed resource, if the source can be identified." Co-Op Reply at 6. This statement ignores the fact that an entire rural community

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[4] ". . . I learned that the Co-Op Mining Company has been and is currently pumping water from a source in Trail Canyon, into the abandoned Trail Canyon Mine where it is stored for release and use in their facilities. Such water would become a part of the groundwater recharge system to the Birch Springs, and depending on its quality and manner of utilization will have an affect on the Birch Springs, since the faulting that feeds the Birch Springs also extends through the Trail Canyon mined area. . . .

A similar concern . . . should be directed to the practice in the Bear Canyon Coal mine where intercepted ground water is wallowed-in by working equipment with its released oils, movement of vehicles in and out of the mine which track into the mine contaminants on their tires from outside of the mine, where water ponded within the floor of the mine washes it off as the vehicles move through it. Some of this water wallowed-through gets back into the existing fracture system and could enter into the recharge conduit system of both the Birch and Big Bear Springs, principally down fault planes that are present."

relies upon Birch Springs as a culinary source of water and these people need assurances now that their water sources are being protected, not statements that a problem could be corrected if it occurred in the future. At best, Co-Op has paid lip service to the serious threats to the health and welfare its mine operations have created for these persons.

b. Oil and Grease in Birch Springs

Co-Op also attempts to attribute the oil and grease found in Birch Springs' water samples in the fall of 1989 to oil used on the lock to the gate securing Birch Springs. Co-Op Reply at 6. This is ludicrous. The lock to Birch Springs is covered by a box designed according to Utah Board of Health standards. These standards require the box to contain a covered vertical lip to prevent outside contaminants from getting into the box. At times, the lock on the lid has been sprayed with lubricating oil, but this oil could not and did not penetrate the box. Co-Op's excuse is ridiculous.

Interestingly, in her February 22, 1991, inspection report, Susan White, a DOGM reclamation specialist, stated that "[a]n oil storage tank which was being stored above the loadout was leaking a small amount of oil. The tanks were essentially empty, however I had the operator place a berm around the tanks before I left the site." Id. at 2. A leakage such as this is a much more plausible explanation for the oil and grease found in Birch Springs' samples in 1989 or of oil and grease recently found in Big Bear Canyon Springs.

c. Monitoring Birch Springs and Big Bear Canyon Springs

Co-Op has not adequately monitored Birch Springs as required by law. Co-Op concedes that it has only monitored Birch Springs when infrequent surface flow occurred. EarthFax report at 3-10. Co-Op claims that it has failed to monitor Birch Springs for the alleged reason that it "has never been given access to these springs which would allow for any additional monitoring." Co-Op Reply at 9. In reality, Co-Op has never requested access from NEWUA for Birch Springs' monitoring.

Co-Op has also been remiss in monitoring Big Bear Canyon Springs. In its letter to the DOGM dated December 10, 1990, CVSSD expressed its concern about Co-Op's failure to monitor Big Bear Canyon Springs.

> Past ground water monitoring has been inconsistent and often lacking. What assurance do we have that future performance will be improved? Co-op has indicated some past sampling from our spring and their intentions for future sampling. However, they have never requested permission to sample from the spring and we have no knowledge of any previous sampling. We believe this should be an extremely vital part of the monitoring program and that it should be done with our knowledge and co-operation. (emphasis added).

CVSSD December 10, 1990, letter at 2, ¶6.

Concerned about the recent quality of Big Bear Canyon Springs, CVSSD sampled the springs for oil and grease. Samples taken on February 14, 1991, revealed a 1.6 mg/l level of oil and grease; samples taken on February 26, 1991, revealed a 0.9 mg/l level of oil and grease. These findings suggest that Co-Op's mining activities are presently causing the oil and grease contaminants and yet Co-Op does not report any oil and grease monitoring of Big

Bear Canyon Springs in its mine plan. Had Co-Op been monitoring these springs as it is required by law, it would have found these contaminants. Instead, Co-Op is content to let unmonitored and potentially dangerous water flow to the water users.

Co-Op's Reply then attempts to shift Co-Op's water monitoring responsibilities to Protestants. Pursuant to Utah Administrative Code, R614-301-731.210 and R614-301-731.220, a mine operator is required to monitor ground and surface water impacted by its operations. Though Protestants prefer to oversee Co-Op's monitoring programs, it is not their primary responsibility to conduct such tests.

4. Proposed Expansion of Co-Op Mining Area

Co-Op has attacked Mr. Montgomery's conclusions concerning the impact of Co-Op's proposed expansion of its mining activities by quoting from page nine of Mr. Montgomery's January 28, 1991, report. Co-Op Reply at 6. In quoting a paragraph of Mr. Montgomery's report, Co-Op excluded a key phrase, which is underscored below.

> The proposed extension of coal mining within the 80 acre tract of the E/2 NW/4 Section 26, immediately east of Birch Spring could possibly adversely affect the spring. This is because cross-jointing in this area intersects the northerly trending fault which is the recharge conduit to Birch Spring. Any recharge water now coming to the spring through these less prominent cross-joints, out of the Blackhawk Formation, that would be intercepted and diverted away by the coal mining would diminish the spring flow. However, the most prominent groundwater transmission system in the area is the north-trending faults and joints, and most of the recharge to Birch Springs comes from the north through this system. Thus, the proposed northerly extension of the Bear Creek Mine into the N/2 of Sec. 14, T 16 S, R 7 E, could also cause a reduction in recharge to the Birch Springs by the intersection and diverting of ground water away from its natural conduit

system. (emphasis added).

Montgomery's January 28, 1991, report at 9.

Viewing the entire text of the Montgomery report, it is clear that there is, at a minimum, a "reasonable likelihood" that Co-Op's proposed expansion will adversely impact Birch Springs.

Co-Op has attempted to bolster the opinion of EarthFax by pointing to Mr. Montgomery's use of the words "could possibly" and "could," but then admits that EarthFax's conclusion are based upon insufficient data:

> The Earthfax conclusion, that additional data is needed to arrive at any certainties, but that mining further north would in all liklihood (sic) have no significant impact upon water quantity or quality of the springs in the area, is also born out by the fact that mining in the area to date, has not impacted the springs. . . .

Co-Op Reply at 7.

This statement is a contradiction in terms. Though EarthFax needs additional data "to arrive at any certainties," it is able to conclude that further mining to the north by Co-Op would not significantly impact water in the springs. This approach is hardly indicative of the careful use of scientific methods to support a conclusion.

Co-Op further contests Mr. Montgomery's conclusion that Co-Op's proposed expansion to the north will create a greater risk of contamination to the Blackhawk-Star Point aquifer, which feeds Birch Springs and Big Bear Canyon Springs:

> Mr. Montgomery suggests that there is a Blackhawk-Star Point aquifer underlying the coal seam being mined by Co-Op, and the potentiometric surface of this aquifer `up dips' at a greater angle towards the north than does the coal seam. Thus, he concludes, the farther north the seam is mined, the greater

> the threat of intercepting this aquifer by mining activity. As concluded in the EarthFax study, if the aquifer does indeed exist, it would appear that it is well below not only the upper seam currently being mined, it is also well below the lower seam of coal, and the possibility of intercepting the aquifer by mining clear to the north of the proposed new area, would be almost non-existent in the upper seam, and extremely remote in the lower seam. . . . (emphasis added)

Co-Op Reply at 7.

This statement is in direct contradiction to concessions made by EarthFax in its March 11, 1991, report at 2-9, and to Mr. Montgomery's analysis in his March 14, 1991, report at 1. Mr. Montgomery's study reveals that there is a regional aquifer within the Star Point-Blackhawk formations from which both Big Bear Canyon Springs and Birch Springs discharge. Exhibit "B" at 1. Co-Op implies, by its statement "if the aquifer does indeed exist," that there is a question as to whether the Blackhawk-Star Point aquifer exists even though its engineer, EarthFax, acknowledges the aquifer's existence. EarthFax report at 2-5.

EarthFax further admits that water in the area of Co-Op's proposed expansion area to the north can easily filter down to the Star Point-Blackhawk aquifer through fractures.

> In areas of fracturing, due to increased rock permeability, water is able to pass vertically through strata which would normally impede such flows. Depending on the degree of interconnection in the fractures, the groundwater flow can be limited to a small area or it can reach the regional water table . . . Lines (1985) indicated that for the hydrogeologically similar area of Trail Mountain, located to the south of the study area, even with the large quantity of rock with negligible permeability, some hydraulic connection exists between the perched aquifers and the regional aquifer. Most of the exchange of water occurs as downward unsaturated flow from perching beds to the regional aquifer along the fracture and faults. (emphasis added).

EarthFax report at 2-9.

Despite its admission that there is a hydrologic connection between the perched aquifers contributing to the regional aquifer below, EarthFax "does not recognize that there is a subtraction from the Star Point-Blackhawk aquifer, which supplies the subject springs." Exhibit "B" at 1. EarthFax goes on to accept, without independent analysis or support, statements by Co-Op that no water was encountered when it drilled boreholes adjacent to the Bear Canyon Mine portal at the top of the Mancos Shale. EarthFax report at 3-2. Given the location of the boreholes, drilling would have gone straight through the Star Point-Blackhawk regional aquifer and water would have to have been encountered. See Exhibit "B" at 1. Either EarthFax failed to adequately review the data or Co-Op provided them with inaccurate data. These contradictions and inconsistencies in the EarthFax report lessen its evidentiary value and bolster Mr. Montgomery's conclusions.

Mr. Montgomery's concerns about the accuracy of EarthFax's report on the location of aquifers is also strengthened by the conclusions of Tom Munson, a DOGM Senior Hydrologist. According to Mr. Munson, EarthFax's conclusion that:

> In the area of present development, the regional water table is located below the Blind Canyon and Hiawatha seams in both the Trail Canyon and Bear Canyon mines as indicated by downhole drilling . . . . has not been supported by data in [its report] and therefore cannot be made. Reference is made to holes drilled but no data has been presented. The Division feels the operator shall plot and document all data associated with drill holes within the Bear Canyon Permit Area and adjacent areas to support any conclusions.

Id. at 2.

Mr. Munson agrees that there is insufficient data to determine if further development of Co-Op's mine to the north would impact the regional water table, but places the burden on Co-Op to address all the requirements of R614-301-728 through future drilling programs and further study. Exhibit "A" at 3, ¶5.

Finally, Co-Op argues that because Plateau Mining Company has operations near its proposed expansion which have not impacted Birch Springs or Big Bear Canyon Springs, Co-Op's proposed operations to the north will likewise not impact these water sources. This argument is without merit. According to Mr. Montgomery,

> Available data on Plateau's mining reports very little water encountered thus-far, which has required the hauling-in of drinking water to the mine. However, I believe that as this mining proceeds and encounters further faults, or prominent joints which intersect faulting in the area, some ground water will be encountered and disrupted from its natural flow and conduit system. . . .

Montgomery's February 8, 1991, report at 1-2.

Due to the different locations of the Plateau's mine and Co-Op's proposed mine, the two cannot be compared. Plateau's operations are further north than Co-Op's proposed expansion. Mr. Montgomery concludes that, given the location of Co-Op's contemplated development, it will likely have a negative impact on Birch Springs and Big Bear Canyon Springs and the regional aquifers feeding them. Montgomery's January 28, 1991, report 7, 9.

5. <u>Promised Future Compliance</u>

Throughout its Reply, Co-Op states that it will instigate testing and monitoring procedures and take other steps to meet the

objections of Protestants. This approach is statutorily insufficient. A successful applicant for a renewal or new mining permit must make a showing that it has already put these testing procedures into place and has already taken steps to adequately protect hydrologic resources. Co-Op's promises mean nothing in this proceeding; rather its continual omissions and failures of compliance are far more determinative.

According to Mr. Munson, Co-Op's application and submissions by its engineer, EarthFax, do not ensure protection of Protestants' water sources.

> The Earthfax Engineering report falls short of providing enough data to demonstrate a finding of no impact to the hydrologic balance. Until more conclusive data is collected regarding the regional potentiometric surface, can the Division make a finding of no impact regarding the regional potentiometric.
>
> The issue of water quality impacts has not been adequately addressed and must be included in any future submittals by Co-Op Mining Company. The 4th quarter data on Big Bear Springs indicates a three-fold increase in total dissolved solids, and additional seepage from the old sealed workings of the Bear Canyon Mine are tentatively held responsible for this increase. This issue must be addressed in any future submittals.

Id. at 4.

CONCLUSION

Co-Op is neither entitled to a renewal nor a new mining permit. First, the terms and conditions of its existing permit are not being satisfactorily met. Second, Co-Op's present coal mining and reclamation operation is not in compliance with its approved plan. Third, Co-Op's renewal would substantially jeopardize its continuing responsibility on existing permit areas, including the

abandoned Trail Canyon Mine. Fourth, Co-Op has failed to provide the DOGM with all of the revised and updated information it has requested, including the revised PHC. Utah Code Ann. §40-10-9(4)(a). See also, Utah Administrative Code R614-301-700 et seq.

As for its application to mine the new area, Co-Op has not met the application requirements. Co-Op has not provided accurate maps clearly showing the land to be affected by its mining operations nor has it made a determination of the probable consequences of the mining and reclamation operations on the hydrologic resources, particularly its impact on the regional water table. Utah Code Ann. §40-10-9(4)(b).

These deficiencies in Co-Op's applications and analysis have been adequately demonstrated by Protestant's geologist, S. Bryce Montgomery. Mr. Montgomery's reports have met the requisite standard by showing that there is, at a minimum, a "reasonable likelihood" that Co-Op's mining operations have adversely impacted Big Bear Canyon Springs and Birch Springs, that contaminants from Co-Op's present mining operations and past Trail Canyon Mine operations have penetrated the Star Point-Blackhawk regional aquifer and that Co-Op's proposed expansion to the north will adversely impact Protestants' water sources. Evidence presented by Co-Op in the form of EarthFax's studies is self-contradictory and does not rebut Mr. Montgomery's well-founded theories.

DOGM Senior Reclamation Hydrologist, Tom Munson, also expressed his concern, in his March 14, 1991, memorandum, about the accuracy of some of EarthFax's conclusions and about Co-Op's

failure to adequately protect hydrologic resources. "The Earthfax Engineering report falls short of providing enough data to demonstrate a finding of no impact to the hydrologic balance. . . . The issue of water quality impacts had not been adequately addressed and must be included in any future submittals by Co-Op Mining Company. . . ." Exhibit "A" at 4.

Birch Springs and Big Bear Canyon Springs are the exclusive sources of culinary and agricultural water for thousands of individuals. Contamination and/or alteration of flow levels to either of these water sources by Co-Op's mining operations would cause irreparable damage to the water sources for an entire community, with potentially devastating results to the populace. In its Reply, Co-Op has attempted to comfort Protestants by saying that it will work to more adequately protect these water sources. Protestants cannot, should not and are not required to wait for Co-Op to comply with mining regulations "sometime" in the future, particularly given Co-Op's history of violations. They are entitled to protection now. Protestants, therefore, request the DOGM to deny Co-Op's renewal and new permit applications.

RESPECTFULLY SUBMITTED this 21st day of March, 1991.

Michele Mattsson

Jeffrey W. Appel
Michele Mattsson
Attorneys for Protestants

ORIGINAL - 015/021

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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IN THE MATTER OF THE APPEAL OF THE FACT OF VIOLATION IN N91-34-2-1 AND N91-26-5-1 AT THE BEAR CANYON MINE, AND N91-26-3-1 AND C91-26-1-1 AT THE TRAIL CANYON MINE, CO-OP MINING COMPANY, EMERY COUNTY, UTAH	:	FINDINGS, CONCLUSIONS AND ORDER INFORMAL HEARING CAUSE NOS. ACT/015/025 AND ACT/015/021

---ooOoo---

On September 4, 1991, the Division of Oil, Gas and Mining ("Division") held an Informal Hearing concerning the Fact of Violation for the above-referenced Notices of Violation ("NOV"). The following individuals attended:

Presiding:	Dianne R. Nielson, Director Division of Oil, Gas and Mining
Petitioner:	Kimly C. Mangum, P.E. Co-Op Mining Company
Division:	Jesse Kelley Reclamation Engineer
	Pamela Grubaugh-Littig Permit Supervisor
	Bill Malencik Reclamation Specialist
Board:	Thomas A. Mitchell Assessment Conference Officer Penalty Assessment
	Joseph C. Helfrich Assessment Officer

The Finding, Conclusions, and Order in this matter are based on information provided by the Petitioner and the Division as part of the Informal Hearing, and information in the files of the Division.

FINDINGS OF FACT

1. Notice of this Informal Hearing was properly given.

2. The Assessment Conference to review the proposed penalties for NOV N91-34-2-1, N91-26-5-1, C91-26-1-1, and N91-26-3-1, was held immediately following this informal hearing regarding fact of violation. Requirements to pay the assessed penalties are stayed pending the decisions in the informal reviews of the fact of violation.

3. NOV N91-34-2-1 was written as part of an inspection conducted at the Bear Canyon Mine on May 16, 1991. It was written for the violation of Utah Admin. R614-301-742.312, for failure to maintain undistrubed ditches D-3U and D-4U, resulting in the ditches being blocked and not functional. According to the inspector, if rainfall or drainage had reported to the ditches, its flow would have been blocked by the debris. Co-Op Mining did not dispute that maintenance had not been performed. However, Co-Op Mining contended that there had been no adverse contribution of sediment to Bear Creek. The event did not occur.

During the Informal Hearing, discussions indicated that even if flow to the ditches was blocked, the drainage would have reported, via the road, to the same sediment pond, with no more impact than if drainage had reported through the ditches. While review may substantiate this claim, the existing plan did not provide for or analyze the impacts of road versus ditch-controlled drainage.

4. NOV N91-26-5-1 was written as part of an inspection conducted at the Bear Canyon Mine on April 30, 1991. The NOV was written for violation of Utah Admin. R614-301-812.400 and R614-300-143 and Utah Code Ann. § 40-10-15, for failure to provide adequate Letter of Credit (reclamation surety) coverage for coal mining and reclamation operations at the Bear Canyon Mine. The Co-Op plan for permit renewal indicated in the text that there were 9 acres of disturbance associated with the mine. The map which accompanied the renewal application indicated 16 acres of disturbance. When the disturbance was ground-checked and new maps prepared, approximately 22 acres of disturbance was determined to exist.

In November, 1990, Co-Op Mining increased its reclamation surety to $290,000, in anticipation of an increased reclamation cost estimate, as part of the repermit review. When the Division determined that the actual disturbed area was approximately 22 acres, it also determined that the posted reclamation bond was insufficient. The evaluation of the required bond amount was based on an estimated cost of $20,000 per acre, not on actual reclamation costs provided in Co-Op's renewal application.

When the disturbed acreage was adjusted to approximately 22 acres and when the reclamation cost estimates provided by Co-Op were confirmed, the bond amount of approximately $270,100 was determined to be sufficient.

Although the amount of disturbed area acreage varied, the bond of $290,000, as originally posted, was never insufficient.

5. NOV N91-26-3-1 was written as part of an inspection conducted at the Trail Canyon Mine on March 26-27, 1991. It was written for violation of Utah Admin. R614-300-143 for failure to comply with terms and conditions of the permit, all applicable performance standards, and requirements of the state program.

With regard to the stipulation, the necessary document was not available at the mine at the time of the inspection. An extension for providing the documentation was granted from April 4 to April 30, 1991. The document was provided by that date.

Co-Op Mining Company stated that the document was actually at the mine all the time and Co-Op questioned the need to provide the document.

Regarding the issue of monitoring, Co-Op did not conduct monitoring in accordance with the schedule in the approved plan. Co-Op Mining Company agreed that it had failed to properly monitor.

The inspector noted that Co-Op provided a copy of the required liability insurance on site, but the document was incomplete, lacking a mine name and permit number. Co-Op contended that the document was in place, irregardless of its deficiency.

With regard to the SPCC plan, the Division inspector noted the SPCC plan on file at the mine showed fuel tanks at the Trail Canyon Mine. However, the fuel tanks were not present on the ground. The inspector noted that the SPCC plan should be updated

to reflect the removal of the tanks. Co-Op Mining indicated that the tanks had been removed during reclamation. The on-the-ground condition (no tanks) was consistent with the reclamation plan in the Trail Canyon permit. Co-Op considered that the SPCC plan did not need to be revised, but rather that, once reclamation had been conducted and the tanks removed, the need for an SPCC plan no longer existed.

6. Failure to abate Cessation Order (FTA-CO) C91-26-1-1 was written on May 1, 1991, for failure to abate NOV N91-26-3-1, as regards the requirement to provide a complete and adequate liability insurance certificate to the Division on April 30, 1991.

No such insurance certificate was provided to the Salt Lake or Price office of the Division or to staff on or before April 30, 1991.

A field inspection on May 1, 1991, indicated that a complete and adequate insurance certificate, stamped received April 29, 1991, was available at the mine. A copy was provided to the Division, terminating the violation and the resulting FTA-CO.

CONCLUSIONS OF LAW

1. Failure to maintain, in accordance with Utah Admin. R614-301-742.312. constitutes a violation, regardless of whether or not subsequent damage occurred as a result of the failure. Unless, and until, the plan is revised to eliminate the

previously-substantiated need to maintain undistrubed ditches D-3U and D-4U, the ditches must be maintained and utilized.

2. If a document is required to be maintained on site at the mine, the document must be available, upon request, to the inspector.

3. A liability form lacking the mine name and permit number is incomplete and not sufficient proof of liability insurance coverage.

4. There is a difference between; 1) never having the fuel tanks on site, and hence needing no SPCC plan, and 2) removing tanks which were once on site and identified as part of an SPCC plan, and hence needing to substantiate, through SPCC plan revision, that tanks have been removed. When the tanks were removed, it constituted a revision in the SPCC plan, indicating that once-present tanks had been removed.

ORDER

Now THEREFORE, it is ordered that:

1. NOV N91-34-2-1 is upheld.

2. NOV N91-26-5-1 is vacated. While the description of the amount of disturbed area acreage was in error in earlier versions of text and maps, the amount of the reclamation surety was sufficient at the time the NOV was written and during additional reviews.

3. NOV N91-26-3-1 is upheld.

4. FTA-CO C91-26-1-1 is also upheld.

5. The finalized assessments, resulting from the Assessment Conference of September 4, 1991, are due and payable to the Division 30 days from the date of this Order or receipt of the final penalty assessment, whichever is later.

6. The Petitioner, Co-Op Mining Company, may appeal to the Board of Oil, Gas and Mining regarding the informal determination of fact of violation and/or finalized assessment by filing paid appeal within 30 days of the date of this Order, in accordance with statutory and regulatory provisions, including placing the assessed penalty in escrow prior to the Board hearing.

So DETERMINED AND ORDERED this 4th day of October, 1991.

Dianne R. Nielson

Dianne R. Nielson, Director
Division of Oil, Gas and Mining

CERTIFICATE OF SERVICE

I hereby certify that I caused a true and correct copy of the forgoing ORDER for Cause Nos. ACT/015/025 and ACT/015/021 to be mailed first class, postage prepaid on October 4, 1991, to:

Wendell Owen
Co-Op Mining Company
P. O. Box 1245
Huntington, Utah 84528

Kimly C. Mangum, P.E.
Co-Op Mining Company
388 East Boynton Road
Kaysville, Utah 84037

BEFORE THE DIVISION OF OIL, GAS AND MINING
DEPARTMENT OF NATURAL RESOURCES
STATE OF UTAH

---ooOoo---

IN THE MATTER OF THE APPEAL OF FACT OF VIOLATION N91-32-5-2, PART 1 OF 2, CO-OP MINING COMPANY, TRAIL CANYON MINE, EMERY COUNTY, UTAH	:	FINDINGS, CONCLUSIONS AND ORDER INFORMAL HEARING CAUSE NO. ACT/015/021

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On November 20, 1991, the Division of Oil, Gas and Mining held an informal hearing concerning the fact of violation for the above-referenced Notice of Violation ("NOV"). The following individuals attended:

Presiding:	Dianne R. Nielson, Director Division of Oil, Gas and Mining
Petitioner:	Kimly C. Mangum, P.E. Mangum Engineering Consultants Representing Co-Op Mining Company
Division:	Henry Sauer Reclamation Specialist Issuing Inspector
	Pamela Grubaugh-Littig Permit Supervisor
Board:	Thomas A. Mitchell, Esq. Assessment Conference Officer Penalty Assessment
	Joseph Helfrich Assessment Officer Penalty Assessment

The Findings, Conclusions, and Order in this matter are based on information provided by the Petitioner in connection with this informal hearing, and information in the files of the Division.

FINDINGS OF FACT

1. Notice of this informal hearing was properly given.

2. NOV N91-32-5-2 is a two-part violation which was issued on August 21, 1991. Fact of Violation is being contested only regarding part 1 of 2. The proposed penalty is being appealed for both parts of the violation.

3. Part 1 of 2 was written for failure to prevent to the extent possible additional contributions of suspended solids and sediments to streamflows outside the permit area, and failure to minimize erosion to the extent possible, in accordance with Utah Admin. R. 614-301-742.111 and 614-301-742.113, and Utah Code Ann. §40-10-17(j)(ii)(A).

4. The proposed penalty assessment for parts 1 and 2 of N91-32-5-2 was held immediately following this informal hearing regarding fact of violation. Payment or appeal of the penalty in part 2 of 2 is directed and governed by the December 11, 1991, final assessment. The requirements regarding the penalty in part 1 of 2 are stayed pending issuance of this order in the fact of violation.

5. On March 27, 1991, the Division issued to Co-Op Mining Company violation N91-26-2-1 at the Trail Canyon Mine for failure to minimize erosion to the extent possible in accordance with Utah Admin. R. 614-301-742.113. This violation was issued by Bill Malencik. In part, the violation included the problem with the same diversion and area which is the subject of N91-32-5-2.

6. By letter to Co-Op Mining Company, dated April 29,

1991, Pam Grubaugh-Littig directed that the plans for the diversion be handled as an amendment to the Mining and Reclamation Plan.

7. On June 12, 1991, by letter from Bill Malencik, the Division directed Co-Op to take no action on their proposal for the subject diversion until after a joint field trip, which would occur before September 15, 1991. That joint field trip occurred on August 16, 1991.

CONCLUSIONS OF LAW

1. Co-Op Mining Company was in the process of complying with N91-26-2-1 when N91-32-5-2, part 1 of 2, was issued for essentially the same concerns and requiring abatement similar to that which Co-Op was already coordinating with the Division under N91-26-2-1.

ORDER

NOW THEREFORE, it is ordered that:

1. NOV N91-32-5-2, part 1 of 2, is vacated.

2. Because N91-32-5-2, part 1 of 2, is vacated, the finalized assessment in part 1 of 2, is not due or payable to the Division. If the penalty for part 1 of 2 has already been paid, it will be refunded.

3. The Petitioner may appeal to the Board of Oil, Gas and Mining the informal determination of fact of violation and/or finalized assessment by filing said appeal within 30 days of the date of this Order, in accordance with statutory and regulatory

requirements, including placing the assessed penalty in escrow.

SO DETERMINED AND ORDERED this 20th day of December, 1991.

Dianne R. Nielson, Director
Division of Oil, Gas and Mining
State of Utah

BEFORE THE DIVISION OF OIL, GAS AND MINING
DEPARTMENT OF NATURAL RESOURCES
STATE OF UTAH

---ooOoo---

IN THE MATTER OF THE APPEAL OF FACT OF VIOLATION N91-20-1-1, CO-OP MINING COMPANY, BEAR CANYON MINE, EMERY COUNTY, UTAH	:	FINDINGS, CONCLUSIONS AND ORDER INFORMAL HEARING CAUSE NO. ACT/015/025

---ooOoo---

On November 20, 1991, the Division of Oil, Gas and Mining held an informal hearing concerning the fact of violation for the above-referenced Notice of Violation ("NOV"). The following individuals attended:

Presiding:	Dianne R. Nielson, Director Division of Oil, Gas and Mining
Petitioner:	Kimly C. Mangum, P.E. Mangum Engineering Consultants Representing Co-Op Mining Company
Division:	Henry Sauer Reclamation Specialist
	Pamela Grubaugh-Littig Permit Supervisor (Issued Violation)
Board:	Thomas A. Mitchell, Esq. Assessment Conference Officer Penalty Assessment
	Joseph Helfrich Assessment Officer Penalty Assessment

The Findings, Conclusions, and Order in this matter are based on information provided by the Petitioner in connection with

this informal hearing, and information in the files of the Division.

FINDINGS OF FACT

1. Notice of this informal hearing was properly given.

2. The Assessment Conference to review the proposed penalties for NOV N91-20-1-1 was held immediately following this informal hearing regarding fact of violation. The requirement to pay the assessed penalty is stayed pending the decision in the informal review of fact of violation.

3. NOV N91-20-1-1 was written on April 26, 1991, for failure to operate in accordance and compliance with the terms and conditions of the permit, all applicable performance standards and requirements of the State Program, specifically for failure to submit all information required by the Division Order issued November 11, 1990, items 8, 14, 17, and 18. Provisions violated were Utah Admin. R. 614-300-143 and 614-303-212. Abatement required submission of all complete and technically adequate information in compliance with the Division Order by May 24, 1991.

4. The Division Order originally required submission of the required information, including the specific items listed above in Paragraph 3, by January 27, 1991. The submission date was extended to March 27, 1991. A letter from Pam Grubaugh-Littig, dated April 11, 1991, informed Co-Op that the necessary information

had not been submitted.

5. On April 23, 1991, approximately one month after the required submission deadline, Co-Op requested additional time to provide the required information.

6. Co-Op contends that the regulations cited are general.

CONCLUSIONS OF LAW

1. While the rules cited in N91-20-1-1 may be considered broad in scope, the specific direction in the Division Order and the NOV N91-20-1-1 were specific in terms of the information required and the dates by which it was to be submitted.

2. Co-Op failed to comply with the Division Order in a timely manner.

ORDER

NOW THEREFORE, it is ordered that:

1. NOV N91-20-1-1 is upheld.

2. The finalized assessment resulting from the Assessment Conference is due and payable to the Division 30 days from the date of this Order.

3. The Petitioner may appeal to the Board of Oil, Gas and Mining the informal determination of fact of violation and/or finalized assessment by filing said appeal within 30 days of the

date of this Order, in accordance with statutory and regulatory requirements, including placing the assessed penalty in escrow.

SO DETERMINED AND ORDERED this 20th day of December, 1991.

Dianne R. Nielson, Director
Division of Oil, Gas and Mining
State of Utah

file

BEFORE THE DIVISION OF OIL GAS AND MINING
DEPARTMENT OF NATURAL RESOURCES
STATE OF UTAH

---ooOoo---

IN THE MATTER OF THE APPEAL OF FACT OF VIOLATION N91-40-2-2, CO-OP MINING COMPANY, BEAR CANYON MINE, EMERY COUNTY, UTAH ACT/015/025	:	FINDINGS, CONCLUSIONS AND ORDER INFORMAL HEARING CAUSE NO. ACT/015/025

---ooOoo---

On March 31, 1992, the Division of Oil, Gas and Mining ("Division") held an informal hearing at the request of Co-op Mining Company ("Co-op") concerning the fact of violation for the above-referenced Notice of Violation ("NOV"). The following individuals attended:

Presiding:	Dianne R. Nielson, Director Division of Oil, Gas and Mining
Petitioner: ("Co-op")	Kimly Mangum Mangum Engineering Consultants Consultant for Co-op Mining Company
	Charles Reynolds Co-op Mining Company
Division:	Lowell Braxton Associate Director for Mining
	Pamela Grubaugh-Littig Permit Supervisor
	Hugh Klein Reclamation Specialist Issuing Inspector
Board:	Joe Helfrich Assessment Officer Penalty Assessment
	William Richards, Esq. Assessment Conference Officer

The Findings, Conclusions, and Order in this matter are based on information provided in connection with this informal hearing, and information in the files of the Division.

FINDINGS OF FACT

1. Notice of this hearing was properly given.

2. The Assessment Conference, to review the proposed penalties for NOV N91-40-2-2, was held immediately following this informal hearing regarding fact of violation. Requirement to pay the assessed penalty is stayed pending the decision in the informal review of fact of violation.

3. NOV N91-40-2-2 was issued on December 19, 1991, based on an inspection on December 17, 1991, by Hugh Klein. The violation has two parts. Although the request for the review of fact of violation did not distinguish the two parts, during the informal conference, Co-op clarified that only part 1 of 2 was being contested with respect to fact of violation.

4. N91-40-2-2, Part 1 of 2 was written for failure to maintain an undisturbed diversion culvert (C-13U), as required in Utah Admin. R614(645)-301-742.312. Culvert was fully clogged in the mid section.

5. N91-40-2-2, Part 2 of 2 was written for failure to provide accurate maps, specifically failure to show the culvert, which is the subject of Part 1 of 2, on Plate 7-1A, as required in Utah Admin. R614(645)-301-521.140.

6. During an inspection earlier in December, 1991, by Bill Malencik, Reclamation Specialist for the Division, Co-op was informed that the culvert needed maintenance. Co-op indicated during the informal conference that it attempted to, but was unable to clear the culvert because the blockage and ground were frozen.

7. Hugh Klein instructed Co-op that the culvert needed cleaning during the beginning of his inspection on December 17, 1991. It was not cleaned out when he completed his inspection.

8. Co-op indicates that the culvert was not fully blocked, although a bend in the culvert pipe might have made it look like it was blocked.

9. Co-op further contends that the culvert which is in place is oversized, such that even when the culvert was partially blocked, it would still have had sufficient flow capacity to meet design criteria. Co-op stated that it tested the ability of the partially blocked culvert to pass water at a time after inspection, and found the flow to be sufficient. However, no such showing was made at the time of the inspection, under conditions existing at the time of the inspection.

10. Because the culvert was not properly designated on the map in the Mining and Reclamation Plan, as indicated in N91-40-2-2, Part 2 of 2, the inspector was limited in his ability to determine if the culvert was properly sized or oversized for the required flow capacity.

CONCLUSIONS OF LAW

1. Co-op did not maintain the culvert as required in Utah Admin. R614(645)-301-742.312.

2. Co-op did not show the culvert on the proper map and in the Mining and Reclamation Plan, as required in Utah Admin. R614(645)-301-521.140.

ORDER

NOW THEREFORE, it is ordered that:

1. NOV N91-40-2-2, Parts 1 of 2 and 2 of 2 are upheld.

2. The finalized assessment, resulting from the Assessment Conference of March 31, 1992, is due and payable to the Division 30 days from the date of this Order.

3. The Petitioner may appeal to the Board of Oil, Gas and Mining the informal determination of fact of violation and/or finalized assessment by filing said appeal within 30 days of the date of this Order, in accordance with statutory and regulatory requirements, including placing the assessed civil penalty in escrow.

SO DETERMINED AND ORDERED this 30th day of April, 1992.

Dianne R. Nielson, Director
Division of Oil, Gas and Mining
State of Utah

CERTIFICATE OF MAILING

I hereby certify that I caused a true and correct copy of the foregoing FINDINGS, CONCLUSIONS AND ORDER for Cause No. ACT/015/025 to be mailed by certified mail, postage prepaid, the 30th day of April, 1992 to:

Kimly Mangum
Mangum Engineering Consultants
388 East Boynton Road
Kaysville, Utah 84037

Charles Reynolds
Co-op Mining Company
P.O. Box 1245
Huntington, Utah 84528

Kim Kubota

P 074 979 732

RECEIPT FOR CERTIFIED MAIL
NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL
(See Reverse)

Sent to Charles Reynolds
Co-op Mining Co

SENDER: Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.
Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.
1. ☐ Show to whom delivered, date, and addressee's address. (Extra charge)
2. ☐ Restricted Delivery (Extra charge)

3. Article Addressed to:
Charles Reynolds
Co-op Mining Co
PO Box 1245
Huntington UT 84528

4. Article Number
P 074 979 732

Type of Service:
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☒ Return Receipt for Merchandise

Always obtain signature of addressee or agent and DATE DELIVERED.

5. Signature — Address
X

6. Signature — Agent
X Beth Owen

7. Date of Delivery
MAY 02 1992

8. Addressee's Address (ONLY if requested and fee paid)

PS Form 3811, Mar. 1988 * U.S.G.P.O. 1988-212-865 DOMESTIC RETURN RECEIPT

KL Informal ACT/015/025

BEFORE THE DIVISION OF OIL GAS AND MINING
DEPARTMENT OF NATURAL RESOURCES
STATE OF UTAH

---ooOoo---

IN THE MATTER OF THE POTENTIAL PATTERN OF VIOLATIONS, INCLUDING NOTICES OF VIOLATION N91-35-1-1, N91-20-1-1, AND N91-26-7-2(#2), CO-OP MINING COMPANY, BEAR CANYON MINE, ACT/015/025, EMERY COUNTY, UTAH	FINDINGS, CONCLUSIONS AND ORDER INFORMAL HEARING CAUSE NO. ACT/015/025

---ooOoo---

On July 8, 1992, the Division of Oil, Gas and Mining ("Division") held an informal hearing concerning the potential pattern of violations represented by the above-referenced Notices of Violation ("NOV"s). The informal hearing was held at the request of the operator/permittee Co-op Mining Company ("Co-op") and in accordance with Utah Admin. R645-400-332 and the Division policy ("Policy") entitled Procedure For Determination of Pattern Of Violations, Utah Code Ann. Section 40-10, as revised April 28, 1992. The purpose of the hearing is to provide an opportunity for Co-op to prove to the Division that the above-referenced NOVs were not caused by Co-op willfully or through unwarranted failure to comply. The following individuals attended the informal conference:

Presiding:	Dianne R. Nielson, Director Division of Oil, Gas and Mining
Petitioner: ("Co-op")	Carl Kingston, Esq. Counsel for Co-op Mining Company
	Wendell Owen Resident Agent Co-op Mining Company

Eldon Kingston
Co-op Mining Company

Kimly Mangum
Mangum Engineering
Consultant to Co-op Mining Company

Division: Lowell Braxton
Associate Director for Mining

Pamela Grubaugh-Littig
Permit Supervisor

Thomas A. Mitchell, Esq.
Assistant Attorney General
State of Utah
Counsel for the Division

Board: Joe Helfrich
Assessment Officer

The Findings, Conclusions, and Order in this matter are based on information provided in connection with this informal hearing and information in the files of the Division.

FINDINGS OF FACT

1. Notice of this hearing was properly given.

2. NOVs N91-35-1-1, N91-20-1-1, and N91-26-7-2(#2) have been identified by the Division as constituting a potential pattern of violations, in accordance with Utah Admin. R645-400-332 and the Policy.

3. NOVs N91-35-1-1, N91-20-1-1, and N91-26-7-2(#2) have been determined to have occurred. The fact of violation was not appealed in N91-35-1-1 and N91-26-7-2(#2). The fact of violation was appealed in N91-20-1-1, the fact of violation was upheld in an informal conference, and the informal order was not appealed.

4. In its consideration of whether the violations were caused willfully or through unwarranted failure to comply, the Division also reviewed other violations at the Bear Canyon Mine, including N91-26-7-2(#1), N91-35-8-1, N90-35-1-1, N90-25-1-1, and N91-26-4-3(31).

5. N91-35-1-1 was issued on February 27, 1991, based on an inspection conducted on February 22, 1991, for failure to conduct mining and reclamation activities in accordance with the approved plan, failure to include a detailed description of each road constructed, used or maintained within the permit area, and failure to remove topsoil from the area to be disturbed, in violation of Utah Admin. R614(645)-301-534.100 through 130, R614(645)-301-527.100, R614(645)-301-527.200 through 210, 230, and 240, R614(645)-301-232.100, and Utah Code Ann. 40-10-18(j). The unauthorized construction consisted of a road which was bladed from the top of the upper road (near upper pad) to the coal shoot where a hoist was installed.

6. With respect to N91-35-1-1, Wendell Owen stated that he gave Co-op employee Kevin Peterson specific directions as to how the coal was to be removed from around the coal shoot. According to Mr. Owen, the violation occurred because the employee did not follow Mr. Owen's directions.

7. The final assessment of NOV N91-35-1-1 included the assignment of 23 points for negligence. On a scale of 0-30 points, the range of 16-30 negligence points represents a greater degree of fault.

8. NOV N91-20-1-1 was written on April 26, 1991, for failure to operate in accordance and compliance with the terms and conditions of the permit, all applicable performance standards and requirements of the State Program, specifically for failure to submit all maps and information required by the Division Order issued November 27, 1990, items 8, 14, 17, and 18. Provisions violated were Utah Admin. R614(645)-300-143 and R614(645)-303-212. The determination of insufficiency of the maps which prompted the Division Order, was based on field inspections and review of plan maps and information. Because the violation was written for failure to comply with the Division order and by its nature did not require substantiation through a field inspection, an inspection was not conducted prior to issuance of the violation.

9. With respect to N91-20-1-1, Co-op believes that they attempted in good faith to redo the maps required in the Division Order. Co-op did not know that the Division would require new maps until the Division Order was written. Co-op anticipated that it would take 6-8 months to redo the maps. The Division originally required that the maps be submitted in 90 days. That deadline was extended to March 27, 1991, a period of approximately 4.5 months. When the consultant who usually does Co-op's maps was unable to do the work, Co-op hired two other consulting groups to redo the maps. Co-op requested an additional extension, but the request was not timely made.

10. The final assessment of NOV N91-20-1-1 included the assignment of 20 points for negligence. On a scale of 0-30 points,

the range of 16-30 negligence points represents a greater degree of fault.

11. NOV N91-26-7-2(#2) was written on July 2, 1991, based on an inspection on July 1, 1991, for failure to obtain Division approval before enlarging the shop pad, in violation of Utah Admin. R614(645)-300-143.

12. With respect to N91-26-7-2(#2), Co-op stated that the objective was to clean out a pond. The material from the pond had previously been taken to another pad area. However, when the pond was enlarged, Co-op's plan did not designate where the material was to be taken. The material was used to enlarge a pad which had not been designated to receive the material. Wendell Owen was responsible for the work, but was not there when the work occurred.

13. The final assessment of NOV N91-26-7-2(#2) included the assignment of 25 points for negligence. On a scale of 0-30 points, the range of 16-30 negligence points represents a greater degree of fault.

CONCLUSIONS OF LAW

1. The occurrence of NOVs N91-35-1-1, N91-20-1-1, and N91-26-7-2(#2) constituted a potential pattern of three same or similar violations, as provided in Utah Admin. R645-400-332 and the Policy, thereby causing the opportunity for this informal hearing.

2. The presumption, in evaluating whether the

violations were caused by the permittee willfully or through unwarranted failure to comply, assumes that a person intends the probable and logical consequences of his actions. As provided in Utah Admin. R645-400-331, a finding of unwarranted failure to comply will be based upon a demonstration of greater than ordinary negligence on the part of the permittee. No evidence has been provided which rebuts this presumption.

3. The Director has reviewed the history of these three violations, N91-35-1-1, N91-20-1-1, and N91-26-7-2(#2), as required by Utah Admin. R645-400-332.300 and the Policy.

4. The violations in N91-35-1-1 and N91-26-7-2 were directly related to the willful and unwarranted failure of Co-op management to sufficiently supervise employees to ensure that the work was properly conducted in accordance with the approved plan. In both NOVs, the permittee was determined to have demonstrated greater than ordinary negligence.

5. NOV N91-20-1-1 was caused by Co-op's failure to meet a deadline for submission of maps and information. Failure of the permittee to diligently complete an abatement is not justification for extension of the abatement time, as delineated in Utah Admin. R645-400-324. However, there is reason to believe that the failure to timely abatement may have been caused by factors in addition to negligence or lack of diligence. In consideration of the work to be done and Co-op's efforts to complete that work, the nature of the response does not constitute a willful or unwarranted failure to comply.

6. The Director has considered the existence of a pattern of violations based on two or more Division inspections, as required by Utah Admin. R645-400-332.100 and the Policy.

7. NOVs N91-35-1-1 and N91-26-7-2(#2) constitute a pattern of violations caused by willful and unwarranted failure to comply, as defined by Utah Admin. R645-400-332.

ORDER

1. NOVs N91-35-1-1 and N91-26-7-2(#2) constitute a pattern of violations caused by willful failure to comply, as defined by Utah Admin. R645-400-332.100.

2. By this order, Co-op is notified of the Division's determination of a pattern of violations.

3. The Division hereby determines and recommends to the Board that an Order To Show Cause be issued pursuant to Utah Admin. R645-400-331, said Order To Show Cause to include a recommendation for a 48-hour suspension of mining operations.

4. Co-op has the right to an appeal of this Informal Order. That appeal is provided through the above-referenced Order to Show Cause. The Board will notify Co-op regarding the date of the formal hearing to consider the Order To Show Cause.

SO DETERMINED AND ORDERED this 27th day of July, 1992.

Dianne R. Nielson

Dianne R. Nielson, Director
Division of Oil, Gas and Mining
State of Utah

CERTIFICATE OF MAILING

I hereby certify that I caused a true and correct copy of the foregoing FINDINGS, CONCLUSIONS AND ORDER for Cause No. ACT/015/025 to be mailed by certified mail, postage prepaid, the 28th day of July 1992, to the following:

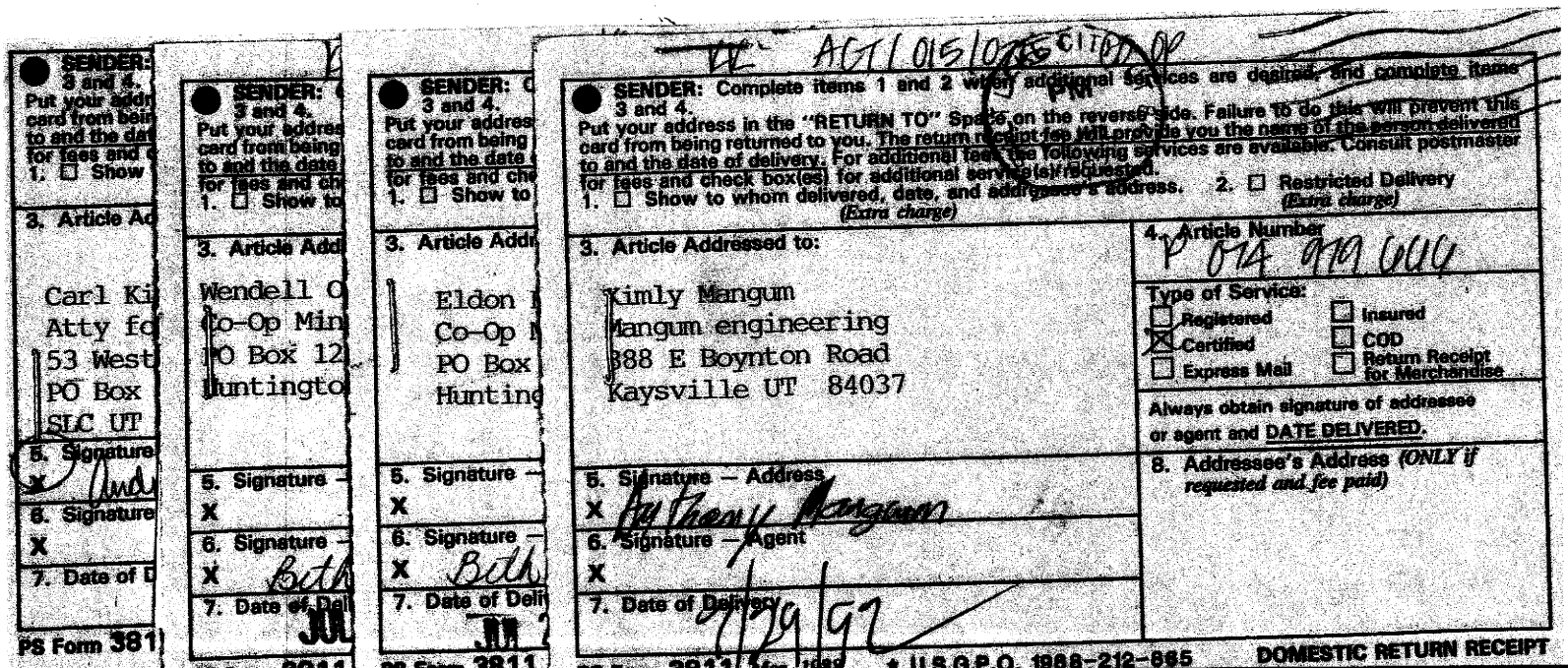
Carl Kingston, Esq.
Attorney for Co-Op
53 West Angelo Avenue
P.O. Box 15809
Salt Lake City, Utah 84115

Wendell Owen
Co-Op Mining Company
P.O. Box 1245
Huntington, Utah 84528

Eldon Kingston
Co-Op Mining Company
P.O. Box 1245
Huntington, Utah 84528

Kimly Mangum
Mangum Engineering
388 E Boynton Road
Kaysville Utah 84037

Kim A. Kuwata


SENDER: Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.
Put your address in the "RETURN TO" space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.
1. ☐ Show to whom delivered, date, and addressee's address. (Extra charge)
2. ☐ Restricted Delivery (Extra charge)
3. Article Addressed to: Kimly Mangum, Mangum engineering, 388 E Boynton Road, Kaysville UT 84037
4. Article Number: P 074 919 044
Type of Service: ☐ Registered ☒ Certified ☐ Express Mail ☐ Insured ☐ COD ☐ Return Receipt for Merchandise
Always obtain signature of addressee or agent and DATE DELIVERED.
5. Signature — Address: X Anthony Mangum
6. Signature — Agent: X
7. Date of Delivery: 7/29/92
8. Addressee's Address (ONLY if requested and fee paid)
PS Form 3811 ★ U.S.G.P.O. 1988-212-885 DOMESTIC RETURN RECEIPT

Copy to PAM, Folder #2 & #5 orig
ACT/015/025

HUNTINGTON-CLEVELAND IRRIGATION COMPANY
55 North Main
Huntington, Utah 84528
Telephone (801) 687-2505

October 23, 1990

RECEIVED
OCT 26 1990
DIVISION OF
OIL, GAS & MINING

Division of Oil and Mining
355 West North Temple
#3 Triad Center Suite 350
Salt Lake City, Utah 84180-1203

Pamela Grubaugh-Littig
Permit Supervisor

Per Rule R 614-300-123, Huntington Cleveland Irrigation Company, files a request for an informal conference, request information, five year permit renewal, Co-op Mining Company, Bear Canyon Mine, Act/015/025, Folder #2, Emery County, Utah.

The reason for this filing, Co-op Mining Company owns no water rights, either surface or underground, with which to mine with or any water rights for their homes use in Bear Canyon or Trail Canyon.

Because of no water rights Huntington Cleveland Irrigation Company files this request for an informal conference.

Sincerely,

Varden Willson

Varden Willson
Secretary
Huntington Cleveland Irrigation Company
Huntington, Utah

Mark Page with nf

VW:lw

To Tom M. 10-30 for discussion

authority, within 30 days after the last publication of the newspaper notice required by R614-300-121.

122.300. The Division will upon receipt of such written comments or objections:

122.310. Transmit a copy of the comments or objections to the applicants; and

122.320. File a copy for public inspection at the Division.

123. Informal Conferences.

123.100. Any person having an interest which is or may be adversely affected by the decision on the application, or an office or a head of a federal, state, or local government agency, may request in writing that the Division hold an informal conference on the application for a permit, significant revision to a permit under R614-303-220, or renewal of a permit under R614-303-230. The request will:

123.110. Briefly summarize the issues to be raised by the requestor at the conference;

123.120. State whether the requestor desires to have the conference conducted in the locality of the proposed coal mining and reclamation operation; and

123.130. Be filed with the Division no later than 30 days after the last publication of the newspaper advertisement required under R614-300-121.

123.200. Except as provided in R614-300-123.300, if an informal conference is requested in accordance with R614-300-123.100, the Division will hold an informal conference within 30 days following the receipt of the request. The informal conference will be conducted as follows:

123.210. If requested under R614-300-123.120, it will be held in the locality of the proposed coal mining and reclamation operation.

123.220. The date, time, and location of the informal conference will be sent to the applicant and other parties to the conference and advertised by the Division in a newspaper of general circulation in the locality of the proposed coal mining and reclamation operation at least two weeks before the scheduled conference.

123.230. If requested in writing by a conference requestor at a reasonable time before the conference, the Division may arrange with the applicant to grant parties to the conference access to the proposed permit area and, to the extent that the applicant has the right to grant access to it, to the adjacent area prior to the established date of the conference for the purpose of gathering information relevant to the conference.

123.240. The requirements of the Procedural Rules of the Board of Oil, Gas and Mining (R619 Rules) will apply to the conduct of the informal conference. The conference will be conducted by a representative of the Division, who may accept oral or written statements and any other relevant information from any party to the conference. An electronic or stenographic record will be made of the conference, unless waived by all the parties. The record will be maintained and will be accessible to the parties of the conference until final release of the applicant's performance bond or other equivalent guarantee pursuant to R614-301-800.

123.300. If all parties requesting the informal conference withdrew their request before the conference is held, the informal conference may be canceled.

123.400. An informal conference held in accordance with R614-300-123 may be used by the Division as the public hearing required under R614-103-234 on proposed relocation or closing of public roads.

124. Public Availability of Permit Applications.

124.100. General Availability. Except as provided in R614-300-124.200 and R614-300-124.300, all applications for permits; permit changes; permit renewals; and transfers, assignments or sales of permit rights on file with the Division will be made available, at reasonable times, for public inspection and copying.

124.200. Limited Availability. Except as provided in R614-300-124.310, information pertaining to coal seams, test borings, core samplings, or soil samples in an application will be made available to any person with an interest which is or may be adversely affected. Information subject to R614-300-124 will be made available to the public when such information is required to be on public file pursuant to Utah law.

124.300. Confidentiality. The Division will provide procedures, including notice and opportunity to be heard for persons both seeking and opposing disclosure, to ensure confidentiality of qualified confidential information, which will be clearly identified by the applicant and submitted separately from the remainder of the application. Confidential information is limited to:

124.310. Information that pertains only to the analysis of the chemical and physical properties of the coal to be mined, except information on components of such coal which are potentially toxic in the environment.

124.320. Information required under section 40-10-10 of the Act that is authorized by that section to be held confidential and is not on public file pursuant to Utah law and that the applicant has requested in writing to be held confidential; and

124.330. Information on the nature and location of archeological resources on public land and Indian land as required under the Archeological Resources Protection Act of 1979 (P. L. 96-95, 93 Stat. 721, 16 U.S.C. 470).

130. Review of Permit Application.

 300- 122.3 — 124.

4873971

C.O.P. COAL DEVELOPMENT CO., INC.
53 West Angelo Avenue
Salt Lake City, Utah 84115
Phone: 486-1458

October 31, 1990

State of Utah
Division of Oil, Gas and Mining
Triad Center
Salt Lake City, Utah

Gentlemen:

Please be advised that I am the owner of 233.77 shares of the capital stock of Huntington-Cleveland Irrigation Co., as evidenced by Certificate #A 2650.

It has been determined that 10 shares of water stock are required for the mining operation at Bear Canyon Mine being conducted by Co-op Mining Company on land being leased by it from C.O.P. Accordingly, I have assigned and set aside, and by this letter I do set aside and assign to Co-op Mining Company, the exclusive right to use water represented by 10 shares of said water stock, in its mining operation at Bear Canyon Mine, for as long as the shares are necessary for such use.

Very truly yours,

Joseph O. Kingston

Joseph O. Kingston, President
C.O.P. Coal Development Co., Inc.

JOK/kj

RECEIVED
OCT 31 1990
DIVISION OF
OIL, GAS & MINING

STATE OF UTAH
NATURAL RESOURCES
Water Rights

Norman H. Bangerter, Governor
Dee C. Hansen, Executive Director
Robert L. Morgan, State Engineer

Southeastern Area • 453 S. Carbon Avenue • P.O. Box 718 • Price, UT 84501-0718 • 801-637-1303

October 31, 1990

Co-Op Mining Company
Attn: Wendell Owen
P.O. Box 1245
Huntington, Utah 84528

Re: Water Right Transfer - Trail and Bear Canyons
Huntington-Cleveland Irrigation Company Shares

Dear Wendell:

To summarize our meeting of October 30, 1990 concerning the above referenced matter, it would appear that there will need to be a total of 48 shares of water transferred by Co-Op for use in the canyon. The breakdown would be 10 shares for Bear Canyon, and 38 shares for Trail Canyon.

As we discussed, it will be necessary for you to have a stock certificate prepared for at least the 48 shares of water which are to be transferred up the canyon for use. You indicated that the shares are presently in the name of Joseph Kingston. If he plans to retain title to the 48 shares, it will be necessary for him to file the paper work with our office in behalf of the Co-Op Mine. Therefore, I would encourage you or him to contact Mr. Varden Willson, Secretary for the Huntington-Cleveland Irrigation Company, and proceed with this matter. Once this stock certificate has been secured, please send a copy to this office, and I will assist you in completing the necessary water right filing. The filing fee will be $30.00, and once the water right papers are filed, it will require at least 90 days for processing.

If you have any questions concerning the procedure to follow, please contact me. Your prompt response to this matter is appreciated.

Sincerely,

Mark P. Page

Mark P. Page
Area Engineer

cc: Varden Willson, H-C Irrigation Co.
✓Bill Malencik, Div. of Oil, Gas & Mining

HUNTINGTON-CLEVELAND IRRIGATION COMPANY
55 North Main
Huntington, Utah 84528
Telephone (801) 687-2505

November 12, 1990

Mr. Lowell P. Braxton
Associate Director, Mining
State of Utah
Department of Oil, Gas, and Mining
1355 West North Temple
#3 Triad Center Suite 350
Salt Lake City, Utah 84180-1203

Mr. Braxton,

Huntington Cleveland Irrigation Company withdraws its formal protest to the mining permit, under ACT/105/025, lease U 24316 and U 024318 for the Co-op Mining Company, Box 11245, Huntington, Utah 84528.

The water problem has been resolved, for years that there is a normal snow fall and a 100% of water allocation, delivered on Primary water. Water years like 1989 and 1990 there is not enough water allocated to the Co-op Mine and homes. In 1990 they would of needed twice as many shares allocated, 96 shares instead of 48 shares, and they will need to adjust for dry years.

Sincerely,

Varden Willson

Varden Willson, Secretary
Huntington Cleveland Irrigation Co.

CC: P. Grubough-Littig
Mark Page
Wendal Owens, Co-op Mine
Joseph O. Kingston

Copy to Tom M and Jesse & Pam Grubaugh-Littig

NORTH EMERY WATER USERS ASSOCIATION

Box 418
Elmo, Utah 84521
Telephone (801) 653-2649

RECEIVED
DEC 11 1990
DIVISION OF
OIL, GAS & MINING

December 10, 1990

Dianne Nielsen PhD, Director
Utah Department of Natural Resources
Division of Oil, Gas and Mining
355 West North Temple, Suite 350
Salt Lake City, Utah 84180-1203

Dear Dr Nielsen:

Pursuant to public notice of an application by CoOp Mining Co. to renew and add additional land to their Mining and Reclamation Permit, the North Emery Water Users Association (NEWUA) is making comment on the permit application. Our comments are allowed under R614-300-122.100.

By this letter, we are requesting an informal conference be held in Emery County, the location of the mine, our water system and water users. This request is pursuant to R614-300-123.100, and R614-300-123.120. We request the conference be held during the evening hours so our Board of Directors and water users can attend.

Our concerns arise because one of our springs (Birch Spring) is used for culinary purposes and is located adjacent to the mining operations of CoOp. The attached document enumerates NEWUA concerns with the Permit Application.

In summary, NEWUA is very concerned with mining by CoOp in the Bear Canyon Mine, and past mining in the Trail Canyon Mine. The new permit application raises many questions regarding the integrity of the source of water to Birch Spring. Several inconsistencies and contradictions in the application need to be addressed.

The source of water for Birch Spring needs to be researched. Mining impacts to the spring must be addressed by hydrogeologists in light of the close proximity of mining operations, and the potential impacts.

The permittee's own statements, and the Division CHIA both indicate a strong possibility that Birch Spring either has been impacted, or may be impacted by mining in the future. These issues must be addressed to protect the integrity of the spring.

Birch Spring is an important source of water for our system. The drought has reduced flows from our other spring sources to a level that has the Board of Directors very concerned. We do not have additional sources of water available for use.

A positive resolution of these issues must be found before the permit is approved. The integrity of Birch Spring is of major concern to the Board of Directors of NEWUA. We solicit the Division's assistance in resolving our concerns.

Respectfully,

Menco Copinga

Menco Copinga
President, Board of Directors

Attachment

c: Gayle Smith
Environmental Health District Engineer
Darrel Leamaster
Company Atorney

North Emery Water Users Association
Comments and Concerns
CoOp Mining Co. Mining and Reclamation Permit Application
Public Notice Dated October 23, 30, November 6 and 13, 1990

1- Plate 7-4a "Ground Water Monitoring" does not show Birch Spring. It is shown on Plate 7-4 as number SBC-5.

Birch Spring is a culinary water source, and should be included in the hydrologic monitoring program of the permittee.

2- According to Tom Munson of Division staff, CoOP has only sampled Birch Spring a few times in the past. Since mining has been conducted for many years in the area, we are wondering why CoOP has not been required to have an extensive monitoring program on this spring. The spring is critical to NEWUA since we have limited sources. CoOp has never requested permission to sample from the collection system at the spring. According to Tom, the sampling conducted to date has been done only when water was overflowing from the overflow box.

3- Plate 7-6 "Water Rights" does not show Birch Spring.

4- Appendix 7-M of the application is an inventory of seeps and springs in the area of the new Federal Coal Leases proposed to be added to the permit. The intent was to identify water sources on the leases and within one-half mile of the leases that could be affected by mining. Birch Spring is located within one-half mile of Lease U-024318, but is not mentioned or shown on the map.

Appendix 7-M also states that U.S. Forest Service files were searched for water rights in the area. Water rights information is the jurisdiction of the Utah State Engineer, not the Forest Service. A search of the State Engineers records would have revealed Birch Spring.

5- Page 7-J13 of the permit application indicates localized aquifers may be dewatered throughout the mine life, and that Bear Canyon Spring may be impacted as mining encroaches upon the fault that "...conducts recharge to the spring." Birch Spring also has fault/fractures as it's source, but is not mentioned.

Page 7-J13 indicates "...vertical and lateral migration of water appears to be partially controlled by fracture conduits...", and that "...readjustment or realignment in the conduit system will inevitably produce changes in the configuration of ground water flow."

This page also states that "Potential changes include increased flow rates along fractures that have "opened" and diverting flow along new fractures or permeable lithologies." Also stated is "Subsurface flow diversions may cause depletion of water in certain localized aquifers, whereas increased flow rates along fractures would reduce ground water residence time and potentially improve water quality." No postulation that the water Quality may be negatively impacted is given. In many cases where mining intercepts water, Total Dissolved Solids, and Specific Conductance levels increase significantly over background levels.

6- Page 7-J14 of the application indicates that, "...the ground water recharge is primarily from snow-melt at higher elevations, and appears to be controlled by permeable lithologies or faults and fractures."

Also stated is that "The recharge area appears to be primarily to the north of the mine permit area, and ground water movement to the south is likely fault-controlled. Mining in either or both seams should have little, if any, impact on such geologic controlled water movement...;"

When mining is, and has been conducted on both sides of the fault/fracture associated with Birch Spring, the likelihood that the fault/fracture has been disturbed is great. Subsidence has, without doubt, impacted the fault above the coal seam. The permittee admits that "...mine water inflow may potentially dewater certain localized aquifers...", (see No. 5 above).

7- Page 7-J15 of the application indicates that, "Potential impacts of mining to local and regional water users could occur in the form of reduced flow to springs or wells...", and "...it is expected that such impacts will be minor based on the location of the coal seams, and the fault fracture controlled nature of the ground water discharges in the area."

The permittee admits that negative impacts could occur to the springs in the area, and that those impacts "will" be minor. Any impacts to Birch Spring are **major** impacts to NEWUA in that Birch Spring is a very important source of water to the system; especially in the past four years. Since 1987, the flow from all of our sources has been steadily dropping due the drought.

An increase in the flow rate of a spring is alluded to by the permittee as a positive impact. If an increase in flow rate happened without any other side affects, the impact may be positive, unfortunately this is not always the case. Birch Spring experienced a 300 percent increase in flow in late

1989, but had to be diverted out of the system because of contamination problems. The event lasted three months, and the water flow dropped back to normal levels; the quality cleared up to a point where the water could be used again.

8- Page 7-J16 of the application indicates that, "Any major amount of water encountered by the mines will be pumped out of the mine, thus returning the water to the surface for use. Any water loss to springs or seeps through mine-induced fractures will likely find its way to the surface at another location..."

These statements are of little comfort to NEWUA as an impact to the spring is likely to be negative. Water lost to the system is an intolerable situation, and should not be allowed. Water at another location will do NEWUA little good in the short term. The period of time between loss and finding the other "location" would be serious to our system. The other problems arising with this scenario are equally disturbing.

Given the monitoring program conducted by CoOp to date, the impact, if biological, could create a serious health hazard before anyone found out about it. Other types of mine induced contamination would be only slightly less serious. This scenario is intolerable, and one that the State Health Department would be very concerned with.

If the spring became contaminated, major portions of our system would be contaminated before it could be diverted out of the system. Any type of monitoring program would be extremely difficult to manage to identify contamination, and give notice in time to divert. Contamination from mining could be in the form of fecal coliform, as well as other mining induced contaminants.

These concerns are magnified by the statement by the permittee that "The fault/fracture controlled nature of the ground water, and the high elevation recharge area increase the likelihood that ground water will still find its way to existing discharge locations, regardless of mining activity."

If mining impacted water "...will still find its way to existing discharge locations..." NEWUA would not want it in it's system. A guarantee would have to be given that no contamination would occur before we could accept this situation. Of course, no guarantees can be given when you are dealing with this type of hydrogeologic setting.

9- The following discussions are based on the **Gentry Mountain Cumulative Hydrologic Impact Assessment** (CHIA) written by the Division:

A. The document states, "Faults and fractures act as effective conduits for ground water and allow unsaturated downward flow. Springs having significant discharges (10 gpm or greater) are most commonly located in proximity to major north-south trending fault or fracture zones..." Also, "...Bear Canyon Fault appears to act as a significant conduit for ground water."

No mention is made of the fault or fracture associated with Birch Spring, but nevertheless, the fault/fracture is there, and it is significant. Water flow from the north along the fault/fracture is undoubtedly the source of the spring.

B. The CHIA states that "Data from seven boreholes located within and adjacent to the Star Point Mines permit area indicate ground water associated with the regional aquifer moves toward the south..." This is further evidence that the source of Birch Spring is from the north. The regional dip of the strata is to the south in the Gentry Mountain area.

C. The CHIA states that "...of mine inflow (80 percent) is from faults and fractures with a lesser amount from paleochannels and wall weeps.", and "Mine water within the CIA represents ground-water depletion from storage in the Blackhawk Formation and Star Point Sandstone and the interception of flow along faults/fractures."

This is further evidence that Birch Spring has it's source from a fault/fracture related source.

D. The CHIA states that, "Dewatering and subsidence related to mining have the greatest potential for impacting ground-water resources in the CIA."

In the case of Birch Spring, mining has been conducted on both sides of the fault/fracture system upgradient from the spring. Subsidence has occurred in the mining zone north of the spring. Both of these facts support the possibility that Birch Spring has already been impacted by mining by CoOp.

E. The CHIA states, "Subsidence impacts are largely related to extension and expansion of the existing fracture system and upward propagation of new fractures. Inasmuch as vertical and lateral migration of water appears to be partially controlled by fracture conduits, readjustment or realignment in the conduit system will inevitably produce changes in the configuration of ground-water flow. Potential changes include increased flow rates along fractures that have been "opened", and diverting flow along new fractures or within permeable lithologies."

Again, mining above the coal seam has the potential to "open", or change the fault/fracture system. Water intercepted in the mine and flowing on the floor can seep back into the fault/fracture system and make it's way to the lower discharge point. Water stored, or impounded against the fault/fracture system creates the potential for re-infiltration of the fault/fracture system. This situation is very possible with Birch Spring, as a couple of water locations shown on CoOp mine maps are located near the fault/fracture system north of the spring.

Open fractures and faults have been documented on Gentry Mountain at the Star Point Mine, and at an unmined area in Tie Fork Canyon. Open fault/fractures are capable of conducting water rapidly downgradient, in this case, to the south toward Birch Spring.

10- The unusual event mentioned at Birch Spring occurred starting in October 1989. Flow increased over 300 percent almost overnight. Water, which in recorded history had been captured in the collection piping system suddenly started flowing from the fault/fractures in the cliff face adjacent to the spring, as well as from the collection system. The increased flow dropped off by the first of February 1990 to pre-event levels.

Total dissolved solids increased 190 percent over background levels. Specific conductance increased 230 percent over background levels. Total iron increased 440 percent over background levels. Oil and grease was measured in one sample to be 3.4 milligrams/liter. Coliforms were measured at 16 when the highest background level had been 2.

The sudden increase and decrease in flow and change in water quality was highly unusual. Flow records at other springs in the vicinity do not indicate a regional trend similar to the Birch Spring event.

The increase in total dissolved solids and specific conductance are typical of mining impacted water. These increases can be documented at several mines in the area. Natural seasonal fluctuations of total dissolved solids and specific conductance occur, but not at similar magnitudes. The presence of oil and grease and an increase in coliforms seems to indicate human caused impacts.

CoOp's own statements in the application support the strong possibility that the Birch Spring event was caused by mining.

From : Emery County Clerk (801) 381-5183 Dec. 13. 1990 09:05 AM P01

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LD 12/18/90

orig mine file
cc L Brayton
~~D Haddock~~ Pam
DRN

DATE: Dec 13, 1990 TIME: _____

TO: Dianne Nielson

COMPANY NAME: St of Ut Oil Gas & Mining Division

FAX NUMBER SENT TO: 359-3940

NUMBER OF PAGES: 4 (including this page)

FROM: Castle Valley Special Service District

ADDRESS: Box 877, Castle Dale, Ut 84513

FAX NUMBER SENT FROM: 1-381-5183

REGULAR PHONE NUMBER: 381-5333

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CASTLE VALLEY SPECIAL SERVICE DISTRICT

P.O. BOX 877
CASTLE DALE, UTAH 84513
TELEPHONE (801) 381-5333
December 10, 1990

DORR W. HANSON
Chairman
DARREL V. LEAMASTER
Manager

State of Utah, Oil, Gas & Mining Division
355 West North Temple, 3 Triad Center
Salt Lake City, Utah 84080

Re: Co-op Mining Company
Application for Renewal and Addition to
Bear Canyon Mine (ACT/015/025)

Gentlemen:

The Co-op Mining Company published a public notice to renew and add additional land to their Mining Permit. Pursuant to that we have examined the Co-op Mining Company Application and Mine plan on file at the Emery County courthouse.

We believe that our interests in the Big Bear Canyon Spring may be adversely affected by this application. We hereby request that the Division hold an informal conference on the application. As allowed under R 614-300-123.120, we desire to have the conference conducted at the coal mine location.

We are vitally concerned with any effects this action may have upon the quantity and/or quality of our culinary water spring (Big Bear Canyon Spring). This spring is located in the permit area and is used to provide drinking water to the communities of Huntington, Cleveland and Elmo. We fully recognize that Huntington City and the Co-op Mining Company have an agreement in place to protect this spring as a water source. However, the continued decline in our spring flow rates, concerns raised by the mining plan, and the lack of previous monitoring data suggest that significant problems with the spring could occur if additional mining activity is allowed beyond that allowed in the 1980 Mine Plan. If the previous mine plan is expanded then additional assurance that our spring will be protected is needed.

Briefly, the issues we would like to have discussed at the hearing include the following:

1. The decline of flow from the Big Bear Canyon Springs over the past several years.

2. The movement of ground water from the recharge area to our springs is in question. Their chapter on Hydrology assumes that ground water flows nearly vertically from the recharge area along fractures and then moves horizontally to the point of discharge at the spring. If the water, in fact, moves on a diagonal line; then their mining operations could intercept the flow. What basis of fact do they have for their assumptions on ground water movement?

3. In the mine plan they discuss the past ground water interceptions at the fault crossings in the East Bleeders Area We would like to discuss its possible link to diminished spring flows. Also, what effects further mining to the North and east will have upon our spring flows.

4. The possibility of contamination of the spring quality due to mine sump leakage into fractures related to faulting, as well as from flow along the fault needs to be discussed. What steps will be taken to assure that downward movement of mine water along these faults and fractures will not contaminate our springs?

5. Almost all of the past monitoring has been done on the downard (East and North) side of the fault associated with Big Bear Spring. Yet the Mine Plan on page 7-30 indicates that ground water movement is "essentially south to southeast." What steps will be taken to adequately monitor on the upstream side of the fault and in the upstream direction of flow?

6. Past ground water monitoring has been inconsistent and often lacking. What assurance do we have that future performance will be improved? Co-op has indicated some past sampling from our spring and their intentions for future sampling. However, they have never requested permission to sample from the spring and we have no knowledge of any previous sampling. We believe this should be an extremely vital part of the monitoring program and that it should be done with our knowledge and co-operation.

7. The State of Utah Public Drinking Water Regulations require a 1500 ft protection zone on all lands equal to or above the operation level of the spring. We believe this will restrict all surface and sub-surface activity within 1500 ft of the spring. We would like to discuss this requirement and its effect on the proposed mining operation.

We believe that the above issues justify the scheduling of a conference and request that one be arranged so we might review our concerns. The above comments are very brief. If more specific and detailed comments are required prior to the conference, please let us know.

Very truly yours,

Darrel V. Leamaster

Darrel V. Leamaster, P.E.
District Manager

cc: Gayle Smith, Health Dept
Huntington City
Cleveland Town
Elmo Town
North Emery Water Users Association

Norman H. Bangerter
Governor
Dee C. Hansen
Executive Director
Dianne R. Nielson, Ph.D.
Division Director

State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
801-538-5340

December 20, 1990

Mr. Wendell Owen
P. O. Box 1245
Huntington, Utah 84528

Dear Mr. Owen:

Re: Copies of Comments and Objections, Co-Op Mining Company, Bear Canyon Mine, ACT/015/025, Folder #2, Emery County, Utah

Enclosed please find copies of the comments and objections to the renewal of the Bear Canyon Mine Coal Mining Permit and the addition of the Federal Lease Tract to the Bear Canyon Mine permit area.

Sincerely,

Pamela Grubaugh-Littig
Permit Supervisor

PGL/mbm
Enclosures
cc: Eldon Kingston
Lowell P. Braxton
AT015025.BC1

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PUBLISHED ON JAN 15 1991

SIGNATURE Kim Lubbers

DATE 01/16/91

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STATE OF UTAH

NOTICE OF INFORMAL HEARING
CAUSE NO. ACT/015/025
BEFORE THE DIVISION OF OIL, GAS AND MINING
DEPARTMENT OF NATURAL RESOURCES, STATE OF UTAH
IN THE MATTER OF THE PERMIT RENEWAL FOR THE CO-OP MINING COMPANY'S BEAR CANYON MINE, EMERY COUNTY, UTAH
THE STATE OF UTAH TO ALL PERSONS INTERESTED IN THE ABOVE ENTITLED MATTER:
Notice is hereby given that the Division of Oil, Gas and Mining will conduct an informal hearing on Tuesday, February 5, 1991, at 6:30 p.m. at the Emery County Courthouse, Second Floor, 95 East Main, Castle Dale, Utah.
The informal hearing will be conducted in accordance with Utah Code Ann. §§ 40-10-13 (1953, as amended) and Utah Administrative R.R. R614-300-122 and 123 (1990).
The permittee, Co-Op Mining Company, is currently operating the Bear Canyon Mine, an underground coal mine in Emery County, Utah. Permittee has applied for renewal of the permit and also revision of the permit to include additional land for mining. Objections including but not limited to, issues of water rights and impact of mining on the quality and quantity of Big Bear Canyon Spring, Birch Springs, and related surface/subsurface hydrology have been raised during the public comment period.
Persons interested in this matter may participate pursuant to Rule R614-300-123. The permit repermit application, subsequent public comments, and request for informal hearing may be inspected in the offices of the undersigned, 3 Triad Center, Suite 350, 355 West North Temple, Salt Lake City, Utah. (801) 538-5340.
DATED this 8th day of January, 1991.
STATE OF UTAH
BOARD OF OIL, GAS & MINING
/s/ Dianne R. Nielson
Director
1A820100

	TELEPHONE
	801-538-5340
	AD NUMBER
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ACT/007/004

January 1991

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STATE OF UTAH)
ss.
County of Carbon,)

I, Dan Stockburger, on oath, say that I am the Publisher of the The Sun Advocate, a weekly newspaper of general circulation, published at Price, State and County aforesaid, and that a certain notice, a true copy of which is hereto attached, was published in the full issue of such newspaper for...One (1).....consecutive issues, and that the first publication was on the

17th.....day of.January., 1991.....

and that the last publication of such notice was in the issue of such newspaper dated the

.....day of....., 19.....

Dan Stockburger

Subscribed and sworn to before me this

17th.....day of.January., 1991.....

Holly Jo Crofts
Notary Public.

My Commission expires October 22, 1994

Residing at Price, Utah

Publication fee, $ .....24.00.....

Notary Public
HOLLY JO CROFTS
280 North 600 West
Price, Utah 84501
My Commission Expires
October 22, 1994
State of Utah

NOTICE OF PERMIT RENEWAL

To Whom It May Concern:

Pursuant to the Utah Coal Mining and Reclamation Act (Utah Code Annotated 1953, Section 40-10-1 et Seq), and the "Regulations Pertaining to Surface Effects of Underground Coal Mining Activities" (Final Rules of the Utah Board of Oil, Gas and Mining), the Utah Division of Oil, Gas and Mining has issued a permanent program mining permit to Castle Gate Coal Company for its permit application No. ACT/007/004. The Company will conduct underground mining activities in accordance with the approved Mining and Reclamation Plan for the Castle Gate Price River Mine Complex associated with the following lands:

Township 12 South, Range 9 East, SLBM, Section 22: Portions of SE¼ SW¼ and SW¼ SE¼ ; Section 26: All but E½ E½ ; Section 27, 28: All; Section 29: All but N½ NW¼ and NW¼ NE¼ ; Section 30: All but N½ N½ ; Sections 31, 32, 33, 34: All; Section 35: Portions of N½ , W½ SW¼ , and SE¼ SE¼ ; Section 36: S½ NW¼ and portions of SW¼ and NE¼ .

Township 13 South, Range 9 East, SLBM, Section 1: Portion of NW¼ NW¼ ; Section 2: Portions of NE¼ and NW¼ ; Section 3: NW¼ and portions of NE¼ , SE¼ and SW¼ ; Section 4: N½ and portions of SE¼ and SW¼ ; Section 5: NE¼ and portions of NW¼ , SE¼ and SW¼ ; Section 6: N½ and portions of SW¼ and SE¼ ; Section 8: Portion of NE¼ ; Section 9: Portions of NE¼ , NW¼ and SW¼ ; Section 10: Portions of NE¼ and NW¼ .

The permit was issued by the Utah Division of Oil, Gas and Mining on December 24, 1990. A copy of the permit, and Decision Document is on file at the following location:

Division of Oil, Gas and Mining, 3 Triad Center, Suite 350, 355 West North Temple, Salt Lake City, Utah 84180-1203, (801) 538-5340.

Anyone having comments pertaining to the Castle Gate Price River Complex should contact Dr. Dianne R. Nielson, Director, Utah Division of Oil, Gas and Mining, at the address referenced above.

BT68/74-75

Published in the Sun Advocate January 17, 1991.

APPROVED FOR PAYMENT DATE

VENDOR # 58156 J

6131 ACCT TASK ACTIVITY

1-28-91

Exhibit 20
ACT/015/025

HUNTINGTON-CLEVELAND IRRIGATION COMPANY
55 North Main
Huntington, Utah 84528
Telephone (801) 687-2505

February 5, 1991

State of Utah
Division of Oil, Gas and Mining
Dianne R. Nielson, Director
#3 Triad Center, Suite 350
355 West North Temple
Salt Lake City, Utah

Dianne R. Nielson:

The Huntington Cleveland Irrigation Company is concerned about the mining operations of the Co-op Mine. Water intercepted by mining operations, taken inside the mine, is taking water from springs and streams from the mountain tops.

Huntington Cleveland Irrigation Company has the first water filings in the Huntington Creek Drainage. Water intercepted by, the Co-op Mine, mining process is taking water that is covered under the Huntington Cleveland Irrigation Company filings.

The Board of Directors, of the Huntington Cleveland Irrigation Company wants to go on file, this fifth day of February, 1991, showing our concerns about this mining operation, at the Co-op Mine, and monitoring and measuring of this water.

Sincerely,

HUNTINGTON CLEVELAND IRRIGATION COMPANY
55 North Main
Huntington, Utah 84528

vw

January 28, 1991

Mr. Darrel V. Leamaster, P. E.
District Manager
Castle Valley Special Service District
P. O. Box 877
Castle Dale, Utah 84513

Mr. Menco Copinga, President
Board of Directors
North Emery Water Users Association
Box 418
Elmo, Utah 84521

Gentlemen:

Re: Hydrologic investigation and report of Big Bear Spring and Birch Spring relative to Co-Op Mining Company past, present, and proposed coal mining, T 15-16 S, R 7 E, SLB & M, Emery Co., Utah

In response to your request of December 18, 1990, and confirmed December 20, 1990, I have made a study of the above referenced and submit the following report.

Acknowledgement and appreciation is expressed for various materials and information provided to me by yourselves, Ben Grimes, and others from your organizations, relative to the matter. Reference has also been made of the following publications:

Brown, T. L., and et al, 1987, Stratigraphic Framework and Coal Resouces of the Upper Cretaceous Blackhawk Formation in the Wasatch Plateau Coal Field, Manti 30'x60' Quadrangle, Emery, Carbon, and Sanpete Counties, Utah: U. S. Geological Survey Map C-94-D;

Danielson, T. W., and et al, 1981, Hydrology of the Coal-Resources Areas in the Upper Drainages of Huntington and Cottonwood Creeks, Central Utah: U. S. Geological Survey in cooperation with the Utah Dept. of Nat. Reources and Energy, Div. of Oil, Gas, and Mining, Water-Resources Investigations Open-File Report 81-539;

Fisher, D. J., and et al, 1960, Cretaceous and Tertiary Formations of the Book Cliffs, Carbon, Emery, and Grand Counties, Utah, and Garfield and Mesa Counties, Colorado: U. S. Geological Survey Prof. Paper 332;

Fouch, T. D., 1976, Revision of the Lower Part of the Tertiary System in the Central and Western Uinta Basin, Utah: U. S. Geological Survey Bulletin 1405-C;

Hintze, L. F. and Stokes, W. L., 1964, compilers, Geologic Map of South-eastern Utah: B. Y. University and Univ. of Utah with Utah State Land Board;

Malencik, B., 1989, Birch Spring Citizen Complaint, unpublished Memorandum Report to Rick Smith, Permit Supervisor: Utah Div. of Oil, Gas and Mining, Dept. of Nat. Resources;

EXHIBIT A

Sanchez, D. D. and Brown, T. L., 1986, Stratigraphic Framework and Coal Resources of the Upper Cretaceous Blackhawk Formation in the Trail Mountain and East Mountain Areas of the Wasatch Plateau Coal Field, Manti 30'x60' Quadrangle, Emery County, Utah: U. S. Geological Survey Map C-94-C;

Spieker, E. M., 1931, The Wasatch Plateau coal field, Utah: U. S. Geological Survey Bulletin 819;

Stokes, W. L. and Cohenour, R. E., 1956, Geologic Atlas of Utah, Emery County: Utah Geol. and Min. Survey Bulletin 52; and

Sumsion, C. T., 1979, Selected Coal-Related Ground-Water Data, Wasatch Plateau-Book Cliffs Area, Utah: U. S. Geological Survey Open-File Report 79-915, prepared in cooperation with the U. S. Bureau of Land Management.

Your attention is directed to the attached hydrologic map which I have prepared on top of the base map of part of Map C-94-D by Brown and others (1987), previously listed.

The faults and prominent joint trends which I have superimposed on this map have been discerned from a combination of personal observations in the field and the study of stereoscopic pairs of aerial photographs obtained from the U. S. Department of Agriculture, being at a scale of approximately 1 inch = 2000 feet, dated 9/23/52, and 1 inch = 5000 feet, dated 9/5/86.

Hydrologic data upon which the potentiometric groundwater contours are plotted are from a combination of drill holes, springs, and observations from within the Bear Canyon Mine. From the cooperation of Wendell Owen of the Co-Op Mining Company, a tour was provided through the existing Bear Canyon Mine along with an explanation from him of past and present conditions within the mine, expecially with regard to water encountered, diverted and used. Also, additional data of the Bear Creek Mine was obtained from viewing a current mining map at the mine, and from the study of maps of the mine dated December 1, 1989, and updated March 7, 1990, submitted to the Emery County office by Co-Op Mining Company. It is my understanding that mining commenced in the Bear Canyon Mine in the year 1982 and ended in the Trail Canyon Mine at about the same time.

The base map which I have used, by Brown and others (1987) illustrates the contact between the Star Point Sandstone and the overlying Blackhawk Formation. The mining coal beds exist within the Blackhawk Formation. Attached to this report is a stratigraphic section of the rock formations present in the area, copied from Danielson and others (1981), Table 1, which illustrates the relationship and description of these rock units. The Birch Spring and Big Bear Canyon Spring of concern discharge from the lower sandstone units of the Star Point Sandstone of upper Cretaceous age, and their locations are shown on the attached map, being within the west and east halfs Section 26, T 16 S, R 7 E. The Star Point Sandstone thickens at and in the vicinity of Big Bear Canyon Spring as shown on the attached Figure 9, Trail and Bear Creek Canyons Stratigraphic Section, from Brown and others (1987). Big Bear Spring discharges downslope from their measured section H47, within the basal, thick sandstone unit of the Star Point Sandstone.

As shown on the attached stratigraphic description of Table 1, the Star Point Sandstone Formation consists of cliff-forming, fine-medium grained sandstone beds that are thin to thick-massive and interbedded gray shale. It is about 400 feet thick and grades downward into the Masuk Member of the gray Mancos Shale which is about 700 feet thick. This thick shale serves as a barrier to downward-moving ground water.

The upper unit of the Star Point Sandstone is medium-thick bedded, well jointed and is presently spilling ground water through the joints and bedding planes, where it overlies a thick section of gray shale containing thin beds of sandstone. This spilling water because of cold weather, has mainly frozen into prominent icicles on the face of the cliffs, upslope from the Big Bear Canyon Spring.

The Blackhawk Formation which overlys the Star Point Sandstone contains the various coal beds that are mined in the area. It is mainly comprised of lenticular, discontinuous sandstone beds, interbedded with gray and tan shales with coals. It is about 650 feet thick.

Conformably above the Blackhawk Formation is the Castlegate Sandstone approximately 200 feet thick, consisting of light brown stream-deposited sandstone and conglomerate. It forms prominent cliffs and is well jointed.

The Castlegate Sandstone is overlain by the North Horn Formation which is both Cretaceous and Tertiary in age. Its total thickness is reported to be about 800 feet, and it consists mainly of vari-colored shale and mudstone interbedded with sandstone and some limestone, being deposited by both streams and lake. It caps the higher mountain ridges and tops of this area, and has been differentially eroded to a lessor thickness.

All of the above described formations are exposed at the surface in the region at varying altitudes from 6800-10,000 feet. Average annual precipitation on Gentry Ridge and Mountain to the north reaches 20-30 inches. Danielson and others (1981) concluded that of this precipitation, groundwater recharge was derived from the snow part of it, and that because of differences in surface relief, water content of the snowpack, and variable rock permeability, the groundwater recharge from this precipitation varies in the area. They observed that the surface relief on the tops of Trail and Gentry Mountains is low because there is not an extensive outcrop of Flagstaff Limestone (the formation immediately above the North Horn Formation), and concluded that groundwater recharge to Trail and Gentry Mountains probably is intermediate to the recharge that occurs on east Mountain and on the steep slopes of Seeley Mountain. They further concluded that the amount of recharge to Trail and Gentry Mountains is probably reflected in the number of springs in these two areas, most of which discharge from the North Horn Formation.

Danielson and others (1981) further reported that recharge to the Star Point -Blackhawk aquifer from direct infiltration of snowmelt on areas of outcrop is probably small in comparison to direct recharge to the Flagstaff Limestone. In the southern part of their study area which included Cottonwood Creek, they observed that outcrop areas of the Blackhawk Formation and Star Point Sandstone usually are less than a mile wide and are usually on steep slopes. They concluded that most of the recharge to the aquifer in the southern part of the area is probably from downward percolation of water, mainly along faults and fractures

from overlying water-bearing zones. In the northern part of their study area, which included the upper drainage of Huntington Canyon, they concluded that the Blackhawk and Star Point formations are exposed over a much greater and wetter area than in the southern part, and that more springs issue from the Blackhawk and Star Point in the northern part of the area, generally reflecting the greater amount of recharge on their outcrops.

Structurally, the subject area, including Gentry Ridge and Mountain to the north and the Meetinghouse Canyon area to the south of Huntington Creek, is unique in being a broad (1½-2 miles wide) graben (a down-dropped area of the earth's crust). This graben extends from the Pleasant Valley Fault on the west which extends northerly through Secs. 22, 27 and 34, T 15 S, R 7 E; Secs. 3, 20, 15, 22, 27 and 34, T 16 S, R 7 E; and Secs. 3 and 10, T 17 S, R 7 E; and the Bear Canyon Fault on the east which extends northerly through Secs. 24, 25, 36, T 15 S, R 7 E; Secs. 1, 12, 13, 24, 25 and 35, T 16 S, R 7 E; and Secs. 2, 11, 14 and 23, T 17 S, R 7 E. Reported maximum displacements on these major faults are 140 feet on the Pleasant Valley Fault and 150 feet on the Bear Canyon fault. Many other northerly-trending, near-vertical faults and prominent joint trends exist between the stated major faults, as shown on the attached hydrogeologic map. Less prominent but plentiful are near-vertical cross-joints in the bedrock which trend N 60°W and N 65-68°E.

Regionally the rock strata in the area dip 2-3 degrees from horizontal to the southeast, but locally within the various fault wedges near the fault planes, the beds may be tilted otherwise. The base map (Brown, et al 1987) used in constructing the attached hydrogeologic map contains structure contours drawn on top of the Star Point Sandstone at an interval of 100 feet. However, this contouring was not extended by them into the graben area between the Pleasant Valley and Bear Canyon Faults. But, their structure contouring a few miles west and a few miles east of the general graben area shows a gently, broad, northeasterly-trending anticline with its axis projecting through Gentry Mountain, and an associated synclinal axis projecting north-northeast of the Bear Canyon Fault. Thus, this warping of the rock strata along with the faults and joints formed within them have created a secondary porosity and permeability therein which has facilitated and enhanced the infiltration, storage and transmission of ground water, forming both perched and general groundwater aquifers, and spillage avenues for spring water. Contouring drawn on the floor of the Bear Canyon Mine, as shown by their engineer, on revised mine map of March 1, 1990, reflects the structure of the rock strata there. It shows local, warping of the rock strata into a small, shallow dome within the center of the E/2 E/2 Sec. 23, T 16 S, R 7 E, which is apparently related to movement along the west side of the Bear Canyon Fault.

Ground water is also stored and conveyed through the intergranular porosity and permeability that exists between the individual sand grains of the many and various sandstone beds present in the area. This is small compared to the secondary porosity and permeability formed from joints, fractures and faults. In addition, greater than the intergranular permeability but less than the secondary permeability of joints and faults, is porosity and permeability along the bedding planes. Because shales are composed mainly of clay, when this clay becomes wetted both the fracture and bedding permeability within the shales are reduced or made nil, as the clays swell and heal, unless the water pressure is sufficient to erode and maintain the water conveyance channels.

Thus, the principal recharge area to the Birch and Big Bear Canyon Springs is Gentry Ridge and Mountain. The principle infiltration and conveyance channels for groundwater feeding the subject springs are the faults and joint systems shown on the stated map, with bedding planes and intergranular porosity being important but more restricted to specific rock units and aquifers. The faults transect all of the rock formations and units, including the shale beds, which allow the infiltration of water directly from the land surface and the spilling of one aquifer to another, up or down depending upon the groundwater pressures involved.

On the attached hydrogeologic map I have drawn potentiometric contours for the ground water in the Blackhawk-Star Point aquifer. The movement of ground water is normal to these potentiometric contours, which is to the southwest and south. Faults and some joints locally interupt and change the groundwater potentiometric surfaces of the various aquifers. The Blackhawk-Star Point aquifer potentiometric surface is also plotted on the attached Hydrogeologic Section (A-A') from Tie Fork Spring through Gentry Mountain to the Big Bear Canyon Spring, and its relationship to the various formations and position of the coal beds in the Bear Canyon Co-Op Mine, can be observed.

Any of the various sandstone or coal units are potential aquifers at any position below the land surface. Where shale beds overlie sandstone or coal units which do not have exposure to the surface, groundwater recharge likely enters them via fault conduits. Thus, aquifers varying from perched, unconfined, and confined may exist and probably do. The perched and unconfined aquifers within bedrock are likely of relatively small storage and yield, and at some elevations contribute to water that recharges confined aquifers.

The ground water being produced from the Bear Canyon Coal bed is apparently perched and unconfined, resting on an underlying siltstone and shale bed. Since this flow has been interupted by the coal mining operations, the underground flow path of some of this ground water has been changed. Since the potentiometric surface of the Blackhawk-Star Point aquifer, from which both the Birch Spring and Big Bear Canyon Spring issue, is at a lower elevation here, some of this in-mine ground water originally contributed some recharge to the Blackhawk-Star Point aquifer along and through faults. How much this original recharge amounted to is not known and could only be quantified by a comparison of accurate spring -flow measurements over a period of at least two years prior to the coal mining, with similar spring measurements over at least two years since coal mining, with an adjustment for changes in precipitation and transmission lag through the measuring periods. Since the recharge to the Big Bear Canyon Spring involves the complete area to the north, including the west Hiawatha mining area, and several fault conduits, the total effects of mining with change in groundwater flows contribute to changes in the Big Bear Spring flow. Thus, in all of the mining operations, ground water that is shifted out of its original flow paths, especially that part of the ground water which did not naturally discharge to the surface as springs or base-flow to streams, is subtracting from the total groundwater system. Danielson, and et al (1981) report that dewatering of the King Mine in the Hiawatha area to the north, probably diverts ground water into the drainage of Cedar Creek, which flows away from the Huntington Canyon area.

Similarly, at the Co-Op Bear Canyon Mine, the ground water which is diverted for mine uses both inside and outside of the mine (estimated to be between 50 -100 gpm), is spilling away from original recharge into existing faults bounding the coal mine. Apparently, some of this water is now spilling through sandstone units at a lower elevation than the coal, which outcrop as cliffs above shale beds, on the south-facing slopes above the Big Bear Canyon Spring. Although some of this spilling water may have occurred originally before any mining operations, much of the present flow appears to be new because of the lack of sustained, water loving vegetation in or near the flow-paths of this water that has surfaced. Because this water is discharging at several places in varying amounts, it would be difficult to measure. It is estimated that at the present time it is approximately 50 gpm. See attached photographs of this area where the discharging water is inpart freezing as large icicles at the land surface.

From available data, as illustrated on the attached hydrogeologic section A-A', the existing faulting through the area from Tie Fork to Big Bear Canyon Spring never completely offsets the Star Point Sandstone against impervious shale beds. Thus, the 350-450 feet thick Star Point Sandstone and overlying basal sandstone units of the Blackhawk Formation, which form the Blackhawk-Star Point aquifer, remain continuous from the main area of recharge to the Big Bear Canyon Spring and to Birch Spring. This provides for a large inter-connected groundwater storage to sustain the continuous existence of the subject springs. The rate of yield to the springs is influenced by the cumulative hydraulic head, of the total, infiltrating groundwater recharge. When some of this recharge is diminished, it will adversely affect the flow rate of the springs.

From the courtesy of Darrel Leamaster and Ben Grimes, discharge records of Big Bear Canyon Spring, Birch Spring, and Tie Fork Spring, and precipitation records have been provided to me. I have combined the flow data for Big Bear Canyon Spring onto one graph for the years 1980-1990, with the inclusion of the average snow melt equivalent in inches of water for the years 1961-1985. This shows that since the year 1987 to the present, there has been a substanial, steady reduction in spring flow from that of the previous years measured and recorded, back through 1980, although the year 1982 was somewhat lower than the other years, but higher than the years since 1987. The average snow water equivalent for the years 1961-1985 in comparison with the peak flow periods of the spring show that there is a three month lag in transmission time for the movement of the recharge water to the spring discharge.

In comparing this graph to that of a graph of average annual precipitation for the three weather stations at Stuart Ranger Station, Red Pine, and Mammoth -Cottonwood, which are all in the close proximity, the average annual precipitation of the area has also dropped for the years 1987-90. Thus, it complicates the quantifying of how much of the reduced spring flow is actually the result of mining operations.

In comparing the flows of the Big Bear Spring with those of Tie Fork Spring (see attached graph from the Castle Valley Special Service District), for the years of 1983-1989, they tend to conform except for the latter part of 1988 when the Tie Fork Spring jumped by about 70 percent. Although there is general inter-connection of the recharge to both springs, Tie Fork Spring is possibly being influenced by mining operations in the west Hiawatha area.

A study of the chemical analyses performed on water samples collected from the Big Bear Canyon Spring from 1977 to January 14, 1991, do not show any significant change until the 1991 analysis. Until 1991, the total dissolved mineral solids have been at or close to 300 mg/l and sulfate content 29 to 48 mg/l. The January 14, 1991, record showed a 27 percent rise in TDS to 382 mg/l. Also, the sulfate content had a jump of 114 percent to 103 mg/l over the highest past analysis of 48 mg/l on a sample collected September 9, 1990. This change in 1991 is significant and indicates some abnormal injection into the recharge system to the spring of sulfates. I believe that these sulfates are being leached from shale beds in the upper Star Point formation, immediately below and by the ground water that is spilling from sandstone beds previously referred to and shown in the attached photographs. A part of this spilling ground water is likely infiltrating into the joints that are exposed immediately downslope from which the Big Bear Spring is discharging.

It is therefore my conclusion that the affect of the Co-Op Bear Creek Mine and possibly the Trail Creek Mine operations have been relatively small in adversing the rights in the Big Bear Canyon Spring, both as to flow rate and contamination. The affect of a small reduction in recharge to the Springs is estimated to be considerably less than the 25 percent allowance provided in paragraph 3, page 1 of the agreement between Co-Op Mining Company and Huntington City, dated January 27, 1982. However, the proposed expansion of the Bear Canyon Mine operations northward another 3/4 mile to the north line of Section 14 will extend the mined area to approximately 75 feet higher in elevation, up-dip than at present (75+7580=7655 feet), which will be near intersecting the potentiometric surface of the Blackhawk-Star Point aquifer. See attached hydrogeologic map and section. Thus, in faults that cut through confining shale beds between the aquifer and mined coal, and within interconnecting cross-joints to these faults, considerable ground water may be encountered, and if diverted away from getting back into the natural conduit system, it would subtract from recharge to the Big Bear Canyon Spring. Also, any contamination generated in the mine workings that could possibly infiltrate into the natural recharge conduit system to the spring, may further adverse spring water quality.

If the groundwater spillage remains as high or increases at the cliff faces upslope from the Big Bear Canyon Spring, there will be a further increase in sulfate content of the spring water, which is undesirable.

With regard to Birch Spring belonging to the North Emery Water users Association, the general hydrologic conditions stated for the Big Bear Canyon Spring also apply here. However, Birch Spring is discharging from a prominent, normal fault having about 20 feet of displacement down on the west, whereas Big Bear Canyon Spring is discharging from three prominent joints along which no obvious displacement has occurrred. Both springs discharge from the lower sandstone unit of the Star Point Sandstone, and the thick, underlying Mancos shale serves as a barrier and deflector to the downward movement of ground water.

The fault from which the Birch Spring issues splays and intersects with other faults which all extend through the mined area of the Co-Op Trail Canyon Coal Mine, as shown on the attached hydrogeologic map. And since the Trail Canyon removed its coal from the Hiawatha seam near the base of the Blackhawk Formation and near the top of the Star Point Sandstone, its total impact on the Birch

Spring is appreciably greater than the impact of the Bear Canyon Mine on Big Bear Canyon springs. Most any ground water encountered in the mine and diverted away from its natural and original conduits would have subtracted from likely recharge supply, through faults, to the Birch Spring. Because of the obvious, open space within the fractured sandstone within the fault zone, that is 12 feet wide at the Birch Spring, any contaminants within the Trail Creek Mine would have easy access into the Blackhawk-Star Point aquifer.

The Trail Canyon Mine which has now had its pillars removed, and since about the year 1982 has been experiencing caving. Such caving to one degree or another has facilitated the rock permeability within and above the mine. Past mining may have partially plugged fault and fracture openings in the mine floor, which original openings may have extended into the underlying Blackhawk-Star Point aquifer. How the encountered groundwater flow has adjusted in its flow pattern within the closed Trail Creek Mine is unknown to me. The potentiometric surface of the Blackhawk-Star Point aquifer could possibly have been encountered within the north-end workings of the Trail Canyon Mine as indicated by the projected contours on the attached hydrogeologic map.

In comparing the attached flow graph of the Birch Spring with flow graphs of Tie Fork Spring and Big Bear Canyon Spring, along with graphs of annual precipitation and average snow water equivalent, the anomalous jump in Birch Spring flow (80 gpm to 230 gpm) from October 1989 through January 1990 is obviously unatural. Furthermore, from the descriptions provided me of this occurrence, I conclude that it is definitely associated with mining activity, and most probably within the caving Trail Canyon Mine. The visual and chemical analysis which showed "oil and grease" with large quantities of suspended sediment in a water sample collected from the spring in October 1989, along with the jump in total dissolved mineral solids (674 mg/l) double of what was analyzed of the spring water in September 1980 (360 mg/l) evidences that contaminated water held in temporary storage within the mine was released suddenly and entered into the fault conduit system that recharges Birch Spring. This sudden entry into the fault conduit was likely due to a build-up in water storage and head within the caved mine to create sufficent water pressure to break through and flush a previously plugged section of the fault. The fact that this anomalous high flow (approximately 0.5 cubic-foot/second) continued for a period of nearly three months evidences that considerable ground water was held in temporary storage. This would amount to approximately 90 acre-feet or about 29,000,000 gallons of water.

Also, the fact that no coliform bacteria was analysed in water samples collected from Birch Spring on August 1, 1986, and December 2, 1986, but in a sample collected October 19, 1989, it showed 16 coliforms present, further shows that the anomalous flow either carried or flushed coliform containing material into the recharge of the spring. A part of this material may have been from packrat and bat dung which I observed to be plentiful within large fractures of the sandstone, in the exposed 12-foot wide fault zone, immediately north and up-gradient from Birch Spring.

Thus, I conclude that continued caving within the Trail Canyon Mine will create additional affects on the Birch Spring, some of which could be beneficial by providing for increased infiltration of snow-melt to create greater recharge to the spring, and some may be adverse such as occurred in late 1989.

The proposed extension of coal mining within the 80 acre tract of the E/2 NW/4 Section 26, immediately east of Birch Spring could possibly adversely affect the spring. This is because cross-jointing in this area intersects the northerly trending fault which is the recharge conduit to the Birch Spring. Any recharge water now coming to the spring through these less prominent cross-joints, out of the Blackhawk Formation, that would be intercepted and diverted away by the coal mining would diminish the spring flow. However, the most prominent groundwater transmission system in the area is the north-trending faults and joints, and most of the recharge to Birch Springs comes from the north through this system. Thus, the proposed northerly extension of the Bear Creek Mine into the N/2 of Sec. 14, T 16 S, R 7 E, could also cause a reduction in recharge to the Birch Springs by the intersection and diverting of ground water away from its natural conduit system.

Respectfully submitted,

S. Bryce Montgomery

Attachments

S. Bryce Montgomery, Geologist

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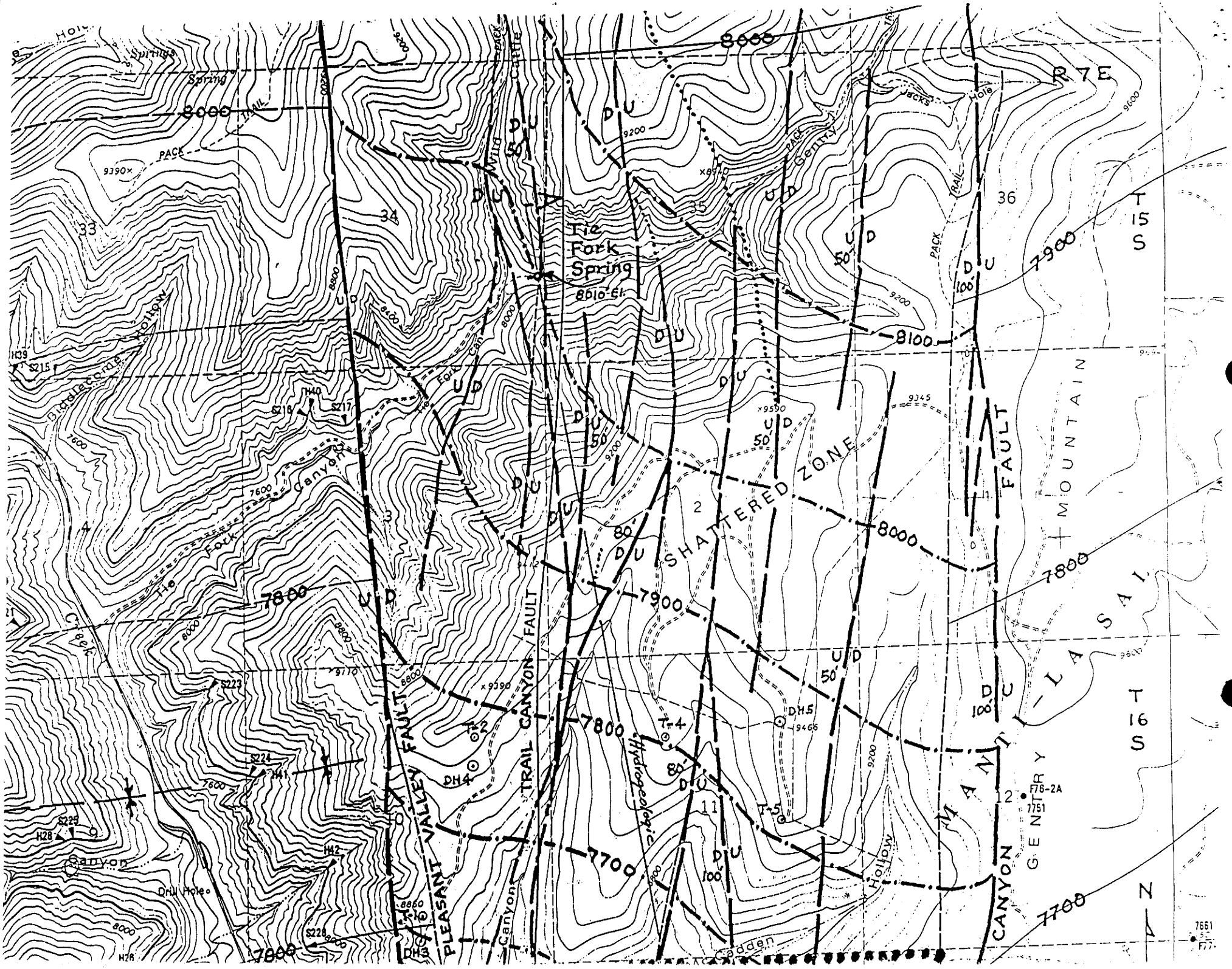
295-8592 home



R 7 E
T 15 S
T 16 S
Tie Fork Spring
8010 El.
SHATTERED ZONE
PLEASANT VALLEY FAULT
TRAIL CANYON FAULT
MANTI-LA SAL
MOUNTAIN
GENTRY
CANYON FAULT
Hydrogeologic
Tie Fork Canyon
Biddlecome Hollow
Jacks Hole
Gentry Hollow
Drill Hole
Canyon
Creek
Spring
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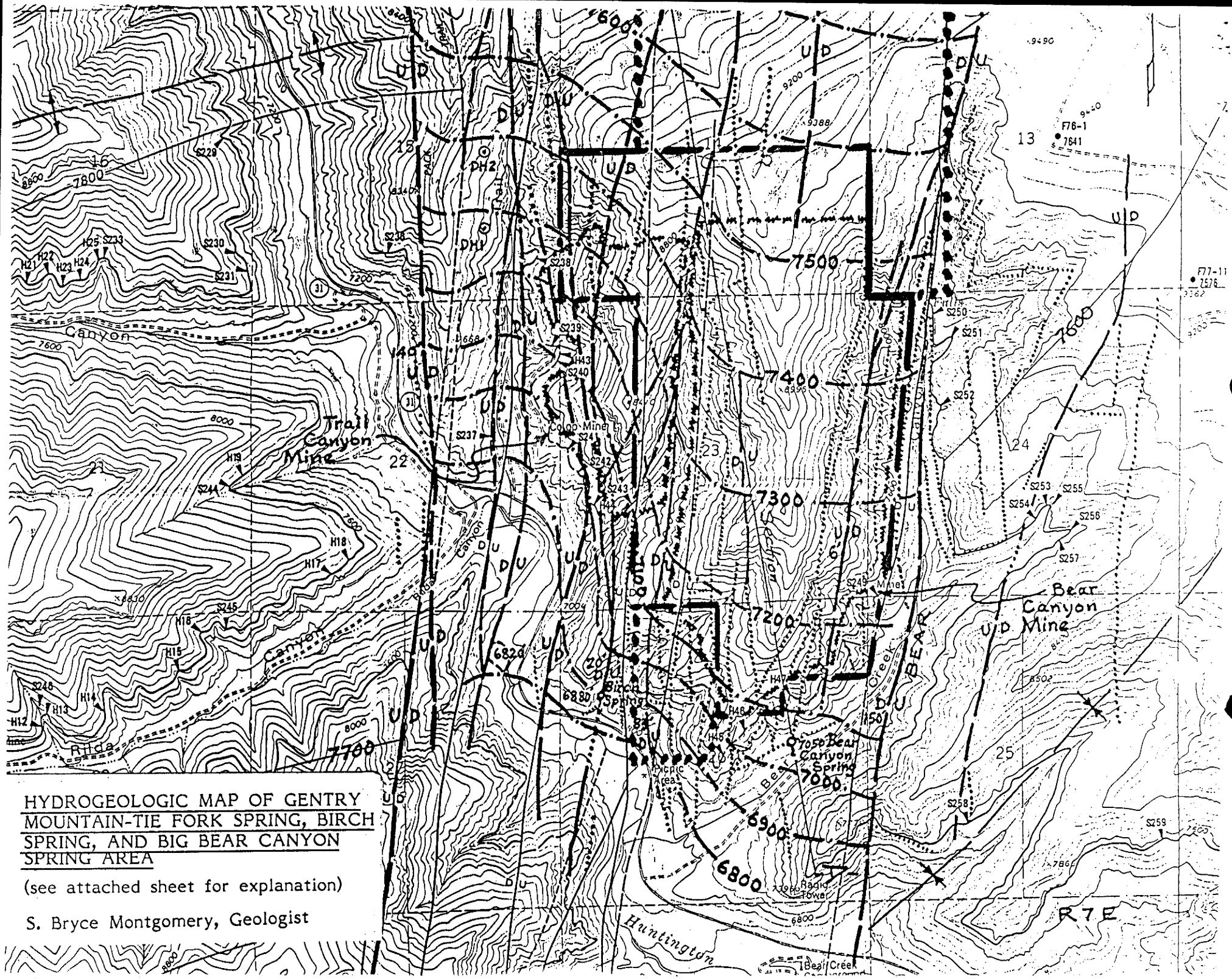


HYDROGEOLOGIC MAP OF GENTRY MOUNTAIN-TIE FORK SPRING, BIRCH SPRING, AND BIG BEAR CANYON SPRING AREA

(see attached sheet for explanation)

S. Bryce Montgomery, Geologist

Explanation for -

HYDROGEOLOGIC MAP OF GENTRY MOUNTAIN-TIE FORK SPRING, BIRCH SPRING, AND BIG BEAR CANYON SPRING AREA

Scale: 1 inch = 2000 feet Topographic contour interval = 80 feet

Base map from part of Brown, and et al, 1987, U. S. G. S. Map C-94-D

S. Bryce Montgomery, Geologist January 1991

LEGEND:

For base map-

MAP EXPLANATION from Brown, et al (1987) USGS Map C-94-D

CONTACT—Between the Star Point Sandstone and overlying Blackhawk Formation. Chevrons enclose zone of intertonguing

U/D FAULT—Dashed where approximately located; short dashed where inferred. U, upthrown side; D, downthrown side

ANTICLINE—Showing direction of plunge

—7500— STRUCTURE CONTOURS—Drawn on top of Star Point Sandstone. Dashed where approximately located or projected. Contour interval 100 feet

• USGS-1 8043 DRILL HOLE—Drilled by U.S. Geological Survey (USGS), Three States Natural Gas Co. (TSN), Utah Geological and Mineral Survey (UGMS), and U.S. Fuels Co. (F). Elevation of top of Star Point Sandstone shown in feet

H28 MEASURED SECTION—S, from Spieker (1931); H, from authors

Other-

U/D 20' Fault discerned from aerial photograph and/or field examination; U on upthrown side; and approximate displacement in feet, observed or reported by others.

Prominent joint trend.

—7200— Groundwater potentiometric surface contours, Blackhawk-Star Point aquifer.

Anticlinal axis.

Synclinal axis.

Existing Bear Canyon Mine permit area.

Proposed Bear Canyon Mine permit area.

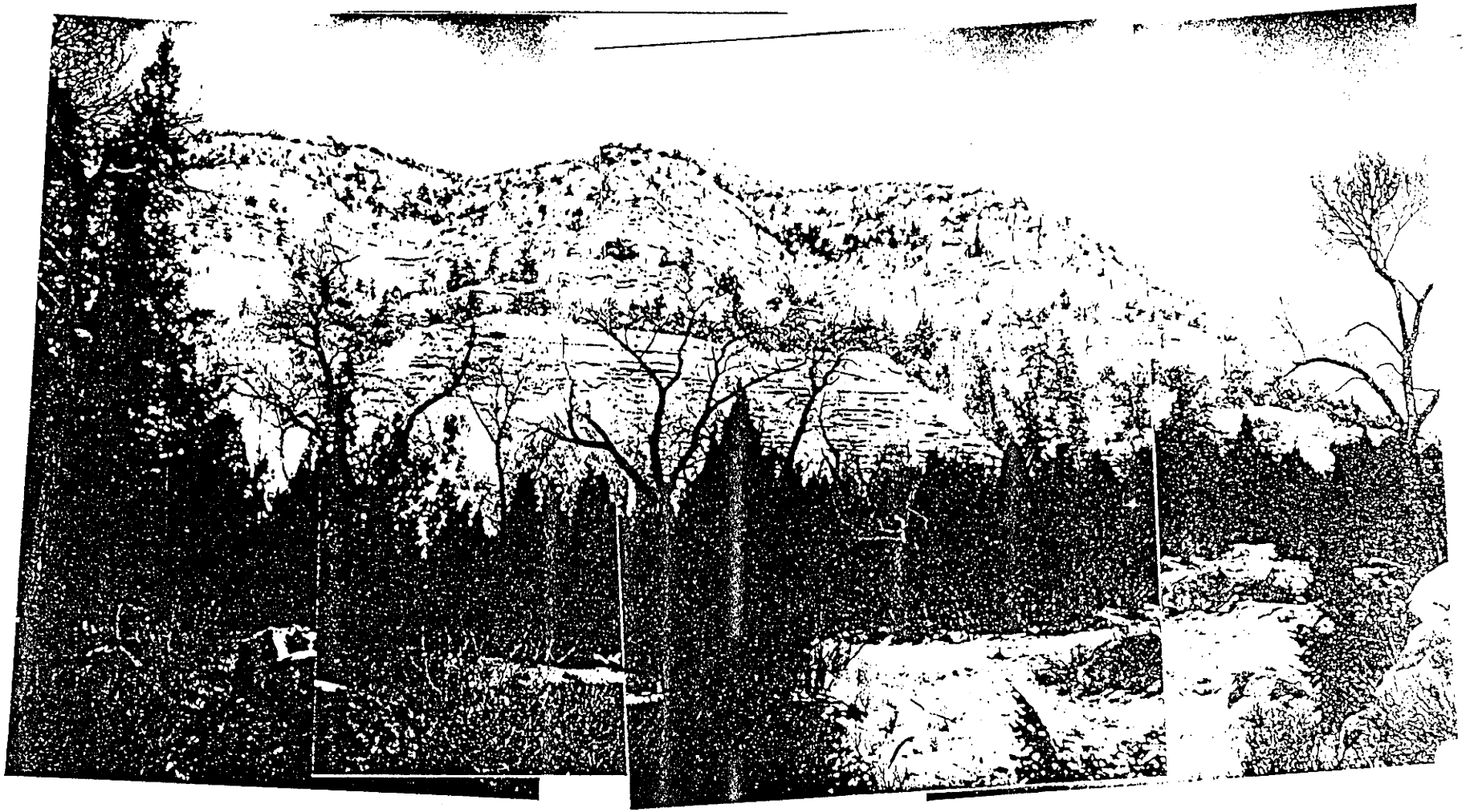
Approximate extent of coal-mined area.

T-5 ⊙ DH3 Approximate location of test drill holes, reported.

Table 1.—Stratigraphic relationships, thicknesses, lithologies, and water-bearing characteristics of geologic units in the upper drainages of Huntington and Cottonwood Creeks (adapted from Stokes, 1964)

System	Series	Formations and members	Thickness (feet)	Lithology and water-bearing characteristics
Quaternary	Holocene and Pleistocene		0-100	Alluvium and colluvium; clay, silt, sand, gravel, and boulders; yields water to springs that may cease to flow in late summer.
Tertiary	Eocene and Paleocene	Flagstaff Limestone	10-300	Light-gray, dense, cherty, lacustrine limestone with some interbedded thin gray and green-gray shale; light-red or pink calcareous siltstone at base in some places; yields water to springs in upland areas. (See table 9.)
	Paleocene	North Horn Formation	800±	Variegated shale and mudstone with interbeds of tan-to-gray sandstone; all of fluvial and lacustrine origin; yields water to springs. (See table 9.)
Cretaceous	Upper Cretaceous	Price River Formation	600-700	Gray-to-brown, fine-to-coarse, and conglomeratic fluvial sandstone with thin beds of gray shale; yields water to springs locally.
		Castlegate Sandstone	150-250	Tan-to-brown fluvial sandstone and conglomerate; forms cliffs in most exposures; yields water to springs locally.
		Blackhawk Formation	600-700	Tan-to-gray discontinuous sandstone and gray carbonaceous shales with coal beds; all of marginal marine and paludal origin; locally scour-and-fill deposits of fluvial sandstone within less permeable sediments; yields water to springs and coal mines, mainly where fractured or jointed.
		Star Point Sandstone	350-450	Light-gray, white, massive, and thin-bedded sandstone, grading downward from a massive cliff-forming unit at the top to thin interbedded sandstone and shale at the base; all of marginal marine and marine origin; yields water to springs and mines where fractured and jointed.
		Masuk Member Mancos Shale	600-800	Dark-gray marine shale with thin, discontinuous layers of gray limestone and sandstone; yields water to springs locally.

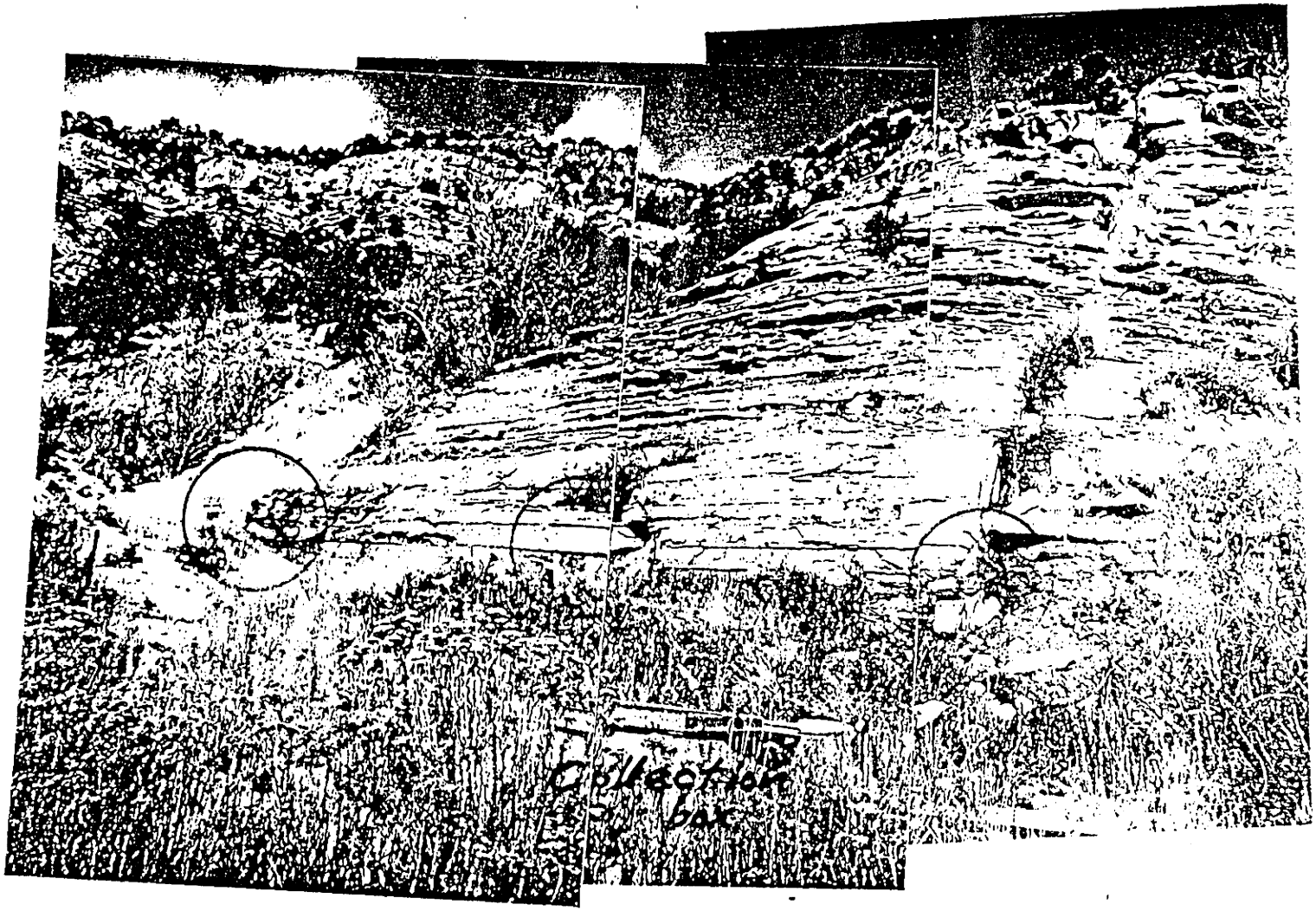
Copied from Danielson, T. W., and et al (1981), U. S. Geological Survey Water-Resources Investigations, Open-File Report 81-539



BIG BEAR CANYON SPRING GENERAL AREA

View is northwest and spring area is circled.

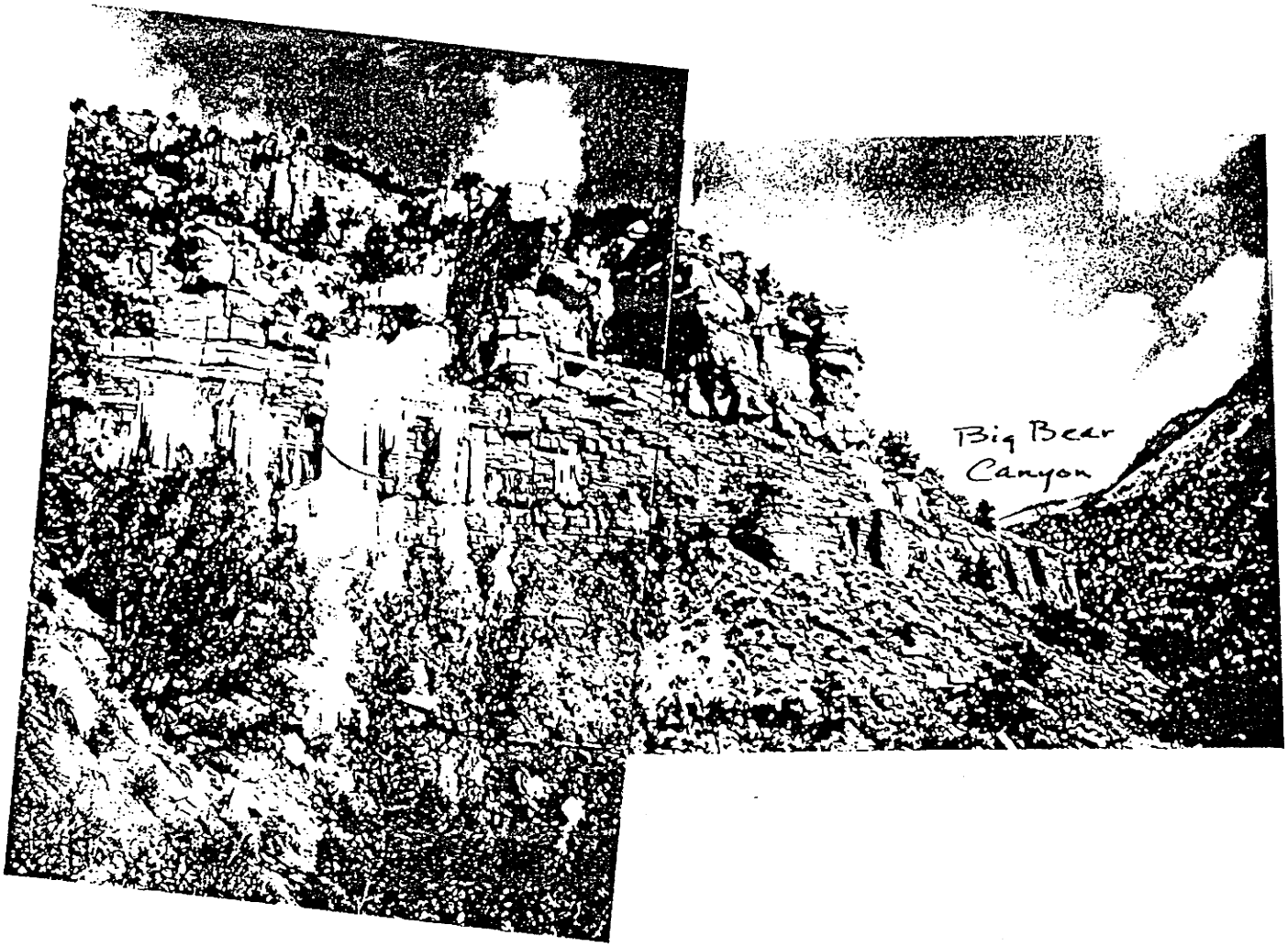
S. Bryce Montgomery, Geologist January 1991



BIG BEAR CANYON SPRING

View is to northwest showing three circled areas of discharge.

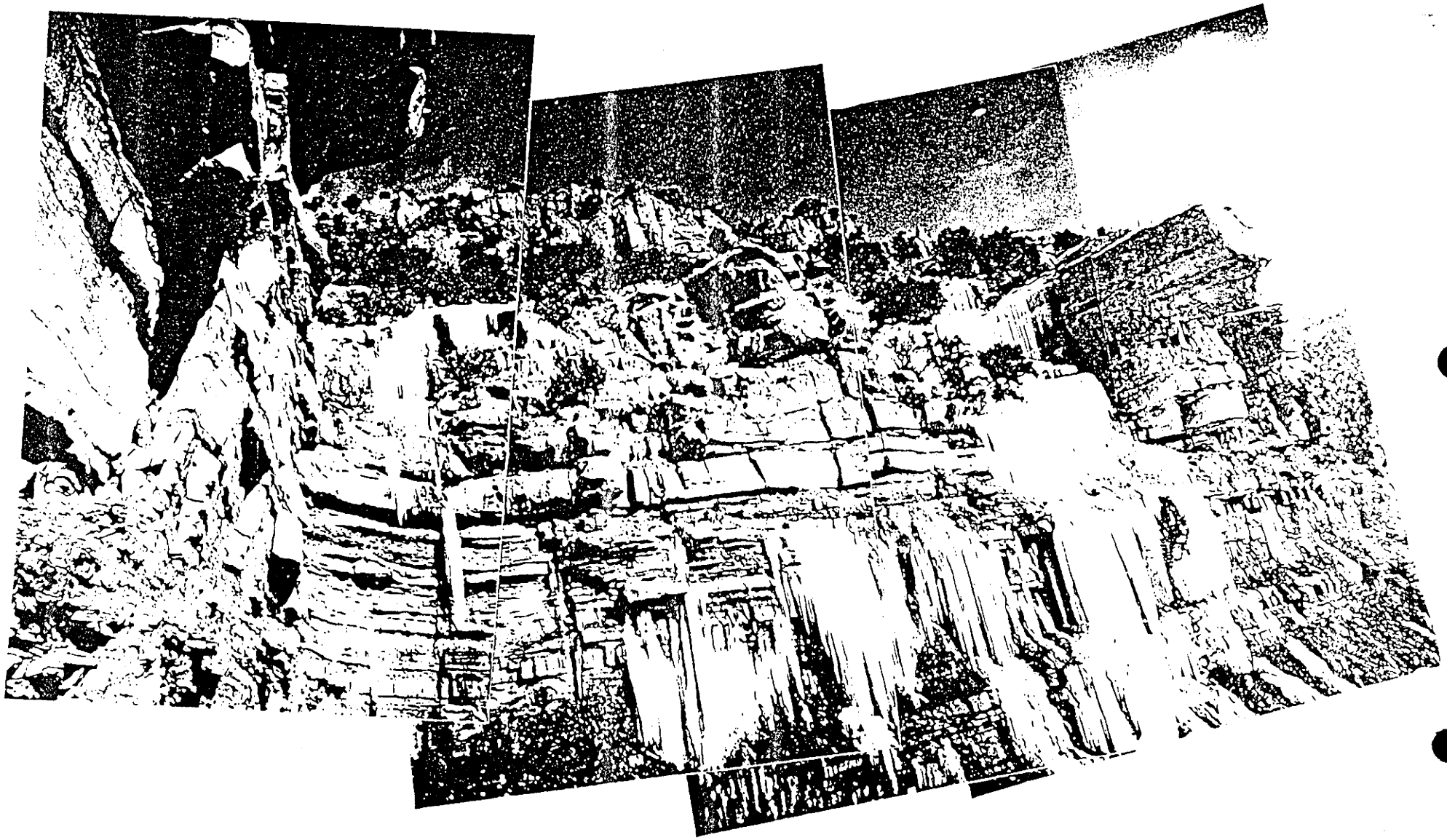
S. Bryce Montgomery, Geologist 1991



GROUNDWATER SPILLAGE AREA ABOVE BIG BEAR CANYON SPRING

View is northward and discharge area with icicles in basal Blackhawk - upper Star Point Formations is circled.

S. Bryce Montgomery, Geologist January 1991



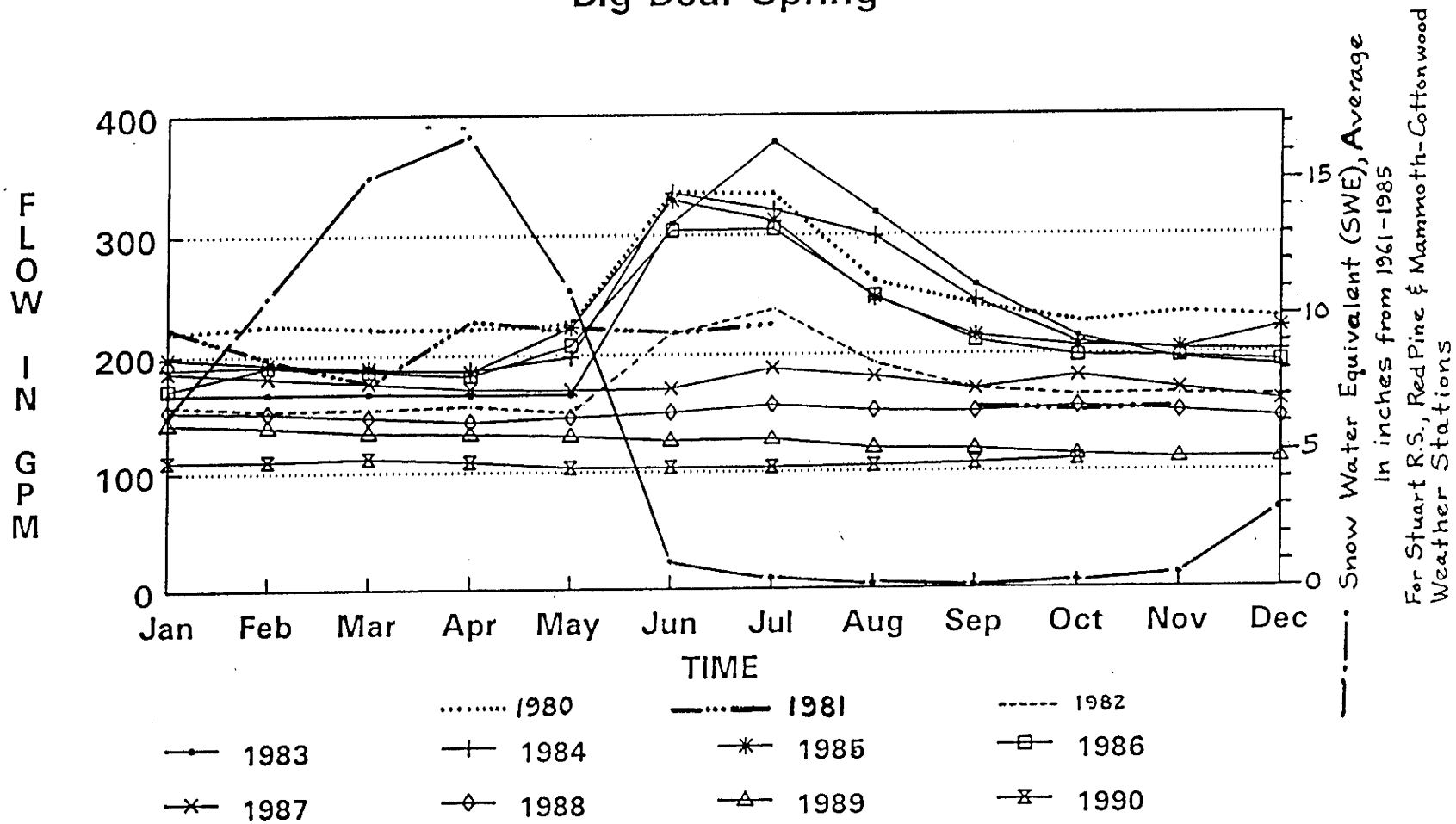
CLOSE-UP OF GROUNDWATER SPILLAGE AREA ABOVE BIG BEAR CANYON SPRING

View is northward showing icicle formations at discharge areas in basal Blackhawk-upper Star Point Formations.

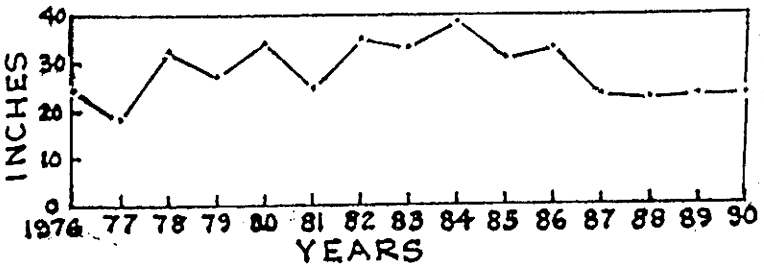
S. Bryce Montgomery, Geologist January 1991

Huntington Spring Flow

Big Bear Spring



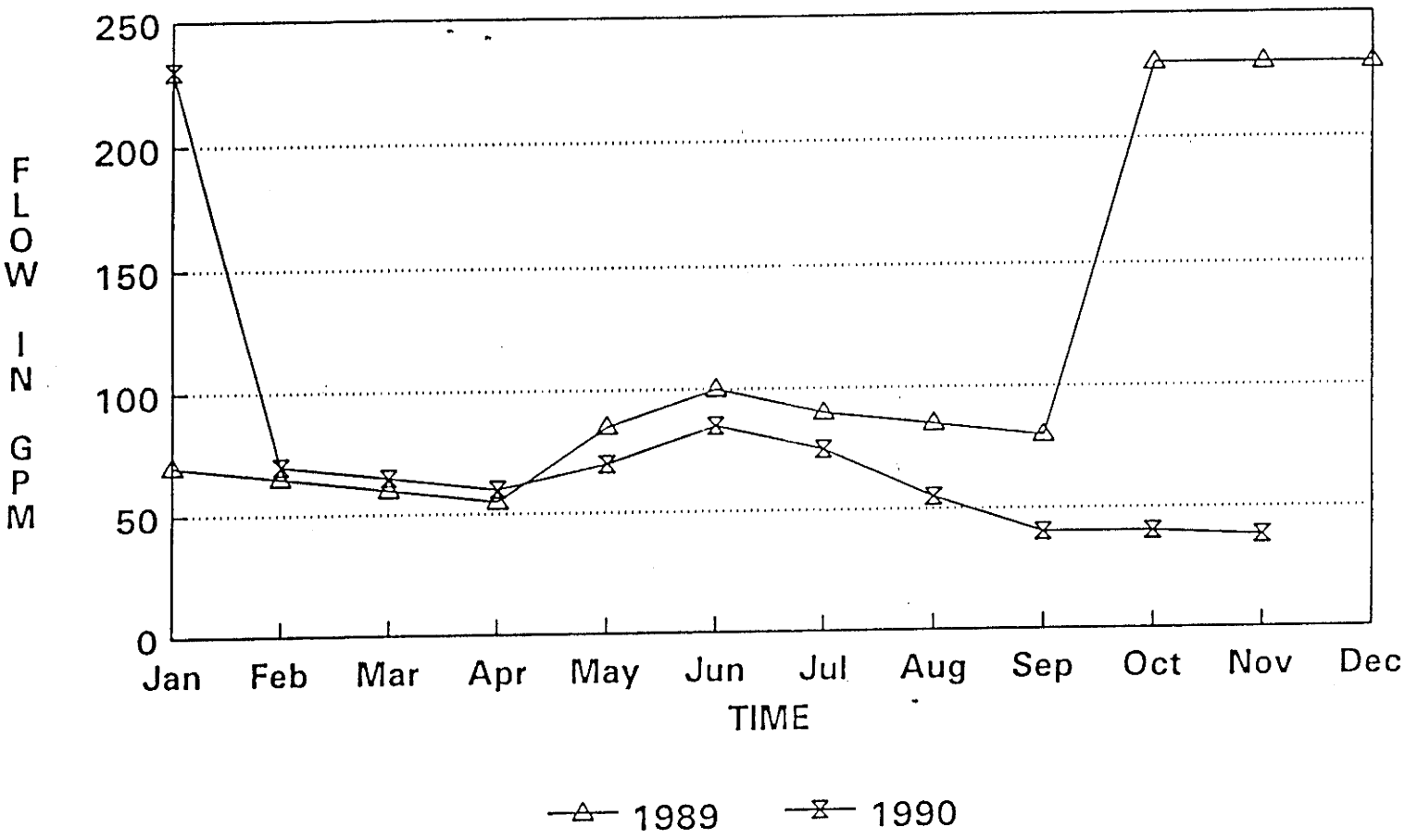
Data From Castle Valley
Special Service District



AVERAGE ANNUAL PRECIPITATION FOR THE THREE WEATHER STATIONS OF STUART R.S., RED PINE AND MAMMOTH - COTTONWOOD
YEARS 1976-1990

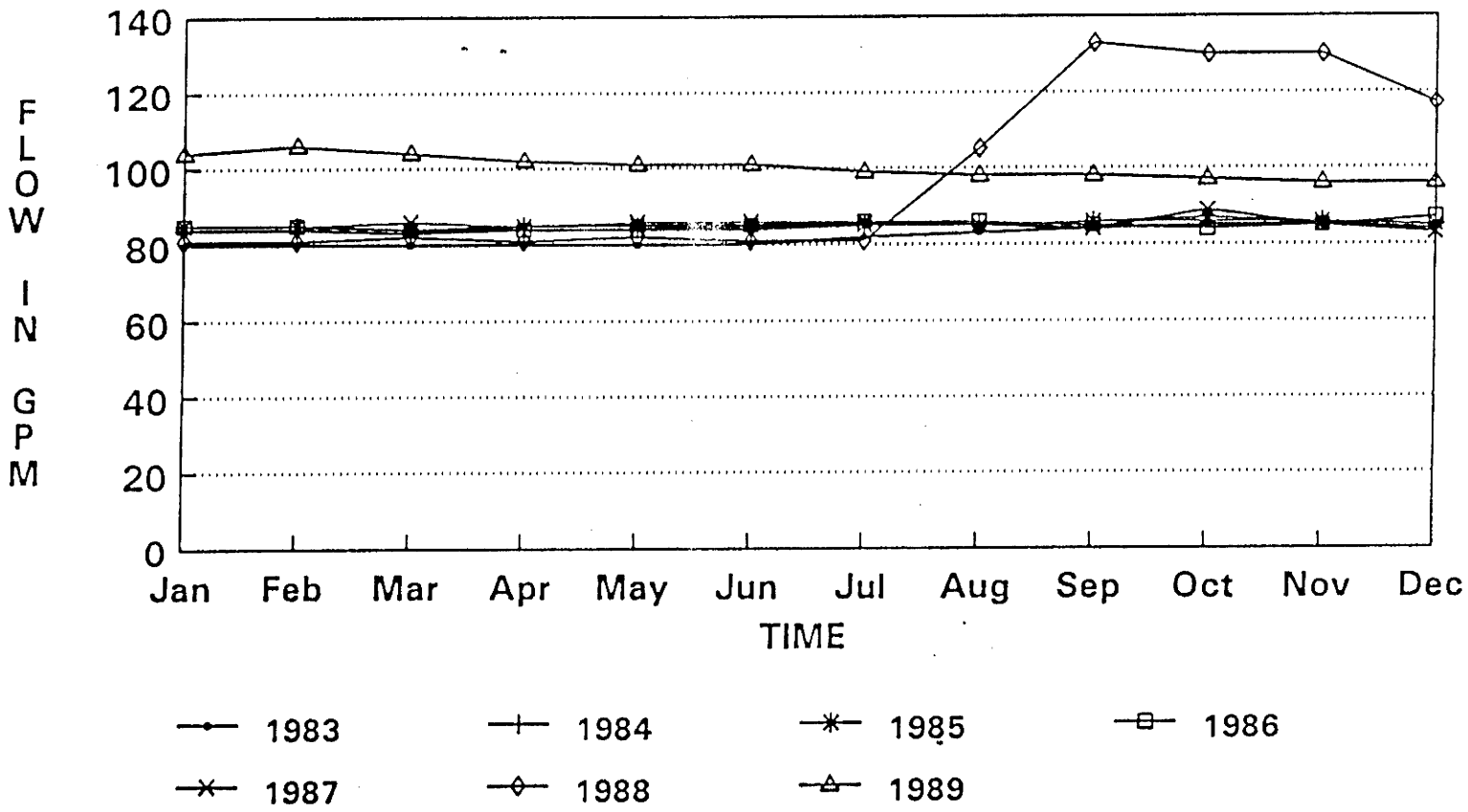
NEWUA Spring Flow

Birch Spring



Huntington Spring Flow

Tie Fork Spring



Data From Castle Valley
Special Service District

February 8, 1991

Mr. Darrel V. Leamaster, P. E.
District Manager
Castle Valley Special Service District
P. O. Box 877
Castle Dale, Utah 84513

Mr. Menco Copinga, President
Board of Directors
North Emery Water Users Association
Box 418
Elmo, Utah 84521

Gentlemen:

Re: Follow-up Report to my Hydrologic Investigation and Report (dated January 28, 1991) of Big Bear Spring and Birch Spring Relative to Co-Op Mining Company Past, Present, and Proposed Coal Mining, T 15-16 S, R 7 E, SLB & M, Emery Co., Utah, since the hearing conducted by the Utah Division of Oil, Gas & Mining on February 5, 1991.

As a follow-up to the hearing conducted by the Utah Division of Oil, Gas & Mining on February 5, 1991, in Castledale, Utah, relative to the above referenced, and our meeting together with others representing the two water districts, including attorneys and engineers, later that same evening, I submit the following.

After further reviewing my own subject report with associated, gathered data, on February 6, 1991, I visited the office of the Utah Division of Oil, Gas & Mining in Salt Lake City and researched further files on the adjacent Trail Canyon Coal Mine of the Co-Op Mining Company, and the coal mines located to the north owned by the Plateau Mining Company, and the United States Fuel Company. Also, while at the Division offices I was able to meet with the geologist David Darby and hydrologist Tom Munson who are involved with the investigation and permiting of the coal mines in the subject area, and we discussed aspects of the subject matter.

This additional research in combination with information presented by representatives of the Co-Op Mining Company at the stated hearing does not change my conclusions presented at the hearing, but do present further understanding and support for those conclusions.

With regard to the influences and affects of the other mining operations in the region, in addition to that of Co-Op Mining Company, research confirms the report of Danielson and et al (1981) of the U. S. Geological Survey, that the mining operations in the west Hiawatha area, in particular by U. S. Fuel Company, did intersect the Bear Canyon Fault and divert water therefrom, at least 100 gpm in the SW/4 Sec. 24, T 15 S, R 7 E. The Plateau Mining Company is mining within the larger graben area located between the Bear Canyon Fault on the east, and the Pleasant Valley Fault on the west, being northwest of the United States Fuel Company operations. Available data on Plateau's mining reports very little water encountered thus-far, which has required the hauling-in of drinking water to the mine. However, I believe that as this mining proceeds and encounters

EXHIBIT B

further faults, or prominent joints which intersect faulting in the area, some ground water will be encountered and disrupted from its normal flow and conduit system. Whether such water is incountered in the United States Fuel Company mine, the Plateau Mining Company mine, or any other mine located within the infiltration and transmission path for ground water that inpart recharges the Big Bear Canyon Spring and Birch Spring, some affect will be experienced by the springs. The magnitude of this affect to the extent of actually adversing water rights in these springs depends on how much water over time is diverted away from getting back into the natural recharge system and how much contamination from mining operations actually gets into the fault and joint conduit system which feed the springs.

The determination of the degree to which any particular mining operation adversed the springs must be done by isolating the hydrogeologic conditions from one operation to the other. This requires measurements at data control points of factors relating to the water storage, water energy levels determining flow and permeability characteristics of the transmitting formations and faults, the amount of available recharge, and the quality of the water as it is affected by both natural conditions and the mining operations.

Thus, a minimum of one cased, test and monitoring drill hole completed within the Blackhawk-Star Point aquifer is needed at a location between the mining operations of the Plateau and U. S. Fuel Companies' mines and the Co-Op Mining Company Trail Canyon and Bear Canyon Mines, preferable within a half mile north of the fartherest north boundary of the Co-Op Mining Company mining activity. Such a monitoring well location would be best situated out of any known, prominent fault, so that information being gathered best represents conditions within the Blackhawk-Star Point aquifer. Such a test well location was drilled by Savage Energy Services Corporation as their No. T-5 drill hole within the N/2 SE/4 Sec. 11, T 16 S, R 7 E, as shown on my hydrogeologic map of the original report. This hole was drilled to a total depth of 2007 feet into the Blackhawk-Star Point aquifer. It reported a fluid level at 1500 feet depth or elevation of 7820 feet from mean sea level. Since their well log shows a penetration of only 85 feet into the Star Point Sandstone, and it is known that there are some interbedded shales between here and the lower sandstone unit from which both the Big Bear Canyon and Birch Springs produce, I recommend that a new monitoring well here be drilled to a total depth of 2300 feet to insure penetration of the full aquifer. The open or perforated areas of the well should be within the lower Blackhawk Formation sandstones beneath the coal beds, and within the sandstone units of the Star Point Sandstone. The monitoring well should be equipped with an automatic, continuous recording device to most efficiently measure the groundwater level, and a small diameter discharge tube with pump to provide for the collection of periodic water samples, preferably on a monthly schedule. Data collected from this well should be compared to water sample and flow-discharge measurements from both the Birch and Big Bear Springs along with precipitation data of the area, preferably on a monthly schedule.

In addition to the collection of the above data, a totalizing meter should be installed into the pump discharge pipelines within the Co-Op, Plateau, and U. S. Fuel mines, and records kept at least monthly of the total water being used within and out of the mines. Such water that is consumed or diverted away from in the mines amounts to a subtraction from the groundwater system. Also, a reasonable water consumption figure should be derived by the stated mining companies

and provided to the water districts of monthly water evaporated from mine encounted water, as a result of the large air-ventilation systems being used.

In talking with personnel in the Utah Division of Oil, Gas & Mining, I learned that the Co-Op Mining Company has been and is currently pumping water from a source in Trail Canyon, into the abandoned Trail Canyon Mine where it is stored for release and use in their facilities. Such water would become a part of the groundwater recharge system to the Birch Springs, and depending on its quality and manner of utilization will have an affect on the Birch Springs, since the faulting that feeds the Birch Springs also extends through the Trail Canyon mined area. Such a practice should be regulated by both the Utah Division of Water Rights, Division of Environmental Health, Bureau of Public Water Supplies, in addition to the Division of Oil, Gas & Mining, to safeguard the Birch Spring resource.

A similar concern by these same agencies should be directed to the practice in the Bear Canyon Coal mine where intercepted ground water is wallowed-in by working equipment with its released oils, movement of vehicles in and out of the mine which track into the mine contaminants on their tires from outside of the mine, where water ponded within the floor of the mine washes it off as the vehicles move through it. Some of this water wallowed-through gets back into the existing fracture system and could enter into the recharge conduit system of both the Birch and Big Bear Springs, principally down fault planes that are present.

Thus, whether one argues that the intercepted water by the mining operations does or doesn't get into the recharge system of the two springs of concern, one way if it does lends to contamination, and the other way if it doesn't causes a subtraction from the the groundwater system that contributes to the spring flows.

In regard to the comparison of spring discharges to average annual precipitation and average snow water equivalent records from the graphs within my original report, I emphasize that the lag time from the infiltration area near the Stuart Ranger Station on Gentry Mountain to the Big Bear Canyon and Birch Springs is three months. The anomalous, abnormal flow experienced by the Birch Spring from October 1989 - January 1990, compared with an anomalous high flow recorded from the Tie Fork Spring from September - December 1988, are a year and a month apart. It is possible that earth tremors may have initiated these two different times of anomalous flow, but the important fact that Birch Spring flowed 300 percent of its normal rate for a period of about four months and then abruptly dropped down to the near normal flow of 60 gpm, shows a large, temporary, lump-type storage buildup within the groundwater system feeding Birch Spring, of about 90 acre-feet of water. The most likely room for such a storage area is the caving Trail Canyon mine, through which the same faults extend that feed the Birch Spring.

I recommend that as the coal mining proceeds within the Bear Canyon Mine or the other mines farther north within the recharge area to the Birch and Big Bear Springs, any significant water flows encountered should be captured and isolated from the mining operations and contamination, be frequently sampled and analyzed, and then inject the uncontaminated water flows back into prominent, permeable faults. The exception to this or to a part of such intercepted water would be where there is a valid water right, which preceeds in priority, the Birch and Big Bear Springs rights, and is approved for diversion and use by the

State Engineer in conformance with established water law. To do otherwise in the diversion and use of the ground water that is intercepted by the coal mining operations is ignoring the water law, which law exists to protect estabished water rights.

The injection of any water intercepted by the mining operations or from another source, back into the groundwater recharge system that is tributary to the Birch and Big Bear Springs should be conducted under the direction of the Utah Divsion of Environmental Health and Utah Division of Water Rights.

I submit a correction to my original report dated January 28, 1991, on page 3, 5th paragraph. In typing the report, a jump was made from the first line of one paragraph, over an omitted paragraph, to a succeeding paragraph. This resulted in leaving out the description of the Price River Formation which exists between the Castlegate Sandstone and the North Horn Formation. As correctly shown in Table 1, Stratigraphic relationships of geologic units, which was included in the report, the Price River Formation consists of about 650 feet of gray and brown, fine-coarse grained and conglomeratic sandstone beds with thin, interbedded gray shales. Thus, the subject paragraph stating that the Castlegate Sandstone is overlain by the North Horn Formation needs to be corrected as above described. The description provided for the North Horn Formation in that paragraph is correct.

Respectfully submitted,

S. Bryce Montgomery, Geologist

845 South Main, Suite 204B
Bountiful, Utah 84010

Telephone 298-9108

cc: Jeff Appel, Attorney
Haley & Stolebarger
175 S. Main, 10th Floor
Salt Lake City, Utah 84111

Ben A. Grimes
c/o Cyprus-Plateau Mining Corp.
P. O. Drawer PMC
Price, Utah 84501

LIST OF CO-OP'S VIOLATIONS OF MINING LAW AND APPLICATION DEFICIENCIES RELATING TO WATER ISSUES

Statutory Provision	Description	Co-Op Violations[1]/Deficiencies
R614-1G-UMC786.29	Environmental protections in permit	RPV, OV
R614-1K-UMC771.19	Compliance with permits measures	RPV, OV
R614-1K-UMC786.27	Compliance with permit requirements	RPV, OV
R614-1K-UMC817.41	Hydrologic balance, general requirements	RPV, OV
R614-1K-UMC817.42	Water quality and effluent limitations	RPV, OV
R614-1K-UMC817.43	Maintenance of diversion ditches	RPV, OV
R614-1K-UMC817.45	Sediment control measures	RPV
R614-1K-UMC817.50	Underground mine entry and access discharges	PV, OV
R614-1K-UMC817.52	Submission of water sampling data, Surface and groundwater monitoring	RPV, OV
R614-1K-UMC817.121	Subsidence control	PV

PV - Past Violations
RPV - Repeated Past Violations
OV - Ongoing Violations
AD - Application Deficient

[1] These listed violations are based upon DOGM citations to Co-Op between 1987 and the present.

EXHIBIT C

Statutory Provision	Description	Co-Op Violations[2]/Deficiencies
R614-1K-UMC817.153	Road Class I drainage	PV
R614-301-721	The application must include premining hydrologic resources within the permit and adjacent areas that may be affected by the mining activity.	AD
R614-301-722	The application must include cross-sections and maps.	AD
R614-301-722.100	The cross-sections and maps must show the extent of subsurface water within and adjacent to the mining operation.	AD
R614-301-722.200	The application must contain cross-sections and maps showing the location of springs within the permit and adjacent area.	AD
R614-301-722.300	The application must contain cross-sections and maps showing the elevations and locations of monitoring stations used to gather water quality and quantity in preparation of the permit application.	AD
R614-301-722.400	The application must contain cross-sections and maps showing the location and depth of water wells in the permit area and adjacent area.	AD

[2] These listed violations are based upon DOGM citations to Co-Op; S. Bryce Montgomery's January 28, 1991, and February 8, 1991, reports on the Co-Op mine and its impacts on water sources in the area; correspondence between Co-Op and the DOGM; and Protestants' observations.

Statutory Provision	Description	Co-Op Violations/Deficiencies
R614-301-724	The application must contain baseline hydrologic and geologic information.	AD
R614-301-724.100	The application must contain location and ownership of springs in the permit, and adjacent area, and other ground water resources.	AD
R614-301-724.300	The application must include geologic information in sufficient detail.	AD
R614-301-724.310	The application must contain a determination of the probable hydrologic consequences of the operation upon the quality and quantity of surface and ground water in the permit and the adjacent areas.	AD
R614-301-724.600	The applicant must provide a survey showing whether aquifers or areas for the recharge of aquifers exist within the permit and adjacent areas and whether subsidence could cause diminution of aquifers or recharge areas.	AD
R614-301-725.300	A permit will not be approved until the necessary hydrologic and geologic information is available.	AD
R614-301-728	The application must contain a list of the Probable Hydrologic Consequences (PHC).	AD
R614-301-728.100	The application must contain a determination of the PHC for the proposed mining operation upon the quality and quantity of ground water under seasonal	AD

Statutory Provision	Description	Co-Op Violations/Deficiencies
	flow conditions for the permit and adjacent areas.	
R614-301-728.200	The PHC determination must be based on baseline hydrologic, geologic, and other information collected for the permit application.	AD
R614-301-728.310	The application must contain a determination as to whether adverse impacts may occur to the hydrologic balance.	AD
R614-301-728.320	The application must contain a determination as to whether acid-forming or toxic-forming materials are present that could result in the contamination of ground water supplies.	AD
R614-301-728.332	The application must include a determination as to the impact of the mining operation on acidity, total and dissolved solids and other important water quality parameters.	AD
R614-301-728.334	The application must include a determination as to the impact of the mining operation on ground water availability.	AD
R614-301-731	A plan must show how ground water resources will be protected including steps to minimize disturbance to the hydrologic balance.	AD
R614-301-731.211	A permit application will include a ground-water monitoring plan based upon the PHC and the analysis of all baseline hydrologic, geologic and other information in the permit application.	AD

Statutory Provision	Description	Co-Op Violations/Deficiencies
R614-301-742.221.33	The sediment ponds must be designed to contain or treat the ten year, twenty-four hour precipitation event.	AD
R614-301-750	All coal mining and reclamation operations will be conducted to minimize disturbance to the hydrologic balance within the permit and adjacent areas, to prevent material damage to the hydrologic balance outside the permit area and support approved postmining land uses.	AD, RPV, OV

ACT/015/025 Informal Hearing
cc Mitchell
Little
Munson
Braxton
DRN

CASTLE VALLEY SPECIAL SERVICE DISTRICT

P.O. BOX 877
CASTLE DALE, UTAH 84513
TELEPHONE (801) 381-5333

February 12, 1991

RECEIVED
FEB 14 1991
DIVISION OF
OIL, GAS & MINING

DORR W. HANSON
Chairman
DARREL V. TEAMASTER
Manager

State of Utah
Oil Gas and Mining Division
355 West North Temple, Suite 350
Salt Lake City, Utah 84080

Attn: Dianne Nielsen, PHD, Director

Re: Co-op Mine Company
Submission of Data
following Public Hearing

Dear Dr Nielsen:

At the conclusion of the Public Hearing on the Co-op Mine application, it was determined that a 10 day period would be allowed for submission of any new materials or rebuttal statements.

By this letter, we are requesting a 10 day extension of that deadline. This would allow a total of 20 days and would postpone the deadline from February 15 to February 25, 1991. Several of our key people are traveling out of the State this week, thus making it impossible for us to respond within 10 days. The Co-op Mining Company and North Emery Water Users have verbally indicated to us that they do not object to the extension.

During the Public Hearing, Mr Grant Wilson, of Huntington, testified concerning problems that Huntington City experienced with the Big Bear Springs in 1976 and 1977. We would like to clarify the events that Mr Wilson discussed. We have discussed this with personnel from the State Dept. of Drinking Water/Sanitation and reviewed records from Huntington City.

In 1976 and early 1977 Huntington City did experience problems with high coliform bacteria counts. These problems were traced to the Big Bear Spring. Huntington City hired Templeton, Link & Associates a consulting engineering firm from Salt Lake, to look into the problem. They determined that the bacteriological contamination was coming from deteriorated collection boxes and collection pipes at the spring. For several months they diverted the spring flow

out of the distribution system. Design drawings and specifications for the spring re-development were prepared and approved by the Health Dept. Huntington City then entered into a construction contract with Angle Construction Company and the re-development work was completed in late 1977 and the spring of 1978. The total spring flow was put back into the system and has run continuously ever since. The collection system and collection boxes that were constructed at that time are still in service.

We trust that this information will help clarify the events that Mr Wilson referred to.

We appreciate your consideration of our request for an extension of the response time for submittal of any additional data on the hearing.

Very truly yours,

Darrel V. Leamaster

Darrel V. Leamaster, P.E.
District Manager

cc: North Emery Water Users Association
Carl Kingston, Co-op Mine Company
Huntington Cleveland Irrigation Company

NORTH EMERY
WATER USERS ASSOCIATION

Box 418
Elmo, Utah 84521
Telephone (801) 653-2649

RECEIVED
FEB 19 1991
DIVISION OF
OIL, GAS & MINING

February 12, 1991

Dianne Nielsen, PhD, Director
Utah Department of Natural Resources
Division of Oil, Gas and Mining
355 West North Temple, Suite 350
Salt Lake City, Utah 84180-1203

Dear Dr. Nielsen,

RE: Extension of Time For Submittal of Additional Information on CO-OP Mining Permit Application

The North Emery Water Users Association would like to ask for an additional 10 days to submit comments, and information to the Division as a result of the Informal Conference held on February 5. We plan to submit through our attorney additional information for consideration. The new date for submittal would be February 25.

Thank you for your help in this matter.

Menco Copinga
Menco Copinga
President
Board of Directors

orig file

Carl E. Kingston
ATTORNEY AT LAW
53 WEST ANGELO AVENUE
P. O. BOX 15809
SALT LAKE CITY, UTAH 84115
TELEPHONE (801) 486-1458 OR (801) 486-5048

RECEIVED
FEB 27 1991
DIVISION OF
OIL, GAS & MINING

February 22, 1991

Dr. Dianne Nielson
Division of Oil, Gas & Mining
355 West North Temple, Suite 350
Salt Lake City, Utah 84080

Re: Co-op Mining Co., application for permit renewal

Dear Dr. Nielson:

I am advised by Co-op's engineering firm (EarthFax Engineering, Inc.) that an additional two weeks extension for filing their report and comments in the above captioned matter has been requested and preliminarily approved by you, subject to agreement of those filing objections to the application. I talked to Darrell LeMaster who advised that he had no objection. I also spoke to Jeffrey Appell, who advised me that he had no objection as long as the opponents would also have the additional time to submit their supplements to or additional comments for the record.

Please accept this letter as our formal request for an additional two weeks, to March 11, 1991 in which to respond to or supplement the informal hearing record.

Very truly yours,

Carl E. Kingston

CEK/kj

cc: Jeffrey Appell, Esq.

LAW OFFICES OF
HALEY & STOLEBARGER
TENTH FLOOR WALKER CENTER
175 SOUTH MAIN STREET
SALT LAKE CITY, UTAH 84111-1956

TELEPHONE
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GEORGE M. HALEY
ROBERT L. STOLEBARGER
JEFFREY W. APPEL
CAROLYN NICHOLS*
JO CAROL NESSET-SALE
GEOFFREY W. LEONARD, P.E.
RICHARD G. HACKWELL
MICHELE MATTSSON
BLAINE J. BENARD

OF COUNSEL
FRANK E. MOSS**
D. FRANK WILKINS

*ALSO ADMITTED IN TEXAS
**ALSO ADMITTED IN WASHINGTON, D.C.

March 13, 1991

RECEIVED
MAR 13 1991
DIVISION OF
OIL GAS & MINING

VIA HAND-DELIVERY

Dianne R. Nielson, Ph.D.
Director, Division of Oil, Gas & Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

Re: ACT/015/025--Amended Memorandum of Law

Dear Ms. Nielson:

Enclosed please find an Amended Memorandum of Law of the North Emery Water User's Association, Castle Valley Special Service District and Huntington City, Utah, ("Protestants") in Opposition to the Granting of Co-Op's Applications. Protestants' original Memorandum of Law was hand-delivered to your office on March 11, 1991. In that memorandum, we relied upon code sections from the 1991 Utah Administrative Code, R614-1A-700 et seq., regarding underground mining. We have subsequently been informed, after an inquiry to Thomas A. Mitchell, that the provisions we relied upon in the recently published 1991 Administrative Code have been amended and that they were included in the 1991 Administrative Code by error.

By our Amended Memorandum, we have corrected all references to the former statute. On most occasions, the provisions we relied upon in the former statute are identical or substantially similar to provisions in the new statute. Therefore, the basic premises of our previous memorandum stand. The original memorandum has only been altered so as to reflect the corrected citations and will supersede the original memorandum of law filed with your office.

Sincerely yours,

Michele Mattsson

Michele Mattsson

cc: Thomas A. Mitchell, Esq.
Carl E. Kingston, Esq.

State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

Norman H. Bangerter
Governor
Dee C. Hansen
Executive Director
Dianne R. Nielson, Ph.D.
Division Director

355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
801-538-5340

March 14, 1991

TO; Pamela Grubaugh-Littig, Permit Supervisor

FROM: Tom Munson, Sr. Reclamation Hydrologist TM

RE: Hydrogeologic Evaluation of the Bear Canyon Mine Permit and Proposed Expansion Areas, Co-Op Mining Company, Bear Canyon Mine, ACT/015/025, Folder #2, Emery County, Utah

SYNOPSIS

This memo reviews the response by Co-Op Mining Company and their consultant, Earthfax Engineering, to the objections raised by C. V. Special Services District North Emery Water Users (NEWU), and Huntington-Cleveland Irrigation District.

ANALYSIS

The conclusions and recommendations found on page 4-1 and 4-2 of Earthfax Engineering report are as follows. I will address each one individually and state its adequacy in addressing the requirements of determining the Probable Hydrologic consequences of mining within the Bear Canyon Permit Area and the proposed Federal Lease.

1) ***The groundwater system in the area of the Trail Canyon and Bear Canyon mines is mainly controlled by geologic structures (faults and fractures) and lithology.***

   a) *I agree that geology is mainly controlled by geologic structures (faults and fractures) and lithology.*

EXHIBIT A

2) ***In the area of present development, the regional water table is located below the Blind Canyon and Hiawatha seams in both the Trail Canyon and Bear Canyon mines as indicated by downhole drilling.***

   a) *This conclusion has not been supported by data in this report and therefore cannot be made. Reference is made to holes drilled but no data has been presented. The Division feels the operator shall plot and document all data associated with drill holes within the Bear Canyon Permit Area and adjacent areas to support any conclusions.*

3) ***Water intercepted within the mine workings of the Bear Canyon Mine have not had any identifiable impact on the spring flows of Big Bear or Birch Springs.***

   a) *This is also not supported by data and to the contrary, data exists which points to water quality changes attributed to the old workings of the Bear Canyon Mine. (See 4th Quarter, 1990, Water Quality Data, Big Bear Spring.) Water quantity versus water quality was addressed in the report. Both have an equal bearing on the issue.*

4) ***No evidence is available to show a mine-related impact on the spring flows of the Big Bear or Birch Springs. The recent reduction in spring flows appear to be caused by the significant reduction of precipitation over the last four to five years.***

   a) *If flow is the issue then I cannot support this conclusion, as this has not been conclusively demonstrated. Recent data from Big Bear Springs shows an increase in flow in the winter months of 1990-1991, not typical of past data.*

5) ***Insufficient data are available to determine if further development of the mine to the north will impact the regional water table.***

   a) *I would agree that insufficient data exists to determine if further development of the mine to the north would impact the regional water table. Therefore, the operator is responsible for addressing all the requirements of R614-301-728 through future drilling programs, etc.*

RECOMMENDATION #1

1) ***Co-Op should arrange with the water companies to allow coordinated monitoring of the springs for flow and water quality. This will ensure an acceptable data base for future investigation of potential impacts to the spring flows.***

   a) *I agree that Co-Op Mining Company must monitor Birch Springs and Big Bear Spring from the source to collect two (2) years of baseline data and then implement operational monitoring after the two (2) year baseline period per the Division Water Monitoring Guidelines for the mine life. This must be implemented immediately. This monitoring will require additional water quality parameters and as such an amendment to the existing water monitoring program must be submitted.*

RECOMMENDATION #2

1) ***Co-Op should install a minimum of four monitoring wells within the Bear Canyon Mine to allow determination of a defendable potentiometric surface of the regional water surface within the present permit area. This information can then be projected into the new lease area.***

   a) *This recommendation appears most reasonable to allow a determination of a defendable potentiometric surface of the regional water surfaces within the present permit area. If this drillhole data provides no conclusive evidence to determine a*

potentiometric surface projected into the new federal lease, then additional groundwater data will be requested site specific to the federal lease permit area. This recommendation must be implemented prior to approval of the new federal lease. The drillhole locations must be shown on a mine workings map.

RECOMMENDATION #3

1) ***Co-Op Mining Company should revise the PHC associated with the mining operation based on the data collected from the new monitoring wells.***

   a) *This recommendation has already been requested by the Division and therefore must be completed prior to approval.*

FINAL ANALYSIS AND RECOMMENDATION

The Earthfax Engineering report falls short of providing enough data to demonstrate a finding of no impact to the hydrologic balance. Until more conclusive data is collected regarding the regional potentiometric surface, can the Division make a finding of no impact regarding the regional potentiometric.

The issue of water quality impacts has not been adequately addressed and must be included in any future submittals by Co-Op Mining Company. The 4th quarter data on Big Bear Spring indicates a three-fold increase in total dissolved solids, and additional seepage from the old sealed workings of the Bear Canyon Mine are tentatively held responsible for this increase. This issue must be addressed in any future submittals.

AT015025.CMC

March 14, 1991

Mr. Jeff Appel, Attorney
Haley & Stolebarger
175 S. Main, 10th Floor
Salt Lake City, Utah 84111

Dear Jeff:

Re: Study of and response to report of Earthfax Engineering, Inc. (Richard B. While) March 11, 1991, for Co-op Mining Company, "Hydrogeologic Evaluation of the Bear Canyon Mine Permit and Proposed Expansion Areas;" and submitted response of Carl E. Kingston, attorney for Co-op Mining Company, dated March 11, 1991, to objections to permit renewal, Cause No. ACT/015/025

As per your telephone request March 13, 1991, and receipt of copies of the above referenced at the end of that day, I have studied these submittals and submit the following.

Basic to the problem and concern of the Co-op Mine operations adversely impacting the Big Bear Canyon Spring and the Birch Spring is found in the third paragraph of page 2-5 and the last paragraph of page 2-9 of the subject report. In brief, there is a regional aquifer in the subject area which is within the Star Point -Blackhawk formations and from which both the Birch and Big Bear Springs discharge. Another further reality is, to quote from the report of R. B. White (1991), "In areas of fracturing, due to increased rock permeability, water is able to pass vertically through strata which normally impede such flows. Depending on the degree of interconnection in the fractures, the groundwater flow can be limited to a small area or it can reach the regional water table (see Figure 2-3). Lines (1985) indicated that for the hydrogeologically similar area of Trail Mountain, located to the south of the study area, even with the large quantity of rock with negligible permeability, some hydraulic connection exists between the perched aquifers and the regional aquifer along the fractures and faults."

Yet, in the last paragraph of page 2-5 of White's report (1991), he states and accepts that no water was encountered in Co-op's borehole drilled adjacent to the Bear Canyon Mine portal, which "was drilled to the top of the Mancos Shale." This hole would have drilled through the Star Point-Blackhawk regional aquifer. Furthermore, White (1991) discounts the measured and reported static water levels in drill holes farther north at higher elevations, which holes penetrated the Star Point-Blackhawk aquifer (see page 3-9 of White's (1991) repot).

White (1991) acknowledges in the second paragraph of page 3-2 of his report, that Co-op Mining Company is diverting and using ground water in the Bear Canyon Mine, yet ~~ir~~regardless of his acknowledgement of perched aquifers contributing to the regional aquifer below, as I have quoted him heretofore, he does not recognize that this is a subtraction from the Star Point-Blackhawk aquifer, which supplies the subject springs. He does relent a little on page 3-10 of his report with the statement: "Therefore, it is felt that minimal impact to the flow of the springs has occurred as a result of the mining operations;" and on page 3-11: "Some very minor impact could occur as a result of dewatering of small isolated sandstone lenses which could contribute small flows, like what is intercepted from roof bolting (1-2 gpm).

EXHIBIT B

However, these areas do not have sufficient long term recharge capacity to be of significant concern for a water supply." Yet, at the bottom of page 3-10 and top of page 3-11 of his report, White acknowledges that the ground water is moving from the north to south where the subject springs discharge, but passes-off the matter stating: "Thus, an impact may occur to the north; however, it is not possible to predict where or if it will occur." The existing and proposed extension of the Bear Canyon Mine exists immediately north of the subject springs, over a distance of 2½ miles.

White (1991) shows on pages 3-3 and 3-4 that the total dissolved solids content of the seepage water from the slopes above Big Bear Canyon Spring is considerably higher than that of the Big Bear Spring and roof drippers in the 3rd West Entries of the Bear Canyon Mine. He concludes from this that: "The flow from the cliff seepage above the spring is considerably different . . . .. Due to the quality differences of the inflow to the mine and seepage from the cliff face, these two sources do not appear to be the same water." As I have previously reported, the discharging water from the cliffs above Big Bear Canyon Spring is in large part coming from shale-sandstone contacts and flows through and over gray shales which shales contain the most salts compared to sandstone or coal beds. Thus, higher quality water such is found within Bear Canyon Mine and the Star Point-Blackhawk aquifer could easily dissolve and pick-up considerable salts as it may have oppertunity to flow through or over weathered shales. Thus, higher quality water intercepted and gathered by mining operations that is rediverted into and through shale areas could easily be degraded, changing the quality but not the physical supply of water itself.

In the second paragraph of page 3-8 and on pages 3-11 and 3-12, White (1991) dismisses the total fluctuations in the subject spring flows to precipitation and states: "During the period of 1984 through 1989, the Bear Canyon Mine intercepted inflows at the abandoned workings, the East Bleeders, and the North Main entries. No significant flow reductions at the Big Bear Spring were reported for this period. Therefore, the water intercepted within the mine did not contribute to the Big Bear Spring flow." The record, including Whites graphs, clearly shows a pronounced drop in the Big Bear Canyon Spring for the year 1987 into the present time. Thus, a very real impact of coal mining operations is a subtracting from the ground water which could be part of the supply to someone elses water rights, such as the subject springs, and not be limited to elevated concentrations of inorganic constituents and acid-mine drainage as inferred in the second paragraph of page 3-10 of White's (1991) report.

With reference to the dismissal by White (1991) on pages 3-11 and 3-12 of his report that the Co-op Mines did not contribute to the abnormal flows and grease -oil contamination in the Birch Spring, he states: "Given the contention that the area is extensively faulted and the faults and fractures are interconnected, the possibility of storing this volume of water as a perched water table above a large extent of the mine, without discharge occurring in other locations, is very unlikely." Coal mining operations include the intentional coating of the walls with lime dust to suppress coal dust, and the floor of the mine is also mantled with fines from the mining operation. This tends to plug or restrict existing fracture and intergranular permeability. Thus, the result is a chamber generally lined with a thin coating of fine-grained materials. Eventually, this coating deteriorates in its effectiveness as a seal. However, for a considerable time the mined-out areas can and do serve as groundwater storage space. In fact, Co-op Mining Company is

presently using a part of the abandoned Trail Canyon Mine for such. Admittedly an alternative source of the surge in the Birch Spring flow could have been natural fracture openings, providing the groundwater storage, as proposed by White (1991), but the sudden release of the large volume of ground water containing oil-grease for a relatively short period, points to the abandoned Trail Canyon Mine as the principal storage source for the flush supply of water experienced.

The proposed minimum of four monitoring wells by White (1991) on page 4-2 of his report would be helpful, but they are not sufficient. They would be located soley in the impacted area of the Bear Creek Mine, and access to them during, and especially following the cessation of mining is of concern. A monitoring well is also needed up-gradient from any area impacted from Co-op mining, which I have previously recommended.

As to the statement by attorney Carl E. Kingston on page 7 of his response stating: "I would submit that the Earthfax report appears to be based upon more extensive research and a more thorough analysis of all available information, and accordingly, is more credible;" I simply state that the events of time have and will continue to verify the truth of basic principals upon which I have based my analysis and conclusions.

Respectfully submitted,

S. Bryce Montgomery, Geologist

3512 South 100 East
Bountiful, Utah 84010

Telephone 298-9108 office
295-8592

cc: Mr. Darrel V. Leamaster, P. E.
District Manager
Castle Valley Special Service District

Mr. Menco Copinga, President
Board of Directors
North Emery Water Users Association

File

Norman H. Bangerter
Governor
Dee C. Hansen
Executive Director
Dianne R. Nielson, Ph.D.
Division Director

State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
801-538-5340

April 10, 1991

TO: Tom Mitchell
Lowell Braxton
Pamela Grubaugh-Littig
Tom Munson

FROM: Dianne R. Nielson, Director DRN

RE: Decision Concerning Informal Hearing, Co-op's Bear Canyon Mine Permit Renewal and Revision, ACT/015/025, Emery County, Utah

Utah Code Annotated §40-10-14(1), requires the Division to make written findings and give reasons for granting or denying the permit in whole or in part, within 60 days after the informal conference. Because the Division twice extended the period for supplementing the record, at the request and with the concurrence of the parties, the deadline for a decision is also extended.

The informal conference was held on February 5, 1991. The period for supplementing the record was extended to March 21, 1991. Therefore, the Division must make its determination no later than May 20, 1991.

Please submit your legal and technical determinations to me by May 13,. These should be in a format which will enable me to readily incorporate them into the findings and conclusions portion of the Division's order. We will meet prior to May 13 to discuss your determinations.

Thank you for your assistance in completing this review. If you have any questions, please see me.

jb
Co-op

an equal opportunity employer

PAUL B. ANDERSON
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RECEIVED
APR 19 1991
DIVISION OF
OIL GAS & MINING

April 18, 1991

Mr. Thomas Munson
Senior Reclamation Hydrologist
Division of Oil, Gas and Mining
3 Triad Center Suite 350
Salt Lake City, Utah 84

RE:Investigation of groundwater resources of Bear Canyon graben area, Emery County, Utah.

Dear Mr. Munson:

I have evaluated the available published reports, testimony in the case of Co-Op Mining and several concerned water users of springs which flow from the graben, Division correspondence, selective annual hydrologic reports from area coal operators and permit applications. Discussions with yourself, Ms. Grubaugh-Littig and Mr. Braxton of the Division have also been taken into consideration. There was not enough time available to make a site visit, so please take this fact into consideration. I have, however, performed other geologic work both in the canyon area and the overlying Gentry Mountain-Gentry Ridge area.

I have tried to comment on points I view as particularly important to the issue of the impact of coal mining in and near the Bear Canyon graben.

1. Aquifer terminology and identification. Danielson (1981, p. 23-24) identifies an aquifer of regional extent in the lower part of the Blackhawk Formation and Star Point Sandstone. He does state insufficient data was available to determine if this aquifer is perched. Other reports often refer to the Star Point/Blackhawk aquifer as the regional aquifer. I will use this terminology in this report.

2. Potentiometric surface of the regional aquifer. Montgomery's (1991) report includes a map which shows contours of the potentiometric surface of the regional or Star Point/Blackhawk formations aquifer. I tried to identify control points for this map. I found only four. I discounted using the holes drilled by Savage Energy Services (T-1 through 5) because from personal experience in the Book Cliffs, the fluid level at the time of

geophysical logging of coal exploration holes does not consistently reflect a true head value for the lower portion of the open hole. No research was done to verify the observation concerning fluid level in wells in the Wasatch Plateau.

In a verbal discussion with Chuck Semborski (4-91), Geologist/Hydrologist for Energy West Mining, he described a strong vertical gradient associated with the Roan Canyon fault zone and Star Point/Blackhawk aquifer just across Huntington Canyon, south of the Bear Canyon Mine. The fault zone head (completed in the lower Blackhawk Formation) was about 200 feet above the surrounding regional aquifer head, which lies in the Star Point Sandstone.

Plateau has mined into the Bear Canyon graben, through the Bear Canyon fault and reported dry conditions (Thomas Munson, personal communication, 1991). Plateau's monitoring well 86-26-6 (NWNWSE 26, 15S, 7E, Plateau Mining, 1989) is perforated in the lower Blackhawk and Star Point Sandstone and lies south of the area of active mining. The head in the well is above the minable coal seams, indicating this block of coal is structurally low enough to put the coals below the water table. The simple concept of a uniformly sloping water table and simple geology just do not hold for the graben area.

Considering the complex geology of the Bear Canyon graben and the regional experience showing complex vertical and horizontal hydraulic gradients in Wasatch Plateau aquifers, more data is necessary to adequately access local flow systems and the potentiometric surface within the graben. I do, however, concur that the general flow direction in the graben appears to be from north to south-southeast.

3. Declines in the regional water table associated with natural climatic conditions. All technical opinions expressed in the case agree that the general decline in the flow rate of Birch and Big Bear Springs from the early '80's to '90's is caused, in part, by a corresponding decline in precipitation for the region. The flow record for Big Bear Spring, as presented in the EarthFax report (1991), shows a reversal of this gradual decline, with an increase in flow beginning in April of 1990 and continuing through the end of the available record (December, 1990). The precipitation record presented by the EarthFax (1991) report does not show a corresponding increase in precipitation during this period. Plateau Mining Company's only out-of-mine groundwater monitoring well in the Star Point/Blackhawk aquifer (hole 86-26-6, NWNWSE 26, 15S, 7E) shows a similar pattern of decline with a slight rise in water level beginning in February of 1990. This well is located in the Bear Canyon graben. The other spring flow data in the EarthFax report do NOT show this same pattern. How these flow and head patterns relate to mining is not known.

4. Fourth quarter of 1989 rise in flow at Birch Spring. The five fold increase in flow at the spring has been postulated as related to mining operations in the area. This is supported by:

1) the sudden rise in flow at the spring with no corresponding increase in precipitation (precipitation has been below normal for several years).

2) Increase in TDS, Mg, Fe (total), coliforms in Birch Spring during the high flow.

3) Oil and grease has shown up in the spring water during the high flows (no baseline water quality data is available on pre-1989 oil and grease for the spring).

4) The direction of dip in the abandoned Trial Canyon Mine is to the southeast, allowing any mine inflow waters to move in that direction. The eastern limit of mining in Trial Canyon Mine corresponds with a fault system mapped by Brown (1987). This is the same fault system from which Birch Spring discharges.

5) It has been reported (Thomas Munson, personal communication,1991) that water is being pumped from a spring across Trial Canyon into the old Trial Canyon Mine for storage and use by local residents in Trail Canyon, adding to the recharge of the old workings which may be connected to the fault system which feeds Birch Spring. Water quality of the pumped water has not been examined.

6) The western limit of the Bear Canyon Mine workings parallel and lie near the fault system from which Birch Spring discharges. In the last half of 1989 the mine was pulling pillars along the western and southern limits of the mine. The southern limits of the present mine are within a quarter mile of Birch Spring. Any subsidence cracks would propagate to the west toward the fault system.

7) Mining at Plateau's Star Point mine has proceeded into the Bear Canyon graben (probable recharge area for Birch and Big Bear Springs).

The above list of evidence does not conclusively identify mining as the source of the problem, nor do the counter arguements completely vindicate mining as responsible for the late 1989 changes at Birch Spring.

5. Changes in water chemistry at Big Bear Spring. Attached are three Piper plots of water analyses from the Bear Canyon graben area. Plot 1 is taken from the mean of numerous water samples from five different stratigraphic units from Danielson's (1981) report. The waters cluster together, showing little individual identity associated with stratigraphy. The Star Point water does exhibit a higher sulfate content (SO_4). Plot 2 is of all the available points in the area (There may be other analysis available from the water users.) See table 1 for a key to the sample numbers on the

plot. Samples which plot out of the clusters shown on plot 1 are suspect as being contaminated, perhaps by mining operations. Samples 10, 12, 13, and 21 are certainly outside of Plot 1 clusters. These samples are from mine waters, with the possible exception of 13. Samples 12 and 13 were both from Co-Op. They are identical analysis and perhaps one was mistakenly duplicated when reporting the analysis? Plot 3 shows the available mine water analysis from the graben area. Samples 10 through 12 and 21 lie outside the cluster of points from plot 1. Samples from mine sumps (10 and 12) could be picking their elevated Na and K from contaminants in the mine. Samples 11 and 21 are both from roof "drippers" and assuming sampling was done to avoid contact with the rib or floor of the mine, should represent a relatively pure sample of the Blackhawk Formation or fracture conveyed water.

Sample 8 is from Big Bear Spring and sampled by Castle Valley Special Service District (CVSSD) in early 1991. Sample 14 is from the same source, reported by Co-Op Mining Company, and sampled in 1984. Indicating, based on the analysis plotted, the spring water is slightly elevated in sulfate relative to sample 5 (regional value for Star Point Sandstone waters), falls near some of the mine water samples, and has not changed appreciably since 1984.

Oil and grease analysis from samples taken at Big Bear Spring by CVSSD on 2-14-91 and again on 2-26-91 showed 1.6 and 0.9 mg/l concentrations (from informal testimony before the Division Director, 3-91). This is well above the 0.05 mg/l detection limit for the oil and grease analysis. It is very difficult to protect samples from contamination from oil and grease sources. Springs must be sampled carefully to avoid contamination from external sources.

6. Interruption of ground-water flow-path by mining. Danielson (1981) addresses this issue and concluded that some water which would normally flow through the regional, and perhaps some of the perched aquifers, has been re-routed through the mines and into various streams. In 1981 Danielson estimated this amount to be about 3% of normal base-flow discharge. Obviously, the amount of interrupted groundwater is related to the area and location of mining. The area of mining has increased since Danielson's work was done. Mines in the Bear Canyon graben discharge groundwater to surrounding streams. Some on a very irregular basis and others on a more routine basis.

EarthFax (1991) reported the Bear Canyon mine had encountered a in-mine flow in the North Mains of about 110 gpm in the summer of 1989. The in-mine flow was reported as continuous to the time of EarthFax visit to the mine in February, 1991. Perched aquifers of relatively small proportions (channel sandstone above the coal seams) generally flow large amounts of water for about two months with the ending flow rate about 10% of the original flow rate (Roger C. Fry, Energy West Mining, personal communication, 1991). The fact that the groundwater encountered at the North Main in the Bear Canyon Mine has continued to flow at a constant rate since it was encountered indicates the source is from well connected

fractures or fault systems with a large storage capacity. It would appear that in this particular location, the mine has encountered and is below a local (?) aquifer's potentiometric surface. How or if this water is connected with the discharges at Big Bear and Birch Springs is unknown. None of the discharge records of the nearby springs indicate a dramatic change in flow rate corresponding with the interception of this in-mine flow in the summer of 1989.

One interesting note. DOGM personnel visited the Bear Canyon Mine in the fall of 1989 and made no mention of a 110 gpm flow being observed within the mine.

CONCLUSIONS

The data I have examined is insufficient to conclusively tie decreased flow or water quality problems at Birch and Big Bear springs to Co-Op's present or past operations. There is, however, ample evidence to suggest that mining in the graben (including all operators) could be affecting the springs' water quality and quantity now. As the area mined in the graben continues to expand, the likelihood of future impacts to the ground-water supply will also increase.

The CHIA for the area is now several years old and considerable new data is available to re-assess ground-water impacts from mining. More data will be required to meet the obligations of SMCRA in protecting this valued resource.

RECOMMENDATIONS

1. The Division should insist on receiving up-to-date information concerning water quality and quantity from all the operators. In order to assess the impact of each operator, ground-water monitoring wells should be placed up- and down- gradient within the regional aquifer and monitored for BOTH quantity and quality. Obtaining water samples from deep wells is not simple, but without this data it is impossible to assess the impacts. Water budget information for water encountered in the mining process must be gathered. This includes amount of inflow, location, description of occurrence, total water consumed in the mine, total water pumped to sumps, total water pumped or discharge to the surface, and estimate of loss from evaporation (this could be estimated based on the volume of air exhausted and its water content).

2. Birch, Big Bear, and perhaps a couple of stations inside Co-Op's active mine should be sampled by a third party. The third party sampler should be approved by the water rights holders to the springs, Co-Op Mining, and the Division. This would avoid potential conflicts over questionable analysis and access. If this

is unacceptable, documentation of the operator's sampling methods should be required as part of the monitoring program. The originals from the laboratory should be required to document each water sample analyzed.

3. Co-Op should install at least one monitoring well north of the new federal lease and four monitoring wells in the mine. The well north of the new federal lease could be located at the bifurcation of McCadden Hollow near the section line between section 11 and 14, T16S, R7E (see attached map). This would probably require a helicopter rig to do the drilling because of access problems. This well would monitor the regional aquifer in a up-gradient position.

Monitoring wells in the unfractured portion of the Star Point Sandstone within the southern portions of the mine are unlikely to encounter any significant saturated thickness. This is supported by the fact that there used to be (prior to 1989) no seeps along the cliffs south and east of the mine in the Star Point Sandstone. If the formation were naturally saturated, the interbedded shale in the formation should inhibit downward flow and produce seeps at these contacts (recall that the dip in the Bear Canyon Mine is to the southeast).

Two of the four in-mine wells should be located on the east and west sides of the mine (see attached map) and attempt to intercept the fractured areas associated with the major faults on each side of the mine which appear to be connected with Birch and Big Bear springs. These wells should be located as far north along the fault zones as possible. This will enable Co-Op to monitor waters that move onto their permit area through the fracture system before these waters encounter potential contaminants from the mine.

The other two holes should be located along the same fault or fracture systems but in the southern most part of the mine. Based on water levels in the springs at the cliff face to the south, these wells will have to be drilled to near the base of the Star Point Sandstone. All wells should be designed to enable recovery of a water sample and measurement of static head. This will aid in understanding the local potentiometric surface. By comparing monitoring data from the two sets of in-mine wells, some information about head and water quality of the spring flow systems will be available.

Monitoring wells designed to monitor fracture flow are more difficult to locate and there is a chance of missing the intended target. The Division should review a detailed plan for drilling, completion, and monitoring of these wells <u>before</u> they are drilled to help increase the odds of successful drilling program.

4. The feasibility of drilling a shallow hole into the old Trail Canyon mine should be evaluated. The hole should be located on the down-dip side of the workings and be capable of extracting a water sample and taking static head measurements. This will help answer how the head in the old workings relates to the head in the fault and if, another surge should occur at Birch Spring, knowing

how the head in the mine reacted would confirm its relationship to the surge.

5. The geologic map in the present PAP is in conflict with several other sources (Montgomery, 1991, EarthFax Report, 1991). A revised geologic map should be submitted to the Division. Included with the geologic mapping should be careful documentation of the structural orientation of faults and major fracture zones encountered in the mine. This is especially important if the fault or fracture produces water.

6. Gypsum used as rock dust is very soluble and will add sulfate ions to the groundwater. Rock dust from the mines in the graben area should be evaluated to see if they are using gypsum. If they are, the feasibility of using isotope geochemistry to fingerprint the sulfur in the gypsum and tie it to increased sulfate in naturally discharging groundwater should be considered. This may help to clearly establish flow paths and their relations to mining.

7. Reassess the CHIA for the area and the ground-water monitoring requirements for all the mines operating in the graben. Much emphasis has been placed on protection of the aquifers which overlie the minable coals, with less attention to the underlying aquifer(s). Potential impacts to both quantity and quality of the Star Point/Blackhawk aquifer should be examined.

8. The Division should develop methods to incorporate data gathered by the operator into a periodic (at least annually) evaluation the CHIA. The USGS has a method for evaluating the head changes in wells from year to year. This type of tracking method could be considered.

Respectfully submitted,

Paul B. Anderson

Paul B. Anderson
Consulting Geologist

cc. Lowell Braxton
Pamela Grubaugh-Littig

REFERENCES

Brown, T.L., et. al., 1987, Stratigraphic framework and coal resources of the Upper Cretaceous Blackhawk Formation in the Wasatch Plateau coal field, Manti 30'x60' quadrangle, Emery, Carbon, and Sanpete Counties, Utah, U.S. Geological Survey Map C-94-D.

Danielson, T.W., M.D. ReMillard, and R. H. Fuller, 1981, Hydrology of the coal-resource area in the upper drainages of Huntington and Cottonwood creeks, Central Utah, U. S. Geological Survey, Water-Resources Investigations, Open-Filed Report 81-539, 85 p.

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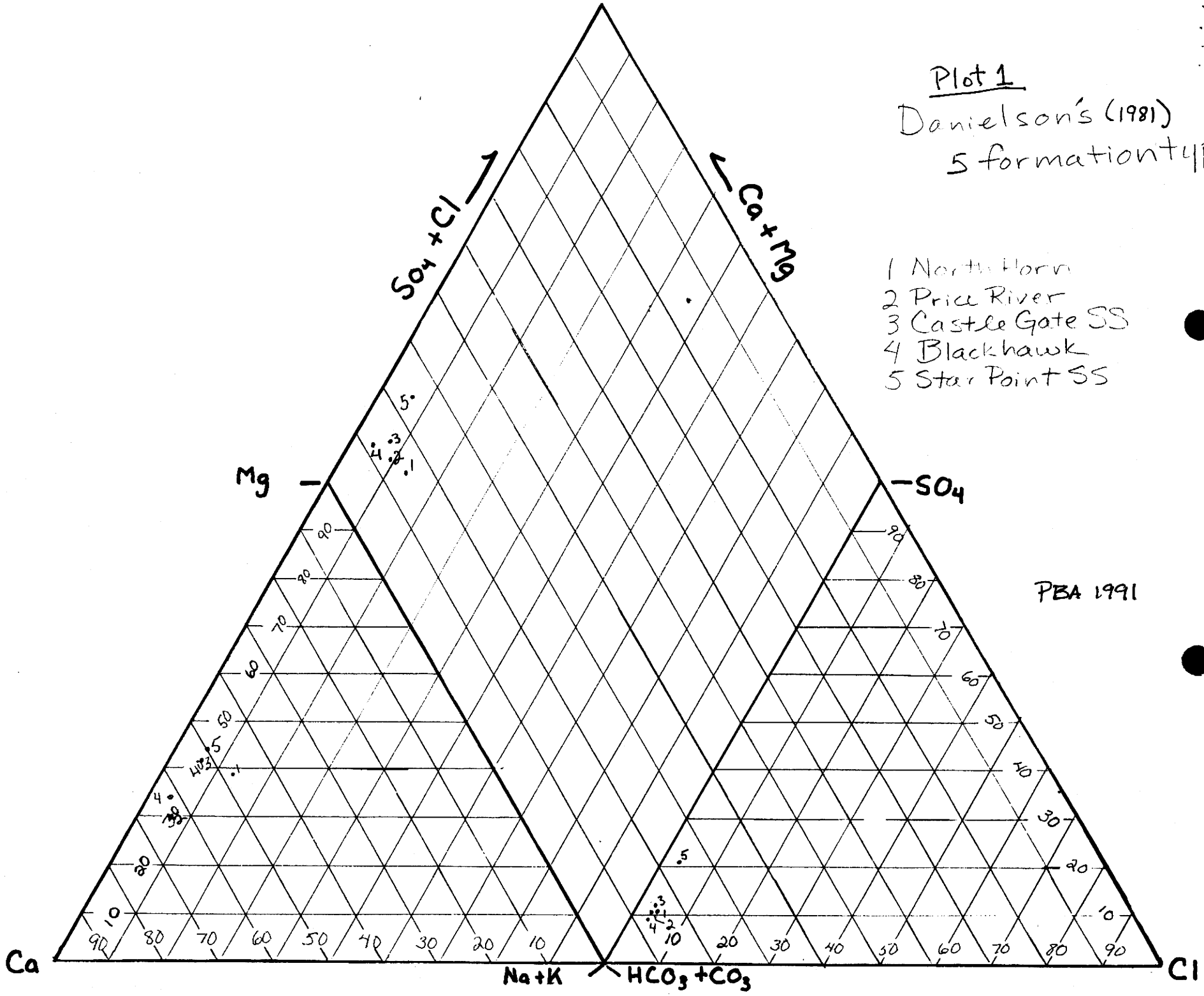
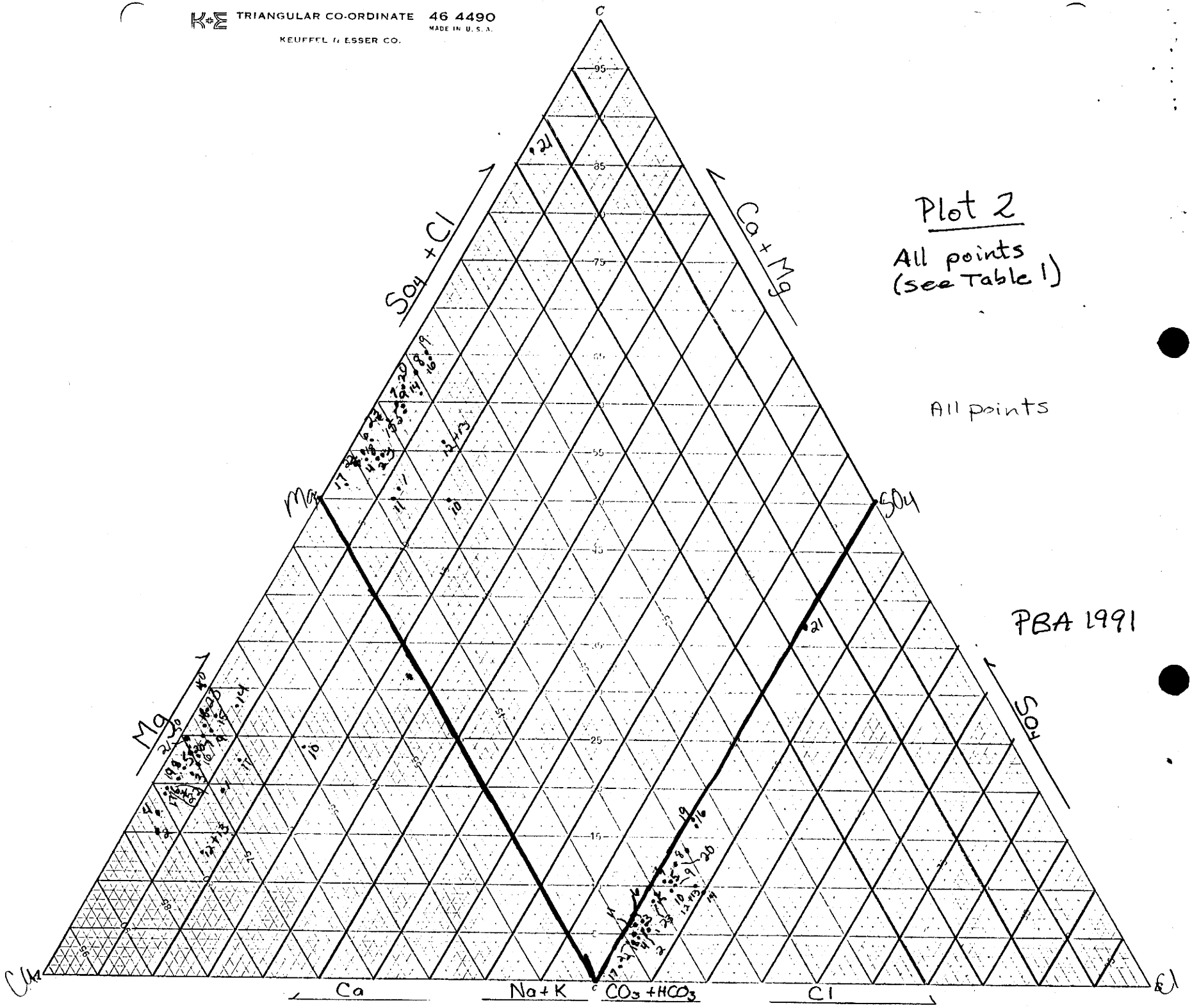
Montgomery, S.B., 1991, Hydrologic investigation and report of Big Bear Spring and Birch Spring relative to Co-Op Mining Company past, present and proposed coal mining, T15-16S, R7E, SLB&M, Emery County, Utah. Report prepared for Castle Valley Special Services District and North Emery Warer Users Association, January 28, 1991.

Plateau Mining Company, 1989, Annual hydrology report, Division of Oil, Gas, and Mining files.


Plot 1
Danielson's (1981)
5 formation types
1 North Horn
2 Price River
3 Castle Gate SS
4 Blackhawk
5 Star Point SS
PBA 1991
SO4 + Cl
Ca + Mg
Mg
SO4
Ca
Na + K
HCO3 + CO3
Cl


K+E TRIANGULAR CO-ORDINATE 46 4490
MADE IN U.S.A.
KEUFFEL & ESSER CO.
Plot 2
All points
(see Table 1)
All points
PBA 1991
SO4 + Cl
Ca + Mg
Mg
SO4
Mg
SO4
Cl
Ca
Na + K
CO3 + HCO3
Cl

Plot 3

24 SBC 7 '88 (Aug.) mine sump - Bear Canyon Mine
25 SBC 8 '88 (Aug) min sump - " " "

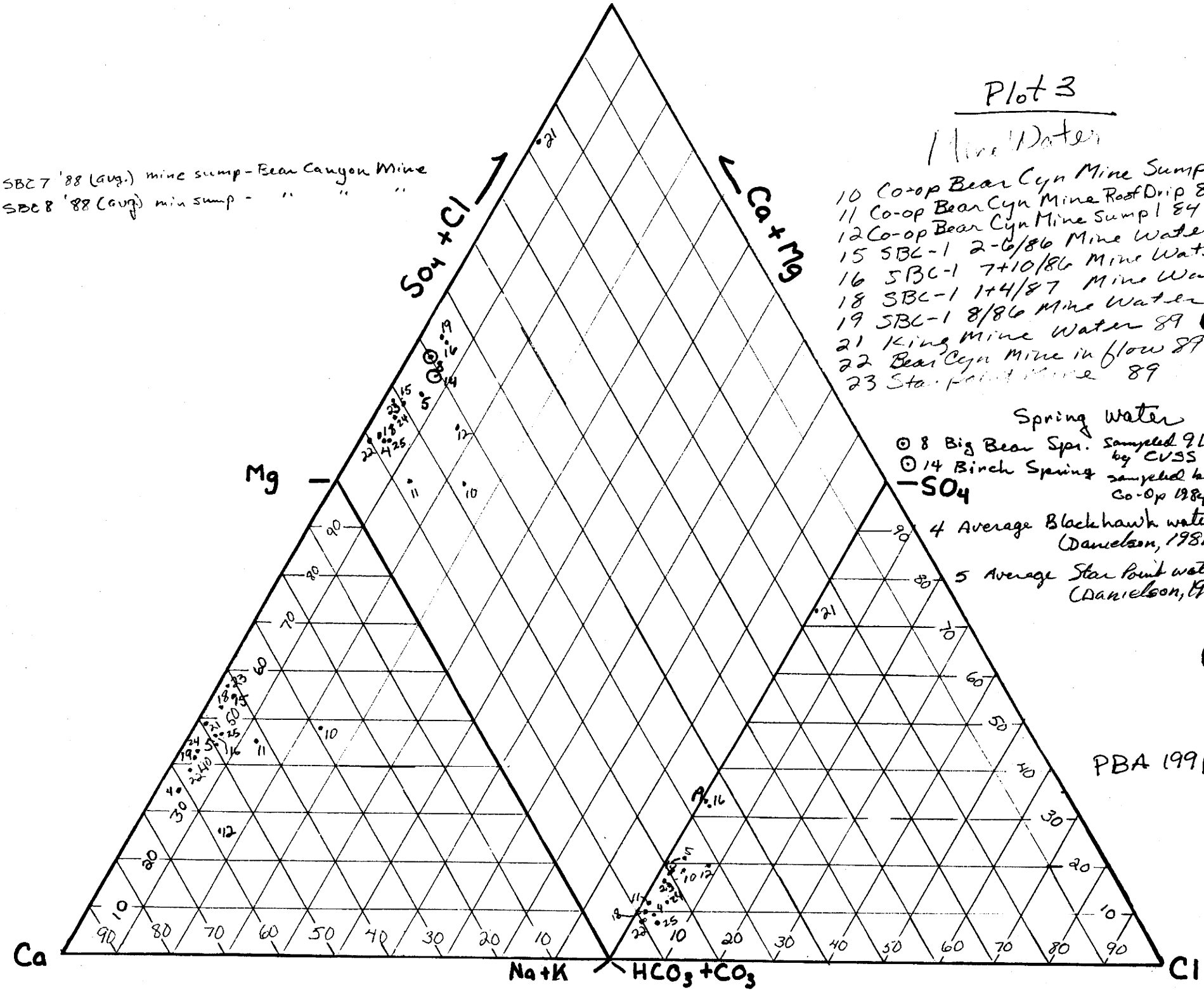
Mine Water

10 Co-op Bear Cyn Mine Sump 3 (89)
11 Co-op Bear Cyn Mine Roof Drip 84
12 Co-op Bear Cyn Mine Sump 1 84
15 SBC-1 2-6/86 Mine Water
16 SBC-1 7+10/86 Mine Water
18 SBC-1 1+4/87 Mine Water
19 SBC-1 8/86 Mine Water
21 King Mine Water 89
22 Bear Cyn Mine in flow 89
23 Star Point Mine 89

Spring Water

⊙ 8 Big Bear Spr. sampled 91 by CVSS
⊙ 14 Birch Spring sampled by Co-Op 1984

4 Average Blackhawk water (Danielson, 1981)
5 Average Star Point water (Danielson, 1981)



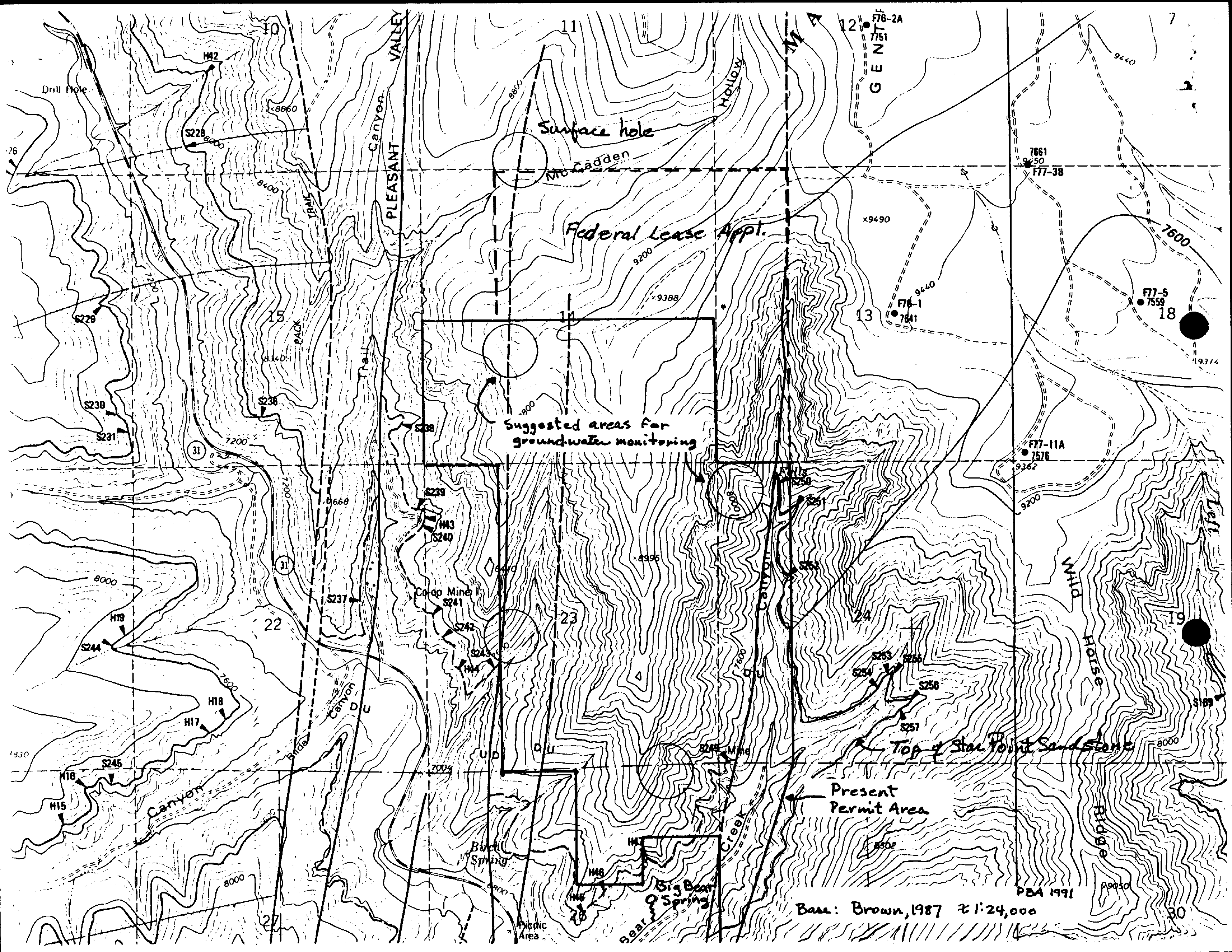
PBA 1991

TABLE 1. Bear Canyon Graben - water quality
Prepared by: Paul B. Anderson, 4/91

	Site ID/Source	% Ca	%Mg	%Na	%K	%HCO3	%SO4	%Cl	Total meq
1	North Horn, Danielson (1981)	48	38	13	0	85	11	4	12.46540
2	Price River, Danielson (1981)	64	30	5	1	87	10	3	9.78919
3	Castlegate Sandstone, Danielson	52	42	5	1	85	12	3	11.48290
4	Blackhawk, Danielson (1981)	62	34	4	1	88	9	3	9.269246
5	Star Point Sandstone, Danielson '81	50	44	5	1	76	21	3	14.96532
6	Blackhawk Wells, Plateau	58	39	2	1	85	13	2	13.14656
7	Birch Springs'86, NEWU Assoc.	46	50	3	1	77	21	2	15.78353
8	Big Bear Spring'91, CVSSD	53	43	3	1	70	27	3	16.35901
9	Birch Springs'78, NEWU Assoc.	44	51	4	1	76	20	4	13.64527
10	Co-op Bear Canyon Mine Su3 84	29	48	21	2	77	19	4	12.19002
11	Co-op Bear Canyon Mine RD3 84	42	45	12	1	88	12	1	14.24840
12	Co-op Bear Canyon Mine Su1 84	58	26	16	0	72	8	20	13.97343
13	Big Bear Spring 84, Co-op	58	26	16	0	72	8	20	13.97343
14	Birch Spring 84,Co-op	37	56	6	1	71	19	10	17.32045
15	SBC-1 2-6 86 mine water,Co-op	42	54	4	1	79	18	2	10.83162
16	SBC-1 7&10 86 mine water,Co-op	49	46	4	1	64	33	2	12.721
17	SBC-6 (Co-op Spring) 9&10 86	59	38	3	0	94	3	3	12.48827
18	SBC-1 mine water 1&4 87,Co-op	45	52	3	0	88	10	2	12.29410
19	SBC-1 mine water 8/86,Co-op	55	41	3	1	66	33	1	16.36532
20	Birch Spring 87, Co-op	50	46	4	1	73	24	2	17.39026
21	King Mine #4 11E '88, USGS	49	49	1	0	26	74	0	35.48401
22	Bear Canyon Mine '88, xc33N 3L USGS	58	39	3	0	90	8	2	11.03568
23	Starpoint Mine '88, 2E, xc23, USGS	43	55	1	1	81	17	2	18.10412
24	Co-op Bear Canyon Mine SBC#7,3-88	56	40	3	0	87	11	2	12.49914
	Co-op Bear Canyon Mine SBC#7,4-88	52	44	3	0	83	16	2	12.82806
	Co-op Bear Canyon Mine SBC#7,9-88	53	44	3	0	90	8	2	11.76853
25	Co-op Bear Canyon Mine SBC#8, [illegible]	56	40	3	0	87	11	2	12.47356
	Co-op Bear Canyon Mine SBC#8,6-88	59	38	3	0	91	7	2	12.0729
	Co-op Bear Canyon Mine SBC#8,9-88	40	57	3	0	92	7	1	11.83325

TABLE 1. (raw data in mg/l) Bear Canyon Graben
Prepared by: Paul B. Anderson, 4/91

Site ID/Source	Cations mg/l				Anions mg/l			
	Ca	Mg	Na	K	HCO3	CO3	SO4	Cl
1 North Horn, Danielson (1981)	61.00	29.00	19.00	0.90	320.00	0.00	32.00	9.80
2 Price River, Danielson (1981)	63.00	18.00	5.70	1.30	260.00	0.00	23.00	5.10
3 Castlegate Sandstone, Danielson	60.00	29.00	7.10	1.30	300.00	0.00	33.00	5.60
4 Blackhawk, Danielson (1981)	57.00	19.00	4.10	1.10	250.00	0.00	21.00	4.30
5 Star Point Sandstone, Danielson '81	75.00	40.00	8.00	2.00	350.00	0.00	77.00	6.90
6 Blackhawk Wells, Plateau	77.45	31.71	3.41	2.03	337.20	0.00	40.40	3.75
7 Birch Springs'86, NEWU Assoc.	70.00	46.00	6.00	2.00	383.00	0.00	64.00	6.00
8 Big Bear Spring'91, CVSSD	88.63	44.40	6.30	2.21	339.00	0.00	103.00	9.00
9 Birch Springs'78, NEWU Assoc.	60.00	43.00	6.00	3.00	315.00	0.00	64.00	10.00
10 Co-op Bear Canyon Mine Su3 84	36.00	36.00	29.20	4.43	285.50	0.00	55.00	8.00
11 Co-op Bear Canyon Mine RD3 84	60.00	38.40	19.20	3.65	383.10	0.00	40.00	2.00
12 Co-op Bear Canyon Mine Su1 84	80.00	21.60	26.00	0.97	309.80	0.00	27.00	50.00
13 Big Bear Spring 84, Co-op	80.00	21.60	26.00	0.97	309.80	0.00	27.00	50.00
14 Birch Spring 84,Co-op	64.00	58.80	12.20	1.97	378.20	0.00	80.00	30.00 S
15 SBC-1 2-6 86 mine water,Co-op	47.20	37.20	4.78	1.90	249.80	0.00	45.80	4.00
16 SBC-1 7&10 86 mine water,Co-op	62.50	36.00	5.75	2.00	249.00	0.00	101.00	5.55
17 SBC-6 (Co-op Spring) 9&10 86	77.00	30.00	4.50	1.00	343.00	0.00	8.00	6.00
18 SBC-1 mine water 1&4 87,Co-op	54.50	38.50	4.50	1.00	332.50	0.00	30.00	4.00
19 SBC-1 mine water 8/86,Co-op	91.00	41.00	5.00	4.00	328.00	0.00	127.00	4.00
20 Birch Spring 87, Co-op	87.00	48.00	7.00	2.00	392.00	0.00	102.00	7.00
21 King Mine #4 11E '88, USGS	180.00	110.00	4.20	2.90	270.00	0.00	610.00	2.60
22 Bear Canyon Mine '88, xc33N 3L USGS	71.00	29.00	3.80	0.70	271.00	0.00	19.00	3.10
23 Starpoint Mine '88, 2E, xc23, USGS	86.00	66.00	3.30	3.70	403.00	0.00	67.00	5.20
24 Co-op Bear Canyon Mine SBC#7,3-88	71.00	31.00	5.00	1.00	326.00	0.00	34.00	4.00
Co-op Bear Canyon Mine SBC#7,4-88	68.00	35.00	4.00	1.00	320.00	0.00	48.00	4.00
Co-op Bear Canyon Mine SBC#7,9-88	62.00	31.00	4.00	1.00	325.00	0.00	22.00	5.00
25 Co-op Bear Canyon Mine SBC#8,3-88	71.00	31.00	5.00	0.00	326.00	0.00	34.00	4.00
Co-op Bear Canyon Mine SBC#8,6-88	72.00	28.00	4.00	0.00	334.00	0.00	20.00	4.00
Co-op Bear Canyon Mine SBC#8,9-88	47.00	40.00	4.00	0.00	337.00	0.00	20.00	3.00



Surface hole
Federal Lease Appl.
Suggested areas for groundwater monitoring
Top of Star Point Sandstone
Present Permit Area
Big Bear Spring
PLEASANT VALLEY
Canyon
Mc Gadden
Hollow
Wild Horse Ridge
Co-op Mine
Birch Spring
Picnic Area
Drill Hole
PBA 1991
Base: Brown, 1987 ≈ 1:24,000

Cwl Rebate file: Mine file LMB } done
ACT/015/025
Informal Hearing

S T A T E M E N T

From:
Paul B. Anderson
Consulting Geologist
807 E South Temple Suite 325
Salt Lake City, UT 84102
(801)-364-6613
Tax ID #528-72-7530

Billing date: 21-Apr-91

For Services From: 03-Apr-91
To: 18-Apr-91

Invoice # 176

RECEIVED
APR 23 1991
DIVISION OF
OIL GAS & MINING

To:
State of Utah - Division of Oil, Gas, and Mining
3 Triad Center Suite 350
Salt Lake City, UT 84180
ATTN: Thomas Munson

RE: Geological consulting for Co-Op Mining Company's Bear Canyon federal lease tract - Contract #91-2626

PERSONNEL FEES
****

Principal Geologist (P. Anderson) @ $50/hour

Date	Task	Hours	
03-25-91	Meet w/ DOGM, review problem (no charge)	0.00	
04-03-91	Review DOGM files	5.25	
04-04-91	Interview USGS staff and obtain water quality data	6.50	
04-05-91	Review EarthFax report and Danielson	7.75	
04-08-91	Review water users reports, data, and testimony	4.50	
04-09-91	Review water users reports, data, and testimony	5.25	
04-10-91	Organize and study data	5.00	
04-11-91	Evaluate water quality data	2.00	
04-12-91	Report preparation	7.25	
04-15-91	Report preparation	4.00	
04-16-91	Present draft report to DOGM	3.75	
04-18-91	Finalize report	1.75	
Total		53.00	$2,650.00

Staff Geologist (M. Suva) @$30/hour

Date	Task	Hours	
03-04-91	Review and copy DOGM files	5.00	
04-04-91	Review maps, plot drill holes and mark faults	6.50	
04-05-91	Organize and evaluate data	5.50	
04-08-91	Piper plots preparation	4.00	
04-09-91	Piper plots preparation	5.00	
04-10-91	Report preparation	4.00	
Total		30.00	$900.00

Total Personnel Fees $3,550.00

GRAND TOTAL DUE (Cost not to exceed by contract) $3,010.00
Net 30 days
THANK YOU! Your business is appreciated.

Paul

ACT/015/025
Informal Hearing

Norman H. Bangerter
Governor
Dee C. Hansen
Executive Director
Dianne R. Nielson, Ph.D.
Division Director

State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
801-538-5340

May 17, 1991

TO: Pamela Grubaugh-Littig, Permit Supervisor

FROM: Tom Munson, Senior Reclamation Hydrologist

RE: Update to the March 14, 1991 Hydrogeologic Evaluation of the Bear Canyon Mine Permit and Proposed Expansion Areas, Co-Op Mining Company, Bear Canyon Mine, ACT/015/025, Emery County, Utah

SYNOPSIS

My previous memo of March 14, 1991 regarding the response from Co-Op Mining Company and their consultant, Earthfax Engineering, to the objections raised by the Castle Valley Special Services District, North Emery Water Users (NEWU) and Huntington-Cleveland Irrigation District discussed point-by-point the conclusions of the Earthfax report. Based on new information provided by Co-Op Mining Company in response to a Division Order dated November 27, 1990, as well as an hydrologic investigation by Paul Anderson, Consultant to the Division, the groundwater impacts associated with the present workings at the Bear Canyon Mine have been re-evaluated. An updated analysis is provided below.

ANALYSIS

The conclusions and recommendations found on page 4-1 and 4-2 of the Earthfax Engineering report are revised as follows. I will address each one individually and state its adequacy in addressing the requirements of determining the Probable Hydrologic Consequences of mining within the present Bear Canyon Permit Area and the proposed Federal Lease.

1) **The groundwater system in the area of the Trail Canyon and Bear Canyon mines is mainly controlled by geologic structures (faults and fractures) and lithology.**

I agree that the groundwater system is mainly controlled by geologic structures (faults and fractures) and lithology.

2) **In the area of present development, the regional water table is located below the Blind Canyon and Hiawatha seams in both the Trail Canyon and Bear Canyon mines as indicated by downhole drilling.**

This assumption is the one which is considered the most probable based on the data collected to date. Conclusive evidence to indicate the contrary has not been presented to date. Based on all evidence presented, there is a strong possibility that a regional water table does exist below the current workings. Whether that water table exists in faults and fractures or within the sandstone units as a whole has not been conclusively determined.

3) **Water intercepted within the mine workings of the Bear Canyon Mine have not had any identifiable impact on the spring flows of Big Bear or Birch Springs.**

It has been discovered that mine water was pumped into old workings in the south end of the mine via a pressure relief valve set-up on the in-mine piping system. This system has recently been changed over from an undersized 2" pipe to a 6" water line where the cycling of a pump will not cause a release of mine water through the pressure relief valve. A water meter documenting flows will be installed on the line going into the old workings to document any water releases into the old works due to emergency situations (see Plate 7-1A, 1990 Mine Water Survey).

Based on the information the Division has received from Co-Op in response to its November 27, 1990 Division Order, and a verification of the pumping system and set-up, conducted on May 16, 1991 by Jesse Kelley, the Division has made the following observations:

1) Pumping water into the old workings via the old pumping and piping system <u>most probably</u> had an effect on the water balance in the old workings, causing a discharge to occur at the outcrop, potentially affecting Big Bear Spring. A monitoring program will be set up to determine if the flows and quality at Big Bear Spring are returning to normal after the piping system was modified.

2) The monitoring program will potentially ascertain any cause and effect between pumping water into the old workings and the flow and quality of Big Bear Spring.

4) **No evidence is available to show a mine-related impact on the spring flows of Big Bear or Birch Springs. The recent reduction in spring flows appear to be caused by the significant reduction of precipitation over the last four to five years.**

Pumping of water into the old workings, as described above in Part 3, may have impacted the quantity of water flowing from outcrops at or near Big Bear and Birch Springs. There is no evidence to support impacts to spring flows from any other coal mining operations within the permit area.

FINAL ANALYSIS AND RECOMMENDATION:

Based on the discovery of the pumping of water into the old workings and the documented increase in flow at Big Bear Spring, the termination of pumping water into the old workings will hopefully solve the current quantity and quality abnormalities at Big Bear Spring. A comprehensive monitoring program will be implemented to ascertain the impact of the termination of pumping into the old works.

Other than the potentiality of this pumping into the old workings and the related outcrop flow, it is felt that there is insufficient evidence to suggest that the current workings at the Bear Canyon Mine are affecting the hydrologic balance associated with Big Bear and Birch Springs.

Further groundwater studies will need to be conducted to ascertain impacts associated with development of additional coal seams within the existing permit area and in adjacent lease blocks.

mbm/jbe
cc: File
Bear Canyon Informal Hearing File (V. Bailey)
Dianne R. Nielson
Tom Mitchell
Pamela Grubaugh-Littig
AT015025.BCM

Informal Hearing
ACT/015/025

State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

Norman H. Bangerter
Governor
Dee C. Hansen
Executive Director
Dianne R. Nielson, Ph.D.
Division Director

355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
801-538-5340

May 20, 1991

Jeffrey W. Appel, Esq.
Michele Mattsson, Esq.
Haley and Stolebarger
175 South Main Street
10th Floor, Walker Center
Salt Lake City, Utah 84111

Carl E. Kingston, Esq.
53 West Angelo Avenue
P. O. Box 15809
Salt Lake City, Utah 84115

Carl

Dear Sirs and Madam:

Enclosed is an investigation prepared by Paul Anderson for the Division regarding groundwater resources in the Bear Canyon graben area. Also enclosed is an update of Tom Munson's hydrogeologic evaluation of the Bear Canyon Mine.

Both of these documents are part of the Division's records for the mine and have been considered in preparation of the Order regarding the Informal Hearing.

Best regards,

Dianne

Dianne R. Nielson
Director

vb
Enclosures (2)
cc: D. Leamaster
M. Copinga
V. Willson
S. Johansen
MI3/54

an equal opportunity employer

Make Informal Hearing

State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

Norman H. Bangerter
Governor
Dee C. Hansen
Executive Director
Dianne R. Nielson, Ph.D.
Division Director

355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
801-538-5340

August 23, 1991

CERTIFIED RETURN RECEIPT REQUESTED
No. P 540 713 852

Kimly C. Mangum, P.E.
Mangum Engineering Consultants
388 East Boynton Road
Kaysville, Utah 84037

Dear Mr. Mangum:

Re: Informal Hearing on Fact of Violation for State Violations N91-34-2-1, ACT/015/025, Bear Canyon Mine and N91-26-3-1, Trail Canyon Mine, ACT/015/021, Co-Op Mining Company, Emery County, Utah

In accordance with your telephone request on August 22, 1991, for an Informal Hearing on state violations N91-34-2-1 and N91-26-3-1, please be advised that the Informal Hearing will be held in conjunction with the Assessment Conference on state violations N91-34-2-1, N91-26-5-1, Bear Canyon Mine, and C91-26-1-1 and N91-26-3-1, Trail Canyon Mine. That conference and informal hearing are scheduled for Wednesday, September 4, 1991, from 10:00 a.m. to noon.

Pertinent, written material you wish reviewed before the conference can be forwarded to me at the address listed above.

The conference will be held in the office of the Division of Oil, Gas and Mining.

Best regards,

Janice V. Brown for

Dianne R. Nielson
Director

vb
cc: W. Owen, Co-Op Mining Company
J. Kathmnn, OSM
J. Helfrich
Public Notice Board

an equal opportunity employer

Norman H. Bangerter
Governor
Dee C. Hansen
Executive Director
Dianne R. Nielson, Ph.D.
Division Director

State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
801-538-5340

July 20, 1992

CERTIFIED RETURN RECEIPT REQUESTED
No. P 540 713 913

Wendell Owen
Co-Op Mining Company
P. O. Box 1245
Huntington, Utah 84528

Dear Mr. Owen:

Re: Informal Hearing for State Violations, N92-40-9-1, C92-40-1-1, N92-40-10-2, and N92-40-8-1, Co-Op Mining Company, Bear Canyon Mine, ACT/015/025, Emery County, Utah

In accordance with your requests dated June 23, 1992, please be advised that the Informal Hearing on state violations N92-40-9-1, C92-40-1-1, N92-40-10-2, and N92-40-8-1, Bear Canyon Mine, has been established for Wednesday, August 12, 1992, beginning at 1:30 p.m.

Pertinent, written material you wish reviewed before the conference can be forwarded to me at the address listed above.

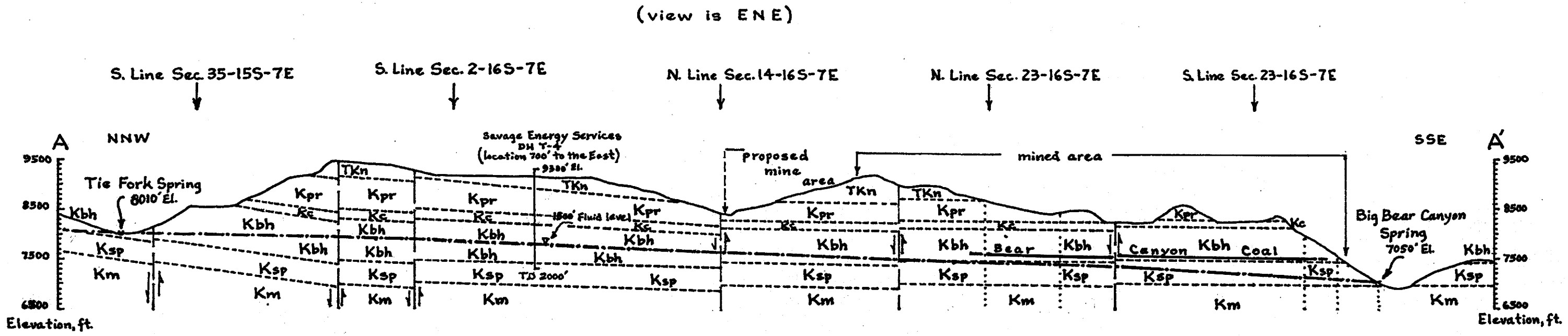
The conference will held in the office of the Division of Oil, Gas and Mining.

Best regards,

Dianne R. Nielson
Director

vb
cc: K. Mangum, Mangum Engineering
B. Freeman, OSM
J. Helfrich
DOGM Price Office
Public Notice Board

an equal opportunity employer



HYDROGEOLOGIC SECTION A-A' THROUGH GENTRY MOUNTAIN-BIG BEAR CANYON SPRING AREA

Scale: 1 inch = 2000 feet

No exaggerated vertical scale

S. Bryce Montgomery, Geologist

January 1991

LEGEND:

CRETACEOUS

TKn = Tertiary-Cretaceous age North Horn Formation

Kpr = Price River Formation

Kc = Castlegate Sandstone

Kbh = Blackhawk Formation containing coal beds (dark solid line)

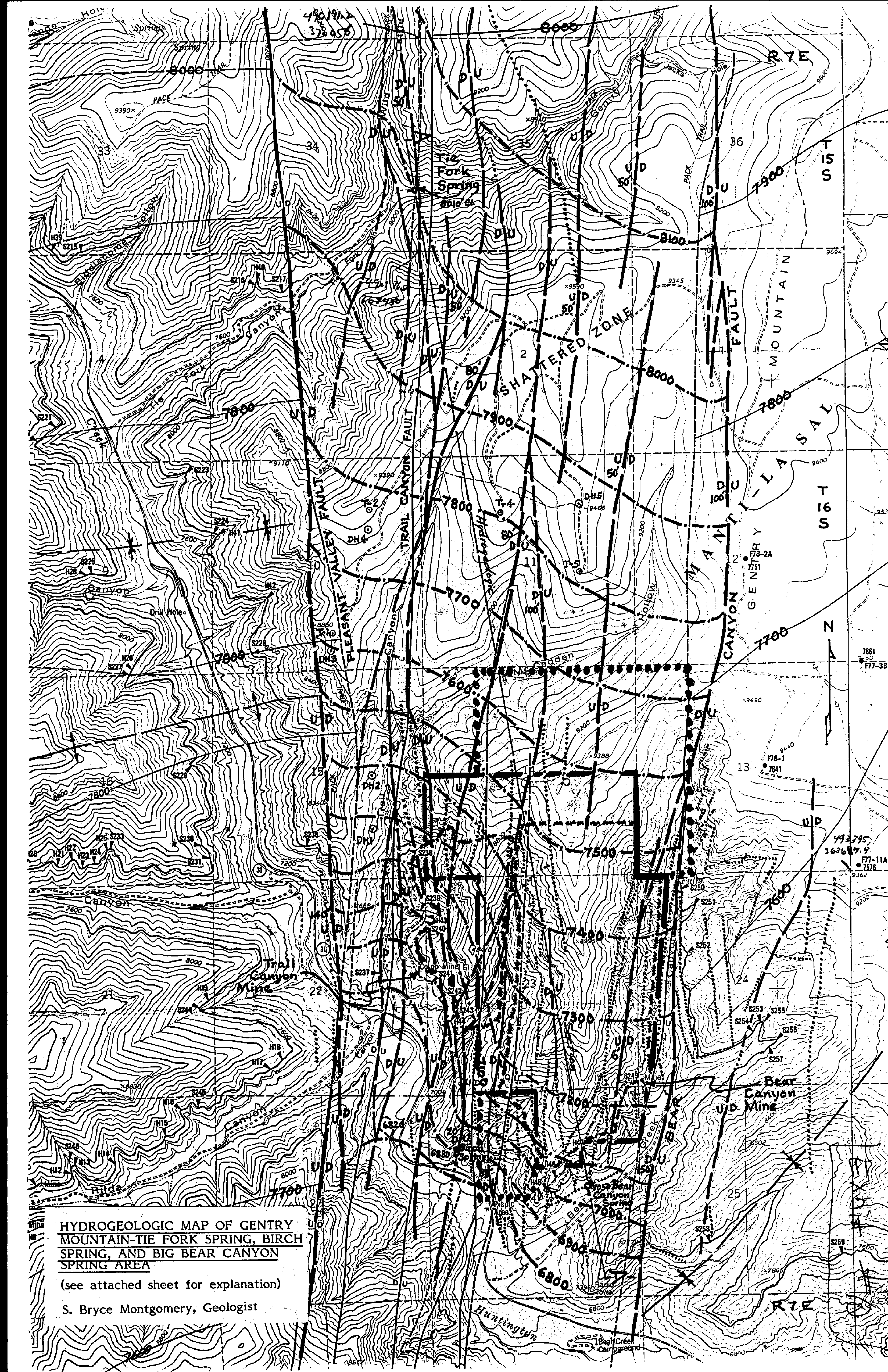
Ksp = Star Point Sandstone

Km = Mancos Shale

----- Approximate contact of geologic formations

Fault plane intersection; arrows show direction of relative movement

—·—·— Potentiometric surface of ground water in Blackhawk-Star Point aquifer



HYDROGEOLOGIC MAP OF GENTRY MOUNTAIN-TIE FORK SPRING, BIRCH SPRING, AND BIG BEAR CANYON SPRING AREA

(see attached sheet for explanation)

S. Bryce Montgomery, Geologist

January 28, 1991

Mr. Darrel V. Leamaster, P. E.
District Manager
Castle Valley Special Service District
P. O. Box 877
Castle Dale, Utah 84513

Mr. Menco Copinga, President
Board of Directors
North Emery Water Users Association
Box 418
Elmo, Utah 84521

Gentlemen:

Re: Hydrologic investigation and report of Big Bear Spring and Birch Spring relative to Co-Op Mining Company past, present, and proposed coal mining, T 15-16 S, R 7 E, SLB & M, Emery Co., Utah

In response to your request of December 18, 1990, and confirmed December 20, 1990, I have made a study of the above referenced and submit the following report.

Acknowledgement and appreciation is expressed for various materials and information provided to me by yourselves, Ben Grimes, and others from your organizations, relative to the matter. Reference has also been made of the following publications:

Brown, T. L., and et al, 1987, Stratigraphic Framework and Coal Resouces of the Upper Cretaceous Blackhawk Formation in the Wasatch Plateau Coal Field, Manti 30'x60' Quadrangle, Emery, Carbon, and Sanpete Counties, Utah: U. S. Geological Survey Map C-94-D;

Danielson, T. W., and et al, 1981, Hydrology of the Coal-Resources Areas in the Upper Drainages of Huntington and Cottonwood Creeks, Central Utah: U. S. Geological Survey in cooperation with the Utah Dept. of Nat. Reources and Energy, Div. of Oil, Gas, and Mining, Water-Resources Investigations Open-File Report 81-539;

Fisher, D. J., and et al, 1960, Cretaceous and Tertiary Formations of the Book Cliffs, Carbon, Emery, and Grand Counties, Utah, and Garfield and Mesa Counties, Colorado: U. S. Geological Survey Prof. Paper 332;

Fouch, T. D., 1976, Revision of the Lower Part of the Tertiary System in the Central and Western Uinta Basin, Utah: U. S. Geological Survey Bulletin 1405-C;

Hintze, L. F. and Stokes, W. L., 1964, compilers, Geologic Map of South-eastern Utah: B. Y. University and Univ. of Utah with Utah State Land Board;

Malencik, B., 1989, Birch Spring Citizen Complaint, unpublished Memorandum Report to Rick Smith, Permit Supervisor: Utah Div. of Oil, Gas and Mining, Dept. of Nat. Resources;

EXHIBIT A

Sanchez, D. D. and Brown, T. L., 1986, Stratigraphic Framework and Coal Resources of the Upper Cretaceous Blackhawk Formation in the Trail Mountain and East Mountain Areas of the Wasatch Plateau Coal Field, Manti 30'x60' Quadrangle, Emery County, Utah: U. S. Geological Survey Map C-94-C;

Spieker, E. M., 1931, The Wasatch Plateau coal field, Utah: U. S. Geological Survey Bulletin 819;

Stokes, W. L. and Cohenour, R. E., 1956, Geologic Atlas of Utah, Emery County: Utah Geol. and Min. Survey Bulletin 52; and

Sumsion, C. T., 1979, Selected Coal-Related Ground-Water Data, Wasatch Plateau-Book Cliffs Area, Utah: U. S. Geological Survey Open-File Report 79-915, prepared in cooperation with the U. S. Bureau of Land Management.

Your attention is directed to the attached hydrologic map which I have prepared on top of the base map of part of Map C-94-D by Brown and others (1987), previously listed.

The faults and prominent joint trends which I have superimposed on this map have been discerned from a combination of personal observations in the field and the study of stereoscopic pairs of aerial photographs obtained from the U. S. Department of Agriculture, being at a scale of approximately 1 inch = 2000 feet, dated 9/23/52, and 1 inch = 5000 feet, dated 9/5/86.

Hydrologic data upon which the potentiometric groundwater contours are plotted are from a combination of drill holes, springs, and observations from within the Bear Canyon Mine. From the cooperation of Wendell Owen of the Co-Op Mining Company, a tour was provided through the existing Bear Canyon Mine along with an explanation from him of past and present conditions within the mine, expecially with regard to water encountered, diverted and used. Also, additional data of the Bear Creek Mine was obtained from viewing a current mining map at the mine, and from the study of maps of the mine dated December 1, 1989, and updated March 7, 1990, submitted to the Emery County office by Co-Op Mining Company. It is my understanding that mining commenced in the Bear Canyon Mine in the year 1982 and ended in the Trail Canyon Mine at about the same time.

The base map which I have used, by Brown and others (1987) illustrates the contact between the Star Point Sandstone and the overlying Blackhawk Formation. The mining coal beds exist within the Blackhawk Formation. Attached to this report is a stratigraphic section of the rock formations present in the area, copied from Danielson and others (1981), Table 1, which illustrates the relationship and description of these rock units. The Birch Spring and Big Bear Canyon Spring of concern discharge from the lower sandstone units of the Star Point Sandstone of upper Cretaceous age, and their locations are shown on the attached map, being within the west and east halfs Section 26, T 16 S, R 7 E. The Star Point Sandstone thickens at and in the vicinity of Big Bear Canyon Spring as shown on the attached Figure 9, Trail and Bear Creek Canyons Stratigraphic Section, from Brown and others (1987). Big Bear Spring discharges downslope from their measured section H47, within the basal, thick sandstone unit of the Star Point Sandstone.

As shown on the attached stratigraphic description of Table 1, the Star Point Sandstone Formation consists of cliff-forming, fine-medium grained sandstone beds that are thin to thick-massive and interbedded gray shale. It is about 400 feet thick and grades downward into the Masuk Member of the gray Mancos Shale which is about 700 feet thick. This thick shale serves as a barrier to downward-moving ground water.

The upper unit of the Star Point Sandstone is medium-thick bedded, well jointed and is presently spilling ground water through the joints and bedding planes, where it overlies a thick section of gray shale containing thin beds of sandstone. This spilling water because of cold weather, has mainly frozen into prominent icicles on the face of the cliffs, upslope from the Big Bear Canyon Spring.

The Blackhawk Formation which overlys the Star Point Sandstone contains the various coal beds that are mined in the area. It is mainly comprised of lenticular, discontinuous sandstone beds, interbedded with gray and tan shales with coals. It is about 650 feet thick.

Conformably above the Blackhawk Formation is the Castlegate Sandstone approximately 200 feet thick, consisting of light brown stream-deposited sandstone and conglomerate. It forms prominent cliffs and is well jointed.

The Castlegate Sandstone is overlain by the North Horn Formation which is both Cretaceous and Tertiary in age. Its total thickness is reported to be about 800 feet, and it consists mainly of vari-colored shale and mudstone interbedded with sandstone and some limestone, being deposited by both streams and lake. It caps the higher mountain ridges and tops of this area, and has been differentially eroded to a lessor thickness.

All of the above described formations are exposed at the surface in the region at varying altitudes from 6800-10,000 feet. Average annual precipitation on Gentry Ridge and Mountain to the north reaches 20-30 inches. Danielson and others (1981) concluded that of this precipitation, groundwater recharge was derived from the snow part of it, and that because of differences in surface relief, water content of the snowpack,, and variable rock permeability, the groundwater recharge from this precipitation varies in the area. They observed that the surface relief on the tops of Trail and Gentry Mountains is low because there is not an extensive outcrop of Flagstaff Limestone (the formation immediately above the North Horn Formation), and concluded that groundwater recharge to Trail and Gentry Mountains probably is intermediate to the recharge that occurs on east Mountain and on the steep slopes of Seeley Mountain. They further concluded that the amount of recharge to Trail and Gentry Mountains is probably reflected in the number of springs in these two areas, most of which discharge from the North Horn Formation.

Danielson and others (1981) further reported that recharge to the Star Point -Blackhawk aquifer from direct infiltration of snowmelt on areas of outcrop is probably small in comparison to direct recharge to the Flagstaff Limestone. In the southern part of their study area which included Cottonwood Creek, they observed that outcrop areas of the Blackhawk Formation and Star Point Sandstone usually are less than a mile wide and are usually on steep slopes. They concluded that most of the recharge to the aquifer in the southern part of the area is probably from downward percolation of water, mainly along faults and fractures

from overlying water-bearing zones. In the northern part of their study area, which included the upper drainage of Huntington Canyon, they concluded that the Blackhawk and Star Point formations are exposed over a much greater and wetter area than in the southern part, and that more springs issue from the Blackhawk and Star Point in the northern part of the area, generally reflecting the greater amount of recharge on their outcrops.

Structurally, the subject area, including Gentry Ridge and Mountain to the north and the Meetinghouse Canyon area to the south of Huntington Creek, is unique in being a broad (1½-2 miles wide) graben (a down-dropped area of the earth's crust). This graben extends from the Pleasant Valley Fault on the west which extends northerly through Secs. 22, 27 and 34, T 15 S, R 7 E; Secs. 3, 20, 15, 22, 27 and 34, T 16 S, R 7 E; and Secs. 3 and 10, T 17 S, R 7 E; and the Bear Canyon Fault on the east which extends northerly through Secs. 24, 25, 36, T 15 S, R 7 E; Secs. 1, 12, 13, 24, 25 and 35, T 16 S, R 7 E; and Secs. 2, 11, 14 and 23, T 17 S, R 7 E. Reported maximum displacements on these major faults are 140 feet on the Pleasant Valley Fault and 150 feet on the Bear Canyon fault. Many other northerly-trending, near-vertical faults and prominent joint trends exist between the stated major faults, as shown on the attached hydrogeologic map. Less prominent but plentiful are near-vertical cross-joints in the bedrock which trend N 60°W and N 65-68°E.

Regionally the rock strata in the area dip 2-3 degrees from horizontal to the southeast, but locally within the various fault wedges near the fault planes, the beds may be tilted otherwise. The base map (Brown, et al 1987) used in constructing the attached hydrogeologic map contains structure contours drawn on top of the Star Point Sandstone at an interval of 100 feet. However, this contouring was not extended by them into the graben area between the Pleasant Valley and Bear Canyon Faults. But, their structure contouring a few miles west and a few miles east of the general graben area shows a gently, broad, northeasterly-trending anticline with its axis projecting through Gentry Mountain, and an associated synclinal axis projecting north-northeast of the Bear Canyon Fault. Thus, this warping of the rock strata along with the faults and joints formed within them have created a secondary porosity and permeability therein which has facilitated and enhanced the infiltration, storage and transmission of ground water, forming both perched and general groundwater aquifers, and spillage avenues for spring water. Contouring drawn on the floor of the Bear Canyon Mine, as shown by their engineer, on revised mine map of March 1, 1990, reflects the structure of the rock strata there. It shows local, warping of the rock strata into a small, shallow dome within the center of the E/2 E/2 Sec. 23, T 16 S, R 7 E, which is apparently related to movement along the west side of the Bear Canyon Fault.

Ground water is also stored and conveyed through the intergranular porosity and permeability that exists between the individual sand grains of the many and various sandstone beds present in the area. This is small compared to the secondary porosity and permeability formed from joints, fractures and faults. In addition, greater than the intergranular permeability but less than the secondary permeability of joints and faults, is porosity and permeability along the bedding planes. Because shales are composed mainly of clay, when this clay becomes wetted both the fracture and bedding permeability within the shales are reduced or made nil, as the clays swell and heal, unless the water pressure is sufficient to erode and maintain the water conveyance channels.

Thus, the principal recharge area to the Birch and Big Bear Canyon Springs is Gentry Ridge and Mountain. The principle infiltration and conveyance channels for groundwater feeding the subject springs are the faults and joint systems shown on the stated map, with bedding planes and intergranular porosity being important but more restricted to specific rock units and aquifers. The faults transect all of the rock formations and units, including the shale beds, which allow the infiltration of water directly from the land surface and the spilling of one aquifer to another, up or down depending upon the groundwater pressures involved.

On the attached hydrogeologic map I have drawn potentiometric contours for the ground water in the Blackhawk-Star Point aquifer. The movement of ground water is normal to these potentiometric contours, which is to the southwest and south. Faults and some joints locally interupt and change the groundwater potentiometric surfaces of the various aquifers. The Blackhawk-Star Point aquifer potentiometric surface is also plotted on the attached Hydrogeologic Section (A-A') from Tie Fork Spring through Gentry Mountain to the Big Bear Canyon Spring, and its relationship to the various formations and position of the coal beds in the Bear Canyon Co-Op Mine, can be observed.

Any of the various sandstone or coal units are potential aquifers at any position below the land surface. Where shale beds overlie sandstone or coal units which do not have exposure to the surface, groundwater recharge likely enters them via fault conduits. Thus, aquifers varying from perched, unconfined, and confined may exist and probably do. The perched and unconfined aquifers within bedrock are likely of relatively small storage and yield, and at some elevations contribute to water that recharges confined aquifers.

The ground water being produced from the Bear Canyon Coal bed is apparently perched and unconfined, resting on an underlying siltstone and shale bed. Since this flow has been interupted by the coal mining operations, the underground flow path of some of this ground water has been changed. Since the potentiometric surface of the Blackhawk-Star Point aquifer, from which both the Birch Spring and Big Bear Canyon Spring issue, is at a lower elevation here, some of this in-mine ground water originally contributed some recharge to the Blackhawk-Star Point aquifer along and through faults. How much this original recharge amounted to is not known and could only be quantified by a comparison of accurate spring -flow measurements over a period of at least two years prior to the coal mining, with similar spring measurements over at least two years since coal mining, with an adjustment for changes in precipitation and transmission lag through the measuring periods. Since the recharge to the Big Bear Canyon Spring involves the complete area to the north, including the west Hiawatha mining area, and several fault conduits, the total effects of mining with change in groundwater flows contribute to changes in the Big Bear Spring flow. Thus, in all of the mining operations, ground water that is shifted out of its original flow paths, especially that part of the ground water which did not naturally discharge to the surface as springs or base-flow to streams, is subtracting from the total groundwater system. Danielson, and et al (1981) report that dewatering of the King Mine in the Hiawatha area to the north, probably diverts ground water into the drainage of Cedar Creek, which flows away from the Huntington Canyon area.

Similarly, at the Co-Op Bear Canyon Mine, the ground water which is diverted for mine uses both inside and outside of the mine (estimated to be between 50 -100 gpm), is spilling away from original recharge into existing faults bounding the coal mine. Apparently, some of this water is now spilling through sandstone units at a lower elevation than the coal, which outcrop as cliffs above shale beds, on the south-facing slopes above the Big Bear Canyon Spring. Although some of this spilling water may have occurred originally before any mining operations, much of the present flow appears to be new because of the lack of sustained, water loving vegetation in or near the flow-paths of this water that has surfaced. Because this water is discharging at several places in varying amounts, it would be difficult to measure. It is estimated that at the present time it is approximately 50 gpm. See attached photographs of this area where the discharging water is inpart freezing as large icicles at the land surface.

From available data, as illustrated on the attached hydrogeologic section A-A', the existing faulting through the area from Tie Fork to Big Bear Canyon Spring never completely offsets the Star Point Sandstone against impervious shale beds. Thus, the 350-450 feet thick Star Point Sandstone and overlying basal sandstone units of the Blackhawk Formation, which form the Blackhawk-Star Point aquifer, remain continuous from the main area of recharge to the Big Bear Canyon Spring and to Birch Spring. This provides for a large inter-connected groundwater storage to sustain the continuous existence of the subject springs. The rate of yield to the springs is influenced by the cumulative hydraulic head, of the total, infiltrating groundwater recharge. When some of this recharge is diminished, it will adversely affect the flow rate of the springs.

From the courtesy of Darrel Leamaster and Ben Grimes, discharge records of Big Bear Canyon Spring, Birch Spring, and Tie Fork Spring, and precipitation records have been provided to me. I have combined the flow data for Big Bear Canyon Spring onto one graph for the years 1980-1990, with the inclusion of the average snow melt equivalent in inches of water for the years 1961-1985. This shows that since the year 1987 to the present, there has been a substanial, steady reduction in spring flow from that of the previous years measured and recorded, back through 1980, although the year 1982 was somewhat lower than the other years, but higher than the years since 1987. The average snow water equivalent for the years 1961-1985 in comparison with the peak flow periods of the spring show that there is a three month lag in transmission time for the movement of the recharge water to the spring discharge.

In comparing this graph to that of a graph of average annual precipitation for the three weather stations at Stuart Ranger Station, Red Pine, and Mammoth -Cottonwood, which are all in the close proximity, the average annual precipitation of the area has also dropped for the years 1987-90. Thus, it complicates the quantifying of how much of the reduced spring flow is actually the result of mining operations.

In comparing the flows of the Big Bear Spring with those of Tie Fork Spring (see attached graph from the Castle Valley Special Service District), for the years of 1983-1989, they tend to conform except for the latter part of 1988 when the Tie Fork Spring jumped by about 70 percent. Although there is general inter-connection of the recharge to both springs, Tie Fork Spring is possibly being influenced by mining operations in the west Hiawatha area.

A study of the chemical analyses performed on water samples collected from the Big Bear Canyon Spring from 1977 to January 14, 1991, do not show any significant change until the 1991 analysis. Until 1991, the total dissolved mineral solids have been at or close to 300 mg/l and sulfate content 29 to 48 mg/l. The January 14, 1991, record showed a 27 percent rise in TDS to 382 mg/l. Also, the sulfate content had a jump of 114 percent to 103 mg/l over the highest past analysis of 48 mg/l on a sample collected September 9, 1990. This change in 1991 is significant and indicates some abnormal injection into the recharge system to the spring of sulfates. I believe that these sulfates are being leached from shale beds in the upper Star Point formation, immediately below and by the ground water that is spilling from sandstone beds previously referred to and shown in the attached photographs. A part of this spilling ground water is likely infiltrating into the joints that are exposed immediately downslope from which the Big Bear Spring is discharging.

It is therefore my conclusion that the affect of the Co-Op Bear Creek Mine and possibly the Trail Creek Mine operations have been relatively small in adversing the rights in the Big Bear Canyon Spring, both as to flow rate and contamination. The affect of a small reduction in recharge to the Springs is estimated to be considerably less than the 25 percent allowance provided in paragraph 3, page 1 of the agreement between Co-Op Mining Company and Huntington City, dated January 27, 1982. However, the proposed expansion of the Bear Canyon Mine operations northward another 3/4 mile to the north line of Section 14 will extend the mined area to approximately 75 feet higher in elevation, up-dip than at present (75+7580=7655 feet), which will be near intersecting the potentiometric surface of the Blackhawk-Star Point aquifer. See attached hydrogeologic map and section. Thus, in faults that cut through confining shale beds between the aquifer and mined coal, and within interconnecting cross-joints to these faults, considerable ground water may be encountered, and if diverted away from getting back into the natural conduit system, it would subtract from recharge to the Big Bear Canyon Spring. Also, any contamination generated in the mine workings that could possibly infiltrate into the natural recharge conduit system to the spring, may further adverse spring water quality.

If the groundwater spillage remains as high or increases at the cliff faces upslope from the Big Bear Canyon Spring, there will be a further increase in sulfate content of the spring water, which is undesirable.

With regard to Birch Spring belonging to the North Emery Water users Association, the general hydrologic conditions stated for the Big Bear Canyon Spring also apply here. However, Birch Spring is discharging from a prominent, normal fault having about 20 feet of displacement down on the west, whereas Big Bear Canyon Spring is discharging from three prominent joints along which no obvious displacement has occurrred. Both springs discharge from the lower sandstone unit of the Star Point Sandstone, and the thick, underlying Mancos shale serves as a barrier and deflector to the downward movement of ground water.

The fault from which the Birch Spring issues splays and intersects with other faults which all extend through the mined area of the Co-Op Trail Canyon Coal Mine, as shown on the attached hydrogeologic map. And since the Trail Canyon removed its coal from the Hiawatha seam near the base of the Blackhawk Formation and near the top of the Star Point Sandstone, its total impact on the Birch

Spring is appreciably greater than the impact of the Bear Canyon Mine on Big Bear Canyon springs. Most any ground water encountered in the mine and diverted away from its natural and original conduits would have subtracted from likely recharge supply, through faults, to the Birch Spring. Because of the obvious, open space within the fractured sandstone within the fault zone, that is 12 feet wide at the Birch Spring, any contaminants within the Trail Creek Mine would have easy access into the Blackhawk-Star Point aquifer.

The Trail Canyon Mine which has now had its pillars removed, and since about the year 1982 has been experiencing caving. Such caving to one degree or another has facilitated the rock permeability within and above the mine. Past mining may have partially plugged fault and fracture openings in the mine floor, which original openings may have extended into the underlying Blackhawk-Star Point aquifer. How the encountered groundwater flow has adjusted in its flow pattern within the closed Trail Creek Mine is unknown to me. The potentiometric surface of the Blackhawk-Star Point aquifer could possibly have been encountered within the north-end workings of the Trail Canyon Mine as indicated by the projected contours on the attached hydrogeologic map.

In comparing the attached flow graph of the Birch Spring with flow graphs of Tie Fork Spring and Big Bear Canyon Spring, along with graphs of annual precipitation and average snow water equivalent, the anomalous jump in Birch Spring flow (80 gpm to 230 gpm) from October 1989 through January 1990 is obviously unatural. Furthermore, from the descriptions provided me of this occurrence, I conclude that it is definitely associated with mining activity, and most probably within the caving Trail Canyon Mine. The visual and chemical analysis which showed "oil and grease" with large quantities of suspended sediment in a water sample collected from the spring in October 1989, along with the jump in total dissolved mineral solids (674 mg/l) double of what was analyzed of the spring water in September 1980 (360 mg/l) evidences that contaminated water held in temporary storage within the mine was released suddenly and entered into the fault conduit system that recharges Birch Spring. This sudden entry into the fault conduit was likely due to a build-up in water storage and head within the caved mine to create sufficent water pressure to break through and flush a previously plugged section of the fault. The fact that this anomalous high flow (approximately 0.5 cubic-foot/second) continued for a period of nearly three months evidences that considerable ground water was held in temporary storage. This would amount to approximately 90 acre-feet or about 29,000,000 gallons of water.

Also, the fact that no coliform bacteria was analysed in water samples collected from Birch Spring on August 1, 1986, and December 2, 1986, but in a sample collected October 19, 1989, it showed 16 coliforms present, further shows that the anomalous flow either carried or flushed coliform containing material into the recharge of the spring. A part of this material may have been from packrat and bat dung which I observed to be plentiful within large fractures of the sandstone, in the exposed 12-foot wide fault zone, immediately north and up-gradient from Birch Spring.

Thus, I conclude that continued caving within the Trail Canyon Mine will create additional affects on the Birch Spring, some of which could be beneficial by providing for increased infiltration of snow-melt to create greater recharge to the spring, and some may be adverse such as occurred in late 1989.

The proposed extension of coal mining within the 80 acre tract of the E/2 NW/4 Section 26, immediately east of Birch Spring could possibly adversely affect the spring. This is because cross-jointing in this area intersects the northerly trending fault which is the recharge conduit to the Birch Spring. Any recharge water now coming to the spring through these less prominent cross-joints, out of the Blackhawk Formation, that would be intercepted and diverted away by the coal mining would diminish the spring flow. However, the most prominent groundwater transmission system in the area is the north-trending faults and joints, and most of the recharge to Birch Springs comes from the north through this system. Thus, the proposed northerly extension of the Bear Creek Mine into the N/2 of Sec. 14, T 16 S, R 7 E, could also cause a reduction in recharge to the Birch Springs by the intersection and diverting of ground water away from its natural conduit system.

Respectfully submitted,

S. Bryce Montgomery

Attachments

S. Bryce Montgomery, Geologist

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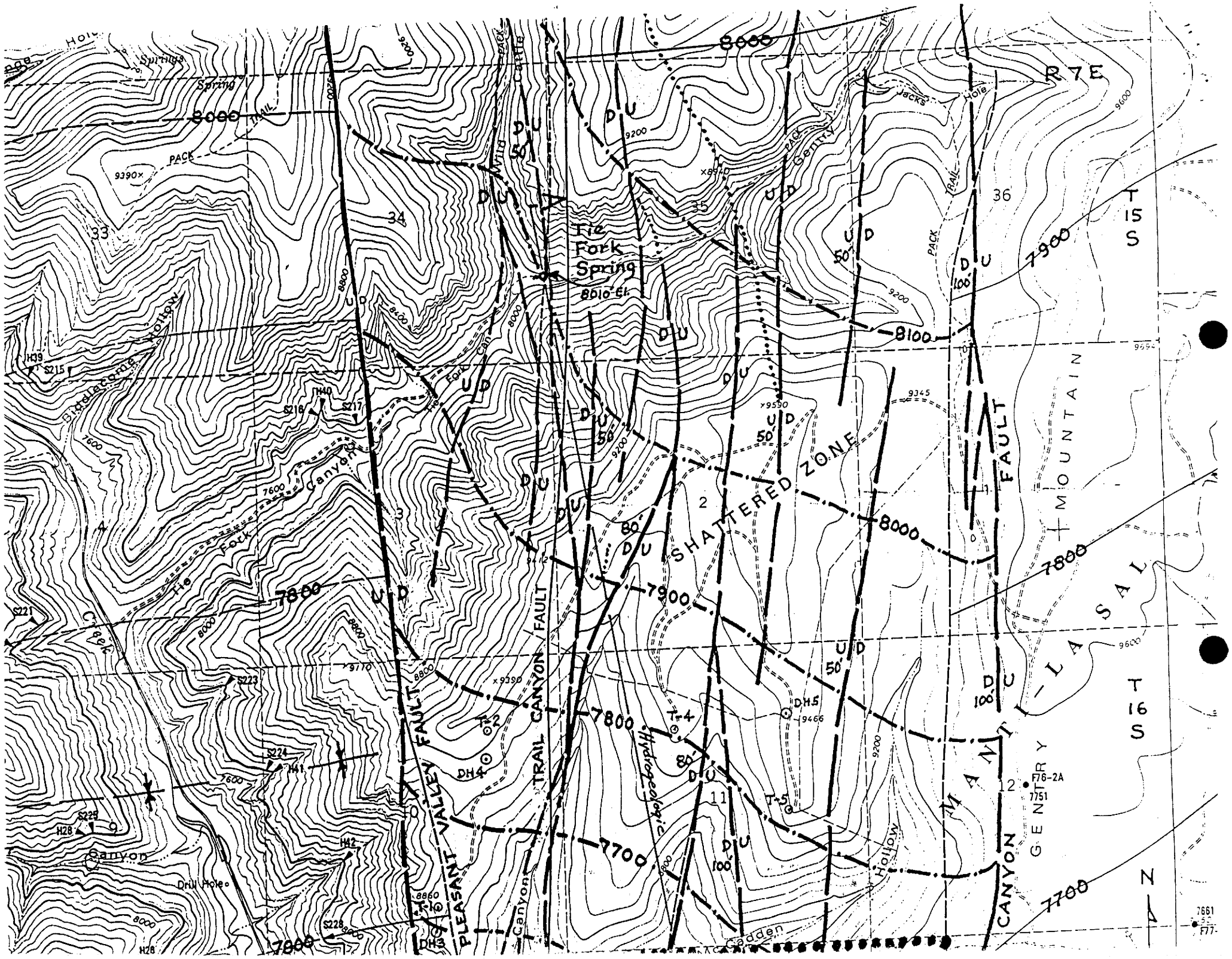
Bountiful, Utah 84010

Telephone 298-9108 office
295-8592 home



R 7 E
T 15 S
T 16 S
Tie Fork Spring
8010' El.
SHATTERED ZONE
PLEASANT VALLEY FAULT
TRAIL CANYON FAULT
MANTI-LA SAL FAULT
MOUNTAIN
GENTRY
Hydrogeologic
Canyon
Drill Hole
Tie Fork Canyon
Biddlecome Hollow
Jacks Hole
Gentry
Hollow
Wild Cattle
PACK TRAIL
Spring
8000
8100
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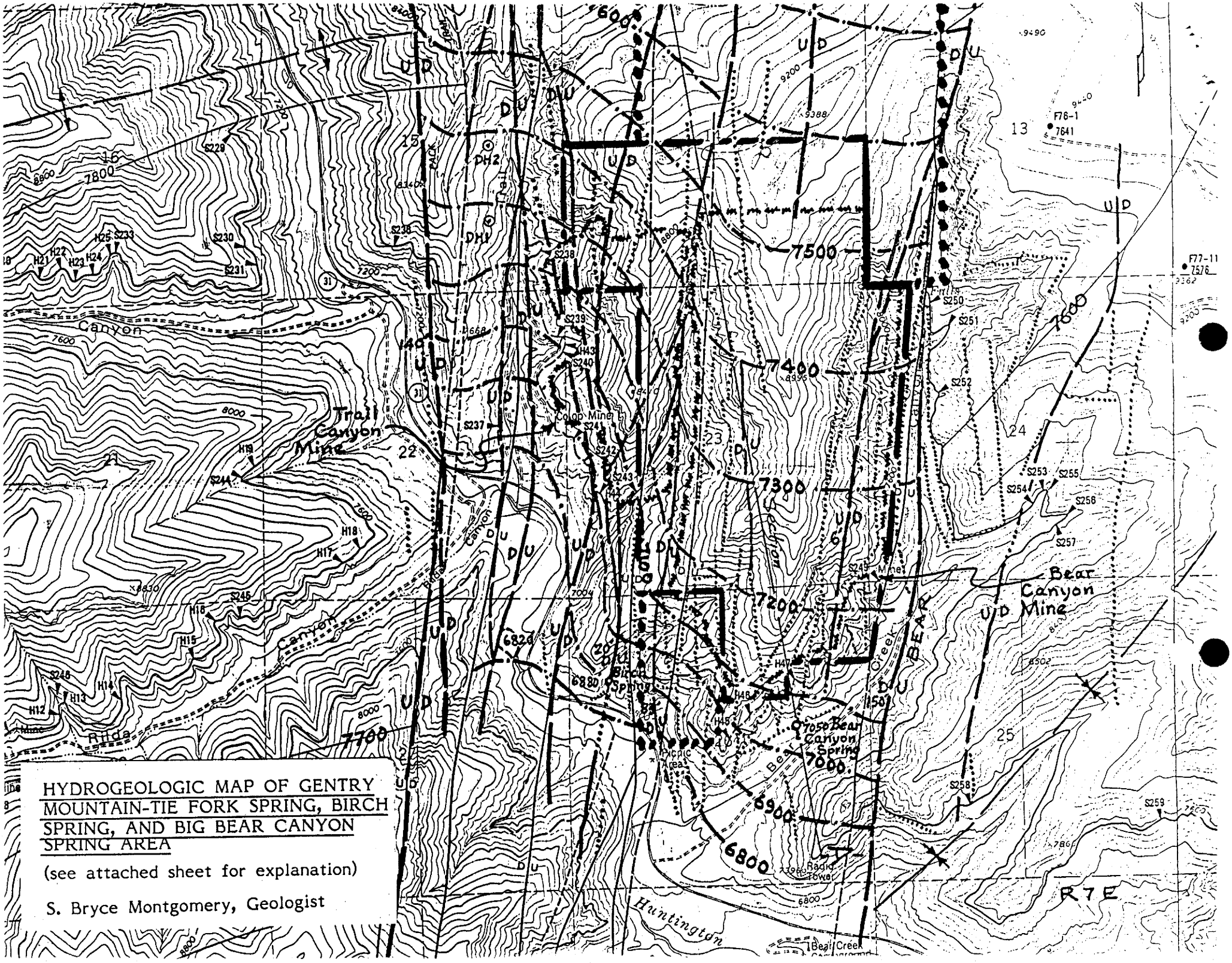


HYDROGEOLOGIC MAP OF GENTRY MOUNTAIN-TIE FORK SPRING, BIRCH SPRING, AND BIG BEAR CANYON SPRING AREA

(see attached sheet for explanation)

S. Bryce Montgomery, Geologist

Explanation for -

HYDROGEOLOGIC MAP OF GENTRY MOUNTAIN-TIE FORK SPRING, BIRCH SPRING, AND BIG BEAR CANYON SPRING AREA

Scale: 1 inch = 2000 feet Topographic contour interval = 80 feet

Base map from part of Brown, and et al, 1987, U. S. G. S. Map C-94-D

S. Bryce Montgomery, Geologist January 1991

LEGEND:

For base map-

MAP EXPLANATION from Brown, et al (1987) USGS Map C-94-D

CONTACT—Between the Star Point Sandstone and overlying Blackhawk Formation. Chevrons enclose zone of intertonguing

U/D FAULT—Dashed where approximately located; short dashed where inferred. U, upthrown side; D, downthrown side

ANTICLINE—Showing direction of plunge

—7500— STRUCTURE CONTOURS—Drawn on top of Star Point Sandstone. Dashed where approximately located or projected. Contour interval 100 feet

• USGS-1 8043 DRILL HOLE—Drilled by U.S. Geological Survey (USGS), Three States Natural Gas Co. (TSN), Utah Geological and Mineral Survey (UGMS), and U.S. Fuels Co. (F). Elevation of top of Star Point Sandstone shown in feet

H28 MEASURED SECTION—S, from Spieker (1931); H, from authors

Other-

U/D 20' Fault discerned from aerial photograph and/or field examination; U on upthrown side; and approximate displacement in feet, observed or reported by others.

Prominent joint trend.

—7200— Groundwater potentiometric surface contours, Blackhawk-Star Point aquifer.

Anticlinal axis.

Synclinal axis.

Existing Bear Canyon Mine permit area.

Proposed Bear Canyon Mine permit area.

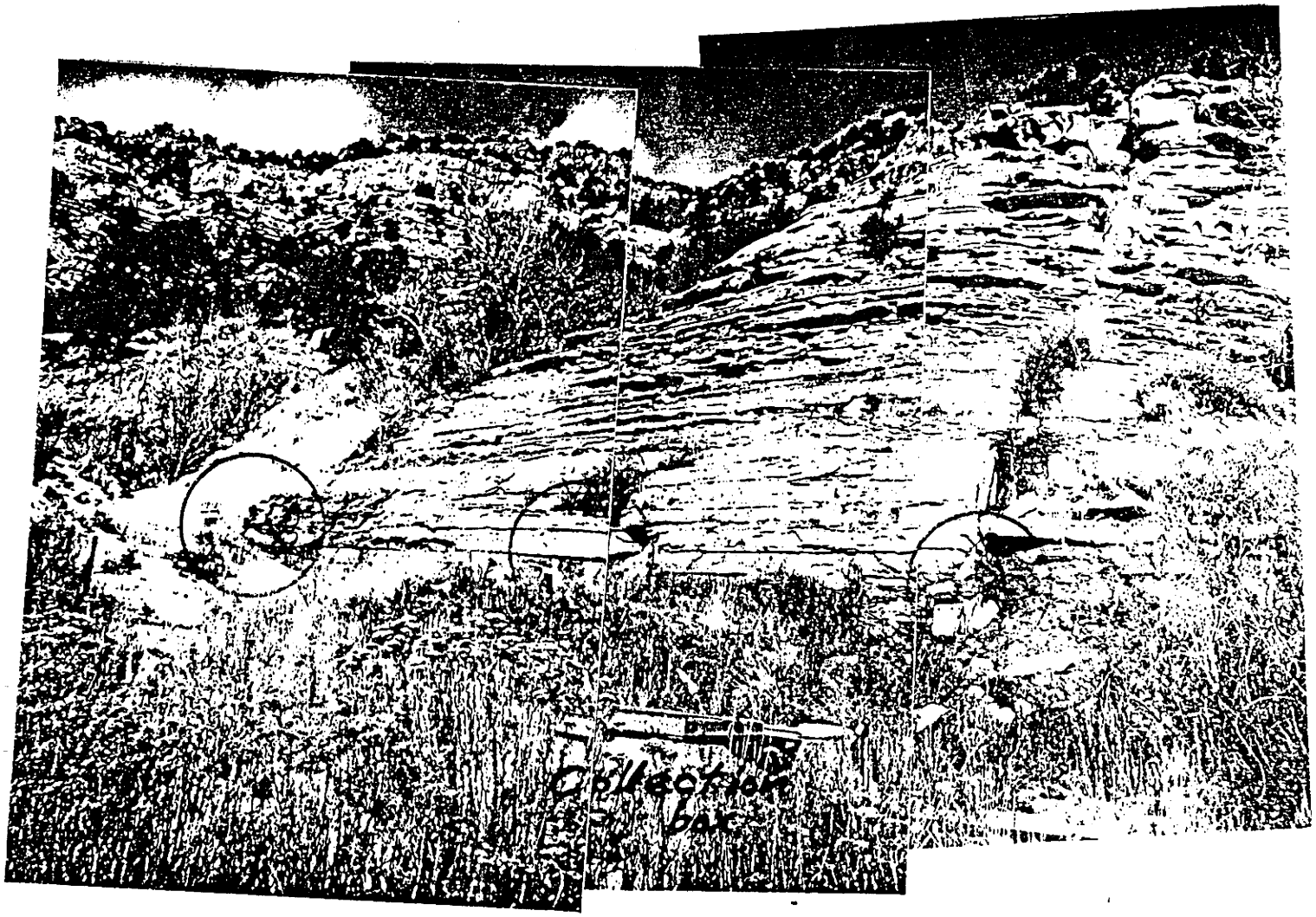
Approximate extent of coal-mined area.

T-5 ⊙ DH3 Approximate location of test drill holes, reported.

Table 1.—Stratigraphic relationships, thicknesses, lithologies, and water-bearing characteristics of geologic units in the upper drainages of Huntington and Cottonwood Creeks (adapted from Stokes, 1964)

System	Series	Formations and members	Thickness (feet)	Lithology and water-bearing characteristics
Quaternary	Holocene and Pleistocene		0-100	Alluvium and colluvium; clay, silt, sand, gravel, and boulders; yields water to springs that may cease to flow in late summer.
Tertiary	Eocene and Paleocene	Flagstaff Limestone	10-300	Light-gray, dense, cherty, lacustrine limestone with some interbedded thin gray and green-gray shale; light-red or pink calcareous siltstone at base in some places; yields water to springs in upland areas. (See table 9.)
	Paleocene	North Horn Formation	800±	Variegated shale and mudstone with interbeds of tan-to-gray sandstone; all of fluvial and lacustrine origin; yields water to springs. (See table 9.)
Cretaceous	Upper Cretaceous	Price River Formation	600-700	Gray-to-brown, fine-to-coarse, and conglomeratic fluvial sandstone with thin beds of gray shale; yields water to springs locally.
		Castlegate Sandstone	150-250	Tan-to-brown fluvial sandstone and conglomerate; forms cliffs in most exposures; yields water to springs locally.
		Blackhawk Formation	600-700	Tan-to-gray discontinuous sandstone and gray carbonaceous shales with coal beds; all of marginal marine and paludal origin; locally scour-and-fill deposits of fluvial sandstone within less permeable sediments; yields water to springs and coal mines, mainly where fractured or jointed.
		Star Point Sandstone	350-450	Light-gray, white, massive, and thin-bedded sandstone, grading downward from a massive cliff-forming unit at the top to thin interbedded sandstone and shale at the base; all of marginal marine and marine origin; yields water to springs and mines where fractured and jointed.
		Masuk Member Mancos Shale	600-800	Dark-gray marine shale with thin, discontinuous layers of gray limestone and sandstone; yields water to springs locally.

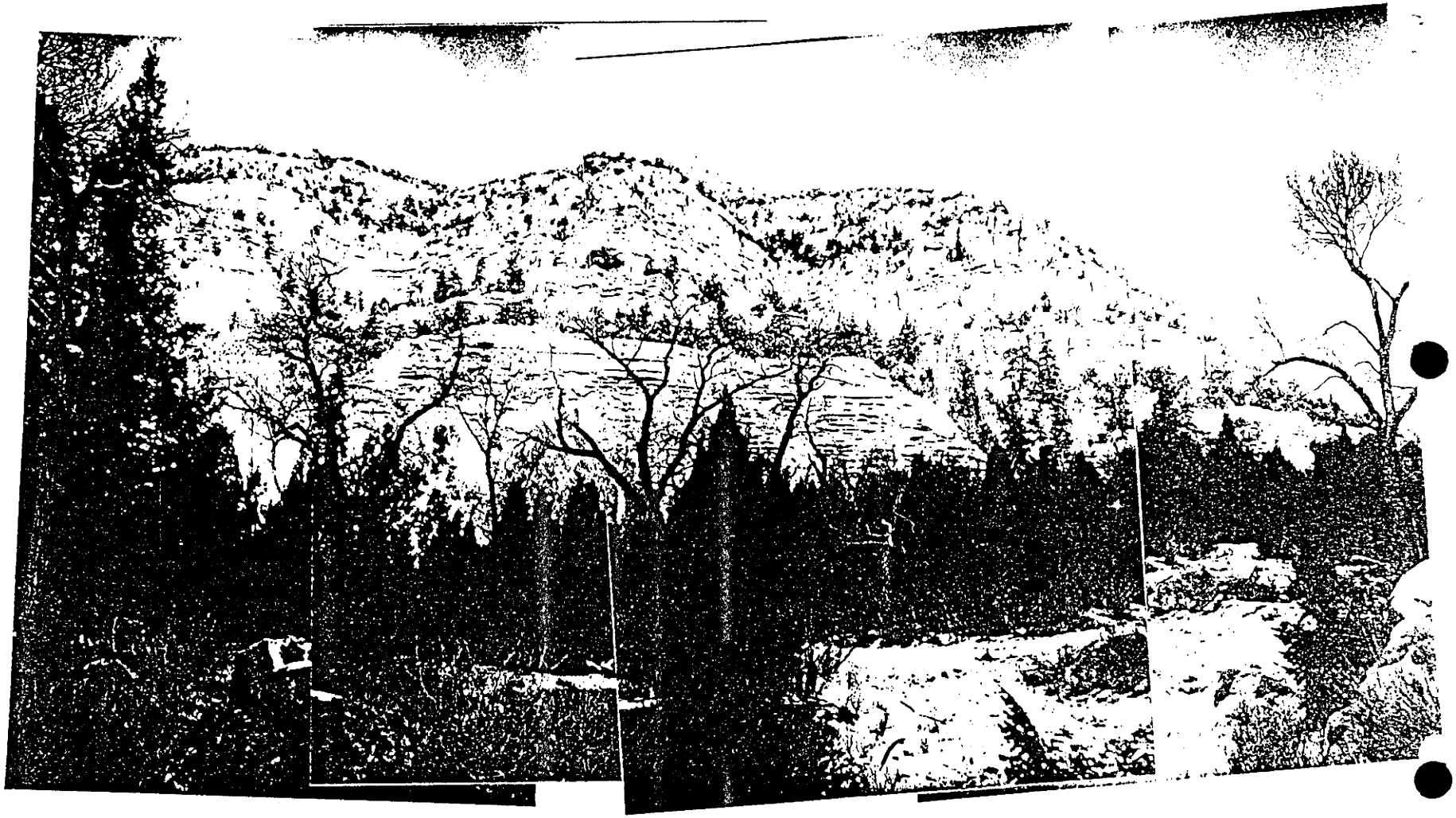
Copied from Danielson, T. W., and et al (1981), U. S. Geological Survey Water-Resources Investigations, Open-File Report 81-539



BIG BEAR CANYON SPRING

View is to northwest showing three circled areas of discharge.

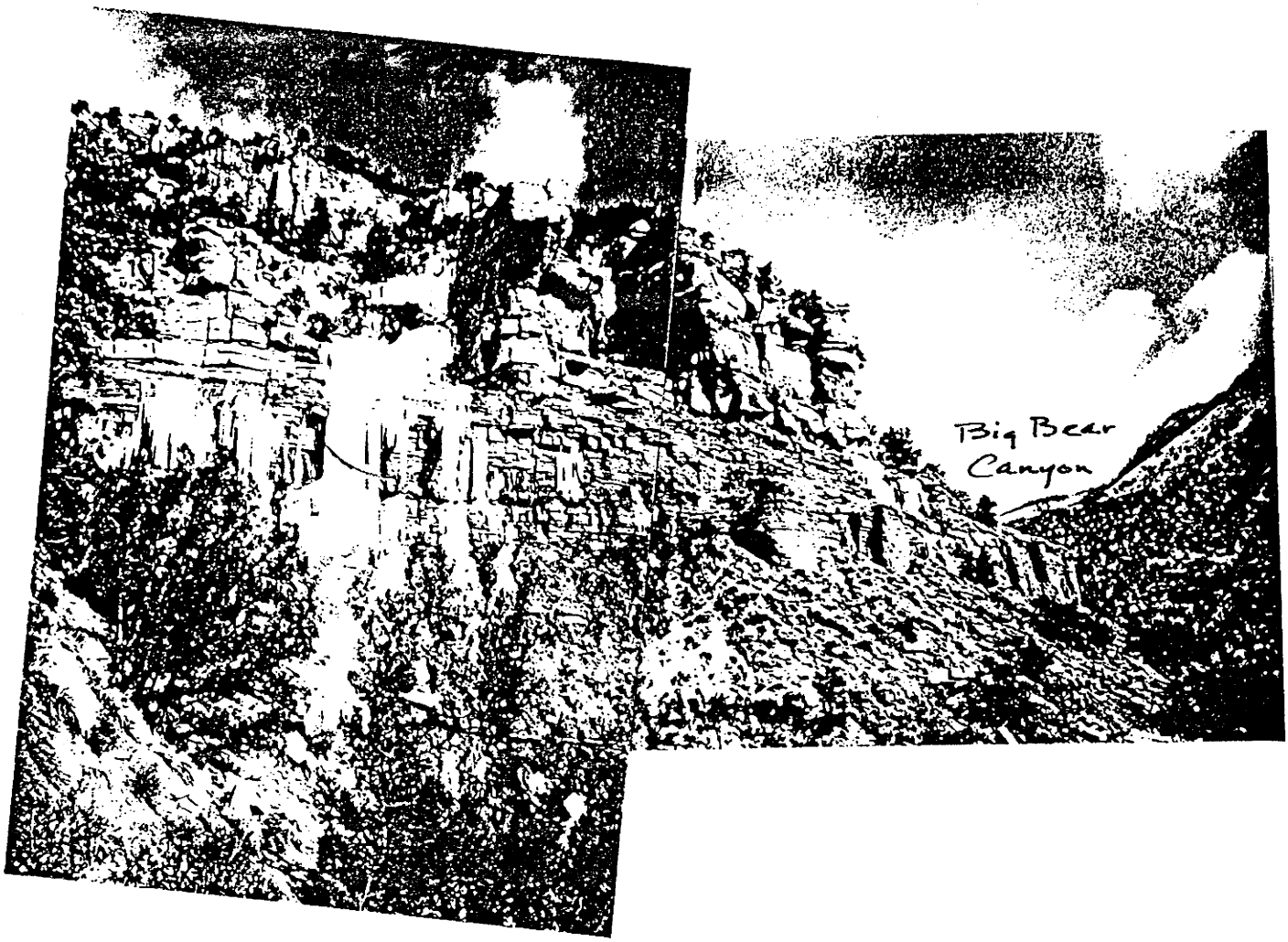
S. Bryce Montgomery, Geologist 1991



BIG BEAR CANYON SPRING GENERAL AREA

View is northwest and spring area is circled.

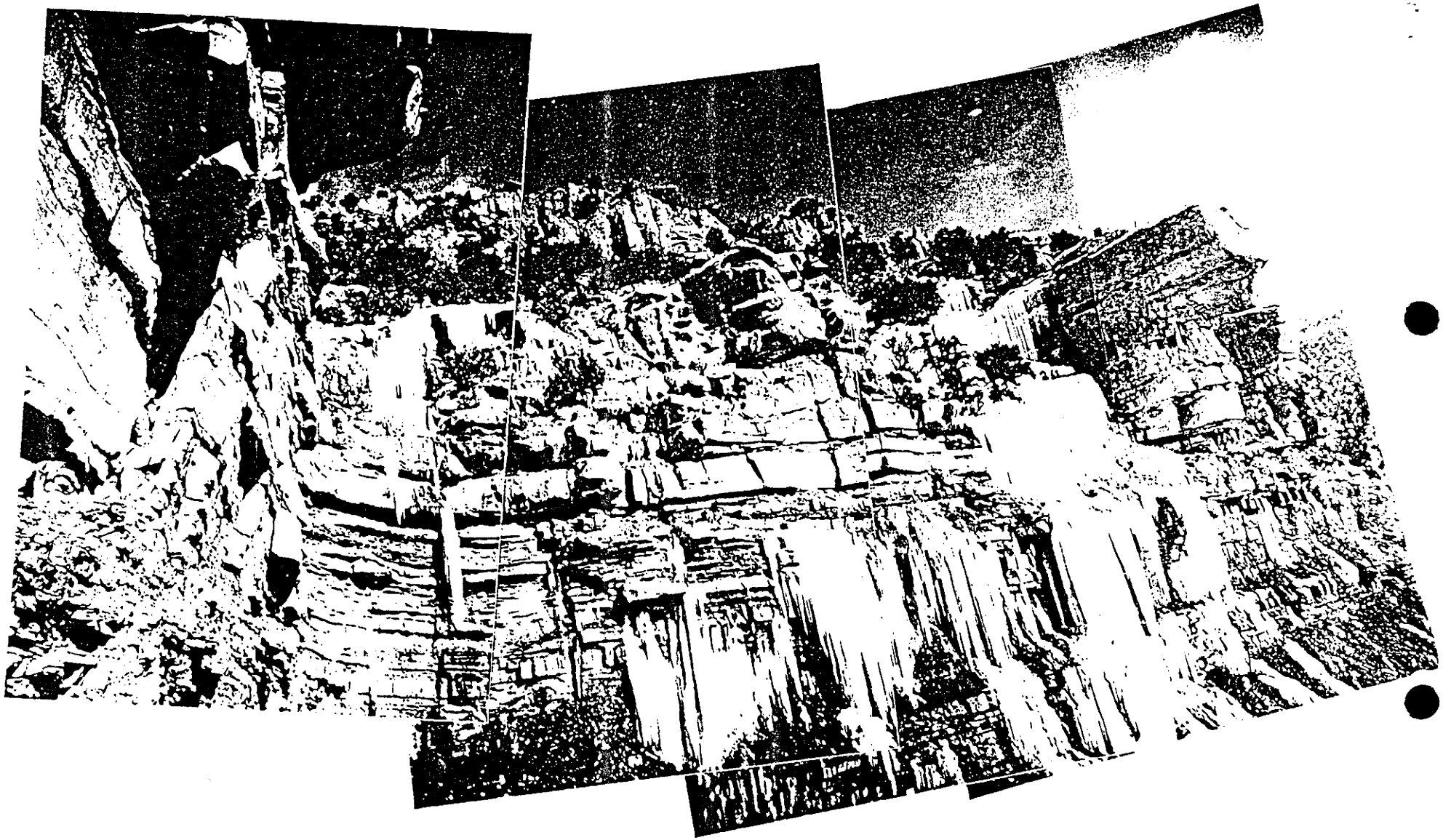
S. Bryce Montgomery, Geologist January 1991



GROUNDWATER SPILLAGE AREA ABOVE BIG BEAR CANYON SPRING

View is northward and discharge area with icicles in basal Blackhawk - upper Star Point Formations is circled.

S. Bryce Montgomery, Geologist January 1991



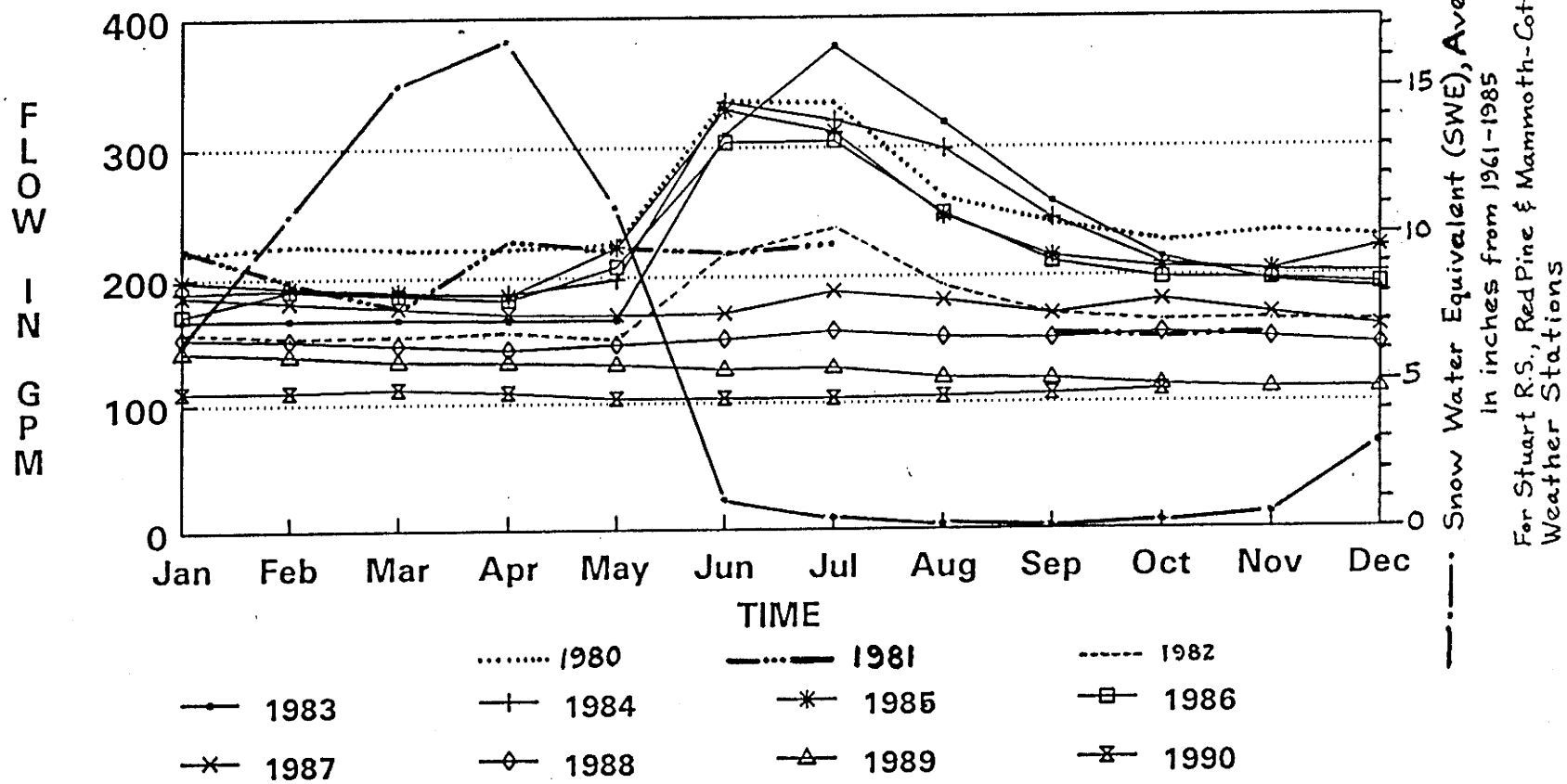
CLOSE-UP OF GROUNDWATER SPILLAGE AREA ABOVE BIG BEAR CANYON SPRING

View is northward showing icicle formations at discharge areas in basal Blackhawk-upper Star Point Formations.

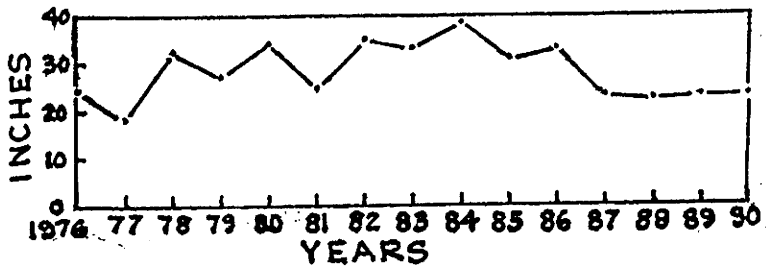
S. Bryce Montgomery, Geologist January 1991

Huntington Spring Flow

Big Bear Spring



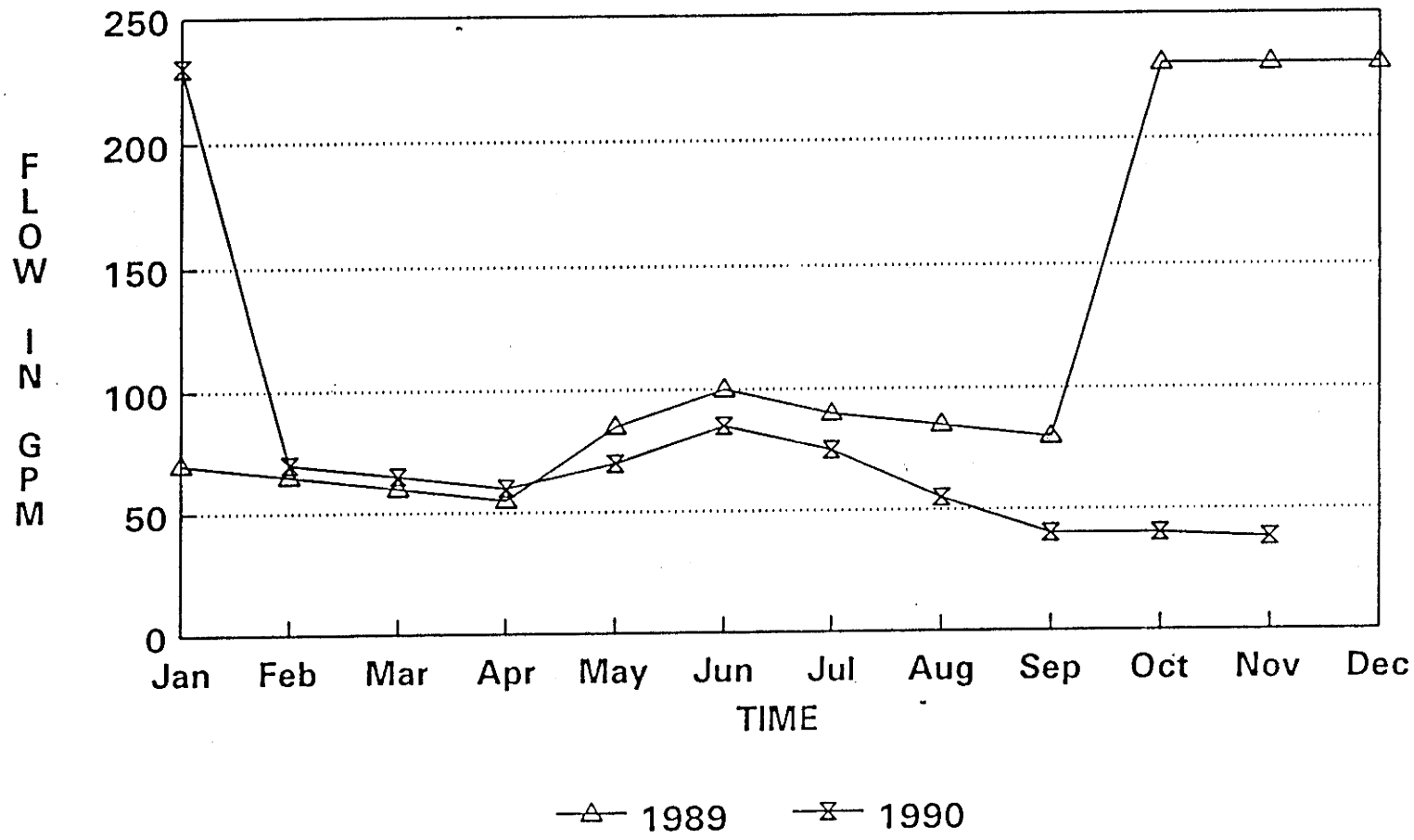
Data From Castle Valley Special Service District



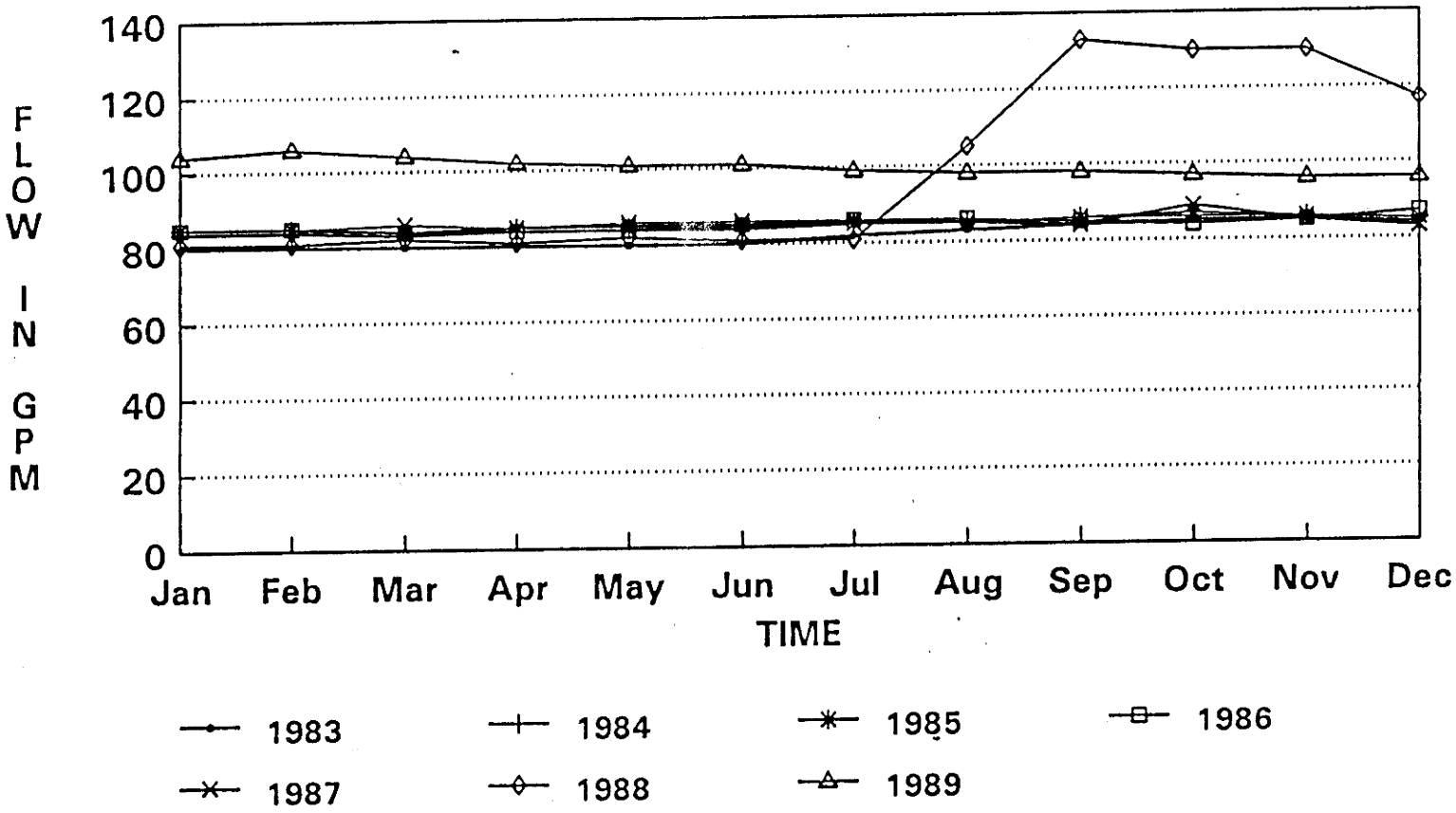
AVERAGE ANNUAL PRECIPITATION FOR THE THREE WEATHER STATIONS OF STUART R.S., RED PINE AND MAMMOTH - COTTONWOOD YEARS 1976-1990

NEWUA Spring Flow

Birch Spring



Huntington Spring Flow
Tie Fork Spring



Data From Castle Valley
Special Service District

February 8, 1991

Mr. Darrel V. Leamaster, P. E.
District Manager
Castle Valley Special Service District
P. O. Box 877
Castle Dale, Utah 84513

Mr. Menco Copinga, President
Board of Directors
North Emery Water Users Association
Box 418
Elmo, Utah 84521

Gentlemen:

Re: Follow-up Report to my Hydrologic Investigation and Report (dated January 28, 1991) of Big Bear Spring and Birch Spring Relative to Co-Op Mining Company Past, Present, and Proposed Coal Mining, T 15-16 S, R 7 E, SLB & M, Emery Co., Utah, since the hearing conducted by the Utah Division of Oil, Gas & Mining on February 5, 1991.

As a follow-up to the hearing conducted by the Utah Division of Oil, Gas & Mining on February 5, 1991, in Castledale, Utah, relative to the above referenced, and our meeting together with others representing the two water districts, including attorneys and engineers, later that same evening, I submit the following.

After further reviewing my own subject report with associated, gathered data, on February 6, 1991, I visited the office of the Utah Division of Oil, Gas & Mining in Salt Lake City and researched further files on the adjacent Trail Canyon Coal Mine of the Co-Op Mining Company, and the coal mines located to the north owned by the Plateau Mining Company, and the United States Fuel Company. Also, while at the Division offices I was able to meet with the geologist David Darby and hydrologist Tom Munson who are involved with the investigation and permiting of the coal mines in the subject area, and we discussed aspects of the subject matter.

This additional research in combination with information presented by representatives of the Co-Op Mining Company at the stated hearing does not change my conclusions presented at the hearing, but do present further understanding and support for those conclusions.

With regard to the influences and affects of the other mining operations in the region, in addition to that of Co-Op Mining Company, research confirms the report of Danielson and et al (1981) of the U. S. Geological Survey, that the mining operations in the west Hiawatha area, in particular by U. S. Fuel Company, did intersect the Bear Canyon Fault and divert water therefrom, at least 100 gpm in the SW/4 Sec. 24, T 15 S, R 7 E. The Plateau Mining Company is mining within the larger graben area located between the Bear Canyon Fault on the east, and the Pleasant Valley Fault on the west, being northwest of the United States Fuel Company operations. Available data on Plateau's mining reports very little water encountered thus-far, which has required the hauling-in of drinking water to the mine. However, I believe that as this mining proceeds and encounters

EXHIBIT B

further faults, or prominent joints which intersect faulting in the area, some ground water will be encountered and disrupted from its normal flow and conduit system. Whether such water is incountered in the United States Fuel Company mine, the Plateau Mining Company mine, or any other mine located within the infiltration and transmission path for ground water that inpart recharges the Big Bear Canyon Spring and Birch Spring, some affect will be experienced by the springs. The magnitude of this affect to the extent of actually adversing water rights in these springs depends on how much water over time is diverted away from getting back into the natural recharge system and how much contamination from mining operations actually gets into the fault and joint conduit system which feed the springs.

The determination of the degree to which any particular mining operation adversed the springs must be done by isolating the hydrogeologic conditions from one operation to the other. This requires measurements at data control points of factors relating to the water storage, water energy levels determining flow and permeability characteristics of the transmitting formations and faults, the amount of available recharge, and the quality of the water as it is affected by both natural conditions and the mining operations.

Thus, a minimum of one cased, test and monitoring drill hole completed within the Blackhawk-Star Point aquifer is needed at a location between the mining operations of the Plateau and U. S. Fuel Companies' mines and the Co-Op Mining Company Trail Canyon and Bear Canyon Mines, preferable within a half mile north of the fartherest north boundary of the Co-Op Mining Company mining activity. Such a monitoring well location would be best situated out of any known, prominent fault, so that information being gathered best represents conditions within the Blackhawk-Star Point aquifer. Such a test well location was drilled by Savage Energy Services Corporation as their No. T-5 drill hole within the N/2 SE/4 Sec. 11, T 16 S, R 7 E, as shown on my hydrogeologic map of the original report. This hole was drilled to a total depth of 2007 feet into the Blackhawk-Star Point aquifer. It reported a fluid level at 1500 feet depth or elevation of 7820 feet from mean sea level. Since their well log shows a penetration of only 85 feet into the Star Point Sandstone, and it is known that there are some interbedded shales between here and the lower sandstone unit from which both the Big Bear Canyon and Birch Springs produce, I recommend that a new monitoring well here be drilled to a total depth of 2300 feet to insure penetration of the full aquifer. The open or perforated areas of the well should be within the lower Blackhawk Formation sandstones beneath the coal beds, and within the sandstone units of the Star Point Sandstone. The monitoring well should be equipped with an automatic, continuous recording device to most efficiently measure the groundwater level, and a small diameter discharge tube with pump to provide for the collection of periodic water samples, preferably on a monthly schedule. Data collected from this well should be compared to water sample and flow-discharge measurements from both the Birch and Big Bear Springs along with precipitation data of the area, preferably on a monthly schedule.

In addition to the collection of the above data, a totalizing meter should be installed into the pump discharge pipelines within the Co-Op, Plateau, and U. S. Fuel mines, and records kept at least monthly of the total water being used within and out of the mines. Such water that is consumed or diverted away from in the mines amounts to a subtraction from the groundwater system. Also, a reasonable water consumption figure should be derived by the stated mining companies

and provided to the water districts of monthly water evaporated from mine encounted water, as a result of the large air-ventilation systems being used.

In talking with personnel in the Utah Division of Oil, Gas & Mining, I learned that the Co-Op Mining Company has been and is currently pumping water from a source in Trail Canyon, into the abandoned Trail Canyon Mine where it is stored for release and use in their facilities. Such water would become a part of the groundwater recharge system to the Birch Springs, and depending on its quality and manner of utilization will have an affect on the Birch Springs, since the faulting that feeds the Birch Springs also extends through the Trail Canyon mined area. Such a practice should be regulated by both the Utah Division of Water Rights, Division of Environmental Health, Bureau of Public Water Supplies, in addition to the Division of Oil, Gas & Mining, to safeguard the Birch Spring resource.

A similar concern by these same agencies should be directed to the practice in the Bear Canyon Coal mine where intercepted ground water is wallowed-in by working equipment with its released oils, movement of vehicles in and out of the mine which track into the mine contaminants on their tires from outside of the mine, where water ponded within the floor of the mine washes it off as the vehicles move through it. Some of this water wallowed-through gets back into the existing fracture system and could enter into the recharge conduit system of both the Birch and Big Bear Springs, principally down fault planes that are present.

Thus, whether one argues that the intercepted water by the mining operations does or doesn't get into the recharge system of the two springs of concern, one way if it does lends to contamination, and the other way if it doesn't causes a subtraction from the the groundwater system that contributes to the spring flows.

In regard to the comparison of spring discharges to average annual precipitation and average snow water equivalent records from the graphs within my original report, I emphasize that the lag time from the infiltration area near the Stuart Ranger Station on Gentry Mountain to the Big Bear Canyon and Birch Springs is three months. 'The anomalous, abnormal flow experienced by the Birch Spring from October 1989 - January 1990, compared with an anomalous high flow recorded from the Tie Fork Spring from September - December 1988, are a year and a month apart. It is possible that earth tremors may have initiated these two different times of anomalous flow, but the important fact that Birch Spring flowed 300 percent of its normal rate for a period of about four months and then abruptly dropped down to the near normal flow of 60 gpm, shows a large, temporary, lump-type storage buildup within the groundwater system feeding Birch Spring, of about 90 acre-feet of water. The most likely room for such a storage area is the caving Trail Canyon mine, through which the same faults extend that feed the Birch Spring.

I recommend that as the coal mining proceeds within the Bear Canyon Mine or the other mines farther north within the recharge area to the Birch and Big Bear Springs, any significant water flows encountered should be captured and isolated from the mining operations and contamination, be frequently sampled and analyzed, and then inject the uncontaminated water flows back into prominent, permeable faults. The exception to this or to a part of such intercepted water would be where there is a valid water right, which preceeds in priority, the Birch and Big Bear Springs rights, and is approved for diversion and use by the

State Engineer in conformance with established water law. To do otherwise in the diversion and use of the ground water that is intercepted by the coal mining operations is ignoring the water law, which law exists to protect estabished water rights.

The injection of any water intercepted by the mining operations or from another source, back into the groundwater recharge system that is tributary to the Birch and Big Bear Springs should be conducted under the direction of the Utah Divsion of Environmental Health and Utah Division of Water Rights.

I submit a correction to my original report dated January 28, 1991, on page 3, 5th paragraph. In typing the report, a jump was made from the first line of one paragraph, over an omitted paragraph, to a succeeding paragraph. This resulted in leaving out the description of the Price River Formation which exists between the Castlegate Sandstone and the North Horn Formation. As correctly shown in Table I, Stratigraphic relationships of geologic units, which was included in the report, the Price River Formation consists of about 650 feet of gray and brown, fine-coarse grained and conglomeratic sandstone beds with thin, interbedded gray shales. Thus, the subject paragraph stating that the Castlegate Sandstone is overlain by the North Horn Formation needs to be corrected as above described. The description provided for the North Horn Formation in that paragraph is correct.

Respectfully submitted,

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Price, Utah 84501

LIST OF CO-OP'S VIOLATIONS OF MINING LAW AND APPLICATION DEFICIENCIES RELATING TO WATER ISSUES

Statutory Provision	Description	Co-Op Violations[1]/Deficiencies
R614-1G-UMC786.29[2] [R614-301-220; R614-301-320; R614-301-411; R614-301-620; R614-301-720][3]	Environmental protections in permit	RPV, OV
R614-1K-UMC771.19 [R614-300-143]	Compliance with permits measures	RPV, OV
R614-1K-UMC786.27 [R614-300-143]	Compliance with permit requirements	RPV, OV
R614-1K-UMC817.41 [R614-300-133.400; R614-301-731.100]	Hydrologic balance, general requirements	RPV, OV
R614-1K-UMC817.42 [R614-301-751]	Water quality and effluent limitations	RPV, OV

PV - Past Violations
RPV - Repeated Past Violations
OV - Ongoing Violations
AD - Application Deficient

[1] These listed violations are based upon DOGM citations to Co-Op between 1987 and the present.

[2] These are the statutory sections that were in effect when Co-Op was charged with the violations.

[3] These bracketed code sections are the comparable current regulations.

EXHIBIT C

Statutory Provision	Description	Co-Op Violations[4]/Deficiencies
R614-1K-UMC817.43 [R614-301-742.300]	Maintenance of diversion ditches	RPV, OV
R614-1K-UMC817.45 [R614-301-752]	Sediment control measures	RPV
R614-1K-UMC817.50 [R614-301-731.521]	Underground mine entry and access discharges	PV, OV
R614-1K-UMC817.52 [R614-301-731.200]	Submission of water sampling data, Surface and groundwater monitoring	RPV, OV
R614-1K-UMC817.121 [R614-301-525.200]	Subsidence control	PV
R614-1K-UMC817.153 [R614-301-742.400]	Road Class I drainage	PV
R614-301-721	The application must include premining hydrologic resources within the permit and adjacent areas that may be affected by the mining activity.	AD
R614-301-722	The application must include cross-sections and maps.	AD
R614-301-722.100	The cross-sections and maps must show the extent of subsurface water within and adjacent to the mining operation.	AD

[4] These listed violations are based upon DOGM citations to Co-Op; S. Bryce Montgomery's January 28, 1991, and February 8, 1991, reports on the Co-Op mine and its impacts on water sources in the area; correspondence between Co-Op and the DOGM; and Protestants' observations.

Statutory Provision	Description	Co-Op Violations/Deficiencies
R614-301-722.200	The application must contain cross-sections and maps showing the location of springs within the permit and adjacent area.	AD
R614-301-722.300	The application must contain cross-sections and maps showing the elevations and locations of monitoring stations used to gather water quality and quantity in preparation of the permit application.	AD
R614-301-722.400	The application must contain cross-sections and maps showing the location and depth of water wells in the permit area and adjacent area.	AD
R614-301-724	The application must contain baseline hydrologic and geologic information.	AD
R614-301-724.100	The application must contain location and ownership of springs in the permit, and adjacent area, and other ground water resources.	AD
R614-301-724.300	The application must include geologic information in sufficient detail.	AD
R614-301-724.310	The application must contain a determination of the probable hydrologic consequences of the operation upon the quality and quantity of surface and ground water in the permit and the adjacent areas.	AD
R614-301-724.600	The applicant must provide a survey showing whether aquifers or areas for the recharge of aquifers exist within	AD

Statutory Provision	Description	Co-Op Violations/Deficiencies
	the permit and adjacent areas and whether subsidence could cause diminution of aquifers or recharge areas.	
R614-301-725.300	A permit will not be approved until the necessary hydrologic and geologic information is available.	AD
R614-301-728	The application must contain a list of the Probable Hydrologic Consequences (PHC).	AD
R614-301-728.100	The application must contain a determination of the PHC for the proposed mining operation upon the quality and quantity of ground water under seasonal flow conditions for the permit and adjacent areas.	AD
R614-301-728.200	The PHC determination must be based on baseline hydrologic, geologic, and other information collected for the permit application.	AD
R614-301-728.310	The application must contain a determination as to whether adverse impacts may occur to the hydrologic balance.	AD
R614-301-728.320	The application must contain a determination as to whether acid-forming or toxic-forming materials are present that could result in the contamination of ground water supplies.	AD
R614-301-728.332	The application must include a determination as to the impact of the mining operation on	AD

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DIVISION OF
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BEFORE THE DIVISION OF OIL, GAS AND MINING
DEPARTMENT OF NATURAL RESOURCES
STATE OF UTAH

IN THE MATTER OF THE PERMIT RENEWAL FOR THE CO-OP MINING COMPANY'S BEAR CANYON MINE, EMERY COUNTY, UTAH	*	RESPONSE TO OBJECTIONS TO PERMIT RENEWAL
	*	CAUSE NO. ACT/015/025

Co-op Mining Company ("Co-op") has applied for a renewal of its mining and reclamation permit and in addition, has asked that its present permit area be expanded. Written objections to Co-op's application were filed by Castle Valley Special Services District, North Emery Water Users Association and Huntington-Cleveland Irrigation Company. By letter dated November 12, 1990, Huntington-Cleveland Irrigation District withdrew its protest.

An informal hearing was conducted by the Division of Oil, Gas & Mining on February 5, 1991, in Castle Dale, Utah, where interested parties were invited to comment concerning Co-op's application. In addition to the parties who had filed written protests, Huntington City appeared through its attorney and voiced objections and Huntington-Cleveland Irrigation District appeared through a representative and expressed concern about Co-op's proposed mining activities, notwithstanding that the District had withdrawn its protest.

At the conclusion of the hearing, the Director stated

that interested parties would have until 5:00 p.m. on February 15. 1991, in which to supplement the record and respond to the points presented at the hearing. The response time was subsequently extended to February 25, 1991, and then to March 11, 1991.

§40-10-9(4((a) U.C.A., 1953, as amended, provides:

> Any valid permit issued pursuant to this chapter shall carry with it the right of successive renewal upon expiration with respect to areas within the boundaries of the existing permit. The holders of the permit may apply for renewal <u>and the renewal shall be issued</u> (but on application for renewal the burden shall be upon the opponents of renewal), subsequent to fulfillment of the public notice requirements of Sections 40-10-13 and 40-10-14 <u>unless it is established that and written findings by the division are made that:</u>
>
> > (i) The terms and conditions of the existing permit are not being satisfactorily met;
> >
> > (ii) The present surface coal mining and reclamation operation is not in compliance with the approved plan;
> >
> > (iii) The renewal requested substantially jeopardizes the operator's continuing responsibility on existing permit areas;
> >
> > (iv) The operator has not provided evidence that the performance bond in effect for the operation will continued in full force and effect for any renewal requested in the application as well as ny additional bond the division might require pursuant to Section 40-10-15; or
> >
> > (v) Any additional revised or updated information required by the division has not been provided.

Although assertions were made at the hearing by representatives for North Emery Water Users and Huntington City

to the effect that Co-op has been cited for certain violations by the Division's inspectors, no documentation was provided. Co-op will agree that it has been cited in the past for certain violations of the Division's reclamation and operating regulations, but Co-op has performed diligently in abating all such violations and will continue to do so. Except for the references made to the violations, none of the objections contended that any of the five grounds cited in §40-10-9(4)(a) applied in the case of Co-op's application. Accordingly, as to the existing permit area, Co-op's permit should be renewed.

The review criteria respecting Co-op's application to increase its present permit area is somewhat different. §40-10-9(4)9b) provides:

> If an application for renewal of a valid permit includes a proposal to extend the mining operation beyond the boundaries authorized in the existing permit, the portion of the application for renewal of a valid permit which addresses any new land areas shall be subject to the full standards applicable to a new application under this chapter;...

Accordingly, Co-op's application regarding the proposed expanded permit area is subject to the requirements of §§40-10-10, 40-10-11, et seq. Co-op's application for renewal contains the necessary information required by those statutes, and in fact, Co-op has retained the services of an additional professional engineering firm (EarthFax Engineering, Inc.) and has committed to add to, modify and expand upon the information provided, in order to meet any legitimate objections or questions

raised by any of the opponents or the Division to Co-op's submittal.

The thrust of the objections raised by those appearing at the hearing concerned the hydrologic consequences of Co-op's proposed mining activities. The objections can be grouped into two general categories: (1) That Co-op's past and current mining activities have had some impact on Big Bear Spring and Birch Spring, and (2) That Co-op's proposal to mine farther north has a potential for greater impact on the two springs.

These objections are addressed more fully in the report of EarthFax Engineering, Inc., which is submitted herewith, but generally, it should be noted that the claimed impact from Co-op's past and present mining activities is simply not supported by the evidence presented. The general conclusion of Mr. Bryce Montgomery, Geologist hired by Castle Valley Special Service District and North Emery Water Users Association, as stated on page 7 of his report is

> It is therefore my conclusion that the affect of the Co-op Bear Creek Mine and possibly the Trail Creek Mine operations have been relatively small in adversing the rights in the Big Bear Canyon Spring, both as to flow rate and contamination. The affect of a small reduction in recharge to the springs is estimated to be considerably less than the 25 percent allowance provided in paragraph 3, page 1 of the agreement between Co-op Mining Company and Huntington City, dated January 27, 1982.

In fact, Co-op would submit that the evidence shows that the effect of Co-op's mining on the spring flow has been

practically non-existent. Although the spring flow has decreased over the past few years while the precipitation has remained relatively constant, the precipitation has continued to be below "normal" levels, which in itself would account for the continued decrease in flow of the springs as the normal recharge areas for the springs continue to decrease because of the below normal precipitation. A comparison of flow rates of the Big Bear Spring and Birch Spring with other springs in the area which could not be affected by Co-op's mining activities will show generally the same pattern of decline, in relation to the same precipitation events.

Mr. Montgomery concluded that the three month abnormal increase in the flow of Birch Spring was "definitely associated with mining activity, and most probably within the caving Trail Canyon Mine" (page 8 of Montgomery report). Mr. Montgomery's conclusion is disputed in the report filed with the Division by Bill Malencik, dated November 1, 1989, and it appears to be a conclusion subject to serious unanswered questions. For instance, it seems highly unlikely that the flow could result from the mine that was caved and pillared over eight years previous to the increased flow. It seems unlikely that the flow would abruptly end and return to precisely normal after three months if an underground water flow were trapped in a reservoir and suddenly broke through, because the break, if there were one, would still be there and would allow continued flow, although in

a greatly diminished quantity. Also, if the water were from a trapped area in the old Trail Canyon mine, and if it contained oil and grease, as reported, the oil and grease would continue to show for the entire three months. The samples taken from Birch Spring showed oil and grease contaminants for only the first sample, likely a result of oil used to oil the lock on the gate securing the spring. Further, if the water were from the old workings, the filtration of the water through the ground to the spring would take out such impurities. In any event, the spring returned to normal after three months, both in quantity and quality of water and there is nothing but conjecture that the event will ever be repeated. Even if the event were to reoccur, there is no reason why reasonable steps could not be taken to make the water quality suitable for the users' needs and increase the availability of this badly needed resource, if the source can be identified.

With respect to Co-op's application to increase the permit area to allow for mining to the north, Mr. Montgomery concludes on page 9 of his report:

> The proposed extension of coal mining within the 80 acre tract of the E/2 NW/4 Section 26, immediately east of Birch Spring <u>could possibly</u> adversely affect the spring...However, the most prominent groundwater transmission system in the area is the north-trending faults and joints, and most of the recharge to Birch Springs comes from the north through this system. Thus, the proposed northerly extension of the Bear Creek Mine into the N/2 of Sec. 14, T 16 S, R 7 E, <u>could</u> also cause a reduction in recharge to the Birch Springs by the intersection and diverting of ground

water away from its natural conduit system."

It must be emphasized that Mr. Montgomery's conclusions are qualified by the words "could possibly" and "could". Even these qualified conclusions are not supported by the report of Earthfax submitted herewith. I would submit that the Earthfax report appears to be based upon more extensive research and a more thorough analysis of all available information, and accordingly, is more credible. The Earthfax conclusion, that additional data is needed to arrive at any certainties, but that mining further north would in all liklihood have no significant impact upon the water quantity or quality of springs in the area, is also born out by the fact that mining in the area to date, has not impacted the springs. Mr. Montgomery suggests that there is a Blackhawk-Star Point aquifer underlying the coal seam being mined by Co-op, and the potentiometric surface of this aquifer "up dips" at a greater angle towards the north than does the coal seam. Thus, he concludes, the farther north the seam is mined, the greater the threat of intercepting this aquifer by mining activity. As concluded in the EarthFax study, if the aquifer does indeed exist, it would appear that it is well below not only the upper seam currently being mined, it is also well below the lower seam of coal, and the possibility of intercepting the aquifer by mining clear to the north of the proposed new area, would be almost non-existent in the upper seam, and extremely remote in the lower seam. The fact that Plateau Mining Co. is

mining the same seam as Co-op, in the same graben area, further north than the proposed expanded boundaries of Co-op's permit areas, without any apparent affect on Birch Spring or Big Bear Spring, certainly supports the conclusion of EarthFax and contradicts the conclusion of Mr. Montgomery in this regard.

The technical objections of North Emery Water Users Association and Castle Valley Special Service District, dealing with the lack of information in Co-op's plan and the lack of water monitoring, may have some merit, and Co-op's position is and always has been, that it will take all reasonable steps to assure that its mining operations will not interfere with or adversely affect the interests of its neighbors. If the Division deems that it would be appropriate to modify the maps, plates and other information submitted in its plan to provide more detail regarding Birch Spring and/or Big Bear Spring, Co-op Will agree to make such revisions. In fact, Co-op has retained the services of EarthFax to provide additional information regarding the hydrology and geology in the affected area, and will provide additional information if the Division deems that additional information is needed.

Co-op's opponents have also objected to the lack of monitoring of Birch Spring. Co-op has monitored Birch Spring as required by the Division, pursuant to its existing Plan. If the Division deems that additional monitoring would be appropriate, Co-op will agree to conduct additional monitoring. The primary

hindrance to such additional monitoring, is that the springs in question are fully enclosed and are accessibly only through a locked gate. Co-op has never been given access to these springs which would allow for any additional monitoring. Co-op appreciates the need for the water users to protect the cleanliness and integrity of its water sources and understands the need to restrict access to the springs. The best solution to the concerns of the water users, may be to provide that the water users themselves provide what additional monitoring the Division deems appropriate, where Co-op shares the cost of such additional monitoring, and where Co-op would have the right to challenge or re-sample the water if a negative impact is claimed by the users. In this way, the users would be able to maintain control over and access to their springs and would be the first to know if any impact were to occur.

Co-op is not adverse to meeting the objections of those filing objections. The report of EarthFax indicates that any negative impact from Co-op's proposed mining plan on the rights of those objecting is highly unlikely and proposes certain monitoring and testing procedures that would assure that the legitimate objections are met. Co-op is willing to take all reasonable steps to satisfy the Division and the users that its mining activities will not adversely effect the existing rights of others, and Co-op submits that the information and reports before the Division indicate that the mining which Co-op proposes

to do can be done without any adverse affect. Accordingly, Co-op's application to extend its permit and expand its permit area ought to be granted.

Respectfully submitted,

Carl E. Kingston
Attorney for Co-op Mining

CERTIFICATE OF MAILING

I hereby certify that I mailed copies of the foregoing Response to Objections to Permit Renewal and copies of the Hydrogeologic Evaluation report prepared by Earthfax Engineering, Inc., to the following, this 11 day of March, 1991, postage prepaid:

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Carl E. Kingston

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IN AND BEFORE THE UTAH STATE DIVISION

OF OIL, GAS, AND MINING

In the Matter of the Renewal Application and New Application of Co-Op Mining Company	Reply of North Emery Water User's Association, Castle Valley Special Service District and Huntington City, Utah, to Co-Op Mining Company's Response to Objections to Permit Renewal ACT/015/025

North Emery Water Users' Association ("NEWUA"), Castle Valley Special Service District ("CVSSD"), and Huntington City, Utah ("Huntington"), hereinafter collectively referred to as "Protestants," by and through its counsel, Jeffrey W. Appel of Haley & Stolebarger, hereby submit the following Reply to Co-Op Mining Company's Response to Objections to Permit Renewal, hereinafter referred to as "Co-Op's Reply."

ARGUMENT

Big Bear Springs, controlled by CVSSD, and Birch Springs, controlled by NEWUA, are the sole source of drinking water for residents of rural Emery County, Utah. Both springs are in the proximity of Co-Op Mining Company's ("Co-Op") past, present and

proposed mining operations. Co-Op operated its Trail Canyon Mine until 1982 and commenced operations in its the Bear Canyon Mine that same year. Co-Op is currently seeking a renewal application for its mining operations in the Bear Canyon Mine and seeks a new permit to expand these operations.

Protestants oppose Co-Op's renewal and new permit applications for the primary reason that Co-Op has never met the statutory requirements necessary to justify the initial issuance of a mining permit, has repeatedly violated mining regulations and has not taken adequate measures to ensure the protection of Protestants' water sources--Big Bear Springs and Birch Springs--as required by law.

Contamination of Big Bear Springs and Birch Springs by Co-Op's mining operations jeopardizes the exclusive sources of culinary and agricultural water for an entire rural community. To grant Co-Op a renewal of its existing permit and a new permit for its future mining operations when it has failed to meet its statutory requirements to protect irreplaceable water resources could devastate an entire rural community. The culinary and agricultural interests of a long-standing rural community are more important, not only intuitively, but statutorily, than the commercial endeavors of a mining company and any balancing approach undertaken by the DOGM should reflect that approach.

A. Renewal Permits

Pursuant to Utah Code Ann. §40-10-9(4)(a),

> The holders of a permit may apply for renewal, and the renewal shall be issued (but on application for renewal the burden shall be upon the opponents of renewal) . . . unless it is established that and written findings by the division are made

that:

> (i) The terms and conditions of the existing permit are not being satisfactorily met;
>
> (ii) The present surface coal mining[1] and reclamation operation is not in compliance with the approved plan;
>
> (iii) The renewal requested substantially jeopardizes the operator's continuing responsibility on existing permit areas;
>
> (iv) The operator has not provided evidence that the performance bond in effect for the operation will continue in full force and effect for any renewal requested in the application as well as any additional bond the division might require pursuant to Section 40-10-15; or
>
> (v) Any additional revised or updated information required by the division has not been provided. (emphasis added).

See also, Utah Administrative Code, R614-303-233.100 et seq.

In its Reply, Co-Op acknowledges that this statute applies to the present facts. Co-Op Reply at 2. Co-Op improperly contends that Protestants have not objected to its renewal permit on any of these five grounds. See Reply at 2. Protestants have consistently maintained that Co-Op has violated at least four of the five exceptions to renewal.

1. The Terms of the Existing Permit Are Not Being Satisfactorily Met

Pursuant to R614-300-143, "[t]he permittee will comply with the terms and conditions of the permit, all applicable performance standards and requirements of the State Program."

In Chapter Three, section 5.3, of its application, Co-Op

---

[1] These regulations on surface mining apply to the surface effects of underground mining.

states that it "will conduct all mine site operations in such a way as to minimize potential impact on surface and ground water quality." Co-Op has not lived up to these promises. On repeated occasions, Co-Op has been cited by the DOGM for violations, many of which have a direct bearing on water resources. See Protestants' Amended Memorandum of Law filed with the DOGM on March 13, 1991 at pp. 24-32, for a more detailed explanation of these violations.

2. The Present Surface Coal Mining[2] and Reclamation Operation is Not in Compliance With the Approved Plan

According to R614-300-142, "[t]he permittee will conduct all coal mining and reclamation operations only as described in the approved application, except to the extent that the Division otherwise directs in the permit." (emphasis added). The language of this section is mandatory, not discretionary. Co-Op's present mining operations and reclamation operations are not in compliance with its approved plan. Co-Op's approved plan states that it will take necessary precautions and abide by all applicable regulations to protect environmental resources in the area of its mining operations, particularly hydrologic resources. Co-Op has failed to do this. In October 1989, a surge of water and increased contaminants was found in Birch Springs; as recently as January of this year, increased contaminants were found in Big Bear Canyon

---

[2] Though this sentence references surface coal mining specifically, the legislative findings and the statement of purposes at the beginning of the chapter refer to coal mining generally. See e.g., Utah Code Ann. §40-10-1, §40-10-2. As with federal statutes, state regulations on surface mining apply to the surface effects of underground mining.

Springs.

Co-Op has repeatedly violated mining regulations and has been cited by the DOGM for such violations. As recently as February 27, 1991, Co-Op was given a Notice of Violation, No. 91-35-01-01, for "[f]ailure to conduct mining and reclamation activities in accordance with the approved plan. . . ." Id. at 2. Co-Op committed this violation while telling the DOGM and others that it was doing all it could do to abide by mining regulations. In spite of all this, Co-Op maintains that it has "performed diligently in abating all such violations and will continue to do so. . . ." Co-Op Reply at 3. The facts speak otherwise.

3. The Renewal Requested Substantially Jeopardizes the Operator's Continuing Responsibility on Existing Permit Areas

Throughout its Reply, Co-Op has maintained that it will take steps to ensure that Protestants' water sources are protected and acknowledges certain problems with its operations that it will correct. It is too late. Co-Op must show that it has taken steps to protect hydrologic resources in the area before it can apply for a mining permit. Since Co-Op has not met its obligations under its current permit, it should not be allowed a renewal or be granted a new permit to mine additional areas. Co-Op must concentrate on its current problems rather than being given a carte blanc to start new mining projects. Serious concerns have been raised and evidence gathered by Protestants that show the Trail Canyon Mine, abandoned by Co-Op nine years ago, is contaminating its water supplies. Co-Op's focus should be on protecting these water resources before it

is allowed to expand its commercial mining operations or proceed further with its current operations.

4. Co-Op Has Not Provided the DOGM With All Requested Revised Information

Co-Op is currently operating under a cessation order and has outstanding unabated violations of mining regulations. See February 27, 1991, Modification of Notice of Violation/Cessation Order. In particular, Co-Op has not provided the DOGM with adequate hydrologic information. According to the March 14, 1991, memorandum of Tom Munson, DOGM Senior Reclamation Hydrologist, "[t]he Earthfax Engineering report [provided by Co-Op] falls short of providing enough data to demonstrate a finding of no impact to the hydrologic balance. . . ." Munson's March 14, 1991, memorandum at 4. Said memorandum is attached as Exhibit "A" and incorporated herein by reference. Mr. Munson further states that Co-Op should revise its Probable Hydrologic Consequences ("PHC") analysis to include data collected from new monitoring wells. Exhibit "A" at 4. The DOGM has requested that Co-Op install new monitoring wells. Mr. Munson concludes that data from these new wells must be incorporated into Co-Op's application prior to its approval. Id.

On February 27, 1991, Co-Op was served with a Notice of Violation No. 91-35-01-01 for constructing a road without prior Division approval. In its Reply, however, Co-Op implies that it has abated all outstanding violations and deficiencies. "Co-Op will agree that it has been cited in the past for certain violations of the Division's reclamation and operating regulations, but Co-Op has performed diligently in abating all such violations

and will continue to do so." Co-Op's Reply at 3. This is not the case. Co-Op has outstanding unabated violations and is currently working under a cessation order. See February 27, 1991, Modification of Notice of Violation/Cessation Order for Cessation Order 90-26-1-1 extending abatement until April 15, 1991. Any other characterization of the facts is simply disingenuous.

B. New Permits

According to Utah Code Ann. §40-10-9(4)(b), "[i]f an application for renewal of a valid permit includes a proposal to extend the mining operation beyond the boundaries authorized in the existing permit, the portion of the application for renewal of a valid permit which addresses any new land areas shall be subject to the full standards applicable to new applications under this chapter . . ." Co-Op acknowledges that this code section is applicable to its request to expand its current mining activities and contends that it has met these statutory requirements. Co-Op's Reply at 3. Once again Co-Op's view of the facts bears no resemblance to reality.

Pursuant to Utah Code Ann. §40-10-10(2), which Co-Op admits is applicable, a permit application and reclamation plan must include, among other things:

> (b) an accurate map or plan, to an appropriate scale, clearly showing the land to be affected as of the date of the application . . .
>
> (c) a determination of the probable hydrologic consequences of the mining and reclamation operations, both on and off the mine site with respect to the hydrologic regime, quantity and quality of water in surface and groundwater systems, including the dissolved and suspended solids under seasonal flow conditions, and the collection of sufficient data for the mine

> site and surrounding areas so that an assessment can be made by the division of the probable cumulative impacts of all anticipated mining in the area upon the hydrology of the area and, particularly, upon water availability. . .

Co-Op has not met these requirements nor has it met all the requisites of Utah Administrative Code R614-301-700 et seq. Though Co-Op provided the DOGM with base maps on February 25, 1991, these and other maps provided by Co-Op do not adequately show the area to be impacted by its proposed mining operations. Co-Op still has not collected sufficient data to determine the hydrologic consequences of its proposed expansion on Big Bear Springs and Birch Springs. In fact, Co-Op has acknowledged that it has tested water in Birch Springs infrequently. Co-Op's Reply at 9. See also, EarthFax report at 3-10. The DOGM has requested that Co-Op update its PHC by including data from new monitoring wells that Co-Op has been requested to install. Exhibit "A" at 4.

In its Reply, Co-Op states that it has "retained the services of EarthFax to provide additional information regarding the hydrology and geology in the affected area, and will provide additional information if the Division deems that additional information is needed." Co-Op's Reply at 8. See also, Co-Op's Reply at 3-4. (". . . Co-Op has retained the services of an additional professional engineering firm (EarthFax Engineering, Inc.) and has committed to add to, modify and expand upon the information provided, in order to meet any legitimate objections or questions raised by any of the opponents or the Division to Co-Op's submittal.") By these statements, Co-Op concedes that it has not adequately investigated the hydrology and geology near its mine

operations. The statute concerning new permits does not say that an applicant may promise to review hydrology or to provide adequate maps in the future, it requires that an applicant shall study these issues and shall include them in its application. Co-Op is not entitled to a permit based upon its promises of future, speculative compliance. It must show present compliance with applicable law. Co-Op cannot demonstrate that compliance.

C. Co-Op Has Failed to Adequately Address Hydrologic Impacts of its Past, Present, and Proposed Mining Operations on Birch Springs or Big Bear Canyon Springs Through its Engineering Firm, EarthFax Engineering, Inc.

The bulk of Co-Op's Reply is dedicated to an attempt to discredit, without success, the theories and conclusions of S. Bryce S. Montgomery, the geologist hired by Protestants to review the impact of Co-Op's mining operations on its water sources. This attempt has failed for the following reasons.

1. Reasonable Likelihood Test

As more fully explained in Protestants' Amended Memorandum of Law submitted to the DOGM on March 13, 1991, the geologist's causation standard is one of "reasonable likelihood"--e.g. in this situation, is there a reasonable likelihood, given the evidence, that the mine operations have or will contaminate Birch Springs and/or Big Bear Canyon Springs. See Protestants' Amended Memorandum of Law at 13, et seq. Mr. Montgomery's January 31, 1991, report, his February 8, 1991, report and his March 14, 1991, report all adequately support Protestants' position that Co-Op's past, present and contemplated mining activities have and will

adversely impact Big Bear Canyon Springs and Birch Springs. These reports meet and exceed the requisites of the "reasonable likelihood" standard. Mr. Montgomery's March 14, 1991, report is attached as Exhibit "B" and incorporated herein by reference.

2. Big Bear Canyon Springs

On page four of its Reply, Co-Op cites Mr. Montgomery's January 28, 1991, report wherein he stated that the "affect of the Co-Op Bear Creek Mine and possibly the Trail Canyon Mine operations have been relatively small in adversing the rights in the Big Bear Canyon Spring . . ." Id. at 7. In citing to this section, however, Co-Op has taken the quote out of context and has failed to include Mr. Montgomery's later clarification of that statement:

> However, the proposed expansion of the Bear Canyon Mine operations northward another 3/4 mile to the north line of Section 14 will extend the mined area to approximately 75 feet higher in elevation, up-dip than at present (75+7580=7655 feet), which will be near intersecting the potentiometric surface of the Blackhawk-Star Point aquifer. . . . Thus, in faults that cut through confining shale beds between the aquifer and mined coal, and within interconnecting cross-joints to these faults, considerable ground water may be encountered, and if diverted away from getting back into the natural conduit system, it would subtract from recharge to the Big Bear Canyon Spring. Also, any contamination generated in the mine workings that could possibly infiltrate into the natural recharge conduit system to the spring, may further adverse spring water quality.

Montgomery's January 28, 1991, report at 7.

Thus, Co-Op has incorrectly stated that Mr. Montgomery found no adverse impact of its proposed mining operations on area water sources.

Co-Op further states that the affect of its mining operations on spring flow "has been practically non-existent." Co-Op Reply at

4-5. Mr. Montgomery's reports, EarthFax's report, Protestants' observations, Co-Op's admissions, and Tom Munson's March 14, 1991, memorandum all show otherwise. According to Mr. Munson, Co-Op's position that "[w]ater intercepted within the mine workings of the Bear Canyon Mine have not had any identifiable impact on the spring flows of Big Bear or Birch Springs" is "not supported by data and to the contrary, data exists which points to water quality changes attributed to the old workings of the Bear Canyon Mine. . . ." Exhibit "A" at 2, ¶3. (emphasis added).

Furthermore, Mr. Munson rejects Co-Op's contentions that changes in flow patterns in Big Bear Canyon Springs and Birch Springs are not mine-related, but rather drought related: "If flow is the issue then I cannot support this conclusion, as this has not been conclusively demonstrated. Recent data from Big Bear Springs shows an increase in flow in the winter months of 1990-1991, not typical of past data. Exhibit "A" at 2, ¶3. (emphasis added).

The impact of Co-Op's mining operations on flow patterns in both springs is of great concern to Protestants. At the February 5, 1991, DOGM hearing in Castle Dale, Utah, CVSSD presented evidence that the pattern between precipitation levels and spring flow began changing in 1989 and that the change was attributable to Co-Op mining activities. EarthFax's report supports this position: "The East Bleeder inflow remained constant until the summer of 1989, when water was encountered at the northern end of the North Main entries. According to Wendell Owen [of Co-Op], the mine intercepted a flow of 110 gpm. . . ." EarthFax Report at 3-1. All

this suggests that Co-Op's mining activities began significantly and adversely impacting spring flow levels in 1989 and that Co-Op's mining activities continue to adversely impact spring flows today.

3. Birch Springs

a. Surge in Birch Springs

Beginning in October 1989 and continuing for months thereafter there was a dramatic rise in the flow of Birch Springs. An October 1989 sample of water from Birch Springs revealed oil and grease and large quantities of suspended sediment as well as increased total dissolved solids which was double the amount found in a sample one month earlier. See Montgomery's January 28, 1991, report at 8. Mr. Montgomery attributes this surge in Birch Springs to an "unnatural cause" that is "definitely associated with mining activity, and most probably within the caving Trail Canyon Mine," used by Co-Op to store water. See Montgomery's January 28, 1991, report at 8; Montgomery's February 8, 1991, report at 3.

Co-Op disputes Mr. Montgomery's conclusion that the "three month abnormal increase in the flow of Birch Springs was 'definitely associated with mining activity, and most probably within the caving Trail Canyon Mine'" by citing to the November 1, 1989 report of Bill Malencik, a DOGM reclamation specialist. (citations omitted). Co-Op's Reply at 5. It is a mischaracterization for Co-Op to claim that Mr. Malencik's report contradicts Mr. Montgomery's conclusions.

On October 25, 1989, Mr. Malencik made a field inspection of Birch Springs and its surroundings. Malencik memorandum, November

1, 1989, at p.1. He observed a "significant amount of water . . . coming out of rock fractures on the cliffs." Id. at 2. On October 30, 1989, Mr. Malencik and others toured the Bear Canyon Mine. Id. at 3. Though Mr. Malencik did not have sufficient evidence at the time to determine whether the culinary water problems in Birch Springs were attributable to the Co-Op mines, he recommended that the DOGM seek assistance from persons with expertise in groundwater hydrology and geology. Id. at 6. Mr. Malencik does not possess expertise in those areas. From his limited observations, Mr. Malencik advanced two theories concerning how mine-related activities could have contaminated Birch Springs. Id. at 5. Mr. Malencik's first theory[3] was that pillars were pulled a quarter a mile from Birch Springs near the time of the surge and may have caused a change in the water source. Id. His second theory was that the mine water built-up in the Trail Canyon Mine over time accumulated next to the fault and followed the fault zone to Birch Springs. Id. The latter theory comports with that of Mr. Montgomery's concerning seepage from the Trail Canyon Mine to Birch Springs. According to Mr. Montgomery,

> Coal mining operations include the intentional coating of the walls with lime dust to suppress coal dust, and the floor of the mine is also mantled with fines from the mining operation. This tends to plug or restrict existing fracture and intergranular permeability. Thus, the result is a chamber generally lined with a thin coating of fine-grained materials. Eventually, this coating deteriorates in its effectiveness as a seal. However, for a considerable time the mined-out areas can and do serve as a groundwater storage space. In fact, Co-Op Mining Company is presently using a part of the abandoned

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[3] In both of these theories, Mr. Malencik noted his difficulties with the analysis.

> Trail Canyon Mine for such. Admittedly an alternative source of the surge in the Birch Spring flow could have been natural fracture openings, providing the groundwater storage, as proposed by White (1991) [EarthFax], but the sudden release of the large volume of ground water containing oil-grease for a relatively short period, points to the abandoned Trail Canyon Mine as the principal storage for the flush supply of water experienced.

Exhibit "B" at 2-3. See also, Montgomery's February 8, 1991, report[4] at 3.

Under the applicable "reasonable likelihood" test, Mr. Montgomery has provided evidence that the surge in Birch Springs in 1989 was attributable to the erosion of the seal of the Trail Canyon Mine and the seepage of this contaminated water into Birch Springs.

Co-Op then states that "[e]ven if the event [at Birch Springs] were to reoccur (sic), there is no reason why reasonable steps could not be taken to make the water quality suitable for the users' needs and increase the availability of this badly needed resource, if the source can be identified." Co-Op Reply at 6. This statement ignores the fact that an entire rural community

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[4] ". . . I learned that the Co-Op Mining Company has been and is currently pumping water from a source in Trail Canyon, into the abandoned Trail Canyon Mine where it is stored for release and use in their facilities. Such water would become a part of the groundwater recharge system to the Birch Springs, and depending on its quality and manner of utilization will have an affect on the Birch Springs, since the faulting that feeds the Birch Springs also extends through the Trail Canyon mined area. . . .

A similar concern . . . should be directed to the practice in the Bear Canyon Coal mine where intercepted ground water is wallowed-in by working equipment with its released oils, movement of vehicles in and out of the mine which track into the mine contaminants on their tires from outside of the mine, where water ponded within the floor of the mine washes it off as the vehicles move through it. Some of this water wallowed-through gets back into the existing fracture system and could enter into the recharge conduit system of both the Birch and Big Bear Springs, principally down fault planes that are present."

relies upon Birch Springs as a culinary source of water and these people need assurances now that their water sources are being protected, not statements that a problem could be corrected if it occurred in the future. At best, Co-Op has paid lip service to the serious threats to the health and welfare its mine operations have created for these persons.

b. Oil and Grease in Birch Springs

Co-Op also attempts to attribute the oil and grease found in Birch Springs' water samples in the fall of 1989 to oil used on the lock to the gate securing Birch Springs. Co-Op Reply at 6. This is ludicrous. The lock to Birch Springs is covered by a box designed according to Utah Board of Health standards. These standards require the box to contain a covered vertical lip to prevent outside contaminants from getting into the box. At times, the lock on the lid has been sprayed with lubricating oil, but this oil could not and did not penetrate the box. Co-Op's excuse is ridiculous.

Interestingly, in her February 22, 1991, inspection report, Susan White, a DOGM reclamation specialist, stated that "[a]n oil storage tank which was being stored above the loadout was leaking a small amount of oil. The tanks were essentially empty, however I had the operator place a berm around the tanks before I left the site." Id. at 2. A leakage such as this is a much more plausible explanation for the oil and grease found in Birch Springs' samples in 1989 or of oil and grease recently found in Big Bear Canyon Springs.

c. Monitoring Birch Springs and Big Bear Canyon Springs

Co-Op has not adequately monitored Birch Springs as required by law. Co-Op concedes that it has only monitored Birch Springs when infrequent surface flow occurred. EarthFax report at 3-10. Co-Op claims that it has failed to monitor Birch Springs for the alleged reason that it "has never been given access to these springs which would allow for any additional monitoring." Co-Op Reply at 9. In reality, Co-Op has never requested access from NEWUA for Birch Springs' monitoring.

Co-Op has also been remiss in monitoring Big Bear Canyon Springs. In its letter to the DOGM dated December 10, 1990, CVSSD expressed its concern about Co-Op's failure to monitor Big Bear Canyon Springs.

> Past ground water monitoring has been inconsistent and often lacking. What assurance do we have that future performance will be improved? Co-op has indicated some past sampling from our spring and their intentions for future sampling. However, they have never requested permission to sample from the spring and we have no knowledge of any previous sampling. We believe this should be an extremely vital part of the monitoring program and that it should be done with our knowledge and co-operation. (emphasis added).

CVSSD December 10, 1990, letter at 2, ¶6.

Concerned about the recent quality of Big Bear Canyon Springs, CVSSD sampled the springs for oil and grease. Samples taken on February 14, 1991, revealed a 1.6 mg/l level of oil and grease; samples taken on February 26, 1991, revealed a 0.9 mg/l level of oil and grease. These findings suggest that Co-Op's mining activities are presently causing the oil and grease contaminants and yet Co-Op does not report any oil and grease monitoring of Big

Bear Canyon Springs in its mine plan. Had Co-Op been monitoring these springs as it is required by law, it would have found these contaminants. Instead, Co-Op is content to let unmonitored and potentially dangerous water flow to the water users.

Co-Op's Reply then attempts to shift Co-Op's water monitoring responsibilities to Protestants. Pursuant to Utah Administrative Code, R614-301-731.210 and R614-301-731.220, a mine operator is required to monitor ground and surface water impacted by its operations. Though Protestants prefer to oversee Co-Op's monitoring programs, it is not their primary responsibility to conduct such tests.

4. Proposed Expansion of Co-Op Mining Area

Co-Op has attacked Mr. Montgomery's conclusions concerning the impact of Co-Op's proposed expansion of its mining activities by quoting from page nine of Mr. Montgomery's January 28, 1991, report. Co-Op Reply at 6. In quoting a paragraph of Mr. Montgomery's report, Co-Op excluded a key phrase, which is underscored below.

> The proposed extension of coal mining within the 80 acre tract of the E/2 NW/4 Section 26, immediately east of Birch Spring could possibly adversely affect the spring. This is because cross-jointing in this area intersects the northerly trending fault which is the recharge conduit to Birch Spring. Any recharge water now coming to the spring through these less prominent cross-joints, out of the Blackhawk Formation, that would be intercepted and diverted away by the coal mining would diminish the spring flow. However, the most prominent groundwater transmission system in the area is the north-trending faults and joints, and most of the recharge to Birch Springs comes from the north through this system. Thus, the proposed northerly extension of the Bear Creek Mine into the N/2 of Sec. 14, T 16 S, R 7 E, could also cause a reduction in recharge to the Birch Springs by the intersection and diverting of ground water away from its natural conduit

system. (emphasis added).

Montgomery's January 28, 1991, report at 9.

Viewing the entire text of the Montgomery report, it is clear that there is, at a minimum, a "reasonable likelihood" that Co-Op's proposed expansion will adversely impact Birch Springs.

Co-Op has attempted to bolster the opinion of EarthFax by pointing to Mr. Montgomery's use of the words "could possibly" and "could," but then admits that EarthFax's conclusion are based upon insufficient data:

> The Earthfax conclusion, that additional data is needed to arrive at any certainties, but that mining further north would in all liklihood (sic) have no significant impact upon water quantity or quality of the springs in the area, is also born out by the fact that mining in the area to date, has not impacted the springs. . . .

Co-Op Reply at 7.

This statement is a contradiction in terms. Though EarthFax needs additional data "to arrive at any certainties," it is able to conclude that further mining to the north by Co-Op would not significantly impact water in the springs. This approach is hardly indicative of the careful use of scientific methods to support a conclusion.

Co-Op further contests Mr. Montgomery's conclusion that Co-Op's proposed expansion to the north will create a greater risk of contamination to the Blackhawk-Star Point aquifer, which feeds Birch Springs and Big Bear Canyon Springs:

> Mr. Montgomery suggests that there is a Blackhawk-Star Point aquifer underlying the coal seam being mined by Co-Op, and the potentiometric surface of this aquifer `up dips' at a greater angle towards the north than does the coal seam. Thus, he concludes, the farther north the seam is mined, the greater

> the threat of intercepting this aquifer by mining activity. As concluded in the EarthFax study, if the aquifer does indeed exist, it would appear that it is well below not only the upper seam currently being mined, it is also well below the lower seam of coal, and the possibility of intercepting the aquifer by mining clear to the north of the proposed new area, would be almost non-existent in the upper seam, and extremely remote in the lower seam. . . . (emphasis added)

Co-Op Reply at 7.

This statement is in direct contradiction to concessions made by EarthFax in its March 11, 1991, report at 2-9, and to Mr. Montgomery's analysis in his March 14, 1991, report at 1. Mr. Montgomery's study reveals that there is a regional aquifer within the Star Point-Blackhawk formations from which both Big Bear Canyon Springs and Birch Springs discharge. Exhibit "B" at 1. Co-Op implies, by its statement "if the aquifer does indeed exist," that there is a question as to whether the Blackhawk-Star Point aquifer exists even though its engineer, EarthFax, acknowledges the aquifer's existence. EarthFax report at 2-5.

EarthFax further admits that water in the area of Co-Op's proposed expansion area to the north can easily filter down to the Star Point-Blackhawk aquifer through fractures.

> In areas of fracturing, due to increased rock permeability, water is able to pass vertically through strata which would normally impede such flows. Depending on the degree of interconnection in the fractures, the groundwater flow can be limited to a small area or it can reach the regional water table . . . Lines (1985) indicated that for the hydrogeologically similar area of Trail Mountain, located to the south of the study area, even with the large quantity of rock with negligible permeability, some hydraulic connection exists between the perched aquifers and the regional aquifer. Most of the exchange of water occurs as downward unsaturated flow from perching beds to the regional aquifer along the fracture and faults. (emphasis added).

EarthFax report at 2-9.

Despite its admission that there is a hydrologic connection between the perched aquifers contributing to the regional aquifer below, EarthFax "does not recognize that there is a subtraction from the Star Point-Blackhawk aquifer, which supplies the subject springs." Exhibit "B" at 1. EarthFax goes on to accept, without independent analysis or support, statements by Co-Op that no water was encountered when it drilled boreholes adjacent to the Bear Canyon Mine portal at the top of the Mancos Shale. EarthFax report at 3-2. Given the location of the boreholes, drilling would have gone straight through the Star Point-Blackhawk regional aquifer and water would have to have been encountered. See Exhibit "B" at 1. Either EarthFax failed to adequately review the data or Co-Op provided them with inaccurate data. These contradictions and inconsistencies in the EarthFax report lessen its evidentiary value and bolster Mr. Montgomery's conclusions.

Mr. Montgomery's concerns about the accuracy of EarthFax's report on the location of aquifers is also strengthened by the conclusions of Tom Munson, a DOGM Senior Hydrologist. According to Mr. Munson, EarthFax's conclusion that:

> In the area of present development, the regional water table is located below the Blind Canyon and Hiawatha seams in both the Trail Canyon and Bear Canyon mines as indicated by downhole drilling . . . . has not been supported by data in [its report] and therefore cannot be made. Reference is made to holes drilled but no data has been presented. The Division feels the operator shall plot and document all data associated with drill holes within the Bear Canyon Permit Area and adjacent areas to support any conclusions.

Id. at 2.

Mr. Munson agrees that there is insufficient data to determine if further development of Co-Op's mine to the north would impact the regional water table, but places the burden on Co-Op to address all the requirements of R614-301-728 through future drilling programs and further study. Exhibit "A" at 3, ¶5.

Finally, Co-Op argues that because Plateau Mining Company has operations near its proposed expansion which have not impacted Birch Springs or Big Bear Canyon Springs, Co-Op's proposed operations to the north will likewise not impact these water sources. This argument is without merit. According to Mr. Montgomery,

> Available data on Plateau's mining reports very little water encountered thus-far, which has required the hauling-in of drinking water to the mine. However, I believe that as this mining proceeds and encounters further faults, or prominent joints which intersect faulting in the area, some ground water will be encountered and disrupted from its natural flow and conduit system. . . .

Montgomery's February 8, 1991, report at 1-2.

Due to the different locations of the Plateau's mine and Co-Op's proposed mine, the two cannot be compared. Plateau's operations are further north than Co-Op's proposed expansion. Mr. Montgomery concludes that, given the location of Co-Op's contemplated development, it will likely have a negative impact on Birch Springs and Big Bear Canyon Springs and the regional aquifers feeding them. Montgomery's January 28, 1991, report 7, 9.

5. <u>Promised Future Compliance</u>

Throughout its Reply, Co-Op states that it will instigate testing and monitoring procedures and take other steps to meet the

objections of Protestants. This approach is statutorily insufficient. A successful applicant for a renewal or new mining permit must make a showing that it has already put these testing procedures into place and has already taken steps to adequately protect hydrologic resources. Co-Op's promises mean nothing in this proceeding; rather its continual omissions and failures of compliance are far more determinative.

According to Mr. Munson, Co-Op's application and submissions by its engineer, EarthFax, do not ensure protection of Protestants' water sources.

> The Earthfax Engineering report falls short of providing enough data to demonstrate a finding of no impact to the hydrologic balance. Until more conclusive data is collected regarding the regional potentiometric surface, can the Division make a finding of no impact regarding the regional potentiometric.
>
> The issue of water quality impacts has not been adequately addressed and must be included in any future submittals by Co-Op Mining Company. The 4th quarter data on Big Bear Springs indicates a three-fold increase in total dissolved solids, and additional seepage from the old sealed workings of the Bear Canyon Mine are tentatively held responsible for this increase. This issue must be addressed in any future submittals.

Id. at 4.

CONCLUSION

Co-Op is neither entitled to a renewal nor a new mining permit. First, the terms and conditions of its existing permit are not being satisfactorily met. Second, Co-Op's present coal mining and reclamation operation is not in compliance with its approved plan. Third, Co-Op's renewal would substantially jeopardize its continuing responsibility on existing permit areas, including the

abandoned Trail Canyon Mine. Fourth, Co-Op has failed to provide the DOGM with all of the revised and updated information it has requested, including the revised PHC. Utah Code Ann. §40-10-9(4)(a). See also, Utah Administrative Code R614-301-700 et seq.

As for its application to mine the new area, Co-Op has not met the application requirements. Co-Op has not provided accurate maps clearly showing the land to be affected by its mining operations nor has it made a determination of the probable consequences of the mining and reclamation operations on the hydrologic resources, particularly its impact on the regional water table. Utah Code Ann. §40-10-9(4)(b).

These deficiencies in Co-Op's applications and analysis have been adequately demonstrated by Protestant's geologist, S. Bryce Montgomery. Mr. Montgomery's reports have met the requisite standard by showing that there is, at a minimum, a "reasonable likelihood" that Co-Op's mining operations have adversely impacted Big Bear Canyon Springs and Birch Springs, that contaminants from Co-Op's present mining operations and past Trail Canyon Mine operations have penetrated the Star Point-Blackhawk regional aquifer and that Co-Op's proposed expansion to the north will adversely impact Protestants' water sources. Evidence presented by Co-Op in the form of EarthFax's studies is self-contradictory and does not rebut Mr. Montgomery's well-founded theories.

DOGM Senior Reclamation Hydrologist, Tom Munson, also expressed his concern, in his March 14, 1991, memorandum, about the accuracy of some of EarthFax's conclusions and about Co-Op's

failure to adequately protect hydrologic resources. "The Earthfax Engineering report falls short of providing enough data to demonstrate a finding of no impact to the hydrologic balance. . . . The issue of water quality impacts had not been adequately addressed and must be included in any future submittals by Co-Op Mining Company. . . ." Exhibit "A" at 4.

Birch Springs and Big Bear Canyon Springs are the exclusive sources of culinary and agricultural water for thousands of individuals. Contamination and/or alteration of flow levels to either of these water sources by Co-Op's mining operations would cause irreparable damage to the water sources for an entire community, with potentially devastating results to the populace. In its Reply, Co-Op has attempted to comfort Protestants by saying that it will work to more adequately protect these water sources. Protestants cannot, should not and are not required to wait for Co-Op to comply with mining regulations "sometime" in the future, particularly given Co-Op's history of violations. They are entitled to protection now. Protestants, therefore, request the DOGM to deny Co-Op's renewal and new permit applications.

RESPECTFULLY SUBMITTED this 21st day of March, 1991.

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March 14, 1991

TO; Pamela Grubaugh-Littig, Permit Supervisor

FROM: Tom Munson, Sr. Reclamation Hydrologist TM

RE: Hydrogeologic Evaluation of the Bear Canyon Mine Permit and Proposed Expansion Areas, Co-Op Mining Company, Bear Canyon Mine, ACT/015/025, Folder #2, Emery County, Utah

SYNOPSIS

This memo reviews the response by Co-Op Mining Company and their consultant, Earthfax Engineering, to the objections raised by C. V. Special Services District North Emery Water Users (NEWU), and Huntington-Cleveland Irrigation District.

ANALYSIS

The conclusions and recommendations found on page 4-1 and 4-2 of Earthfax Engineering report are as follows. I will address each one individually and state its adequacy in addressing the requirements of determining the Probable Hydrologic consequences of mining within the Bear Canyon Permit Area and the proposed Federal Lease.

1) ***The groundwater system in the area of the Trail Canyon and Bear Canyon mines is mainly controlled by geologic structures (faults and fractures) and lithology.***

   a) *I agree that geology is mainly controlled by geologic structures (faults and fractures) and lithology.*

EXHIBIT A

2) *In the area of present development, the regional water table is located below the Blind Canyon and Hiawatha seams in both the Trail Canyon and Bear Canyon mines as indicated by downhole drilling.*

   a) *This conclusion has not been supported by data in this report and therefore cannot be made. Reference is made to holes drilled but no data has been presented. The Division feels the operator shall plot and document all data associated with drill holes within the Bear Canyon Permit Area and adjacent areas to support any conclusions.*

3) *Water intercepted within the mine workings of the Bear Canyon Mine have not had any identifiable impact on the spring flows of Big Bear or Birch Springs.*

   a) *This is also not supported by data and to the contrary, data exists which points to water quality changes attributed to the old workings of the Bear Canyon Mine. (See 4th Quarter, 1990, Water Quality Data, Big Bear Spring.) Water quantity versus water quality was addressed in the report. Both have an equal bearing on the issue.*

4) *No evidence is available to show a mine-related impact on the spring flows of the Big Bear or Birch Springs. The recent reduction in spring flows appear to be caused by the significant reduction of precipitation over the last four to five years.*

   a) *If flow is the issue then I cannot support this conclusion, as this has not been conclusively demonstrated. Recent data from Big Bear Springs shows an increase in flow in the winter months of 1990-1991, not typical of past data.*

5) ***Insufficient data are available to determine if further development of the mine to the north will impact the regional water table.***

   a) *I would agree that insufficient data exists to determine if further development of the mine to the north would impact the regional water table. Therefore, the operator is responsible for addressing all the requirements of R614-301-728 through future drilling programs, etc.*

RECOMMENDATION #1

1) *Co-Op should arrange with the water companies to allow coordinated monitoring of the springs for flow and water quality. This will ensure an acceptable data base for future investigation of potential impacts to the spring flows.*

   a) *I agree that Co-Op Mining Company must monitor Birch Springs and Big Bear Spring from the source to collect two (2) years of baseline data and then implement operational monitoring after the two (2) year baseline period per the Division Water Monitoring Guidelines for the mine life. This must be implemented immediately. This monitoring will require additional water quality parameters and as such an amendment to the existing water monitoring program must be submitted.*

RECOMMENDATION #2

1) *Co-Op should install a minimum of four monitoring wells within the Bear Canyon Mine to allow determination of a defendable potentiometric surface of the regional water surface within the present permit area. This information can then be projected into the new lease area.*

   a) *This recommendation appears most reasonable to allow a determination of a defendable potentiometric surface of the regional water surfaces within the present permit area. If this drillhole data provides no conclusive evidence to determine a*

potentiometric surface projected into the new federal lease, then additional groundwater data will be requested site specific to the federal lease permit area. This recommendation must be implemented prior to approval of the new federal lease. The drillhole locations must be shown on a mine workings map.

RECOMMENDATION #3

1) *Co-Op Mining Company should revise the PHC associated with the mining operation based on the data collected from the new monitoring wells.*

   a) *This recommendation has already been requested by the Division and therefore must be completed prior to approval.*

FINAL ANALYSIS AND RECOMMENDATION

The Earthfax Engineering report falls short of providing enough data to demonstrate a finding of no impact to the hydrologic balance. Until more conclusive data is collected regarding the regional potentiometric surface, can the Division make a finding of no impact regarding the regional potentiometric.

The issue of water quality impacts has not been adequately addressed and must be included in any future submittals by Co-Op Mining Company. The 4th quarter data on Big Bear Spring indicates a three-fold increase in total dissolved solids, and additional seepage from the old sealed workings of the Bear Canyon Mine are tentatively held responsible for this increase. This issue must be addressed in any future submittals.

AT015025.CMC

March 14, 1991

Mr. Jeff Appel, Attorney
Haley & Stolebarger
175 S. Main, 10th Floor
Salt Lake City, Utah 84111

Dear Jeff: Re: Study of and response to report of Earthfax Engineering, Inc. (Richard B. While) March 11, 1991, for Co-op Mining Company, "Hydrogeologic Evaluation of the Bear Canyon Mine Permit and Proposed Expansion Areas;" and submitted response of Carl E. Kingston, attorney for Co-op Mining Company, dated March 11, 1991, to objections to permit renewal, Cause No. ACT/015/025

As per your telephone request March 13, 1991, and receipt of copies of the above referenced at the end of that day, I have studied these submittals and submit the following.

Basic to the problem and concern of the Co-op Mine operations adversely impacting the Big Bear Canyon Spring and the Birch Spring is found in the third paragraph of page 2-5 and the last paragraph of page 2-9 of the subject report. In brief, there is a regional aquifer in the subject area which is within the Star Point -Blackhawk formations and from which both the Birch and Big Bear Springs discharge. Another further reality is, to quote from the report of R. B. White (1991), "In areas of fracturing, due to increased rock permeability, water is able to pass vertically through strata which normally impede such flows. Depending on the degree of interconnection in the fractures, the groundwater flow can be limited to a small area or it can reach the regional water table (see Figure 2-3). Lines (1985) indicated that for the hydrogeologically similar area of Trail Mountain, located to the south of the study area, even with the large quantity of rock with negligible permeability, some hydraulic connection exists between the perched aquifers and the regional aquifer along the fractures and faults."

Yet, in the last paragraph of page 2-5 of White's report (1991), he states and accepts that no water was encountered in Co-op's borehole drilled adjacent to the Bear Canyon Mine portal, which "was drilled to the top of the Mancos Shale." This hole would have drilled through the Star Point-Blackhawk regional aquifer. Furthermore, White (1991) discounts the measured and reported static water levels in drill holes farther north at higher elevations, which holes penetrated the Star Point-Blackhawk aquifer (see page 3-9 of White's (1991) repot).

White (1991) acknowledges in the second paragraph of page 3-2 of his report, that Co-op Mining Company is diverting and using ground water in the Bear Canyon Mine, yet regardless of his acknowledgement of perched aquifers contributing to the regional aquifer below, as I have quoted him heretofore, he does not recognize that this is a subtraction from the Star Point-Blackhawk aquifer, which supplies the subject springs. He does relent a little on page 3-10 of his report with the statement: "Therefore, it is felt that minimal impact to the flow of the springs has occurred as a result of the mining operations;" and on page 3-11: "Some very minor impact could occur as a result of dewatering of small isolated sandstone lenses which could contribute small flows, like what is intercepted from roof bolting (1-2 gpm).

EXHIBIT B

However, these areas do not have sufficient long term recharge capacity to be of significant concern for a water supply." Yet, at the bottom of page 3-10 and top of page 3-11 of his report, White acknowledges that the ground water is moving from the north to south where the subject springs discharge, but passes-off the matter stating: "Thus, an impact may occur to the north; however, it is not possible to predict where or if it will occur." The existing and proposed extension of the Bear Canyon Mine exists immediately north of the subject springs, over a distance of 2½ miles.

White (1991) shows on pages 3-3 and 3-4 that the total dissolved solids content of the seepage water from the slopes above Big Bear Canyon Spring is considerably higher than that of the Big Bear Spring and roof drippers in the 3rd West Entries of the Bear Canyon Mine. He concludes from this that: "The flow from the cliff seepage above the spring is considerably different . . . .. Due to the quality differences of the inflow to the mine and seepage from the cliff face, these two sources do not appear to be the same water." As I have previously reported, the discharging water from the cliffs above Big Bear Canyon Spring is in large part coming from shale-sandstone contacts and flows through and over gray shales which shales contain the most salts compared to sandstone or coal beds. Thus, higher quality water such is found within Bear Canyon Mine and the Star Point-Blackhawk aquifer could easily dissolve and pick-up considerable salts as it may have oppertunity to flow through or over weathered shales. Thus, higher quality water intercepted and gathered by mining operations that is rediverted into and through shale areas could easily be degraded, changing the quality but not the physical supply of water itself.

In the second paragraph of page 3-8 and on pages 3-11 and 3-12, White (1991) dismisses the total fluctuations in the subject spring flows to precipitation and states: "During the period of 1984 through 1989, the Bear Canyon Mine intercepted inflows at the abandoned workings, the East Bleeders, and the North Main entries. No significant flow reductions at the Big Bear Spring were reported for this period. Therefore, the water intercepted within the mine did not contribute to the Big Bear Spring flow." The record, including Whites graphs, clearly shows a pronounced drop in the Big Bear Canyon Spring for the year 1987 into the present time. Thus, a very real impact of coal mining operations is a subtracting from the ground water which could be part of the supply to someone elses water rights, such as the subject springs, and not be limited to elevated concentrations of inorganic constituents and acid-mine drainage as inferred in the second paragraph of page 3-10 of White's (1991) report.

With reference to the dismissal by White (1991) on pages 3-11 and 3-12 of his report that the Co-op Mines did not contribute to the abnormal flows and grease -oil contamination in the Birch Spring, he states: "Given the contention that the area is extensively faulted and the faults and fractures are interconnected, the possibility of storing this volume of water as a perched water table above a large extent of the mine, without discharge occurring in other locations, is very unlikely." Coal mining operations include the intentional coating of the walls with lime dust to suppress coal dust, and the floor of the mine is also mantled with fines from the mining operation. This tends to plug or restrict existing fracture and intergranular permeability. Thus, the result is a chamber generally lined with a thin coating of fine-grained materials. Eventually, this coating deteriorates in its effectiveness as a seal. However, for a considerable time the mined-out areas can and do serve as groundwater storage space. In fact, Co-op Mining Company is

presently using a part of the abandoned Trail Canyon Mine for such. Admittedly an alternative source of the surge in the Birch Spring flow could have been natural fracture openings, providing the groundwater storage, as proposed by White (1991), but the sudden release of the large volume of ground water containing oil-grease for a relatively short period, points to the abandoned Trail Canyon Mine as the principal storage source for the flush supply of water experienced.

The proposed minimum of four monitoring wells by White (1991) on page 4-2 of his report would be helpful, but they are not sufficient. They would be located soley in the impacted area of the Bear Creek Mine, and access to them during, and especially following the cessation of mining is of concern. A monitoring well is also needed up-gradient from any area impacted from Co-op mining, which I have previously recommended.

As to the statement by attorney Carl E. Kingston on page 7 of his response stating: "I would submit that the Earthfax report appears to be based upon more extensive research and a more thorough analysis of all available information, and accordingly, is more credible;" I simply state that the events of time have and will continue to verify the truth of basic principals upon which I have based my analysis and conclusions.

Respectfully submitted,

S. Bryce Montgomery, Geologist

3512 South 100 East
Bountiful, Utah 84010

Telephone 298-9108 office
295-8592

cc: Mr. Darrel V. Leamaster, P. E.
District Manager
Castle Valley Special Service District

Mr. Menco Copinga, President
Board of Directors
North Emery Water Users Association

Informal Hear
ACT/015/025

State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

Norman H. Bangerter
Governor
Dee C. Hansen
Executive Director
Dianne R. Nielson, Ph.D.
Division Director

355 West North Temple
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801-538-5340

May 20, 1991

Jeffrey W. Appel, Esq.
Michele Mattsson, Esq.
Haley and Stolebarger
175 South Main Street
10th Floor, Walker Center
Salt Lake City, Utah 84111

Carl E. Kingston, Esq.
53 West Angelo Avenue
P. O. Box 15809
Salt Lake City, Utah 84115

Dear Sirs and Madam:

Enclosed is an investigation prepared by Paul Anderson for the Division regarding groundwater resources in the Bear Canyon graben area. Also enclosed is an update of Tom Munson's hydrogeologic evaluation of the Bear Canyon Mine.

Both of these documents are part of the Division's records for the mine and have been considered in preparation of the Order regarding the Informal Hearing.

Best regards,

Dianne R. Nielson
Director

vb
Enclosures (2)
cc: D. Leamaster
M. Copinga
V. Willson
S. Johansen
MI3/54

an equal opportunity employer

Norman H. Bangerter
Governor
Dee C. Hansen
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State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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May 21, 1991

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10th Floor Walker Center
175 South Main
Salt Lake City, Utah 84111-1956

Carl Kingston, Esq.
53 West Angelo Avenue
P.O. Box 15809
Salt Lake City, Utah 84115

Dear Sirs:

Re: Division Order, Informal Hearing, Cause ACT/015/025

Enclosed is the above-referenced Division order regarding the repermit renewal and permit revision for the Bear Canyon Mine.

In accordance with Utah Admin. R. 614-300-200.211 you may file an appeal of this order with the Board of Oil, Gas and Mining, at the above address within 30 days of receipt of this order. Please call me if you have any questions.

Best regards,

Dianne R. Nielson
Director

lsj
Enclosure
cc: Darrel V. Leamaster
Menco Copinga
Varden Willson
Scott Johansen, Esq.
DN68

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Informal Hearing
ACT/015/025

State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

Norman H. Bangerter
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Dianne R. Nielson, Ph.D.
Division Director

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May 21, 1991

Jeffrey Appel, Esq.
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10th Floor Walker Center
175 South Main
Salt Lake City, Utah 84111-1956

Carl Kingston, Esq.
53 West Angelo Avenue
P.O. Box 15809
Salt Lake City, Utah 84115

Jeff

Dear Sirs:

Re: Division Order, Informal Hearing, Cause ACT/015/025

Enclosed is the above-referenced Division order regarding the repermit renewal and permit revision for the Bear Canyon Mine.

In accordance with Utah Admin. R. 614-300-200.211 you may file an appeal of this order with the Board of Oil, Gas and Mining, at the above address within 30 days of receipt of this order. Please call me if you have any questions.

Best regards,

Dianne

Dianne R. Nielson
Director

lsj
Enclosure
cc: Darrel V. Leamaster
Menco Copinga
Varden Willson
Scott Johansen, Esq.
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Mine file

State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

Norman H. Bangerter
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Dee C. Hansen
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Dianne R. Nielson, Ph.D.
Division Director

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Salt Lake City, Utah 84180-1203
801-538-5340

August 23, 1991

CERTIFIED RETURN RECEIPT REQUESTED
No. P 540 713 854

Kimly C. Mangum, P.E.
Mangum Engineering Consultants
388 East Boynton Road
Kaysville, Utah 84037

Dear Mr. Mangum:

Re: Rescheduling of Assessment Conference for State Violations N91-34-2-1 and N91-26-5-1, ACT/015/025, Bear Canyon Mine and C91-26-1-1 and N91-26-3-1, ACT/015/021, Trail Canyon Mine, Co-Op Mining Company, Emery County, Utah

In accordance with your telephone request on August 22, 1991, for an Informal Hearing on state violations N91-34-2-1 and N91-26-3-1, please be advised that the Assessment Conference on state violations N91-34-2-1, N91-26-5-1, Bear Canyon Mine and C91-26-1-1 and N91-26-3-1, Trail Canyon Mine will be held in conjunction with the Informal Hearing. The time for the Assessment Conference has been changed from 9:00 to 11:00 a.m. to 10:00 a.m. until noon on September 4, 1991, to accommodate the Informal Hearing.

Pertinent, written material you wish reviewed before the conference can be forwarded to me at the address listed above.

The conference will be held in the office of the Division of Oil, Gas and Mining.

Very truly yours,

Thomas A. Mitchell
Assessment Conference Officer

vb
cc: W. Owen, Co-Op Mining Company
J. Kathmann, OSM
Public Notice Board

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Mine file

State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

Norman H. Bangerter
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November 4, 1991

CERTIFIED RETURN RECEIPT REQUESTED
No. P 540 713 863

Mr. Kimly C. Mangum, P.E.
Mangum Engineering Consultants
388 East Boynton Road
Kaysville, Utah 84037

Dear ~~Mr. Mangum~~ Kimly:

Re: Informal Hearing for State Violations N91-20-1-1, ACT/015/025, Bear Canyon Mine and N91-32-5-2, ACT/015/021, Trail Canyon Mine, Emery County, Utah

In accordance with your requests dated June 24 and September 28, 1991, please be advised that the informal hearing on state violations N91-20-1-1, Bear Canyon Mine and N91-32-5-2, Trail Canyon Mine, has been established for Wednesday, November 20, 1991, beginning at 10:00 a.m. This hearing will be held in conjunction with the assessment conference.

Pertinent, written material you wish reviewed before the conference can be forwarded to me at the address listed above.

The conference will be held in the office of the Division of Oil, Gas and Mining.

Best regards,

Dianne

Dianne R. Nielson
Director

vb
cc: W. Owen, Co-Op Mining Co.
B. Freeman, OSM
J. Helfrich
DOGM Price Office
Public Notice Board

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