RAS 9091

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:
Thomas S. Moore, Presiding Officer
Richard F. Cole, Special Assistant
Robin Brett, Special Assistant

In the Matter of:	)	
	)	
HYDRO RESOURCES, INC.	)	Docket No. 40-8968-ML
P.O. Box 777	)	ASLBP No. 95-706-01-ML
Crownpoint, NM 87313	)	
	)	

INTERVENORS' MOTION FOR ISSUANCE OF A SUBPOENA FOR THE PRODUCTION OF DOCUMENTS AND TO SUPPLEMENT THE HEARING RECORD AND MOTION FOR STAY OF PROCEEDINGS; EXPEDITED CONSIDERATION REQUESTED

I. INTRODUCTION

Pursuant to 10 C.F.R. §§ 2.1209, 2.1231, 2.1237, and 2.730, Eastern Navajo Diné Against Uranium Mining ("ENDAUM") and Southwest Research and Information Center ("SRIC") (collectively, "Intervenors"), hereby move the Presiding Officer to issue a subpoena requiring Hydro Resources, Inc. ("HRI") to provide to Intervenors the documents specified below and issue an order requiring HRI and the Nuclear Regulatory Commission Staff ("Staff") to supplement the hearing record with the documents specified below. Intervenors have no objection to reasonable conditions the Presiding Officer may impose to insure that legitimately confidential or sensitive information is protected. Intervenors are filing this motion because the documents are needed in order to determine the geophysical environment of the aquifers within Section 17, Crownpoint,

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and Unit 1, specifically to determine whether faulting, fracturing, erosion channels or all of these conditions exist at HRI's proposed mine sites. Neither HRI nor the Staff has been willing to make these documents available to the Intervenors as part of the hearing record, despite Intervenors' good faith efforts to negotiate a reasonable agreement granting access to these documents. The failure of HRI and the Staff to produce these documents represents a violation of the Atomic Energy Act and NRC regulations.

II. FACTS AND PROCEDURE

Intervenors seek, per numerous previous requests, the following documents, ("Requested Documents") that are referred to throughout the record:

1. Fence diagrams and/or structural cross-sections for Section 17, Unit 1, and Crownpoint. Fence diagrams and/or structural cross sections are referred to in the Consolidated Operations Plan, revision 0.0 at page 90 (1996)[1], attached hereto as "Exhibit 1". They are also referred to in Analysis of Hydrodynamic Control, HRI, Inc., Crownpoint and Church Rock New Mexico Uranium Mines, at 3 and 7 (Geraghty and Miller, 1993), attached hereto as "Exhibit 2" and NUREG 1508 at 3-15. These diagrams are the bases for the site-specific determinations that no inter-aquifer connections caused by changes in geologic strata positions or thicknesses exist. In particular, they purport to support HRI's claims that mine fluids will not affect any underlying or overlying fresh water aquifers
2. Borehole information for Borehole 2.8/17/7, referred to at p. 3-35 of NUREG-1508 and the borehole upon which Fig. 3.7 in NUREG-1508 is based. These NUREG pages are attached hereto as "Exhibit 3". This information should include down-borehole camera images, rock cores, core photos, drillers notes and loggers notes.
3. Documentation of driller's logs, pump test information and water level information, including hydrographs, for wells CP-1 and CP-4 and documentation of well completion difficulties for well CP-4. This information is referred to in the Crownpoint Technical Report at pages 46, 49-55 and at Appendix A, Table 4 (1992), attached hereto as "Exhibit

[1] COP revision 2.0, §8.2, which corresponds to the above citation for revision 0.0 does not contain any reference to fence diagrams, cross-sections, or boreholes.

> 4". The site-specific aquifer testing effort of which these wells were a part is explicitly referred to in NUREG-1508 at 3-29. While HRI provided pump test information for some of its exploration holes, it has not provided this information for CP-1 and CP-4, and this information is not part of the hearing file. Additionally, in an October 16, 1998 letter to Mr. Bob Carlson, attached hereto as "Exhibit 5", Mark Pelizza states that geophysical logs of monitor wells CP-1 through CP-10 are provided in the hearing file. However, geophysical logs are different from driller's logs and each type of log provides different information. In the October 16, 1998 letter, Mr. Pelizza does not address the absence of driller's logs.

Intervenors initially requested the information and documents listed above, in addition to the same information for Section 8, from HRI and the Staff in a written request to the Staff on September 29, 1998. Letter from Johanna Matanich to John Hull and Mitzi Young and attached list ("Matanich Letter"). A copy of that letter is attached hereto as "Exhibit 6". Counsel for Intervenors at the time, Johanna Matanich, made several telephone calls to the Staff and HRI to follow up on the request. ENDAUM and SRIC Motion For Issuance Of A Subpoena For The Production Of Documents, Or, Alternatively, To Supplement The Hearing Record And To Postpone The Deadline For Filing Written Presentations On Groundwater Issues And NEPA Issues; Expedited Consideration Requested ("December 1998 Subpoena Motion") at 3, fn.1 (December 10, 1998). On November 13, 1998, the Staff responded. Letter from Mitzi Young to Johanna Matanich ("Young Letter") attached hereto as "Exhibit 7". Attached to the Young Letter was a letter from Mark S. Pelizza, President of HRI, to Bob Carlson of the NRC, dated October 16, 1998. The Young Letter contained some, but not all, of the information requested by Intervenors. December 1998 Subpoena Motion at 3.

On December 10, 1998, Intervenors filed a Motion requesting that the Presiding Officer issue a subpoena for the remaining documents or in the alternative order that the

hearing record be supplemented with that information. December 1998 Subpoena Motion at 13. On December 16, 1998, the Presiding Officer issued an order denying Intervenors' December 1998 Subpoena Motion. Subpoena Order (December 16, 1998) (unpublished). In denying the motion, the Presiding Officer determined that there was not yet any need for relief. December 1998 Subpoena Order at 2. Instead, the Presiding Officer determined that the Intervenors could argue in their written presentations that there are essential evidentiary gaps in the record and therefore HRI has failed to meet its burden of proof. Id. Further, at some future date, the Presiding Officer noted that Intervenors could argue that the Presiding Officer must require oral arguments and suggest cross-examination for use by the Presiding Officer. Id. At that time, the Presiding Officer determined that should additional documents be needed with respect to an oral presentation or testimony, the Presiding Officer could obtain them. Id. Finally, the Presiding Officer concluded that it would be better to determine the evidentiary matters in light of the complete arguments on the merits that would be available later in the proceeding. Id. The Presiding Officer never reached the merits of Intervenors' contentions.

Intervenors were never permitted to review the Requested Documents and argued in their brief regarding groundwater protection at Section 8 that HRI had misrepresented the geophysical environment at Section 8 because the hearing record lacked drillers' logs, structural cross-sections and fence diagrams for Section 8. Intervenors Amended Written Presentation In Opposition To Hydro Resources, Inc.'s Application For A Materials License With Respect To Groundwater Protection, Vol. I, Legal Brief, at 23-27 (January

18, 1999). The Presiding Officer rejected Intervenors' arguments on this point with respect to Section 8. LBP-99-30, 50 NRC 77, 85 (1999).

After subsequent litigation regarding Section 8 and unsuccessful settlement negotiations, Intervenors have since noted that that the records they requested in 1998 are still excluded from the record, with respect to Section 17, Unit 1 and Crownpoint. Joint Status Report at 3-5 (March 26, 2004); Joint Status Report at 3-4 (April 30, 2004). Despite repeated reference in the record to the original data, cited above, the original data have not been provided. This information forms part of the basis for the determination that HRI's operations would not affect any aquifer overlying or underlying the Westwater Canyon aquifer, where mining will occur at Section 17, Crownpoint and Unit 1. Because the Staff relied on the above information to make its determination to grant HRI's source materials license application, it should be part of the hearing file. Moreover, because the Requested Documents are referred to in the record and were presumably considered by the Staff in making its decision to grant HRI's license application, Intervenors are not seeking this information pursuant to discovery; rather, Intervenors are simply seeking to review the same information the Staff reviewed. However, even if the Staff did not actually review this information, Intervenors should still be permitted to review it because it is cited in application documents.

Pursuant to the Presiding Officer's direction, Intervenors and HRI have been negotiating the terms of a protective agreement to allow Intervenors access to the documents requested. See, Transcript of April 14, 2004 telephone conference at 35-36. However, HRI and Intervenors have been unable to reach an agreement as to the terms of the protective agreement. Intervenors therefore respectfully request that the Presiding

Officer issue a subpoena for the Requested Documents, require that the record be supplemented with the Requested Documents and stay the proceedings until Intervenors' experts have had the opportunity to review the documents.

III. ARGUMENT

The Requested Documents should be subpoenaed and placed in the record for three reasons. First, the Requested Documents are necessary for Intervenors to meaningfully evaluate HRI's materials license application and the Staff's granting of that application and therefore essential for a meaningful public hearing under the Atomic Energy Act. Second, the Requested Documents are essential to insure that Intervenors are given a fair and impartial hearing under NRC regulations. Third, NRC regulations require that the Requested Documents be part of the hearing file.

A. The Documents Sought By Intervenors Are Crucial To Meaningfully Analyzing HRI's Materials License Application.

As explained below, the Requested Documents are critical to meaningfully analyze HRI's contentions regarding Section 17, Crownpoint and Unit 1's geophysical environment. Without these documents, Intervenors would be unable to fully critique HRI's technical determinations regarding the hydrology of the CUP.

1. Structural Cross-Sections, Structural Contour Maps And Fence Diagrams.

As explained by Intervenors' previously, structural cross-sections, structure contour maps, and fence diagrams are needed so that Intervenors can determine the potential for excursions that would result from faulting and channelization in and through the ore zones. See eg., Joint Status Report at 3-5 (March 26, 2004); Reply Affidavit of Michael G. Wallace at 3-6 (March 4, 1998), attached hereto as "Exhibit 8". Structural cross-sections and fence diagrams show the actual surface elevations of the various

geologic units of Section 17, Crownpoint, and Unit 1, and therefore reveal faulting and erosional surfaces. A structural cross-section begins with uniform surface elevations on the land surface and faithfully represents the actual elevations, above sea level, of the tops of each underlying geologic strata at each borehole location considered. Fourth Affidavit of Michael G. Wallace, Fig. 1, (December 10, 1998), attached hereto as "Exhibit 9". If one part of a geologic unit is juxtaposed with part of a different unit through faulting, a pathway for lixiviant exists. Id.

The stratigraphic or lithographic cross-sections, which are already in the record, are more simplified geological maps which do not provide this information. Stratigraphic cross-sections do not link borehole data by elevation. Id., Fig. 2, attached hereto as "Exhibit 10". Instead, these cross-sections level the elevation of each geologic unit to portray each unit as a relatively straight layer. Id. Structural cross-sections and structure contour maps are clearly central to determining the true geophysical nature of Section 17, Crownpoint and Unit 1.

2. Driller's Logs

In addition to structural cross-sections, structure contour maps, and fence diagrams, driller's logs are critical to understanding the geophysical nature of Section 17, Crownpoint, and Unit 1. Driller's logs are necessary to verify the data contained in any structural cross-sections and structure contour maps. Fourth Affidavit of Michael G. Wallace at 4, attached hereto as "Exhibit 11". Driller's logs contain detailed descriptions of the strata encountered at each foot in a borehole based on the written observations of the field geologist. Reply Affidavit of Michael G. Wallace at 5-6, n. 6. Driller's logs

would give the most direct evidence for the existence of sand channels in the Westwater Canyon Member. Id.

Driller's logs for the monitor wells that were sunk into the Dakota aquifer should also be included. In determining whether the overlying Dakota aquifer is hydrologically connected to the Westwater aquifer, where mining is proposed to take place, HRI drilled monitor wells in the Dakota aquifer and pumped water from the underlying Westwater aquifer. Crownpoint Technical Report at 46. If there is any response from the monitor well in the overlying aquifer, then the two aquifers are hydrologically connected. Id.

The Administrative Record indicates that HRI drilled a monitor well in the Dakota aquifer, but inexplicably moved it further and further from the pumping well. Id. HRI claimed that the monitor well was moved progressively further from the pumping well because of "barometric inefficiencies". Id.

B. The Information Requested By Intervenors Is Essential To Insure A Meaningful Public Hearing.

The information requested by Intervenors is critical to a meaningful analysis of HRI's materials license application and the Staff's granting of that application. Section 189 of the Atomic Energy Act ("AEA") provides, "[i]n any proceeding under this chapter, for the granting, suspending, revoking of any license or construction permit ... the Commission shall grant a hearing upon request of any person whose interest may be affected by the proceeding ..." 42 U.S.C § 2239(a)(1)(A). The United States Court of Appeals for the District of Columbia Circuit interpreted this provision to require meaningful public participation in NRC proceedings. Union of Concerned Scientists v. U.S. Nuclear Regulatory Commission, 735 F.2d 1437, 1446 (D.C. Cir. 1984), citing Bellotti v. U.S. Nuclear Regulatory Commission 725 F.2d 1380,

1389 (D.C. Cir. 1983) (Wright, J., dissenting). Thus, while the NRC has the freedom to structure its proceedings so as to maintain their integrity, one of its goals must be to assure that there is meaningful public participation. Id. Moreover, the court noted that administrators may not lightly sidestep procedures that involve the public in deciding important questions of public policy. Id., citing Environmental Defense Fund, Inc. v. Ruckleshaus, 439 F.2d, 584, 594 (D.C. Cir. 1971).

At a minimum, meaningful public participation should include fundamental principles of fairness. See e.g., Olehouse v. Commodity Credit Corp., 42 F.3d 1560, 1584 (10th Cir. 1994), citing Garvey v. Freeman, 397 F.2d 600, 612 (10th Cir.1968) (hearings and appeals under 7 C.F.R. § 780 must conform to basic concepts of fair play, including full, albeit informal, discussion of the pertinent issues with the rights of confrontation and cross-examination); Oberstar v. FDIC, 987 F.2d 494, 504 (8th Cir. 1993) ("The statute [18 U.S.C. § 1818(i)(2)(H)] provides that a respondent who makes a timely hearing request ... 'shall be afforded an agency hearing'. Implicit in that is a mandate that the hearing be fundamentally fair."). Meaningful public participation must also include access to all material evidence. Greene v. Babbitt, 64 F.3d. 1266, 1274 (9th Cir. 1994) (Indian tribe's due process rights were violated by the United States Department of Interior where, in the course of a tribal recognition proceeding, the tribe did not have access to all of the material evidence and therefore had to speculate whether its materials adequately addressed materials submitted by others).

As noted in Section III.A, above, the Requested Documents are essential for Intervenors to meaningfully assess the geophysical environment in which HRI intends to conduct its ISL operations at Section 17, Unit 1 and Crownpoint. Without these

documents, Intervenors would be at a disadvantage in determining whether there is communication between aquifers and thus the potential for horizontal and vertical excursions to occur undetected. The Requested Documents are referred to throughout the record and were therefore presumably reviewed by the Staff in order to verify their authenticity and accuracy. Intervenors should be allowed to review those documents as well.

C. Failure To Provide Intervenors The Information Requested Violates NRC Regulations.

Failure to provide Intervenors with the Requested Documents also violates NRC regulations for two reasons. First, prohibiting Intervenors from reviewing the Requested Documents abrogates the Presiding Officer's duty to conduct a fair and impartial hearing. Second, the Requested Documents are referred to in HRI's license application materials and thus should be part of the hearing file pursuant to 10 C.F.R. § 2.1231(b).

a. Intervenors Should Be Permitted To Review The Requested Documents To Insure A Fair And Impartial Hearing.

Section 2.1209 of the NRC regulations indicates that the Presiding Officer shall have all powers necessary to conduct a fair and impartial hearing. 10 C.F.R. §2.1209. That section also provides specifically that the Presiding Officer has authority to issue subpoenas for the production of documents. Id. at §2.1209(h); In the Matter of St. Mary's Medical Center, CLI-97-14, 46 NRC 287, 291 (1997) ("[A]n agency's subpoena power is essentially analogous to the broad subpoena powers accorded to a grand jury").

The Presiding Officer can therefore rule that a subpoena be issued for the production of specific documents. The Presiding Officer can also direct supplementation of the record. In addition, 10 C.F.R. §§2.1237 and 2.730 provide that a party may seek

relief by means of a written motion addressed to the Presiding Officer. This motion is therefore an appropriate avenue for Intervenors' request.

In In the Matter of Wisconsin Electric Power Co. (Point Beach Nuclear Plant, Units 1 and 2), a Licensing Board interpreted the scope of 10 C.F.R. § 2.718, whose language parallels that of § 2.1209. LBP-82-12, 15 NRC 354, 355 (1982). In interpreting § 2.718, the Licensing Board declared that the right of the public to be fully apprised of NRC actions would only be abridged after balancing legitimate concerns for the protection of competitive positions. Id. Additionally, the Commission's Statement of Policy on Conduct of Adjudicatory Proceedings provides that it is the Commission's objective to provide a fair hearing process. In the Matter of Statement of Policy On Conduct of Adjudicatory Hearings, CLI-98-12, 48 NRC 12, 13 (1998).

In this case, Intervenors would be deprived of a fair and impartial hearing if they are not permitted to view the Requested Documents. The Requested Documents are referred to throughout the existing record, indicating that HRI has these records and that the Staff has viewed them and used them as a basis for its decision to grant HRI its source and byproduct materials license. Fundamental fairness demands that if the Staff and HRI reviewed these documents Intervenors should likewise be allowed to do so.

Furthermore, any proprietary information in the Requested Documents can be redacted so as to protect HRI's "competitive position". It is Intervenors' position that the uranium ore grade and location is the only information that could reasonably be construed as proprietary. Intervenors have no interest in this information and do not seek it. Intervenors are concerned exclusively with the geophysical and hydrological environment at Section 17, Unit 1 and Crownpoint. Any information regarding the

uranium ore grade and location at Section 17, Unit 1 and Crownpoint could be redacted from any of the Requested Documents, thereby protecting HRI's competitive position.

Moreover, some information pertaining to uranium ore grade and location is already in the record, making any argument that Intervenors should not be allowed to see the Requested Information because it contains proprietary information meritless. Ore-grade data for the Church Rock site is contained in several documents already in the Hearing Record. For instance, ore-grade information for the Church Rock mining sites appeared in the original Church Rock Environmental Report. See, Fig. 6.6-1 at 355-362; Fig. 6.6-2 at 363; and Table 6.6-1 at 364 (April 1988) (ACN 8805200344). Identical ore grade information also appears in the Revised Church Rock Environmental Report. See Fig. 6.6-1 at 281-288; Fig. 6.6-2 at 289; and Table 6.6-1 at 290) (March 16, 1993) (ACN 9304130415), attached hereto as "Exhibit 12". Ore-grade information for the Crownpoint site is contained in the Crownpoint Technical Report. See Fig. 4.6-2 at 93 and Table 4.6-1 at 94 (June 1992) (ACN 9509080094), attached hereto as "Exhibit 13". These same data for the same borehole were also contained in the Unit I Allotted Lands Environmental Assessment. See Fig. 6.6-2 at 6-16 and Table 6.6-1 at 6-17 (January 6, 1992) (ACCN 9509080065), attached hereto as "Exhibit 14". Throughout this entire proceeding, Intervenors have referred to these data only once, and that was in the context of their concerns about uranium mining-related contamination in the Church Rock area. Written Testimony of Douglas M. Brugge, Ph.D. (February 16, 1999), Exhibit 3-F, attached to Eastern Navajo Diné Against Uranium Mining's and Southwest Research and Information Center's Brief in Opposition to Hydro Resources, Inc.'s Application for Materials License with Respect to Environmental Justice Issues (February 19, 1999).

b. The Requested Documents Should Be Part Of The Hearing File.

NRC regulations provide that the hearing file shall include the licensee's license application and any amendments thereto and any NRC environmental impact statement or assessment relating to the application. 10 C.F.R. § 2.1231(b). In this case, HRI's application included the Consolidated Operations Plan, version 0.0 (September 30, 1996) (ACN 9701160106) and later revisions 1.0 (May 15, 1997) (ACN 9705220214), and 2.0 (August 15, 1997) (ACN 9708210179), Church Rock Environmental Report (April 13, 1988) (ACN 880520034), Church Rock Revised Environmental Report (March 16, 1993) (ACN 9304130415), Crownpoint Project Technical Report and Analytical Summary (July 31, 1992) (ACN 9509080094), Unit 1 Environmental Assessment (January 6, 1992) (ACN 9509080065), and Geraghty and Miller's Hydrodynamic Control report (October 1993) (ACN 931216178). The NRC's environmental assessment consisted of the Final Environmental Impact Statement for the Crownpoint Uranium Project, NUREG 1508, (February 1997).

As Intervenors have previously noted, the Requested Documents are referred to throughout HRI's application documents. See eg., Joint Status Report at 3-5 (March 26, 2004). Because the Requested Documets are referred to throughout HRI's application documents, they should be included in the hearing file pursuant to the plain language of 10 C.F.R. § 2.1231(b).

D. The Above-Captioned Proceeding Should Be Stayed Pending Review Of The Requested Documents.

In addition to requesting that they be allowed to review the Requested Documents, Intervenors also request an immediate stay, effective until 30 days after the Requested Documents are made available to them, of the above-captioned proceedings so

that their technical experts have time to review and meaningfully analyze the documents. In deciding whether a Licensing Board proceeding should be stayed, the Commission has enumerated four factors that must be considered. First, the movant must show that it is likely to prevail on the merits. In the Matter of Allied General Nuclear Services, ALAB-296, 2 NRC 671, 677 (1975). Second, the movant must show that it will suffer irreparable harm if the motion is not granted. Id. at 677-678. Third, the tribunal must consider whether the issuance of a stay would substantially harm the other parties in the proceeding. Id. at 678. Finally, the tribunal must consider the public interest. Id.

Here, Intervenors satisfy all four factors. As argued above, both the Atomic Energy Act and the NRC regulations mandate a fair and meaningful adjudication process. When HRI and the NRC Staff have reviewed certain documents important to evaluating a critical issue in this licensing proceeding, but Intervenors have not, the process becomes neither fair nor meaningful. Under the AEA and NRC regulations, as outlined above, Intervenors are entitled to review the Requested Documents, and are likely to succeed on the merits of their argument.

Intervenors would also be irreparably harmed if a stay is not granted to allow Intervenors to review the Requested Documents. As agued in part III.A, above, the Requested Documents are critical to a meaningful analysis of the geophysical and hydrological environment where HRI's proposed ISL operations are to take place. Without having reviewed these documents when HRI and presumably the Staff have had the opportunity to review them, the Intervenors are placed at a distinct disadvantage in these proceedings. Moreover, if Intervenors are permitted to review the Requested Documents, their technical experts will need time to meaningfully evaluate their

significance. Thus, to avoid prejudice and irreparable harm, Intervenors should be allowed to review the Requested Documents and the above-captioned proceedings should be stayed to allow Intervenors' technical experts adequate time to review and evaluate them.

Issuance of a stay would not substantially harm other parties in the proceeding. HRI does not plan to commence operations at its Church Rock site until 2007 at the earliest. Press Release, "Uranium Resources, Inc. Announces Commencement of Vasquez Production, Current Operating Plans and Quotation of Its Common Stock on the OTC Bulletin Board" at 1 (October 18, 2004), attached hereto as "Exhibit 15". Intevenors request a stay of 30 days, in addition to the time it would take to make the Requested Documents available to them. This clearly will not interfere substantially with HRI's mining plans. Likewise, the Staff is not harmed by a stay. HRI's license has been granted by the Staff and it has no further licensing responsibilities other than its continuing duty to review HRI's operations which have not yet begun. Thus, harm to HRI and the Staff imposed by a stay is negligible.

Finally, the public interest is clearly best served by insuring a fair and impartial hearing process. The public hearing aspect is a centerpiece of the licensing process. Union of Concerned Scientists v. U.S. Nuclear Regulatory Commission, 735 F.2d at 1446. By demonstrating that the public hearing process is fair and open, the public interest would be best served.

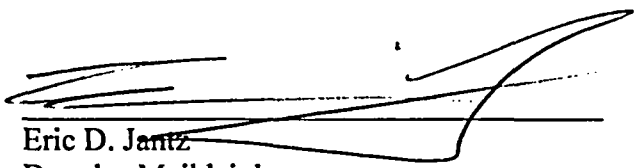
Intervenors therefore respectfully request:

1. That the Presiding Officer issue a subpoena for and require supplementation of the record with the Requested Documents;

2. That the Presiding Officer grant an immediate stay of the above-captioned proceeding, effective until 30 days after the Requested Documents are made available to Intervenors, in order to allow Intervenors' technical experts the opportunity to meaningfully evaluate the Requested Documents; and

3. That consideration of this Motion is expedited.

Dated: December 29, 2004.



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NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:
Thomas S. Moore, Presiding Officer
Richard F. Cole, Special Assistant
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HYDRO RESOURCES, INC.	)	ASLBP No. 95-706-01-ML
(P.O. Box 777	)	
Crownpoint, New Mexico 87313)	)	

CERTIFICATE OF SERVICE

I hereby certify that copies of "Intervenors' Motion For Subpoena Of Documents And To Supplement The Hearing Record And Motion For Stay Of Proceedings; Expedited Consideration Requested" in the above-captioned proceeding have been served on the following by U.S. Mail, first class, via U.S Mail, first class and via E-mail to those parties indicated with an asterix, and via Federal Express to the Office of the Secretary and ASLBP this 29th day of December, 2004:

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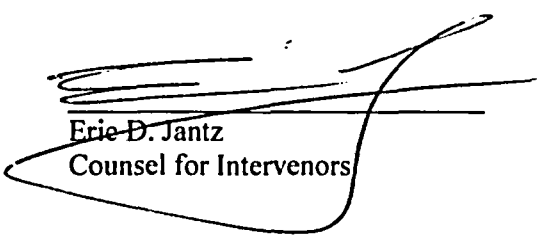

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CROWNPOINT URANIUM PROJECT
CONSOLIDATED OPERATIONS PLAN

HRI, Inc.
2929 Coors Road
Albuquerque, New Mexico 87120

Revision 0.0
September 30, 1996

a) These sands are separated from the production zone by the Dakota, which will be monitored.

b) The massive Mancos shale which separates the Dakota from the Mesa Verde group make interformational transfer impossible.

c) Mechanical integrity test will assure that casing does not leak into shallow sands of the Mesa Verde group.

d) Sands of the Mesa Verde group are not substantial aquifers.

8.2 Underlying Zones

Underlying the host sand at Churchrock, Crownpoint, and Unit One, is the Recapture member of the Morrison Formation. The Recapture Member is a basin wide depositional unit. Toward the edge of the Jurassic basin (precursor to the San Juan Basin) the deposited stratigraphy includes eolian and a fluvial facies. Toward the interior of the basin, deposition was dominantly fine grained mudstone and shale deposited in a lacustrine environment. The deposits of eolian and fluvial facies interfinger basinward with the fine grain mudstone and shale.

The lacustrine facies is recognized throughout the south side of the present San Juan basin. As presently mapped at outcrop it is 200 feet thick. At Churchrock it is 180 feet thick, while at Crownpoint/UNIT 1, it is 260 feet thick.

At Crownpoint there are three holes that penetrated the total section of Recapture shale. Drill hole 24-156C on HRI, Inc.'s property, drill hole 28-132, located 1 mile east of Crownpoint, and drill hole 16-224, located 2 miles west of Crownpoint. Even though there are a large number of drill holes, most only penetrated the upper 5 to 40 feet of Recapture shale. At Churchrock, drill hole 2.8/17/7 penetrated the total section of Recapture shale. As at Crownpoint, there are a large number of drill holes at Churchrock. Most penetrated only the upper 5 to 40 feet of Recapture shale.

Based on the cross sections, fence diagram, and the drill holes at or near each property, it is clear that the Recapture shale underlies the host sand at all three sites. Due to the 200 to 260 foot thickness the underlying Recapture shale, there is no possibility for interformational transfer of mine fluids which would effect of any underlying fresh water aquifers.

ANALYSIS OF HYDRODYNAMIC CONTROL, HRI, INC. CROWNPOINT AND CHURCHROCK NEW MEXICO URANIUM MINES

October 7, 1993

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The mining horizon is underlain by shales of the Recapture Member of the Morrison Formation. The Recapture shales are approximately 250 feet thick within the area of the Crownpoint Mine. The ore sands are overlain by the Brushy Basin Member of the Morrison Formation, which is comprised of shales approximately 70 feet thick in the mine area.

STRUCTURE

Structural cross sections prepared by HRI were examined in detail for the evidence of geologic faults which could be conduits for migration of fluids out of the mine zone or which could reduce the effectiveness of the monitoring program. There is no indication that faults with any significant displacement are present within the mine area. A nearby seven-meter fault mapped by the U.S. Geological Survey (Crownpoint Quadrangle) is not evident in the mine area and, if present, is projected to cut the ore zone north of the mine.

MINING FLUID CONTAINMENT

Vertical Containment

Prior to filing the application for a discharge permit, HRI conducted a pumping test in the production zone to determine the effectiveness of the overlying Brushy Basin to contain fluids within the ore body. The pumping test consisted of producing groundwater from the mine zone while monitoring fluid levels in observation wells completed within the ore body, as well as within the first overlying aquifer above the Brushy Basin Member (Dakota Formation). An observation well completed in the production zone approximately 1930 feet from the pumping well experienced fluid level declines of approximately 14 feet during the test. However, an observation well completed in the Dakota Sandstone, approximately 1866 feet from the pumping well, showed no response to pumping. The lack of response in the first overlying aquifer indicates that the Brushy Basin shales provide adequate upper confinement for mining fluids. The thick Recapture shales will provide lower containment.

throughout the life of the mine is 8 to 16 feet. Because water is not removed from storage during mining, the only affect on nearby municipal wells may be a slight increase in pumping costs (estimated to range from 2 to 5 percent).

HRI CHURCHROCK MINE

LITHOLOGY

As in the Crownpoint Mine, the ore in the Churchrock Mine area is contained within the massive Westwater Canyon Member sands, although at depths shallower than at Crownpoint (Figure 18). The ore zone is overlain by shales of the Brushy Basin Member and underlain by shales of the Recapture Member. Lower shales of the Brushy Basin Member are approximately 10-15 feet thick and uniform throughout the site. There is a thin sand in the middle of the Brushy Basin in the HRI Churchrock Mine that is continuous across the mine area. This sand will be designated as the first overlying aquifer.

The Recapture shale consists predominantly of shales in its upper part, and a review of the structural and lithologic cross sections presented in the application indicate that the upper 160 feet of Recapture consists predominantly of shale.

STRUCTURE

A review of the structural cross sections prepared by HRI indicates that no significant geologic faults are present within the Churchrock Mine area. No faults are indicated in the mine area on U.S. Geological Survey geologic maps.

NUREG–1508
BLM NM–010–93–02
BIA EIS–92–001

Final
Environmental Impact Statement
to Construct and Operate the Crownpoint Uranium Solution Mining Project, Crownpoint, New Mexico

Docket No. 40–8968
Hydro Resources, Inc.

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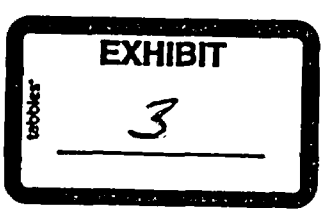
Division of Waste Management
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555–0001

in Cooperation With

Albuquerque District
U.S. Bureau of Land Management
Albuquerque, New Mexico 87107

Navajo Area Office
U.S. Bureau of Indian Affairs
Gallup, New Mexico 83701



The aquifer formations located beneath the Church Rock site are similar to those beneath the Crownpoint and Unit 1 sites. The Recapture Shale at the Church Rock site is about 55 m (180 ft) thick. At the Church Rock site, drill hole 2.8/17/7 penetrated the total section of Recapture Shale. Most of the holes drilled at the Church Rock site only penetrated the upper 1.5 to 12.2 m (5 to 40 ft) of the Recapture Shale. Water quality in the Westwater Canyon beneath the Church Rock site is good and usually meets New Mexico drinking water quality standards (Table 3.19).

A piezometric surface map of the Church Rock property was prepared by mapping water level data collected in March 1993. The potentiometric surface slopes north-northeastward and is roughly parallel to the structural dip of the sedimentary rocks in the region. The potentiometric surface slopes approximately 0.41 degrees from 2012 to 1995 m mean sea level (msl) (6600 to 6550 ft msl) in elevation (Figure 3.11). The calculated groundwater flow velocity is 2.7 m/year (8.7 ft/year) (Reed 1993).

At the Church Rock site, the top of the Brushy Basin Shale contains the "B" sand. The "B" sand is an artesian aquifer that is 4 to 9 m (13 to 28 ft) thick, with 5 to 10 m (16 to 32 ft) of mudstone between it and the top of the Westwater Canyon aquifer and 5 to 10 m (16 to 33 ft) of mudstone between it and the bottom of the Dakota Sandstone aquifer. Water quality in the Brushy Basin "B" sand is good (Table 3.20).

Similarly, water quality in the Dakota Sandstone aquifer at the Church Rock site is good and meets New Mexico drinking water quality standards (Table 3.21). Vertical flow in the Dakota Sandstone is believed to be downward because the Dakota Sandstone aquifer is over-pressured relative to the Westwater Canyon aquifer. HRI believes that the lateral direction of groundwater flow in the Dakota Sandstone at the Church Rock site is northerly (HRI 1996a). However, lateral groundwater flow has not been determined accurately at this time due to the lack of sufficient monitoring wells (HRI 1996a). (Collection of additional groundwater data will be required of HRI.)

HRI has monitored water levels and conducted pump tests at the Church Rock site. In September and October 1988, pump tests were conducted in the Westwater Canyon aquifer to determine the hydraulic properties of ore-bearing sandstone and to determine the degree of vertical hydraulic confinement between the Dakota Sandstone aquifer, the Brushy Basin "B" Sand aquifer, and the Westwater Canyon aquifer. Additional data from monitor wells were used to determine the degree of hydraulic communication that exists between the mineralized zone and perimeter monitoring points. Four wells were completed in the Westwater Canyon aquifer, one was completed in the Brushy Basin "B" Sand aquifer, and one was completed in the Dakota Sandstone aquifer. The results indicated that transmissivities ranged from 86 to 123 m^2/day (926 to 1326 gal/day/ft) (Table 3.22). No aquifer interconnection was detected by the test (i.e., no draw down was detected by the Dakota Sandstone or Brushy Basin "B" Sand monitor wells). To further verify the properties of the aquitards, HRI undertook a laboratory study. Through this study, HRI tested core samples of the aquitard materials and found that they have sufficiently less vertical permeability than the Westwater Canyon aquifer.

The Church Rock site also contains another preexisting hydrologic feature. In Section 17 at the southern end of the site, large vertical mine workings are connected to tunnels constructed in the

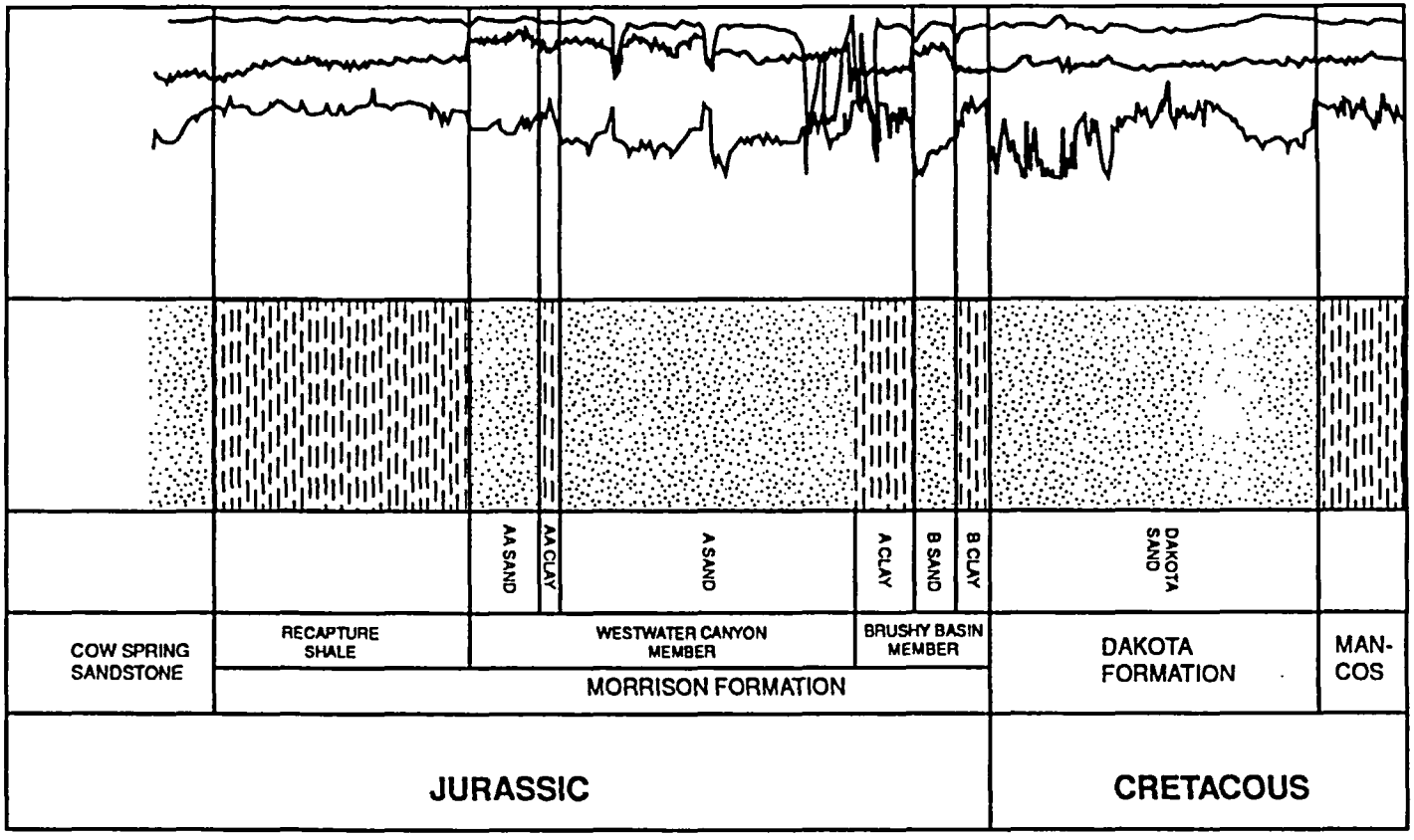


Figure 3.7. Stratigraphic column of the Church Rock site.

CROWNPOINT PROJECT

IN-SITU MINING

TECHNICAL REPORT

SUBMITTED BY

HRI, INC.

JUNE 12, 1992

EXHIBIT

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2.3.2.3 Monitor Well Preparation

A plan view of the area with locations of the pump test wells is shown in Appendix A as Figure 2. The locations of the wells completed into the Westwater Canyon aquifer were chosen for three reasons: (1) to allow characterization of the aquifer over a large region, (2) to confirm the thicknesses estimated for the upper aquiclude, especially to the north, and (3) to provide additional geologic data on the ore and individual roll fronts. Multiple observation wells, at various distances and directions from the pumped well, are required to determine the homogeneity of an aquifer through the symmetry of the pressure response and the variability of the calculated formation parameters. Figure 2 shows the locations of the older observation wells (CP-2, CP-3) and the newer monitor wells (CP-6 through CP-10) in relation to the primary pumping well, CP-5.

Various completion data are shown in Appendix A, Table 1. The older wells, CP-1 through CP-5, were drilled in 1980 and the steel casing cemented with cement baskets placed near the top of the Westwater and uncemented, slotted casing extending into the Westwater below. Wells CP-1 through CP-4 were completed with the larger diameter 10-3/4" casing since they were intended as dewatering wells for the proposed underground mine at Crownpoint (Conoco, 1982). Well CP-5 (also known as the 'Construction Water Well') was completed with smaller 6-5/8" casing and equipped with a 30 horsepower submersible pump. This well has provided water for the existing plant facility since its installation.

The newer monitor wells (CP-6 through CP-9) were drilled in 1990 and completed with 5-1/2", 14 lb/foot steel casing which was cemented from the bottom to the surface and then perforated with oil field-shaped charges, as shown in Appendix A, Table 1. Wells CP-6, CP-7 and CP-8 were opened with ten feet of perforation in each of the top, middle and bottom (but above the AA Clay) portions of the Westwater, for a total of thirty feet. Well CP-9 was completed as an individual zone well for another purpose and was not used for this test.

An attempt was made to re-complete well CP-4, and then CP-1 as a Dakota monitor well. This was done for two reasons:

1. These wells were reasonably close to the proposed pump test well, CP-5. Pumping just this one well (CP-5) then would serve two purposes of the pump test, namely, to test the continuity of the Westwater and the integrity of the overlying aquiclude in the local mine area.

2. The costs could be minimized, since the re-completion costs were considerably less than the full drilling and completion costs of a new well.

The recompletion consisted of cementing off the lower section (the Westwater) of the well and then perforating and developing the overlying Dakota. The risks associated with the recompletion of these wells were readily understood since HRI personnel are experienced in drilling and re-completing of wells in both ISL and the oil field industries. Problems did develop as anticipated. Drill pipe was lost in well CP-4 causing it to be abandoned, and the response of the Dakota in CP-1 to the usual fluctuations caused by barometric and diurnal influences was considered too poor for its use as a monitor well. As a result, well CP-10 was drilled as a twin (a nearby well) to the Westwater monitor well, CP-8, and completed into the Dakota with a thirty foot open hole section, (Appendix A, Table 1). Field representatives from the New Mexico State engineer's Office were on site during the cementing of casing for the five new wells, CP-6 through CP-10.

Each monitor well to be used in the pump test (CP-2, CP-3, CP-6, CP-7, CP-8 and CP-10) was developed using a combination of air compressors (for air jetting) and submersible pumps. Fluid levels in the wells were then monitored with Electric Handlines (also called "E-lines", "Well Sounders" and "M Scopes") and/or Steven's Chart Recorders to ensure that they responded to the ordinary barometric and diurnal fluctuations.

Phase One proceeded as scheduled until an instantaneous power outage (or "power bump", as it is called locally) occurred at 0545 hours, 4-18-92, and caused the pump to stop. It was off for less than two minutes before being restarted at the 100-101 gpm flowrate. This was the only interruption during the 72 hour pumping period. The pump was shut off manually at 1100 hours, 4-20-91 (after 4320 minutes of drawdown), and the recovery portion of Phase One begun. Two representatives from the New Mexico Environmental Department (ED) visited the site during the drawdown of CP-5 to observe the monitor wells, equipment, personnel, and test procedures. In addition, two representatives of the NTUA (Crownpoint office) visited and observed the test.

The drop in fluid level at the Westwater monitor well CP-8, due to pumping of CP-5, was -14.21 feet (as measured, see Appendix A, Table 5). This compares to a rise in fluid level over the same period of +0.053 feet (Table 5) in Well CP-10, which monitors the overlying Dakota Sandstone. The large drawdown in CP-8 coupled with the actual rise in water level in CP-10 caused HRI to end the test at this point (as discussed above) and not proceed into Phase Two.

2.3.2.7 Analysis and Results

All Steven's Recorders had twenty-four hour clocks installed for this pump test, which means that twenty-four hours is required to completely track across the time scale of the chart. All charts were manually digitized into two-hour increments and input into computer files. Files were also built for the manual fluid level and flowrate readings. This data was then plotted versus time and scrutinized for obvious errors and those errors corrected or that information deleted.

Well locations were corrected for drill hole elevation to the mid-point of the Westwater Canyon Sandstone and are shown for wells CP-1 through CP-8 in Appendix A, Table 3. Since well CP-10 is shallower than the Westwater and extends to just above the top of the Brushy Basin, the correction for deviation was made to the bottom (TD) of the well. The elevations to the top of the casings for those same wells are also shown in Appendix A, Table 3. Surface locations and elevations for the Crownpoint town wells were estimated from USGS Topographic maps and are also noted in that Table. Distances between various wells, using the locations of the wells at the mid-point of the Westwater Canyon (Appendix A, Table 3), were calculated and are tabulated in Appendix A, Table 4.

The following are some abbreviations used in the various tables and plots for this report:

antec	=	antecedent;
baro	=	barometric;
corr	=	correction;
feet H_2O	=	feet of water;
F.L.	=	fluid levels
gpm	=	Flowrate in gallons per minute;
MSL	=	feet above Mean Sea Level Elevation;
regress	=	linear regression;
S	=	storage coefficient (dimensionless);
T	=	transmissivity (gpd/ft).

A note on the precision of the various estimates of transmissivity and storage coefficient in this analysis. The transmissivity is typically carried to four digits and the storage coefficient to three digits here. This was not intended to imply that all of those digits are significant. Although an error analysis was not undertaken, the range of the numbers themselves indicates that, at most, two digits would be significant, and in some cases, possibly just one digit. In general, the numbers were reported in this form as a matter of convenience in transferring them from the various computer programs to this report.

As discussed earlier, the primary objectives of this test were to show the degree of communication between the Westwater and the First Overlying Zone, the Dakota Sandstone; and to show continuity in the Westwater Canyon Sandstone in that monitor wells will communicate easily across our initial proposed project area. A secondary objective was to estimate the various formation flow parameters (transmissivity and storage coefficient).

Fluid levels, calculated to Mean Seal Level elevation and just prior to starting the pump in CP-5 on 4-17-91, are shown in Appendix A, Table 5. Typically, when static fluid levels and chemical water quality differ markedly for different sands or zones, the degree of hydraulic connection between them is negligible or nonexistent. As can be seen from Table 5, the beginning fluid levels in the twin wells CP-8 (Westwater) and CP-10 (Dakota) are very dissimilar, a 98.87 feet difference. In addition, the ground water chemistry (Appendix A, Table 9) from individual well water samples reveals a marked contrast in water quality (compare sodium, sulfate, TDS, conductivity) for the Westwater and Dakota aquifers. The fluid levels and water quality strongly indicate that the Dakota and the Westwater Canyon are indeed hydraulically isolated from each other. The results shown in Figures C.10-A and C.8-A and in the composite Figure 8, Appendix A, bears this out and is discussed in more detail below.

Barometric readings taken at the project site during the pump test were converted from "inches of mercury" to "feet of water" and plotted in Figure 7, Appendix A. As atmospheric pressure changes and is charted by the barograph, the water level in a well typically goes up or down by some fraction of the change in barometer. This fraction is known as "barometric efficiency". The wellbore fluid level moves in reverse to the atmospheric pressure. As the atmospheric pressure goes up (an increasing barometer), the wellbore fluid level will go down and vice versa. Note the large changes in the barometer reading in Figure 7 during the pumping of CP-5.

Figure C.10-A shows that the fluid levels in well CP-10 (Dakota) are affected considerably by the barometric, diurnal, and antecedent conditions. The measured fluid levels were adjusted and re-plotted with various fractions (barometric efficiency) times the inverse of the barometric readings and a barometric efficiency of 0.35 settled upon. This is plotted in Figure C.10-A as the curve "Corrected for Baro.". The importance of accounting for changes in barometric pressure is especially evident when considering the trend of the measured fluid levels while pumping well CP-5, as compared to the corrected levels (see Figure C.10-A).

The recurring daily fluctuations in CP-10 demonstrate the diurnal or tidal influences on the water levels. As can be seen from Figure C.10-A, these cyclic changes do not take away from the overall, upward trend of the fluid levels corrected for barometric pressure and as a result no diurnal corrections were made.

The general upward trending slope in Figure C.10-A is indicative of antecedent conditions, in other words, the continuing and outside influence on the pressure response of a well. A "best" line fit was developed using linear regression through the curve corrected for barometric changes. This "best" line fit to the antecedent rise in fluid level gave a slope of +0.022 feet/day and is plotted in figure C.10-A as "Antec. by Regress.".

The wells CP-10 (First Overlying Zone monitor) and CP-8 (completed in the Westwater) were drilled as twins and are 72 feet apart. The drawdown in well CP-8 while pumping CP-5 was substantial, at 14.21 feet (see Tables 5 & B-8, Appendix A, and Figures C.8-A and C.8-B). A composite plot of CP-8 and CP-10 on the left side and those for CP-8 on the right side of the graph. Thus, the scale for CP-10 covers 1.0 feet, while that for CP-8 covers 20.0 feet. The large drawdown in CP-8 coupled with the attendant, overall rise in fluid level and lack of response in CP-10, and the disparity in beginning fluid levels and the water qualities of the two wells show that the Dakota Sandstone and the Westwater Canyon are, for all practical expectations, separated hydrologically.

As an additional comment to the composite graph, Figure 8, note the general rise in fluid levels in CP-10 beginning about 4-8-91, and the corresponding decrease in levels in CP-8. The drop in level in CP-8 most reasonably could be attributed o pumping of the Crownpoint Town water wells, which would affect a very

large region. The coincident and opposite rise in levels in CP-10 is typical of zones hydraulically disconnected from, but vertically close to, the pumping aquifer and is called the Moordbergum or Mandel-Cryer effect.

Typically, a well not affected by pumping and which reacts strongly to barometric and diurnal fluctuations is used to develop corrections for other wells which do not respond to the pumping. In this case, with no response in CP-10 from pumping of CP-5, corrections for the various cyclic and random changes in fluid levels could be made to other wells from CP-10. This was done in the first part of the analysis for this Area Pump Test.

The pump test analysis proceeded in two parts. The first portion involved an examination of the data and calculation of the various formation flow parameters (transmissivity and storage coefficient) using data corrected for barometric, diurnal and antecedent conditions, but not modified for the interference caused by other flowing wells. Except for well CP-10, the barometric and diurnal corrections turned out to be negligible as compared to the larger corrections made for the production from the Town of Crownpoint water wells. As a result, only the second portion of the analysis is presented here and "uncorrected" in the various tables and figures of this report refers to the fluid levels "as measured", while "corrected" refers to those corrections for the Town water wells determined from computer simulation.

As noted above, the various flow characteristics for the Westwater has been estimated in other studies and was not a primary objective here. However, by investigating the influence of the producing Town water wells on the HRI observation wells, the degree of scale of those effects could be determined. Obviously, this would involve computer simulation, and selection of the best computer model for this effort had to be considered. Models were available and on hand utilizing either the Theis solution or numerical techniques (specifically finite difference) to solve the radial diffusivity equation. The single, most important difference between the solution methods for these models is that the Theis model assumes homogeneity in the system, whereas the numerical models allow the formation characteristics (transmissivity, thickness, etc.) to vary.

The Theis solution model was ultimately selected for use for the following reasons. In order to take advantage of the non-homogeneity aspect of the finite difference model, data as to the variability of the system must already be available, and then the model set up and calibrated. Over the relatively small region that this Area Pump Test was to encompass, even when including the area of Crownpoint Town water wells, the detail is simply not available and the finite difference model would run as a homogeneous system, just as the Theis solution model.

The changing flowrates of the Town water wells have to be included in any analysis. As it happened, any change in rate lingers for some time and is usually accounted for mathematically using a special technique called superposition. Thus, any model chosen would have to handle the may changes in flowrates represented by the Town water wells. The available Theis model does so and provides an immediate graphic comparison of measured versus estimated drawdowns for any combination of the producing wells. The finite difference model accounts for changing flowrates, but in a manner more unwieldy for the user.

Two other considerations let to choosing the Theis model for this study. Generally, the Theis models re much easier to set up and very fast to run and re-run. Secondly, most analyses of pump tests involve using the Theis solution and various semi-lot techniques, which were developed as extensions of that theory, to solve for the formation flow parameters, and are all based on the same limiting assumptions. Even with these restrictions, these analytical methods have proven to give excellent results as to general formation flow characteristics and are used extensively even to providing the input data for finite difference/finite element models.

All analyses for the Westwater observation wells were made in the same general manner. Consequently, that method will be described in detail for one well, arbitrarily CP-7, with the similarities to other wells understood. The fluid levels for Well CP-7 from early to late April, 1991 are tabulated in Table B.7-A and plotted in Figure C.7-A.

All flowrates for the Town or Crownpoint water wells from November, 1990 through April, 1991 (see Appendix A, Tables 3 & 4 and Figures 5 & 6) and varying on a daily basis were included in the computer simulation using superposition. Also included in this model were the flowrates from Well CP-5 (Table B.5-A) and well CP-6 (Table B.6-B). In addition, for the sake of completeness, the following were included: the 124 minute flow of well CP-5 for 103.3 gpm on 2-19-91, and again for 79 minutes at 107.6 gpm on 4-1-91, as well as the 60 minute flow of CP-6 at 18.7 gpm on 4-23-91. The individual start and stop times for flowrates in the model can be set to the second.

The most prominent feature of Figure C.7-A, as well as the region of most interest, is the drawdown and recovery caused by producing well CP-5. As a result, this was the feature chosen to be history-matched and the area most closely observed during the ensuing trial and error pressure matches with the simulator. All production wells were included from November, 1990, and transmissivity and storage coefficient were varied until the best match, of the CP-5 drawdown and the other fluid level changes, occurred. A transmissivity of 2556 gpd/ft and a storage coefficient of 1.39e-4 (dimensionless) achieved the best results here and was plotted as the "simulation" curve in Figures C.7-A and C.7-G. The simulation was then run with only the Town of Crownpoint water wells and the resulting estimated drawdown noted as "Town Wells" on the various figures (again, Figures C.7-A and C.7-B). The estimated effect of the Town wells was then subtracted from the measured fluid levels and the "corrected" curve plotted (Figure C.7-B). Table 6, (Appendix A) contains a summary of the transmissivities and storage coefficients used to history-match fluid levels for the various Westwater monitor wells.

Figure C.7-D is the log-log Theis-type curve match for the uncorrected drawdowns in well CP-7 during the water production from CP-5. Also shown in that plot is the match of the pressure derivatives, that is, the first derivatives of both the Theis curve and the uncorrected, measured fluid levels. As can be seen from Fighre C.7-D, the first derivative has a more pronounced curvature than its parent (the Theis solution) and actually reverses slope on the log-log plot. When both the Theis and its derivative curve are moved at the same time, a more firm match will usually result than with the Theis curve alone, since there is normally a much smaller area in which a fit is good for both curves, especially if the match depends on data at the later times. This technique has gained considerable popularity since 1979 and is used extensively in the petroleum industry since it provides a more certain diagnostic tool for many of the complex geologic systems normally encountered, such as double porosity, fracture, leakage dominated, and bounded (Tiab and Kumar, 1980; Bourdet *et al.*, 1983; Bourdet *et al.*, 1989; Ehlig-Economides *et al.*, 1990). There are many additional publications, and some describe extending the technique to using the pressure integral and the second derivative.

The transmissivity calculated from the curve match in Figure C.7-D is 1734 gpd/ft and the storage coefficient is 1.37e-4 (dimensionless). It should be noted that, although a computer was used to facilitate the curve matches presented in this report, the selection of each match was done manually. Figure C.7-E presents the log-log match to the "corrected" drawdown data for the Theis curve and its derivative over the same time period as Figure C.7-D. The transmissivity in this case is 2198 gpd/ft and the storage coefficient, 1.54e-r.

A straight line at the later times in a semi-log plot of drawdown versus log of time determines the transmissivity and storage coefficient. This provides estimates of those parameters which are preferable as compared to the log-log plots discussed earlier. This is so because the number of reasonable straight liens through the later times is usually much smaller than the possible curve matches in a log-log plot and this results in a smaller range of possible transmissivities and storage coefficients from semi-log plots.

However, the proper straight line forms in a semi-log plot only after a specific, minimum time has passed, which itself is dependent on the flow characteristics of the formation. In ground water terms, the time must be such that $u <= .025$ and in petroleum terms, dimensionless time (tD) $>= 10$. This minimum time was estimated from the log-log Theis curve matches and then shown on the semi-log plots. Linear regression was used to determine the "best" straight line fit for points with times greater than the calculated minimum time. The transmissivity was then calculated from the slope of that straight line and the storage coefficient

from the X-intercept. Figure C.7-F shows that results for the uncorrected fluid levels and Figure C.7-G for the "corrected" data (corrected for the concurrent water production from the Town of Crownpoint water wells).

Semi-log analysis of the recovery or buildup data (after drawdown has ended) is favored over that of the drawdown analysis because the recovery data is less affected by changes in flowrate of the pumping well, which might have occurred earlier, than is the drawdown data. The time on the abscissa or X-axis is replaced by a ratio of the production time to shut-in time, t/t'. Proceeding to an even more important buildup plotting technique, the Residual Drawdown curve simply takes the difference between the initial and the shut-in fluid levels and plots this on the ordinate or Y-axis. The transmissivities are then calculated from the slopes of the "best" straight lines beyond a certain minimum time, as explained earlier. This is shown for both the uncorrected and corrected fluid levels in Figure C.7-H and the resulting transmissivities noted.

The analysis as described above wa identical for all of the Westwater observation wells (CP-2, CP-3, CP-6, CP-7 and CP-8). The transmissivities calculated from the various plots for those wells are summarized tin Table 7 (Appendix A) and the storage coefficients in Table 8. (Appendix A)

The semi-log Residual Drawdown curve was chosen for the pressure buildup plot because it has the significant advantage of resulting in straight lines which pass through the X-axis at the origin (zero) if there are no unusual effects, either within the zone being tested or from outside influences. A number of influences might cause displacement from the zero point, but in particular, the continued depressurization from other production wells will cause a shift to the left. This provides one means of validating the corrections made earlier for the Town of Crownpoint water wells: the lines through the corrected points should fall closer to the zero point than those for the uncorrected points.

This does happen for wells CP-2, CP-6 and CP-7 (Figures C.2-H, C.6-H and C.7-H, respectively). Figure C.3-H shows the lines to be about equidistance on either side of the zero point, but both are fairly close to zero. The difference is considered to be negligible when considered the proximal location of CP-3 and CP-2 and that CP-2 showed an X-intercept of the corrected data very close to zero.

Well CP-8 (Figure C.8-H), on the other hand, also has straight lines on both sides of the zero point, but both are further from zero than for CP-3. As can be seen from Table 8, the wells with the lowest storage coefficients are wells CP-3 and CP-8, with well CP-8 about half of CP-3 and about 2-1/2 times less than the average of CP-2, CP-6 and CP-7. Considering that a line drawn from CP-5 to CP-6 (Appendix A, Figure 2) is between wells CP-3 and CP-8 and that well CP-6 has an estimated storage coefficient close to 1.0e-4, it appears that the lower storage coefficient at CP-8 is a local phenomenon. Whether it extends further to the west from CP-8 is unknown.

This lower storage coefficient at CP-8 was also reflected in the computer simulations described earlier (Appendix A, Table 6). The simulations matched the most dominant feature of the fluid level curves, the drawdown caused by CP-5, and by their very nature, would most closely reflect the conditions between CP-5 and the individual observation well. If the storage coefficient used in the simulation was lower than the regional average, then the drawdown attributed to the Town wells would be too large, a as would be the resulting correction, and the line in the plots, such as Figure C.8-H, would be shifted to the right. If the formation parameters (transmissivity and storage coefficient) local to the monitor wells were near the regional average, then the correction determined by the simulation would place the X-intercept on the semi-log residual drawdown plots very near to zero, as for CP-2, CP-6 and CP-7. This indicates that regionally, between wells CP-2, CP-6, and CP-7 and the Town water wells, the storage coefficient is about 1.0e-4.

As a note, another simulation was run for well CP-8 with the storage coefficient doubled to 9e-5. In that case, the effects of the Town wells were decreased by just over 40%, which would shift the "corrected" line in Figure C.8-H to the left and closer to the zero point.

One final set of figures was constructed for the drawdowns associated with the production from well CP-5 and are called semi-log distance drawdown plots. The drawdown for a particular time and monitor well is

plotted against the inverse of the distance squared from the pumping well. The greater the homogeneity (the less the anisotropy) of a formation, the closer the points will fall to a straight line. The lines determined from linear regression on the semi-log drawdown plots were used to compute the drawdowns at 2880 and 4200 minutes into the pumping of CP-5. This "uncorrected" and "corrected" data were then plotted at Figures 10 and 11, Appendix A.

Two times (2880 and 4200 minutes) were used to ensure that time would not drastically affect the pressure relationship of the Mine Zone monitor wells one to another, which in turn would cause Figures 10 and 11 to differ markedly from each other in overall appearance. Both figures area reasonably the same. Note that the points for CP-2, CP-3, CP-6 and CP-7 lie, generally in a straight line, indicating homogeneity between those wells. Linear regression was used to determine the "best" line fit using the points from those four wells (excluding CP-8) and the resulting transmissivities and storage coefficients are shown in Figures 10 and 11 and in Tables 7 and 8. Not surprisingly, CP-8 lies off the line represented by the other wells.

If it is assumed that the points in Figure 10 and 11 (Appendix A) are not adequately represented by straight lines, then the system is non-homogeneous. One common method of depicting such a system is with variable transmissivities that can be separated by direction to obtain maximum and minimum values which are mutually perpendicular (an anisotrophic system). Such an analysis was conducted here to allow comparison of the various estimated parameters for the different systems. This method assumes a constant storage coefficient with a variable transmissivity and, as noted above, there is evidence of just the opposite at well CP-8. As a result, the values shown below are averages with and without well CP-8 included. The angle (in degrees) of the average major transmissivity is measured such that zero is to the east and increases counter-clockwise (e.g., an angel of -45 degrees would be to the southeast and +45 degrees, to the northeast).

Using the uncorrected data:

	Excluding Well CP-8	Including Well CP-8
Storage Coefficient	9.10e-5	7.93e-5
Major Transmissivity	2,453	4,039
Minor Transmissivity	1,749	1,184
Angle of Major Transmissivity	-27	-27

Using the data corrected for the Town water wells:

	Excluding Well CP-8	Including Well CP-8
Storage Coefficient	8.48e-5	7.42e-5
Major Transmissivity	4,303	5,772
Minor Transmissivity	1,959	1,526
Angle of Major Transmissivity	-9	-17

2.3.2.8 Conclusions

1. The Dakota Sandstone Formation is hydrologically separate from the Westwater Canyon Sandstone. This is borne out by the water quality and fluid levels of the two sands, as well as, by the negative response of the Dakota during this Area Pump Test.

2. The continuity of the Westwater is excellent across the area of the projected ISL mine. Production Zone Monitor wells will respond readily to changes within the Mine Area.

3. Transmissivity for the Westwater Canyon Sandstone, corrected for the coincident production from the Town of Crownpoint water wells, averages about 2600 gpd/ft through the area and the storage coefficient, about 9e-5 (dimensionless).

2.3.2.9 Acknowledgements

Mr. Pelizza, Environmental Manager for HRI, coordinated all aspects of this test with the various regulatory agencies and the Navajo Tribe.

Mr. Frank Lichnovsky, Senior Geologist with HRI, provided the log correlations and geological interpretations. In addition, he coordinated the drilling and recompletion work at the Crownpoint site.

Mr. Salvador Chavez, Environmental Coordinator at HRI's Crownpoint Project, had responsibility for most onsite operations:

- developing and preparing Crownpoint monitor wells;
- compiling flowrate data from the Town of Crownpoint's water wells;
- day to day data collection and data quality control.

Mr. Craig Bartels, Reservoir Engineer, prepared the pump test analysis.

Table 4

Distances to Monitor Wells

Hydro Resources, Inc.
Crownpoint Project
Crownpoint, New Mexico

	Distances to the Crownpoint Monitor Wells (feet)						
		Town of Crownpoint Water Wells					
Monitor Well	Pumping Well CP-5	NTUA #1	NTUA Conoco	NTUA Littlewater	BIA #3	BIA #5	BIA #6
CP-1	951	3,187	7,790	40,194	3,319	3,317	5,646
CP-2	946	3,101	7,591	40,256	3,513	3,544	5,600
CP-3	545	3,498	7,918	40,641	3,798	3,785	6,001
CP-4	485	3,624	8,119	40,661	3,717	3,673	6,103
CP-5	0	4,043	8,400	41,145	4,179	4,110	6,546
CP-6	2,138	5,346	8,725	42,824	6,244	6,222	7,877
CP-7	1,397	3,242	7,121	40,710	4,443	4,541	5,783
CP-8	1,930	5,756	9,566	43,054	6,081	5,967	8,300
CP-9	2,227	5,394	8,723	42,878	6,325	6,306	7,921
CP-10	1,866	5,709	9,547	42,995	6,012	5,897	8,252

Note 1: Locations for the Crownpoint monitor wells ('CP') include deviations to the midpoint of the Westwater Canyon Sandstone (except for CP-10, which is to the top of the Brushy Basin Shale).

Note 2: Locations for Town of Crownpoint Water Wells are surface locations and were estimated from USGS Topographic Maps.

HRI, INC.

(A Subsidiary of Uranium Resources, Inc.)

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Fax: (505) 786-5555

October 16, 1998

Mr. Bob Carlson
Project Manager
Office of Nuclear Material Safety & Safeguards
U.S. Nuclear Regulatory Comission
2 White Flint North
11545 Rockville, Pike
Mail Stop T-7J9
Washington, D.C. 20852

RE: New Mexico Environmental Law Center Information Request

Dear Mr. Carlson:

To follow-up on our telephone conversation of yesterday, I believe that most of the information requested by NMELC can be found in the record as follows:

1. Structural cross-sections and structural contour maps - The cross sections described in the Geraghty and Miller "Hydrodynamic Control" report are the same cross sections labeled as Figures 2.6-6 through 2.6-10 of the *Churchrock Revised Environmental Report*, March 1993 (Updated October 11, 1993), and labeled Figure 2.2-7 through 2.2-10 within the *Crownpoint Project In-Situ Mining Technical Report*, June 12, 1992. Cross sections for the Unit 1 location, not referenced by Geraghty and Miller, are within Appendix D-1 of the *Unit 1 UIC Application and Technical Report*, October 9, 1992. All of these reports are part of the hearing record. No structure contour maps have been required or provided.

2. Driller's logs - Monitor wells drilled at Churchrock Section 8 are CR1 through CR8 (n=8). Monitor wells drilled at Crownpoint Section 24 are CP1 through CP10 (n=10). Geophysical logs of monitor wells CR1 through CR6 along with logs from select exploration holes are duplicated on Figures 2.6-6 through 2.6-8 of the *Churchrock Revised Environmental Report*, March 1993. Geophysical logs of monitor wells CP1 through CP10 along with logs from select exploration holes are duplicated on Figure 2.2-7 through 2.2-13 within the *Crownpoint Project In-Situ Mining Technical Report*, June 12, 1992. Both of these reports are part of the hearing record. By having these cross-sections, Petitioners have log copies that have photographically have been reduced to equal scale and will provide a more ready comparison of geologic data than will full size logs of different scale.

Any more detailed analysis of exploration data as closely guarded proprietary information and will not be made available. Additionally, as described in Section 8 of the COP, the geological analysis and hydrological testing that is submitted after the wellfield installation is provided to regulators as positive proof that the mine unit will perform as specified in the license. An infinite amount of drill holes could not replace the confidence that is derived from the actual wellfield testing.

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3. Orebody maps – This information is not required by NRC and is not part of the hearing record. In addition, as stated in #2 above, details of the subsurface orebody is not public information.

4. Surface elevation of boreholes – This information is not part of the hearing record and as stated in #2 above, HRI will not agree to provide the exploration database. Therefore borehole surface elevations serve no purpose.

5. Excursion scenario modeling - Petitioners have requested a copy of the software that has been licensed to HRI to perform a variety of types of multiple well subsurface analysis at ISL locations. This software is not part of the hearing record and is not available to the public unless they are willing to pay license fees.

The software simply provides a user-friendly interface to conduct millions of calculations and provide instantaneous visual results using well-known reservoir theory specified for ISL. The user provides a given combination of input parameters such as well numbers, well patterns, well spacing, permeability, formation thickness, flow rates, etc. HRI will provide licensing information so Petitioners can purchase the software directly.

6. Supplement aquifer modeling for Churchrock and Crownpoint Sites dated October 19, 1993 – I have searched my files and have not been able to locate a copy of this correspondence. To the best of my recollection the "Supplement" that Petitioners request are the mining sequence work sheets that were referenced on page 4 of the Geraghty and Miller study that was transmitted to NRC the previous day. I know of no other supplementary aquifer modeling that was done at that time. The mining sequence work sheets are attached hereto. Note that the Crownpoint worksheet is also within the October 15, 1996 (Response to NRC Comments) Q2/78 that is part of the hearing record.

7. NRC solute-transport model – I understand that this information is to be distributed by NRC.

8. Copies of three Mobil references – I understand that this information is to be distributed by NRC.

9. Teton and Mobil water quality data – I understand that this information is to be distributed by NRC.

10. Vacuum drier/bag filter emission control system – HRI has described the Vacuum dryer that is proposed for the Crownpoint project initially in § 3.2 of the Churchrock Project Environmental Report dated 4-88 and most recently in the COP Rev. 2.0 § 2.5. Both of these reports are part of the hearing record. The Vacuum dryer is widely used, off the shelf, zero emission technology. Petitioners, however, they may wish to contact vendors and get additional information.

Please feel free to contact me with questions pertaining to this matter.

Sincerely,

Mark S. Pelizza
Vice President
Health, Safety and Environmental Affairs

Cc: Tony Thompson

NEW MEXICO
ENVIRONMENTAL LAW CENTER

September 29, 1998

John T. Hull
Mitzi Young
Nuclear Regulatory Commission
Office of General Counsel
Mail Stop 0-15, B-18
Washington, DC 20555

VIA FACSIMILE
CONFIRMATION SENT
VIA FIRST CLASS MAIL

RE: HEARING FILE Hydro Resources Inc.
Docket No. 40-8968-ML, ASLBP No. 95-706-01-ML

Dear Mr. Hull and Ms. Young:

I am writing on behalf of Intervenors ENDAUM and SRIC. Their review of the hearing file has taken some time, given the events of this past summer. Now that they have had a chance to review the file, they believe there are several documents that should be included in the record. Attached is a list of ten items that have been identified, along with the rational behind this request and citation to where these items have been referenced by the NRC Staff and/or HRI. It is evident that these documents have been used by either HRI or the Staff in their preparations for this project. Most represent documents that are prepared as part of standard industry practice.

Please add these documents to the hearing file and make them available as soon as possible. If you have any questions or wish to discuss this request, please feel free to call.

Best Regards,

Johanna Matanich

Enclosure: 1
cc: Mr. Robert Carlson
Project Manager
Anthony J. Thompson
Shaw, Pittman, Potts & Trowbridge
Jep Hill
Diane Curran
Chris Shuey
Mitchell Capitan
Roderick Ventura

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INFORMATION ON CROWNPOINT URANIUM PROJECT REQUESTED BY ENDAUM AND SRIC

1. Structural cross-sections and structural contour maps for all three sites.

   Rationale and Reference: This information is needed to evaluate excursion potential resulting from faulting in and through the ore zones. Such structural cross-sections and contour maps were cited in Geraghty and Miller's "Hydrodynamic Control" report, October 1993.

2. Drillers' logs for all Crownpoint monitoring wells (n=10) at the Crownpoint site, for all Church Rock monitoring wells (n=12) at the Church Rock site, and for a representative sample of the 100+ boreholes at Unit 1 site. ENDAUM's and SRIC's ground water experts will assist in selecting boreholes at Unit 1.

   Rationale: These logs are critical for verifying the accuracy of the structural cross-sections and contour maps listed in item #1 above. They are essential if the cross-sections and contour maps in #1 are not available or do not exist. In the latter case, all drillers' logs would be needed if ENDAUM's and SRIC's experts are required to construct their own structural cross-sections and contour maps. We know that such drillers' logs exist because they are routinely provided by the driller at the time each borehole is drilled.

3. Maps of orebodies at each site, including those depicted in three dimensions.

   Rationale and Reference: These maps are required to define the three-dimensional geometry and directional orientation of the orebodies and the sand lenses in which they occur. The generalized orebody outlines shown in the FEIS and in the various environmental reports are inadequate. These maps are necessary to further evaluate mine zone confinement, lixiviant containment, and hydrogeologic properties. HRI Exhibit 8 in the HRI water rights transfer hearing before the N.M. State Engineer this spring was described as an "ore body map." ENDAUM and SRIC believe that HRI has such drawings as part of its routine mineralization characterization program.

4. Surface elevations for all boreholes at all three sites.

   Rationale: The environmental reports for each site list surface elevations for wells used only for baseline water quality assessment; there are no surface elevations for the vast majority of boreholes. Our experts need this information (which amounts only to a list of the boreholes, by site identification number, and their surface elevations) to verify reported drawdowns in previous pump tests and, secondarily, to construct actual structure cross-sections and/or fence diagrams if the information is Item #1 is not available.

5. Excursion scenario modeling done by HRI staff for all three sites.

Rationale and Reference: Results of HRI's excursion modeling are essential for evaluating the probability of excursions. We base our knowledge about the existence of such modeling on statements made by Anthony Thompson, HRI attorney, on the September 16, 1998 bus tour. Mr. Thompson even mentioned that this modeling was done by HRI's reservoir engineer, Mr. Craig Bartels.

6. Supplement aquifer modeling for the Church Rock and Crownpoint sites.

Reference and Rationale: HRI's Mark Pelizza, in his September 8, 1998 affidavit, under the section "Materials Prepared" references an October 19, 1993, document that he describes as "Church Rock and Crownpoint Aquifer Modeling Supplement." This document is not listed on the Hearing File Index. ENDAUM and SRIC believe that this information may have relevance to the October 1993 "Hydrodynamic Control" report prepared for HRI by Geraghty and Miller.

7. Description and findings of an NRC Staff solute-transport model for radium-226 concentrations at Town of Crownpoint water wells supporting FEIS.

Reference and Rationale: The NRC Staff discussed results of its own modeling of radium-226 concentrations in Crownpoint town wells based on ground water flow velocities calculated by Geraghty and Miller. See, FEIS at 4-47 to 4-49. The FEIS, however, gave no citation for the Staff's analysis. You cited William Ford's memorandum to Robert Carlson, dated March 11, 1997, as the basis for the well relocation proposal in your September 23, 1998 letter to Judges Bloch and Murphy. If this memo and its attachments were used for the February, 1997 FEIS discussion on pages 4-47 - 4-49, please confirm that fact with us. And, if this was not the basis for that analysis, or if other documents were used to draw those conclusions, please provide the proper documents. ENDAUM and SRIC need documentation of the Staff's radium-transport analysis to evaluate its assumptions and methods. Ultimately, this analysis is needed to determine if HRI's proposed restoration will achieve ground water protection standards for radium and other contaminants. (The NRC Staff doubts that radium-226 concentrations will meet federal drinking water standards, let alone baseline, following restoration at the Crownpoint site. See, Joe Holonich letter to Susan Jordan (July 17, 1997) at 2-3.)

8. Copies of three documents pertaining to restoration and license termination at the Mobil Section 9 Pilot Project.

References and Rationale: ENDAUM and SRIC desire copies of the following three documents referenced by NRC Staff hydrologist William Ford in his February 20, 1998, affidavit:

R. Mobil Alternative Energy, Inc., 1986
S. Mobil Mining and Minerals Company, 1986
V. NRC Environmental Assessment for SUA-1479, Feb. 4, 1988.

None of these documents is in the Hearing File. All are needed to further evaluate operational and restoration characteristics of the Mobil Section 9 Pilot ISL Project in Crownpoint.

9. **Post-restoration water quality data for Mobil Section 9 Pilot Project and Teton Section 13 Pilot Test.[1]**

Rationale and References: ENDAUM's and SRIC's geochemist recommends that a water quality survey be conducted at the Mobil and Teton pilot test sites to evaluate the long-term effectiveness of restoration used at those sites. Preparatory to conducting such a survey, our expert wants to review water quality data for those sites collected after restoration efforts ended. If wells and boreholes at those sites have been plugged and abandoned, making the subsurface environment unaccessible, post-restoration water quality data may be the only field-level evidence that describes long-term restoration effectiveness. Both tests are described in the FEIS at 4-26 through 4-40. Mobil's test is described in the documented cited by Ford and in a 1993 summary prepared by HRI (see, Enclosure 3 with letter from Mark Pelizza to Ramon Hall [March 16, 1993] [ACN 9304130415]). The Teton test is described in an HRI summary provided to the NRC Staff in November 1993 (see, letter from Mark Pelizza to Joel Grimm [November 29, 1993] [ACN 9402240123]).

10. **Any NRC Staff, NRC contractor or licensee reports that evaluate the asserted efficiency of the vacuum drier/bag filter emission control system for the yellowcake drier at the central processing plant.**

Rationale and References: ENDAUM's and SRIC's experts need this information to evaluate HRI's assertion that particle emissions from the central processing plant will be "virtually zero" because of the 99.99 percent removal efficiency of the vacuum drier/bag filter emission control system. (See, ENDAUM-SRIC Second Amended Request at 112 and Exhibit 14, attaching relevant excerpts from HRI's Crownpoint Technical Report [June 12, 1992] at 65-73). The operational experience of facilities that use this technology is necessary to evaluate this claim.

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[1]ENDAUM and SRIC request that NRC indicate whether such post-restoration water quality data exist, and if they do not, whether access to the sites' ground water is possible through existing wells or boreholes.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

OFFICE OF THE
GENERAL COUNSEL

NOV 16 1998

November 13, 1998

Fed X 9:05 am

Johanna Matanich, Esq.
New Mexico Environmental Law Center
1405 Luisa St., Suite 5
Santa Fe, NM 87505

In the Matter of
HYDRO RESOURCES, INC (HRI)
Docket No. 40-8968-ML

Dear Ms. Matanich:

By letter dated September 29, 1998, you forwarded a request, on behalf of Intervenors ENDAUM and SRIC, that additional documents be added to the hearing file in the above-captioned proceeding and that the Staff provide certain information. *See* Letter from J. Matanich to J. Hull and M. Young, dated September 29, 1998. *See also* Letter from J. Hull, NRC, to Administrative Judges, dated June 11, 1998 (forwarding Hearing File). Intervenors' request for information and documents has been submitted in the above-captioned 10 C.F.R. Part 2, Subpart L proceeding where discovery is prohibited, but the Presiding Officer may rule on issues regarding appropriate materials for the hearing file. *See* 10 C.F.R. § 2.1231. Further, even when discovery is permitted under NRC regulations, the Staff is not required to respond to interrogatories or requests for documents in a formal, trial-type NRC proceeding unless (1) the presiding officer determines that the interrogatory answer is necessary to a proper decision in the proceeding and (2) that the document is not publicly available. *See* 10 C.F.R. §§ 2.720(h)(2)(ii), 2.744, 2.790.

While the Staff views the September 29 letter as being beyond the scope of 10 C.F.R § 2.1231 and contrary to the discovery regulations cited above, without waiving these objections, the Staff response is provided below.

1. **Structural cross-sections and structural contour maps for all three sites.**

Structural cross-sections submitted to the NRC are included in the applications or environmental reports for the sites and are part of the hearing file. *See* Letter from Mark S. Pelizza, HRI, to Bob Carlson, NRC, dated October 16, 1998 (Pelizza Letter) (attached), at 1.

2. **Driller's logs for all Crownpoint monitoring wells (n=10) at the Crownpoint site.**

This request apparently seeks "driller's logs" that record what a driller found when drilling a bore hole. The Staff did not use these logs, but used the geophysical logs with stratigraphic interpretations on cross sections submitted with the application. These logs are all part of the hearing file. *See* Pelizza Letter at 1.

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3. **Maps of ore bodies at each site, including those depicted in three dimensions.**

Maps of ore bodies, such as depicted at FEIS, pages 3-16 (Fig. 3.6) and 3-20 (Fig. 3.8) were submitted with the application and are part of the hearing file. Three-dimensional maps were not submitted to the NRC. *See* Pelizza Letter at 2.

4. **Surface elevations for all boreholes at all three sites.**

Surface elevations were not submitted to the NRC. *See* Pelizza Letter at 2.

5. **Excursion scenario modeling done by HRI staff for all three sites.**

HRI excursion scenario modeling was not submitted to the NRC. *See* Pelizza Letter at 2.

6. **Supplement aquifer modeling for the Church Rock and Crownpoint sites** [provide "Church Rock and Crownpoint Aquifer Modeling Supplement," dated October 19, 1993, cited in the Mark Pelizza affidavit of September 8, 1998].

The Staff has not been able to locate the requested document in its files, but notes that the document requested is listed as a reference in Appendix A of the HRI License. Documents believed to be similar to the October 19, 1993 supplement are attached to the Pelizza Letter. *See* Pelizza Letter at 2 and attachment. The Crownpoint worksheet was also submitted as part of an October 15, 1996, HRI response that is already part of the hearing record. *See id.*

7. **Description and findings of an NRC Staff solute-transport for radium-226 concentrations at Town of Crownpoint water wells supporting FEIS** [Was the FEIS discussion of groundwater impacts at pages 4-47 through 4-49 based on the information in William Ford's memorandum to Robert Carlson, dated March 11, 1997?]

Yes. Please note that the Staff does not agree with the assertion in item 7 that "[t]he NRC staff doubts that radium-226 concentrations will meet federal drinking water standards, let alone baseline, following restoration at the Crownpoint site. See Joe Holonich letter to Susan Jordan (July 17, 1997) at 2-3."

8. **Copies of three documents pertaining to restoration and license termination at the Mobil Section 9 Pilot Project [referenced by NRC Staff Hydrologist William Ford in his February 20, 1998 affidavit]**

R. **[Mobil Alternative Energy, Inc., 1986]** Letter from J. F. Cullen, Mobil Alternative Energy, Inc., to Felix R. Miera, New Mexico Radiation Protection Bureau, dated January 22, 1986, Restoration Progress Report, Crownpoint Section 9 Pilot, In Situ Leach Plant [AN. 9808120141]

S. **[Mobil Mining and Minerals Company, 1986]** Letter from J. F. Cullen, Mobil Mining and Minerals Company, to Gary Konwinski, NRC, dated November 14, 1986, forwarding Mobil Pilot In-Situ Leach Uranium Project restoration declaration with four attachments. [AN. 8702060301]

V. **[NRC Environmental Assessment for SUA-1479, Feb. 4, 1988]** Letter to Jim Analla, BIA, from Edward Hawkins, URFO, Reg. IV, NRC, dated February 4,

1988 [AN. 8802230395], transmitting *Draft Finding of No Significant Impact Regarding A Termination of the Source and Byproduct Material License* and *Environmental Assessment in Consideration of the Release of Source Material License SUA-1479 for Mobil Oil Corporation, Crownpoint, Section 9, In Situ Test Project* [AN. 8802230437]

Copies of the three documents are attached and will be added to the hearing file. (These documents are part of the HRI docket and also available from the PDR.)

9. **Post-restoration water quality data for Mobil Section 9 Pilot Project and Teton Section 13 Pilot Test.**

Documents "S" and "V" in item 8, above, contain the requested data. Reference 13 in document "V" identifies "Mobil Oil Corporation, September 1987. Groundwater Restoration Stability Results," however, the Staff could not locate that reference. The Staff did locate and is providing the following document (in Docket No. 40-8911) that contains data from stability samples collected from November 1986 to April 1987 (and the document will be added to the hearing file):

Letter from J. F. Cullen, Mobil Coal Producing Inc., to Thomas T. Olsen, NRC, dated June 2, 1987. [AN. 8708240360]

10. **Any NRC Staff, NRC contractor or licensee reports that evaluate the asserted efficiency of the vacuum drier/bag filter emission control system for the yellowcake drier/bag filter emission control system for the yellowcake drier at the central processing plant.**

The only information the NRC used to evaluate the HRI vacuum dryer was provided with the application. *See* FEIS at 4-74; Pelizza Letter at 2.

Attachment 2 is a supplemental HRI Hearing File Index, which includes the documents identified above and updates the index to include other documents enclosed herewith.

Sincerely,

Mitzi A. Young
Counsel for NRC Staff

Enclosures: As stated

cc w/encls: Peter Bloch, Presiding Officer
Thomas Murphy, Special Assistant
Anthony Thompson
Roderick Ventura
Diane Curran
OCAA
PDR
SECY
ASLB Panel
Adjudicatory File

cc: w/o encls: Remainder of Service List

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD PANEL

Before Chief Administrative Judge
B. Paul Cotter, Jr., Presiding Officer

Administrative Judge
Thomas D. Murphy, Special Assistant

In the matter of	
	Docket No. 40-8968-ML
HYDRO RESOURCES, INC.	
2929 Coors Rd., NW, Suite 101	ASLBP No. 95-706-01-ML
Albuquerque, NM 87120	
	March 4, 1998

REPLY AFFIDAVIT OF MICHAEL G. WALLACE

Michael G. Wallace, being duly sworn, states as follows:

1. My name is Michael G. Wallace. I am of sound mind and body and competent to make this affidavit. I know the information stated herein from my personal knowledge and from my review of documents and affidavits described herein, except that the information stated as my opinion is my professional opinion.

Professional Qualifications

2. My education and experience as a professional hydrologist are described in my resume and summarized in an affidavit I gave on January 13, 1998 (hereafter, "January 13 Affidavit" or "Wallace Affidavit"), in support of ENDAUM's and SRIC's Motion for Stay, Request for Prior Hearing, and Request for Temporary Stay ("ENDAUM/SRIC Motion for Stay," Exhibit 12 and Exhibit A) (January 15, 1998).

conditions resolves the deficiencies in HRI's proposal that I discussed in my previous affidavit.

Expert Conclusions:

I. NRC's and HRI's Hydrogeologic Characterization of the Westwater Canyon Member Remains Seriously Flawed

6. I remain convinced that the NRC Staff's and HRI's understanding of the Westwater Canyon Member in the area of the Unit 1 and Crownpoint mining sites as one continuously thick and unbounded sandstone unit is seriously flawed. Mr. Clement and Mr. Bartels do not even address my discussion of the Westwater Canyon geology, and Mr. Ford's response ignores the extensive published, peer-reviewed geologic literature cited in my affidavit in support of my opinion. Mr. Ford instead relies heavily on the lithologic cross-sections that accompanied HRI's application in reaching his conclusion that the Westwater is "comprised of thick sand units. . .hydrologically interconnected vertically and horizontally. . . ." Ford Affidavit, ¶9.

7. Mr. Ford's reliance on the lithologic, or "stratigraphic," cross-sections derived from geophysical logs is not a sufficient basis for his characterization of the Westwater as a thick, essentially continuous sandstone. Lithologic cross-sections of this type, by themselves, are not adequate to depict, in sufficient detail, the geometry and areal extent, of the individual sand, silt, and shale layers that exist at each of the proposed mining sites. The cross-sections Mr. Ford referred to were prepared by HRI and included in HRI's environmental reports for the Church Rock, Unit 1 and Crownpoint sites. Upon inspecting these cross-sections, I observed that they had been constructed from geophysical logs laid side-by-side on large sheets of paper so that the top of the Westwater Canyon Member formed a single, horizontal line across the sheet, regardless of the

elevation of the Westwater point in any particular borehole.[1] Because stratigraphic cross-sections ignore elevation differences between the different strata at different points, they are not sufficient by themselves in discerning the lateral continuity of the individual layers. Never in my professional experience and training have I seen stratigraphic cross-sections used solely to evaluate the orientation and geometry of multiple strata in a geologic environment as complex as that of the Westwater Canyon. Other tools for geologic assessment, such as fence diagrams, structural cross-sections (in which the geologic strata are correlated by elevation, not by formation), and structure contour maps are routinely used, in combination, to discern the existence of thin and narrow sand channels that are commonly bounded by siltstone and shale lenses in fluvial (i.e., streambed) formations like that of the Westwater Canyon.[2]

8. In my review of documentation submitted by HRI, the FEIS, and the Ford, Bartels and Clement affidavits, I find no evidence that HRI or NRC used either fence diagrams, structural cross-sections or structure contour maps in their evaluation of the geology at the project sites, such that the existence of narrow, thin and bounded sand channels could be verified or refuted through geologic correlation. This is especially peculiar for at least three reasons:

(a) the extensive professional literature that consistently describes the Westwater as

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[1] See, e.g., Figure 2.6-7 of HRI's Unit 1 Environmental Assessment, January 6, 1992, identified in the Ford Affidavit as "HRI, 1992a".

[2] I note that the NRC's Draft Standard Review Plan for uranium ISL mining applications states that geologic interpretations "should be accompanied by...geologic, topographic, and isopach maps[,]...[c]ross sections through the ore deposit[,]...[and] [f]ence diagrams showing stratigraphic correlations between wells." Draft Standard Review Plan for In Situ Leach Uranium Extraction License Applications, NUREG-1569. October 1997, at 2-16.

a series of stacked and braided stream deposits;[3]

(b) evidence from the literature that individual "ore pods" in the Crownpoint area range "from a few feet to 200 ft (60 m) wide and from a few inches to 20 ft (6 m) thick";[4] and

(c) HRI's own graphic depiction of the LB Sand as a snake-like channel measuring approximately 80 feet to 140 feet in width in Section 24 of the Crownpoint mine site, a graphic which I have attached to this affidavit as Exhibit A.[5]

9. NRC's and HRI's apparent failure to use these tools of geologic interpretation to address this critical issue of channelization is even more perplexing given their representatives' admissions that there is extensive geologic data from more than 320 boreholes in the Unit 1-Crownpoint area and more than 170 boreholes in Section 8 at the Church Rock site. (See Ford Affidavit, ¶10, at 9, and Clement Affidavit, ¶2 at 2.) Many of these boreholes were drilled for the purpose of delineating the uranium mineralization of the different strata (Clement Affidavit, ¶2, at 2-3). Such geologic data can be, and routinely are, used to construct fence diagrams, structural cross-sections and structure contour maps.[6]

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[3] Dr. Abitz and I both cited and reviewed that literature in great detail in our respective affidavits in support of the ENDAUM/SRIC Motion for Stay. See Abitz Affidavit, ¶¶7-13, at 6-10, and Wallace Affidavit, ¶¶5-9, at 7-10. By contrast, Mr. Ford did not cite a single reference from the literature to support his conclusion that the Westwater in the project area is comprised of "thick. . .interconnected sandstone layers." Ford Affidavit, ¶17, at 12.

[4] Abitz Affidavit, ¶9, at 8, citing Wentworth et al. (1980), which was attached as Exhibit 15 to ENDAUM's and SRIC's Second Amended Request, August 19, 1997.

[5] Again, both Dr. Abitz and I referenced this diagram in our separate explanations of the hydrogeologic characteristics of the Westwater Canyon Member. See Abitz Affidavit, ¶10, at 8, and Wallace Affidavit, ¶13, at 12.

[6] Another useful tool for geologic assessment and interpretation are the driller's logs that likely exist for the several hundred boreholes at the three proposed mining sites. Driller's logs

10. Accordingly, nothing in the Ford, Bartels or Clement affidavits changes my view that NRC's and HRI's conceptual model of the hydrology of the Westwater Canyon Member is seriously flawed, and that the Westwater is in fact a series of thin, stacked and criss-crossing sand channels bounded by less permeable siltstones and shales. The likely existence of thin sand channels in the formation has wide-reaching implications for lixiviant control, efficacy of the monitoring well networks to detect excursions, the velocity of groundwater carrying mining solutions, and, in the case of the Unit 1 and Crownpoint sites, protection of the Crownpoint municipal water system located downgradient from the mining sites, as explained in ¶¶10-16 and ¶¶40-41 of my January 13 affidavit. Therefore, I remain of the view that solution mining at all three sites poses an immediate and irreparable harm to the native, high-quality ground water, and, in the cases of Unit 1 and Crownpoint sites, an immediate and irreparable harm to the health of residents who use the Crownpoint water system for drinking water.

II. Mr. Ford's Opinion on Monitoring Well Density and Configuration Ignores the Influence of Municipal Wells and Inappropriately Relies on Future Data Collection

11. Mr. Ford asserts that the recommendation in the Groundwater Monitoring STP[7] that a higher density of monitor wells be placed downgradient from the mining zone "appears to have been based on the faulty assumption that excursions will occur with a greater frequency on the down-gradient side than in the up-gradient direction." Ford Affidavit, ¶15. Mr. Ford's claim that

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(which are also called "borehole logs") contain detailed descriptions of the strata encountered at each foot in a borehole based on the written observations of the field geologist. More than the generalized cross-sections provided by HRI, driller's logs would give the most direct evidence for the existence of sand channels in the Westwater Canyon Member. Such driller's logs were not evident in any of the HRI or NRC documents I reviewed to date.

[7] Groundwater Monitoring at Uranium In Situ Solution Mines, U.S. Nuclear Regulatory Commission, Staff Technical Position Paper WM-8102. December 1981.

December 10, 1998

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

Before the Honorable Peter B. Bloch, Presiding Officer

In the Matter of)	
)	
HYDRO RESOURCES, INC.)	Docket No. 40-8968-ML
(2929 Coors Road, Suite 101)	ASLBP No. 95-706-01-ML
Albuquerque, NM 87120)	
)	

FOURTH AFFIDAVIT OF MICHAEL G. WALLACE

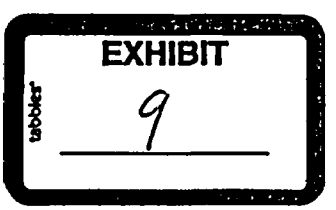
Michael G. Wallace, being duly sworn, states as follows:

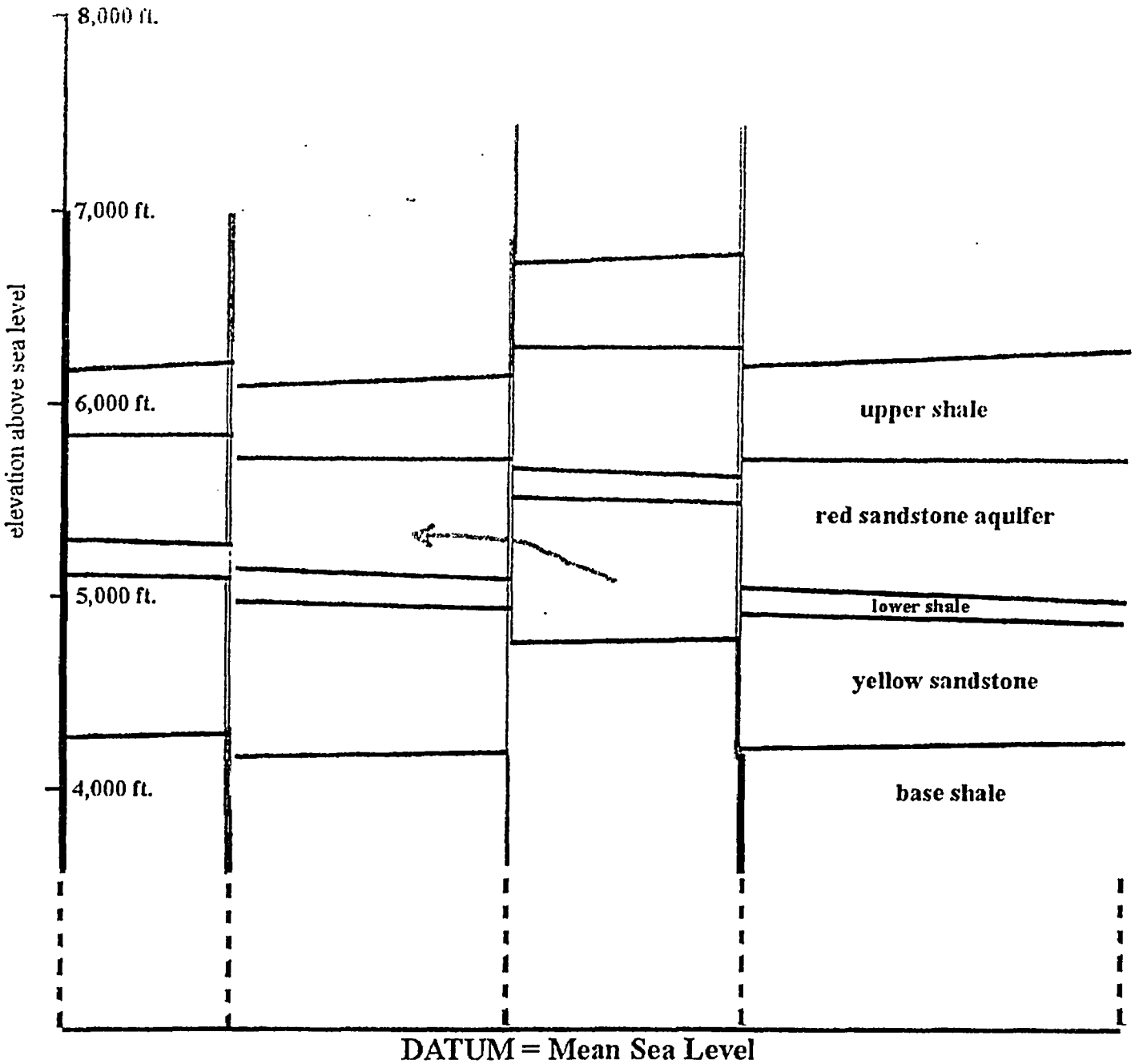
1. My name is Michael G. Wallace. I am of sound mind and body and competent to make this affidavit. I know the information stated herein from my personal knowledge and from my review of documents and affidavits described herein, except that the information stated as my opinion is my professional opinion.

Professional Qualifications

2. My education and experience as a professional hydrologist are described in my resume and summarized in an affidavit I gave on January 13, 1998, in support of ENDAUM's and SRIC's Motion for Stay, Request for Prior Hearing, and Request for Temporary Stay, Exhibit 12 and Exhibit A (January 15, 1998).

Purpose of this Affidavit



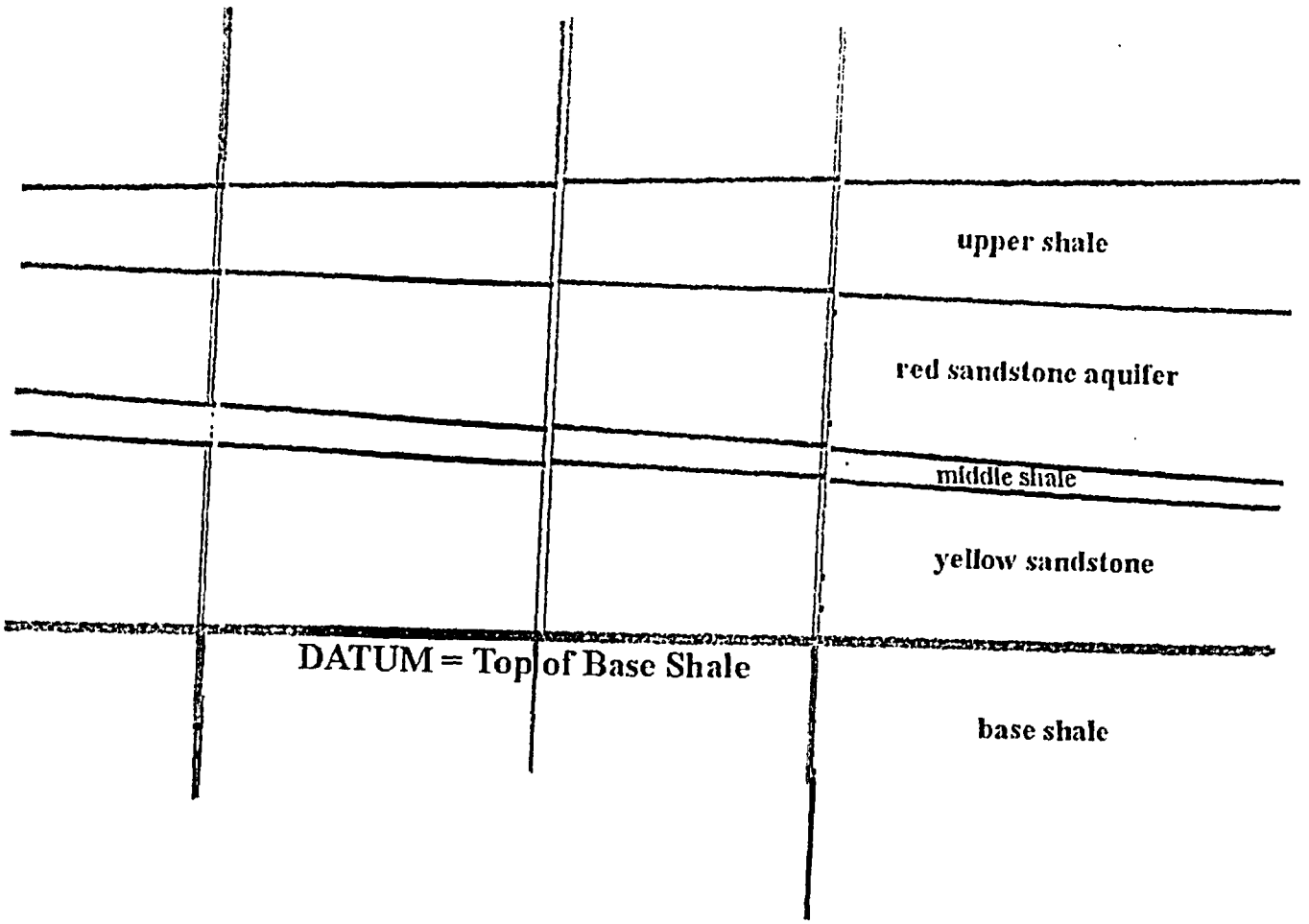


A Structural Cross Section recreates the actual elevations and thicknesses of each unit, measured from a common reference elevation (sea level, in most cases). This type of cross section honors the true elevations, thereby making it possible to determine if faulting causes one layer to be juxtaposed against another.

The red arrow indicates how this juxtaposition could allow water (or lixiviant) to easily travel from a lower geologic formation to an overlying aquifer

Figure 1. A Structural Cross Section. Part 1 of 2 parts, drawn to illustrate the important differences between a stratigraphic and a structural cross section.

Michael Wallace, December, 1998



A Stratigraphic Cross Section aids in recreating aspects of the original depositional environment of the buried units of concern. Geologic units are shifted up or down by the analyst in order to make a single layer have a perfectly horizontal top (thus, the absurd land surface profile in this example).
Because of this shifting by the analyst, the actual displacements caused by faulting are lost*. Therefore, this type of diagram CANNOT be used to determine whether or not the Dakota is connected to the WWC. These are the only types of cross sections that were reviewed by the NRC in this application.

Figure 2. A Stratigraphic Cross Section. Part 2 of 2 parts, drawn to illustrate the important differences between a stratigraphic and a structural cross section

*If top-of-borehole elevations were available, then a structural cross section could be drawn from this. Currently, HRI refuses to provide such information, making it impossible to evaluate whether or not aquifers are juxtaposed.

EXHIBIT
tabbies
10

Michael Wallace, December, 1998

December 10, 1998

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

Before the Honorable Peter B. Bloch, Presiding Officer

In the Matter of)	
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HYDRO RESOURCES, INC.)	Docket No. 40-8968-ML
(2929 Coors Road, Suite 101)	ASLBP No. 95-706-01-ML
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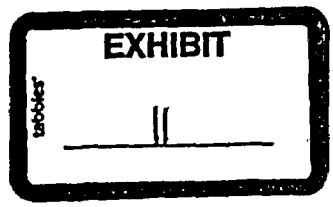
Purpose of this Affidavit



are stratigraphic cross-sections, not structural cross-sections.[1] I noted this critical distinction previously in my second and third affidavits. See Wallace March 4 Affidavit ¶¶ 7-8 and Wallace September 1 Affidavit ¶ 9. It remains my professional opinion, structural cross-sections and/or structure contour maps are absolutely necessary to adequately conceptualize the geologic and hydrologic environment of the WWC. Structural cross-sections and structure contour maps will demonstrate whether faulting exists, and the extent of its impact.

8. Structural cross-sections and structure contour maps can be constructed from the actual drillers' logs, which are prepared when boreholes are drilled into the earth's surface. The drillers' logs should exist, because, in my experience, they are routinely provided by the driller at the time each borehole is drilled. In this instance, the surface elevations of the borehole sites can also be used to convert the stratigraphic cross-sections already provided into structural cross-sections, if the angle of the borehole is known. All four sources of information (structure cross-sections, structure contour maps, drillers' logs and borehole elevations) should be examined to verify accuracy.

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[1] Citing Mr. Pelizza's October 16, 1998 letter, counsel for NRC stated that "Structural cross-sections [were] submitted to NRC [and] are included in the applications or environmental reports for the sites . . ." Letter from Mitzi A. Young to Johanna Matanich (November 13, 1998) at 1. This is incorrect. Mr. Pelizza's letter cited "cross-sections" in each of the three environmental reports. Letter from Mark S. Pelizza to Bob Carlson at 1. Again, based on my extensive review of these reports, the figures cited by Mr. Pelizza are stratigraphic cross-sections, not structural cross-sections. Indeed a comparison of Figure 1 attached to this affidavit to Figure 2.6-6 of HRI's Church Rock Revised Environmental Report (March 1993) shows clearly that the cross-sections in the HRI application are stratigraphic, not structural.

HRI, INC.

CHURCHROCK PROJECT

REVISED ENVIRONMENTAL REPORT

MARCH, 1993

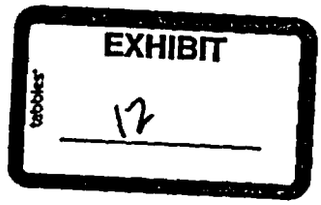


Figure 6.6-1

Western Atlas International

CORE LABORATORIES

January 8, 1988

Uranium Resources, Inc.

P. O. Box 186
Bruni, TX 78344
Attn: Sergio Garza

Sample No : M871633
Date Sampled: N/A
Sample ID : CR3

Location Code: 46231
Date Received: 11/17/87

No.	Sample ID.	Uranium U3O8 (%)	TOC (ppm)
1	178	0.023	1140.
2	690	0.009	441.
3	691	0.010	479.
4	692	0.002	442.
5	693	<0.001	307.
6	694	<0.001	399.
7	695	<0.001	240.
8	696	0.001	312.
9	697	0.002	300.
10	698	0.001	297.
11	699	0.003	281.
12	760	<0.001	232.
13	761	0.001	204.
14	762	0.007	383.
15	763	0.006	223.
16	764	0.008	176.
17	765	0.012	425.
18	766	0.009	427.
19	767	0.014	371.
20	768	0.013	194.
21	769	0.012	416.
22	771	0.009	379.
23	772	0.012	252.
24	773	0.008	188.
25	774	0.011	447.
26	775	0.015	169.
27	776	0.015	586.

Figure 6.6-1 (Continued)

Western Atlas International
A Litton/Dresser Company

CORE LABORATORIES

January 8, 1988

Uranium Resources, Inc.
Attn: Sergio Garza

Sample No : M871633 Location Code: 46231

No.	Sample ID.	Uranium U3O8 (%)	TOC (ppm)
28	777	0.013	435.
29	778	0.025	241.
30	779	0.024	272.
31	780	0.036	994.
32	781	0.040	455.
33	782	0.034	361.
34	783	0.030	246.
35	784	0.036	293.
36	785	0.092	289.
37	786	0.234	165.
38	787	0.214	149.
39	789	0.260	307.
40	790	0.218	243.
41	793	0.058	128.
42	817	0.031	191.
43	818	0.052	144.
44	819	0.335	375.
45	820	<0.001	1230.
46	821	<0.001	435.
47	822	<0.001	259.
48	823	<0.001	235.
49	824	<0.001	439.
50	825	<0.001	292.
51	826	<0.001	269.
52	827	0.003	458.
53	828	<0.001	443.
54	829	<0.001	883.
55	830	<0.001	159.
56	831	0.007	244.
57	832	0.018	167.
58	833	0.012	151.
59	834	0.022	129.

Figure 6.6-1 (Continued)

Western Atlas International

CORE LABORATORIES

January 8, 1988

Uranium Resources, Inc.
Attn: Sergio Garza

Sample No : M871633 Location Code: 46231

No.	Sample ID.	Uranium U308 (%)	TOC (ppm)
60	835	0.052	135.
61	836	0.032	138.
62	837	0.031	276.
63	838	0.027	102.
64	839	0.048	151.
65	840	0.037	315.
66	841	0.039	632.
67	842	0.031	1110.
68	843	0.031	769.
69	844	<0.001	339.
70	845	<0.001	279.
71	846	<0.001	179.
72	847	<0.001	132.
73	848	<0.001	188.
74	849	<0.001	198.
75	850	<0.001	147.
76	851	<0.001	121.
77	852	<0.001	58.
78	853	<0.001	106.
79	854	<0.001	650.
80	855	<0.001	80.
81	856	<0.001	82.
82	857	<0.001	129.
83	858	<0.001	121.
84	859	<0.001	88.
85	860	<0.001	209.
86	861	<0.001	94.
87	862	0.002	58.
88	863	0.003	109.
89	864	0.004	101.
90	865	0.002	106.
91	866	0.001	70.

Figure 6.6-1 (Continued)

Western Atlas International

CORE LABORATORIES

January 11, 1988

Uranium Resources, Inc.

Promenade Bank Tower, Suite 735
Richardson, TX 75080
Attn: Mark Pelizza

Sample No : M871711
Date Sampled: N/A
Sample ID : HRI - CR4

Location Code: 46231
Date Received: 12/03/87

No.	Sample ID.	Uranium U3O8 (%)	TOC (ppm)
1	788 - 789	0.155	487.
2	791 - 792	0.173	82.
3	792 - 793	0.242	134.
4	794 - 795	0.091	130.
5	795 - 796	0.062	136.
6	796 - 797	0.086	134.
7	797 - 798	0.127	118.
8	798 - 799	0.146	87.
9	799 - 800	0.110	233.
10	800 - 801	0.124	664.
11	801 - 802	0.074	304.
12	802 - 803	0.122	494.
13	803 - 804	0.067	298.
14	809 - 810	0.029	277.

Figure 6.6-1 (Continued)

Western Atlas International

CORE LABORATORIES

January 11, 1988

Uranium Resources, Inc.

Promenade Bank Tower, Suite 735
Richardson, TX 75080
Attn: Mark Pelizza

Sample No : M871711
Date Sampled: N/A
Sample ID : HRI - CR4

Location Code: 46231
Date Received: 12/03/87

No.	Sample ID.	Uranium U_3O_8 (%)	TOC (ppm)
15	785 - 786	0.220	485.
16	786 - 787	0.121	426.
17	787 - 788	0.074	724.
18	788 - 789	0.083	553.
19	789 - 790	0.116	614.
20	790 - 791	0.109	272.
21	791 - 792	0.123	240.
22	792 - 793	0.186	339.
23	793 - 794	0.219	495.
24	794 - 795	0.105	491.
25	795 - 796	0.022	378.
26	796 - 797	0.089	627.
27	798 - 799	0.006	279.
28	800 - 801	0.005	212.

Figure 6.6-1 (Continued)

Western Atlas International

CORE LABORATORIES

January 11, 1988

Uranium Resources, Inc.

Promenade Bank Tower, Suite 735
Richardson, TX 75080
Attn: Mark Pelizza

Sample No : M871711
Date Sampled: N/A
Sample ID : HR1 - CR4

Location Code: 46231
Date Received: 12/07/87

No.	Sample ID.	Uranium U308 (%)	TOC (ppm)
29	797 - 798	0.013	273.
30	799 - 800	0.021	178.
31	801 - 802	0.005	228.
32	802 - 803	0.005	176.
33	803 - 804	0.008	377.

Figure 6.6-1 (Continued)

Western Atlas International

CORE LABORATORIES

January 11, 1988

Uranium Resources, Inc.

Promenade Bank Tower, Suite 735
Richardson, TX 75080
Attn: Mark Pelizza

Sample No : M871711
Date Sampled: N/A
Sample ID : HRI - CR5

Location Code: 46231
Date Received: 12/07/87

No.	Sample ID.	Uranium U3O8 (%)	TOC (ppm)
34	701 - 702	0.088	437.
35	702 - 703	0.097	548.
36	703 - 704	0.044	545.
37	704 - 705	0.032	942.
38	705 - 706	0.065	819.
39	706 - 707	0.082	535.

Figure 6.6-1 (Continued)

Western Atlas International

CORE LABORATORIES

January 11, 1988

Uranium Resources, Inc.

Promenade Bank Tower, Suite 735
Richardson, TX 75080
Attn: Mark Pelizza

Sample No : M871711
Date Sampled: N/A
Sample ID : HRI - CR6

Location Code: 46231
Date Received: 12/07/87

No.	Sample ID.	Uranium U308 (%)	TOC (ppm)
40	510 - 511	0.000	616.
41	511 - 512	0.007	7249.
42	512 - 513	0.005	9699.
43	513 - 514	0.004	6943.
44	514 - 515	0.002	2290.
45	515 - 516	0.004	401.
46	516 - 517	0.014	10315.
47	517 - 518	0.002	505.
48	518 - 519	0.004	388.
49	519 - 520	0.005	254.
50	555 - 556	0.003	281.
51	556 - 557	0.002	471.
52	557 - 558	0.003	580.

Figure 6.6-2

Hazen Research, Inc.
4601 Indiana St. • Golden, Colo. 80403
Tel: (303) 279-4501 • Telex 45-860

DATE February 9, 1988
HRI PROJECT 009-173
HRI SERIES NO. 37508-B
DATE RECD. 12/21/87
CUST P.O.#

Uranium Resources, Inc.
Mr. Sergio C. Garza
Post Office Box 196
Bruni, Texas 78344-0196

REPORT OF ANALYSIS

SAMPLE NO. 37508-1
SAMPLE IDENTIFICATION: CR-3

Uranium as U_3O_8, %	0.202
Uranium as U_3O_8, % (Replicate)	0.213
Uranium as U_3O_8, % (Replicate)	0.209
Gross Gamma (Radium Equivalent), pCi/g	510
Radium 226 (+-Precision*), pCi/g	510(+-30)
Vanadium, %	0.02
Selenium, ppm	0.3
Carbonate as C, %	0.04
Total Carbon, %	0.25
Organic Carbon (calculated), %	0.21
Manganese, %	0.011
Arsenic, ppm	3
Calcium, %	0.208
Zinc, %	0.002
Iron, %	0.804
Ferrous Iron, %	0.48
Magnesium, %	0.147
Molybdenum, %	<0.001
Sulfide, %	<0.01
Copper, %	<0.001
Lead, %	0.003

By: Robert Rostad
Laboratory Manager

*Variability of the radioactive disintegration process (counting error) at the 95% confidence level, 1.96 x sigma.

Exchangeable Cations, Cation Exchange Capacity and Exchangeable Sodium Percentage results to follow.

Table 6.6-1

Core Information

1. SAMPLE CORE

- Core designation	: Churchrock #2
- Well number	: CR-3
- Ore used on leach from core depth	: 786 to 793 feet and 796 to 799 feet

2. LEACH ORE SAMPLE

- Mass of ore	: 8635.5 grams
- Volume of ore	: 4401.3 CM^3
- Porosity (Core Services)	: 25%
- Pore Volume	: 1100 CM^3
- Moisture	: 10.7% (average)
-Mass of Dry Core	: 7711.5 grams
- Percentage U_3O_8 (by Hazen)	: 0.208% (average)
- Mass U_3O_8	: 16.040 grams

CROWNPOINT PROJECT

IN-SITU MINING

TECHNICAL REPORT

SUBMITTED BY

HRI, INC.

JUNE 12, 1992

EXHIBIT

13

HAZEN
Hazen Research, Inc.
4601 Indiana St • Golden, Colo. 80403
Tel:(303) 279-4501 • Telex 45-860
Fax:(303) 278-1528

Core Sample Assays

Figure 4.6-2

Note: All samples are from Well No. 4.71/99.45

Sample No.	Blended Core	1885' 2"	1886' 4"	1810' 0"	1811'0"
U_3O_8[1] %	0.122	0.123	0.050	0.069	0.099
Ra^{226} pCi/g	250	280	150	230	260
Total C %	0.16	0.14	0.02	0.14	0.04
Organic C %	0.14	0.13	0.01	0.12	0.01
As ppm	<1				
Ca %	0.152				
Fe^{tot} %	0.87				
Fe^{+2} %	0.69				
Mg %	0.188				
Mn %	0.009				
Mo %	<0.001	<0.001	<0.001	<0.001	<0.001
Se ppm	8.0	2.6	1.3	65	115
S^{tot} %	0.16				
$S^{=}$ %	0.08				
TiO_2 %	0.24				
V %	<0.01				
Zn %	0.006				
cation exchange	3.74 meq/100g				

Interval	Assay, % U_3O_8[1]
1796.0'	0.015
1796.5'	0.084
1797.0'	0.073
1812.5'	0.039
1813.0'	0.051
1813.5'	0.102
1814.0'	0.196
1815.0'	0.087
1815.5'	0.083
1816.0'	0.030

[1] Fluorometric analysis for U_3O_8

Table 4.6-1

4.71/99.5

Core Information

1. SAMPLE CORE

- Core designation	: Crownpoint #1
- Well number	: 4.71/99.45 (CP-8)
- Ore used on leach from core depth	: 1,796 to 1,797 feet & 1,812 to 1,816 feet

2. LEACH ORE SAMPLE

- Mass of ore	: 7,429 grams
- Volume of ore	: 4,054 CM^3
- Porosity (Core Services)	: 25.1%
- Pore volume	: 1,017.6 CM^3
- Moisture	: 10.2% (average)
- Percentage U_3O_8 (by Hazen)	: .122 (average)
- Mass U_3O_8	: 8.139 grams

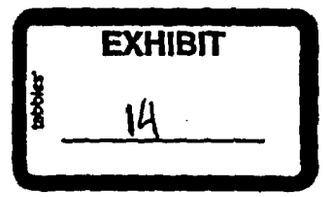
ENVIRONMENTAL ASSESSMENT
HRI,INC. UNIT 1 ALLOTTED LEASE PROGRAM
EASTERN NAVAJO DISTRICT, NEW MEXICO

SUBMITTED TO:

U.S. DEPARTMENT OF INTERIOR, BUREAU OF INDIAN AFFAIRS

WINDOW ROCK, ARIZONA

JANUARY 6, 1992



HAZEN
Hazen Research, Inc.
4601 Indiana St • Golden, Colo. 80403
Tel:(303) 279-4501 • Telex 45-860
Fax:(303) 278-1528

Figure 6.6-2

Core Sample Assays

Note: All samples are from Well No. 4.71/99.45

Sample No.	Blended Core	1885' 2"	1886' 4"	1810' 0"	1811'0"
U_3O_8[1] %	0.122	0.123	0.050	0.069	0.099
Ra^{sol} pCi/g	250	280	150	230	260
Total C %	0.16	0.14	0.02	0.14	0.04
Organic C %	0.14	0.13	0.01	0.12	0.01
As ppm	<1				
Ca %	0.152				
Fe^{TOT} %	0.87				
Fe^{sol} %	0.69				
Mg %	0.138				
Mn %	0.009				
Mo %	<0.001	<0.001	<0.001	<0.001	<0.001
Se ppm	8.0	2.6	1.8	65	115
S^{TOT} %	0.16				
$S^{=}$ %	0.06				
TiO_2 %	0.24				
V %	<0.01				
Zn %	0.008				
cation exchange	3.74 meq/100g				

Interval	Assay, % U_3O_8[1]
1796.0'	0.015
1796.5'	0.034
1797.0'	0.073
1812.5'	0.039
1813.0'	0.051
1813.5'	0.102
1814.0'	0.196
1815.0'	0.037
1815.5'	0.033
1816.0'	0.030

[1] Fluorometric analysis for U_3O_8

Table 6.6-1

4.71/99.5

Core Information

1. SAMPLE CORE

- Core designation	: Crownpoint #1
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- Mass U_3O_8	: 8.139 grams

Press Release Source: Uranium Resources, Inc.

Uranium Resources, Inc. Announces Commencement of Vasquez Production, Current Operating Plans and Quotation of Its Common Stock on the OTC Bulletin Board

Monday October 18, 12:16 pm ET

LEWISVILLE, Texas--(BUSINESS WIRE)--Oct. 18, 2004--Uranium Resources, Inc. ("URI") (OTCBB:URIX - News; Pink Sheets:URIX - News) announced today that it has commenced uranium production at its Vasquez in-situ leach property. URI expects Vasquez to produce 300,000 to 350,000 pounds of uranium in 2004. The first sales are scheduled for the fourth quarter of 2004, with 231,000 pounds scheduled for delivery. With these 2004 deliveries, we have eliminated the Company's need to secure the previously disclosed $2.2 million of inventory financing requirements in 2004. In 2005 we expect to deliver between 414,000 and 459,000 pounds, with 600,000 pounds scheduled for delivery in each of the years 2006 through 2008. The 2004 deliveries, all of the 2006 through 2008 deliveries, and 300,000 pounds of the deliveries in 2005 are subject to quantity flexibility, allowing, at the option of the buyer an increase or decrease to their deliveries by 15%.

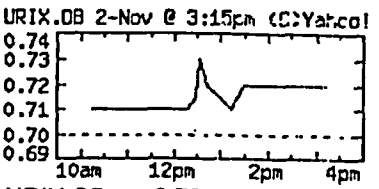
Paul K. Willmott, Chairman and President of the Company stated that the Company's uranium production at Vasquez marks a milestone in the Company's history. Through the dedication and perseverance of URI's employees and investors, URI has been able to weather the extended downturn of the uranium marketplace in the late 1990's and early 2000's to emerge again as a strong and growing Company. Production from Vasquez is the first step in URI's plan to bring on additional uranium projects in South Texas and New Mexico.

Mr. Willmott stated that the Company is pursuing plans for the development of its existing property at Kingsville Dome in South Texas with the goal to bring that property into production in mid to late 2005 and also to develop its Churchrock property in New Mexico, possibly as early as 2007. Mr. Willmott stated that the Company is engaged in exploratory discussions with a number of sources regarding the funding to finance these projects. Mr. Willmott stated that the Company is positioned to capitalize on the continuing strength in the uranium marketplace.

URI also announced that beginning October 15, 2004 shares of its common stock ($0.001 par value) became eligible and began quotation on the OTC Bulletin Board under the symbol URIX. Currently the Company's shares are quoted on both the OTC Bulletin Board and the Pink Sheets.

This press release contains "forward-looking statements." These include, without limitation, statements relating to future mining plans, production and other such matters. The words "expect," "anticipate," "estimate," or "plan" and similar expressions identify forward-looking statements. Such statements are based on certain assumptions and analyses made by the Company in light of its experience and its perception of historical trends, current conditions, expected future developments and

Related Quote



URIX.OB 0.72 +0.02 News

View Detailed Quote

Delayed 20 mins

Quote data provided by Reuters

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- URANIUM RESOURCES INC /DE/ Files SEC form 8-K, Other Events, Financial Statements and Exhibits - EDGAR Online (Mon Oct 18)
- URANIUM RESOURCES INC /DE/ Files SEC form 8-K, Other Events, Financial Statements and Exhibits - EDGAR Online (Wed Aug 18)
- URANIUM RESOURCES INC /DE/ Files SEC form 10QSB, Quarterly Report - EDGAR Online (Fri Aug 13)

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- Nextel and Verizon Settle Legal Disputes - Associated Press

EXHIBIT 16 tabbies

other factors it believes are appropriate in the circumstances. The Company does not undertake to update, revise or correct any of the forward-looking information. Factors that could cause actual results to differ materially from the Company's expectations expressed in the forward-looking statements include, but are not limited to, the following: industry conditions; volatility of uranium prices; operational risks; potential liabilities, delays and associated costs imposed by government regulation (including environmental regulation); inability to raise the funds for the substantial capital expenditures required to fund operations; and risks related to exploration and developmental drilling. For a more complete explanation of these various factors, see "Cautionary Statements" included in the Company's latest Annual Report on Form 10-KSB filed with the Securities and Exchange Commission.

Uranium Resources, Inc. is a Dallas area-based uranium-mining company whose shares are quoted on the OTC Bulletin Board under the symbol URIX. The Company specializes in in-situ solution mining and holds substantial uranium mineralization in South Texas and New Mexico.

Contact:

Uranium Resources, Inc.
Paul K. Willmott or Thomas H. Ehrlich, 972-219-3330

Source: Uranium Resources, Inc.

NEW MEXICO
ENVIRONMENTAL LAW CENTER

December 29, 2004

BY ELECTRONIC MAIL, U.S. FIRST CLASS MAIL AND FEDERAL EXPRESS

U.S. Nuclear Regulatory Commission
Office of the Secretary
Attn: Rulemaking and Adjudications Staff
One White Flint North
11555 Rockville Pike
Rockville, MD 20852

Re: In the Matter of: Hydro Resources, Inc.; Docket No: 40-8968-ML

Dear Sir or Madam:

Please find enclosed for filing "Intervenors' Motion For Subpoena Of Documents And To Supplement The Hearing Record And Motion For Stay Of Proceedings; Expedited Consideration Requested". Copies of the enclosed have been served on the parties indicated on the enclosed certificate of service. Additionally, please return a file-stamped copy in the attached self-addressed, postage prepaid envelope.

If you have any questions, please feel free to contact me at (505) 989-9022. Thank you for your attention to this matter.

Sincerely,

Eric D. Jantz
Douglas Meiklejohn
New Mexico Environmental Law Center
Attorneys for Intervenors

Enclosures

1405 Luisa Street, Suite 5, Santa Fe, New Mexico 87505
Phone (505) 989-9022 Fax (505) 989-3769 nmelc@nmelc.org