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THE PUEBLO OF SAN ILDEFONSO'S
COMMENT ON
PROPOSED NPDES PERMIT NO. NM0028355
FOR THE LOS ALAMOS NATIONAL LABORATORY

Introduction

The Pueblo of San Ildefonso is submitting this comment on proposed National Pollutant Discharge Elimination System (hereafter "NPDES") permit No. NM0028355 because of the impacts on Pueblo members of the water discharged by the Los Alamos National Laboratory (hereafter "LANL"). Specifically, the Pueblo is concerned about four aspects of the proposed permit.

First, it fails to cover discharges from a major waste disposal site, Technical Area 54 Area G. Those discharges are subject to NPDES regulation and should be covered by the permit. Second, the proposed permit makes all of the LANL's discharges subject to the State of New Mexico's livestock and wildlife watering standard for water quality. Water discharged from several of the outfalls governed by the permit, however, has been and is used for primary human contact purposes by members of the Pueblo. For that reason, the Environmental Protection Agency (hereafter "EPA") should separate out those specified outfalls and require that their discharges comply with the State of New Mexico's primary contact standard.

The Pueblo's third and fourth concerns relate to conditions that should be imposed on the permit. Because the Pueblo has initiated the process of adopting its own water quality standards, the permit should include a provision that it will be reopened as



soon as the Pueblo does promulgate those standards. Finally, the permit should require that the Pueblo be represented on the committee established by LANL and the State of New Mexico to study the use of water discharged by LANL.

I. The Clean Water Act and its implementing regulations require that the proposed permit cover discharges from Technical Area 54 Area G.

The Clean Water Act prohibits discharges of pollutants into navigable waters of the United States without a permit issued either by the Environmental Protection Agency (hereafter "EPA") or the state in which the discharge occurs.¹ This mandate has not been delegated to the State of New Mexico, and the EPA is therefore responsible for enforcement of the Act here. Pursuant to that responsibility, the EPA has proposed to issue a NPDES permit to LANL to cover its discharges of water at its facilities in Los Alamos, New Mexico. In order to comply with the Act, however, that permit must be modified to cover discharges from a major waste disposal area at the LANL, Technical Area 54 Area G.

The Clean Water Act defines a "discharge of a pollutant" as the addition of any pollutants to the navigable waters of the United States from any point source, and indicates that a point source is "any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel ... from which pollutants are or may be discharged."² The federal courts have determined that this definition includes surface runoff of

¹ 33 U.S.C. section 1311(a).

² 33 U.S.C. section 1362 (12), (14).

contaminated water from a landfill and from spoil piles at a mine.³
This analysis is applicable to Technical Area 54 Area G at LANL.

As is indicated in the attached statement (exhibit D) of Dr. Guarav Rajen, a radionuclide transport chemist, Ms. Jeanne Lubbering, an ecologist with extensive experience in NPDES permitting issues, and Syed Rizvi, a chemical engineer, Area G is a waste disposal site located within Technical Area 54 at the Los Alamos National Laboratory. Dr. Rajen, Ms. Lubbering, and Mr. Rizvi have pointed out that the wastes that have been buried in Area G are highly contaminated with tritium, and documents generated by LANL demonstrate that tritium has been found at ten times background levels in the sediments of runoff channels leading from Area G. On the basis of that information, Dr. Rajen, Ms. Lubbering, and Mr. Rizvi have concluded that runoff water from Area G carries contaminants into surface waters.

Finally, Dr. Rajen, Ms. Lubbering, and Mr. Rizvi have stated that the evidence of tritium discharges from Area G makes it likely that pollutants subject to NPDES regulation are also being discharged from that Area. In that event, an NPDES permit is required for Area G by 40 CFR section 122.21. For these reasons, the proposed permit must be amended to cover discharges from Area G. The EPA should determine the nature and extent of those discharges and include in the proposed permit provisions necessary to require that discharges from Area G comply with the Act and its

³ O'Leary v. Moyer's Landfill, Inc., 523 F. Supp. 642 (E.D. Pa. 1981); Sierra Club v. Abston Construction Company, Inc., 620 F.2d 41 (5th Cir. 1980).

implementing regulations.

II. The EPA should require that discharges from certain outfalls covered by the proposed permit meet New Mexico's primary human contact standard.

A. The water discharged from certain outfalls covered by the proposed permit is used for human contact.

The attached affidavits of Adam Martinez and Gilbert Sanchez and the materials prepared by Dr. Florence Hawley Ellis (exhibits A, B, and C) demonstrate that a number of springs that flow on San Ildefonso Pueblo land directly below LANL discharges are being and have been used extensively in the past in a primary contact manner. Members of the Pueblo continue to use a number of springs affected by LANL discharges for ceremonial purposes, specifically the "Old Pear Tree Area" in Los Alamos Canyon, the "Flower Water Mountain Area" in (G) Juaje Canyon, and the "Serpent Ruins Area" in Water Canyon. At one point, the water in the canyons below Los Alamos was used for a number of different purposes such as livestock watering, gardening and human consumption. These materials also confirm that without LANL's discharges, it is very likely that the members of the Pueblo would continue to consume and irrigate with and to use the water for ceremonial purposes.

The impact of LANL's discharges on these waters is explained by the attached statement of Dr. Rajen, Ms. Lubbering, and Mr. Rizvi. They point out that tracing tritium demonstrates the hydrologic connection between LANL's upstream discharges and the downstream waters in the canyons on the Pueblo's lands. Since the levels of tritium found in the Pueblo's waters do not occur naturally, Dr. Rajen, Ms. Lubbering, and Mr. Rizvi have concluded

that LANL's discharges are reaching those waters, which members of the Pueblo use for primary human contact purposes.

- B. The State of New Mexico should have required that the discharges involved meet the State's primary human contact standard.

In its certification of the proposed permit, the State of New Mexico designated the use of LANL's discharged water as livestock and wildlife watering. This designated use does not correspond with the existing primary human contact use demonstrated in Adam Martinez and Gilbert Sanchez's affidavits and in the materials compiled by Florence Hawley Ellis. This result violates the New Mexico Water Quality Act and the New Mexico Water Quality Control Commission Standards.

The Water Quality Act and the Water Quality Control Commission Standards require that a primary contact standard should have been imposed upon the outfalls specified in the statement of Dr. Rajen, Ms. Lubbering, and Mr. Rizvi.⁴ The Water Quality Act grants duties and powers to the Water Quality Control Commission to promulgate standards to prevent or abate water pollution in the state.⁵ The Commission Standards are to take into consideration such factors as interference with health, the public interest, and successive uses.⁶ The Commission's Standards state: "The purpose of these standards is to designate the uses for which the surface waters of the State of New Mexico shall be protected and to prescribe the

⁴ See attached exhibit D at page 2.

⁵ N.M.S.A. 1978 section 74-6-4.

⁶ N.M.S.A. 1978 74-6-4(D) (1), (2), and (4).

water quality standards necessary to sustain the designated uses."⁷

In addition, the New Mexico Environment Department, under the authority delegated to it by the Commission, requires the highest and best degree of wastewater treatment practicable and commensurate with protecting and maintaining the attainable or designated uses and existing water quality of the receiving water.⁸ The Environment Department did not follow these requirements with respect to its certification of the proposed permit. Instead, the Department erroneously designated the waters used by members of the Pueblo for primary human contact as used only for livestock and wildlife watering.

C. The EPA should correct the State's error.

The Clean Water Act mandates protection of the nation's waters. This purpose is to be achieved in various ways, one of which is the protection of water based upon its use. The Act set a goal of providing for recreation in navigable water by July 1, 1983, and requires states to set standards consisting of the designated uses of the navigable waters involved and the water quality criteria for those waters based upon the uses to which they are put.⁹ That section of the Act also indicates that state standards shall protect the public health and welfare and shall take into consideration various specific uses, including

⁷ Water Quality Standards for Interstate and Intrastate Streams in New Mexico, Section 1-100(A). (hereafter WQCC Standards).

⁸ WQCC Standards Section 1-101(B)(4).

⁹ 33 U.S.C. section 1251(a)(2); 33 U.S.C. section 1313(c)(2).

recreation.¹⁰ These purposes are carried forward by the regulations adopted by the EPA to implement the Act. Section 131.10 of 40 CFR requires each state to specify uses of water to be achieved and protected, and mandates that the classification of waters take into account the use and value of water for various purposes, including water for public water supplies and recreation. The Act and the regulations therefore mandate that states classify and protect waters based upon their uses. These requirements are the basis for the State of New Mexico's classification of designated uses, including primary human contact and livestock and wildlife watering.

As was explained by Dr. Rajen, Ms. Lubbering, and Mr. Rizvi, the State of New Mexico erred when it classified the water in the Los Alamos, (G)Juajie, and Water canyons as water used for livestock and wildlife watering. The State's incorrect classification of those waters violates the mandates of the Clean Water Act and its implementing regulations that water be protected in accordance with its use, and the EPA should correct the State's error. Section 1313 of 33 U.S.C. provides that the EPA shall approve or disapprove proposed state water standards, and that the EPA shall promulgate standards for a state "in any case where the Administrator determines that a revised or new standard is necessary to meet the requirements of this chapter."¹¹ The EPA therefore also has the authority to require that states not only

¹⁰ Id.

¹¹ 33 U.S.C. section 1313(c)(4)(B).

promulgate appropriate standards, but apply them consistently with the requirements of the Act and its regulations, and the EPA should exercise that authority in this proceeding.

Moreover, the Pueblo of San Ildefonso should not be barred from raising this issue before the EPA by section 124.55(e) of 40 CFR. That section indicates that conditions or limitations resulting from a state certification shall be raised in the state appeal process and not through the Clean Water Act regulations, but that principle should not be applied to the Pueblo in this matter for three reasons.

First, the Pueblo could not have appealed the State of New Mexico's certification of the proposed permit. The Pueblo was not aware of the State's administrative proceeding on the proposed permit until after the State Environment Department had made its decision on certification. More importantly, at the time the Environment Department made that decision, LANL was the only party permitted to file an appeal.¹² The Pueblo therefore had no remedy through a state appeal process.

Second, the Pueblo of San Ildefonso is a sovereign nation, and the Clean Water Act specifically provides equivalent status as the State of New Mexico.¹³ The EPA therefore should not require the Pueblo to submit to the State's administrative process in order to

¹² Until June 1993, the New Mexico Water Quality Act, N.M.S.A. 1978 section 74-6-5 (K) provided for appeals only by applicants for permits and permittees.

¹³ 33 U.S.C. section 1377(a). "Indian tribes shall be treated as States for purposes of such section 101(g)."

assert the Pueblo's interests under federal law. This is particularly inappropriate in a situation such as this in which the Pueblo is seeking to protect its resources and members.

Finally, prohibiting the Pueblo from raising this issue is contrary to the Clean Water Act's mandate that the public participate in decisions on NPDES permits. Section 1251(e) of 33 U.S.C. of the Act mandates that the EPA provide for, encourage, and assist public participation in the development, revision, and enforcement of regulations, standards, effluent limitations, plans, and programs under the Act. This proceeding on the issuance of the proposed permit involves the enforcement of standards, plans, and programs under the Act, and the EPA therefore should allow the Pueblo to participate in the proceeding, rather than precluding that participation.

III. The EPA should modify the proposed permit to provide for reopening it and to include the Pueblo in the study of uses of the water discharged by LANL.

The regulations adopted to implement the Clean Water Act indicate that the EPA shall impose conditions on an NPDES permit that are necessary to assure compliance with the Act and all applicable regulations.¹⁴ This requirement mandates that the EPA make issuance of the proposed permit subject to two conditions. First, the Pueblo should be included in the management of the study to be conducted on the uses of the water discharged by LANL. Second, the proposed permit should be reopened if the Pueblo establishes its own water quality standards.

¹⁴ 40 CFR section 122.43(a).

As is reflected in the record of this proceeding, LANL appealed the State of New Mexico's initial decision on certification of the proposed permit. That appeal was settled by means of an agreement that was subsequently approved by the State Water Quality Control Commission. A copy of which is attached as exhibit E. The settlement calls for a study of the uses of the water discharged by LANL, and provides that the study is to be managed by a committee composed of representatives of LANL and the State Environment Department. The Pueblo requested that the Water Quality Control Commission modify that settlement to include a representative of the Pueblo on the study management committee, but the Commission did not do so. The Pueblo therefore requests that the EPA modify the settlement agreement to include the Pueblo on that committee.

There are two grounds for the Pueblo's request. First, the Pueblo is the party most directly affected by the study. As Dr. Rajen, Ms. Lubbering, and Mr. Rizvi have indicated in their statement, significant amounts of the water discharged by LANL flows directly or indirectly into Pueblo waters. Their statement and the affidavits of Adam Martinez and Gilbert Sanchez also confirm that those waters are used by members of the Pueblo. The Pueblo therefore has a direct interest in the results of the study. Second, much of the information that is crucial to the study is held by members of the Pueblo. They are the only people who know about the uses, particularly ceremonial uses, of water on the Pueblo reservation. Moreover, their knowledge of the ceremonial

uses of water is confidential, and a study conducted on that use of water will almost certainly be incomplete if members of the Pueblo are not involved. The EPA therefore should modify the settlement agreement to include the Pueblo on the study management committee.

The second condition that the EPA should impose on the proposed permit is a provision that it will be reopened if the Pueblo of San Ildefonso adopts its own water quality standards. The Clean Water Act regulations adopted by the EPA require that the State of New Mexico's water quality standards provide for the attainment and maintenance of downstream waters.¹⁵ As Gilbert Sanchez pointed out during the public hearing in this matter, the Pueblo is considering adoption of its own water quality standards. In addition, the Pueblo has initiated that process. Any discharges from LANL that flow into Pueblo waters will have to meet standards promulgated by the Pueblo. The EPA should therefore amend the proposed permit to provide that it shall be reopened to achieve compliance with those standards if they are adopted during the term of the permit.

Conclusion

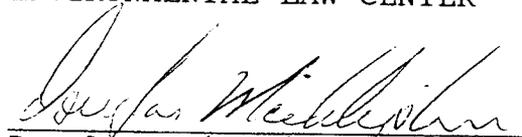
For these reasons, the EPA should not approve proposed NPDES permit No. NM0028355 as drafted. Rather, the EPA should require that the proposed permit cover Technical Area 54 Area G, apply New Mexico's primary human contact standard to those outfalls that discharge waters used by members of the Pueblo of San Ildefonso, include the Pueblo in the study of uses of the water discharged

¹⁵ 40 CFR section 131.10.

pursuant to the proposed permit, and provide that the proposed permit be reopened to comply with standards adopted by the Pueblo.

Dated: August 6, 1993.

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ENVIRONMENTAL LAW CENTER



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Attorney for the
Pueblo of San Ildefonso

State of New Mexico

County of Santa Fe

Affidavit of Adam Martinez

Adam Martinez states:

I am Adam Martinez of the San Ildefonso Pueblo. I was born December 27, 1903 and I have lived on San Ildefonso Pueblo my whole life.

When I was a young man in the 1920's and 30's, every few weeks I would go with Mike Martinez of my family and others to many of the canyons on San Ildefonso land to check on our livestock. There were many gardens planted around the springs in the canyons on the San Ildefonso Pueblo. When we would go up the canyons on horseback to check our livestock, we would often take a melon or two as the gardens were rarely visited.

Every few weeks we went to the spring below Horseshoe Bend in the Los Alamos Canyon. It was a watering hole for horses and cattle. The Old Pear Tree Area (Indian Springs) was a place where we watered our horses and drank the water ourselves. The spring off State Road 30 is used for ceremonies. The Flower Water Mountain Area was a watering hole for cattle. We also drank from it, and it was used for ceremonies. The (G)Juajie Canyon Area was used for dry farming and ceremonies. The Serpent Ruins Area was a watering hole for cattle and horses, we drank from it, and used it for ceremonies. Since the Laboratory was established most of the springs dried up and there is little water for gardening or watering livestock in the canyons.

Exhibit A

We stopped using the area before the laboratory was established because of cattle rustling. We have continued to use the springs in the canyons for ceremonial purposes.

Adam Martinez

Adam Martinez

Dated: August 4, 1993

Subscribed and sworn to before me this ^{4th} day of August, 1993

Jose V. Zepeda

Notary Public

My commission expires: May 17, 1997

Seal

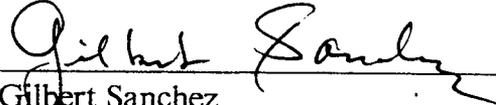
State of New Mexico

County of Santa Fe

Affidavit of Gilbert Sanchez

1. I am Gilbert Sanchez, a member of the San Ildefonso Pueblo and First Lieutenant Governor of the San Ildefonso Pueblo.
2. I have read the Affidavit of Adam Martinez concerning the use of water sources by the people of San Ildefonso Pueblo west of the Rio Grande.
3. I am familiar with the areas described by Adam Martinez in his affidavit and have personally visited the sites many times.
4. The water source referred to as "The Old Pear Tree Area" in the Adam Martinez Affidavit is located in Los Alamos Canyon.
5. The water source referred to as "the Flower Water Mountain Area" is located in Juajie (Guaje) Canyon.
6. The water source referred to as "The Serpent Ruins Area" is located in Water Canyon.

Further Affiant Sayeth Not.



 Gilbert Sanchez

State of New Mexico)
) ss
 County of Santa Fe)

Subscribed and sworn to before me by Gilbert Sanchez this 3rd day of August, 1993.

Melanie Garcia
Notary Public

My Commission expires:

July 15, 1995

SI-1

SAN ILDEFONSO
THE HISTORIC AND PREHISTORIC PERIODS

by
Dr. Florence Hawley Ellis

Prepared for the Bureau of Indian Affairs
United States Department of Interior

Exhibit C

CHAPTER III

San Ildefonso's Irrigation Systems

In the old Pueblo concept, nature does not function on its own but with the cooperation of mankind, who must perform the proper ceremony at the proper time. The failure of rain, then, is attributed to lack of sufficient or correct ritual, or to witchcraft perpetrated by someone who wishes one ill. The water spirits, *katcinas* (*kossa*), are responsible for bringing precipitation, and the rain priests are responsible for bringing the *katcinas* up from the Below through springs or ponds. San Ildefonso's Sacred Spring or Pool of the West (*Tsampije pokwing*) (Photograph 11), one of San Ildefonso's most venerated shrines, lies in the hills at the edge of the Pajarito Plateau only about a mile from Perage. This venerated spring never goes dry and in years of adequate rainfall, pours out a stream to run toward the Rio Grande. Hewett (1938:125) describes its place in the life of the people:

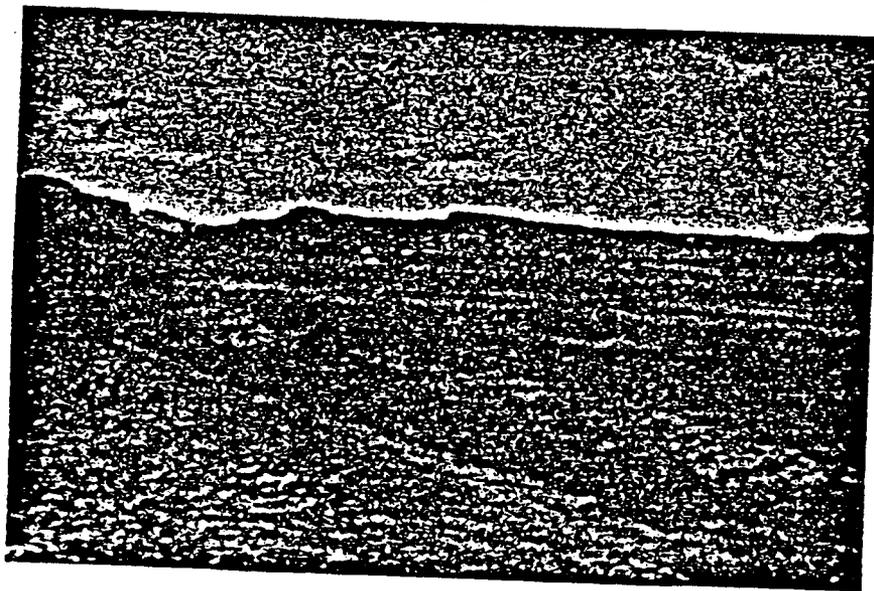
"The holy water of the Christian font is not one whit more sacred than this of the Sacred Spring of the West. The pool has a function similar to that of Toreva Spring at Hopi Mishongnove (Middle Mesa) in the Flute Ceremony. But the ritual water from the Below is brought up in small water vials of clay (*woposa*) instead of in little gourds, as at Toreva. The priest, when he rises from the water, also brings up *Awanyu* [plumed serpent symbolic of rivers] with him.... The ancient pear trees over the spring...still live and bear fruit."

Location of this sacred spring may have been a consideration in the move of Pajaritan peoples to Perage, for if this spring held up when others failed, attention to rituals associated with its specific cult would appear the more important and rewarding. The old hut where the rain priest used to come for prayers has fallen down (we picked up a piece of Polished black pottery from the site, a piece of glaze on red, and one of plain gray culinary, as well as 5 pieces of chipped obsidian). but water from the spring still is used in rituals and the spring still is sacred.

The San Ildefonso custom of planting near springs probably was followed by other pueblos, as well, though all were not equally fortunate in availability of such water sources. Besides the pear trees at the Sacred Spring of the West, there could have been gardens dampened with water carried from the spring. Very old peach trees (seen by FHE before 1930) grew there until they fell in old age. A half mile from the Sacred Spring, on the south side of the ridge is another spring, boxed in a few years ago for the use of San Ildefonso cattle;



Photograph 11
San Ildefonso's
Sacred Spring
of the West.



Photograph 12
A lateral from
the old Acequia
Otra Banda, west
side of Rio
Grande.

one or two very old pear trees still grow nearby. Dominguez, inspecting the region in 1776, mentions still others at a spring in the upper part of White Rock Canyon, just south of the Otowi Bridge.

The people of Perage probably farmed in the big shallow arroyo to the north of their pueblo, but an economic consideration which presumably was of major importance in selection of their new home was the fact that ground on the west side of the Rio Grande, as well as on the east, could be farmed with aid of ditches taking water from the Rio Grande. Dominguez, in assessing the state of each pueblo as well as of its church, provides an excellent summary of San Ildefonso's use of lands in 1776:

'Said pueblo [San Ildefonso] is in the form of a very large plaza, clean and without any impediments. It consists of four tenements with three large passageways to the east, south, and north at their respective corners, and a small one to the west to lead to the church. The houses are arranged as I said at Tesuque, but larger and better kept than there... Around the plaza at proportionate distances are the corrals, ovens, and hen-houses.

...The Indians of this pueblo have lands in all four directions, but not divided equally, for to the east, north, and south, there are little less than three-quarters of a league. To the west, indeed, they have even more than a league, occupying both banks of the Rio del Norte, since it runs through them. Those on the west side of the river are irrigated from this very river through adequate ditches taken from it where necessary. Some of those on the east side, where the pueblo is, are irrigated from the river, and others from the spring in the little swamp I mentioned ["about a musket shot to the west"] when I was speaking of the convent lands. Still others are irrigated from the Nambe River, which is very scanty by the time it reaches these parts, because everyone located beyond Nambe bleeds it, as is understood, and when it dries up, there are hardships for those of these lands.

...These lands are very fertile and produce an abundant and very fine harvest of everything planted in them. Father Vega says that the melons and watermelons gathered here are better and larger than those from the Terra Caliente. In this pueblo, there are ten orchards of two

Pueblo lands on the east, and to the territory belonging to Santa Clara Pueblo on the north. Their most southern farm lands were the plots which were planted to beans and corn by farmers such as Maria Martinez' father, Tomas Montoya, on the high mesa on the western side of the Rio Grande at the entrance to White Rock Canyon. There precipitation was the only source of water for the crops, as for those of San Ildefonso's ancestors living on the Fajarito Plateau, though on the Plateau spring water may have been used for watering some small gardens. The San Ildefonso ancestors who lived in the Rio Grande Valley were blessed with available living streams and did irrigate by ditch before arrival of the Spaniards, as stated by tradition and also as concluded by archaeologists in finding traces of ditches associated with dateable potsherds and with remains of field houses not far from prehistoric ruins, especially at Sapawe near El Rito in the Chama drainage and in the Nambe Valley (see Nambe Water Claims report by F. Ellis for more coverage of prehistoric irrigation). Prehistoric irrigation is documented elsewhere in the Pueblo Southwest by numerous recent finds of ditches and also by the reports of early Spaniards entering the region.

were consulted in the home of the latter. Martin Aguilar, governor, and Gilbert Sanchez, chief of the local police force, aided with translations and contributed further data. Sanchez did much of the boring for specimens to date cottonwoods from the bosque.

(Re-written and new data added, 1974. To be substituted for pp. 23 and ff to end of Ellis paper on San Ildefonso.)

varieties of peaches and an occasional apricot tree. They are to the south in a canyon formed by mesas on both banks of the Rio del Norte, and they are watered from a little spring that is at the foot of the east mesa." (Adams and Chavez, 1956: 71).

Was there actually a water shortage because of increased use of river water upstream or because of temporary shortage of precipitation? Our best source of evidence lies in the rings of Rio Grande area conifers. "Narrow rings in Douglas-fir and ponderosa pine imply low precipitation and high temperatures throughout the entire year, with a somewhat greater weight placed on the climate of autumn, winter, and spring" says Fritts (Fritts, Harold C., 1965 Tree-Ring Evidence for Climatic Changes in Western North America, Monthly weather Review 93: 7, pp. 426). The tree ring indices derived from ponderosa pine for our area certainly show no evidence of extended drought in the decade before Dominguez arrived. On the contrary, if we think in terms of 100 being the average or "normal" year, we find that eight were above normal, one (1776) was normal, and only two, 1773 and 1775 were below normal.

<u>1766</u>	<u>1767</u>	<u>1768</u>	<u>1769</u>	<u>1770</u>	<u>1771</u>	<u>1772</u>	<u>1773</u>	<u>1774</u>	<u>1775</u>	<u>1776</u>
133	101	127	123	139	158	120	43	109	72	100

(Smiley, Stubbs, and Bannister, A Foundation for the Dating of some Late Archaeological Sites in the Rio Grande Area, New Mexico. U. of Ariz. Bull. Lab. of Tree Ring Research, Bull., No. 6. 1953. p. 55)

One must assume, then, that the statement of water shortage having resulted from increased use of water upriver was based upon fact. At this time there were six ranches between San Ildefonso and Fojoaque Pueblo. The fourteen non-Indian families, comprising seventy persons who lived on those ranches, were said to be efficient in their cultivation. They presumably depended on water from the Fojoaque River. We have no statement of non-Indians at that period having used land on the eastern or the western bank of the Rio Grande nor of their having been on San Ildefonso's land on the Fojoaque.

Originally, say the elders of San Ildefonso*, their lands extended as far as one could see to the mesas and mountains of the west, to Jacona

* Juan Cruz Roybal (1896), J. Richard Martinez (1889), Miguel Martinez (1900), Antonio Peña (1900), Adam Martinez (1903), and Luis Gonzales (1905) met with me several times in 1974 and went into the field with me to discuss the problems of San Ildefonso's lands and water use. Maria Martinez (1884) and her sister, Desideria Sanchez (ca 1889),

HANDBOOKS OF ARCHAEOLOGICAL HISTORY

by

EDGAR L. HEWETT

So Live the Works of Men



ALBUQUERQUE, NEW MEXICO
1938

EXHIBIT

On the top of Black Mesa (Tuñjopiñ) north of San Ildefonso and south of Santa Clara, were formerly two shrines—one, a boulder shrine still there, the other, a fire shrine constructed of lava stones, now demolished, but the site still marked by the pile of fallen basalt. "Tuñjo" is the scene of much mythology and legendry, as well as of historical incidents. Under it lived the giant, *Tsavijo*, and his family—wife and daughter. Near here he was slain by the Hero Twins and his remains lie buried under Black Mesa. Another version has it that he was trussed up by the Twins in unbreakable bonds and still lives there. His groans may be heard at times, especially when something is needed to awe bad children. The cave on the north side of Black Mesa, avoided by the superstitious Indians, was the entrance to the abode of *Tsavijo*. Black Mesa has figured in both prehistoric and historic sieges. In accounts of one of the latter appears Juan Archeveque, one of the murderers of LaSalle near the mouth of the Trinity River in Texas, who, with his fellow assassins, drifted west to the Rio Grande and up to Santa Fe and Santa Clara, where he was married, and finally out onto the great plains, where he died with his boots on.

The shrines of the sacred lakes are the most venerated of all. The Tewa have no doubt that the World Mountain shrines were possessions of the ancient Pajaritans. They ascribe to them, likewise, the shrines of the Sacred Lakes, pools which are still potent in their ceremonies. The pool in the sand dunes east of Alamosa, Colorado, by way of which the ancestors emerged from the underworld, has been described in a previous section (page 33). Of constant use in affording "medicine water" (*wopo*) for the rain ceremonies, are the pools of the four directions. The Sacred Pool of the East (*T'ampije pokwing*) is in a swampy place in the valley east of San Ildefonso pueblo. That of the North (*Pimpije pokwing*) is on the east side of the Rio Grande, north of the confluence of Santa Cruz Creek with the great river. Here is where the *kosa* (Keres, *koshare*) get the clay with which they paint their bodies for ceremonies in which they participate. The Lake of the South (*Akompije pokwing*) is just back of the water tank of the D. & R. G. railway ("place where the train drinks"), south of the Otowi bridge across the Rio Grande. The Sacred Pool of the West (*Tsampie pokwing*) is in a romantic spot which I hope

will never become too well known, in the hills west of the Rio Grande, on the very rim of Pajarito Plateau. It would be safe to say that for a thousand years it has supplied "medicine water" for the rituals of Rio Grande Indians. The holy water of the Christian font is not one whit more sacred than is this of the Sacred Spring of the West. The pool has a function similar to that of Toreva Spring at Hopi Mishongnovi (Middle Mesa) in the Flute Ceremony. But the ritual water from the Below is brought up in small water vials of clay (*woposa*), instead of in little gourds, as at Toreva. The priest, when he rises from the water, also brings up Awanyu with him (Plate F). The ancient pear trees over the spring, probably as old as the famous apple trees of Manzano, still live and bear fruit. Here you can see, if you are a perfectly initiated Indian, the little fairy-like creatures, Blue Man, Green Man, Speckled Man, hopping in and out of the pool and among the branches of the old pear trees. Once in a blue moon you can see the kosa sprites peeping up over the rim of the sun (see frontispiece).

The old hut of the rain priest, on the hill overlooking the shrine, has fallen down and is no longer used. Here, through many an evening, I sat at the feet of my most revered teacher of anthropology, old Weyima, rain priest of San Ildefonso, and caught some glimpses into the mystic world of the Pajaritans. It is significant that the stories, as told by him and later by his successor, Potsonutsi (Diegito), never varied from one another by so much as a word.

That springs should be among the most venerated of shrines, and the water of sacred pools be looked upon as veritable "holy water," is understood when it is known that, to the Indians of the Southwest, water is a symbol of life itself, an emanation from the Sky Father, *Makowa sendo*; the element to which Earth Woman, *Naukwijo*, owes all fertility and fruitfulness—all of which the ancients correctly worked out without any university courses in meteorology.

The above are samples of what I had in mind when I said that through the fondness of the Pueblos for story telling and facts of geography, together with the absence of tabu in discussing words and their meaning, we are able to penetrate to some extent into their

esoteric world. There may be added here a few examples of what they reveal through their graphic art, largely symbolic:

1. Altar Painting: The painting herein shown (Fig. 17) is not from Pajarito Plateau nor from any Tewa town. Its symbolism, however, is as well understood by the Tewa as it is by the Jemez people, in whose pueblo the best example of this design of the *Opa* (universe) is found. It is said to be very ancient and of common knowledge among all the Pueblo villages. Herein is disclosed the essential structure of an esoteric world.

2. Paintings of Ceremonies: These paintings by young Pueblo artists, with interpretations that have come out spontaneously in conversations with the artists and older people interested in their work, have been an almost inexhaustible source of information. This is a phase of Pueblo culture that came near becoming a lost art. It was revived a few years ago, as described in one of my annual reports (1920):

In 1918, Crescencio Martinez, a Tewa Indian from the pueblo of San Ildefonso, brought to our attention a number of water color paintings executed by him, illustrating the costumed figures in certain ceremonies performed by his people. Struck by the artistic merit of these as well as by their ethnological value, we engaged him to produce, in water color, pictures of all the characters that appear in the summer and winter ceremonies. These he finished just before his untimely death. Other young Indians of his town, as well as from adjacent villages, noting that the work of Crescencio met with appreciation and remuneration, made it known that they could do similar work. This they were urged to do by the staff of the School and by the officials of the United States Indian School in Santa Fe. The result has been that a number of young people from fourteen to twenty years of age, working at the Indian School, the Museum studios, and at their own homes, have been producing paintings that command the respectful interest of the artists of this country. Their paintings are in demand for display in the best galleries of the United States, and even in European galleries.

The remarkable thing about this is not the discovery that there are artists of high ability among the Indians, but the fact that, with

no instruction in drawing or color, they are able to produce work of such artistic merit. Their work is as definitely racial as anything that has come out of oriental countries, and although in the midst of American artists whose work they see constantly in the Museum galleries, they remain practically uninfluenced. It is not yet possible to foresee the importance of this new development in Indian art. It can be said, however, that a talent is manifesting itself in a surprising way which, with the encouragement it is receiving, may be destined to affect materially the place of Indian culture in the estimation of thinking people.

A number of ancient ceremonies that had fallen into disuse have been revived through interest in these paintings. One or two examples of these may be presented here:

The Sun Dance: This ceremony, formerly engaged in by practically the entire village, has come to be a dance in which the whole population is represented by two men and two women representing the two halves of the village. It is a spring dance celebrating the return of the growing season with a dramatization of the planting, cultivating, and growth of the corn as a result of the return of the sun. This ceremony had entirely disappeared from the pueblos, and was recently revived by the Indians of Santa Clara. It is almost identical with the ceremony known as the Acequia Dance, in which the principal episode of the celebration is the turning on of the water in the ditches with the advent of the planting season. The Acequia Dances of Isleta have become well known.

The Bow and Arrow Dance: This is one of the favorite hunting dances of the Pueblos, and survives in nearly all of the villages. It is a ceremony in which the whole population participated, at least symbolically, and is a dramatization of the sympathetic relationship which man has always tried to sustain with the animals of the forest. The ceremony is rich in mimicry and symbolism. The movements of hunters and of the animals hunted are all represented. Some of the formations are extremely beautiful, particularly those in which the dancers arrange themselves in the form of the great bow and arrow. Various forms of this ceremony are to be seen. In some cases it is

known as the Arrow Dance. In others, some of the elements of the ceremony are merged into those that appear under other names, such as the Antelope Dance, the Buffalo Dance, the Antlers Dance, etc.

Thus in the rituals, dramas, arts of the living, the ancient Pajaritans have their "Imperishable Record," and from their abode in Weyima they come to mingle with and guide the people in the "good way." And to these Old Ones the living through unending time pay reverential homage by seeking the ancient wisdom and conforming life to the "good way" of their divine ancestors. This is the purest form of ancestor veneration—erratically called in the histories of religions, ancestor *worship*. Just another "boner" in nomenclature. Worship is homage paid to deity. These ancestral spirits among the Pueblos are *not* deities.

IV. MINOR EXCAVATIONS: OTOWI, SANKEWI'I, AND TSIREGE

About five miles west of where the Rio Grande enters White Rock Canyon is the prehistoric settlement of Potsuwi'i or Otowi. To reach it one ascends the mesa by following up Alamo Canyon from its confluence with the Gaujes. The summit of the first mesa is reached at the head of that part of Alamo Canyon known as the Black Gorge. The first canyon entering the Alamo from the north above this point is the Otowi. Following this for about two miles, a point is reached where the long, narrow potrero bounding the canyon on the north is entirely cut out for a distance of nearly a mile, thus throwing into one squarish open park the width of two small canyons and the formerly intervening mesa. From the midst of this park, roughly a mile square, a view of surpassing beauty is to be had. Half a mile to the south, the huge Rincon del Pueblo bounds the valley with a high unbroken line, perhaps five hundred feet above the dry arroyo at the bottom. An equal distance to the north is the more abrupt Otowi Mesa, and east and west to about an equal height rise the wedge-like terminal buttes which define this great gap in the middle mesa. Toward each of the four corners one looks into a thickly wooded gorge. The whole area is well forested.

The parallel canyons running through this glade are prevented from forming a confluence by a ridge, remnant of the intervening

mesa. Upon the highest point of this ridge is a large pueblo ruin which formed the nucleus of the Otowi settlement. In every direction are clusters of excavated cliff dwellings of contemporaneous occupation, and on a parallel ridge to the south are the ruins of one pueblo of considerable size and six small ones, all antedating the main Otowi settlement.

The traditions of Otowi are well preserved. It was the oldest village of the Powhoge people of which they have definite traditions. They hold that prior to the building of this village they occupied many of the scattered small houses of the adjacent mesas. They know that when the mesa life became untenable from lack of water, and removal to the valley a necessity, a large detachment from Otowi founded the pueblo of Perage in the valley on the west side of the Rio Grande, about a mile from their present village. Their ancient sacred spring, Tsampije pokwing (sacred pool of the west), lies in the hills less than a mile southwest of Perage. It is the best preserved of their four cardinal rain shrines, still used in connection with all rain ceremonies. It is the most vital hereditary possession of the San Ildefonso people, linking Powhoge, Perage, and Otowi in unbroken continuity.

Two types of excavated cliff dwellings are found at Otowi. The first is the open-front dwelling (Fig. 25h), usually, though not always, single-chambered—in most cases a natural cave, enlarged and shaped by excavation. The second is wholly artificial (Fig. 25c) with closed front of the natural rock *in situ*. These are usually multiple-chambered with floors below the level of the threshold; generally a crude fireplace beside the doorway, seldom provided with smoke vent; rooms usually rectangular and well shaped; floors plastered always, and walls usually plastered to a height of three or four feet. The front walls are from one to two feet thick. In some cases a little masonry has been used for casing about the doorways. Occasionally, porches were built over doorways, but nowhere were there large house groups against the cliff as at Puyé and in the Rito. For the most part, the dwellings are found in clusters and at two levels, that is, at the top of long steep slopes of the talus and again in the face of a second terrace above.

STATE OF NEW MEXICO
COUNTY OF BERNALILLO

THE AFFIDAVIT OF GAURAV RAJEN, PH.D. (MECHANICAL ENGINEERING), JEANNE M.P. LUBBERING, M.S. (RANGE SCIENCE AND ECOLOGY), AND SYED N. RIZVI, B.S., (CHEMICAL ENGINEERING).

AUGUST 4, 1993

Gaurav Rajen, Ph.D. (Mechanical Engineering), Jeanne M.P. Lubbering, M.S. (Range Science and Ecology), and Syed N. Rizvi, B.S., (Chemical Engineering), state that the following report represents their objections to, and their views, comments, and concerns regarding the renewal of the National Pollutant Discharge Elimination System (NPDES) Permit #NM 0028355 for the Los Alamos National Laboratory (LANL) as it is presently written. This statement is based upon review of the permit, review of other pertinent and available documentation, and the combined experience of the individuals preparing this statement.

Summary

We oppose the renewal of LANL's NPDES permit #NM 0028355 as it is written for the following reasons: 1) the designated uses of the waters into which the discharges occur and flow into do not correspond to the actual uses to which the waters are put by downstream communities - the designated uses are "wildlife watering", whereas the actual use is "primary contact" by humans; 2) there is documented evidence that discharges of pollutants by LANL have contaminated downstream surface waters, at levels above those considered safe for occasional human consumption and primary contact, at levels above the Department of Energy's (DOE) Derived Concentration Guides for uncontrolled areas, and above the criteria set by the U.S. Environmental Protection Agency (EPA) corresponding to primary contact uses; 3) accidental yet continuous discharges from waste disposal facilities should be considered a "point" source discharge, and the permit does not address such discharges, such as from Area G in Technical Area 54. Furthermore, the permit refers solely to State and Federal regulations that must be complied with: Tribal regulations are not mentioned in the permit. The Pueblo of San Ildefonso (Pueblo) is developing water quality standards, and, therefore, the permit should expressly state that it will be reopened as soon as the Pueblo develops its water quality standards. Given the history of radioactive discharges by LANL, all radionuclides that are capable of being regulated by the EPA should be monitored in the discharged effluents, and numerical criteria must be established for all such radionuclides.

1.0 Introduction

This report is written to support the assertion by the Pueblo of San Ildefonso (Pueblo) that LANL's NPDES permit #NM 0028355 should not be renewed in its present form. Our opposition to the permit as it is presently written stems primarily from the following three reasons: 1) the designated uses of "wildlife watering" for the waters into which the discharges occur and flow do not correspond to the existing "primary contact" uses of the waters by downstream communities; 2) there is a documented and well established hydrologic connection between many of the discharge locations and regions in which primary contact uses occur, and the criteria set

in the permit are not protective of human health and the environment downstream of the discharges; 3) accidental yet consistent discharges from waste disposal facilities should be considered in the permit as point sources, and are not. In this report we substantiate these reasons through discussion of the salient points, and by citing references and analytical data. Other modifications that need to be made to the permit are the inclusion of language that recognizes the sovereign rights of the Pueblo to regulate upstream effluent discharges that impact its surface and groundwater; and the expansion of the list of radionuclides that need to be monitored in each discharge.

2.0 Primary Contact Uses of Receiving Waters

Affidavits have been provided by members of the Pueblo that they use and have used the surface waters and springs in canyons emanating from LANL for consumption, for irrigation, and for ceremonial purposes. The canyons of concern are Los Alamos, Sandia, Guaje, Mortandad, and Canada del Buey. All of these canyons connect with the Rio Grande, which is used for primary contact by Pueblo members. In years of drought, or because of anthropogenic causes, such as underground explosions that open new fracture systems, or excessive pumping in a well field, the surface waters in the canyons may infiltrate completely into the shallow alluvial aquifer in certain stretches of the canyon systems. However, further downstream, these waters then reappear onto the surface on the canyon floors or in adjoining mesa walls through seeps and springs. Therefore, the uses of the downstream seeps and springs must also set the criteria that regulate the upstream discharges. This is why Mortandad and Canada del Buey canyons must also be considered as impacting waters used for primary contact, although overland surface flow is not always continuous or well defined in these canyon systems.

Some of the outfalls that are potentially impacted by the primary contact standard are the following: 01A-001; 01S; 02A-129; 03A - 020, 021, 022, 023, 027, 031, 032, 034, 035, 036, 037, 040, 042, 043, 045, 047, 048, 109, 113, 114, 124, 125, 136, 146, 148, 158, 160 ; 04A - 013, 014, 016, 018, 094, 117, 123, 126, 127, 131, 135, 137, 140, 142, 152, 161, 163, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179; 050; 05S; 06S; 07S; 09S; 12S; 13S. These outfalls have been identified from a LANL map titled "NPDES OUTFALLS" prepared by the LANL Facilities Engineering Division on 12/5/86 (ENG Drawing R-92), based on their proximity and elevation with regard to the various canyons. More detailed information is not available at the time of writing this report to better identify the concerned outfalls. All the outfalls that discharge into Los Alamos, Sandia, Guaje, Mortandad, Canada del Buey, and their tributary canyons should have to meet criteria based on a primary contact use of the receiving waters. We believe that LANL should provide all the concerned agencies with an exhaustive list of the various outfalls identifying which canyons each outfall impacts. Staff from the Pueblo Office of Environmental Protection of the All Indian Pueblo Council requested such a list from LANL scientists on July 23, 1993, but have not yet been provided such a list.

If the designated uses of the receiving waters are considered to be primary contact, the criteria that have been established in the permit will have to be made more stringent. The criteria for accelerator produced tritium is a good example. It will have to be reduced from 0.003 mCi/l to a figure closer to the standard for human consumption of 20,000 pCi/l. Similarly, the criteria for fecal coliform, heavy metals, etc., will have to be made more stringent.

3.0 Hydrologic Connection Between the Outfalls and Downstream Waters

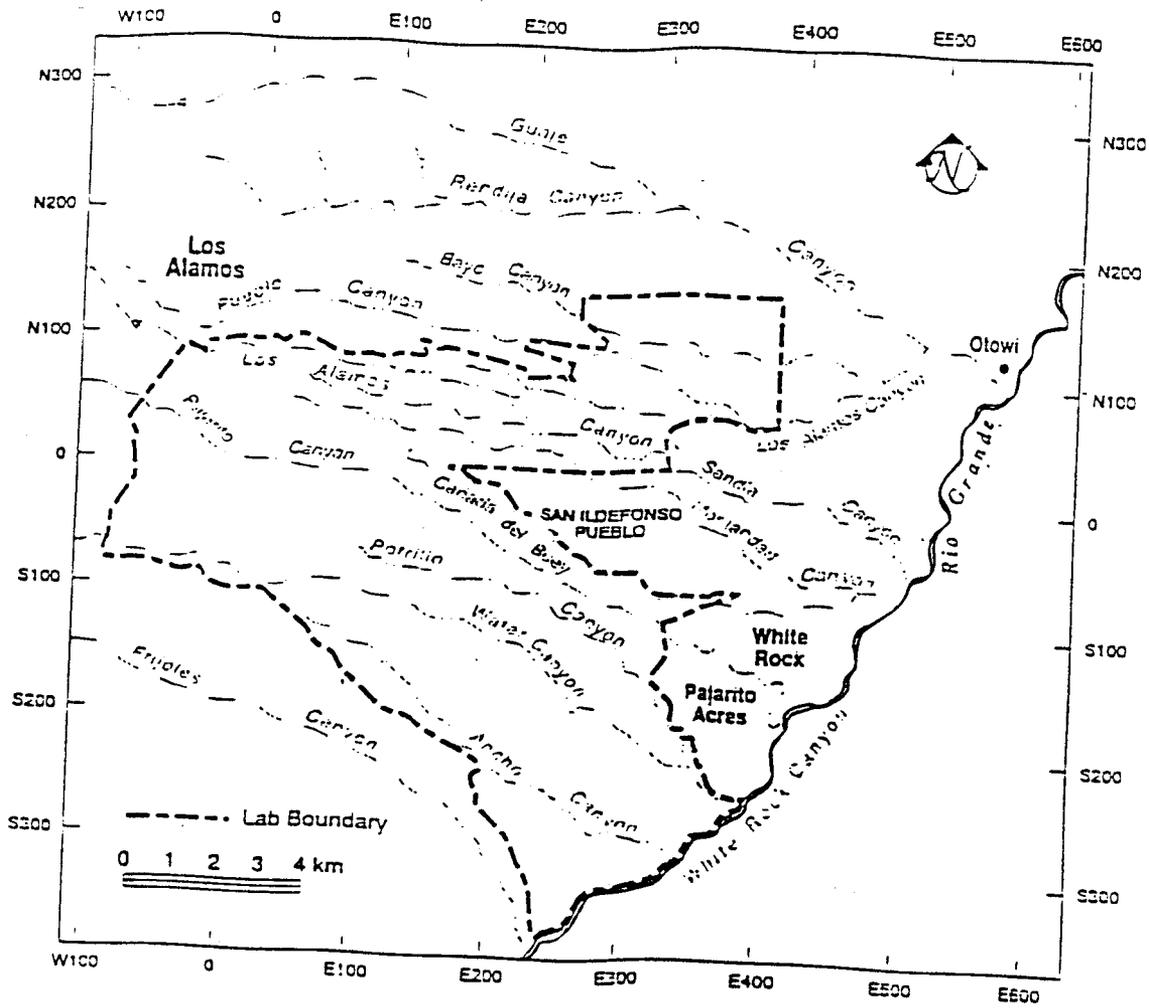
Figure 1 displays a rendition of the proximity of LANL to the Pueblo's lands. As can be seen in this figure, Guaje, Los Alamos, Sandia, Mortandad, and Canada del Buey are some of the canyons which enter the Pueblo's lands, and into which LANL discharges effluents. In the early years of LANL's operations, liquid radioactive wastes were discharged without any pretreatment into some of these canyons (DOE, 1979). To establish the hydrologic connection between the upstream outfalls, and the lower reaches of the canyons on Pueblo lands, let us consider Los Alamos canyon as an example. Radionuclides that have been discharged by LANL into this canyon serve as tracers that establish the hydrologic connection of interest. Considerable overland flow presently occurs in Los Alamos canyon. However, similar hydrologic connections can be established even for the canyons in which overland flow is limited, if the shallow subsurface flow is taken into account.

In 1990, according to LANL (LANL, 1992), over 4000 microCi of Plutonium was carried by spring run-off into the lower reaches of Los Alamos canyon and onto the Pueblo's lands from contaminated sediments that exist on LANL's property. Other long-lived radionuclides such as Americium, Cesium and Strontium have also been identified in the surface waters of Los Alamos canyon, but their full amount transported into lower Los Alamos canyon and onto the Pueblo's lands is not well documented (LANL, 1992). Tritium is another radionuclide which has been released into the environment by LANL in vast quantities and is of great concern. Tritium is easily absorbed into the human body as a part of radioactive water, and can be incorporated into the human genetic system. The shallow groundwater in upper Los Alamos canyon contained 259,000 picocuries/liter of tritium in 1979 (DOE, 1979). The rate of alluvial water movement in a related canyon (Mortandad canyon) has been estimated to be of the order of 10 m/day (DOE, 1979). With tritium having a half-life of approximately twelve years, and the possibility of alluvial water having moved at the rate of 3,650 m/year, tritium contaminated water could easily have been transported onto the Pueblo of San Ildefonso's lands along Los Alamos canyon. The Pueblo of San Ildefonso's lands are only a few miles from LANL's discharge points in Los Alamos canyon. At present, there has been very limited sampling on the Pueblo's lands of the shallow groundwater in lower Los Alamos canyon. However, analysis of waters from the seeps and springs close to the Rio Grande along Los Alamos canyon has demonstrated elevated concentrations of tritium and other radionuclides in these waters. The hydrologic connection between upstream discharges and the downstream waters on the Pueblo's lands is, therefore, well established.

4.0 Continuous Discharges from Waste Disposal Facilities

As an example of a continuous discharge that is occurring from a waste disposal facility, let us consider Area G, in Technical Area 54.

Technical Area 54, Area G, is situated at the edge of Pueblo of San Ildefonso lands, and on the rim of the canyon, Canada del Buey. Highly radioactive wastes are disposed of at this area in pits and shafts; and transuranic wastes are stored temporarily in leaking drums and buried earth berms, waiting to be shipped to the Waste Isolation Pilot Project plant. The State of New Mexico's Environment Department has confirmed that there are serious violations of environmental regulations at this site.



LOS ALAMOS NATIONAL LABORATORY
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Figure 1: Map showing the geographical contiguity of LANL and the Pueblo of San Ildefonso. Other Pueblos' lands lie in close proximity.

A detailed performance assessment of this site has yet to be made available to the Pueblo. It appears, however, that the long-term isolation of the radioactive wastes at this site is highly improbable without further actions being taken immediately. The host rock is fractured, and the wastes have been deposited with minimal engineered barriers. LANL personnel have suggested that radionuclides will sorb onto clay particles in the fractures. However, tritium is not likely to sorb. Tests in Mortandad canyon have established good hydraulic conductivity between old and new test wells through the fact that tritium was transported very easily between the wells.

The wastes buried at Technical Area 54 Area G are highly contaminated with tritium. Because of inadequate record-keeping, we believe that it is difficult to determine with certainty whether the tritium is accelerator or reactor produced, and exactly what other hazardous, mixed, and radioactive wastes are buried at this facility. However, large amounts of industrial solvents, asbestos, and other hazardous wastes are known to be buried here. Sediments in drainages leading off from this area have been found to have high levels of tritium, several times above background values (LANL, 1992). Tritium has been found at high levels (over ten times the background levels) in the sediments of run-off channels leading from this area (LANL, 1992). Some of these channels lead into Canada del Buey, and onto the Pueblo's lands.

In a LANL memorandum (Jacobsen, 1992), from tests conducted in 1985, the level of tritium in soils at a depth of 10-30 cm at a location within Technical Area 54 Area G was described as 160000 nCi/l. The 1985 Environmental Surveillance report for 1985 (LANL, 1986), however, describes the levels of tritium in on-site soils and sediments from effluent release areas in Technical Area 54 as 0.0 pCi/l. The implication of this value is that there are no high readings within this area. This value is contradicted by values in a later LANL memorandum. An environmental assessment report prepared for a planned expansion of Area G (LANL, 1991), states that at several sampling stations within Area G "elevated tritium concentration levels, approximately double background levels, were recorded in 1985 but were below regional concentrations in subsequent years". The LANL memorandum (Jacobsen, 1992) states that tritium levels in 1989 were as high as 380000 nCi/l in soils within Area G. The published Environmental Surveillance report for 1989 does not provide the levels of tritium in on-site soils and sediments for Technical Area 54 (LANL, 1990). An on-site area for which some data is provided is described in this report (LANL, 1990) as "East of Technical Area 54". The levels of Plutonium at this location are described as approximately 0.01 pCi/g. The table in which this data appears is labelled "Radiochemical Analyses of On-Site Soils and Sediments": the implication of this table heading is that the locations described are representative of the areas in which they occur. The LANL memorandum (Jacobsen, 1992), however, describes the levels of Plutonium in Technical Area 54 Area G in 1989 to be of the order of 10 pCi/g. The environmental assessment (LANL, 1991) that discusses the expansion of Area G describes the levels of Plutonium in Area G in 1980 to have a highest concentration of 1.37 pCi/g, and to occur only in shallow soils 0-1 cm deep. The LANL memorandum (Jacobsen 1992), however, describes the levels of Plutonium in soils to be as high as 2.46 pCi/g and at a depth of 10-30 cm.

The Environmental Assessment for the expansion of Area G (LANL, 1991) describes the burial at Area G of tritium-contaminated wastes that have levels greater than 100 Ci/cu.m. Such wastes are buried in 65 ft. shafts with metal liners, as opposed to wastes that are less than 100 Ci/cu.m., which are buried without additional liners. Given the fact that some wastes have tritium levels greater than 100 Ci/cu.m., and some have less, a good estimate of the tritium levels for order of magnitude calculations is 100 pCi/cu.m. Assuming a hundred shafts of volume

approximately 60 cu.m., the total amount of radioactivity that is buried is of the order of 600,000 Ci. This is a very large amount of radioactivity. The rock in which the wastes are placed is fractured- naturally, and from construction. In 1990, tests of sediments from run-off channels leading from this area, (LANL, 1992) established that levels of tritium in the soil were much higher than background. Despite the fact that tritium contaminated wastes have been buried at this site, the Environmental Surveillance report for 1990 states that "tritium in soil moisture was about 5 to 10 times the background limit in seven of the nine samples for no apparent reason". These samples were collected from run-off channels leading off from Technical Area 54 Area G. Table 2 presents the maximum levels of selected radionuclides within the soils at Area G for various years. These values are compared to the regional background values for soils reported by LANL for the corresponding years.

Given the fact that sediments in channels leading from this waste disposal facility are contaminated, it is likely that runoff from this area consistently carries contaminants into surface waters. Therefore, this facility should be considered a "point" source, and needs to be permitted. Discharges into Canada del Buey could impact this facility to a great extent, as they may saturate the underlying rock below the disposal shafts and enhance the mobility of contaminants escaping from their engineered containment.

5.0 Tribal Regulations and Additional Radionuclides that Need to be Monitored

The permit needs to recognize that the Pueblo has a government-to-government relationship with the EPA, that allows it to exercise sovereign powers and regulate environmental activities on Pueblo lands. Therefore, the permit should contain language that it will be reopened as soon as the Pueblo develops water quality standards or other applicable regulations.

All radionuclides that can be regulated by the EPA should be monitored and have criteria established through the permit. We believe that the EPA has some discretion in this regard, as there are many naturally occurring radionuclides, separate from source, by-product and special nuclear materials, that are present in LANL's wastewater discharges. LANL uses a large number of radionuclides in its activities, many of which pose a threat to human health and the environment. Therefore, a more complete list of radionuclides must be included in the permit. Examples of such radionuclides are the isotopes of Uranium, Thorium, and Radon.

TABLE 2: Maximum Soil Concentrations of Selected Radionuclides at Technical Area 54 Reported in LANL Memoranda and Compared to the Regional Background Described in Published Reports (Jacobsen, 1992a; LANL, 1986; LANL 1989; LANL 1990, LANL, 1992. See Appendix A for copies of relevant references.)

LANL Memorandum	Published Reports
Soils in Area G	Average for Regional Soils
1985	
H-3 - 160,000 nCi/l	H-3 - 0.0 pCi/l
U - 8.99 ppm	U - 2.6 ppm
Pu 238 - 2.47 pCi/g	Pu 238 - 0.0 pCi/g
Pu 239 - 7.02 pCi/g	Pu 239 & 240 - 0.01 pCi/g
1989	
H-3 - 380,000 nCi/l	H-3 - 960.0 pCi/l
U - 4.22 ppm	U - 2.6 ppm
Pu 238 - 9.98 pCi/g	Pu 238 - 0.0017 pCi/g
Pu 239 - 0.38 pCi/g	Pu 239 & 240 - 0.01 pCi/g
1990	
	H-3 - 600 pCi/l
	U - 2.4 ppm
	Pu 238 - 0.015 pCi/g
	Pu 239 & 240 - 0.022 pCi/g

6.0 Conclusions

The NPDES permit #NM 0028355 for the Los Alamos National Laboratory (LANL) as it is presently written should not be renewed. There is a well established hydrologic connection between the outfalls within LANL, and the surface waters on the Pueblo. However, the designated uses of the receiving waters do not correspond with the existing uses, and the present regulatory criteria are not protective of human health and the environment.

In all of the outfalls that discharge to canyons used by the Pueblo, we request that the limiting criteria for the regulated pollutants be based on primary contact designated use. In addition, the Pueblo of San Ildefonso requests that the outfalls that discharge to such canyons be removed from the general permit and issued separate permits to deal specifically with the water quality concerns of the Pueblo of San Ildefonso.

Gaurav Rajen
Gaurav Rajen, Ph.D.

Syed Rizvi
Syed N. Rizvi, Chemical Engineer

Jeanne M.P. Lubbering
Jeanne M.P. Lubbering, M.S., Ecologist

Subscribed and sworn to before me by Gaurav Rajen, Jeanne M.P. Lubbering and Syed N. Rizvi on August 6, 1993.

Lynn B. Moore
Notary Public



OFFICIAL SEAL
LYNN B. MOORE
NOTARY PUBLIC - STATE OF NEW MEXICO
Notary Bond Filed With Secretary of State

My Commission Expires 7-9-96

My commission expires: 7-9-96

References

Department of Energy, 1979, Final Environmental Impact Statement, DOE/EIS-0018.

Jacobsen, K., 1992, Environmental Surveillance at Area G, LANL Memorandum EM-8:92-1818.

Los Alamos National Laboratory, 1986, Environmental Surveillance at Los Alamos During 1985, Environmental Protection Group, LA-10721-ENV.

Los Alamos National Laboratory, 1989, Environmental Surveillance at Los Alamos During 1988, Environmental Protection Group, LA-12000-ENV.

Los Alamos National Laboratory, 1990, Environmental Surveillance at Los Alamos During 1989, Environmental Protection Group, LA-11628-ENV.

Los Alamos National Laboratory, 1991, Environmental Assessment Expansion of Area G, EA-90-004L.

Los Alamos National Laboratory, 1992, Environmental Surveillance at Los Alamos During 1990, Environmental Protection Group, LA-12271-MS.

DR. GAURAV RAJEN

EDUCATION

- Ph.D., Mechanical Engineering, University of Delaware, Newark, Delaware, 1989: Specialization in the thermal-fluid sciences, transport of fluids and contaminants in the environment, computer simulation.
- B.Tech. and M.Tech., Aeronautical Engineering, from the Indian Institute of Technology, Bombay, one of India's premier engineering and research institutions.

EXPERIENCE

Scientist/Engineer IV	New Initiatives Group
Apr. 1993 -	Mission Research Corporation, Albuquerque, NM
Adjunct Faculty	Dept. of Mechanical Engineering
Jan. 1993 -	University of New Mexico, Albuquerque, NM
Director	Pueblo Office of Environmental Protection
Jan. 1992 - Apr. 1993	All-Indian Pueblo Council, Albuquerque, NM
Sr. Environmental Eng.	Navajo Superfund Program
May 1990 - Dec. 1991	Navajo Nation, Window Rock, AZ
Research Associate	Department of Civil Engineering
1989-1990	Colorado State University, Fort Collins, CO
Research Associate	Department of Mechanical Engineering
1986-1989	Colorado State University, Fort Collins, CO
Research Associate	Department of Mechanical Engineering
1984-1986	University of Delaware, Newark, DE

Dr. Rajen has been involved with the study of waste management activities at the Los Alamos National Laboratory that impact the Pueblo of San Ildefonso since January 1992. He has prepared reports and analyzed problems related to the discharge of effluents into the canyons entering the Pueblo from LANL's property, air emission issues, and waste disposal at Technical Area 54, Area G. In the past, Dr. Rajen has helped develop expert testimony related to protests by the Navajo Nation of a permit issued by the State of New Mexico for the in situ mining of uranium. His area of expertise is contaminant transport in the subsurface and the assessment and remediation of hazardous and radioactive waste sites.

Dr. Rajen currently is the Principal Investigator at Mission Research Corporation for two projects related to pollution prevention and environmentally conscious manufacturing (funded by the U.S. EPA), and a project related to technical and economic feasibility studies of alternative energy systems for use in rural areas of the western United States (funded by the Western Area Power Administration). His interests and involvement in environmental protection and pollution prevention date from several years. Recently, he has helped organize two sessions at the Second International Congress on Environmentally Conscious Manufacturing to be held in Arlington, VA, in August 1993, and will edit part of the Conference proceedings. Dr. Rajen is the prime initiator of Environmental Protection of Indigenous Lands, an International Journal, to be launched in 1993 by the All Indian Pueblo Council, a consortium of nineteen sovereign Indian tribes in New Mexico. He is currently an Adjunct Faculty member at the University of New Mexico, and teaches courses and advises graduate students on research related to environmentally conscious manufacturing and other environmental issues. In the past, Dr. Rajen has worked on several projects funded by the EPA through cooperative agreements with Indian tribes. These projects have dealt with water quality and sludge management issues, air quality control, pollution prevention, and the identification, assessment, and remediation of hazardous waste sites. Dr. Rajen created the first comprehensive pollution prevention programs for Indian tribes in the country funded by the EPA.

In his previous employment with the All Indian Pueblo Council, Dr. Rajen created from inception and managed an environmental office for the All Indian Pueblo Council. He was involved in He increased the budget of the office from \$350,000 at the start of his tenure to over \$1,500,000 dollars within one year, and recruited, trained, and supervised a staff of eighteen technical employees. This office dealt with NPDES and Sludge Management problems on all the nineteen Pueblos of New Mexico, including the Pueblo of San Ildefonso.

For the Navajo Nation, Dr. Rajen managed technical and administrative functions of a CERCLA/SARA program, developed and obtained funding for proposals worth \$823,000, negotiated with federal and state agencies and responsible parties on RI/FSs and RODs for two NPL sites, set and achieved targets, authored a Quality Assurance Project Plan (that has been adopted by several other states); directed technical staff's production of over forty preliminary assessments and fourteen CERCLA site inspections of hazardous waste sites. For the site inspections, he devised the sampling and safety plans, led the field investigation team, and wrote site inspection reports. He created a Geographic Information Systems based site discovery effort, that identified and prioritized hazardous waste sites. Performed risk assessments for three abandoned uranium mines which led to an emergency response and removal action at the sites. Member of several national EPA workgroups that prepared guidance on hazardous waste site assessment.

Conducted research and helped to manage projects funded by the U.S. Nuclear Regulatory Commission and the U.S. Department of Agriculture. These projects involved the computer simulation using Supercomputers and experimental studies of flow, heat, and contaminant transport in two and three-dimensional saturated and unsaturated porous and fissured media. The applications of the research included the design of high-level nuclear waste repositories, and control of groundwater pollution. Developed large-scale numerical simulation codes, including pre- and post-processors.

PUBLICATIONS

Rajen, G., "Vibration-induced thermal convection in fluid-saturated porous media," with F. A. Kulacki, *Fundamentals of Heat Transfer in Porous Media*, ASME HTD-Vol. 193, 28th National Heat Transfer Conference, San Diego, CA, 1992.

The Pueblo Office of Environmental Protection, with D. Sanchez, and L. Suina, *Proceedings, New Mexico Conference on the Environment, Albuquerque, NM, 1992.*

"A computer-based graphics program to assess the impacts of hazardous waste sites," *Proceedings, The Environmental Technology Expo, ETE 92, Chicago, IL, 1992.*

"Assessments of hazards posed by abandoned uranium mines on the Navajo Nation," with P. Antonio, et al., *Proceedings, ATSDR National Minority Health Conference, Atlanta, GA, 1991.*

"Buoyancy-induced flow and heat transfer in fissured media, with F. A. Kulacki, *Proceedings, Convective Heat and Mass Transfer in Porous Media*, NATO Advanced Study Institute, Izmir, Turkey; Amsterdam: Kluwer Publishers, 1990.

"Three-dimensional buoyancy-induced flow and heat transfer around an underground structure," with F. A. Kulacki, *Proceedings, First International Symposium on Unique Underground Structures*, Denver, CO, 12-15 June 1990.

"Three-dimensional natural convection in a porous layer locally heated from below," with F. A. Kulacki, *Heat and Mass Transfer in Frost and Ice, Packed Beds, and Environmental Discharges*, AIAA/ASME Thermophysics and Heat Transfer Conference, ASME HTD Vol. 139, pp. 65-70, 1990.

"Buoyancy-Induced Flow and Heat Transfer in Porous and Fissured Media," Ph. D. Thesis, University of Delaware, 1989.

"A boundary element analysis of natural convection in fluids and porous media," with F. A. Kulacki, *Advanced Boundary Element Methods*, ed. T.A. Cruse, Springer Verlag, Berlin Heidelberg, pp. 325-330, 1988.

"Natural convection in a porous layer locally heated from below - a regional laboratory model for a nuclear waste repository," ASMEHTD, *Heat Transfer Problems in Nuclear Waste Management*, 24th National Heat Transfer Conference, Pittsburgh, PA, Vol. 67, pp. 19-26, 1987.

"Hydrothermal impact of a nuclear waste repository," with F. A. Kulacki, *Proceedings, 28th U.S. Symposium on Rock Mechanics*, Tucson, AZ; Rotterdam: A.A. Balkema Press, 1987.

"The finite contour method," AIAA Paper 87-0148, *25th Aerospace Sciences Meeting*, Reno, NV, 1987.

"Convective heat transfer in partially filled cylinders," with A. E. Jones and F. A. Kulacki, *AIChE Winter Meeting*, Miami, FL, 1986.

"Natural convection in porous media using boundary elements," AIAA Paper 86-1263, *4th AIAA/ASME Thermophysics and Heat Transfer Conference*, Boston, MA, 1986.

Rajen, G., and Kulacki, F.A., 1985, "Thermal convection through a system of rigid idealized fissures, with F. A. Kulacki, *Research and Engineering Applications in Rock Masses*, ed. E. Ashworth; Rotterdam: A. A. Balkema Press, pp. 817-823, 1985.

Poster Sessions:

"Two-dimensional analysis of leaching processes in the Vadose zone," with H. Rector and C. V. Alonso, *Front Range Meeting*, American Geophysical Union, Boulder, CO, 1990.

"Appropriate technology for the Mars colony: Lessons from the Third World, *Case for Mars III*, University of Colorado, Boulder, CO, 1987.

Technical Comments:

"Discussion of 'Heat transfer to separated flow regions from a rectangular prism in a cross stream'," *Journal of Heat Transfer*, Vol. 107, p. 739, 1985.

"Comment on 'Aerodynamic penalties of heavy rain on landing aircraft'," *Journal of Aircraft*, Vol. 21, p. 92, 1983.

Jeanne Marie Petrofes Lubbering
59 Santa Maria Drive
Edgewood, New Mexico 87015-9741
(505) 281-7694

EDUCATION

M.S. Range Science, 1988, Texas A & M University
Primary emphasis: Habitat evaluation, range ecology and planning

B.S. Wildlife and Fisheries Science, 1986, Texas A & M University

CERTIFICATION

Habitat Evaluation Procedures (HEP), 1992, Jacksonville, Florida
OSHA 40-HR Health and Safety Course (1990, 1991, 1992, 1993)

PROFESSIONAL EXPERIENCE

All Indian Pueblo Council/Pueblo Office of Environmental Protection, Albuquerque, NM Ecologist

Primary responsibilities are to address National Pollutant Discharge Elimination System (NPDES) permitting issues and concerns for the nineteen (19) Pueblos of New Mexico, through a U.S. Environmental Protection Agency Clean Water Act 104(b) Grant.

Duties include field assessment of existing wastewater treatments, and potential point source or stormwater discharges; preparation of biosolid guidelines under recent 503 regulations; and design of alternative or enhancement treatments for existing wastewater facilities.

Other responsibilities include technical support to the nineteen Pueblos of New Mexico for water quality issues; assistance with treatment-as-state applications; comment and testimony assistance to Pueblos for contested permits off tribal lands (upstream discharger).

Fugro-McClelland, Inc., Dallas, TX and Albuquerque, NM. Senior Scientist/Ecologist, Project Manager.

Primary responsibilities include management of environmental projects, costing, budget and personnel allocation for projects, and marketing of environmental services.

Project experience includes: supervision of ecological assessments of habitat for animal population requirements, and development of management/planning procedures of natural resources; Phase I and Phase II Environmental Site Assessments for developed and undeveloped acreage, industrial properties, high rise structures, and commercial and residential properties for insured depositor institutions and law firms; regulatory audits; and, contract and subcontract negotiation and management.

Project experience also includes impact assessment of oil and gas operations, Northern Oriente, Ecuador, cooperative work with Corps of Engineers for wetland delineations and 404 permitting, and cooperative work with U.S. Fish and Wildlife Service and state agencies for critical and endangered species habitat assessments.

Duties also included preparation of proposals for a variety of projects, report writing, invoicing, preparation of 245/255 qualifying packages, and quality assurance/quality control (QA/QC) for all projects.

Thompson and Knight, Dallas, Tx. Environmental Legal Assistant.

Responsibilities included provision of technical expertise to attorneys for ecological assessment reports and interpretation of technical environmental guidance documents. Assisted in review of NPDES permit parameters, mining permitting and compliance, RCRA Part B permitting and bioassay and bioaccumulation technical parameters.

Prepared permit review and comments for Lone Star Steel Company (LSSC). Tasks included review of NPDES permit violation reports, provided by Texas Water Commission; review of NPDES permit writer handbook and investigation of documentation for bioassays and toxicity testing of LSSC effluent.

Assisted in preparation of testimony for Occidental Chemical Company RCRA permit renewal. Testimony was prepared based on review of available documentation for groundwater flow, alleged violations of phosphoric acid releases to surface water, bioassays prepared by outside consultant and review of public comment and testimony.

Provided on site client representation and contracting assistance for environmental services. Job duties required familiarity with federal and state environmental regulations (RCRA, CERLA, TSCA, CWA, CAA, TWC, UST, & LUST, SWMA, ESA, NEPA).

Self-employed, College Station, TX. Ecological contract services.

Provided contract services for private landowners and research facilities. Contract services included habitat/resource partitioning for ungulate ranchers, animal trapping for forage studies, and research and documentation of field techniques.

TECHNICAL EXPERIENCE

Flora and fauna inventories for forage measurement and habitat evaluation including structure assessment, cover, and bedding requirements.

Endangered species and critical habitat assessments.

Wetland delineations, 404 permitting, mitigation and compensation planning.

Aerial photographic interpretation for woodlands, habitat, and mapping.

NEPA compliance, environmental impact studies and audits.

Incorporation of habitat field methodology into software program.

Ornithological population and banding studies.

Establishment of nature trails and floral/faunal interpretation program.

Water quality field testing and sampling.

Subsurface investigations for hydrocarbon/petroleum product contamination according to NMED and TWC regulations.

PRESENTATIONS

"Proposed Model for Regulation of Native and Captive Wildlife: Its implications for Texas Exotic Ranchers." Exotic Wildlife Assoc., Kerrville, Texas, March 3, 1988.

"Research Needs and Current Information for Exotic Ranchers." First International Wildlife Ranching Symposium, New Mexico State University, Las Cruces, New Mexico, May 14, 1998.

"An Approach for Strategically Planning Exotic Animal Introductions and Maintenance." Ungulate Behavior Conference (in honor of Dr. Fritz Walther). Texas A & M University, College Station, Texas, May 25, 1988.

"Natural Resource Issues." Resolution Trust Corporation, Dallas, Texas, December 5, 1991.

"Environmental Site Assessment Methods." Environmental Training Center, University of Texas, Arlington, Texas, July, 22, 1992.

PUBLICATIONS

"An Approach for Strategically Planning Exotic Animal Introductions and Maintenance." J. Applied Animal Behavior Science 29 (1991).

SYED N. RIZVI

EDUCATION

- B.S., Chemical Engineering, University of Punjab, Lahore, Pakistan;
major: process control; minor: waste management

EXPERIENCE

Senior Environmental Engineer

Pueblo Office of Environmental Protection
All-Indian Pueblo Council, Albuquerque, NM

Laboratory Director
Sept. 1990 – July 1992

Assaigai Analytical Laboratories
Albuquerque, NM

Successfully managed an operation of \$2 million/year of analytical quality work. As Laboratory Director, assisted departmental supervisors in technical aspects of routine analytical laboratory operations. Specific duties included client interface on technical reports and liaison between clients and analytical chemists. The nature of work involved dealing with broad range of environmental regulations (e.g. EPA, RCRA, SDWA, NPDES, NIOSH, OSHA, CERCLA, CWA, DOT, HMTA), and coordination with NMED, the City of Albuquerque, the State of New Mexico, the Texas Water Commission, and other regulatory agencies. Prepared the standard operating procedures and laboratory quality control/quality assurance manuals in compliance with EPA, SW-846, and EPA 500 & 600 series. Additionally, involved in instrumentation with special emphasis on troubleshooting and maintenance. Hands-on experience conducting a multitude of analyses under EPA protocol and methodologies in the areas of organic, inorganic, trace metals, and wet chemistry. Knowledge of RADIANT SAM computer system for sample tracking and reporting.

Laboratory Supervisor
Jan. 1990 – Sept. 1990

Alltech Environmental Laboratories
Albuquerque, NM

Responsible for design, construction, supervision, and furnishing of a 2000 ft² environmental testing laboratory in Albuquerque, New Mexico. The laboratory specialized in hazardous waste analyses of air, water, waste water, soil, and asbestos. Equipment included chromatography, GC, GC/MS, spectrophotometer (UV), VARIAN, SCHMADZU, TCLP, FTIR, atomic absorption Hitachi Z-8100, and various bench chemistry instruments.

Manager
July 1988 – Dec. 1989

The Supply Cabinet
Fairfax, VA

Managed a retail store specializing in office and business equipment.

Assistant Manager,
Production and Utilities
April 1985 – May 1988

Rupali Polyester Ltd.
Pakistan

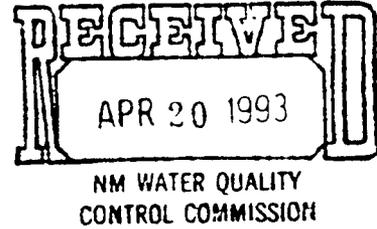
Responsible for technical operations, design and modification of process control for a plant processing 32 tons of polyester yarn daily. Responsible for operations, troubleshooting, and maintenance for steam boilers, chillers, compressors, water supply, nitrogen, and air conditioning plants. Hands-on experience in power plant for maintenance, troubleshooting, and modifications in everyday analyses of cooling water, waste water, and other facets of operation. Supervisory responsibility for staff of 100 including skilled and unskilled operators. Worked in all three shifts and reported directly to Engineering Manager.

AFFILIATIONS

- Member, Institute of Chemical Engineers, USA
- Member, Institute of Chemical Engineers, Pakistan
- Member, Engineering Council of Pakistan

BEFORE THE NEW MEXICO WATER QUALITY CONTROL COMMISSION

IN RE: CONDITIONAL CERTIFICATION)
OF DRAFT NATIONAL POLLUTANT)
DISCHARGE ELIMINATION SYSTEM)
(NPDES) PERMIT NO. NM0028355)
)
THE REGENTS OF THE UNIVERSITY OF)
CALIFORNIA and the UNITED STATES)
DEPARTMENT OF ENERGY,)
)
Petitioners.)
_____)



SETTLEMENT AGREEMENT

The United States Department of Energy, The Regents of the University of California (collectively, the "Petitioners"), and the New Mexico Environment Department ("NMED"), agree:

1. Recitals. On October 14, 1992, Petitioners filed a Petition for Review with the New Mexico Water Quality Control Commission ("Commission") appealing the conditional certification dated September 11, 1992, by NMED (the "Conditional Certification") of the draft NPDES Permit published May 16, 1992 (the "1992 Draft NPDES Permit") by the United States Environmental Protection Agency ("USEPA"). Pursuant to an order of the Hearing Officer, the parties met on March 17, 1993 for purposes of negotiation of a possible settlement of this proceeding. At the settlement conference, the parties agreed to certain points of settlement and agreed to continue settlement negotiations. Settlement negotiations have been ongoing since that date, and an agreement in principle with respect to settlement of this matter has been reached.

2. Purpose. The purpose of this agreement is to set forth all of the terms and conditions of the settlement among Petitioners and NMED in this proceeding.

3. Conditional Certification. NMED will withdraw the Conditional Certification and issue a new certification certifying the 1992 Draft NPDES Permit based upon effluent limitations that protect livestock and wildlife watering, as set forth in Section 3-101 and other applicable sections of the New Mexico Water Quality Standards for Interstate and Intrastate Streams in New Mexico ("The New Mexico Water Quality Standards") and other applicable state and federal laws and regulations. The effluent limitations in the certification shall be those set forth in Exhibit 1 to this agreement. Exhibit 1 to this agreement is incorporated into this agreement as if fully set forth in this agreement. The new certification shall provide for a term of the 1992 NPDES Permit of five years from the date issued and shall provide for a reopener clause containing the provisions set forth in paragraph 4 below.

4. Reopener Clause. The 1992 NPDES Permit shall contain a reopener clause to allow the permit to be modified, as required, under the following circumstances:

(A) to reflect any applicable changes to the New Mexico Water Quality Standards;

(B) to impose new or additional permit limitations as allowed by law or regulation that

arise as a result of the information obtained from the study referred to below in Section 6;

(C) as provided by law. For the purpose of this paragraph 4C, Petitioners will provide NMED with copies of its annual environmental surveillance reports, the addition and deletion of new outfalls, its waste stream characterization final studies, and its NPDES discharge monitoring reports.

5. Voluntary Dismissal of Petition for Review and Withdrawal of Motions. Petitioners shall file a voluntary dismissal of their Petition for Review and the parties shall withdraw all pending motions after NMED has withdrawn the Conditional Certification and issued the new certification.

6. Study. A study shall be conducted for the purpose of identifying the stream uses associated with the watercourses in the canyons into which Petitioners discharge waters subject to NPDES regulation. The study shall be prepared by a neutral, unbiased, third party who shall be selected as provided under the New Mexico Procurement Code for the provision of services by professional consultants. A four-person selection committee composed of two representatives of Petitioners and two representatives of NMED shall be established. The selection committee shall prepare a request for proposals ("RFP"), including a statement of work, and select the consultant to conduct the study. The parties shall have the right to fully

participate in drafting the RFP, including the scope of workplans and required studies necessary to accomplish the purpose of the study and to review all drafts of the study and provide comments on all drafts.

If the selection committee cannot agree on any matter within its responsibility, the matter shall be referred to a dispute resolution committee whose members shall be the Secretary or Deputy Secretary of NMED, the Associate Director for Operations of the Los Alamos National Laboratory and the Manager of the Los Alamos Area Office of the Department of Energy. The dispute resolution committee shall make a good faith effort to resolve the matter. If the dispute resolution committee cannot unanimously agree on a resolution of the matter, the Secretary of NMED shall make the final decision concerning the matter.

7. NMED Review of Data and Studies. After NMED issues the new certification, the parties shall have the right to submit data and studies, including water quality, hydrological and ecological data and studies, to the consultant selected under the RFP only after prior NMED determination that the water quality data for use by the consultant adheres to the methods authorized under 40 C.F.R. § 136 and Section 1-103 of the New Mexico Water Quality Standards, to the extent that 40 C.F.R. § 136 and Section 1-103 are applicable to the data being submitted. Copies of any data or studies provided to the consultant by NMED shall be provided to Petitioners.

8. Access to Data. The parties shall have the right to access and copy, during normal business hours, all raw and validated data associated with any data or studies submitted to or prepared by the consultant for purposes of conducting the study.

9. Cost of the Study. Petitioners shall contribute up to \$180,000 for fees and costs of the consultant that conducts the study described in paragraph 6.

10. Approval by Commission. Pursuant to paragraph 12 of the Procedural Order entered by the Commission in this proceeding, this agreement is subject to approval of the Commission.

11. Entire Agreement - Binding Effect. This agreement constitutes the entire agreement of the parties and the obligations hereunder shall be binding on the parties and their successors jointly and severally after approval by the Commission.

DATED: April 20, 1993.

VIRTUE, WILSON & NAJJAR

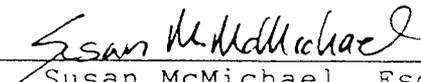
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UNITED STATES DEPARTMENT OF
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By 
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*approved by telephone
4-20-93*

NEW MEXICO ENVIRONMENT DEPARTMENT

By 
Susan McMichael, Esq.
Counsel for the New Mexico
Environment Department
P.O. Box 26110
Santa Fe, NM 87501

APPROVED:

William R. Hendley
Hearing Officer

APPROVED:

NEW MEXICO WATER QUALITY
CONTROL COMMISSION

By _____
Chairperson