

**NM1 - 5**

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**GENERAL  
CORRESPONDENCE**

**YEAR(S):  
1980's**

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to 4,020 against.

Under the congress' rules, the delegates were required to take separate votes on each candidate.

The result was announced at the end of the eighth day of the congress after a brief break to count the secret ballots.

Gorbachev's victory was greeted by loud applause from the delegates at the Kremlin's Palace of Congresses.

Seven candidates were nominated

government that Gorbachev heads.

The top party job carries no fixed term of office. But the meeting changed party rules to require that the general secretary be elected by a congress, which traditionally meets every four or five years, rather than by the Central Committee, which meets several times a year. The change will make it harder for opponents to oust Gorbachev as party leader.

ne told the delegates.

Later, he spoke only briefly to accept his nomination.

"I carry the most responsibility for what has been done," he told the delegates. "You have the possibility, you have a lot of information, it's right that you should decide."

He acknowledged that he has not been able to give both the Soviet presidency and the party leadership full attention.

and target about the other property owners. That's what the council is doing; taking care of its citizens."

Most of those easements gathered over the years are from private citizens.

Those easements along Broadway were for utilities, Nobis said. "Just because we're using it, doesn't mean we own it. We just wanted to make sure that we are not denying the owner the right to negotiate," Nobis added.

# Gas wastewater straining dump sites

## ■ Gas production stresses disposal companies; illegal activity possible

Wren Propp  
Staff writer

High production rates at gas-drilling rigs throughout the county have placed a strain on private companies who provide dump sites for the wastewater created by the work, a state Oil Conservation Division official said.

"We have more water than we have places for disposal. On the very down side, we may see some additional illegal disposal," OCD Environmental Bureau

Chief David Boyer said Monday from his Santa Fe office.

This abundance of wastewater has caused the closure of Basin Disposal Inc., north of Bloomfield on New Mexico 544 — temporarily closed while the water levels are lowered enabling aeration machinery to work, Boyer said.

Frank Chavez, district supervisor for the OCD, said the disposal company may be closed less than a week. The company stopped taking additional loads of produced water on June 29.

Rep. Jerry Sandel, D-Farmington, and an owner of Basin, said the higher levels come from the demand placed on the disposal facility after loads were turned away by the other disposal fa-

cility in the county — Southwest Disposal.

Boyer said the OCD found hydrogen sulfide fumes at the Basin site on the evening of June 28. The effect of hydrogen sulfide gases created at the site was the subject of a 1987 suit against the company.

Southwest Disposal president Dave Swezey said from his Denver office today his facility's closure was due to work needed on the company's aeration system.

"We stopped taking water while the work was being done. I understand that rain, what you call the monsoon season, has also slowed activity in the field," he said.

That facility's closing lasted about four or five days, Swezey said. The facility is open now.

Swezey explained that coal gas-seam drilling produces a great deal of water, and because of geologic formations, pumping the water back is an energy-intensive proposition.

More facilities that can dispose of the wastewater — called "produced water" — are needed in the area, Boyer said.

"The OCD would like to see new facilities begin work," Boyer said.

Another facility, on Crouch Mesa, has been proposed, but that proposal is still being considered, Boyer said.

FOT 210-90



## Oil Field Dump Owners Must Pay Court Costs

FARMINGTON — The owners of an oil field waste dump have been ordered to pay about \$55,000 in court costs and \$206,329 to attorneys who represented people who lived near the dump.

Samuel Montoya, a former state Supreme Court justice who presided over the district court trial, issued his final ruling Tuesday in the nearly monthlong trial last November.

Attorneys said Basin Disposal Inc. has 30 days to appeal Montoya's decision.

Montoya in March ordered Basin Disposal to pay plaintiffs some \$705,000 for physical and mental suffering caused by fumes from the dump.

The 61 people had contended that hydrogen sulfide fumes from Basin Disposal caused them mental and physical problems during the spring and summer of 1987.

Basin Disposal, which is three miles north of Bloomfield, is owned by Rep. Jerry Sandel, D-Farmington; his mother, Salley Sandel; David Turner and his father, D.C. Turner. Salley Sandel was not named in the lawsuit.

Montoya's March ruling said Basin's owners failed to adequately protect the public from dangers associated with operating a disposal facility for water produced from oil and gas wells.

12/20

# Witness says dump may not have been only fumes source

By Bill Papich  
Daily Times staff

A source of hydrogen sulfide fumes that allegedly caused health problems for residents near Bloomfield may have been the Conoco San Juan Gas Plant — in addition to an oil field waste dump operated by Basin Disposal Inc.

Basin Disposal is being sued by 63 people who lived near it and contend that the fumes came exclusively from the dump's 280-foot long wastewater evaporation pond.

But testimony in San Juan District Court Monday by an environmental engineer for the state Oil Conservation Division indicated some of the "rotten egg" smelling gas may have come from the gas plant.

Basin Disposal is located about three miles north of Bloomfield on New Mexico 544. The Conoco plant is about 1½ miles south of the dump.

The 63 people say the gas from the dump caused such ailments as bloody noses, nausea, headaches and sleeplessness. They allege the fumes began coming from the dump in spring 1987 and were detected as recently as last month.

They're suing Basin Disposal for unspecified damages.

Basin Disposal is owned by state Rep. Jerry Sandel, his mother Sally Sandel, and the owners of Chief Transport Co. — David Turner and his father D.C. Turner.

The environmental engineer, Roger Anderson, testified that OCD investigations for hydrogen sulfide

included checking the Conoco plant, which had a past record of hydrogen sulfide emissions.

He noted the plant began operating in December 1986, and he assumes it began emitting hydrogen sulfide immediately.

Anderson said he learned of the hydrogen sulfide emissions after reviewing communications between the state Environmental Improvement Division and Conoco.

"We have correspondence between the EID and CONOCO that they (CONOCO) were violating their stack emissions," he told the court.

"It was a brand new plant. The quantity of hydrogen sulfide was unforeseen at the time they designed the plant," Anderson added.

During one period after the plant opened, it was emitting 3.6 million cubic feet of carbon dioxide daily, he said, adding that carbon dioxide contains 80 parts per million of hydrogen sulfide.

The permit issued by the OCD for the plant's operation specifies it cannot emit more than 10 parts per million of hydrogen sulfide gas, Anderson said.

The trial by judge, before former state Supreme Court Justice Samuel Montoya, is in its fourth week. Although attorneys have said they expected it to end this week, the judge indicated it may continue past Christmas.

If the trial isn't over by Thursday, Montoya said he'll adjourn the court until next Tuesday.

# Fumes may have exceeded safe levels — official <sup>12/19</sup>

By Bill Papich  
Daily Times staff

**AZTEC** — Levels of hydrogen sulfide gas at an oil field waste dump near Bloomfield may have been six times greater than levels that cause "great concern" to the public safety, according to a state official.

But drastic actions to protect the public safety were never initiated. Roger Anderson, an environmental engineer for the state Oil Conservation Division, testified in San Juan District Court today.

Anderson indicated the actions weren't initiated because apparently the OCD doubted the accuracy of the gas-level readings.

Anderson was testifying today in the trial of Basin Disposal Inc., oil-field waste dump located on New Mexico 544, about three miles north of Bloomfield.

Basin is being sued by 63 people who lived near the dump and claim hydrogen sulfide fumes from it caused them health problems — including nausea, vomiting, headaches and sleeplessness.

Basin is owned by state Rep. Jerry Sandel, his mother, Sally Sandel, and the owners of Chief Transport Co. — David Turner and his father, D.C. Turner.

Under questioning by an attorney representing the plaintiffs — David Stout of Albuquerque — Anderson confirmed that another OCD official measured the gas at 300 parts per million at the dump in June 1987.

Plaintiffs allege the fumes first started coming from the dump in spring 1987 and have continued until as recently as last month.

And Anderson admitted that if the

June 1987 reading was accurate the public safety would have been threatened — possibly requiring the dump to be closed.

"All the data and technical literature about the effects of hydrogen sulfide indicated that anything above 50 parts per million would be of great concern," Anderson testified.

On other occasions during the summer of 1987 the OCD measured 200 parts per million of the gas, he said. But again he doubted the accuracy of the readings, questioning the calibrations on instruments used to measure "rotten egg" smelling gas.

"Whether it was a reflection of the actual concentrations I don't know," Anderson told the court.

He referred to the gas measurements as "potential elevated levels" rather than actual levels.

But the OCD did order Basin Disposal's owners to post a sign in the front of the dump warning of hazardous gas emissions. And the signs' posting should have been an alert to the public's safety, Anderson's testimony indicated.

Stout asked him to read an OCD regulation to the court, stating why the posting of the sign was required by the agency.

The rule states: "The intent of this rule is to provide . . . for public safety in areas where concentrations of greater than 100 parts per million may be encountered."

The non-jury civil trial before former State Supreme Court Justice Samuel Montoya is in its fourth week.

# Toxicologist doubts gas harmed residents' health

By Bill Papich  
Daily Times staff

AZTEC — A toxicologist says he doubts that hydrogen sulfide fumes from an oil field waste dump near Bloomfield harmed the people living nearby.

But Dr. Ernest Dixon admitted he's never personally diagnosed the people, or visited the site.

The Washington, D.C., doctor gave his opinions about the effects of hydrogen sulfide in San Juan District Court today — testifying in the trial of Basin Disposal Inc. He was presented as a witness for Basin Disposal.

The dump is along New Mexico 544 about three miles north of Bloomfield, and Basin Disposal is being sued by 63 people who lived near it and claim hydrogen sulfide emissions from the dump damaged their health.

Basin Disposal is owned by state Rep. Jerry Sandel, his mother Sally Sandel, and the owners of Chief Transport Co. — David Turner and his father D.C. Turner.

People suing Basin claim hydrogen sulfide fumes began com-

ing from the dump in spring 1987, and have continued as recently as last month.

An attorney for Basin Disposal — Deborah Mande of Albuquerque — asked Dixon to read a list of ailments that plaintiffs attributed to the hydrogen sulfide. The list included vomiting, nausea, bloody noses, and memory loss.

But Dixon testified that none of them can be attributed directly to hydrogen sulfide — at least at the levels measured near the dump in summer 1987.

"Most of the symptoms are the kind that are common place — the general type symptoms that any of us can experience on occasions," Dixon said.

He noted his analysis of the symptoms was based on hydrogen sulfide levels recorded by the Oil Conservation Division.

And Dixon said diaries and calendars kept by plaintiffs — recording when they allegedly were sickened by the gas — are not credible.

"I would not rely on that," he testified.

# Witness: Officials disagreed on sprinklers

By Bill Papich

Daily Times staff

The director of the state Oil Conservation Division allowed sprayers turned on over an oil field waste dump after the OCD's district supervisor ordered them turned off because of concern for peoples' health.

The state director's decision to revoke the district supervisor's decision was revealed Tuesday in the trial of the suit against Basin Disposal Inc., an oil field waste dump near Bloomfield.

The sprayers surrounding Basin's 280-foot long evaporation pond for disposal of so-called "produced water," spray the water into the air to enhance evaporation, according to OCD officials. People living near the pond say hydrogen sulfide gas levels increased when the sprayers were on.

Basin Disposal is being sued in San Juan District Court in a non-jury trial for unspecified damages by 63 people who live, or

have lived, near the dump and who claim the "rotten egg" smelling gas caused them health problems.

Although the OCD's district supervisor, Frank Chavez, ordered the sprayers turned off in August 1987, Chavez's order was rescinded by OCD headquarters in Santa Fe, according to testimony by Dave Turner.

Turner is part owner of Basin Disposal. The order came from state OCD director William J. LeMay, Chavez said from his office.

Basin Disposal is owned by Turner, his father D.C. Turner, state Rep. Jerry Sandel, D-San Juan, and Sandel's mother Sally. The dump is located about three miles north of Bloomfield on New Mexico 544.

Plaintiffs in the trial say they first noticed hydrogen sulfide coming from the evaporation pond in spring 1987. The fumes still were noticeable four weeks ago, some plaintiffs allege.

Under questioning Tuesday by an attorney for the plaintiffs — Joe Goldberg of Albuquerque — Dave Turner said Basin installed a sprinkler system to enhance evaporation of the wastewater pond.

"We were getting close to reaching our capacity," he said, describing his concern that the pond was filling too fast.

After the dump opened in October 1985, it began receiving much more wastewater than Basin's owners had anticipated, he said.

"We wanted to continue spraying to enhance evaporation. The initial idea of the facility was to accumulate in the winter and evaporate in the summer," Turner testified.

But in August 1987, Chavez ordered the sprayers turned off because of his concern they were increasing hydrogen sulfide gas levels, according to OCD officials. Chavez had been answering complaints about the gas for months, the OCD said.

Sometimes he answered them by visiting the homes of nearby residents in the middle

of the night, using an instrument to measure the gas levels, according to OCD records.

Turner testified he wanted the sprayers turned on again and asked Red Walsh — the engineer who designed the evaporation pond — to travel to Santa Fe to ask OCD officials to evaluate Chavez's order.

"We asked Mr. Walsh if he could check it out for us," Turner told the court.

Later, OCD director LeMay permitted the resumption of spraying, according to Chavez.

Turner said owners of Basin Disposal were concerned about the fumes in the summer of 1987, treating the evaporation pond with thousands of dollars of chemicals.

During the treatment, nearby residents were provided motel rooms at Basin's expense, because the reaction of the chemicals in the pond was then unknown, he noted.

"We were doing everything we could to reduce the (gas) levels. The goal was to do everything possible as quickly as possible," he said.

# Excess waste may be cause of fumes, says 1 Basin owner

By Bill Papich  
Daily Times staff

**AZTEC** — Unanticipated amounts of oil field waste from Colorado helped fill the oil field waste water pond sooner than had been expected, testimony in San Juan District Court indicated today.

The testimony came from David Turner, part owner of Basin Disposal Inc., a 22-acre disposal site located about three miles north of Bloomfield on New Mexico 544.

Turner was testifying in the third week of a lawsuit brought by 63 people who live or have lived near Basin and are suing the company claiming the hydrogen sulfide gas caused them health problems.

Turner was being questioned today by Albuquerque attorney Joe Goldberg, who represents the plaintiffs.

Other owners of Basin include state Rep. Jerry Sandel, D-San Juan, his mother Sally, and David Turner's father, D.C. Turner.

Plaintiffs allege the fumes began coming from Basin's waste water evaporation pond in spring 1987, and have continued as recently as a month ago.

Turner said when he and Basin's other owners were planning construction of the dump, they anticipated receiving 800 to 1,000 barrels of produced water a day. But about three months after it opened in October 1985, the dump was receiving "two or three times our initial estimates," Turner said.

And about half the waste was being trucked from oil wells in Colorado, Turner noted.

"We did a big portion for Amoco" in Colorado, he said.

"It was a new area being developed by one of our customers. It was the type of situation that more or less coincided with the opening of Basin," he testified.

He noted most of the waste was trucked from Colorado by Chief Transport Co. — owned by him and his father.

As more produced water was received, Basin's 280-foot long evaporation pond was filling quickly, Turner said. That prompted him and Basin's other owners to install a sprinkler system around the pond to enhance evaporation, he said.

Installation of the sprinklers was approved by the state Oil Conservation Division, Turner noted.

But after the system was installed, the OCD said the spraying was a contributing factor to complaints of foul odors from nearby residents, Turner said.

Then in August 1987, the OCD ordered the sprinkler system turned off because of concerns about the gas, according to the agency.

Basin's owners also tried to solve problems caused by the fumes by treating the evaporation pond with thousands of dollars of chemicals in addition to providing motel rooms for nearby residents during the treatment, Turner said.

"We did all kinds of things. We had all kinds of people out there looking for solutions to the problem," he told the court.

"The goal was to do everything possible as quickly as possible."

Eventually the OCD permitted the spraying to resume, Turner said. Although nearby residents continued to complain about odors, he said he never believed the sprayers contributed to the odors.

"I don't believe it made the problem any worse," he said. "I've never seen anything that would qualify if it was part of the problem or not."

When asked by attorney Goldberg if he ever attempted to contact nearby residents to personally hear their complaints, Turner said he was advised against it by Farmington attorney John Dean.

Dean advised against it, because the residents had already announced they were filing a lawsuit against Basin Disposal, Turner said.

# Psychiatrist testifies pit fumes didn't cause stress disorder in children

By Bill Papich

Daily Times staff

**AZTEC** — A psychiatrist testified Friday at the trial of Basin Disposal Inc. that three children aren't suffering post traumatic stress disorder from breathing hydrogen sulfide fumes from the disposal site.

The oil field waste dump three miles north of Bloomfield on New Mexico 44 is being sued by 63 people who lived near it and claim hydrogen sulfide fumes from its wastewater evaporation pond damaged their health.

In earlier court testimony, a psychiatrist said the three children — who are among the plaintiffs — were diagnosed as having the stress disorder, usually associated with Vietnam veterans.

But Dr. Arthur Egelman, an Albuquerque psychiatrist, testified Friday in San Juan District Court that the previous diagnosis by psy-

chologist Dr. Samuel Roll was wrong.

"There's no indication their lives have been affected (by the fumes) other than by a bad smell," Egelman told the court.

Plaintiffs allege the "rotten egg" smelling hydrogen sulfide afflicted them with numerous ailments, including nausea, vomiting, and bloody noses. They say the fumes started in spring 1987 and have continued as recently as a month ago.

Basin Disposal is owned by Rep. Jerry Sandel, D-San Juan, his mother, Sally, and the owners of Chief Transport Co. — David Turner and his father, D.C. Turner.

The psychiatrist had testified the children — two 12-year olds and a 6-year old — will need years of treatment to overcome mental disorders associated with the gas emissions.

Dr. Egelman, however, said Roll's diagnosis of the children was

not according to the "Diagnostic and Statistical Manual," a book which sets standards for patient admissions to mental institutions.

Standards for diagnosing post traumatic stress disorder include "stressor," symptoms from "catastrophic" experiences associated with military combat, torture and imprisonment in concentration camps, Egelman said. Symptoms of the disorder can be social withdrawal, memory loss and sleep disturbance, he added.

"None of these symptoms were present in the children," he said. "Psychologists are capable of making a diagnosis, but there's no indication Dr. Roll adhered to any of the criteria."

But under questioning from an attorney representing the plaintiffs — Joe Goldberg of Albuquerque — Egelman admitted he'd never met

the children, as the psychologist had done. Egelman said he based most of his conclusions about the children's mental condition on previous testimony by the children.

Goldberg asked, "Are you sure that gives you the information you need in order to reach opinions of the symptoms?"

Egelman answered, "There are no symptoms. Dr. Roll advanced absolutely nothing about a medical disorder."

He continued, noting that for post traumatic stress disorder diagnosis to be credible, the disorder must be caused by actual life threatening experiences — again referring to military combat and torture.

"The fact of the matter is..." Egelman testified. "An objective observer would conclude the person's life was in danger. It's not enough to say the person thought he might die."

# Gas reported when wind blew wrong way

By Bill Papich  
Daily Times staff

A civil engineer says most people who lived south of an oil field waste dump and complained about hydrogen sulfide gas from the dump, did so when wind was blowing the gas north — away from their homes.

And the engineer said a recommendation to install an aeration system at the dump to alleviate the fumes — recommended by the state Oil Conservation Division — would have increased the fumes.

The engineer, Dr. Hal Cooper of Albuquerque, said he has extensive experience studying conditions like the ones that caused the gas at Basin Disposal Inc. — located about three miles north of Bloomfield on New Mexico 544.

He was testifying in San Juan District Court Thursday at a trial in which Basin Disposal is accused of damaging the health of 63 people who live or have lived near the dump.

The people allege that hydrogen sulfide fumes coming from the dump since spring 1987 have caused them ailments including headaches, nausea, vomiting, and sleeplessness. And the fumes have been detected as recently as a month ago, the plaintiffs allege.

Basin Disposal is owned by Rep. Jerry Sandel, his mother Sally, and the owners of Chief Transport Co. — David Turner and his father D.C.

Turner. The dump opened in October 1985. Plaintiffs are suing for unspecified damages.

During testimony in the trial Thursday — now in its third week — Cooper said he was hired by attorneys for Basin Disposal to compare complaints about the gas with wind directions the days the complaints were filed with the OCD.

He indicated that many of the complaints may be inaccurate because most plaintiffs live south of the dump and complained about hydrogen sulfide when winds were blowing north.

Of the 243 complaints filed by plaintiffs, Cooper said 80 percent of them occurred when winds were blowing the gas north from the dump, not south where they could be smelled by plaintiffs. He testified he didn't measure the wind directions himself, but "calculated" them.

But when an attorney for the plaintiffs — Joe Goldberg of Albuquerque — asked to see the calculations, Cooper couldn't produce them.

"I think I threw them away," Cooper told the court.

Cooper also was questioned by one of Basin's attorneys, Albuquerque lawyer John Wells. Wells asked him if he approved of chemical treatments the owners of Basin performed on the dump's 280-foot long wastewater evaporation pond.

According to previous testimony, the fumes were coming from the pond and Basin's owners began treating it with chemicals to reduce the

fumes in July 1987. Cooper said all chemical treatments were correct and approved by the OCD.

The chemicals reduced, but did not eliminate the fumes, he added.

In earlier testimony, however, Goldberg had accused Basin's owners of not heeding an OCD recommendation to install an aeration system in the pond. An aeration system pumps air through the wastewater, helping to eliminate hydrogen sulfide fumes, according to the OCD.

Although the evaporation pond has an aeration system now — installed this fall — it would have been a mistake to install one in summer 1987 because the pond was too full at that time, Cooper testified.

"In my opinion it would have been a very unfortunate thing to do," he said. "It would have stripped out hydrogen sulfide into the air, aggravating the problem."

Cooper, who said he has a doctorate in engineering, told the court he reviewed the dump's design specifications submitted to the OCD, determining they conformed to all OCD regulations.

The non-jury trial is being heard by former state Supreme Court Justice Samuel Montoya. Attorneys say they expect the trial to last another week.

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## Dismissal motion denied in trial of Basin Disposal

City/county

From staff reports

AZTEC — Attorneys for an oil field waste dump asked a judge Thursday to dismiss charges that the dump's owners should be held liable for allegedly damaging the health of people who lived near it.

The 63 people allege that hydrogen sulfide fumes coming from the dump caused their health problems.

But the judge, former state Supreme Court Justice Samuel Montoya, denied the request.

Montoya is presiding over the non-jury trial of Basin Disposal Inc., an oil field waste dump located

about three miles north of Bloomfield on New Mexico 544. Basin is being sued for unspecified damages.

Attorneys for plaintiffs say the dump's owners were negligent in approving the design and operation of the dump. The dismissal of charges request came from one of Basin's attorneys, John Wells of Albuquerque.

Basin Disposal is owned by Rep. Jerry Sandel, D-San Juan, his mother Sally, and the owners of Chief Transport Co., David Turner and his father D.C. Turner. The trial has lasted three weeks.

Plaintiffs allege that hydrogen sulfide fumes from Basin's 280-foot long evaporation pond for disposal of so-called "produced water" made them sick.

They claim the fumes started coming from the pond in spring 1987 and have continued as recently as a month ago.

Health problems allegedly caused by the fumes include bloody noses, nausea, headaches, and sleeplessness.

Wells asked for dismissal of charges that Basin's owners were negligent in designing the dump and locating it near mobile homes.

"The area was unzoned and rural" with other commercial development in the area, Wells said.

"At the time it was designed and installed, the hydrogen sulfide problem was not foreseeable. Without that foreseeable problem there's no basis to find negligence in the location of the facility," he said.

"The (design) duty is that of the engineer. There's no evidence that the design did not conform to stan-

dards." of the Oil Conservation Division.

Red Walsh, a petroleum engineer, designed Basin's evaporation pond.

And Wells asked the judge to dismiss charges that Basin was improperly operated. Plaintiffs have indicated they believe Basin was receiving oil field waste which Basin's owners knew might produce the hydrogen sulfide.

"The source was not what went into the pond," Wells said. "The source was the action of anaerobic bacteria in the pond."

"So, certainly there could be no negligence in operating this facility."

Anaerobic bacteria is produced by biological chemical reactions which can occur in wastewater ponds under certain circumstances, producing hydrogen sulfide, according to the OCD.

But an attorney for the plaintiffs, Joe Goldberg of Albuquerque, said Basin's owners were negligent.

"There's indisputable evidence that shows the activities on the defendant's land created a hazardous condition," Goldberg said.

He noted that Basin's owners posted a sign in front of the dump saying, "Danger Hydrogen Sulfide" — acknowledging they recognized dangers posed by the dump. The OCD, however, has said they ordered Basin's owners to post the sign.

And Goldberg said the fact that Basin's owners provided motel rooms for some plaintiffs to get them away from fumes in 1987, also verifies dangers from the dump.

"I can recognize no better evidence to show the danger," he said, referring to Basin providing lodging for plaintiffs.

He said that during one period Basin's owners allowed the dump the receive twice the amount of oil field waste for which it was designed.

ARTHRITIS  
AND  
HOT  
WATER  
TREATMENT



By Lloyd Husted,  
Sales Mgr.  
Raindrops, Inc.

The National Arthritis Foundation has endorsed spas and warm water exercise. According to the Arthritis Foundation, there are over 100 different kinds of Arthritis; most forms are characterized by inflammation of the joints. Inflammation causes swelling, pain and stiffness, and can result in loss of joint motion or function.

Hot Water Therapy and the proper exercise program, as prescribed by your Doctor or Health Professional, can help relieve many of the symptoms of Arthritis.

Ask the friendly people at RAINDROPS, INC. for the free booklet published by the Arthritis Foundation. Information about possible income tax deduction is included.

Raindrops will compete with anyone in price and will offer you the very best in products, featuring over 30 different models of spas. We save you money on your spa purchase because we buy factory direct as distributors for both Jacuzzi Whirlpool and Dimension One Products. We invite you to visit our huge showroom. We're not fancy, but we are nice. Ask about our incredible 30 day promise - Satisfaction guaranteed or your money back.

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# Wednesday

## OCD director overruled decision

The director of the state Oil Conservation Division allowed sprayers turned on over an oil field waste dump near Bloomfield — reversing the district supervisor's order to turn them off because of concern for the health of area residents.

That's what testimony dis-

closed Tuesday in the lawsuit trial for Basin Disposal Inc.

And the headline on Tuesday's trial story incorrectly reflected the thrust of the story — because it was written from an earlier story version that was rewritten.

Today's story is on Page A1.

## Basketball tops sports section

Basketball tops today's sports package with reports on the the Window Rock, Ariz., — Shiprock boys game and the Gallup-Kirtland Central boys and girls games.

Farmington High's participation in the Page, Ariz., tournament is covered in two previews.

The FHS girls' tournament and two divisions of the San Juan Basin Junior High tournament also have stories.

Branching off from basketball are columns on rodeo and bowling.

Stories in the Sports section, Pages A10 to A15.

## Utah county commission action

MONTICELLO, Utah — San Juan County Commissioners voted to include Blanding and Monticello in the new county Transportation District, pending approval by the two cities, during Monday's regular commission meeting.

And commissioners apparently must cut \$675,000 from requests for the county's 1989 budget as budget requests from various departments total near-

ly \$4.5 million, with projected revenues for next year expected to be a little more than \$3.8 million.

While, the San Juan County Transportation Service District responded Monday to accusations by the Aneth Chapter, saying the county did not use reservation oil and gas money for county projects.

Stories, Page B1.

## Utah hires economic chief

MOAB, Utah (AP) — A former Provo woman, who helped 280 businesses to establish in central Utah over the

past seven years has been hired to help with economic development in southeastern Utah.

Story Page A8.

## Boy adjusting to new arms

ALBUQUERQUE (AP) — Before he was fitted with his new automated arms, Armando Gutierrez pulled on his shoes and socks with his teeth and wrote with his foot.

Now his new battery-powered arms are helping him learn to do everyday tasks in a more conventional way.

Story Page B11.

## State employees may get raises

SANTA FE (AP) — State employees are expected to get raises to legislators and the state na-

# DAI

FAR

Wednesday evening, December 14, 1988

## BHS band director to return

By Deborah Tracy  
Daily Times staff

BLOOMFIELD — High School Band Director Frank Anderson was reinstated unanimously by Bloomfield School Board after a nearly two-hour executive session Tuesday night.

The decision was announced to a standing-room-only crowd, which Superintendent Jack Ward estimated at 50 to 60 people.

Related story on Page A8

The board turned to the Anderson issue immediately after approval of the previous meeting's minutes at the start of the 7 p.m. session.

The board received a copy of the Anderson case police file, Ward said this morning.

Ward also said the alleged participants — students or parents — didn't have an opportunity to speak to the board.

After the executive meet, the move to reinstate Anderson came from board member Verl Farnsworth. And a large portion of the audience applauded as the motion was seconded and unanimously approved.

Then Anderson said, "I appreciate what the board has done, and I am sorry the situation is

# Witness: Officials disagreed on sprinklers

By Bill Papich

Daily Times staff

The director of the state Oil Conservation Division allowed sprayers turned on over an oil field waste dump after the OCD's district supervisor ordered them turned off because of concern for peoples' health.

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have lived, near the dump and who claim the "rotten egg" smelling gas caused them health problems.

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Turner is part owner of Basin Disposal. The order came from state OCD director William J. LeMay, Chavez said from his office.

Basin Disposal is owned by Turner, his father D.C. Turner, state Rep. Jerry Sandel, D-San Juan, and Sandel's mother Sally. The dump is located about about three miles north of Bloomfield on New Mexico 544.

Plaintiffs in the trial say they first noticed hydrogen sulfide coming from the evaporation pond in spring 1987. The fumes still were noticeable four weeks ago, some plaintiffs allege.

Under questioning Tuesday by an attorney for the plaintiffs — Joe Goldberg of Albuquerque — Dave Turner said Basin installed a sprinkler system to enhance evaporation of the wastewater pond.

"We were getting close to reaching our capacity," he said, describing his concern that the pond was filling too fast.

After the dump opened in October 1985, it began receiving much more wastewater than Basin's owners had anticipated, he said.

"We wanted to continue spraying to enhance evaporation. The initial idea of the facility was to accumulate in the winter and evaporate in the summer," Turner testified.

But in August 1987, Chavez ordered the sprayers turned off because of his concern they were increasing hydrogen sulfide gas levels, according to OCD officials. Chavez had been answering complaints about the gas for months, the OCD said.

Sometimes he answered them by visiting the homes of nearby residents in the middle

of the night, using an instrument to measure the gas levels, according to OCD records.

Turner testified he wanted the sprayers turned on again and asked Red Walsh — the engineer who designed the evaporation pond — to travel to Santa Fe to ask OCD officials to evaluate Chavez's order.

"We asked Mr. Walsh if he could check it out for us," Turner told the court.

Later, OCD director LeMay permitted the resumption of spraying, according to Chavez.

Turner said owners of Basin Disposal were concerned about the fumes in the summer of 1987, treating the evaporation pond with thousands of dollars of chemicals.

During the treatment, nearby residents were provided motel rooms at Basin's expense, because the reaction of the chemicals in the pond was then unknown, he noted.

"We were doing everything we could to reduce the (gas) levels. The goal was to do everything possible as quickly as possible," he said.

# Worker — unlined pits used by Basin

By Bill Papich  
Daily Times staff

**AZTEC** — An employee of an oil field waste dump says so-called "produced water" from oil well drilling was put in unlined pits during 1985 because large quantities of the waste was being received at the dump.

The main wastewater evaporation pond at Basin Disposal Inc. — which is lined to prevent leakage — was filling too fast, Audrey Bryan said.

An employee of Basin Disposal since 1985, Bryan was testifying Friday in San Juan District Court, where Basin is being sued by 63 people who say hydrogen sulfide fumes from the dump made them sick.

The plaintiffs live, or have lived, near the dump located about three

miles north of Bloomfield on New Mexico 544. They began complaining about the fumes in spring of 1987.

Basin Disposal is owned by Rep. Jerry Sandel, D-San Juan, his mother Sally, and the owners of Chief Transport Co. — David Turner and his father D.C. Turner.

Testifying before former state Supreme Court Justice Samuel Morley, who will decide the lawsuit, Bryan said the dump began receiving large quantities of produced water shortly after it opened in October 1985.

"The AMOCO (well) locations in Colorado didn't have a place ... and shipped it to us" during the winter of 1985, Bryan said.

He explained his job with Basin

Disposal was to record tank truck deliveries to the 22-acre facility, which sometimes occurred 24 hours a day, he said. Chief Transport hauled most of the waste, he noted.

When one his employers, David Turner, became concerned that Basin's 280-foot long evaporation pond was filling too fast, Turner ordered wastewater dumped in unlined pits, Bryan testified.

But after the pits were discovered leaking the summer of 1987, Basin began hauling produced water to an injection well, he said.

Injection wells dispose of the waste thousands of feet underground, according to the state Oil Conservation Division.

Since then, the pits have been lined, Bryan told the court.

When asked if he's ever noticed odors at the dump, Bryan said he's smelled something like "sewer gas."

Although the plaintiffs have claimed the odors have caused them health problems, including bloody noses, burning eyes, headaches, vomiting and sleeplessness, Bryan said he's never suffered from the fumes himself.

Bryan added that he worked at the dump 12 hours a day when plaintiffs were complaining about hydrogen sulfide.

**Fantasy Land  
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# Residents near Basin Disposal begin testimony

By Cindy Johnson  
Daily Times staff

AZTEC — Bloomfield area residents, who claim they suffered illnesses caused by fumes from an oil field waste dump near Bloomfield, began their testimony Thursday in San Juan District Court.

Two men — one a former resident of the area and the other an Environmental Improvement Division inspector — claimed they suffered headaches when odors from the pit were noticeable.

More than 60 people joined to sue Basin Disposal Inc. for unspecified damages for alleged health problems and property devaluation.

Rep. Jerry Sander, D-San Juan and one of four Basin Disposal owners, attended the Thursday afternoon session.

The trial by judge — being heard by

former state Supreme Court Justice Samuel Montoya — is expected to continue for two more weeks.

Len Murray, a Farmington EID office inspector, said he suffered low-grade headaches on two occasions in 1988. In both cases Murray said he was at the waste site about 30 to 35 minutes.

But Murray said he had no idea what levels of hydrogen sulfide were present when the odors were noticeable — because the environmental agency doesn't monitor the gas.

The agency refuses to accept authority for alleged hydrogen sulfide emissions from Basin Disposal, which in this area can't be more than .01 parts per million, Murray said.

A second witness complained of headaches, a scratchy throat, running nose and nervousness.

Kenneth Raney admitted he had difficulty

remembering dates, but said his symptoms began in September 1986, shortly after he was married and moved a second trailer onto property he is purchasing with his parents.

Raney couldn't remember whether he noticed the rotten egg smell while his wife was pregnant.

But he said he first noticed a sewer odor in April 1987. Their infant child cried for long periods when the odor was present, he added.

By January 1987 Raney said he was sure the odors came from Basin Disposal.

He said he called Sander to see if the odors problem was being resolved, and he testified Sander assured him everything was being done that could be done.

Raney said he temporarily moved his family from their home on the east side of New Mexico 544 two times in 1987. But finally, the

family decided to move their trailer, he added.

He estimated moving expenses at \$710.

Raney said he was taken to San Juan Regional Medical Center in January 1987 for what he believed was an illness caused by fumes from the waste pit.

Raney admitted he was aware he had pressures from having a new wife, infant son and the night shift on a new job, and noted he was admitted to Sun Crest Hospital for treatment because he thought it might help.

He added he didn't recall telling doctors he was depressed because of family problems, financial worries, or about an accident that occurred seven years ago.

He also said he wasn't sure whether the medication provided was an anti-depressant.



(Staff photo by Andy Porter)

### Lighting the way

Allison Chavez, secretary of the San Juan College Indian Club, prepares a string of Christmas lights at the Farmington Intertribal Indian Organization center. Festive displays on homes and businesses have made evenings colorful affairs as Christmas approaches.

# Doctor reports dump anxieties

By Cindy Johnson  
Daily Times staff

AZTEC — A neuropsychologist to-day testified on the anxiety levels of 40 people living near a Bloomfield area oil field dump, who claim to have suffered mild to moderate symptoms as a result of fumes from the site.

Dr. John Rhodes said he spent two days last month interviewing 40 of the 63 people suing Basin Disposal Inc. for unspecified damages for health problems they claim were caused by hydrogen sulfide fumes from the dump.

Basin Disposal is owned by Rep. Jerry Sandel and his mother, Sally, and David Turner and his father, D.C. Turner.

### Related story, Page 2

The San Juan District Court trial by judge was moved from Farmington to Aztec this week. Former state Supreme Court Justice Samuel Montoya is presiding.

Plaintiffs allege they first noticed the fumes in the spring of 1987 and say fumes were noticeable as recently as one month ago.

Rhodes said the method used to evaluate the 40 area residents are guidelines — not absolutes. "It's a clinical judgment," he added.

The method doesn't evaluate all personality aspects, but covers more than one, Rhodes said, noting that care was taken to consider cul-

ported his 14-year-old companion spoke incantations to Satan before thrusting a knife into a Fruitland girl's body, a deputy sheriff testified at a hearing today.

Deputy Det. David Whitaker was reporting the content of statements Chad Lee Freeman gave at the Sheriff's office after the youth was detained in the death of Marlene Wilson, 17, whose body was found in Fruitland Sept. 19.

Freeman named Jimmy Santiago Gutierrez Jr. as the killer, but Sheriff's officers believe Freeman wielded the knife, Whitaker said.

The testimony was presented before San Juan District Judge James L. Brown, who is expected to decide if Freeman can be tried as an adult.

sentence that can be given age.

According to testimony, he and Gutierrez threw a regulation ditch. Deputies body was found by a ditch downstream.

Gutierrez fancied himself that killing in the make him immortal, Whit told him.

Freeman and Gutierrez "Wilson just before waterfall north of the My Whitaker added.

tural influences when interviewing Navajo and Hispanic people.

He explained there are two types of anxiety symptoms — those from exposure to fumes and those from having something physically wrong. Sometimes, he said, it's difficult to determine which is the predominate factor.

And, he added, he isn't sure whether the physical symptoms are caused from exposure or from anxiety.

But Rhodes said he has read that headaches are found consistently among people who have been exposed to this type of fume.

He classified those he interviewed as having mild to moderate anxiety

symptoms, and rated his findings on a scale of one to 10. The most severe symptoms would be a 10, requiring hospitalization, he said.

Most of those he interviewed were ranked at a one or two anxiety level, he said.

And many who were given a higher ranking had other problems — such as a past history of alcoholism, which may effect their anxiety levels, Rhodes reported.

"Regardless of how this case comes out, we know from clinical experience that there could be an increase of marital and alcohol problems in this type of group," Rhodes said.

Medical Center, Aztec Police Chief Cruz said. Cruz said. Whitlock was cited for a traffic light violation, the chief said.

## Donations asked for fire victims

Clothing and other donations are needed for a Farmington police officer and his family whose mobile home was destroyed by fire Sunday.

Officer Paul Dunn, his wife Monica and their three children need clothing and other items, a police spokesman said.

The family's West Apache Street home was destroyed — apparently after heat from a wood stove ignited curtains, police noted.

Donations may be submitted to a special Dunn family account at First Interstate Bank.

Some clothing donations — for the Dunns' daughters — already have been given to police, but more items are needed, the spokesman said.

The Dunns have a three-month-old girl and two older girls who wear sizes 12 slim and 7 junior.

## People near dump said in need of help

By Bill Papich  
Daily Times staff

AZTEC — A neuropsychologist testified in San Juan District Court Monday that people who lived near a Bloomfield area oil field dump need months of mental therapy to overcome problems caused by breathing alleged fumes from the dump.

Testifying at the trial of Basin Disposal Inc. — located about three miles north of Bloomfield on New Mexico 544 — Dr. John Rhodes of Albuquerque recommended the psychotherapy.

The trial by judge began a week ago before former state Supreme Court Justice Samuel Montoya.

The trial will determine if 63 people who lived near Basin Disposal should be awarded unspecified damages for ill health that they attribute to hydrogen sulfide fumes from the dump.

Plaintiffs allege they first noticed the fumes in spring of 1987, and that the fumes have continued as recent-

ly as last month.

Basin Disposal is owned by Rep. Jerry Sandel, D-San Juan, his wife Sally, and the owners of Chief Transport Co. — David Turner and his father D.C. Turner. The 22-acre disposal facility was built in 1985.

Dr. Rhodes was introduced by plaintiffs attorneys Bill Carpenter and Joe Goldberg of Albuquerque, and Chester Miller of Farmington.

Rhodes said he interviewed 40 plaintiffs Nov. 10 and 11, and determined that hydrogen sulfide fumes harmed them mentally, as well as physically, and that some will need psychotherapy to resume normal lives.

His list of mental ailments allegedly suffered from the gas seemed almost endless as he responded to questions from Carpenter.

Rhodes said the effects included prolonged anger, anxiety, tension, mental fatigue, sleeplessness, confusion, defensiveness, depression, irritability, lack of concentration,

hostility, social withdrawal, stress and memory loss.

And his list of unhealthy physical conditions caused by the gas poisoning also was lengthy.

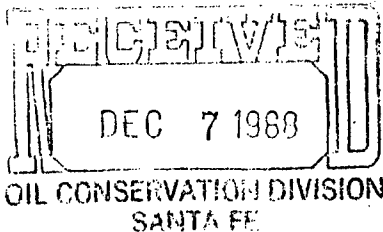
It included dizziness, nausea, burning eyes, shakiness, headaches, bloody noses, frequent urination, sore throats, vomiting, bloody stools, cold hands, abdominal pains, dry mouths and diarrhea.

"There was this (gas) threat hanging over their heads," Rhodes told the court. "When you have no control you ultimately feel helpless — that you can't do anything."

"The more of that kind of stress, the more likely you are to have these symptoms," he said.

When Carpenter asked him if he could compare the alleged gas poisoning from Basin Disposal to some other poisoning incident, Rhodes compared it to Germany's slaughter of six million Jews and non-Aryan people during World War II.

## Daily record



A2—Thursday, December 1, 1988 Farmington (N.M.) Daily Times

# Witness: State approved plans for pit

By Roger Burr  
Daily Times staff

Designs for an oil field waste disposal pit — that allegedly is producing potentially dangerous gas — were approved by the state, a petroleum engineer testified Wednesday.

Engineer Red Walsh of Farmington said he was involved with Basin Disposal Inc. since the inception of the disposal pit idea in 1984 — through attempts to prevent production of the gas.

Efforts to control inadvertent fumes have continued into this year, also under the purview of the state Oil Conservation Division, Walsh added.

Basin Disposal is being sued by 63 nearby residents who claim they've been sickened, and their property devalued, by the facility located off New Mexico 544 north of Bloomfield.

Former state Supreme Court Justice Samuel

Z. Montoya is presiding over the non-jury trial that opened Monday and is scheduled to last as long as a month.

Walsh was subpoenaed by both sides as an expert witness in the case.

Under questioning by plaintiffs' attorney Joe Goldberg of Albuquerque, Walsh said the pit was built to dispose of liquid oil and gas field waste — to replace dumps that had just been closed in the Lee Acres and Kirtland areas because of problems there.

In examining the Basin Disposal site, Walsh said he didn't think about area residents of the unzoned area, nor did he worry about hydrogen sulfide because he didn't expect the pit to produce the gas.

In earlier testimony, Teresa McDaniel told of her family moving last fall from her trailer near Basin Disposal.

She said she and her two daughters period-

ically had suffered the effects of hydrogen sulfide over 18 months. She cited those effects as burning eyes, raw throats and bloody noses.

Under cross examination by defense attorney Deborah Mande of Albuquerque, McDaniel said she never sought medical treatment for the ailments, explaining "I couldn't afford to at the time."

She noted her daughter was incorrect if the child said in a deposition that the illnesses weren't serious enough to seek medical attention.

Also under Mande's questioning, McDaniel said she never thought of asking about zoning or other land use restrictions when buying her mobile home site in 1981.

"I just liked the area," she said, adding she and husband Gary McDaniel have since moved the family to the Hammond Ditch Road area south of Bloomfield.

## Doctor tells of poisoning evidence 12/4/88

By Roger Burr  
Daily Times staff

An industrial medical specialist testified today to finding evidence of hydrogen sulfide poisoning among 63 neighbors of Basin Disposal Inc.

Dr. Don Fisher said he examined more than a dozen plaintiffs, and found them to have suffered headaches and nausea.

Many had dried muscus in their noses, Fisher added under questioning by plaintiffs' attorney Joe Goldberg of Albuquerque.

Fisher was qualified as an expert witness on chemical poisoning by presiding Judge Samuel Z. Montoya — a former state Supreme Court judge

Related stories Page A2

Montoya was called out of retirement when San Juan County's three district court judges disqualified themselves from the Basin trial.

State Rep. Jerry Sandel, D-San Juan, is among the owners of the Basin Disposal facility — a series of mud and liquid waste pits near Bloomfield, where oil and gas field wastes are accepted.

The trial, now in its fifth day, is expected to last as long as a month.

Fisher said some of the people he examined in November still live near the dump — while others have moved away.

He said those that have moved have recovered somewhat from

symptoms that they said were most serious in summer 1987.

In addition to headaches, bloody noses and generalized irritability, an elderly man he examined experienced an aggravation of pre-existing emphysema, Fisher testified. The emphysema remains worse to this day, he said.

Another person's pre-existing neurological damage — the result of a head injury — was aggravated by exposure to the potentially harmful gas, the doctor said.

Hydrogen sulfide also worsened asthma in members of a family with a history of the medical condition, Fisher added.

And he listed what he said were hydrogen sulfide-caused ailments of

persons he didn't personally examine.

Some the ailments were noted in diaries and on calendars — often not by the ill person but by a family member, the doctor said.

Judge Montoya admitted such testimony as evidence only after Fisher assured the court that diaries commonly are used in investigating illnesses among large numbers of persons suffering similar symptoms.

Attorney Goldberg also told the court the diary and calendar notations will be corroborated by plaintiffs' testimony.

He intends to call as witnesses most of the adult plaintiffs and the older children, Goldberg added.

## Nageezi Chapter to have election

**WINDOW ROCK, Ariz.** — A special election is scheduled Tuesday to replace Nageezi Chapter's representative on the Dziłth-Na-O-Díth-Híle School Board.

The tribe's Board of Election Supervisors removed Archie Werito from the school board in mid-October because he had failed to attend more than three consecutive meetings, Election Administration Deputy Director Edison Wauneka said.

Werito was removed from his post after chapter members approved a resolution 55-0 in February to ask the election board to do so, Wauneka said.

Eugene Guerito and Ida Mae Begay are running against each other to replace Werito.

Polls at the chapter house will be open from 8 a.m. to 7 p.m. Tuesday but absentee ballots must be turned in Monday.

# Attorneys question engineer about pit's design

By Bill Papich  
Daily Times staff

The engineer who designed an oil field dump near Bloomfield was questioned in district court Thursday about how he researched the design. The questions came from attorneys representing people who say the facility made them sick.

Basin Disposal Inc., whose site was designed by petroleum engineer Red Walsh, is being sued for unspecified damages by 63 people who lived near the dump about three miles north of Bloomfield on New Mexico 544.

The plaintiffs claim the oil field waste-water dump began emitting hydrogen sulfide fumes in spring 1987, and that emissions were detected as recently as three weeks ago.

Although Walsh said the dump's waste-water evaporation pond was designed and built with approval from the state Oil Conservation Division, an attorney for the plaintiffs questioned whether it's the proper design.

And he questioned if the facility used correct methods to process so-called produced

water associated with oil field drilling, regardless of OCD approval of the methods.

The San Juan District Court trial began Monday and is being heard without a jury by former Supreme Court Justice Samuel Montoya.

Attorney Joe Goldberg, representing the plaintiffs, asked Walsh how raw waste from oil and gas wells was processed at Basin Disposal. Walsh said it first was put into "skimmer tanks," which separate out dirt and rocks.

When trucks dump their loads at Basin Disposal, the skimmer tanks separate the foreign material from the "clean produced water," which then is deposited in the waste-water holding pond, Walsh explained.

But not until the concoction settles in the skimmer tanks for 1½ to two hours, he added.

Goldberg also asked Walsh: "If there was testimony that the minimum time should be no less than 24 hours to allow solids to go to the bottom, would you disagree?"

Walsh said: "I can't answer that question

because it depends on the condition of the fluids."

When Montoya asked Goldberg what testimony he was referring to, Goldberg said the testimony will occur later in the trial.

Attorneys familiar with the case say the trial could last weeks.

Again questioning whether Basin Disposal was designed properly, Goldberg asked Walsh if he previously had designed a commercial oil field dump.

Walsh said he's been involved in designing wastewater evaporation ponds for exclusive use by companies, but never a commercial facility.

Goldberg then asked Walsh how he calculated evaporation rates for Basin's pond. When the produced water leaves the skimmer tanks, it goes into the pond and evaporates at specific rates, Walsh had said earlier.

Walsh said the pond was 12 to 13 feet deep, 136 feet wide and 317 feet long. He said he estimated about five feet of the pond's water will evaporate annually.

Goldberg then asked what happens to the rest of the pond's water — the other seven feet. Would evaporation have to be induced mechanically or the water disposed of in another way, he asked.

Yes, Walsh said.

According to the OCD, the pond is equipped with a sprinkler system designed to quicken evaporation by spraying mist over the pond. The OCD ordered the sprinklers turned off in the summer of 1987, after nearby residents complained about hydrogen sulfide gas.

Earlier, Goldberg had said the pond's depth of 12 feet was too deep, creating an "anaerobic environment" that can produce hydrogen sulfide gas.

The OCD, however, never objected to plans to build the pond that deep, Walsh said.

Goldberg asked Walsh why he didn't consider building two ponds — each half the size and half its depth.

"I hesitate to answer because I haven't worked it out on my topography map," Walsh said.

## CORRECTION

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# Judge questions medical evidence at Basin trial

By Bill Papich  
Daily Times staff

The judge hearing the case of an oil field dump accused of making people sick from hydrogen sulfide gas questioned medical evidence presented at the trial Thursday.

An attorney for the plaintiffs was asked by former Supreme Court Justice Z. Samuel Montoya how

transcripts describing people's sickness were obtained.

The San Juan District Court non-jury trial against Basin Disposal Inc. began in Farmington Monday. The lawsuit claims hydrogen sulfide from the dump has made area residents sick since the spring of 1987.

The suit was filed by 63 people who lived, or still live, near the 22-acre dump on New Mexico 544 about three miles north of Bloomfield.

Basin accepts "produced water" waste from oil and gas well drilling.

The attorney for the plaintiffs, Joe Goldberg of Albuquerque, presented Dr. Don Fisher and ques-

tioned him about his knowledge of hydrogen sulfide gas.

Fisher said he's medical director for Public Service Company of New Mexico. He reported he'd examined people living near the dump and determined they suffered ill health from the gas.

But the validity of Fisher's testimony was questioned by Basin Disposal attorneys.

Representing Basin Disposal, Albuquerque attorney Deborah Mande raised doubt whether Fisher is an absolute authority on hydrogen sulfide gas and its affects on people.

Mande questioned Fisher about people exposed to hydrogen sulfide gas whom he examined in the past — prior to his examination of those living near the dump.

Mande asked: "You've only seen three patients (before) exposed to hydrogen sulfide?"

"Yes," Fisher replied. Mande then asked: "And you didn't know the gas levels?"

Fisher said, "Yes" (meaning no). Fisher earlier told the court he had examined 20 of the plaintiffs this past October and November, and he noted 12 of them still live near the dump.

Of the 12, Fisher said he noticed physical signs of exposure to hydrogen sulfide gas among nine of them.

"The most prominent affect was mucus in the nose — a dry crust," he said. "People no longer living at the site did not have this problem."

Goldberg continued his questioning, asking Fisher why he's sure people living near the dump were sick from hydrogen sulfide.

Fisher said he had reviewed diaries kept by people living near the dump, and their personal records of alleged sickness from the

gas. But as he continued testifying, Montoya interrupted, questioning the credibility of the diaries.

Fisher admitted he didn't obtain the diaries from the people themselves, but "from Goldberg's office."

When Montoya asked about the origins of the diaries, Goldberg said some were from children — indicating they were written by parents of the children.

"What are their ages?" the judge asked Fisher.

"I don't know," Fisher answered. Montoya then told Goldberg,

"When you don't have information directly from the individual involved, I want to know the source of the information." Goldberg agreed and requested a brief court adjournment to confer privately with Fisher. When court resumed, Montoya decided to adjourn until today.

*Sundays offer time to really settle down with the newspaper —*  
**Sunday's Daily Times**  
has news, features and a special magazine section, plus great comics.  
*Take time for the Times Sundays.*



# Basin defense questions doctor on residents' illness

By Roger Burr  
Daily Times staff

A Basin Disposal Inc. defense attorney had her chance to question a medical doctor Friday, and tried to show the doctor erred in diagnosing plaintiffs' illnesses allegedly caused by a potentially dangerous gas.

Albuquerque Attorney Deborah Mande, co-counsel for the defendant, got Dr. Don Fisher to admit residents of the unincorporated area near Bloomfield also suffered symptoms not commonly associated with hydrogen sulfide poisoning.

Fisher had testified for the plaintiffs that many of the 63 complainants reported headache, bloody noses and upper respiratory problems — medically accepted results of exposure to the gas.

Under cross examination by Mande, however, Fisher agreed some plaintiffs reported "usual sweating," irritability, and depression. One woman also blamed Basin Disposal Inc. for weight gain, he said.

Fisher said such symptoms aren't

directly the result of hydrogen sulfide.

But he emphasized the word "direct," adding concerns about Basin and the gas could have caused multiple physical and emotional illnesses.

Fisher explained one woman was so worried about Basin's nearby oil and gas field waste pit she was afraid "she'd fall asleep and not awaken."

The industrial medicine specialist was on the witness stand all day Friday — the fifth day of the Basin trial in district court in Farmington.

The trial is moving to district court in Aztec on Monday.

Unspecified damages are sought from Basin and its owners — state Rep. Jerry Sandel, his wife Sally Sandel, David Turner, and Turner's father D.C. Turner.

Sandel said outside the courtroom that more than \$700,000 has been invested in Basin Disposal Inc., including construction and trying to prevent emissions of hydrogen sulfide.

Called as a plaintiffs' witness, Fisher said he interviewed about 20 of the persons who are suing Basin for sickening them, and devaluing their property.

Those interviewed were chosen by defense attorneys — when he asked to talk to plaintiffs with pre-existing conditions that might be aggravated by toxic gases, Fisher said.

Fisher admitted to Mande that a number of the plaintiffs already had asthma, emphysema and neurological problems before alleged

tions were leveled at Basin's 22-acre site.

Some reported headaches before there was reason to believe Basin inadvertently was producing hydrogen sulfide, Fisher agreed.

One man blamed gastro-intestinal problems on something he'd eaten — until attending a meeting of area families and being told the gas was making him feel poorly, Fisher said.

Had the residents come to him with their problems outside the context of the Basin lawsuit, he

wouldn't have immediately diagnosed hydrogen sulfide poisoning, Fisher admitted during Mande's cross examination.

He only knew of alleged exposure to the gas because the people he examined told him about it, he said.

But Fisher stuck with his claim that many of the plaintiffs were suffering exposure to the gas.

While some headaches might have more mundane causes, clusters of headaches point to hydrogen sulfide as the culprit, he maintained.

## Engineer says oil field waste dump built according to state regulations

By Bill Papich  
Daily Times staff

The petroleum engineer who designed an oil field dump near Bloomfield said today the dump's waste water evaporation pond was built according to guidelines required by the state Oil Conservation Division.

And at no time during or before the pond's construction did the OCD indicate a concern the pond might produce hydrogen sulfide gas, the engineer said.

Red Walsh testified in San Juan District Court during a trial to determine if Basin Disposal Inc. is liable for hydrogen sulfide fumes which allegedly sickened people living near the dump. The non-jury trial began Monday.

Basin Disposal is being sued by 63 residents who have lived, or still are living, in the area of the dump, about three miles north of Bloomfield on New Mexico 544. The residents are seeking unspecified damages.

Basin consists of several drilling "mud pits" and a waste water evaporation pond.

Under questioning by Basin's attorney John Wells, Walsh said he's been a petroleum engineer since 1953 and has been involved in designing numerous disposal pits. But never has one

(Earlier Story, Page A2)

produced hydrogen sulfide gas, except for Basin Disposal, Walsh said.

Plaintiffs allege hydrogen sulfide fumes started coming from Basin's evaporation pond in spring of 1987 and fumes were detected as recently as three weeks ago. The dump was built in 1985.

Walsh indicated that owners of Basin Disposal — Rep. Jerry Sandel and his wife Sally, and trucking company owners D.C. Turner and his son David — never sought to circumvent OCD regulations in building the pond.

Selection of the dump site and every stage of its construction was approved by the OCD, he noted.

Walsh said he was contracted by Basin in July 1985 to design a dump for waste water associated with oil and gas well drilling. Plans called for it to be easily accessible and centrally located to 1,600 area rigs, he explained.

As required by the OCD, Basin also contracted a geologist to examine the 22-acre site north of Bloomfield — to survey underground water formations, Walsh said. And an OCD official per-

sonally walked the entire site with him and Sandel, approving the site for construction of the dump, he added.

Wells stressed what Walsh was saying, telling Judge Samuel Montoya that, "they (Basin) relied on the OCD totally" in site approval and constructing the dump.

Montoya, a former state Supreme Court Justice, is hearing the non-jury trial because San Juan County's three district court judges excused themselves from the trial.

The evaporation pond was even over-built, Walsh said, to ensure it could accommodate unticipated amounts of wastewater. The pond is 12 to 13 feet deep, he noted.

"I was trying to allow for what might come to be the unknown," he told the court.

Attorney Joe Goldberg, representing the plaintiffs, indicated earlier that the evaporation pond is too deep, and its depth can cause an "anaerobic environment" — producing hydrogen sulfide gas.

But Walsh said the OCD didn't object to the evaporation pond's depth.

Walsh added that dirt banks around the pond were designed to OCD requirements to control wind blowing over the pond.

# State official describes amount of gas from dump as 'intolerable'

By Roger Burr  
Daily Times staff

A state official described as intolerable the levels of potentially dangerous gas emanating from an oil field dump near Bloomfield, operated by Basin Disposal Inc.

Frank Chavez, district superintendent of the Oil Conservation Commission office in Farmington, testified in court today he was concerned for the health of people living near the pit.

Chavez was being questioned by Joe Goldberg, one of three Albuquerque attorneys representing 63 Bloomfield area residents who say hydrogen sulfide from the site endangered their health and devalued their property.

They are seeking unspecified damages. The trial — expected to last about a month — is before Samuel Z. Montoya, a

## Earlier story Page 2

former state Supreme Court judge, because all three San Juan District Court judges have excused themselves.

State Rep. Jerry Sandel, D-San Juan, is one of three Basin Disposal owners.

Chavez admitted today he was surprised when able to verify residents' complaints of hydrogen sulfide — because such a gas shouldn't be a byproduct of Basin Disposal.

But he mentioned in passing he'd received a report Basin was treating oil without a permit.

Describing odors from the site as similar to rotting potatoes, Chavez said the needle went off the scale on a gas detection device capable of detecting 50 parts per million of hydrogen sulfide.

He detected 1.7 parts per million of the

gas at an area home in the summer of 1987, and personally suffered a headache, nausea and difficulty breathing — classic symptoms of hydrogen sulfide poisoning, Chavez told the court.

Attorney Goldberg noted in opening arguments Monday that it is unsafe to breathe 20 parts per million of hydrogen sulfide in an eight hour period.

Chavez added the gas definitely was coming from the pit, and noted that area wells and the Conoco gas plant about two miles away were eliminated as sources.

Chavez said he was surprised again this spring, when he found the gas still coming from the pit.

He had thought Basin Disposal's mitigation efforts would have eliminated the problem, Chavez explained.

But the gas levels "were out of control," he added.

# Dump's attorneys question it caused illnesses

By Bill Papich  
Daily Times staff

Attorneys representing owners of an oil field dump near Bloomfield are questioning whether it caused sickness among people living near the dump.

The questioning began Monday during the first day of a trial to determine if Basin Disposal Inc. is liable for the reported sickness of plaintiffs — allegedly caused by hydrogen sulfide fumes.

An attorney for 63 people who brought suit against Basin used the words "foul, offensive, and sickening" to describe fumes that come from the disposal pit — beginning in May 1987.

Although attorneys for Basin admit hydrogen sulfide fumes have been a problem at the site — three miles north of Bloomfield on New Mexico 544, they question the ill health affects plaintiffs attribute to them.

The non-jury trial in San Juan District Court in Farmington is being heard by former state Supreme Court Justice Samuel Z. Montoya — because San Juan County's

three district judges excused themselves from the trial.

Joe Goldberg, the plaintiffs attorney, said, "It (hydrogen sulfide) caused them substantial irritation in the eyes, running noses, nausea and respiratory problems in the upper tract."

The fumes continue to plague the area, and were detected as recently as three weeks ago, he added.

Hydrogen sulfide fumes from the dump once were measured at 200 parts per million, Goldberg said. The U.S. Occupational Safety and Health Administration considers it unhealthy to breathe more than 20 parts per million in eight hours, he added.

Goldberg didn't say who measured 200 parts per million or when that amount was recorded.

Attorneys representing Basin, whose owners include Rep. Jerry Sandel, D-San Juan, and trucking company owners David Turner and his father, D.C. Turner, doubted Goldberg's allegations.

Speaking on behalf of Basin, attorney John Wells said the state Oil Conservation Division

never detected hydrogen sulfide fumes of more than .17 parts per million at the site.

That's not enough to endanger people living near the dump, Wells said.

And when the people went to their doctors for treatment of ailments allegedly caused by the fumes, the doctors never determined without doubt that hydrogen sulfide was the cause, he noted.

Goldberg said what once was "a beautiful place to live" has been abandoned by many people who previously had mobile homes on land near where Basin Disposal was built. The 22-acre waste disposal site opened in 1985.

But Wells said many of the 63 plaintiffs moved to the area after Basin was constructed. And he indicated the fumes could have emanated from another source.

Of the 223 complaints concerning hydrogen sulfide gas reported to the OCD, only 22 were recorded when wind was blowing from the dump toward peoples' homes south of the facility, he said.

Plaintiff Terry Crawford testified he moved his mobile home on land just south of

Basin Disposal after the dump was built "because we had a lot of time and money invested in the land."

Then in early spring 1987 he detected odors and noticed a white film on his car — "more like salt," he said.

Later in June 1987, Crawford said the "rotten egg smell" became extreme.

"You just didn't want to breathe," he told the court.

As recently as three weeks ago he's measured hydrogen sulfide levels of .3 and .4 parts per million in the area, Crawford said. He measures gas levels with a hand-held device, he noted.

Deborah Mande, another attorney representing Basin, asked Crawford if he's ever suspected the hydrogen sulfide could originate from the Conoco gas plant about two miles from his home.

Crawford said he hadn't, adding he's never taken measurements near the plant.

When Mande asked Crawford how he knows the gas is blowing from the direction of Basin Disposal, he said: "I stand out in the back yard to see which way it's coming."

# Oil pit trial begins

By Bill Papich  
Daily Times staff

A trial began today to determine if people living near a county oil field dump should be compensated for sickness allegedly caused by fumes from the dump.

And lawyers for the 63 plaintiffs also are asking compensation for alleged loss of property values in the suit before San Juan District Court in Farmington.

Attorneys for both sides have said they expect the trial to last for weeks.

The defendant is Basin Disposal Inc., located about three miles north of Bloomfield on New Mexico 544.

The residents say their sickness was caused by hydrogen sulfide fumes.

"Compensation (we're asking) will be very large because we have a very large number of plaintiffs here," Joe Goldberg, an Albuquerque attorney, told Judge Samuel Z. Montoya.

Montoya, a former state Supreme Court Justice, was appointed by the Supreme Court to preside over the non-jury trial because San Juan County's three district court judges excused themselves.

One of the Basin Disposal owners — Rep. Jerry Sandel, D-San Juan — sat with two attorneys representing Basin as Goldberg presented his opening arguments.

Basin's attorneys are Albuquerque attorneys John Wells and Deborah Mande.

Other Basin Disposal owners include the owners of Chief Transport Co. — David Turner and his father, D.C. Turner.

Farmington attorney Chester Miller also is representing the plaintiffs.

Goldberg told the court that hydrogen sulfide fumes began coming from Basin Disposal in May 1987 — and the gas continues today. The 22-acre disposal site opened in 1985.

"The evidence will show . . . a disposal facility should not be placed for prevailing winds to go over the facility and down to the residential area," Golberg said.

But Wells argued that Basin Disposal was built under supervision and approval of the state Oil Conservation Division.

"Basin Disposal is subject to all OCD regulations," Wells said, adding that the owners also commissioned a geological survey of the area and their plans weren't resisted by the state Environmental Improvement Division.

"These people all looked at it and saw no problem with the site," Wells said.

He said the site was chosen because of its central location to energy extraction activities, highway accessibility, distance from residential areas, and lack of closeness to groundwater.

"There were no zoning controls. The area was basically unused land. There were two or three mobile homes about 700 feet south of the site," Wells said.

Earlier, Goldberg asked the judge if proceedings could continue in the same courtroom, rather than be moved each week as planned. Goldberg noted he must move "hundreds" of exhibits.

"I'm going to take whatever facilities they offer us," Judge Montoya responded.

# Trial scheduled on Monday for Basin Disposal

By Bill Papich  
Daily Times staff

A trial to determine if a county oil field waste dump caused injury to people living near it and devalued surrounding property begins Monday in Farmington.

The trial comes after about 70 people filed suit against Basin Disposal Inc. in June 1987 alleging that hydrogen sulfide fumes from the facility's evaporation pond made them sick.

A 22-acre wastewater disposal facility for oil and gas well drilling waste, Basin Disposal is located about three miles north of Bloomfield on New Mexico 544. Owners of the company include state Rep. Jerry Sandel, D-San Juan, and David Turner and his father D.C. Turner.

The Turners also own and operate Chief Transport Co. while Sandel owns Triple S Trucking. Both companies haul oilfield waste water.

The lawsuit also alleges that oil and gas drilling waste at the dump leaked into surrounding property, devaluing the property.

The trial starts Monday in district court in Farmington beginning at 9 a.m., according to San Juan District Court files.

All three San Juan District Court judges have excused themselves from the case, according to Farmington attorney Chester Miller.

Miller is one of two attorneys representing the 70 people who filed suit against Basin Disposal. The non-jury trial will be judged by former state Supreme Court Justice Samuel Z. Montoya, designated by the Supreme Court to preside over the trial, Miller said.

The other attorney representing the plaintiffs is Albuquerque attorney Joe Goldberg, according to district court files. Goldberg was Secretary of Human Services under former Gov. Toney Anaya's administration and also served in the state Health and Environment Department during Anaya's term.

Representing Basin Disposal will be Albuquerque attorneys John Wells and Deborah Mande of the Albuquerque law firm Wells and Mande, P.A., according to district court files.

The trial could last several weeks, Miller said. Peter Pierotti, a legal assistant to Wells and Mande, said he expects the trial to last about a month.

The lawsuit stems from events that began at Basin Disposal Inc. in late May of 1987 when residents living near the facility complained of foul odors coming from Basin's 280 foot by 130 foot waste evaporation pond. The state Oil Conservation Division determined the odors were small amounts of hydrogen sulfide gas.

Some nearby residents claimed they required emergency medical care for respiratory problems because of the fumes, although the OCD never said it considered the fumes dangerous. Sandel said employees at the dump didn't get sick from the fumes.

Nevertheless, Basin Disposal began treating the evaporation pond with chemicals about the beginning of July 1987 in an attempt to reduce hydrogen sulfide fumes. Then on July 7, 1987, the OCD ordered the facility closed to all dumping except dry drilling mud because of per-

sistent hydrogen sulfide fumes.

While the dump was closed the OCD ordered more chemical treatments while Basin Disposal offered to house people in area motels until the fumes decreased. Finally, on July 17, 1987, the OCD said Basin Disposal could open again because hydrogen sulfide fumes had diminished.

Nearby residents, however, continued to complain about fumes. The residents formed a group called PHEW — People's Health and Environmental Welfare — with the stated purpose of closing Basin Dis-

posal.

The group held weekly meetings and wrote letters to state and local representatives complaining about the facility, in addition to group complaints to the OCD and the state Environmental Improvement Division. But Basin Disposal was never closed again. The OCD said the facility complied with state regulations.

Then in mid-October 1987 Basin Disposal was granted permission by the OCD to drill a 3,900-foot deep injection well to dispose of wastes.

Dave Boyer

# B'field Residents Angry Over Dumps

F07 5/25/87

By Bill Papich  
Daily Times Staff  
BLOOMFIELD — In front of what was an unusually large crowd Monday night, the Bloomfield City Council heard complaints about waste disposal sites on the north and south side of town.

The council chamber was packed with people who live near the dumps, and who claim the dumps disrupt their lives and threaten their health.

The complaints inspired the council to look into the possibility of seeking a joint powers agreement with San Juan County that could lead to the city and county being able to zone areas up to one mile outside city limits.

Talmadge Hill, a man who lives near a sludge waste dump just south of Bloomfield, told the council that because of flies in the area "animals run insane and keel over dead." A woman in the audience, who lives near Basin Disposal Inc., an oil field waste dump on the north side of town that has been emitting hydrogen sulfide fumes said, "near Basin Disposal, all the flies are dead."

Council attorney David Brainerd was asked if there were any legal means by which the city could take action against either of the dumps. He told the council and the crowd that a state statute authorizes a city the size of Bloomfield to take a "nuisance action," with agreement from the county, against an "industrial nuisance" to the city within one mile of city limits. "This is the most direct route," he said.

However, the nuisance action, as it is presently authorized, would only apply to the sludge dump on the south side of town, owned by Jerry Finney, president of Environmental Services Inc. Finney's dump is within a mile of town. Basin Disposal Inc., the oil field dump is more than a mile from town. "We can't touch that one," said Mayor R.T. Toliver.

But Brainerd said there is a possibility that the one mile limit jurisdiction could be extended with a joint powers agreement with the county.

Earl Hickam, a member of the county planning and zoning commission who was at the meeting said, "At this point I can't tell you

anything," about the feasibility of a joint powers agreement. But he urged those concerned about the dumps to attend a planning and zoning commission meeting tonight at 6 p.m. in the county Administrative Building.

Mayor Toliver said the sludge dump problem should be resolved by October 30. "I talked with the Environmental Protection Agency today. He (Finney) has until Oct. 30 to put the sludge in a concrete building or he'll have to stop (accepting sludge). The EPA and the city feels he needs a new location."

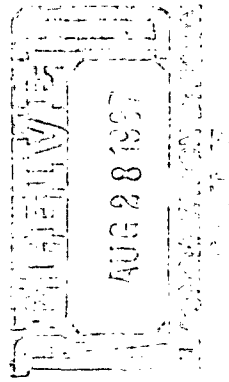
The Mayor said the council is doing everything it possibly can to resolve the problems of waste dumps near the city. In referring to the owners of the dumps he told the crowd that the law places limitations on how the city can regulate them. "We can't just go out and poke him in the nose and say you can't do that."

The council was also concerned with another problem the city has been facing over the years — fireworks. Fire Chief George Duncan addressed council members and urged them to repeal a city or-

dinance that authorizes the sale of fireworks in Bloomfield between June 25 and July 5. He said the law should be changed because it is costing his department too much money to respond to brush fires caused by fireworks. The council agreed with Duncan and requested from attorney Brainerd that he draw up a new ordinance which would outlaw the sale and possession of fireworks within city limits.

The council also adopted an ordinance that will allow municipal court to sentence people to community service. "It seems to be a feasible alternative to probation and jail," said Brainerd. All state communities have the option of sentencing people to community service for certain crimes under legislation passed during the 1987 legislative session, he said.

In a final note, the council announced there will be an auction of used city equipment to be held Sept. 26 at 10 a.m. in the Municipal Operations Center. The sealed bid auction will include a few used cars, transmissions and a cash register.



*Dave Boyer*

mer?  
Roger Poole  
Flora Vista

8-20-87

To the Editor:

How do we teach our children and grandchildren to abide by our state and government laws when a state agency and a business — located within a quarter-mile of my home — do not abide by the laws set forth?

From my point of view and several other families living in North Heights the agencies have their laws, businesses have their laws and then the people are the ones to suffer. For instance, if a trucker was stopped by the Division of Transportation and red tagged, the driver, or the owner, either one could not move that truck until repairs were made.

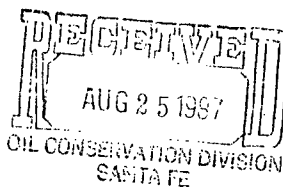
But this is not the way it works for Basin Disposal. When the hydrogen sulfide got so bad that the families in North Heights were sick, then and only then did the Oil Conservation Division shut them down for approximately one week while the holding ponds were being treated.

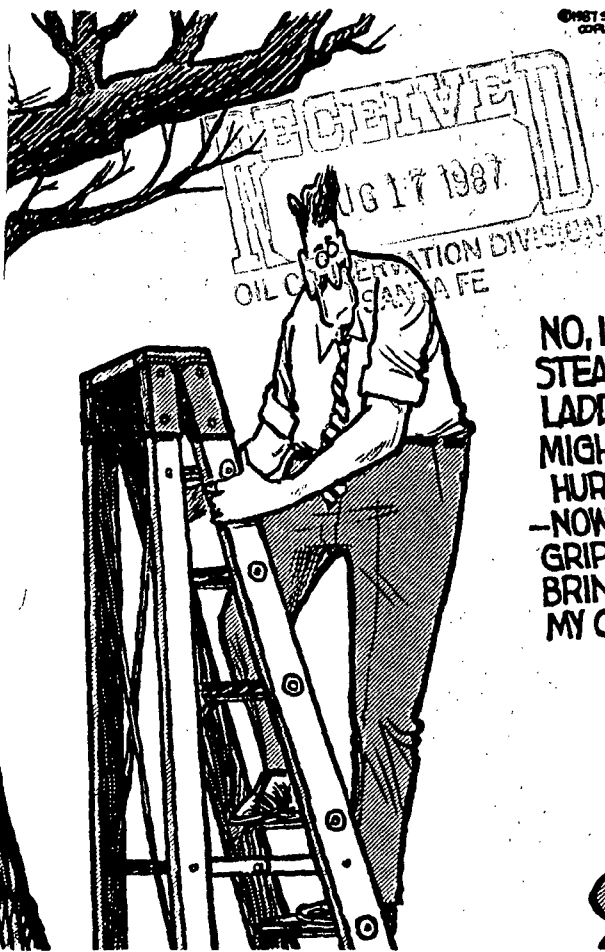
Now they are open for business 24 hours a day. For those that do not know, hydrogen sulfide is organic, and grows rapidly. We are still getting sick and it still smells very bad, and in the early morning hours it's worse.

The state allows 0.01 parts per million in the air that surround us, but the levels of hydrogen sulfide have been as high as 13.0 ppm on our properties. I have literature I received in the mail and it showed that the levels were at times as high as 200.0 ppm at Basin Disposal's fence.

Now we all know that you can't contain hydrogen sulfide in the air when the wind blows through the valley all the time, and most of the time it blows straight toward the families that live in North Heights. Is someone going to die from hydrogen sulfide before something is done? Any replies on this matter would be appreciated.

Pat Hargis  
Bloomfield





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## Reader's Forum

Letters should be no more than 300 words long. The writer must sign his name for publication, and give his address and a telephone number through which the letters can be verified, although neither street addresses nor telephone numbers will be published. The Times reserves the right to edit or reject contributions — and to limit frequent writers.

### To the Editor:

Hydrogen sulfide is defined as a colorless, flammable, very poisonous gas that has a disagreeable odor suggestive of rotten eggs. Hydrogen sulfide is an irritant of the eyes and respiratory tract at low concentrations. At high concentrations, people can experience headaches, nausea, dizziness, confusion and weakness, followed by unconsciousness and death.

This poisonous gas is coming from Basin disposal, about three miles north of Bloomfield. My family and I have experienced some of the symptoms described, and we are very concerned about our health and the health of everyone nearby, including the city of Bloomfield.

Recently my family and a few of our neighbors walked down an arroyo next to Basin Disposal. The bottom of the arroyo held black, smelly dirt and water that had leaked out of the waste dump. The fumes were so bad that my husband became nauseated and vomited as we returned home. That same arroyo runs into a larger arroyo, which runs into Bloomfield.

Another waste dump is set to open any day located a quarter mile west of Bloomfield. I'm wondering if the people in that area were kept in the dark about the future waste dump like we were about Basin Disposal.

I've also heard that a stockyard is being considered built close to Basin Disposal. The people who want to build it might want to reconsider since all those sheep in the southern part of the state were supposedly killed by hydrogen sulfide, alther their owner couldn't prove it.

Basin Disposal and other waste dumps should be everyone's concern. It's not just a pollution problem and a nuisance, it's a health hazard! I'm sure the owners of Basin Disposal wouldn't want their families living close to it.

Join us at our weekly meeting every Tuesday night at 7:30 at St. Mary's Recreation Hall in Bloomfield.

Mrs. Gail Beal  
Bloomfield

## Today in History

By The Associated Press  
Today is Monday, Aug. 10, the

# Modern Luminarias

Where can I buy electric luminarias? L.M., Farmington.

At least one source for electric luminarias, when in season, is the Santa Fe Store, 211 Old Santa Fe Trail, Santa Fe, N.M. 87501. The phone number is 982-2425. They come in two types, one using the traditional brown paper bag as a shade and a slightly more expensive version featuring a plastic-coated brown bag for better weather resistance.

Having seen my share of kung-fu and ninja films, I've often wondered just what, or who, the kung-fu'ers and the ninjas actually were, or are. Are these specific titles or just generic terms? Are there actually ninjas or kung-fu people still running (or leaping) around? B.L., Kirtland.

"Kung-fu" is a generic term meaning simply skill or ability. The term refers to no specific fighting style or martial art, according to *Martial Arts, Traditions, History and People* by John Corcoran and Emil Farkas.

Very generally speaking, there are three main types of kung-fu: for fighting, for show and for health. There are literally hundreds of styles, most formed around a more limited number of approaches to a specific subject, be it combat, health or whatever. For in-

## Let's Settle It



By Andy Porter

All questions sent in to "Let's Settle It" should contain the person's full name, address and phone number. Full names will be used unless otherwise requested; in that case, only initials will be listed. Send your questions to "Let's Settle It," P.O. Box 458, Farmington Daily Times, Farmington 87409. No phoned in questions, please.

stance, t'ai-chi-ch'uan (sometimes shortened to t'ai-chi) is a style of kung-fu intended for health.

Kung fu originated in ancient China, where it is still practiced under the official, and more precise, term of "wu-shu." Although kung-fu practitioners were undoubtedly among the thousands of Chinese immigrants who began arriving in the U.S. around 1848, few people outside the Chinese communities were allowed to study the art. This began changing in the 1960s when several teachers began opening schools to the general public. Since then kung-fu schools have gradually spread, aided by the popularity of movies and TV shows on the subject.

"Ninja" is derived from "Ninjutsu," a feudal Japanese discipline embracing numerous martial arts practices. It was developed sometime prior to the late 13th century by Japanese mountain mystics to provide se-



This Dog's Fighting  
Crime and Helping Kids  
page two

The Stewards Find  
Irony in Business  
page three

Catching the Bad Guy  
Just Part of His Job  
page six

Wrestlers Participate  
In National Cham-  
pionships  
page ten

# Independent Review

Aztec, N.M. 87410 • Volume 99/Issue 2 • Thursday, July 16, 1987

25¢

## Families Unhappy With Disposal Plant Problem

By Dorothy Nobis  
Managing Editor

Children don't swing from the swings of the jungle gym that stands in the back yard of the home of Tim and Terri Payne. The slide, once used by giggling children, is coated with desert sand, no longer a spot where the Payne children spend their summer vacation hours.

The Paynes, and other families who live close to the Basin Disposal Plant, located just north of Bloomfield, are being kept from their homes by problems at the waste disposal pond at the plant. It's not a problem one can readily see, but it most certainly is one that the families, and those traveling by the plant, can smell.

The odor, most commonly associated with the smell of rotten eggs, is caused by hydrogen sulfide. While the chemical is not yet considered dangerous, the smell caused by the chemical has caused physical ailments in many of the families in the subdivision that surrounds the disposal plant.

"It's (the smell), worst at dusk, when the temperature goes down," said Mrs. Payne. "But often during the middle of the night, the smell gets so bad that we're forced to leave our home and go to relatives to sleep."

Nausea, vomiting, runny noses and watering eyes are just some of the symptoms residents around the disposal plant have experienced in recent months.

"I collapsed the night of July 3," said Pat Hargis, who lives near the Paynes. "And Tim Payne and Kevin Saiz, who's mother lives nearby, also collapsed. We had the rescue units out and I'm convinced it's because of that smell."

It's not just humans that have been affected by the strong odor, either. "Most of my tropical fish have died," said Mrs. Payne, "and my dog's been vomiting and has absolutely no



### Stinky

Amanda Payne, five-year-old daughter of Terri and Tim Payne, expresses her displeasure at the odor emitted from the holding pond at Basin Disposal, just north of Bloomfield.

(Review Photos by Dorothy Nobis)

energy anymore. I'm sure it's the hydrogen sulfide."

Ms. Hargis' poodle was vomiting Wednesday morning, and 24 of the chickens she has had in the past year have died. "I don't know if the chickens died because of the smell, but I'm sure it didn't help them," she said. "And just this morning my neighbor found three of her chickens dead. It's got to have something to do with the smell."

While residents around the plant have been complaining to owners of Basin Disposal Plant since December, the odor — and the displeasure of the residents — remains. "We worked very hard to get this land out here," Mrs. Payne said. "We wanted to be out where the kids could play without worry, where the dogs could be off a leash and where we could enjoy some solitude and peace."

"Now, with the problems of the plant, the kids can't even go outside to play, the dog just lays

under the porch, and we don't enjoy our home," she added.

"I moved out here to get away from problems in town," Mrs. Hargis said. "I wanted to be out where I could raise chickens and go outside in my nightgown if I wanted to. Now, my chickens are dead and the last thing I want to do is go outside."

While owners of Basin Disposal Plant, and local officials of the Oil Conservation Division, are attempting to solve the problem of the odor, the families who live around the business are spending much of their time in motels, or the homes of families and friends. Accommodations at local motels is being provided by the owners of Basin, but Ms. Hargis thinks that's not enough.

"I'd like the owners of that plant to stay in my house for awhile," she said. "They say they understand our problem, but until they have to live there, and breathe that air, they'll

never fully appreciate just what we're all going through."

"They keep saying, 'It can't be that bad,' but they're wrong," Mrs. Hargis added. "It's worse than anything I've encountered in my life."

"The worst of it is," said Mrs. Payne, "is that we don't know what the long-term affects of hydrogen sulfide are. A hundred years ago, nobody knew that cigarette smoking was bad for your health. Twenty years ago, soldiers in Viet Nam didn't know that Agent Orange was bad for them. What will we find out hydrogen sulfide is doing to us?"

"We don't know what these chemicals are doing to us, because we're not chemists," Mrs. Payne added. "But we do know that we're all physically sick and emotionally exhausted from the problems caused by the plant."

"We're all on edge," Mrs. Hargis said of her family and neighbors. "We rant and rave

at each other, and we really don't mean it. But it's a problem we can't escape and one we can't seem to solve."

The residents have filed suit against the owners of Basin Disposal, but their chances of recovering any damages are slim, at least that's what Mack Mantle believes.

"I doubt that anything will come of it (the lawsuit)," said Mantle. "They (the owners) have money and what are poor people like us going to do against people like them?"

Mantle owns five acres of land near the plant. He is presently erecting a building on part of that land, and had hopes of leasing the building. "Now, because of the smell and the problems with the plant, I'll never get anybody to lease this building," Mantle said. "I have land here that I bought for an investment, but I couldn't give this land away now."

— Continued on page 12 —

continued from page 1

"I've got a son who would like to move out here, but he has a baby on the way," Mantle added. "There's no way I'd let them move out here with that hydrogen sulfide. There's no telling what side effects it could have and I don't want my grandchild hurt by it."

The water-holding pond at the plant received a sodium bleach treatment several weeks ago, the first of such chemical treatments the owners hope will alleviate the gas problem. "The residents should get some relief from the smell soon," said Frank Chavez of the local Oil Conservation Division in a telephone interview Tuesday. But, when contacted Wednesday morning, Mrs. Kargis said her son had gone to their home Tuesday evening and complained of nausea and feeling ill. "He said the smell was just awful," she said Wednesday morning.

So, while the smell continues to permeate the air, and the families who live in the vicinity of the plant continue to be ill, there will be no children swinging on the swings or sliding down the slide.

"If they'd just close the plant down until they get the problem solved," said Mrs. Hargis, "I'd feel better. They shouldn't have built it so close to a residential area anyway, regardless of the lack of zoning in the area."

"After all," Ms. Hargis added, "we were here first. We bought land here so we could raise our families and live comfortably. And now, because of the Basin Disposal Plant, we're being kept away from our homes. We're not allowed to live and enjoy the very life that we all worked very hard to have. The clean air we moved out here to have, is here no more."

# Site of Disposal Ordered

owners have come to court, putting people in the city jail and other day Inn and other except Thursday six nights, people option to spend the night," said Chester, who represents the living near the suit against Baisn 25, alleging it has health problems and value. "I would keep this up (provided) as long as there is safety."

not sure how much to neutralize the

hydrogen sulfide gas in the holding pond. The increased chemical treatments of the waste water ordered by the agency will not take place until a large shipment of sodium bleach arrives at the facility, said Chavez. The treatment chemical is not readily available in the Four Corners Area in such large quantities, he said.

Sandel said today that the treatment chemical has been ordered from a company in Salt Lake City and should be arriving soon. "We are just waiting to hear from the manufacturer in Salt Lake City. They (the chemicals) should be here in a few days."

"I think we were assured yesterday

## on Trial Opens

you, memories that and embarrassing,"

is were expression-ecutor spoke.

weren't involved in s," defense attorney reporters outside

court. He compared the prosecutor's speech to "yesterday's mashed potatoes — there was nothing new."

Raymond Buckley is on trial for 79 counts of molestation, while his mother faces 20 counts. Both also are charged in a single conspiracy count.

## il Lifts Moratorium

s Staff Writer

ld City Council Mon- moratorium imposed hook-ups to the city aits, but passed new-erning future hook-

y 18, anyone outside ating to tap into the stem must agree to majority of their water pay the city \$720 for service connection de-

between the city and San Juan County establishing fees to be paid to the county for housing people arrested in Bloomfield. The council voted to guarantee a payment of \$20 per day for each prisoner the city sends to the jail. In addition, the council voted to guarantee a \$15 booking charge for each prisoner. Bloomfield will also pay some medical expenses for prisoners.

The council also gave its approval for a zoning change that will permit


day that this will solve the problem. The chemist says it (the treatment chemical) will clean things up within 24 hours. We're going by what the experts tell us."

An additional problem, seepage from some smaller unlined pits, may be alleviated by dumping the contents into the main holding pond, Chavez said.

The OCD has found that no ground water has been contaminated by the seepage except in an area 50 feet from a fence that surrounds the pits, Chavez said. He said he hopes all waste water in the unlined mud pits can be dumped into the main pond, which is lined, after the gas problem there is cleared up.

Chavez said the OCD is going out of its way to relieve problems at Basin Disposal without getting much help from other government agencies.

"We're not a health agency. It's out of our league and legislative mandate. The state epidemiology office does not want to become involved. They said they're busy with other things like the plague. They told us they didn't have enough background in low-level exposure to hydrogen sulfide gas."




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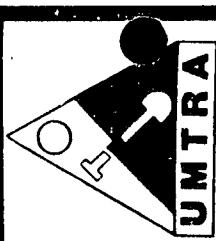
112 N. Behrend  
327-0438

Trina Culbert • Max Lawler





## NOTICE OF



## PUBLIC MEETING

The U.S. Department of Energy will hold a public meeting regarding the cleanup of the uranium mill tailings at Mexican Hat, Utah.

**Where: Halchita School Dormitory  
within the Utah Navajo  
Development Council Complex  
When: Tuesday, July 14, 1987**

a Hero

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m. John Poindexter,  
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thlessly are hoping for  
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ter replacing North on  
hot seat.

'Hero'

The



Cover

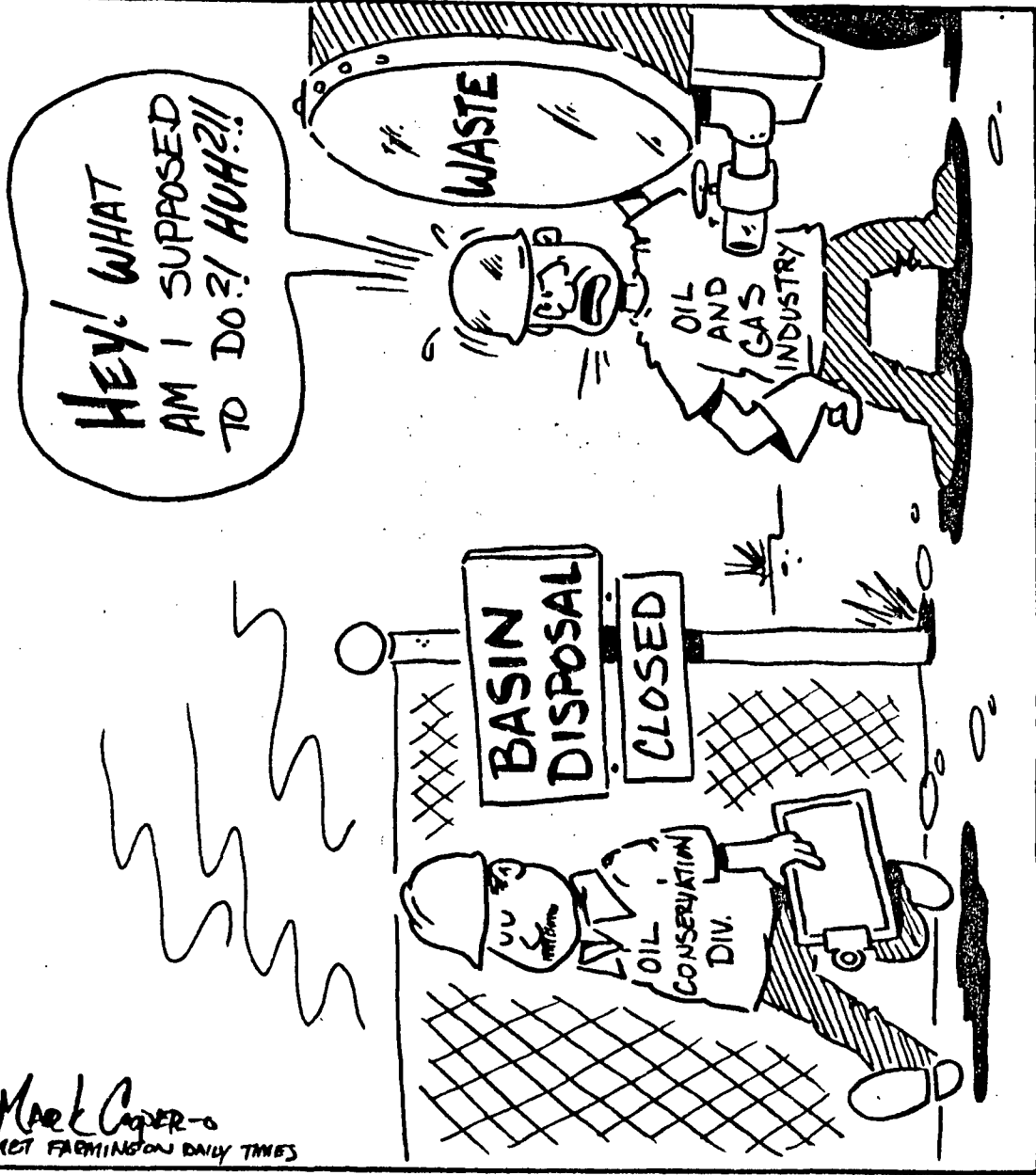
Early Times

Defense Spending

Today we have excerpts from

Mark Cooper

1987 FARMINGTON DAILY TIMES



Silence  
From  
Moscow

By Rowland Evans  
And Robert Novak

WASHINGTON — Foreboding silence from Moscow, following strong earlier hints that Foreign Minister Eduard Shevardnadze would arrive here this week, threatens plans for Ronald Reagan to meet Mikhail Gorbachev in a Washington treaty-signing summit this fall.

U.S. arms negotiators were informed in June that Shevardnadze's long-awaited trip to see Secretary of State George Shultz would probably take place July 13 and 14. But since then, Shevardnadze has said not a word about coming here. Reinforcing the silence, Soviet arms negotiators in Geneva have suddenly halted progress on the new intermediate-range missile treaty (INF), cutting the heart out of the administration's hopes for a major foreign policy triumph.

Administration officials admit not knowing Moscow's mind. But raising major concern among them is escalation of Kremlin demands for removal of 72 old Pershing I missiles as part of the INF package. That is a high-stakes poker game based on Soviet perception that the beleaguered president cannot

Dave Boyer

Independent Review

Thursday, August 6, 1987



RECEIVED  
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## Area Man Begins Recycling Service

By Cindy Johnson  
Daily Times Staff

**BLOOMFIELD** — Jerry Finney started with the belief that a no waste society can exist by creating markets for recycling through development of new manufacturing methods.

It took two years of research to bring some of those goals to fruition, but Finney's new business, Environmental Maintenance Services, is now spread over 4 acres of land south of Bloomfield.

And if the business expands according to Finney's calculations, the waste products dumped into area landfills could be reduced by 70 to 80 percent, which would reduce the headaches and costs to governmental agencies operating landfills.

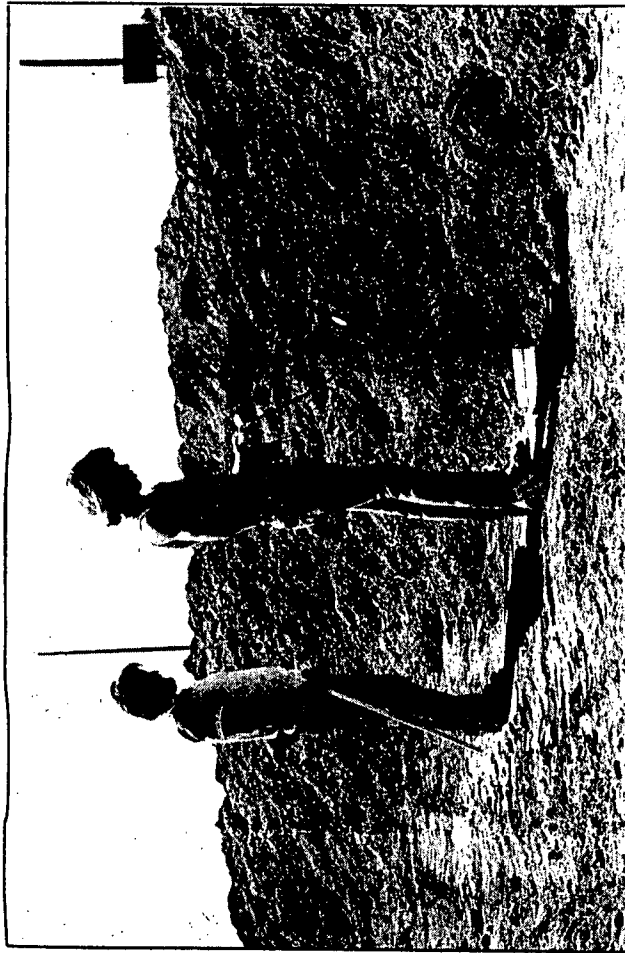
"We're trying to solve three distinct problems facing the county, the cities and the state," Finney said about the first phase of his business which is converting sewer sludge, manure and paper into a soil conditioner.

Although New Mexico does not have regulations governing composting, the Environmental Improvement Division has approved the measures the company has taken to protect groundwater and reviews chemical analysis reports.

While other companies are converting septic wastes, Finney says using all three products to make a soil conditioner is unique in the country.

The process takes five days if done indoors under controlled conditions or 21 days outdoors. Currently the operation is conducted outside Finney's home and produces a mild, inoffensive odor.

However, some area residents un-



(Staff Photo by Cindy Johnson)

### The Work Piles Up

Under the supervision of Jerry Finney, Dave Hall monitors the heat and moisture content of compost piles each day. Temperatures, controlled by water, must be sludge, paper and manure are killed.

Ultimately, money will be saved when using the product because nitrogen is held in the compost mixture meaning irrigation can be reduced and less fertilizer will have to be purchased, Finney said.

But plans stretch farther than the compost pile. Finney, a silent partner and a few investors are searching for a site centrally located in the San Juan County for a complete recycling center. He expects to have a permit to recycle anti-freeze and oil, and also will handle bottles, cans, tires and anything else that can be rejuvenated.

Soon after the business was given a permit by EID, a contract with San Juan County for removal of San Juan County's stable wastes was signed. The contract does include a bond, which can be used if for any reason the county is required to take over the service.

"It will be a relief once it's in the management phase instead of the pioneering phase," he said about ongoing research and plans.

## Business Highlights

### Active Rig Count

	July 27 1987	June 29 1987	July 28 1986
New Mexico	37	32	15
Texas	253	256	234
Colorado	26	23	13
Utah	8	5	7
Arizona	0	0	0
Wyoming	36	28	18
Total U.S.	917	813	716
Total Canada	179	147	69

(Source: Hughes Tool Co. and the International Association of Drilling Contractors)

**Uniforce-Employ-Mint**, of Farmington has begun its annual recruitment drive for retirees. The drive, which will last through Sept. 15, provides temporary jobs for retired persons. The jobs include secretarial-clerical, typing, telemarketing and reception, as well as mailroom and light industrial assignments, according to Michelle Walters, owner. Uniforce Temporary Services is a nationally franchised, publicly held temporary personnel service providing employment for general and automated office, light industrial, marketing, accounting and technical categories from a network of 60 offices coast to coast.

**Theodore Russell**, general agent in Aztec for the Franklin Life Insurance Co. of Springfield, Ill., has earned one of the company's top sales honors, according to Franklin President Howard C. Humphrey. Russell has been named an "Honorable Mention" qualifier for Franklin's Centurion Club, a national honor organization of the company's most successful sales associates. Russell's qualification was based upon outstanding personal sales totals for June.

**Val Anderson**, business manager for Bloomfield Municipal Schools, was named Outstanding Business Manager of the year by the New Mexico Association of School Business Officials at the New Mexico School Administrators Award Banquet in Albuquerque last Wednesday. Ms. Anderson has been employed by the Bloomfield Municipal Schools for 29 years and as business manager for 16 years. She is current president of the New Mexico Association of School Business Officials, serves on the New Mexico School Administrators Executive Board, is a member of the State Finance Transition Committee, is a Realtor in San Juan County and is an active member of the First Baptist Church in Bloomfield.



**Hershey Foods Corp.** has announced record consolidated net sales and earnings for the second quarter ended July 5. Net sales were \$497,745,000 compared with \$450,201,000 for the second quarter of 1986. Net income was \$27,021,000 or 30 cents per share, compared with \$24,577,000 or 26 cents per share for the same quarter last year. Net sales for the first six months of 1987 were \$1,067,994,000 compared with \$958,197,000 in the first half of 1986. Net income for the first six months of 1987 was \$59,915,000 or 66 cents per share, compared with \$51,588,000 or 55 cents per share in the first half of 1986.

**G.A. "Dusty" Rhoads**, vice president of X-Pert Well Service in Hobbs, was elected president of the Association of Oilwell Servicing Contractors during that group's national summer meeting.

# Additional Treatment Considered To Curb Waste Dump Gas Leak

THE ASSOCIATED PRESS

FARMINGTON — A gas and oil field waste dump might have to undergo a second treatment process to try to stem hydrogen sulfide leaks, officials said.

Representatives of the state Environmental Improvement Division and the Oil Conservation Division on Thursday toured Basin Disposal Inc. near Farmington.

Frank Chavez of the OCD said it might be possible to stop the gas fumes by adding a bactericide to the facility's wastewater holding pond.

The holding pond had previously been treated with a chemical bleach, a \$60,000 process that appears not to have worked.

But Chavez said the level of hydrogen sulfide fumes coming from the pond is lower now than before the treatment.

The EID sent four representatives from its Santa Fe offices.

"We had been asking the EID from the beginning to become involved," Chavez said. "Because a lot of it (problems at the dump) was out of our area of expertise and

legislative mandate."

EID officials said they will act only in an advisory role to the OCD.

"The primary responsibility still rests with the OCD," said Dr. Millicent Eidson, an EID environmental epidemiologist.

Eidson, who was among the state officials who visited Basin Disposal Thursday, said high levels of hydrogen sulfide were not observed.

Eidson said she distributed survey forms to people living in the area of the dump asking them to record any health problems they have had.

ALBUQUERQUE JOURNAL 8/1/87 3

Dave Boyer

# City / County

## Closure of Waste Dump Sought

By Bill Papich  
Daily Times Staff

BLOOMFIELD — A group of more than 30 people who live in the area surrounding Basin Disposal Inc. met near town Wednesday night to launch a campaign aimed at shutting down the gas and oil field waste disposal site.

The organization, which met in the recreation hall at the El Paso Gas Plant, calls itself PHEW — an acronym for People's Health and Environmental Welfare. The organization was formed, members say, because their health has been and still is being affected by hydrogen sulfide fumes that continue to come from the disposal site just north of Bloomfield on New Mexico 44. The Oil Conservation Division has said the fumes pose no threat to humans. The OCD ordered the facility closed July 6 when the fumes coming from the dump's waste water holding pond were recorded at their highest level. But the OCD allowed the dump to open again July 17 after its owners, state Rep. Jerry Sandel, D-San Juan, and his business associates, D.C. Turner, a Farmington businessman, and his son David Turner spent \$60,000 to treat the disposal site with chemicals that according to the OCD alleviated gas problems. However, motorists driving by the disposal site Wednesday night could smell fumes coming from the holding pond.

PHEW President Bill Williams, who owns a mobile home near Basin Disposal, opened the meeting by urging its members to write their state and U.S. senators urging them to look into problems at the dump. As two reporters took notes at the meeting, Williams said he believed the success of PHEW's campaign against Basin Disposal will depend on the media.

the newspapers and radio and T.V. stations." He told PHEW members that more work was needed to get more people involved in the campaign against Basin Disposal. He suggested the organization start a weekly newsletter, put up posters in communities and send out postcards urging people to join PHEW. He also said the organization needed a bank account so it can begin buying stamps and envelopes. A hat was passed among the crowd sitting at rows of banquet tables and cash was thrown in the hat.

PHEW's lawyer, Chester Miller, who filed a lawsuit against Basin Disposal June 25 on behalf of people living near the dump, said the state is being thrown in the hat.

### Teens Held in Burglaries

Two 13-year-old cousins were detained Wednesday in connection with a rash of residential burglaries committed in the Highland View district of Farmington.

Farmington Police Detective Sgt. Mike Heal said John DeHoff and Kevin DeHoff, both residents of Highland View Drive on the city's southeastern side, are accused of nine burglaries, with possibly more complaints to come as the investigation continues. The boys were picked up when

epidemiologist is preparing questionnaires for PHEW members that will ask them to record when they smell gases coming from the dump and what the gases do to them. Miller also urged the group to begin attending Bloomfield City Council meetings and go to county commissioner meetings.

"You aren't organizing because it (Basin Disposal Inc.) is inconvenient," he said. "You are organizing because it makes you sick; because you vomit in your own homes."

County Commissioner Mike Sullivan was at the meeting and addressed PHEW members. "I don't want you people to think I'm taking the side of Basin Disposal because

I'm not. But the commission has no authority over this." He was referring to the lack of zoning power through county government.

A woman in the audience suggested that PHEW begin holding regular weekly meetings on Tuesday instead of Wednesday, because some people concerned about the dump go to church Wednesday nights. "The smell from Basin Disposal has interrupted church services (near) here," she said. PHEW president Williams said meetings in the future would be held at 7 p.m. every Tuesday night at the El Paso Gas Plant recreation hall.

Meanwhile, the Environmental Improvement Division is now involved with investigating complaints against Basin Disposal. Representatives of the division's Air Quality Bureau will visit the dump today, according to David Duran, an environmental engineer with the bureau.

"We will make a determination if hazardous waste regulations apply," said Duran. "We will take ambient measurements of hydrogen sulfide to see what the levels are and to see if levels may be posing any problems to health. We will take a look at the entire situation to see if the EID has any jurisdiction."

Previous investigations of the dump had been handled by the OCD. Attempts to contact the OCD this morning were unsuccessful. Phone lines to the agency's Santa Fe office were busy and the OCD representative in Aztec was said to be in a conference.

Because of PHEW's expressed intent to involve the news media in its campaign, Sandel has indicated he no longer wants to comment on the issue.

### Daily Record

### Obituaries

COPPEDGE — Les Coppedge, 54, San Carlos, Ariz., formerly of Farmington, died Tuesday, July 28, at San Carlos. He was born Dec. 1,



## Teen Held in Auto Thefts

By Roger Burr  
Daily Times Staff

The fourth teen-ager implicated in 20 auto thefts was detained Wednesday when he showed up in District Court for a hearing, Farmington police said.

Detective Sgt. Mike Heal said that the boy, James Thrasher Jr., 15, 2903 Ladera, is accused in a juvenile petition of four counts of auto theft. He and Ike Worden, 14, 1708 E. 31st, are believed to have been involved in 20 auto thefts committed between late last year and July when police found a recently stolen pickup abandoned north of Farmington, staked it out and detained Worden and another boy when they showed up.

The boy detained with Worden, and a fourth youth, are said to have been much less involved in the thefts.

Thrasher was accompanied to court by his mother and a representative of attorney Leon

Taylor's Albuquerque law firm. San Juan District Court Benjamin S. Eastburn arrested Thrasher on the auto theft, sentenced him to 10 days county jail on an old misdemeanor complaint and a complaint failure to appear.

Heal said more auto thefts may be filed against Thrasher. But the number of counts necessarily affect the severity of the penalty given juvenile auto thefts, who unless tried as adults can't be sentenced to more than years at the reform school.

Thrasher's whereabouts have been unknown to police since, with defendants in custody and an warrant being prepared, he is out of sight as far as investigation was concerned.

Heal said the District Attorney called detectives to say that Thrasher was to be at the District Court in

## Assault Suspects Bound

By Times Staff Writer

Two Fruitland men accused of shooting at and threatening two others last month, in what authorities described as an ongoing dispute, were bound over for trial in San Juan District Court on charges of aggravated assault.

Nelson Yazzie, alias Nelson White, 34, waived his right to a preliminary hearing Wednesday before Division 2 Magistrate Ellen Holloway, and Richard Howard, 29, did the same before Division 3 Magistrate Terry Pearson. The charges

also carry firearm enhancement that could increase any possible cause guns were involved.

The charges were filed in connection with June 20 incident area of the Bisti Highway Farmington, in which Begay and Wilbert Ha listed by deputy sheriffs.

Assistant District Attorney Cade alleged that one of was shot at and a gun the other's head.

## Recent Humidity Blam' For Library's Heat

The Humidity Blame

For Library's Heat



# Gas Ruled Out in Deaths of Sheep

By Susan Landon

JOURNAL STATE NEWS WRITER

The deaths of nearly 200 sheep near Tatum remained a mystery Tuesday, after state officials determined that the animals' deaths earlier this month were not caused by hydrogen sulfide.

"We're still hard pressed to say what killed them," said Jerry Sexton, district supervisor of the state Oil Conservation Division in Hobbs.

Meanwhile, a report by a Lovington veterinarian said the animals may have died of thirst. The report said a concrete water tank may have been too high for the animals to reach.

But the owner of the animals disputed that diagnosis, the Associated Press reported. A veterinarian who examined the sheep for owner Jim Wagner of Roswell said the animals had suffered extensive

damage in the lung cavities and noses, Wagner said.

After the animals were found dead July 18 by an overseer, State Police reported that it appeared the animals had died from inhaling hydrogen sulfide from an oil tank in the area.

But Sexton said the tank, owned by American Trading and Production Corp. of Midland, Texas, was a quarter of a mile away from the sheep — too far for gas to reach them.

Wayne King, field superintendent for the Midland company, examined the tank area after the sheep died and found no gas seepage.

"Everyone would like to find out what killed the sheep," said King. "We never felt we were the cause of it."

On Tuesday, State Police Officer Tami Law of Hobbs said hydrogen sulfide has been ruled out as the cause of death. She also said the

water in the area has been examined, and no poisons were found in it.

"We're looking at the pasture they were grazing on," she said.

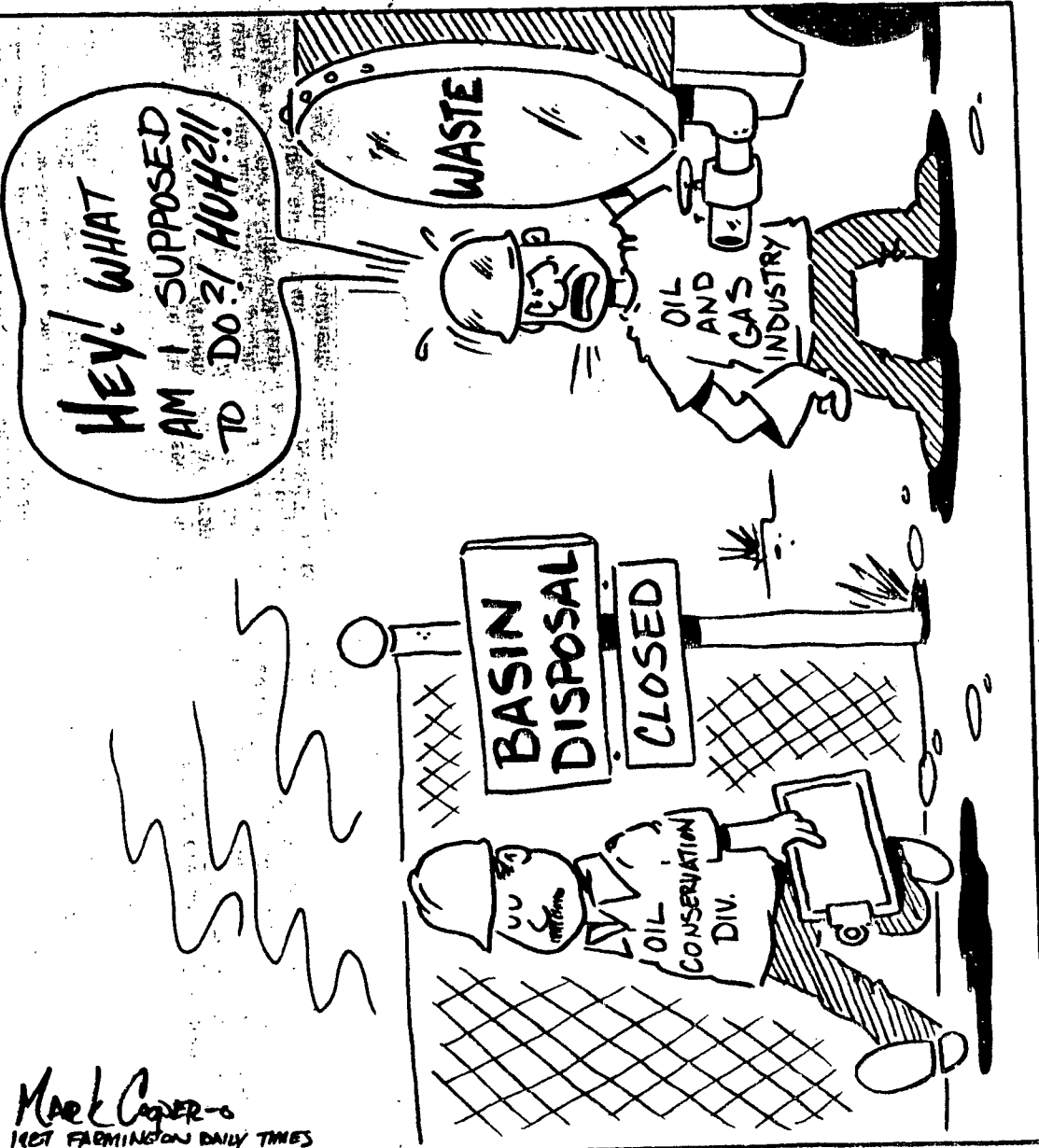
She has received the report of Lovington veterinarian Louie P. Clark, and was trying to reach the Roswell veterinarian who had examined the sheep for the owner.

On July 20, the Lovington veterinarian examined the carcasses. Clark's report said, "If something has to be looked at that would kill that many sheep so quickly with no mutilation signs, then water deprivation diagnosis fits these limitations."

Law said the sheep handlers told State Police that all the animals died at once. But she said police now believe the animals did not all die at the same time.

State Police were continuing their investigation Tuesday.

*ALBUQUERQUE JOURNAL • 7/29/87*



Mark Cooper  
1987 FARMINGTON DAILY TIMES

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# Editorial

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*Saturday, July 11, 1987*

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## Hazardous Wastes

Local authorities had better come up with a solution for disposing of oilfield wastes, or the situation at Basin Disposal will look like the proverbial Sunday School picnic.

The state Oil Conservation Division ordered Basin shut down this week because of complaints from neighbors that odors from the facility were making them ill and well water was being contaminated.

A landfill near Lee Acres that accepted oilfield hazardous waste was shut down a couple of years ago after it was discovered that nearby residents were getting ill from that facility's fumes while water wells were becoming contaminated. That landfill was operated by San Juan County on land leased

from the federal Bureau of Land Management.

Oil and gas drilling activity in the area, although currently in a slump, is gradually increasing, and it won't cease simply because there is no legal place to deposit oilfield wastes.

Some unscrupulous operators just might try to dump their wastes anywhere they can without being detected.

And as a result, ground water and the health of county residents will again be threatened to an extent never experienced before.

Surely, with the millions of acres of land in San Juan County, a suitable site for hazardous waste disposal can be found that will not threaten the health and resources of county residents.

# State Closes Bloomfield Oil Dump

THE ASSOCIATED PRESS

FARMINGTON — A state agency ordered the closing of a privately owned oil field waste dump near Bloomfield because hydrogen sulfide gas levels were not diminishing in the waste-water holding pond, an official said.

Frank Chavez of the state Energy and Minerals Department's Oil Conservation Division said the division on Tuesday barred the dumping of all materials except dry drilling mud at the Basin Disposal Inc. site.

"We want to stabilize water in the pond without adding any more to it and work with the water that is there," Chavez said.

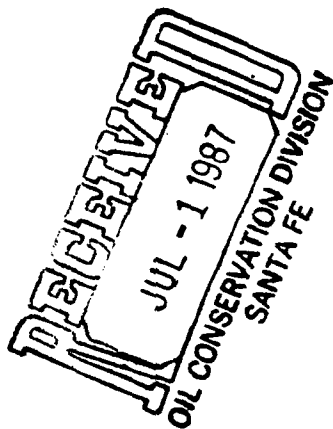
The decision followed the June 25 filing of a lawsuit by people living near the disposal site. The lawsuit claimed hydrogen sulfide gas from the holding pond has caused health problems for nearby residents.

Residents also have said the pits are leaking and contaminating soil in the area.

Chemical treatments of the pond began Friday and will continue, Chavez said. The division also has limited several drilling mud waste pits to dry material in an effort to prevent seepage from the pits, he said.

Chavez said the dump site's problems were not caused by any wrongdoing.

"It's not due to carelessness on the operators' part due to violation of any statutes," Chavez said. "It's just an uncommon situation that happened."



FOT 6-26-87

# Suit Filed To Close Waste Dump

By Bill Papich  
Daily Times Staff

Thirteen people living near a private oil field waste dump operated by Basin Disposal Inc. north of Bloomfield filed suit Thursday asking that the facility be shut down, alleging that fumes from the dump have made them sick.

"Some of the plaintiffs have re-

quired emergency medical care," said F. Chester Miller, the attorney who filed the suit on behalf of the plaintiffs. "When it gets really bad my people go in their mobile homes, shut the windows and turn their air conditioners off. They feel like they've become prisoners in their own homes."

A part owner of the waste dump,

state Rep. Jerry Sandel, D-San Juan, said his employees at the waste dump have not had the same reaction as nearby residents to odors coming from the facility's wastewater holding pond.

"Our people are out there 11 hours a day and have not reported sickness or ill affects."

The lawsuit filed in San Juan District Court in Aztec follows an investigation by the Oil Conservation Division that began about a month ago after residents near the facility complained about foul odors coming from the holding pond. The OCD determined that a small amount of a mix of hydrogen sulfide gas and water had been dumped in the holding pond, and it ordered the pond's sprinkler evaporation system turned off to keep gas levels at a minimum. It has never been determined who dumped the gas or where it came from.

Following their investigation, the OCD said that although there were odors of hydrogen sulfide gas in the area, the levels of fumes were not high enough to threaten the health of people. Hydrogen sulfide gas in

large amounts can be fatal. Frank Chavez of the OCD said another test will be conducted today at the holding pond to determine present levels of the gas.

The lawsuit alleges that Basin Disposal Inc. neglected to use standards for inspection of materials dumped at the site and that trucking companies knowingly dumped hazardous materials there. The plaintiffs have charged the company with misrepresentation, alleging that before opening the site the disposal site owners assured people living in the area that fumes, odors or gases would not interfere with their lives. The suit also alleges that waste water from the site has leaked onto people's property. The plaintiffs are asking for compensatory and punitive damages to be determined by the court.

Farmington Daily Times  
June 26, 1987

*Farmington Daily Times 6/12/87*

## Word Hazardous Called Inappropriate by OCD

The use of the word hazardous by the Daily Times in describing oil field waste dumped at Basin Disposal Inc. is inappropriate terminology, according to the owners of the company and officials of the Oil Conservation Division.

Basin Disposal Inc., north of Bloomfield, was described as a hazardous oil field waste dump in a recent Daily Times story reporting on an investigation of the disposal site by the OCD after nearby residents complained of foul odors coming from the facility's holding pond for oil field waste. The OCD determined that a small amount of a hydrogen sulfide gas and water mix

had been dumped in the holding pond. Hydrogen sulfide can be dangerous to health when breathed in large amounts. The OCD has since ordered the owners of the company to shut down its sprinkler evaporation system until the hydrogen sulfide gas goes away naturally from the pond or until the company treats the pond with chemicals that will neutralize the gas.

Frank Chavez, district supervisor for the OCD, said today that "hazardous waste is not a generic term." He said "the Environmental Protection Agency determines what substances are considered hazardous waste."

"What you call hazardous is now very specific as defined by the EPA," Chavez said. "When you call something hazardous you're calling something a more imminent danger to someone's life." He said that oil field waste dumped at the facility is not "potentially hazardous," although it could be considered "potentially polluting," because if it wasn't disposed of properly it could contaminate ground water.

Chavez said wastewater mixes dumped at the disposal site contain hydrocarbons produced in oil and gas formations. "When sprayed (at Basin Disposal Inc.) these hydrocarbons evaporate and therefore don't come in contact with ground water and break down into small forms that aren't potentially polluting," he said.

Meanwhile, the OCD is awaiting laboratory tests on wastewater from the facility's holding pond to determine how to solve the problem of hydrogen sulfide fumes coming from the pond that area residents are breathing daily. Chavez said the fumes are not dangerous to breathe at current levels.

# Waste Site Must Be Treated

By Bill Papich  
Daily Times Staff

Owners of Basin Disposal Inc., an oilfield waste disposal site north of Bloomfield, may be forced to treat its waste disposal pond with expensive chemicals in order to stay open, according to officials of the Oil Conservation Division.

A holding pond at the facility, designed to take oil field wastes mixed with water, became contaminated with a mix of hydrogen sulfide gas and water last week bringing complaints of foul odors from nearby residents. Hydrogen sulfide can be hazardous to health when breathed in large amounts.

Since then, the OCD has ordered Basin Disposal to shut off its evaporation sprinkler system, and that has caused the holding pond to fill up faster than normal. It's now four feet from the top. When it gets to one and one-half feet from the top OCD regulations require that the facility stop taking additional oil field waste.

At a meeting Wednesday between owners of Basin Disposal and officials of the OCD the owners of the company were given two choices to alleviate the problem.

"It's an either-or situation," said David Boyer of the OCD. "If they want to start it up again (the evaporation system) then they'll have to chemically treat the pond. However, there may be enough natural chemical reaction in the pond to take care of the hydrogen sulfide, if they keep the system down."

Boyer said chemical treatment to get rid of the gas involves adding ferric chloride and sodium hydroxide to the pond, a treatment that could prove costly for the owners.

"In any event, we will not let them put it (the sprayer system) back in operation if it causes a safety problem," said Boyer. "In either case, the health and safety of people nearby and employees of the company will be protected."

Boyer said that until the problem is solved the facility will be limited in the amount of waste material it can dispose of, adding that the company may soon have to begin storing waste in tanks to stay open.

Jerry Sandel, part owner of Basin Disposal Inc., has said that if his company is forced to shut down it could encourage illegal dumping of oilfield waste.

Although it hasn't been determined yet where the hydrogen sulfide gas came from, Sandel believes it was dumped from a waste hauling truck coming from the Barker Dome area north of Farmington where some gas wells are known to produce the gas.

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FARMINGTON DAILY TIMES

JUNE 10, 1987

# Closure of Hazardous Waste Dump Would Create Problems

By Bill Papich  
Daily Times Staff

A mixture of hydrogen sulfide gas and water dumped at Basin Disposal Inc. near Bloomfield could force the disposal company to shut down, according to officials of the state Oil Conservation Division and one of the owners of the company.

"If it does get to that point it could create illegal dumping problems," said Jerry Sandel, part owner of Basin Disposal. "There's really no other place for them (hazardous oil field waste trucks) to go," said Sandel, who is also a state legislator and the owner of Aztec Well Servicing Co.

Last week The Oil Conservation Division was investigating the facility amid complaints of foul odors in the area. Division officials determined that a small amount of hydrogen sulfide gas, which can be dangerous when large amounts of

the gas are breathed, had been dumped at the site. The officials ordered the facility to shut down its evaporation system. With its evaporation system shut off the holding pond for hazardous wastes is filling up more quickly than it normally would.

The evaporation system consists of sprayers around the pond that spray the mixture of water and waste into the air over the pond to facilitate quicker evaporation, making more room in the pond for dumping. OCD regulations require that the holding pond maintain a level less than one and one-half feet from the top. "When they get to that level they have to lock the gates," said David Boyer of the OCD.

"We're trying to work with them to avoid that," Boyer said officials of the OCD and owners of the disposal site will be meeting today to discuss future actions that may be taken to

alleviate the problem.

Sandel said he's in the process of applying for a permit to dump hazardous waste in a disposal well — underground areas where it is safe to dump such materials. However, he said the situation at his present disposal site, on New Mexico 44 between Bloomfield and Aztec, has not yet reached the point where he would be forced to use disposal wells.

"We're about four feet from the top (of the holding pond) now," said Sandel. "We have tanks for additional storage (of hazardous waste)."

Without the sprayers the rapidity of evaporation at the holding pond will depend on the weather and the rate of dumping. Besides the suspension of spraying at the pond, Boyer said evaporation may also have been slowed lately by recent high humidity and rain. However,

Boyer is looking at other methods to getting rid of the gas by "adding other chemicals that will cause it (the hydrogen sulfide) to change its form to a non-hazardous form."

Although Sandel believes the hydrogen sulfide gas was dumped by a truck coming from the Barker Dome area north of Farmington, where some gas wells have been known to produce hydrogen sulfide gas, Boyer said it may be difficult to ever determine exactly where the gas came from. Nevertheless, Sandel said he is not accepting any more wastewater mix from the Barker Dome area.

Trucks dumping at Basin Disposal present trip tickets at the site when dumping, empty their load and leave. Even after an extensive examination of the company's log books it would be difficult to determine exactly who dumped the gas at the site, said Boyer.



# Dumping of Gas North of Bloomfield Investigated

By Bill Papich  
Daily Times Staff

The state Oil Conservation Division is trying to determine the origin of hydrogen sulfide gas dumped in a liquid waste facility north of Bloomfield. Large amounts of hydrogen sulfide gas can be dangerous when breathed.

Complaints about foul odors by people living near Basin Disposal Inc., on New Mexico 44 between Bloomfield and Aztec, prompted officials from the OCD to investigate the facility earlier this week. Basin Disposal Inc. disposes of potentially hazardous oil field wastes.

State Rep. Jerry Sandel, part

owner of the facility, said the investigators found small amounts of the gas mixed with water at the disposal site's settling pond, but not enough to cause ill effects to nearby residents.

"There's a small odor sometimes, not a constant odor," said Sandel. "There's no problem. Within a week or ten days it will be gone."

Sandel said water containing the gas was probably dumped by a truck coming from the Barker Dome area north of Farmington where some gas wells are known to produce hydrogen sulfide gas. The gas is diluted with water for dis-

posal purposes.

"Some hauler apparently hauled a small amount of the gas to our disposal site," said Sandel. "We are not taking any more water from

that area." He said there are several companies operating gas wells in the Barker Dome area, and OCD officials are still trying to determine which company hauled the

gas to the disposal site. Sandel said the OCD is constantly monitoring his disposal facility. David Boyer, the OCD official in charge of investigating odors at the

disposal facility, said the hydrogen sulfide can be eliminated by "adding other chemicals that will cause it to change its form to a non-hazardous form."

People/Places



STATE OF NEW MEXICO

OIL CONSERVATION DIVISION  
RECEIVED

New Mexico  
DRUG FREE  
It's a State of Mind

ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT  
OIL CONSERVATION DIVISION  
AZTEC DISTRICT OFFICE

1000 RIO BRAZOS ROAD  
AZTEC, NEW MEXICO 87410  
(505) 334-6178

BRUCE KING  
GOVERNOR

ANITA LOCKWOOD  
CABINET SECRETARY

MATTHEW BACA  
DEPUTY SECRETARY

CERTIFIED MAIL  
RETURN RECEIPT NO. P-843-754-792

December 27, 1991

Basin Disposal, Inc.  
P. O. Box 100  
Aztec, NM 87410

Attn. David Turner

RE: OIL ON THE SURFACE OF WATER EVAPORATION POND (F-03-29N-11W)

Dear Mr. Turner:

The evaporation pond at your disposal facility in F-03-29N-11W San Juan County New Mexico continues to have oil on the surface in violation of the Basin Disposal, Inc. permit as a Commercial Surface Waste Disposal Facility. Oil has been present on the pit's surface since December 17, 1991, verbal requests for removal of the surface oil have not resulted in a good faith effort to comply. A good faith effort is considered by this office to be a vacuum truck working a minimum of eight hours per day on the removal of oil from the pit's surface for the dates of December 28, 29, 30, 31 of 1991. Basin Disposal personnel at the facility have been informed of this requirement. The absence of a good faith effort to remove oil from the surface of the Basin Disposal evaporation pond will result in closure of the facility until all oil is removed from the evaporation pond surface. I will inspect the evaporation pond on December 31, 1991, hopefully significant progress will have been made in removing the oil. If progress is not being made my only option will be to close the evaporation facility.

If you have questions please feel free to call this office.

Sincerely,

Denny G. Foust

Environmental Geologist

xc: Environmental Bureau-Santa Fe



OIL CONSERVATION DIVISION

**WALSH**

ENGINEERING & PRODUCTION CORP.

RECEIVED

Petroleum Engineering Consulting

Lease Management

Contract Pumping

204 N. Auburn  
P. O. Drawer 419  
Farmington, New Mexico 87499  
(505) 327-4892

'91 AUG 11 8 57

July 31, 1991

William J. LeMay, Division Director  
Energy & Minerals Department  
N.M. Oil Conservation Commission  
P. O. Box 2088  
Santa Fe, New Mexico 87504-2088

REF: Basin Disposal, Inc.  
Application for Land Management

Dear Mr. LeMay:

This is to advise you that Basin Disposal, Inc. is withdrawing the above referred to application.

Basin Disposal, Inc. will continue to review the situation concerning the removal of solids from the mud pit.

The continuation of the review is being performed to develop a program for removing the solids from the mud pits.

Thank you for your cooperation and consideration in this matter.

Very truly yours,

Ewell N. Walsh, P.E.  
President

ENW:rr

cc: Basin Disposal, Inc.  
Frank Chavez, District Supervisor  
N.M. Oil Conservation Commission - Aztec, N.M.

BASIN DISPOSAL INC.

MEETING ON LAND FARM APPLICATION

7/30/91 7:00 P.M.

Naaba School  
Bloomfield, NM

Basin: David Turner (owner), Red Walsh (consultant), Red Birdsong (consultant), Eddie Slavens (consultant).

Landowners: Complaining of dust blowing at Basins - very thick - on Mon. (7-29) afternoon.

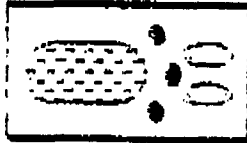
Others complaining of odors over the past 2 days.  
Odors of  $H_2S$  & chlorine mixed.

Basically all landowners object to the landfarm

Mayor - Art Kittell

Speaking for City of Bloomfield & Senator Southwest Disposal if broke lose would ruin the city of Bloomfield's water supply - best water in the country. Videotaped trucks unloading - not all being sampled & tested. Pond is full of heavy metals and spray on berms and surrounding land could contaminate Bloomfield water. Sampled ditch and backside of ditch. Not contaminated.

Basin disposal is too close to the city and residences. Request Basin to move site to ~~the~~ a remote location northeast of the city by Navajo dam where most of the drilling is located. Land is available (BLM). Also request if have a hearing for it to be held in Bloomfield.

**BASIN DISPOSAL, INC.**

"SPECIALIZING IN DISPOSAL OF PRODUCED WATER AND DRILLING MUD"

P. O. BOX 100 • AZTEC, NEW MEXICO 87410 • PHONE: (505) 334-3013

July 25, 1991

To Whom it may concern:

We will be conducting an informational meeting for surrounding land owners on July 30, 1991, at 7:00 PM in the multi-purpose room of Naza Aní Elementary School.

The purpose of the informal meeting is to answer questions on our proposed land management application pending before the New Mexico Oil Conservation Division.

Sincerely yours,

D.C. Birdsong - Agent

DAVID TURNER  
President

PHONES:  
(505) 325-1845 & 325-2396

# CHIEF TRANSPORT CO.

WATER & LAND SERVICE

P.O. BOX 358 • FARMINGTON, NEW MEXICO 87499

FAX NUMBER (505) 326-0955

## FAX MESSAGE COVER SHEET

DATE:

7/29/91

TO:

01 Conservation Division

ATTN:

Dave Bayer

TRANSMISSION CONSISTS OF COVER SHEET PLUS 1 PAGES.

MESSAGES:

IF THERE IS ANY PROBLEM WITH THIS TRANSMISSION, PLEASE CALL  
(505) 325-1845.

SIGNED:

**BASIN DISPOSAL, INC.**

"SPECIALIZING IN DISPOSAL OF PRODUCED WATER AND DRILLING MUD"

P. O. BOX 100 • AZTEC, NEW MEXICO 87410 • PHONE: (505) 334-3013

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Sincerely yours,

D.C. Birdsong - Agent

STATE OF NEW MEXICO  
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT  
OIL CONSERVATION DIVISION

BRUCE KING  
GOVERNOR

POST OFFICE BOX 2088  
STATE LAND OFFICE BUILDING  
SANTA FE, NEW MEXICO 87504  
(505) 827-5800

July 25, 1991

CERTIFIED MAIL -  
RETURN RECEIPT NO. P-757-737-763

Mr. David. C. Turner  
Basin Disposal, Inc.  
P. O. Box 100  
Aztec, New Mexico 87410

RE: Pond Liner Repair

Dear Mr. Turner:

Your letter of July 24, 1991, proposing the steps to be taken to drain and repair your leaking evaporation pond has been received and reviewed by OCD. The procedures you propose are necessary and appropriate for repair of the pond and are hereby approved with the following conditions:

1. The leak detection system (LDS) will be completely drained before resuming introduction of fluids into the pond. The LDS will be monitored daily during refilling of the pond to determine if repairs are adequate.
2. Basin Disposal will provide a summary report of the leaks detected and repairs made within thirty days of completion, and
3. Dewatered solids will be disposed of at an OCD-approved disposal site. If necessary, the solids will be neutralized to below 12.5 pH prior to disposal.

In accordance with your commitment to keep OCD informed of the progress of the project, you are requested to notify the Santa Fe office when:

1. The pond has been emptied of fluids and solids;
2. Liner repairs have been completed, and



Mr. David C. Turner


July 25, 1991

-2-

3. Dewatered solids have been moved for final disposal, including date and place of disposal.

If you have any questions, please contact Roger Anderson at 827-5884.

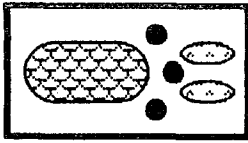
Sincerely,



David G. Boyer, Hydrogeologist  
Environmental Bureau Chief

DGB/sl

cc: OCD Aztec Office  
Richard Cheney



# BASIN DISPOSAL, INC.

"SPECIALIZING IN DISPOSAL OF PRODUCED WATER AND DRILLING MUD"  
P. O. BOX 100 • AZTEC, NEW MEXICO 87410 • PHONE: (505) 334-3013

RECEIVED  
'91 JUL 29 AM 9 05

July 24, 1991

Mr. Boyer  
Oil Conservation Division  
State of New Mexico  
State Land Office Building  
P.O. Box 2088  
Santa Fe, NM 87504-2088

Dear Mr. Boyer:

As per your conversation with Richard Cheney this morning, we are proposing to begin the procedure for locating the suspected leak in the liner of the main holding pond at Basin Disposal. The procedure we are proposing is as follows:

1. Lower levels of the pond to approximately 12-18 inches by injecting fluids and by storing fluids in frac tanks.
2. Transfer drilling mud from the four mud pits on the west end of the property to adjacent pits to the east.
3. Transfer the bottom 12-18 inches of material from the holding pond to the four mud pits previously mentioned.
4. Inspect the entire liner and repair leaks if found.
5. De-water and dispose of solids from the bottom 12-18 inches of material.

We have effectively initiated this procedure on this date. We are in the process of lowering the operating level of the pond and we are installing additional frac tanks to assist in this operation. We will keep you informed of the progress and the status of each phase of the project.

Sincerely yours,

David C. Turner  
Secretary

**BASIN DISPOSAL, INC.**

"SPECIALIZING IN DISPOSAL OF PRODUCED WATER AND DRILLING MUD"

P. O. BOX 100 • AZTEC, NEW MEXICO 87410 • PHONE: (505) 334-3013

July 24, 1991

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State of New Mexico  
State Land Office Building  
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Santa Fe, NM 87504-2088

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Sincerely yours,

David C. Turner  
Secretary

DAVID TURNER  
President

PHONES:  
(505) 325-1845 & 325-2396

# CHIEF TRANSPORT CO.

WATER & LAND SERVICE

P. O. BOX 358 • FARMINGTON, NEW MEXICO 87499

FAX NUMBER (505) 325-0955

## FAX MESSAGE COVER SHEET

DATE:

7/25/91

TO:

State of NM Oil Conservation Division

ATTN:

Dave Boyer

TRANSMISSION CONSISTS OF COVER SHEET PLUS 1 PAGES.

MESSAGES:

IF THERE IS ANY PROBLEM WITH THIS TRANSMISSION, PLEASE CALL  
(505) 325-1845.

SIGNED:

D.T.



# BASIN DISPOSAL, INC.

"SPECIALIZING IN DISPOSAL OF PRODUCED WATER AND DRILLING MUD"

P. O. BOX 100 • AZTEC, NEW MEXICO 87410 • PHONE: (505) 334-3013

OIL CONSERVATION DIVISION  
RECEIVED

'91 JUL 25 AM 9 07

July 24, 1991

Mr. Bill Olson, Hydrogeologist  
State of New Mexico  
Oil Conservation Division  
Department of Energy, Minerals and Natural Resources  
State Land Office Building  
Post Office Box 2088  
Santa Fe, NM 87504-2088

Dear Bill:

Enclosed are the mail receipts and xerox copies of letters sent to landowners within one half mile of Basin Disposal, Inc.

Thank you,

*DC Birdsong*  
D.C. Birdsong - Agent

DCB/tjl

enc.



# BASIN DISPOSAL, INC.

"SPECIALIZING IN DISPOSAL OF PRODUCED WATER AND DRILLING MUD"

OIL CONSERVATION DIVISION  
P.O. BOX 100 • AZTEC, NEW MEXICO 87410 • PHONE: (505) 334-3013

'91 JUL 25 PM 1 47

July 5, 1991

✓ Magee Transportation, Ltd.  
P.O. Box 627  
Bloomfield, New Mexico 87413-0627

To whom it may concern:

Enclosed is a notice of Publication by the State of New Mexico Energy, Minerals and Natural Resources Department, Oil Conservation Division which details our application to modify the Basin Disposal facility located in the SW/4 NW/4 and the SE/4 NW/4, Section 3, Township 29 North, Range 11 West, NMPM, San Juan County, New Mexico.

If you do not have an objection to the application please advise--by letter--the Director of the Oil Conservation Division at the following address:

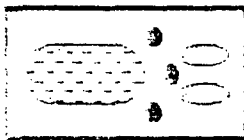
Director, Oil Conservation Division  
State Land Office Building  
P.O. Box 2088  
Santa Fe, NM 87504-2088

Thank you,

*D.C. Birdsong*  
D.C. Birdsong - Agent

DCB/jva

certified/file



# BASIN DISPOSAL, INC.

"SPECIALIZING IN DISPOSAL OF PRODUCED WATER AND DRILLING MUD"  
OIL CONSERVATION DIVISION  
P. O. BOX 100 • AZTEC, NEW MEXICO 87410 • PHONE: (505) 334-3013

'91 JUL 25 PM 1 47

July 12, 1991

Bureau of Land Management  
John Phillips, Acting Area Manager  
1235 La Plata Hwy  
Farmington, New Mexico 87401

To whom it may concern:

My original letter of July 5, 1991 with Notice of Publication by the State of New Mexico Energy, Minerals and Natural Resources Department, Oil Conservation Division detailing our application to modify the Basin Disposal facility located in the SW/4 NW/4 and the SE/4 NW/4, section 3, Township 29 North, Range 11 West, NMPM, San Juan County, New Mexico was in *error*.

The last paragraph should have read:

If you have an objection to the application please advise--by letter--the Director of Oil Conservation Division at the following address:

Director, Oil Conservation Division  
State Land Office Building  
P.O. Box 2088  
Santa Fe, NM 87504-2088

Thank you,

D.C. Birdsong - Agent

DCB/tjl

certified/file

**SENDER:**

- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece next to the article number.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

**3. Article Addressed to:**

Marilyn Ann White  
1853 Mike Hill  
El Paso, TX 79936

**4a. Article Number**

P 789 913 059

**4b. Service Type**

- ☐ Registered ☐ Insured  
☒ Certified ☐ COD  
☐ Express Mail ☐ Return Receipt for Merchandise

**7. Date of Delivery**

JUL 16 1991

**5. Signature (Addressee)****6. Signature (Agent)****8. Addressee's Address (Only if requested and fee is paid)**

PS Form 3811, October 1990

★U.S. GPO: 1990-273-861

**DOMESTIC RETURN RECEIPT**

**SENDER:**

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2. ☐ Restricted Delivery

Consult postmaster for fee.

**3. Article Addressed to:**

Phillip L. Dix  
P.O. Box 796  
Bloomfield, NM 87413

**4a. Article Number**

P 789 913 067

**4b. Service Type**

- ☐ Registered ☐ Insured  
☒ Certified ☐ COD  
☐ Express Mail ☐ Return Receipt for Merchandise

**7. Date of Delivery**

7/18/91

**5. Signature (Addressee)****6. Signature (Agent)****8. Addressee's Address (Only if requested and fee is paid)**

PS Form 3811, October 1990

★U.S. GPO: 1990-273-861

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1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

**3. Article Addressed to:**

Wayne Hare  
P.O. Box 352  
Bloomfield, NM 87413

**4a. Article Number**

P 789 913 056

**4b. Service Type**

- ☐ Registered ☐ Insured  
☒ Certified ☐ COD  
☐ Express Mail ☐ Return Receipt for Merchandise

**7. Date of Delivery****8. Addressee's Address (Only if requested and fee is paid)****5. Signature (Addressee)****6. Signature (Agent)**

PS Form 3811, October 1990

★U.S. GPO: 1990-273-861

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I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
  2. ☐ Restricted Delivery
- Consult postmaster for fee.

3. Article Addressed to:

Charles Evenson  
P.O. Box 507  
Bloomfield, NM 87413

4a. Article Number

P 789 913 066

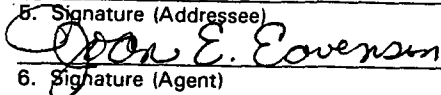
4b. Service Type

- ☐ Registered ☐ Insured  
☒ Certified ☐ COD  
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery

7/13/91

5. Signature (Addressee)



6. Signature (Agent)

8. Addressee's Address (Only if requested and fee is paid)

PS Form 3811, October 1990

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3. Article Addressed to:

Bruce Smith/ Jimmie Brockwell  
217 N. Swartz  
Farmington, NM 87401

4a. Article Number

P789 917 326

4b. Service Type

- ☐ Registered ☐ Insured  
☐ Certified ☐ COD  
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery

5. Signature (Addressee)

6. Signature (Agent)

8. Addressee's Address (Only if requested and fee is paid)

PS Form 3811, October 1990

★U.S. GPO: 1990-273-861

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  2. ☐ Restricted Delivery
- Consult postmaster for fee.

3. Article Addressed to:

ANDREW WADDOUPS  
PO BOX 1603  
BLOOMFIELD NM 87413-1603

4a. Article Number

P 789 913 094

4b. Service Type

- ☐ Registered ☐ Insured  
☒ Certified ☐ COD  
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery

5. Signature (Addressee)

6. Signature (Agent)

8. Addressee's Address (Only if requested and fee is paid)

PS Form 3811, October 1990

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I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

**3. Article Addressed to:**

David Douglas  
P.O. Box 1058  
Bloomfield, NM 87413

4a. Article Number  
P 789913 064

**4b. Service Type**

- ☐ Registered ☐ Insured  
☒ Certified ☐ COD  
☐ Express Mail ☐ Return Receipt for Merchandise

**7. Date of Delivery**

7/18/91

**5. Signature (Addressee)****8. Addressee's Address (Only if requested and fee is paid)****6. Signature (Agent)**

*David Douglas*

PS Form 3811, October 1990

★U.S. GPO: 1990-273-881

**DOMESTIC RETURN RECEIPT**

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I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

**3. Article Addressed to:**

James A. Schaffer  
P.O. Box 588  
Fort Defiance, AZ 86504

4a. Article Number  
P 789 913 062

**4b. Service Type**

- ☐ Registered ☐ Insured  
☒ Certified ☐ COD  
☐ Express Mail ☐ Return Receipt for Merchandise

**7. Date of Delivery**

7-15-91

**5. Signature (Addressee)****8. Addressee's Address (Only if requested and fee is paid)****6. Signature (Agent)**

*James Schaffer*

PS Form 3811, October 1990

★U.S. GPO: 1990-273-881

**DOMESTIC RETURN RECEIPT**

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I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

**3. Article Addressed to:**

Sidney A. Martin  
P.O. Box 1620  
Pagosa Springs, CO 81147

4a. Article Number  
P 789 913 061

**4b. Service Type**

- ☐ Registered ☐ Insured  
☒ Certified ☐ COD  
☐ Express Mail ☐ Return Receipt for Merchandise

**7. Date of Delivery**

7-17-91

**5. Signature (Addressee)****8. Addressee's Address (Only if requested and fee is paid)****6. Signature (Agent)**

*Sidney A. Martin*

**DOMESTIC RETURN RECEIPT**

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I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

Magee Transportation, Ltd.  
P.O. Box 627  
Bloomfield, NM 87413

4a. Article Number

P 789 917 317

4b. Service Type

- ☐ Registered ☐ Insured  
☒ Certified ☐ COD  
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery

5. Signature (Addressee)

6. Signature (Agent)

8. Addressee's Address (Only if requested and fee is paid)

PS Form 3811, October 1990

★U.S. GPO: 1990-273-861

**DOMESTIC RETURN RECEIPT**

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I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

Samuel C. Hollat  
P.O. Box 2016  
Bloomfield, NM 87413

4a. Article Number

P 789 913 058

4b. Service Type

- ☐ Registered ☐ Insured  
☒ Certified ☐ COD  
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery

7/15/91

5. Signature (Addressee)

6. Signature (Agent)

8. Addressee's Address (Only if requested and fee is paid)

PS Form 3811, October 1990

★U.S. GPO: 1990-273-861

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2. ☒ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

IRVIN LITKE  
PO BOX 518  
BLOOMFIELD NM 87413-0518

4a. Article Number

P 789 913 093

4b. Service Type

- ☐ Registered ☐ Insured  
☒ Certified ☐ COD  
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery

5. Signature (Addressee)

6. Signature (Agent)

8. Addressee's Address (Only if requested and fee is paid)

PS Form 3811, October 1990

**SENDER:**

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- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece next to the article number.

3. Article Addressed to:

Gordon Crane  
P.O. Box 190  
Aztec, NM 87410-0100

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

4a. Article Number

P 789 913 070

4b. Service Type

- ☐ Registered ☐ Insured  
☒ Certified ☐ COD  
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery

8. Addressee's Address (Only if requested and fee is paid)

5. Signature (Addressee)

6. Signature (Agent)

PS Form 3811, October 1990

★U.S. GPO: 1990-273-861

**DOMESTIC RETURN RECEIPT****SENDER:**

- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece next to the article number.

3. Article Addressed to:

Linn R. Blancett  
P.O. Box 55  
Aztec, NM 87410-0055

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

4a. Article Number

P 789 913 051

4b. Service Type

- ☐ Registered ☐ Insured  
☒ Certified ☐ COD  
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery

8. Addressee's Address (Only if requested and fee is paid)

5. Signature (Addressee)

6. Signature (Agent)

PS Form 3811, October 1990

★U.S. GPO: 1990-273-861

**DOMESTIC RETURN RECEIPT****Fold at line over top of envelope to the****SENDER:**

- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece next to the article number.

3. Article Addressed to:

Kenneth Raney  
P.O. Box 2122  
Bloomfield, NM 87413

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☒ Restricted Delivery

Consult postmaster for fee.

4a. Article Number

P 789 913 063

4b. Service Type

- ☐ Registered ☐ Insured  
☒ Certified ☐ COD  
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery

7/13/91

8. Addressee's Address (Only if requested and fee is paid)

5. Signature (Addressee)

6. Signature (Agent)

**SENDER:** Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.  
Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.

1. ☐ Show to whom delivered, date, and addressee's address. (Extra charge) 2. ☐ Restricted Delivery (Extra charge)

3. Article Addressed to:  First Interstate Bank Trustee for Hattie McClure P.O. Box 4140 Farmington, NM 87499	4. Article Number P 789 913 069
5. Signature — Addressee X	Type of Service: <input type="checkbox"/> Registered <input type="checkbox"/> Insured <input checked="" type="checkbox"/> Certified <input type="checkbox"/> COD <input type="checkbox"/> Express Mail <input type="checkbox"/> Return Receipt for Merchandise
6. Signature — Agent X	Always obtain signature of addressee or agent and DATE DELIVERED.
7. Date of Delivery 7-16-91	8. Addressee's Address (ONLY if requested and fee paid)

PS Form 3811, Apr. 1989

★U.S.G.P.O. 1989-238-815

DOMESTIC RETURN RECEIPT

**line over top**

**SENDER:**

- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece next to the article number.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address

2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:  W.W. Windham 78 County Road 5500 Farmington, NM 87401	4a. Article Number P 789 917 323
5. Signature (Addressee) W.W. Windham	4b. Service Type <input type="checkbox"/> Registered <input type="checkbox"/> Insured <input checked="" type="checkbox"/> Certified <input type="checkbox"/> COD <input type="checkbox"/> Express Mail <input type="checkbox"/> Return Receipt for Merchandise
6. Signature (Agent)	7. Date of Delivery 7-15-91
	8. Addressee's Address (Only if requested and fee is paid)

PS Form 3811, October 1990

★U.S. GPO: 1990-273-861

DOMESTIC RETURN RECEIPT

**SENDER:**

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- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece next to the article number.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address

2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:  Gary McDaniel P.O. Box 2176 Bloomfield, NM 87413	4a. Article Number P 789 913 065
5. Signature (Addressee) Gary McDaniel	4b. Service Type <input type="checkbox"/> Registered <input type="checkbox"/> Insured <input checked="" type="checkbox"/> Certified <input type="checkbox"/> COD <input type="checkbox"/> Express Mail <input type="checkbox"/> Return Receipt for Merchandise
6. Signature (Agent)	7. Date of Delivery 7-16-91
	8. Addressee's Address (Only if requested and fee is paid)

PS Form 3811, October 1990

★U.S. GPO: 1990-273-861

DOMESTIC RETURN RECEIPT

**SENDER:**

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- Complete items 3, and 4a & b.
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- Write "Return Receipt Requested" on the mailpiece next to the article number.

I also wish to receive the following services (for an extra fee):

- ☐ Addressee's Address
- ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

Mack Mantle  
1213 Camino Monte  
Farmington, NM 87401

4a. Article Number

P 789 917 321

4b. Service Type

- ☐ Registered ☐ Insured  
☒ Certified ☐ COD  
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery

7/13/91 MW

5. Signature (Addressee)

8. Addressee's Address (Only if requested and fee is paid)

6. Signature (Agent)

PS Form 3811, October 1990

★U.S. GPO: 1990-273-861

**DOMESTIC RETURN RECEIPT**

**SENDER:**

- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece next to the article number.

I also wish to receive the following services (for an extra fee):

- ☐ Addressee's Address
- ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

Adobe Contractors Inc.  
P.O. Box 970  
Aztec, NM 87410

4a. Article Number

P 789 913 052

4b. Service Type

- ☐ Registered ☐ Insured  
☒ Certified ☐ COD  
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery

7-15-91

5. Signature (Addressee)

8. Addressee's Address (Only if requested and fee is paid)

6. Signature (Agent)

PS Form 3811, October 1990

★U.S. GPO: 1990-273-861

**DOMESTIC RETURN RECEIPT**

Fold

**SENDER:**

- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece next to the article number.

I also wish to receive the following services (for an extra fee):

- ☐ Addressee's Address
- ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

Colleen Miszkief  
2109 E. 16th St.  
Farmington, NM 87401

4a. Article Number

P 789 917 322

4b. Service Type

- ☐ Registered ☐ Insured  
☒ Certified ☐ COD  
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery

7-15-91

5. Signature (Addressee)

8. Addressee's Address (Only if requested and fee is paid)

6. Signature (Agent)

PS Form 3811, October 1990

★U.S. GPO: 1990-273-861

**DOMESTIC RETURN RECEIPT**

**SENDER:**

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- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece next to the article number.

I also ☐ to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

Lee M. Crane  
313 S. Mesa Verde  
Aztec, NM 87410

4a. Article Number

P 789 913 053

4b. Service Type

- ☐ Registered ☐ Insured  
☒ Certified ☐ COD  
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery

5. Signature (Addressee)

*Lee M. Crane*

6. Signature (Agent)

8. Addressee's Address (Only if requested and fee is paid)

PS Form 3811, October 1990

U.S. GPO: 1990-273-861

**DOMESTIC RETURN RECEIPT**

**SENDER:**

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- Complete items 3, and 4a & b.
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- Write "Return Receipt Requested" on the mailpiece next to the article number.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

Lou Ellen Wernet  
5212 Wyoming NE #G-26  
Albuquerque, NM 87111

4a. Article Number

P 789 913 060

4b. Service Type

- ☐ Registered ☐ Insured  
☒ Certified ☐ COD  
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery

5. Signature (Addressee)

*Lou Ellen Wernet*

6. Signature (Agent)

8. Addressee's Address (Only if requested and fee is paid)

PS Form 3811, October 1990

U.S. GPO: 1990-273-861

**DOMESTIC RETURN RECEIPT**

**SENDER:**

- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
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- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece next to the article number.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

BYRON MARTIN  
PO BOX 342  
BLOOMFIELD NM 87413-0342

4a. Article Number

P 789 913 076

4b. Service Type

- ☐ Registered ☐ Insured  
☐ Certified ☐ COD  
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery

5. Signature (Addressee)

6. Signature (Agent)

*Byron Martin*

Addressee's Address (Only if requested and fee is paid)

PS Form 3811, October 1990

**SENDER:**

- Complete items 1 and 2 for additional services.
- Complete items 3, and 4.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece next to the article number.

I also wish to receive the following service (for an extra fee):

- ☐ Addressee's Address
- ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:  John Phillins 1235 La Plata Hwy Farmington, NM 87401	4a. Article Number P 789 913 054
5. Signature (Addressee) <i>[Signature]</i>	4b. Service Type <input type="checkbox"/> Registered <input type="checkbox"/> Insured <input checked="" type="checkbox"/> Certified <input type="checkbox"/> COD <input type="checkbox"/> Express Mail <input type="checkbox"/> Return Receipt for Merchandise
6. Signature (Agent)	7. Date of Delivery 7-15-91
	8. Addressee's Address (Only if requested and fee is paid)

PS Form 3811, October 1990

★U.S. G.P.O. 1990-273-881

**DOMESTIC RETURN RECEIPT**

● **SENDER:** Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.  
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1. <input type="checkbox"/> Show to whom delivered, date, and addressee's address. (Extra charge)	2. <input type="checkbox"/> Restricted Delivery (Extra charge)
3. Article Addressed to:  Donald C. Adams 3807 Sunset Farmington, NM 87401	4. Article Number P 789 917 319
5. Signature — Addressee X	Type of Service: <input type="checkbox"/> Registered <input type="checkbox"/> Insured <input checked="" type="checkbox"/> Certified <input type="checkbox"/> COD <input type="checkbox"/> Express Mail <input type="checkbox"/> Return Receipt for Merchandise
6. Signature — Agent X <i>[Signature]</i>	Always obtain signature of addressee or agent and <b>DATE DELIVERED</b> .
7. Date of Delivery 7-15-91	8. Addressee's Address (ONLY if requested and fee paid)

PS Form 3811, Apr. 1989

★U.S.G.P.O. 1989-238-815

**DOMESTIC RETURN RECEIPT**

● **SENDER:** Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.  
Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.

1. <input type="checkbox"/> Show to whom delivered, date, and addressee's address. (Extra charge)	2. <input type="checkbox"/> Restricted Delivery (Extra charge)
3. Article Addressed to:  Jimmie Brockwell 217 N. Swartz Farmington, NM 87401	4. Article Number P 789 917 318
5. Signature — Addressee X <i>[Signature]</i>	Type of Service: <input type="checkbox"/> Registered <input checked="" type="checkbox"/> Insured <input checked="" type="checkbox"/> Certified <input type="checkbox"/> COD <input type="checkbox"/> Express Mail <input type="checkbox"/> Return Receipt for Merchandise
6. Signature — Agent X	Always obtain signature of addressee or agent and <b>DATE DELIVERED</b> .
7. Date of Delivery	8. Addressee's Address (ONLY if requested and fee paid)

PS Form 3811, Apr. 1989

★U.S.G.P.O. 1989-238-815

**DOMESTIC RETURN RECEIPT**



**SENDER:**

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- Complete items 3, and 4a & b.
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- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece next to the article number.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

**3. Article Addressed to:**

Tim and Terry Payne  
P.O. Box 305  
Bloomfield, NM 87513

**4a. Article Number**

P 789 913 055

**4b. Service Type**

- |   |   |
|---|---|
| <input type="checkbox"/> Registered           | <input type="checkbox"/> Insured                        |
| <input checked="" type="checkbox"/> Certified | <input type="checkbox"/> COD                            |
| <input type="checkbox"/> Express Mail         | <input type="checkbox"/> Return Receipt for Merchandise |

**7. Date of Delivery**

7-13-94

**5. Signature (Addressee)**

*Tim Payne*

**6. Signature (Agent)****8. Addressee's Address (Only if requested and fee is paid)**

**BASIN DISPOSAL, INC.**

"SPECIALIZING IN DISPOSAL OF PRODUCED WATER AND DRILLING MUD"

P. O. BOX 100 • AZTEC, NEW MEXICO 87410 • PHONE: (505) 334-3013

July 25, 1991

To Whom it may concern:

We will be conducting an informational meeting for surrounding land owners on July 30, 1991, at 7:00 PM in the multi-purpose room of Nacoba Ani Elementary School.

The purpose of the informal meeting is to answer questions on our proposed land management application pending before the New Mexico Oil Conservation Division.

Sincerely yours,

D.C. Birdsong - Agent

XX  
XX  
XX  
XX  
XX

XX  
XX  
XX  
XX  
XX

ANNETTE DAVIS  
ODECO, INC  
PO BOX 1058  
BLOOMFIELD, NM 87413

BETTY HOLLAR  
PO BOX 2016  
BLOOMFIELD, NM 87413

ERNEST G. MOTTO  
ADOBE CONTRACTORS, INC  
PO BOX 970  
AZTEC, NM 87410

CHARLES & JOAN EAVENSON  
PO BOX 507  
BLOOMFIELD, NM 87413

IRVIN & DORIS LITKE  
PO BOX 518  
BLOOMFIELD, NM 87413

MARILYN ANN WHITE  
1853 MIKE HILL  
EL PASO, TX 79936



STATE OF NEW MEXICO  
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT  
OIL CONSERVATION DIVISION

BRUCE KING  
GOVERNOR

September 16, 1991

POST OFFICE BOX 2088  
STATE LAND OFFICE BUILDING  
SANTA FE, NEW MEXICO 87504  
(505) 827-5800

To Whom It May Concern:

This letter is to advise those protestors of record in the Basin Disposal Modification request that on July 31, 1991, Basin Disposal Inc. withdrew it's request for the modification of it's previously approved surface waste disposal permit. The existing mud storage will continue to be regulated pursuant to the previously approved permit and liner replacement will continue.

If you have any questions please contact me at the above address.

Sincerely,

Roger C. Anderson  
Environmental Engineer

xc. OCD Aztec Office

OIL CONSERVATION DIVISION  
RECEIVED

July 22, 1991

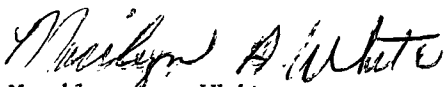
'91 JUL 26 AM 9 28

Director, Oil Conservation Division  
State Land Office Building  
P.O. Box 2088  
Santa Fe, NM 87504-2088

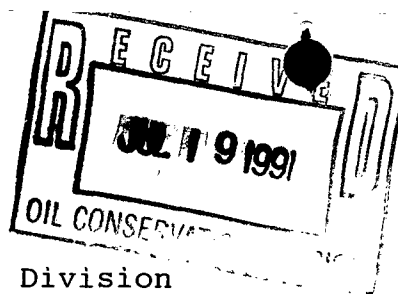
Dear Mr. Lemay:

In response to your letter pertaining to modifications proposed by Basin Disposal Inc. at their waste disposal site, I would like to have this letter serve as objection to any modification, additions, expansions or other changes in their facility. I feel that the facility has already damaged the environment, lowered surrounding property values and caused property owners enough concern.

Please make sure my letter of objection is given consideration when making the decision requested by Basin Disposal.



Marilyn Ann White  
1853 Mike Hill  
El Paso, Texas 79936



July 19, 1991

Director, Oil Conservation Division  
State Land Office Building  
P.O. Box 2088  
Santa Fe, NM 87504-2088

Dear Sir:

In reply to the letter from D.C. Birdsong, Agent for Basin Disposal, Inc., dated July 12, we definitely object to their plans to modify a commercial solid waste disposal facility in our area.

First, by diskings the material into the soil it would create a condition causing winds in this area to be saturated with these particles, creating a pollution problem that would be very disturbing. Also this type of soil we feel water at 180 feet would not be safe for long.

Second, this is a company that has a past record of complete disregard for the welfare of the citizens living near their business. As records show it took a court action to get them to clean up their liquid waste pond to the point it was not actually harmful to the health of people in the area. The court records also will show that after the initial court order to keep it safe, the following year they again had to be forced to shut down for a time and again clean it up to healthful standards. When Basin Disposal was started we were assured it would handle non-hazardous liquids only.

Third, we resent the manner and timing of their letters of notification being sent on July 12 (a time we were on vacation) and stating we would be allowed 30 days after the date of publication on or before June 28. We are told it was published in the Albuquerque Journal. This of course is a publication we residents do not subscribe to. This leaves very little time to investigate ways to stop their action. It is also very difficult for area residents to travel to Santa Fe, since they are either employed or senior citizens.

Yours truly,

*Irvin L. Litke*

*Doris L. Litke*

Irvin L. Litke

Doris L. Litke

Box 518

Bloomfield, NM 87413

OIL CONSERVATION DIVISION  
RECEIVED

NOTICE OF OBJECTION

'91 JUL 22 AM 9 23

P.O. Box 507  
Bloomfield, New Mexico 87413  
July 18, 1991

William J. LeMay  
Director, Oil Conservation Division  
State Land Office Building  
P.O. Box 2088  
Santa Fe, New Mexico 87504-2088

Re: Basin Disposal, Inc.  
Notice of Publication by State of New Mexico  
Energy Minerals & National Resources Department,  
Oil Conservation, Division, dated June 19, 1991

Dear Mr. LeMay:

This is to advise you of our objection to the above-mentioned application to modify the Basin Disposal facility located in the SW/4 NW/4 and the SE/4 NW/4, Section 3, Township 29 North, Range 11 West NMPM, San Juan County, New Mexico, which was enclosed with a letter dated July 5, 1991 and an additional letter dated July 12, 1991 correcting the last paragraph of this Notice.

This objection is based upon property depreciation, health problems, environmental problems, and long-term problems.

We feel that you should take into very serious consideration what it will do to the air we are breathing. The area it is located at is a very windy area which already blows dirt and anything else in the air onto surrounding properties. Would you live here?

If you let it happen we will have another "LOVE CANAL" situation where after many years of dumping waste, it eventually came to the surface poisoning many people and destroying their lives and future generations.

Why can't this be put in a location where it is not a main highway where people are travelling by it every day and being exposed to it. I am sure there are many other locations which would serve the same purpose.

Please take a better look at this situation before giving approval.

Also ROY & MISTY EAVENSON  
who reside at the same address.

Sincerely yours,

*Charles Eavenson*  
Charles Eavenson

*Joan E. Eavenson*  
Joan E. Eavenson

CERTIFIED MAIL: RETURN RECEIPT REQUESTED

# Adobe Contractors, Inc.

LICENSED CONTRACTOR

OIL CONSERVATION DIVISION  
RECEIVED

P.O. BOX 970

AZTEC, NEW MEXICO 87410

'91 JUL 22 AM 9 23 PHONE: 632-1486

*General Dirt Moving, Land Leveling, Oilfield Roads & Locations*

July 18, 1991

Director, Oil Conservation Division  
State Land Office Building  
P.O. Box 2088  
Santa Fe, New Mexico 87504-2088

Re: Application to modify the Basin Disposal facility located in the SW/4 NW/4,  
section 3 Township 29 North, Range 11 West, NMPM, San Juan County, New Mexico

Dear Sirs:

I would like to take this opportunity to object to the application to modify Basin Disposal's previously approved surface waste disposal permit.

Our business was established for a number of years prior to construction of the original Basin Disposal facility and I have a number of concerns involving any type of expansion related to the present facility.

My objections include, but are not limited to the following:

1. Release into the atmosphere potentially hazardous materials either disposed of directly or which may form during biodegradation of organic material.
2. Proximity of the site to a well traveled highway; due to the anticipated increase of truck traffic in the area on the two-lane highway, there is a great potential for an increase in auto accidents.
3. The continued devaluation of property which has already occurred and can be directly linked to the construction of the original Basin Disposal facility.

I find it disturbing to have the proposed facility referred to as "a land management area where **NON-HAZARDOUS** clay based drilling solids will be mixed with natural soils or other suitable inert materials and disked into the land surface. The mixture will be disked periodically to enhance biodegradation of organic matter. The application addresses methods for total containment of the mixture from surrounding surface area, and replacement of liners in the existing mud storage pits."

If the material they are planning to haul into the area is completely non-hazardous, why are so many precautions going to be made to contain the mixture? I can appreciate the efforts they are taking to avoid any unforeseen problems, but, that I feel, only legitimizes our concerns.



# Adobe Contractors, Inc.

LICENSED CONTRACTOR

P.O. BOX 970

AZTEC, NEW MEXICO 87410

PHONE: 632-1486

*General Dirt Moving, Land Leveling, Oilfield Roads & Locations*

Isn't there already a facility in place which serves the same function, approximately ten miles south of Bloomfield? How many more waste disposal sites are needed in this area? If there truly is a need for another site, I am sure a more remote site shouldn't be that hard to locate. While it may "inconvenience" the owners, at least some regard could be shown for the area landowners health and safety.

We implore you to act on behalf of the people who will be most affected by construction of this facility and refuse approval for modification of the Basin Disposal facility.

Sincerely,

*Ernest G. Motto by M.S.*

Ernest G. Motto, President  
ADOBE CONTRACTORS, INC.

OIL CONSERVATION DIVISION  
RECEIVED

Machelle Stinson  
P.O. Box 618  
Aztec, New Mexico 87410

'91 JUL 22 AM 9 24

July 18, 1991

Director, Oil Conservation Division  
State Land Office Building  
P.O. Box 2088  
Santa Fe, New Mexico 87504-2088

Re: Application to modify the Basin Disposal facility located in the  
SW/4 NW/4 and the SE/4 NW4, section 3, Township 29 North, Range 11 West,  
NMPM, San Juan County, New Mexico

Dear Sirs:

As an individual, employed by Adobe Contractors, Inc., for the past seven years, I would like to object to the modifications being proposed by Basin Disposal. Due to my experiences with Basin Disposal in the past, we realize that many unforeseen circumstances can arise involving produced drilling water and materials. Although in their application they have addressed ground water I would request further environmental impact studies be conducted to determine the effects of vapors and fumes being formed through evaporation and emitted into the air.

Because we are serviced with water pumped from Bloomfield, the ground water issue is one of the least serious effects that could be addressed. Unfortunately, we have no outside source for the air we breathe

If the owners of Basin Disposal are so certain there are no health hazards involved in the construction of their latest endeavor, I would respectfully suggest they build the facility in the immediate vicinity of their properties in Aztec.

Yours Truly,

*Machelle Stinson*

Machelle Stinson



# United States Department of the Interior

BUREAU OF LAND MANAGEMENT  
Farmington Resource Area  
1235 Laplata Highway  
Farmington, New Mexico 87401



IN REPLY REFER TO:  
1703 (019)

Director, Oil Conservation Division  
State Land Office Building  
P. O. Box 2088  
Santa Fe, NM 87504-2088

JUL 16 1991

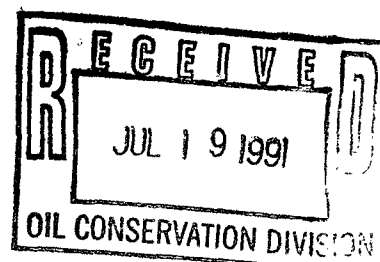
Dear Sirs:

At this time the Bureau of Land Management (BLM) has no objections to Basin Disposal's modification of their facilities. Although, it is our recommendation that Basin install monitoring wells, if they aren't already in place, to monitor the migration of any material off of Basin's property. The BLM also reserves the right to object to Basin's operation in the future if we feel that their operation is effecting BLM property, which is adjacent to their facility.

Thank you for your cooperation in this matter.

Sincerely,

John A. Phillips  
Acting Area Manager





STATE OF NEW MEXICO  
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT  
OIL CONSERVATION DIVISION

BRUCE KING  
GOVERNOR

July 24, 1991

POST OFFICE BOX 2088  
STATE LAND OFFICE BUILDING  
SANTA FE, NEW MEXICO 87504  
(505) 827-5800

**CERTIFIED MAIL**  
**RETURN RECEIPT NO. 106-675-363**

Ms. Betty Hollar  
P.O. Box 2016  
Bloomfield, N.M. 87413

**RE: BASIN DISPOSAL, INC. APPLICATION FOR LAND MANAGEMENT PROGRAM  
FOR SOLIDS FROM DRILLING MUD PITS**

Dear Ms. Hollar:

On July 19, 1991, you contacted me by telephone to voice your objection to the Basin Disposal, Inc. application to biodegrade non-hazardous clay-based drilling solids at their previously approved surface waste disposal facility north of Bloomfield, New Mexico.

The New Mexico Oil Conservation Division (OCD) rules require any objections or comments be filed in writing with the OCD within 30 days of public notice. We have made a note of your verbal objection to Basin Disposal's application, but it cannot be used in considering the application. In order for your objection to be considered, please submit your comments or objections in writing to me at the above address on, or before, August 12, 1991, the close of the public comment period.

If you have any questions, please do not hesitate to call Roger Anderson of my staff at (505) 827-5884.

Sincerely,

William J. LeMay  
Director

WJL/WCO

xc: Frank Chavez, OCD Aztec Office  
Robert Stovall, OCD Legal Bureau  
D.C. Birdsong, Basin Disposal



ODECO, INC. OIL CONSERVATION DIVISION  
REC'D

P. O. BOX 1058  
BLOOMFIELD, N. M. 87413  
505-632-3392

'91 AUG 12 AM 8 55

August 8, 1991

David B.

Mr. William J. Lemay, Director  
State of New Mexico  
Oil Conservation Division  
State Land Office Building  
P. O. Box 2088  
Santa Fe, NM 87504-2088

Re: Basin Disposal, Inc.'s Application to Modify  
Their Previously Approved Surface Waste Disposal  
Permit

Dear Mr. Lemay:

Today, we received a letter from Basin Disposal, Inc. informing us of their decision to withdraw their land management application that is pending before the State of New Mexico Oil Conservation Division. We were simultaneously preparing a letter to your office regarding their letters dated July 5th, 12th and 29th.

We have acquired five acres of land across the highway from their facility under a real estate contract with David Douglas. We were deeply concerned about the possibility of an odor problem arising similar to what has been experienced with their facility in the past by other surrounding landowners. In addition, we were disturbed that approval of their application could result in a substantial amount of increased traffic on the already busy highway. Furthermore, we were troubled that their modification might pose a potential hazardous material threat to the area.

While we are certainly pleased with Basin's decision to withdraw their application, we also wanted to express our concerns about their application to your office at this time.

Respectfully submitted

ODECO, INC.

  
Annette Davis  
President

OIL CONSERVATION DIVISION  
RECEIVED

'91 AUG 1 AM 8 59

July 25, 1991

Director Oil Conservation Division  
State Land Office Building  
PO Box 2088  
Santa Fe, NM 87504-2088

ATTN: MR. WILLIAM J. LAMAY

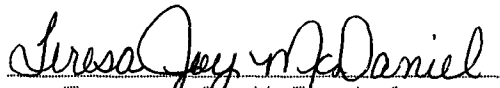
We have been out of town and only recently returned and read your letter. We hope that we are not too late to protest the possibility of approval of the application for Basin Disposal.

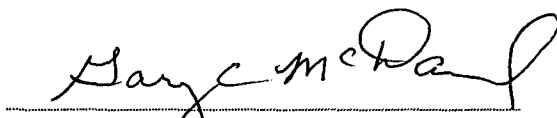
The owners of Basin Disposal have been told many times to clean out the waste pits, and can not be depended on to keep the waste disposal free from dangerous gases and chemicals.

We cannot be expected to believe that the substances to be mixed in with the soil near our property is or will remain non-hazardous.

We hope that you will make the right decision to protect the enviroment and the people.

Respectfully Yours,

  
Teresa J. McDaniel

  
Gary C. McDaniel

OIL CONSERVATION DIVISION  
RECEIVED

July 25, 1991

'91 AUG 1 AM 9 00

Director Oil Conservation Division  
State Land Office Building  
PO Box 2088  
Santa Fe, New Mexico 87504-2088

ATTN: MR. WILLIAM J. LAMAY

Dear Sir,

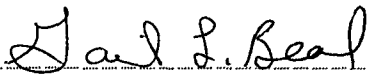
We are very interested in the outcome of your decision to approve or deny Basin Disposals application.

We don't believe that the drilling solids that are to be disked into the land that we are living close to will stay non-hazardous. We know from experience that the owners of Basin Disposal cannot be trusted to protect the surrounding area and families from dangerous pollution.

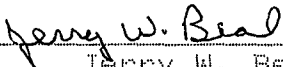
Basin Disposals solution to a very important problem looks good on paper, but sounds like the cheapest way for them to go. Maybe a better solution would be to disk the so-called non-hazardous waste into a remote area that is not occupied.

We will remain in close contact with the situation.

Thank-you,



Gail L. Beal



Jerry W. Beal

OIL CONSERVATION DIVISION  
RECEIVED

'91 AUG 1 AM 8 59

July 25, 1991

Director Oil Conservation Division  
State Land Office Building  
PO box 2088  
Santa Fe, NM 87504-2088

ATTN: MR. WILLIAM J. LAMAY

We are planning on moving to an area near Basin Disposal. We heard about Basin Disposals recent application; and are greatly concerned about the idea of waste from Basin Disposal being mixed into the surface area.

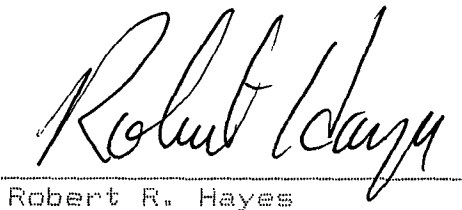
~~We have a new baby and need to know that the area will~~  
be safe. We need more proof than words on paper that the drilling solids are non-hazardous.

We know that Basin Disposal has had a lot of problems with H2S and has not done a very good job of monitoring the dangerous gas.

Your first priority should be to protect the people and the environment.

Thank You,

  
DeAnna L. Hayes

  
Robert R. Hayes

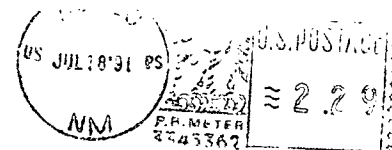


Adobe Contractors, Inc.  
P.O. BOX 970  
AZTEC, NEW MEXICO 87410

**CERTIFIED**

P 911 173 192

**MAIL**



Director, Oil Conservation Division  
State Land Office Building  
P.O. Box 2088  
Santa Fe, New Mexico 87504-2088

*CERTIFIED MAIL: Return Receipt Requested*

Is your RETURN ADDRESS  
completed on the reverse side?

Thank you for using  
Return Receipt Service.

MEMORANDUM OF MEETING OR CONVERSATION

☒ Telephone

☐ Personal

Time

1600

Date

7/16/90

Originating Party

Charles Choulson - OCP Aztec

Other Parties

Bill Olson - OCD Santa Fe

Subject

Bloomfield H<sub>2</sub>S Reports

Discussion

Two separate residents south of the Conoco plant have reported symptoms of H<sub>2</sub>S exposure.

One is the Tipton residence. The Tiptons live on the 1<sup>st</sup> road south of the Naby school. Phone # 632-2937

The other resident is the Bennet's. The Bennets live on 310 Sage Lane approximately 200' from the stack. 2 adults and 4 children live there. Phone # 632-1222

These people were referred to Aztec Office by EID Farmington Office

Conclusions or Agreements

In addition, Charles stated that he was at Basin Disposal today and noticed no H<sub>2</sub>S odor. Basin is currently down to 6.2° ft. freeboard and expects to open when the level is down further

Distribution

Basin Disposal File  
OGB

Signed

Bill Olson

MEMORANDUM OF MEETING OR CONVERSATION

☒ Telephone ☐ Personal

Time 3:45

Date 7/9/90

Originating Party

Other Parties

Frank Chavira - OCS Intec

Dave Boyer - OCS

Subject

Discussion

Pond level - 2.8", slight H<sub>2</sub>S odor, wind less than 10 mph  
Chemicals used for treating: Nalco from Chem-Link "OCS B-6605" for use in generation of chlorine-dioxide.

No complaint's on H<sub>2</sub>S since shut-down

Conclusions or Agreements

Distribution

Basin File

Signed

David H. Boyer

OIL CONSERVATION DIVISION

Santa Fe, New Mexico

TELECOPIER TRANSMITTAL SHEET

TO: Richard Cheney / FAX 327-1471  
FROM: David Boyer / 827-5912  
DATE: 7/2/90

NUMBER OF SHEETS (INCLUDING TRANSMITTAL SHEET): 5

IF YOU HAVE ANY PROBLEMS WITH THIS TRANSMISSION, PLEASE CALL  
(505) 827-5806.

MESSAGE

Richard -  
you will receive this letter in the  
mail, but I wanted you to get  
a copy ASAP.

*Dave*

FAX NUMBER: (505) 827-5741



STATE OF NEW MEXICO  
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT  
OIL CONSERVATION DIVISION

GARREY CARRUTHERS  
GOVERNOR

POST OFFICE BOX 2088  
STATE LAND OFFICE BUILDING  
SANTA FE, NEW MEXICO 87504  
(505) 827-5800

July 2, 1990

Mr. Richard P. Cheney  
Brewer Associates, Inc.  
P. O. Box 2079  
Farmington, New Mexico 87499

RE: Basin Disposal Inc. - Bloomfield Disposal Facility

Dear Mr. Cheney:

Enclosed is a copy of my notes of our phone conversation of June 29th, together with a copy of OCD's letter to Basin Disposal ordering them to cease accepting fluids. Please notify me if anything in my notes is inaccurate or needs clarification.

Based on our review of your letter of April 27, 1989, which provides us with the design specifications, and our June 29th conversation, we decided that the pond level would have to be lowered to a maximum of six feet of fluids to allow the approved design to function properly. Immediate action was necessary and taken because of the high growth rate of the H<sub>2</sub>S producing bacteria. If you have any comments, please contact me at 827-5812.

Sincerely,

A handwritten signature in cursive script that reads "David G. Boyer".

David G. Boyer, Hydrogeologist  
Environmental Bureau Chief

DGB/sl

Enclosures

MEMORANDUM OF MEETING OR CONVERSATION

☒ Telephone ☐ Personal

Time 11:30 AM

Date 6/29/90

Originating Party

David Boyer, OGD

Other Parties

Richard Cheney, Brewer Assoc  
Farmington 327-3306

Subject Basin Disposal Aeration System

Discussion

I called Cheney to inquire about the approved installed system. He stated it was installed as proposed in their 5/1/89 letter, and all eight aerators were in and operating. He stated that he has seen some salt buildup on the equipment. I told him what the problem was (1.1 ppm  $H_2S$  on 6/28) and the fluid freeboard was about 2 feet. He stated that with the "anti-erosion" devices to protect the liners from scour, the maximum operating depth of the pond should be about 6 feet.

Conclusions or Agreements

Without the devices, the range would be between 5 and 10 feet of fluids

Distribution

Basin Disposal file  
Richard Cheney.

Signed

David B Boyer



STATE OF NEW MEXICO  
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT  
OIL CONSERVATION DIVISION

GARREY CARRUTHERS  
GOVERNOR

POST OFFICE BOX 2088  
STATE LAND OFFICE BUILDING  
SANTA FE, NEW MEXICO 87504  
(505) 827-5800

June 29, 1990

CERTIFIED MAIL  
RETURN RECEIPT NO. P-918-402-312

Mr. Jerry Sandell  
Basin Disposal Inc.  
P. O. Box 100  
Aztec, New Mexico 87410

Mr. D. C. Turner  
Basin Disposal Inc.  
P. O. Box 100  
Aztec, New Mexico 87410

RE: Basin Disposal, Inc.  
Produced Water Disposal Facility  
San Juan County, New Mexico

Dear Mr. Sandell and Mr. Turner:

On June 28, 1990, at approximately 8:00 P.M., Mr. Frank Chavez, Aztec District Supervisor, visited your facility in response to two citizens complaints of odors. Mr. Chavez accompanied the Basin Disposal Operator on his scheduled monitoring for H<sub>2</sub>S. H<sub>2</sub>S levels as high as 1.1 ppm were observed on the south and east sides of the pond. On return to the office, no readings were entered in the required logs. When asked for a copy of the log, the operator could not locate one.

In a phone conversation this date with Mr. David Boyer of my staff, Mr. Richard P. Cheney, PE, of Brewer Associates, the engineer that designed Basin Disposal's Mixing and Aeration System, stated that with current "anti-erosion" devices installed to prevent damage to the flexible membrane liner, the operating depth of fluid in the pond should be kept to a maximum of 6 feet to prevent bacteria from generating H<sub>2</sub>S.

Due to the reoccurrence of H<sub>2</sub>S emissions above 1 ppm and the failure to maintain or produce a written log of monitoring readings as required, you are directed to take the following actions:

**RECEIVED**  
JUN 29 1990  
OIL CON. DIV.  
DIST.

*Tom Fisk*  
*6/29/90*



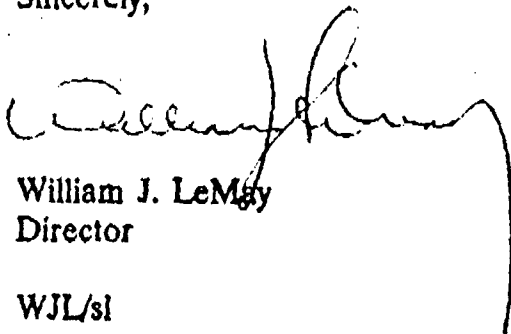
Mr. Jerry Sandell and  
Mr. D. C. Turner  
June 29, 1990  
Page -2-

1. Effective midnight June 29, 1990, cease receiving fluids for disposal.
2. Immediately begin lowering the fluid level in the pond. No fluids can be accepted until the fluid depth in the pond is six (6) feet or less.
3. Maintain the fluid depth of six (6) feet or less based on the maximum fluid level in the design criteria of the aeration system. The maximum allowable fluid depth may be lowered by the OCD if aeration and circulation of the pond is not achieved and H<sub>2</sub>S emissions continue.
4. Immediately begin hourly monitoring for H<sub>2</sub>S at the previously designated locations on a 24 hour basis and maintain the required records.

These requirements shall remain in effect until such time as the current H<sub>2</sub>S problem ceases and OCD is able to ascertain whether additional requirements are necessary to prevent occurrences of high H<sub>2</sub>S levels in the future. Additional requirements or stipulations may be required if these measures are not effective in eliminating measurable H<sub>2</sub>S.

If you have questions on these requirements, please contact Mr. David Boyer of my staff at 827-5812.

Sincerely,



William J. LeMay  
Director

WJL/sl

cc: OCD Aztec Office  
Red Walsh, Walsh Engineering



STATE OF NEW MEXICO  
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT  
OIL CONSERVATION DIVISION

GARREY CARRUTHERS  
GOVERNOR

POST OFFICE BOX 2088  
STATE LAND OFFICE BUILDING  
SANTA FE, NEW MEXICO 87504  
(505) 827-5800

June 29, 1990

CERTIFIED MAIL  
RETURN RECEIPT NO. P-918-402-312

Mr. Jerry Sandell  
Basin Disposal Inc.  
P. O. Box 100  
Aztec, New Mexico 87410

Mr. D. C. Turner  
Basin Disposal Inc.  
P. O. Box 100  
Aztec, New Mexico 87410

RE: Basin Disposal, Inc.  
Produced Water Disposal Facility  
San Juan County, New Mexico

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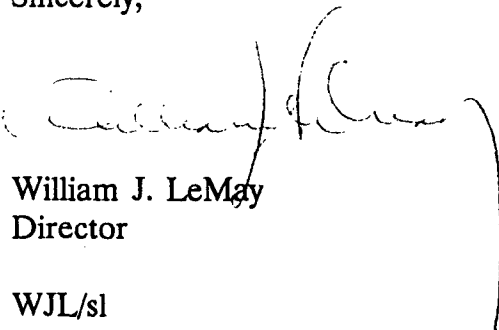
Mr. Jerry Sandell and  
Mr. D. C. Turner  
June 29, 1990  
Page -2-

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These requirements shall remain in effect until such time as the current H<sub>2</sub>S problem ceases and OCD is able to ascertain whether additional requirements are necessary to prevent occurrences of high H<sub>2</sub>S levels in the future. Additional requirements or stipulations may be required if these measures are not effective in eliminating measurable H<sub>2</sub>S.

If you have questions on these requirements, please contact Mr. David Boyer of my staff at 827-5812.

Sincerely,



William J. LeMay  
Director

WJL/sl

cc: OCD Aztec Office  
Red Walsh, Walsh Engineering



CONSERVATION DIVISION

RENEWABLE ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION  
AZTEC DISTRICT OFFICE

90 JUL 3 AM 9

1000 RIO BRAZOS ROAD  
AZTEC, NEW MEXICO 87410  
(505) 334-6178

June 29, 1990

Mr. William J. LeMay, Director  
Oil Conservation Division  
P.O. Box 2088  
Santa Fe, NM 87504-2088

RE: H2S at Basin Disposal

Dear Mr. LeMay:

At 8:00 PM on June 28, I received a telephone call at home from Mr. Tim Payne who lives near Basin Disposal. He complained that the hydrogen sulfide odors were very high at his home. I immediately went to Basin Disposal. When I arrived, the operator was just coming out of the office to make his rounds with the H2S monitor. I accompanied him on this round. On the south and east sides of the pit, we measured H2S levels as high as 1.1 PPM. When we returned to the office, he did not record any of the readings. When I asked for a copy of the previous readings, he could not locate it.

I went next to the Payne's residence. When I arrived there, the H2S odor was as strong as it was at the pit and as uncomfortable as during some of the worst times in 1987. Mr. Payne related that this week was the worst it had been all year.

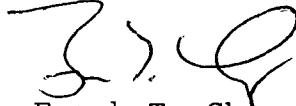
Earlier this week Mr. Gholson received a call from a female employee at the construction company office across the highway from Basin Disposal relating that the H2S odors were again present. Also, Mrs. Alice Dugger of our staff who drives by Basin Disposal daily complained about the odor.

This morning at 10:00 AM, I returned to Basin Disposal. I asked the operators if they had taken readings for H2S and they replied that they had and had found nothing. We then went to the pit and measured 0.2 PPM on the west side of the pit with the wind blowing at 5-10 MPH.

Mr. William J. Lemay, Director  
Page 2  
June 29, 1990

Our previous experience indicates that the readings obtained at the berm are not much different than those at the fenceline 20 feet away and are dependent on temperature and wind direction. The water level is currently 2.5 feet below the top of the pit, biocide is being added every day, and the aeration and circulation systems are operating.

Sincerely,

A handwritten signature in dark ink, appearing to read 'F. Chavez', with a stylized flourish at the end.

Frank T. Chavez  
NMOCD Supervisor  
District III

FTC:sh



STATE OF NEW MEXICO  
ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT  
OIL CONSERVATION DIVISION  
AZTEC DISTRICT OFFICE

1000 RIO BRAZOS ROAD  
AZTEC, NEW MEXICO 87410  
(505) 334-6178

June 29, 1990

Mr. William J. LeMay, Director  
Oil Conservation Division  
P.O. Box 2088  
Santa Fe, NM 87504-2088

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Mr. William J. Lemay, Director  
Page 2  
June 29, 1990

Our previous experience indicates that the readings obtained at the berm are not much different than those at the fenceline 20 feet away and are dependent on temperature and wind direction. The water level is currently 2.5 feet below the top of the pit, biocide is being added every day, and the aeration and circulation systems are operating.

Sincerely,

Frank T. Chavez  
NMOCD Supervisor  
District III

FTC:sh

OIL CONSERVATION DIVISION

Santa Fe, New Mexico

TELECOPIER TRANSMITTAL SHEET

TO: FRANK CHavez  
FROM: Dave Boyer  
DATE: 6/29/90

NUMBER OF SHEETS (INCLUDING TRANSMITTAL SHEET): 4

IF YOU HAVE ANY PROBLEMS WITH THIS TRANSMISSION, PLEASE CALL  
(505) 827-5806.

MESSAGE

FRANK -

Could you please have a staff member go out and take current readings (at the berm and seenceline) and find out if they have readings on file for the past 72 hours. I'm worried with this heat, the problem will get worse.

Thanks  
Dave

FAX NUMBER: (505) 827-5741





STATE OF NEW MEXICO  
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT  
OIL CONSERVATION DIVISION

GARREY CARRUTHERS  
GOVERNOR

POST OFFICE BOX 2088  
STATE LAND OFFICE BUILDING  
SANTA FE, NEW MEXICO 87504  
(505) 827-5800

November 23, 1987

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

Basin Disposal, Incorporated  
C/O Walsh Engineering  
P. O. Drawer 419  
Farmington, New Mexico 87401

RE: H<sub>2</sub>S Contingency Plan

Dear Mr. Walsh:

The Oil Conservation Division has received and is in the process of reviewing your proposal dated September 28, 1987 for an H<sub>2</sub>S contingency plan for your Bloomfield disposal facility. After several discussions with you in person and by phone, the following clarifications or requirements are necessary for review to continue:

1. In Item 2 you state that H<sub>2</sub>S readings will be obtained every two (2) hours during normal operating hours, 7:00 AM to 7:00 PM, Monday through Saturday. As discussed in our phone conversations this proposal is acceptable provided a gradual phase out of the 24 hour monitoring schedule is performed. The 24 hour per day monitoring phase out schedule agreed to is:
  - a. Beginning November 1, 1987, obtain H<sub>2</sub>S monitor readings hourly for a 24 hour period three times a week. Obtain hourly readings during operating hours for the remaining four days in this week.
  - b. Beginning November 9, 1987, obtain H<sub>2</sub>S monitor readings hourly for a 24 hour period two times a week. Obtain hourly readings during operating hours for the remaining five days in this week.
  - c. Beginning November 16, 1987, obtain H<sub>2</sub>S monitor readings hourly for a 24 hour period once a week. Obtain hourly readings during operating hours for the remaining six days in this week.
  - d. Beginning November 30, 1987, obtain H<sub>2</sub>S monitor readings as proposed in your contingency plan.
2. pH will be obtained once each shift during normal operating days. If the pH of the pond falls below 8, immediate actions will be taken to raise it to 8.

3. The spray system operating requirements need clarification. The conditions which prohibit the operation of the spray system are:
- a. The spray system will not operate when winds are in excess of 15 mph, sustained or in gusts.
  - b. The spray system will not be operated when the wind direction is to the Southeast, South, or Southwest.
  - c. The spray system will be operated during daylight hours only.
  - d. Individual sprayers in the system will be oriented to direct the fluid spray so that no direct spray or windblown drift will leave the confines of the lined portion of the pit.
4. In Item 3 it is stated "In the event of accidental release of health threatening concentrations of  $H_2S$ ,...". "Health threatening" can be very ambiguous. Any release in excess of 10 ppm as measured at the fence line will require the notification of the public safety personnel listed in the plan.
5. Item 4 states that a "continual" release of  $H_2S$  in excess of 1.0 ppm will require the notification of Oil Conservation Division personnel. Continual does not identify a time period. Any two consecutive time periods where any monitoring readings at the fence line are in excess of 1.0 ppm will require the notification of Oil Conservation Division personnel. Consecutive readings do not have to occur at the same measuring point.
6. If consecutive readings of 1 ppm of  $H_2S$  are encountered, hourly monitoring 24 hours per day will be instituted immediately. In addition, pond samples will be analyzed daily for dissolved sulfides.

Please submit an amended contingency plan that includes these requirements. If you have any questions please call me at (505) 827-5885.

Sincerely,



Roger Anderson  
Environmental Engineer

cc: OCD - Aztec

RA:sl



EXHIBIT NO. 5

BASIN DISPOSAL, INC.  
H<sub>2</sub>S Contingency Plan

1. Incoming fluids will be monitored by H<sub>2</sub>S Monitor, the type currently being utilized, for presence of H<sub>2</sub>S.

Incoming fluids indicating, by monitor, H<sub>2</sub>S in excess of 10.0 ppm will be stored for treatment prior to disposal in disposal pond or in Salt Water Disposal Well.

2. The current method of monitoring the levels of H<sub>2</sub>S leaving the boundries of the facility, monitoring at the fence line, will be utilized. Monitor readings will be obtained every two (2) hours during the time the facility is manned or during normal operating hours. Normal operating hours, to be utilized, are from 7:00 AM to 7:00 PM, Monday through Saturday of each week.

The spray system will only be utilized during normal operating hours. Also spray system will be utilized when winds are not in excess of 15 mph or from the southern direction or quadrants.

3. In the event of accidental release of health threatening concentrations of H<sub>2</sub>S, the following public safety personnel will be notified by telephone:

1. San Juan County Fire Marshall
2. San Juan County Sheriffs Department
3. New Mexico State Police

Telephone numbers to contact the above will be posted at the Disposal Facility and employees instructed as to when and how to contact the above. In addition the Designated Representative or alternate will be available to contact the above.

4. In the event of continual H<sub>2</sub>S releases in excess of 1.0 ppm leaving the premises one of the following OCD personnel will be immediately notified by telephone.

1. Frank Chavez
2. Charley Gholson
3. Ernie Busch

Telephone numbers to contact the above will be posted at the Disposal Facility and employees instructed as to when and how to contact the above. In addition the Designated Representative or alternate will be available to contact the above.

Submitted by Walsh Engg  
September 28, 1987  
WFB



OIL CONSERVATION DIVISION  
RECEIVED

**WALSH**

ENGINEERING & PRODUCTION CORP.

55 JUN 18 1990

Petroleum Engineering Consulting  
Lease Management  
Contract Pumping

204 N. Auburn  
P. O. Drawer 419  
Farmington, New Mexico 87499  
(505) 327-4892

June 12, 1990

Mr. Roger Anderson  
Energy & Minerals Department  
N.M. Oil Conservation Commission  
P. O. Box 2088  
Santa Fe, New Mexico 87504-2088

REF: Basin Disposal

Dear Mr. Anderson:

This is to advise you of a modification to the disposal of produced water.

A larger pump was installed for disposing of produced water in the injection well.

The pump installed was:

Gaso Fig. No. 5350-MM  
2-1/2" Plungers x 3-1/2" Stroke  
Quintaplex  
with  
Westinghouse 100 H.P. Electric Motor

Injection, with larger pump, commenced June 11, 1990.

After 24 hours the injection rate was approximately 3000 barrels per day at 1240 psig.

Very truly yours,

Ewell N. Walsh, P.E.  
President

ENW:rr

cc: Frank Chavez, District Supervisor  
OCD, Aztec, N.M.

cc: Basin Disposal, Inc.



2506 West Main Street  
Farmington, New Mexico 87401  
Tel. (505) 326-4737

CLIENT: OCD  
ID: 8908221510  
SITE: Basin Pond  
LAB NO: F2097

DATE REPORTED: 09/20/89  
DATE EXTRACTED: 09/15/89  
DATE RECEIVED: 08/29/89  
DATE COLLECTED: 08/22/89

Analysis Requested: Purgeable halocarbons in water.

Parameter	Concentration	Units
Bromobenzene	ND (1.0)	ug/l
Bromodichloromethane	ND (1.0)	ug/l
Bromoform	ND (1.0)	ug/l
Carbon Tetrachloride	ND (1.0)	ug/l
Chlorobenzene	ND (1.0)	ug/l
Chloroethane	ND (1.0)	ug/l
Chloroform	3.01 (1.0)	ug/l
Chloromethane	ND (1.0)	ug/l
Dibromochloromethane	ND (1.0)	ug/l
Dibromomethane	ND (1.0)	ug/l
1,2-Dichlorobenzene	ND (1.0)	ug/l
1,3-Dichlorobenzene	ND (1.0)	ug/l
1,4-Dichlorobenzene	ND (1.0)	ug/l
Dichlorodifluoromethane	ND (1.0)	ug/l
1,1-Dichloroethane	ND (1.0)	ug/l
1,2-Dichloroethane	ND (1.0)	ug/l
1,1-Dichloroethene	ND (1.0)	ug/l
trans-1,2-Dichloroethene	ND (1.0)	ug/l
1,2-Dichloropropane	ND (1.0)	ug/l
1,3-Dichloropropylene	ND (1.0)	ug/l
2,2-Dichloropropane	ND (1.0)	ug/l
Dichloromethane	ND (1.0)	ug/l
1,1,1,2-Tetrachloroethane	ND (1.0)	ug/l
1,1,2,2-Tetrachloroethane	ND (1.0)	ug/l
Tetrachloroethene	ND (1.0)	ug/l
1,1,1-Trichloroethane	ND (1.0)	ug/l
1,1,2-Trichloroethane	ND (1.0)	ug/l
Trichloroethene	ND (1.0)	ug/l
Trichlorofluoromethane	ND (1.0)	ug/l
1,2,3-Trichloropropane	ND (1.0)	ug/l
Benzyl Chloride	ND (1.0)	ug/l

**RECEIVED**

OCT - 3 1989

OIL CONSERVATION DIV.  
SANTA FE



2506 West Main Street  
Farmington, New Mexico 87401  
Tel. (505) 326-4737

CLIENT: OCD  
ID: 8908221510  
SITE: Basin Pond  
LAB NO: F2097  
Analysis Requested: Purgeable halocarbons in water.

DATE REPORTED: 09/20/89  
DATE EXTRACTED: 09/15/89  
DATE RECEIVED: 08/29/89  
DATE COLLECTED: 08/22/89

bis(2-chloroethoxy)methane	ND	(1.0)	ug/l
bis(2-Chloroisopropyl)ether	ND	(1.0)	ug/l
Bromomethane	ND	(1.0)	ug/l
Chloracetaldehyde	ND	(1.0)	ug/l
1-Chlorohexane	ND	(1.0)	ug/l
1-Chloroethyl Vinyl Ether	ND	(1.0)	ug/l
Chloromethyl methyl ether	ND	(1.0)	ug/l
Chlorotoluene	ND	(1.0)	ug/l
1,3-Dichloropropene	ND	(1.0)	ug/l

Method:

8010 Halogenated Volatile Organics, SW-846, USEPA (1982).

(Detection limit in parenthesis.)

ND - Parameter not detected at the stated detection limit.

C. Neal Schaeffer  
Senior Chemist

**RECEIVED**

OCT - 3 1989

OIL CONSERVATION DIV.  
SANTA FE



STATE OF NEW MEXICO  
RECEIVED DIVISION  
ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT  
OIL CONSERVATION DIVISION  
'90 APR 23 AM 9 37 AZTEC DISTRICT OFFICE

1000 RIO BRAZOS ROAD  
AZTEC, NEW MEXICO 87410  
(505) 334-6178

April 19, 1990

Mr. Ewell N. Walsh  
Walsh Engineering &  
Production Corp.  
P.O. Drawer 419  
Farmington, NM 87499

RE: Basin Disposal, Inc. Mud Pits

Dear Mr. Walsh:

As per our telephone conversation of April 3, 1990, your application to expand the mud disposal area by four to six pits approximately 150 feet west of the existing site is approved.

The pits will be lined and mud with detectible amounts of oil will not be put in the pits.

Sincerely,

Frank T. Chavez  
Supervisor  
District III  
NMOCD

FTC:sh

cc: Santa Fe

**WALSH**

ENGINEERING &amp; PRODUCTION CORP.

Petroleum Engineering Consulting  
Lease Management  
Contract Pumping204 N. Auburn  
P. O. Drawer 419  
Farmington, New Mexico 87499  
(505) 327-4892

April 3, 1990

Mr. Frank Chavez  
N.M. Oil Conservation Commission  
1000 Rio Brazos Road  
Aztec, New Mexico 87410REF: Basin Disposal, Inc.  
Drilling Mud Pits

Dear Mr. Chavez:

Approval is requested, on behalf of Basin Disposal, Inc., to expand the fenced area of the facility to allow construction of additional pits to only receive drilling mud.

Basin Disposal, Inc. will not accept loads of drilling mud, for disposal in drilling mud pits, that have detectable amount of oil in drilling mud.

It is proposed to expand the fenced area, to the west, approximately 150 feet. After completing the dirt construction the fence will be expanded to again have a fence enclosing the facility.

The expanded area will be sufficient for additional four (4) to six (6) drilling mud pits. The pits, approximately 100 feet long, 30 feet wide and 6 to 8 feet deep, will be lined with plastic.

Your approval of this request would be appreciated.

Very truly yours,

Ewell N. Walsh, P.E.  
PresidentENW:rr  
cc: Basin Disposal, Inc.**RECEIVED**  
APR 03 1990  
OIL CON. D'  
DIST



MEMORANDUM OF MEETING OR CONVERSATION

☒ Telephone

☐ Personal

Time 10 AM

Date 2/27/90

Originating Party

Red Walsh, Walsh Eng.  
327-4892

Other Parties

David Boyer, OCH

Subject

Produced Water from Meridian Val Verde  
Gas Plant

Discussion

Red called to inquire if it was OK for  
Basin Disposal to take wastewater from the  
Val Verde plant. I said yes since it is  
water from primary gas production  
operations and Class II wells are authorized  
to dispose of this.

Conclusions or Agreements

I told him to notify appropriate  
persons, and I would put memo in file.

Distribution

Basin Disposal File

Signed

H. B. Boyer



STATE OF NEW MEXICO  
ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT  
OIL CONSERVATION DIVISION  
AZTEC DISTRICT OFFICE

1000 RIO BRAZOS ROAD  
AZTEC, NEW MEXICO 87410  
(505) 334-6178

October 11, 1989


Mr. Ewell N. Walsh  
P.O. Drawer 419  
Farmington, NM 87499

Re: Mud Pit Expansion at Basin Disposal

Dear Mr. Walsh:

You are hereby authorized to construct two more drilling mud disposal pits under the condition that they are lined as are the existing pits and as previously agreed you will not accept loads of mud with detectable oil.

Sincerely,

  
Frank T. Chavez  
District 3 Supervisor

FTC/jgb

~~cc: Dave Boyer~~

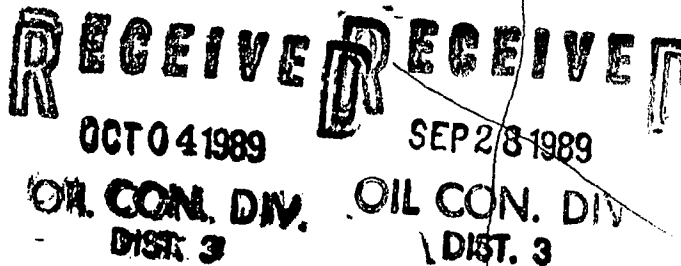
OIL CONSERVATION DIVISION  
RECEIVED  
'89 OCT 12 AM 8 59

**WALSH**

ENGINEERING &amp; PRODUCTION CORP.

Petroleum Engineering Consulting  
Lease Management  
Contract Pumping3001 Northridge Drive  
P.O. Drawer 419  
Farmington, New Mexico 87401  
(505) 327-4892

October 4, 1989

Mr. Frank Chavez  
N.M. Oil Conversation Commission  
1000 Rio Brazos Road  
Aztec, New Mexico 87410REF: Basin Disposal, Inc.  
Letter of September 12, 1989  
Drilling Mud Pits

Dear Mr. Chavez:

This is to advise you, as per our conversation, that Basin Disposal Inc. will not accept loads of drilling mud, for disposal in drilling mud pits, that have detectable amount of oil and drilling mud.

Therefore, it is requested that the request, as per the above-referred-to letter, be approved for construction of two (2) additional mud pits.

Very truly yours,

Ewell N. Walsh, P.E.  
President

ENW:rr

cc: Basin Disposal, Inc.

FILED  
DISTRICT COURT  
SAN JUAN COUNTY,  
N.M.

JUN 6 1 33 PM '89

ELEVENTH JUDICIAL DISTRICT COURT  
COUNTY OF SAN JUAN  
STATE OF NEW MEXICO

No. CV-87-569-1102

STATE OF NEW MEXICO; TIMOTHY PAYNE,  
et al.,

Plaintiffs,

v.

BASIN DISPOSAL, INC., et al.,

Defendants.

FINAL JUDGMENT

THIS MATTER having come on for trial on the merits in this Court beginning November 30, 1988, and the Court having entered its Findings of Fact and Conclusions of Law on March 13, 1989, and this Court having amended its Findings of Fact and Conclusions of Law in accordance with the evidence.

NOW THEREFORE IT IS ORDERED, ADJUDGED AND DECREED in accordance with the Court's Amended Findings of Fact and Conclusions of Law that plaintiffs recover from defendants Basin Disposal, Inc., Jerry Sandel, D.C. Turner, and David Turner the following: Jerry Beal, \$20,560.00; Gail Beal, \$17,400.00; Justin Lesky, \$7,000.00; Terry G. Crawford, \$16,860.00; Judy Crawford, \$19,520.00; Timothy Crawford, \$6,000.00; Jennifer Crawford, \$15,480.00; Jessica Crawford, \$15,480.00; Jimmie Brockwell, \$37,870.00; Carolyn Brockwell, \$22,750.00; Kimberly Ann Brockwell, \$4,500.00; Larry

Charley, \$22,680.00; Cora Charley, \$19,080.00; Larrial Charley, \$13,500.00; Farrell Charley, \$6,000.00; Delauren Ann Charley, \$6,000.00; Dolores Mescale (Long), \$15,660.00; Lucy Largo, \$1,000.00; Corlina Largo, \$4,750.00; Raymond DeHerrera, \$14,612.57; Dorthy DeHerrera, \$10,452.57; Abel Gallegos, \$5,250.00; Cruz Gallegos, \$5,250.00; Mary Lou Castillo (Gallegos), \$2,300.00; Rafael V. Castillo (Gallegos), \$7,870.00; Lawrence A. Gallegos, \$1,840.00; Patricia Hargis, \$26,880.00; William Hargis, \$9,660.00; Charles Hargis, \$16,160.00; Mack Mantle, \$23,710.00; Brooke McDaniel, \$7,500.00; Ronnie McDaniel, \$11,000.00; Teresa McDaniel, \$17,620.00; DeAnne McDaniel, \$7,500.00; MBM, a partnership, \$15,120.00; Gary McDaniel, \$18,120.00; Johanna McDaniel, \$11,000.00; Rhonda McDaniel, \$4,500.00; Joshua McDaniel, \$4,500.00; Harold Pacheco, \$7,720.00; Bessie Pacheco, \$13,755.00; Darryl Pacheco, \$4,375.00; Darrick Pacheco, \$3,500.00; Julie Ann Pacheco, \$3,500.00; Tim Payne, \$20,540.00; Teresa Payne, \$23,200.00; Lynn Payne, \$6,000.00; Amanda Payne, \$13,000.00; Doug Shipp, \$5,000.00; Kenneth N. Raney, \$25,120.00; Rose Raney, \$25,120.00; Richard Raney, \$12,000.00; Kenneth J. Raney, \$3,329.25; Traci Raney, \$4,500.00; Michael Raney, \$750.00; Lila Saiz, \$15,125.00; Bobby Carl White, \$3,000.00; Serene M. White, \$3,000.00; Bill Williams, \$11,830.00; Marty DeHerrera, \$3,000.00; Tonya McDaniel, \$4,500.00 for a total of \$704,799.39 in compensatory damages, \$206,329.50 for a reasonable attorney's fee, plus plaintiffs' costs of \$55,119.01 as allowed by law, and pursuant to the Court's Order on Costs, entered in this cause, plus interest at the rate of fifteen percent

(15%) per annum from the date of entry of this Final Judgment until defendants pay this judgment in full; and

IT IS FURTHER ORDERED, ADJUDGED AND DECREED that the defendants may operate their produced water disposal facility only under the following conditions:

1. that the defendants maintain the disposal pit in an aerobic condition;

2. keep the level of water in the disposal pit at a depth of no more than three (3) feet;

3. continue to operate the injection well for the disposal of excess produced water;

4. keep the spray and aeration systems in operation;

5. continue the present chemical treatment of the settling tanks and the disposal pit;

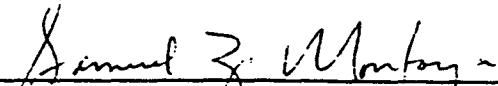
6. cease the depositing of any oils in the disposal pit and in the mud pits;

7. remove oils from said pits which are still present or which might accumulate in the future;

8. continue monitoring the emissions of hydrogen sulfide and limit such emissions to 0.010 parts per million, in compliance with the ambient air quality standards as promulgated by the Environmental Improvement Board of the State of New Mexico under its Air Quality Control Regulation 201 dated June 15, 1981;

9. monitor the build-up of sludge in the bottom of the disposal pit and remove same, if anaerobic conditions begin to develop in the disposal pit.

FURTHER, this Court retains continuing jurisdiction to enforce the conditions it finds necessary, as set forth in this judgment, to abate the nuisance.

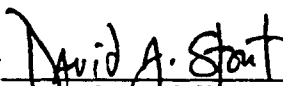
  
\_\_\_\_\_  
HONORABLE SAMUEL Z. MONTOKA  
District Judge Pro Tem

APPROVED AS TO FORM:

WELLS & MANDE, P.A.

By Approved Telephonically  
Deborah Mande  
Attorneys for Defendants  
301 Gold Avenue, SW  
P.O. Box 1787  
Albuquerque, NM 87103  
(505) 243-3727

CARPENTER and GOLDBERG, P.A.

By   
\_\_\_\_\_  
Joseph Goldberg  
David J. Stout  
Attorneys for Plaintiffs  
1600 University, NE, #B  
Albuquerque, NM 87102  
(505) 243-1336

ELEVENTH JUDICIAL DISTRICT COURT  
COUNTY OF SAN JUAN  
STATE OF NEW MEXICO

FILED  
DISTRICT COURT  
SAN JUAN COUNTY,  
N.M.

JUN 6 1 33 PM '89

No. CV-87-569-1102

STATE OF NEW MEXICO; TIMOTHY PAYNE,  
et al.,

Plaintiffs,

v.

BASIN DISPOSAL INC., et al.,

Defendants.

This matter is before the Court as plaintiffs' Motion To Amend Court's Findings of Fact and plaintiffs' Petition for Attorneys' Fees. The Court, having examined the legal memoranda of the parties, the pertinent legal authority and having heard oral argument of counsel hereby enters the following as its Amended Findings of Fact and Conclusions of Law in accordance with its rulings at the hearing of May 23, 1989.

COURT'S AMENDED FINDINGS OF FACT

1. Defendant Basin Disposal, Inc. ("Basin") is a New Mexico corporation doing business in San Juan County, New Mexico.

2. Defendant Jerry Sandel is a citizen and resident of San Juan County, New Mexico. Mr. Sandel is the president and treasurer of Basin. He is also a director of the corporation and owns twenty-five (25) percent of the capital stock in the corporation.

3. Defendant David Clifford Turner, III is a citizen and resident of San Juan County, New Mexico. Mr. David Turner is the secretary of Basin. He is also a director of the corporation and



owns twenty-five (25) percent of the capital stock in the corporation.

4. Defendant D.C. Turner is a citizen and resident of San Juan County, New Mexico. Mr. Turner is a vice-president and director of the corporation and owns twenty-five (25) percent of the capital stock in the corporation.

5. Mr. David Turner and Mr. D.C. Turner are also the owners and operations of Chief Transport Company, a trucking business which hauls water, formation fluids, drilling muds and other various materials and wastes related to the production of oil and gas.

6. Mr. Sandel also controls other business entities including Triple S Trucking Company, Inc. Triple S Trucking Co. is also in the business of hauling production fluids, muds, and wastes to and from the oil and gas fields.

7. Basin Disposal, Inc. is a disposal facility for waste products from the oil and natural gas industry. The primary operation of Basin is to serve as a waste repository for produced water. Produced water or formation water is a by-product of the production of oil and natural gas. When the oil or natural gas is extracted from the ground a certain amount of water present in the geologic formation is also brought to the surface. The constituents of produced water vary from formation to formation. To a lesser extent, Basin also accepts drilling muds, frac gels, reserve fluids, and other oil field wastes for disposal. Basin's facility is located on a twenty-two (22) acre site approximately two and one-half (2.5) miles north of Bloomfield, New Mexico on the west side of state

Highway 44 as the road proceeds north toward Aztec. The facility presently includes a large evaporation pond capable of holding some four million gallons of fluid, twelve (12) lined mud pits, and numerous storage tanks in various facets of the operation. The facility opened for business on or about October 1, 1985.

8. The Basin facility is subject to and regulated by the New Mexico Oil Conservation Division ("OCD").

9. The Basin Disposal Facility is located in San Juan County on Highway 44 between Bloomfield and Aztec, New Mexico, in a rural, unzoned, mixed use area.

10. The location, design, construction, and operation of the facility were approved by the OCD and were in compliance with all applicable permits, rules, regulations and criteria of the OCD.

11. Plaintiffs are all citizens and residents of San Juan County, New Mexico with the following exceptions: Harold Pacheco currently resides in California, Bobbie White and Serena White currently reside in California, Kimberly Brockwell currently resides in Texas. At the time these plaintiffs suffered the injuries complained of in this lawsuit, they were residents of San Juan County, New Mexico.

12. All other plaintiffs either currently reside in the immediate vicinity of Basin or did so at relevant times since the waste site was opened in October of 1985.

13. Basin started to emit hydrogen sulfide gas at least as early as the spring of 1987.

14. The levels of hydrogen sulfide gas emitted from Basin have been measured in a range between 0.1 and 300 parts per million (ppm). The Gas-Tech monitor used by Basin operators to measure ambient air emissions of hydrogen sulfide was unreliable. The monitor readings taken from that monitor were and are unreliable and have been systemically measuring the ambient air hydrogen sulfide levels below what the levels were in fact. Defendants' own expert, Dr. Rabinovitz, found in the fall of 1988 that Basin's monitor was incapable of calibration and that it had been underrecording hydrogen sulfide levels.

15. The emissions of hydrogen sulfide from Basin have continued up to the time of trial, in varying degrees.

16. The emissions of hydrogen sulfide from Basin carry over to the homes of the plaintiffs in sufficient concentrations to cause adverse physical and psychological effects and to create intolerably obnoxious odors.

17. The emissions of hydrogen sulfide from Basin carry over to highway 44 and throughout the surrounding area for a distance of approximately .5 to 1.0 mile north and 1.0 to 1.5 miles south. The odors are obnoxious and offensive to members of the public.

18. The spray system operated by Basin caused mist from Basin to carry over to the homes and property of the Payne family, Pat Hargis, and the Crawford family. This occurred at least during March of 1986. The mist left a powdery particulate residue as if a salty substance had been sprinkled on their motor vehicles which was hard to remove and damaged the paint and roof of the vehicles.

19. During the summer of 1987, a rain storm flushed materials which Basin had allowed to seep into the arroyo immediately south of the facility down the arroyo and onto the property of the Payne family and Mack Mantle. The "green foam" which was carried onto these plaintiffs' properties left a scummy residue.

20. The emissions of hydrogen sulfide from Basin were caused by the activity of bacteria which existed in the anaerobic environment created in the main evaporation pond.

21. The hydrogen sulfide emissions were caused by the design and operation of the waste disposal facility including the following acts and omissions by Basin and the individual defendants.

- a. the depth of the pond in excess of eleven feet;
- b. the acceptance of volumes of produced water two to three times in excess of the design capacity;
- c. the increase in the maximum water level of the pond;
- d. the operation of the spray system;
- e. the failure to monitor incoming loads of produced water from hydrogen sulfide prior to the summer of 1987;
- f. the failure to permit loads of produced water to settle prior to being placed in the main evaporation pond;
- g. the failure to increase the number of settling tanks to accommodate the increased volume of produced water;
- h. the ongoing presence of free-floating oil on the surface of the main evaporation system;
- i. the failure to remove sediments and sludge from the main evaporation pond;

j. the policy of the defendants to take every load of produced water brought to the facility regardless of its source or content;

k. the failure to exercise due caution with regard to loads of materials which may have contained high concentrations of bacteria, sulfides, or sulfates;

l. the decision to accept loads of produced water containing high concentrations of hydrogen sulfide and to store those loads in tanks with vents exposing the contents to the atmosphere.

22. Jerry Sandel, David Turner, and D. C. Turner made all of the decisions concerning the operation and maintenance of the facility including those identified in paragraph 18 above which caused the emissions of hydrogen sulfide.

23. Jerry Sandel, David Turner, and D. C. Turner established all of the policies and procedures which governed the operation of Basin including those identified in paragraph 18 above which caused the emissions of hydrogen sulfide.

24. A major contributing factor to the hydrogen sulfide problem was the individual defendants' choice of location for the waste disposal site. At the time the defendants purchased the site, there was a trailer located on the land where Ron Karcher was then living. In addition to Mr. Karcher, there were at least sixteen (16) families living within one-half mile of the location chosen by the defendants for their waste disposal facility. Including

within this group were forty-five (45) of the plaintiffs comprising some twelve (12) family groups.

25. The fifteen (15) remaining plaintiffs had either: (1) purchased the property prior to the building of Basin and were in the process of preparing the land in order to move to the site; or (2) move in with relatives who were already living there; or (3) were born there.

26. The unlined mud pits located to the west of the main evaporation pond were an ongoing problem. The original two pits were increased to four sometime in the winter of 1986. The pits were expanded to serve as a storage place for produced water because the main evaporation pond was reaching its capacity. The storage of produced water in the unlined mud pits was a violation of the OCD directives concerning what materials could be stored in the mud pits. Ultimately, the number of mud pits was expanded to twelve and all but one, were subsequently lined.

27. The presence of oil in the mud pits has been a recurrent problem which the defendants have failed to remedy despite repeated and ongoing directives from the OCD. There continues to be oil in the mud pits as found by the Court on its visit to the facility on December 22, 1988. Oil in the mud pits during the warm months of the year volatilizes and causes offensive hydrocarbon odors.

28. The emissions of hydrogen sulfide from Basin caused the plaintiffs to experience adverse health effects. The emissions of hydrogen sulfide caused the following physical effects either by direct exposure or as an indirect effect resulting from the stress

of living in a noxious environment: eye irritation, nose irritation, throat irritation, lung irritation, headaches, nausea, vomiting, bloody noses, insomnia, irritability, and diminished concentration.

29. The emissions of hydrogen sulfide from Basin also caused the plaintiffs to suffer adverse psychological effects. The emissions of hydrogen sulfide from Basin caused the plaintiffs to experience anxiety, depression, anger, and frustration. The emissions of hydrogen sulfide also caused Jennifer Crawford, Jessica Crawford, and Amanda Payne to develop post-traumatic stress disorder.

30. There is a need in San Juan County for disposal facilities for produced water. Basin, however, has accepted produced waters regardless of whether the source was San Juan County or even New Mexico. In fact, within weeks of opening on October 1, 1985, Basin's volume of intake was 1500 to 2000 bbls per day. The design capacity of the evaporation pond was 750 bbls. per day. A substantial or significant portion of this produced water did not come from the vulnerable areas in the San Juan Basin, but rather was trucked in from the Amoco fields in southern Colorado. Chief Transport Co., owned by the Turners, had a contract with Amoco to transport its produced water to the Basin disposal pond, including the produced waters from Colorado.

31. The individual defendants knew, from the time they first started operating the Basin facility in October of 1985, that produced water contained materials with dangerous properties and spe-

cifically knew that hydrogen sulfide was one of those dangerous materials in produced water.

32. The individual defendants failed to institute any policies or procedures to adequately protect the public and plaintiffs from these known dangers.

33. The emissions of hydrogen sulfide from Basin invaded the homes and property of plaintiffs. These hydrogen sulfide emissions were real and appreciable invasions into plaintiffs' homes and onto their property which were obnoxious and intolerable to normal persons in this particular locality.

34. The emissions of hydrogen sulfide from Basin interfered with and disrupted plaintiffs' freedom from annoyance and discomfort in the use and enjoyment of their land.

35. The emissions of hydrogen sulfide from Basin substantially interfered with plaintiffs' private use and enjoyment of their land.

36. Defendants' conduct with regard to the operation of Basin, at least from late May 1987 until the present, was intentional because during that time defendants knew that their conduct was causing the emissions of hydrogen sulfide or knew that the emissions of hydrogen sulfide was substantially certain to result from their conduct.

37. Defendants' conduct and operation of the waste disposal site was unreasonable because the gravity of the harm caused by the emissions of hydrogen sulfide was substantial and is continuing. The emissions of hydrogen sulfide affected the lives and property



where plaintiffs lived; it invaded their homes. The location of Basin was in an area of multiple uses, but there was a substantial residential population within close proximity to the disposal site at the time that defendants purchased the site and commenced construction. The burden on plaintiffs to avoid the harm is substantial and significant. The cost of relocating, the only practical means of avoiding the hydrogen sulfide emissions, is virtually prohibitive for some of these plaintiffs.

38. The conduct of defendants, from the time of decision to locate the site at its present location in August of 1985 to the present, created an unreasonable risk of a significant, substantial and unreasonable invasion of plaintiffs' use and enjoyment of their land which was a reasonably foreseeable occurrence of defendants' conduct.

39. Once the problem of hydrogen sulfide emissions from Basin arose, the efforts undertaken by the defendants to remedy the problem were not reasonable. Defendants disregarded the advice and counsel of experts in the trade including the advice and recommendations of persons from the Oil Conversation Division and from the Environmental Improvement Division of the New Mexico Health and Environment Department.

40. Among the unreasonable actions or omissions of defendants in failing to reasonably or adequately cure the known conditions causing the hydrogen sulfide emissions are the following:

a. the failure to drain the pond and clean out the sludge which was a major source of the hydrogen sulfide emissions because the sludge was a concentrated anaerobic environment;

b. the failure to install, in a timely manner, an adequate aeration system;

c. installing an inadequate and underpowered aeration system, when defendants belatedly installed one in August of 1988;

d. the continued use of the spray system after it was known or reasonably should have been known to defendants that the operation of the spray system would "strip" the water of hydrogen sulfide and thereby cause increased offensive and unhealthy hydrogen sulfide emissions;

e. continuing to accept produced water and other drilling fluids at rates in excess of the facility's design capacity and thereby continuing conditions which would maintain an anaerobic environment;

f. continuing to take produced water with unreasonably high levels of hydrogen sulfide, sulfides, and sulfates;

g. selection of the Biogenesis material as the primary mechanism of chemical remediation, without adequate investigation and under circumstances in which defendant knew or reasonably should have known that the Biogenesis material would not effect an adequate remedy to the conditions causing hydrogen sulfide emissions;

h. the treatment of the pond with concentrations of chemicals which defendants knew to be insufficient to effect a solution to the hydrogen sulfide problem;

i. the storage of produced water containing high concentrations of dissolved hydrogen sulfide in storage tanks which were not completely closed, thereby allowing hydrogen sulfide emissions into the atmosphere.

41. The defendants knowingly created and maintained the waste disposal facility which since at least late May 1987 and continuing to the time of trial generated hydrogen sulfide in sufficient concentrations to affect the health and well-being of the plaintiffs and other persons residing in the area.

42. The emissions of hydrogen sulfide affect a substantial number of persons, both plaintiffs and non-plaintiffs, who live and work in the vicinity of Basin.

43. The emissions of hydrogen sulfide from Basin disperse throughout the surrounding area and cause offensive and obnoxious odors affecting persons driving on highway 44 and those individuals who live and work in the vicinity of Basin. These emissions of hydrogen sulfide have caused adverse health effects to some persons who have traveled the public roads and highway near Basin or who work in the vicinity.

44. Basin and the individual defendants are without lawful authority to create these emissions of hydrogen sulfide.

45. The emissions of hydrogen sulfide are injurious to the public health and welfare.

46. The emissions of hydrogen sulfide interfere with the exercise and enjoyment of public rights and the right to use the public thoroughfares in the residential areas around Basin and on the highway.

47. The emissions of hydrogen sulfide from Basin have diminished the property value of the land surrounding the facility.

48. The emissions of hydrogen sulfide from Basin constitute an unreasonable interference with rights common to the public.

49. The conduct causing the emissions of hydrogen sulfide is continuing even after defendants knew it had a significant effect upon public rights.

50. The conduct of defendants directly infringed the right of possession to land enjoyed by the Hargis family.

51. The conduct of defendants directly infringed the right of possession to land enjoyed by Tim Payne and his family.

52. The defendants owed plaintiffs a duty to use reasonable care to insure that the operation of BASin would not injure them.

53. The defendants' conduct as found above was not reasonable and it was reasonably foreseeable that the hydrogen sulfide, which defendants knew was a material with dangerous properties present in produced water, would be emitted from the evaporation pond and that oils on the mud pits would volatilize and cause offensive odors.

54. A waste disposal facility for produced waters as operated by defendants is a dangerous activity.

55. Defendants knew or should have known that plaintiffs were a risk from this activity.

56. Jerry Sandel, David Turner, and D. C. Turner, as officers and directors of Basin, directly participated in or had knowledge amounting to acquiescence of the tortious conduct which caused plaintiffs' injuries. The conduct of the individual defendants in the operation of Basin was unreasonable and intentional because the individual defendants knew or should have known that their conduct in operating the facility would interfere with plaintiffs' health, comfort and use as well as enjoyment of their property.

57. The emissions of hydrogen sulfide was continued from at least late May of 1987 up until the time of trial. There is a strong temperature dependence on the anaerobic bacterial reaction which generates the hydrogen sulfide emissions so that the emissions problems are dramatically increased as the temperature rises. The evidence establishes that it is substantially probable that unless adequate remedial measures are taken, hydrogen sulfide emissions will continue in the future.

58. The frequency of the hydrogen sulfide emissions and its reoccurrence renders a complete remedy at law inadequate.

59. All of the plaintiffs have been damaged by the hydrogen sulfide emissions from Basin. Some of the plaintiffs moved away from their property and left the site because of fear for their own health. Other plaintiffs moved away because of concerns for their children's health and well-being. Those plaintiffs who were not in a position to move away permanently found that when the hydrogen

sulfide emissions enveloped their homes they would leave their homes and go to the homes of relatives, or friends, or campsites, or anywhere they could to get away from the odors. They would have to shut off their air coolers which otherwise would suck the hydrogen sulfide fumes into their homes, and close their windows and doors, to escape the noxious odors, and resulting in intolerable heat and loss of ventilation in plaintiffs' homes. The hydrogen sulfide emissions affected their comfort as well as plaintiffs' social relations. The odors discouraged plaintiffs from inviting friends and family to their homes and otherwise using their homes and property in the normal social way.

60. The majority of the plaintiffs were evacuated from their homes on July 7, 1987 on two different occasions for a total of eight days while the disposal pit was being chemically treated and lodged in motels at Aztec and Farmington at Basin's expense.

61. Plaintiffs retained counsel in order to abate the nuisance caused by the emissions of hydrogen sulfide from Basin.

62. Counsel for plaintiffs have expended considerable amounts of time in attempting to require defendants to abate the nuisance.

63. The evidence herein establishes that the plaintiffs suffered adverse health effects for at least six months of each year for the years 1987 and 1988; that plaintiffs lost the use and enjoyment of their property through the annoyance, inconvenience, discomfort and vexation caused by the hydrogen sulfide emissions while living at the disposal site; that some of the plaintiffs suffered psychological injuries in varying degrees, some of which will

require psychological counseling; that some of the plaintiffs experienced diminution in the value of their property; that some of the plaintiffs incurred expenses in moving their mobile homes away from the Basin disposal site; other plaintiffs incurred other special damages which are hereinafter set forth. That all of such damages were caused by the hydrogen sulfide emissions from the disposal site or the operation of the facility, and that by reason thereof, the plaintiffs are entitled to an award of damage as follows:

64. Jerry Beal suffered nausea, nose-bleeding, headaches, stomach-ache, difficulty in breathing, vomiting, and is awarded damages as follows:

Physical injuries:	\$ 5,000.00
Psychological injuries:	\$ 3,000.00
Psychological counselling	\$ 4,320.00
Loss of use and enjoyment of Property:	\$ 5,000.00
Property loss (diminished value):	<u>\$ 3,240.00</u>
Total:	\$20,560.00

65. Gail Beal suffered nausea, eye-irritation, nose-bleeding, headaches, burning eyes, sinus infections, and is awarded damages as follows:

Physical injuries:	\$ 5,000.00
Psychological injuries:	\$ 2,000.00
Psychological counselling	\$ 2,160.00
Property loss (diminished value):	\$ 3,240.00
Loss of use and enjoyment of Property:	<u>\$ 5,000.00</u>
Total:	\$17,400.00

66. Justin Lesky, age 15, suffered nausea, eye irritation, nose-bleeding, headaches and is awarded damages as follows:

Physical injuries:	\$ 2,750.00
Psychological injuries:	\$ 1,500.00
Loss of use and enjoyment of Property:	<u>\$ 2,750.00</u>
Total:	\$ 7,000.00

67. Terry G. Crawford suffered nausea, headaches, burning eyes, sore throat, and is awarded damages as follows:

Physical injuries:	\$ 6,000.00
Psychological injuries:	\$ 1,500.00
Loss of use and enjoyment of Property:	\$ 6,000.00
Property loss (diminished value):	<u>\$ 3,360.00</u>
Total:	\$16,860.00

68. Judy Crawford suffered nausea, headaches, sore throat, and is awarded damages as follows:

Physical injuries:	\$ 6,000.00
Psychological injuries:	\$ 2,000.00
Psychological counselling:	\$ 2,160.00
Loss of use and enjoyment of Property:	\$ 6,000.00
Property loss (diminished value):	<u>\$ 3,360.00</u>
Total:	\$19,520.00

69. Timothy Crawford, age 15, suffered nausea, headaches, and is awarded damages as follows:

Physical injuries:	\$ 2,000.00
Loss of use and enjoyment of Property:	<u>\$ 4,000.00</u>
Total:	\$ 6,000.00



70. Jennifer Crawford, age 12, suffered headaches, post-traumatic anxiety and depression, and is awarded damages as follows:

Physical injuries:	\$ 3,000.00
Psychological injuries:	\$ 3,000.00
Psychological counselling:	\$ 6,480.00
Loss of use and enjoyment of Property:	<u>\$ 3,000.00</u>
Total:	\$15,480.00

71. Jessica Crawford, age 12, suffered eye-irritation, nose-bleeding, headaches, burning eyes, post-traumatic stress disorder, and is awarded damages as follows:

Physical injuries:	\$ 3,000.00
Psychological injuries:	\$ 3,000.00
Psychological counselling:	\$ 6,480.00
Loss of use and enjoyment of Property:	<u>\$ 3,000.00</u>
Total:	\$15,480.00

72. Jimmie Brockwell suffered eye-irritation, headaches, burning eyes, and is awarded damages as follows:

Physical injuries:	\$ 6,000.00
Loss of use and enjoyment of Property:	\$ 6,000.00
(residence)	
Property loss (diminished value):	\$10,750.00
1/2 interest in 20 acre tract:	<u>\$15,120.00</u>
Total:	\$37,870.00

73. Carolyn Brockwell suffered headaches, sore throat, and is awarded damages as follows:

Physical injuries:	\$ 6,000.00
Loss of use and enjoyment of Property:	\$ 6,000.00
Property loss (diminished value of residence)	<u>\$10,750.00</u>
Total:	\$22,750.00

74. Kimberly Ann Brockwell suffered headaches, and is awarded damages as follows:

Physical injuries:	\$ 1,500.00
Loss of use and enjoyment of Property:	<u>\$ 3,000.00</u>
Total:	\$ 4,500.00

75. Larry Charley suffered eye-irritation, nose-bleeding, burning eyes, dizziness, moderately severe psychological stress, and is awarded damages as follows:

Physical injuries:	\$ 6,000.00
Psychological injuries:	\$ 3,000.00
Psychological counselling:	\$ 4,320.00
Loss of use and enjoyment of Property:	\$ 6,000.00
Property loss (diminished value):	\$ 2,920.00
Lost use of sheep and horse corrals:	<u>\$ 440.00</u>
Total:	\$22,680.00

76. Cora Charley suffered nausea, nose-bleeding, headaches, sore throat, vomiting, and is awarded damages as follows:

Physical injuries:	\$ 6,000.00
Psychological injuries:	\$ 2,000.00
Psychological counselling:	\$ 2,160.00
Loss of use and enjoyment of Property:	\$ 6,000.00
Property loss (diminished value):	<u>\$ 2,920.00</u>
Total:	\$19,080.00

77. Larrial Charley suffered eye-irritation, nose-bleeding, headaches, irritation and is awarded damages as follows:

Physical injuries:	\$ 6,000.00
Psychological injuries:	\$ 1,500.00
Loss of use and enjoyment of Property:	<u>\$ 6,000.00</u>
Total:	\$13,500.00

78. Farrell Charley, Age 10, suffered nose-bleeding, headaches, sore throat, vomiting, and is awarded damages as follows:

Physical injuries:	\$ 3,000.00
Loss of use and enjoyment of Property:	<u>\$ 3,000.00</u>
Total:	\$ 6,000.00

79. Delauren Ann Charley, age 4, suffered headaches, stomach-ache, sore throat, nose irritation, and is awarded damages as follows:

Physical injuries:	\$ 3,000.00
Loss of use and enjoyment of Property:	<u>\$ 3,000.00</u>
Total:	\$ 6,000.00

80. Dolores Mescale (Long) suffered eye-irritation, nose-bleeding, headaches, sore throat, and is awarded damages as follows:

Physical injuries:	\$ 6,000.00
Psychological injuries:	\$ 1,500.00
Psychological counselling:	\$ 2,160.00
Loss of use and enjoyment of Property:	<u>\$ 6,000.00</u>
Total:	\$15,660.00

81. Lucy Largo suffered from bronchitis sinus (laryngitis), and is awarded damages as follows:

Physical injuries:	\$ 500.00
Loss of use and enjoyment of Property:	<u>\$ 500.00</u>
Total:	\$ 1,000.00

82. Corlina Largo suffered eye-irritation, nose-bleeding, headaches, and is awarded damages as follows:

Physical injuries:	\$ 2,000.00
Psychological injuries:	\$ 750.00
Loss of use and enjoyment of Property:	<u>\$ 2,000.00</u>
Total:	\$ 4,750.00

83. Raymond De Herrera suffered nausea, eye-irritation, headaches, stomach-ache, dizziness, vomiting, and is awarded damages as follows:

Physical injuries:	\$ 3,000.00
Psychological injuries:	\$ 2,000.00
Psychological counselling:	\$ 2,160.00
Loss of use and enjoyment of Property:	\$ 3,000.00
Property loss - improvements cost:	
2.5 acre tract	\$ 1,566.32
4.7 acre tract	\$ 691.42
Moving expenses (2 mobile home trailers):	<u>\$ 2,194.83</u>
Total:	\$14,612.57

84. Dorothy De Herrera suffered nausea, headaches, stomach-ache, diarrhea, and is awarded damages as follows:

Physical injuries:	\$ 3,000.00
Loss of use and enjoyment of Property:	\$ 3,000.00
Property loss/improvements lost:	
2.5 acre tract	\$ 1,566.32
4.7 acre tract	\$ 691.42
Moving expenses (2 mobile home trailers):	<u>\$ 2,194.83</u>
Total:	\$10,452.57

85. Abel Gallegos suffered headaches, burning eyes, stomach-ache, dizziness, sore throat, vomiting, irritation, and is awarded damages as follows:

Physical injuries:	\$ 2,000.00
Psychological injuries:	\$ 750.00
Loss of use and enjoyment of Property:	\$ 2,000.00
Moving expenses:	<u>\$ 500.00</u>
Total:	\$ 5,250.00

86. Cruz Gallegos suffered eye-irritation, headaches, vomiting, irritation, and is awarded damages as follows:

Physical injuries:	\$ 2,000.00
Psychological injuries:	\$ 750.00
Loss of use and enjoyment of Property:	\$ 2,000.00
Moving expenses:	<u>\$ 500.00</u>
Total:	\$ 5,250.00

87. Mary Lou Castillo (Gallegos), age 14, suffered nose-bleeding, eyes, stomach-ache, eye irritation, and is awarded damages as follows:

Physical injuries:	\$ 750.00
Psychological injuries:	\$ 750.00
Loss of use and enjoyment of Property:	<u>\$ 800.00</u>
Total	\$ 2,300.00

88. Rafael V. Castillo (Gallegos), age 12, suffered headaches, stomach-ache, throat, vomiting, and is awarded damages as follows:

Physical injuries:	\$ 750.00
Psychological injuries:	\$ 2,000.00
Psychological counselling:	\$ 4,320.00

Loss of use and enjoyment of Property: \$ 800.00

Total \$ 7,870.00

89. Lawrence A. Gallegos is awarded special damages as follows:

Improvements made to property of Abel Gallegos,  
labor and backhoe rental \$ 1,840.00

90. Patricia Hargis suffered nausea, eye-irritation, nose-bleeding, severe headaches, nervousness, vomiting, and is awarded damages as follows:

Physical injuries: \$ 6,000.00  
Psychological injuries: \$ 2,000.00  
Psychological counselling: \$ 4,320.00  
Loss of use and enjoyment of Property: \$ 6,000.00  
Property loss (diminished value): \$ 7,560.00  
Trespass damages: \$ 1,000.00  
Total: \$26,880.00

91. William Hargis suffered nausea, headaches, stomach-ache, dizziness, and is awarded damages as follows:

Physical injuries: \$ 3,000.00  
Psychological injuries: \$ 1,500.00  
Psychological counselling: \$ 2,160.00  
Loss of use and enjoyment of Property: \$ 3,000.00  
Total: \$ 9,660.00

92. Charles Hargis suffered nausea, eye-irritation, headaches, burning eyes, nervousness, nose irritation, and is awarded damages as follows:

Physical injuries: \$ 6,000.00  
Psychological injuries: \$ 2,000.00  
Psychological counselling: \$ 2,160.00

Loss of use and enjoyment of Property: \$ 6,000.00  
Total: \$ 16,160.00

93. Mack Mantle suffered nausea, eye-irritation, nose-bleeding, headaches, burning eyes, stomach-ache, dizziness, sore throat, vomiting, irritation, and is awarded damages as follows:

Physical injuries: \$ 2,000.00  
Psychological injuries: \$ 750.00  
Psychological counselling: \$ 2,160.00  
Loss of use and enjoyment of Property: \$18,800.00  
Total: \$23,710.00

94. Brooke McDaniel, age 15, suffered eye-irritation, nose-bleeding, headaches, sleeplessness, sore throat, and is awarded damages as follows:

Physical injuries: \$ 3,000.00  
Psychological injuries: \$ 1,500.00  
Loss of use and enjoyment of Property: \$ 3,000.00  
Total: \$ 7,500.00

95. Ronnie McDaniel suffered nausea, nose-bleeding, headaches, and is awarded damages as follows:

Physical injuries: \$ 4,500.00  
Psychological injuries: \$ 1,500.00  
Loss of use and enjoyment of Property: \$ 4,500.00  
Special damages: Moving expenses: \$ 500.00  
Total: \$11,000.00

96. Teresa McDaniel suffered eye-irritation, nose-bleeding, burning eyes, sore throat, irritation, and is awarded damages as follows:

Physical injuries: \$ 6,000.00

Psychological injuries:	\$ 1,500.00
Loss of use and enjoyment of Property:	\$ 6,000.00
Property loss (diminished value):	<u>\$ 4,120.00</u>
Total:	\$17,620.00

97. DeAnne McDaniel, age 18, suffered nose-bleeding, headaches, stomach-ache, dizziness, and is awarded damages as follows:

Physical injuries:	\$ 3,000.00
Psychological injuries:	\$ 1,500.00
Loss of use and enjoyment of Property:	<u>\$ 3,000.00</u>
Total:	\$ 7,500.00

98. MBM, a partnership, is awarded damages for property loss as follows:

1/2 loss of MBM, 1/2 loss to Brockwell	<u>\$15,120.00</u>
Total:	\$15,120.00

99. Gary McDaniel suffered eye-irritation, headaches, anxiety, shortness of breath, and is awarded damages as follows:

Physical injuries:	\$ 6,000.00
Psychological injuries:	\$ 2,000.00
Loss of use and enjoyment of Property:	\$ 6,000.00
Property loss (diminished value):	<u>\$ 4,120.00</u>
Total:	\$18,120.00

100. Johanna McDaniel suffered nausea, headaches, sore throat, diarrhea, and is awarded damages as follows:

Physical injuries:	\$ 4,500.00
Psychological injuries:	\$ 1,500.00
Loss of use and enjoyment of Property:	\$ 4,500.00



Moving expenses: \$ 500.00

Total: \$11,000.00

101. Rhonda McDaniel, age 9, suffered nausea, nose-bleeding, headaches, vomiting, and is awarded damages as follows:

Physical injuries: \$ 2,250.00

Loss of use and enjoyment of Property: \$ 2,250.00

Total: \$ 4,500.00

102. Joshua McDaniel, age 4 suffered nausea, eye-irritation, vomiting, irritation, and is awarded damages as follows:

Physical injuries: \$ 2,250.00

Loss of use and enjoyment of Property: \$ 2,250.00

Total: \$ 4,500.00

103. Harold Pacheco suffered headaches, and is awarded damages as follows:

Physical injuries: \$ 2,000.00

Loss of use and enjoyment of Property: \$ 2,000.00

Property loss (diminished value): \$ 3,720.00

Total: \$ 7,720.00

104. Bessie Pacheco suffered nausea, slight depression and is awarded damages as follows:

Physical injuries: \$ 3,500.00

Psychological injuries: \$ 875.00

Psychological counselling: \$ 2,160.00

Loss of use and enjoyment of Property: \$ 3,500.00

Property loss (diminished value): \$ 3,720.00

Total: \$13,755.00

105. Darryl Pacheco, age 16, suffered nose-bleeding, headaches, shortness of breath and is awarded damages as follows:

Physical injuries:	\$ 1,750.00
Psychological injuries:	\$ 875.00
Loss of use and enjoyment of Property:	<u>\$ 1,750.00</u>
Total:	\$ 4,375.00

106. Darrick Pacheco, age 9, suffered nose-bleeding, vomiting, and is awarded damages as follows:

Physical injuries:	\$ 1,750.00
Loss of use and enjoyment of Property:	<u>\$ 1,750.00</u>
Total:	\$ 3,500.00

107. Julie Ann Pacheco, age 10, suffered nose-bleeding, vomiting, and is awarded damages as follows:

Physical injuries:	\$ 1,750.00
Loss of use and enjoyment of Property:	<u>\$ 1,750.00</u>
Total:	\$ 3,500.00

108. Tim Payne suffered nausea, eye-irritation, nose-bleeding, sore throat, difficulty in breathing, stress, and is awarded damages as follows:

Physical injuries:	\$ 6,000.00
Psychological injuries:	\$ 1,500.00
Psychological counselling:	\$ 2,160.00
Loss of use and enjoyment of Property:	\$ 6,000.00
Property loss (diminished value):	\$ 3,880.00
Trespass damages:	<u>\$ 1,000.00</u>
Total:	\$20,540.00

109. Teresa Payne suffered nausea, eye-irritation, headaches, upper respiratory infection, sore throat, vomiting, and is awarded damages as follows:

Physical injuries:	\$ 6,000.00
Psychological injuries:	\$ 3,000.00
Psychological counselling:	\$ 4,320.00

Loss of use and enjoyment of Property: \$ 6,000.00  
Property loss (diminished value): \$ 3,880.00  
Total: \$23,200.00

110. Lyn Payne, age 14, suffered nausea, eye-irritation, headaches, dizziness, and is awarded damages as follows:

Physical injuries: \$ 3,000.00  
Loss of use and enjoyment of Property: \$ 3,000.00  
Total: \$ 6,000.00

111. Amanda Payne, age 6, suffered nausea, eye-irritation, headaches, sore throat, nose irritation, and is awarded damages as follows:

Physical injuries: \$ 3,000.00  
Psychological injuries: \$ 3,000.00  
Psychological counselling: \$ 3,000.00  
Re-evaluation: \$ 1,000.00  
Loss of use and enjoyment of Property: \$ 3,000.00  
Total: \$13,000.00

112. Doug Shipp, age 18, suffered headaches, burning eyes, and is awarded damages as follows:

Physical injuries: \$ 3,000.00  
Loss of use and enjoyment of Property: \$ 2,000.00  
Total: \$ 5,000.00

113. Kenneth N. Raney suffered nausea, headaches, burning eyes, stomach-ache, dizziness, mental stress, and is awarded damages as follows:

Physical injuries: \$ 6,000.00  
Psychological injuries: \$ 2,000.00  
Psychological counselling: \$ 4,320.00  
Loss of use and enjoyment of Property: \$ 6,000.00

Property loss (diminished value):	<u>\$ 6,800.00</u>
Total:	\$25,120.00

114. Rose Raney suffered nausea, nose-bleeding, headaches, burning eyes, stomach-ache, dizziness, sore throat, vomiting, irritation, and is awarded damages as follows:

Physical injuries:	\$ 6,000.00
Psychological injuries:	\$ 2,000.00
Psychological counselling:	\$ 4,320.00
Loss of use and enjoyment of Property:	\$ 6,000.00
Property loss (diminished value):	<u>\$ 6,800.00</u>
Total:	\$25,120.00

115. Richard Raney suffered nausea, eye-irritation, sore throat, and is awarded damages as follows:

Physical injuries:	\$ 6,000.00
Loss of use and enjoyment of Property:	<u>\$ 6,000.00</u>
Total:	\$12,000.00

116. Kenneth J. Raney suffered headaches, sore throat, nose irritation, and is awarded damages as follows:

Physical injuries:	\$ 1,500.00
Loss of use and enjoyment of Property:	\$ 1,500.00
Special damages: Moving expenses:	<u>\$ 329.25</u>
Total:	\$ 3,329.25

117. Traci Raney suffered nausea, headaches, burning eyes, stomach-ache, dizziness, vomiting, irritation, and is awarded damages as follows:

Physical injuries:	\$ 1,500.00
Psychological injuries:	\$ 1,500.00
Loss of use and enjoyment of Property:	<u>\$ 1,500.00</u>
Total:	\$ 4,500.00

118. Michael Raney, age 1, suffered irritability and is awarded damages as follows:

Physical injuries:	<u>\$ 750.00</u>
Total:	\$ 750.00

119. Lila Saiz suffered nausea, eye-irritation, nose-bleeding, headaches, burning eyes, stomach-ache, dizziness, sore throat, vomiting, irritation, and is awarded damages as follows:

Physical injuries:	\$ 3,500.00
Psychological injuries:	\$ 1,500.00
Psychological counselling:	\$ 4,320.00
Loss of use and enjoyment of Property:	\$ 3,500.00
Property loss (diminished value):	\$ 2,080.00
Special Damages: Moving expenses:	<u>\$ 225.00</u>
Total:	\$15,125.00

120. Bobby Carl White suffered nausea, nose-bleeding, headaches, nose irritation, and is awarded damages as follows:

Physical injuries:	\$ 1,500.00
Loss of use and enjoyment of Property:	<u>\$ 1,500.00</u>
Total:	\$ 3,000.00

121. Serene M. White suffered nausea, headaches, vomiting, and is awarded damages as follows:

Physical injuries:	\$ 1,500.00
Loss of use and enjoyment of Property:	<u>\$ 1,500.00</u>
Total:	\$ 3,000.00

122. Bill Williams suffered nausea, eye-irritation, nose-bleeding, headaches, burning eyes, stomach-ache,

dizziness, sore throat, vomiting, irritation, and is awarded damages as follows:

Physical injuries:	\$ 4,000.00
Psychological injuries:	\$ 750.00
Loss of use and enjoyment of Property:	\$ 4,000.00
Property loss (diminished value):	\$ 2,080.00
Special damages: Moving expenses:	<u>\$ 1,000.00</u>
Total:	\$11,830.00

123. Marty De Herrera, age 18, suffered nausea, eye irritation, and is awarded damages as follows:

Physical injuries:	\$ 1,500.00
Loss of use and enjoyment of Property:	<u>\$ 1,500.00</u>
Total:	\$ 3,000.00

124. Tonya McDaniel, age 6, suffered nausea, bloodshot eyes, headaches, vomiting and is awarded damages as follows:

Physical injuries:	\$ 2,250.00
Loss of use and enjoyment of Property:	<u>\$ 2,250.00</u>
Total:	\$ 4,500.00

125. The hourly rates for plaintiffs' attorneys as reflected in their application for attorneys' fees are reasonable. The Court finds that the time expended by plaintiffs attorneys as submitted in their application, should be reduced by ten percent (10%) to reflect any unnecessary use of more than one attorney for certain tasks.

126. On the basis of the plaintiffs' application for attorneys' fees, plaintiffs are entitled to \$206,329.50 as a reasonable attorneys' fee.

## CONCLUSIONS OF LAW

1. This Court has jurisdiction over the parties and the subject matter in this action.

2. The operation of Basin by the defendants created a private nuisance which proximately cause plaintiffs' injuries.

3. The operation of Basin by the defendants created a public nuisance. Plaintiffs are entitled to an award of a reasonable attorney's fee for abating the public nuisance.

4. Defendants were negligent in the operation of Basin. Defendants' negligence was a proximate cause of plaintiffs' injuries.

5. Defendants' negligent operation of the waste disposal site caused a trespass of fluids and particulate matter from Basin on the properties of the Payne and Hargis families.

6. Jerry Sandel, David Turner and D.C. Turner, as officer and directors of Basin, negligently managed, supervised and operated the waste disposal site and in addition directly participated in the conduct and acts which caused the public and private nuisance. Jerry Sandel, David Turner, and D.C. Turner are individually liable for plaintiffs' damages.

7. The Court having found that there is a need for a commercial waste disposal facility for produced water in San Juan County concludes that a balancing of the equities herein compels the Court to rule that plaintiffs are not entitled to injunctive relief. The Court further concludes that the injuries to the plaintiff are out-

weighed by the harm that would result by ordering the waste disposal facility to be shutdown and to cease operating completely.

8. The Court also concludes that the continued operation of the disposal facility under conditions to be set by the Court will eliminate the nuisance created by the past operation of the facility and thereby protect the underground waters in the vulnerable areas in San Juan County.

9. Plaintiffs have no adequate remedy at law except by a multiplicity of suits because of the continuing nature of the nuisance.

10. Plaintiffs are not entitled to an award of punitive damages.

11. The Court concludes that the nuisance created can be abated if the conditions for the continued operation of the facility as set forth herein are complied with. Accordingly, the facility can continue its operations under the following conditions:

- (1) Maintain the disposal pit in an aerobic condition. -
- (2) Keep the level of water in the disposal pit at a ✓ depth of no more than 3 feet.
- (3) Continue to operate the injection well for the disposal of excess produced water.
- (4) Keep the spray and aeration systems in operation.
- (5) Continue the present chemical treatment of the settling tanks and the disposal pit.
- (6) Cease the depositing of any oils in the disposal pit and in the mud pits.



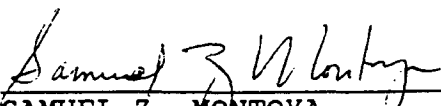
- (7) Remove oils from said pits which are still present or which might accumulate in the future.
- (8) Continue monitoring the emissions of hydrogen sulfide and limit such emissions to 0.010 parts per million, in compliance with the ambient air quality standards as promulgated by the Environmental Improvement Board of the State of New Mexico under its Air Quality Control Regulation 201 dated June 15, 1981.
- (9) Monitor the build-up of sludge in the bottom of the disposal pit and remove same, if anaerobic conditions begin to develop in the disposal pit.

12. Plaintiffs are entitled to recover their costs as permitted by law.

13. The Court retains its equitable jurisdiction to enforce the conditions it finds necessary to abate the nuisance.

14. Plaintiffs are entitled to reasonable attorney's fee which includes a fee for attorney time only and not for paralegal time.

15. Plaintiffs' requested hourly rates are reasonable, but the Court finds that a reduction of ten percent (10%) for such attorney's requested fee is warranted to reflect the unnecessary use of more than one attorney for certain tasks.

  
\_\_\_\_\_  
SAMUEL Z. MONTOYA  
District Judge Pro-Tem



STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

GARREY CARRUTHERS  
GOVERNOR

POST OFFICE BOX 2088  
STATE LAND OFFICE BUILDING  
SANTA FE, NEW MEXICO 87504  
(505) 827-5800

May 8, 1989

CERTIFIED MAIL  
RETURN RECEIPT NO. P-106 675 528

Mr. Richard P. Cheney  
BREWER ASSOCIATES  
P. O. Box 2079  
Farmington, New Mexico 87499

RE: Aeration System  
Basin Disposal Inc.  
Bloomfield Disposal Facility

Dear Mr. Cheney:

The Oil Conservation Division (OCD) has received your proposal dated April 27, 1989, for the installation of floating aerators in the lined evaporation pit at the Basin Disposal Inc. Bloomfield Disposal Facility located in Section 3, Township 29 North, Range 11 West, NMPM, San Juan County, New Mexico. The design specifications are acceptable and your proposal is hereby approved.

Please be advised that the approval of this proposal does not relieve Basin Disposal Inc. of liability should the operation result in actual pollution of the environment which may be actionable under other laws and/or regulations.

If you have any questions, please contact Roger Anderson at (505) 827-5884.

Sincerely,

William J. LeMay  
Director

WJL/RCA/sl

cc: OCD Aztec Office  
Mr. Jerry Sandel



# BREWER ASSOCIATES, INC.

ENGINEERS • SURVEYORS

P. O. BOX 2079 • FARMINGTON, NM 87499 • (505) 327-3303  
CLOVIS, NM • (505) 763-4255

April 27, 1989

Mr. David Boyer  
Oil Conservation Division  
Land Office Building  
310 Old Santa Fe Trail  
Santa Fe, New Mexico 87501

RECEIVED

MAY - 1 1989

OIL CONSERVATION DIV.  
SANTA FE

Re: Basin Disposal Mixing and Aeration System

Dear Mr. Boyer:

As previously discussed with you, Basin Disposal is proposing to install eight 2 hp floating aerators in their disposal facility north of Bloomfield, New Mexico. The purpose of the aerator installation is to assure complete mixing of the basin and the addition of oxygen to prevent anaerobic conditions from forming. As you are aware, under the intermittent and variable loading conditions at Basin Disposal, it is difficult to estimate actual oxygen requirements. The aerators that are being furnished are capable of transferring oxygen at the rate of 3.0 pounds per hp/hr as determined by the unsteady state test technique at the standard conditions of 0 dissolved oxygen, 1 atmosphere of pressure, and 20° centigrade. We have also specified that each aerator shall provide sufficient kinetic energy to the basin to provide uniform oxygen dispersion such that any given dissolved oxygen sample taken at random, from the basin, shall not vary more than 2 milligrams per liter or 20%, whichever is greater from the average of ten samples simultaneously drawn at random from the basin. We believe that this will ensure complete mixing of the basin and prevent anaerobic conditions from forming.

The horsepower being applied to the basin is somewhat less than is normally considered desirable for mixing in wastewater treatment plants. A primary consideration in wastewater treatment plants is the requirement for maintaining biological solids in suspension. In this particular type of industrial application, we do not anticipate the production of a large amount of biological solids. Therefore, the velocities required for mixing are much less in this particular application. At maximum depth, the design is approximately 4 hp/mg, and at minimum depth, the design is approximately 28 hp/mg. One other additional consideration was the preservation of the integrity of the pond lining. The aerators are being equipped with erosion control devices to prevent scouring. Even under these conditions, the minimum operating depth is two feet.

Mr. David Boyer  
April 27, 1989  
Page two

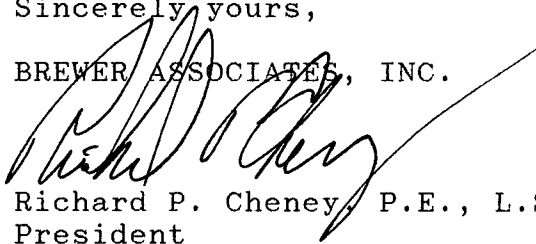
One other calculation that demonstrates the ability of the proposed system to provide mixing utilizes the pumping rate of the aerators. Floating aerators, such as these, are essentially pumps. The pumping rate of the aerators proposed is 1740 gpm. At this rate, the aerators would pump an amount equal to the entire pond volume in approximately 45 minutes at the minimum pond elevation, and every 4.5 hours at the maximum pond elevation. In other words, at the maximum pond elevation, the pond could be "turned over" five times every 24 hours.

As previously stated, under the above described conditions, we do not believe that anaerobic conditions will be able to survive in the holding pond. Hydrogen sulfide production should, therefore, be more a function of the amount of hydrogen sulfide contained in the wastewaters delivered to the facility rather than the amount of hydrogen sulfide produced as a result of anaerobic activities.

I am enclosing a copy of the layout of the proposed installation as well as specifications of the aerators being installed. If I can be of additional assistance or provide additional information, please feel free to contact me at your convenience.

Sincerely yours,

BREWER ASSOCIATES, INC.



Richard P. Cheney, P.E., L.S.  
President

RPC:yf PRO89/

Enclosures

**Aztec, New Mexico**

Objective:      Size Aqua-Jet for given situation.

Design Data:

Basin Volume:    3.7 MG

Lined with membrane

**Design Calculations:**

Use 4 HP/MG for O<sub>2</sub> dispersion

$$(3.7 \text{ MG}) (4 \text{ HP/MG}) = 14.8 \text{ HP}$$

**Recommendation:**

Eight (8) 2 HP Aqua-Jet Aerators  
with anti-erosion assemblies.

NOTE: 2 ft is the recommended minimum operating depth.

JDM/JEG/rh  
3-22-89

## STAINLESS STEEL AERATOR SPECIFICATIONS

### 1. GENERAL

Furnish and install 8 2 HP floating aerators. Each aerator shall consist of a motor, a direct drive impeller driven at a constant speed and an integral flotation unit.

### 2. AERATOR DRIVE MOTOR

- 2.1 The motor shall deliver 2 horsepower and shall be wired for 230/460 volts, 60 cycle, three phase service.
- 2.2 The motor shall be totally enclosed, fan cooled, and generally rated for severe chemical duty, and shall have a 1.15 service factor.
- 2.3 The motor windings shall be nonhygroscopic, and insulation shall equal or exceed NEMA Class "F".
- 2.4 A condensate drain shall be located at the lowest point in the lower end-bell housing.
- 2.5 A labyrinth seal shall be provided below the bottom bearing to prevent moisture from penetrating around the motor shaft.
- 2.6 All motor frame parting surfaces shall be deep registered and Permatex sealed.
- 2.7 All through bolts, nuts, and screws shall be of type 18-8 stainless steel.
- 2.8 A stainless steel nameplate shall be provided with each motor and shall be securely fastened thereto. The voltage, speed, insulation class, amperage, service factor, wiring diagram, motor serial number, and the manufacturer's name and address shall be steel stamped or otherwise permanently marked.

### 3. MOTOR SHAFT

- 3.1 Unit shall have a one-piece motor shaft continuous from the top motor bearing, through the lower bearing and down to and through the propeller. This shaft will be manufactured from 17-4 PH stainless steel, or comparable stainless steel having a minimum yield strength of 100,000 psi on units 3 HP and larger. For 1 and 2 HP units, this shaft will be manufactured from 303 stainless steel, or comparable stainless steel having a minimum yield strength of 30,000 psi.

### 4. RPM

Units shall operate at the lowest RPM offered in this size by the manufacturer. In no case shall nominal RPM exceed 1800 for units meeting the one-piece shaft specified above. Units featuring one-

piece shaft shall operate nominally at 1800 RPM in the size range of 1-15 HP, or at a nominal maximum speed of 1200 RPM for units in the 20-75 HP size range.

## 5. MOTOR BEARING

- 5.1 Motor bearings shall be regreasable. Sealed bearings are not acceptable and bearings shall be shielded on the bottom side only.
- 5.2 The top and bottom motor bearings shall be of the combined radial and axial thrust type and shall be packed at the factory with CHEVRON SR1-2 grease (or an approved equivalent lithium-base waterproof grease).
- 5.3 The lower motor bearing inner race shall be locked to the motor shaft via a special washer and locking nut arrangement. The shaft shall be threaded just below the lower bearing and shall have a keyway cut into the motor shaft. This key shall accept a tab from the I.D. of the locking washer, and the locking nut shall have recesses to accept a tab from the O.D. of the locking washer to prevent the nut from backing off. Snap ring type bearing retainers will not be acceptable.

## 6. DIFFUSER HEAD

- 6.1 The design of the diffuser head shall be such that the liquid spray will discharge at an angle of 90° to the motor shaft, and over a 360° pattern in the horizontal plane, and shall be a stainless steel monolithic casting.
- 6.2 The diffuser head casting shall act as a base for the aerator motor, and alignment of the motor to this base shall be controlled by machined index fittings that engage the P-base of the motor. Diffuser head/motor arrangements that are dependent upon bolt holes only for alignment will not be acceptable.
- 6.3 The diffuser head casting shall act as a thrust block to deflect the high velocity, pumped volume of the aerator from the vertical to the horizontal direction. In order to minimize vibration, to provide adequate strength, the diffuser head casting shall weigh no less than \_\_\_\_\_ lbs. The bottom side of this casting shall have a 90° radiused transition to effect the hydraulic change in direction with a minimum of head loss.
- 6.4 The diffuser head shall absorb all normal and shock loads encountered by the propeller, and transmitted to the diffuser head via the motor shaft and lower motor end-bell. The diffuser head shall distribute these forces into the float via webs that terminate in a flange or ring that is an

integral part of the diffuser head. This flange shall mate with a similar flange that is an integral part of the float/volute to spread the stresses generated by the propeller uniformly around the float so that no point loading of the float is allowed. These flanges shall be machined flat to provide proper bearing surfaces. The alignment of the diffuser head flange to the float/volute shall be by use of an index pilot; and, bolt holes only shall not be acceptable.

- 6.5 Specifically, diffuser head designs that employ studs and spacers, or shoulder bolts are not allowed. Load bearing flange-to-flange connections will be mandatory.

NOTE:

Aqua-Aerobic Systems strongly recommends the following language be incorporated into the aerator specification.

- 6.6 The diffuser head shall contain an anti-deflection journal insert to limit the radial deflection of the motor shaft.
- 6.7 This anti-deflection journal insert shall be located in the lower extremity of the diffusion head, approximately one-half the distance between the motor base and the lower end of the shaft.
- 6.8 The journal insert shall be machined from Delrin and shall be a minimum of 0.020" larger through the bore than the diameter of the motor shaft.
- 6.9 Units featuring a one-piece unsupported shaft will not be acceptable.
- 6.10 There shall be a fluid deflector located on the motor shaft immediately below the anti-deflection journal, which shall cover completely the anti-deflection journal insert and the lower portion of the diffusion head.
- 6.11 This fluid deflector shall be molded from black neoprene and shall be press fit onto the motor shaft.

7. FLOTATION

- 7.1 Each aerator shall have 200 lbs. reserve buoyancy to insure stability and to provide support flotation required during aerator servicing. Floats shall be one-piece, i.e. segmented floats are not acceptable.
- 7.2 Flotation stability will be mandatory. Under no circumstances will unstable flotation designs requiring counter balancing or ballast of liquid or solid mass or weight displacement be acceptable. Only aerators demonstrating stable operational characteristics, without rocking or oscillating and causing mooring stress, will be acceptable.



- 7.3 The float shall be fabricated of a minimum of 14 gauge 304 stainless steel.
- 7.4 The float shall be constructed so that all stress imposed from wave action and mooring line tension shall be transmitted from each mooring line to another by pulling across the float in such a manner as not to "flex" the structure.
- 7.5 All floats shall be constructed so that the internal void can be filled full of closed cell polyurethane foam having a minimum 2.0 lbs./ft<sup>3</sup> density and shall be completely sealed water tight.
- 7.6 All floats shall have six mooring points, spaced for 3 or 4-point mooring around the outer circumference. No mooring connections will be allowed as imbedments in the upper or lower float covers. Only tension type connections perpendicular to the outer sidewall will be approved. All mooring connections shall be stainless steel.
- 7.7 The float construction shall be such that the volute will distribute the load of the entire motor, drive, diffusion head and volute static load plus; the entire dynamic load from the propeller thrust and radial forces by spreading these forces uniformly around the full 360° circumference of the float's central core. Point connected joints or point stressed connections will not be accepted.

## 8. PROPELLER

- 8.1 The propeller shall be a precision casting of 316 stainless steel, and shall be specifically designed for the application intended. It shall be a self-cleaning type that will not accumulate fibers, rags, stringy materials, etc.
- 8.2 Each propeller blade shall be pitched so that the pitch angle and rake angle are within  $\pm 2$  percent of the other blade(s).
- 8.3 The propeller shall be pitched so that the drive motor is loaded between 88% and 95% of full-load nameplate horsepower.

## 9. VOLUTE

- 9.1 The propeller shall operate in a volute made of 304 stainless steel. It shall be round and true so that propeller blade tip clearance is uniform within the volute as is it rotates. The volute shall have a minimum of 3/16 inch wall thickness and a minimum of four full-length stainless steel gussets shall be welded on 90° spacing around the circumference of the volute between the top and bottom flanges.

- 9.2 The volute shall have a large flange at its top extremity that completely encircles the volute, and this flange shall match a similar flange on the bottom of the diffuser head to provide for a bolted, machined flange-to-flange fit to provide uniform distribution of the dynamic loads generated by the propeller and the static weight of the motor and drive. A machined index in the upper flange shall provide concentric alignment of the propeller in the volute by engaging the inside diameter of the mating flange on the diffusion head. Bolt holes alone will not be acceptable to locate the important alignment of the propeller.
- 9.3 Fiberglass volutes, or carbon steel volutes or carbon steel volutes that are fiberglass or stainless steel lined are not acceptable.

#### 10. INTAKE CONE

- 10.1 The intake cone shall be fabricated from 304 stainless steel having a gradually expanding opening outward to the intake end. The length and inlet diameter shall be sufficient to provide uniform inlet hydraulics so that no increase in vibration is caused due to its' shape or size.
- 10.2 The material used to fabricate the intake cone shall be structurally sufficient to support the weight of the entire aerator assembly when the aerator is free-standing on dry ground.
- 10.3 For maximum in-depth mixing efficiency, the intake cone shall be designed so that the suction lift from the aerator propeller is vertical from the liquid depth below the aerator. Unless specifically required for anti-erosion requirements, side or angle entry suction inlets will not be approved.

#### 11. BALANCING

The entire rotating assembly including the motor rotor, shaft and impeller shall be dynamically balanced to within 2.0 mils peak-to-peak horizontal displacement measured at the upper and lower motor bearing. Measurements shall be taken at a frequency equivalent to the motor RPM.

Measurements shall be taken with the motor in a vertical, shaft down position and with the motor or the entire power section mounted on resilient pads. Certified copies of the balance inspection shall be supplied with each aerator.

## 12. MOORING

- 12.1 The anchor cable shall be installed as recommended by the manufacturer so the aerator shall be permitted to rise and fall with water level variations, but will have a minimum of lateral movement.
- 12.2 The maximum amount of anticipated water level variation is \_\_\_\_\_ feet.
- 12.3 Anchor cable shall be 7 X 19 construction, 304 stainless steel and 3/16" diameter.
- 12.4 Mooring hardware (thimbles and clips) shall be of 316 stainless steel. Galvanized hardware is not acceptable.

## 13. ELECTRICAL SERVICE CABLE

- 13.1 Each unit shall be furnished with \_\_\_\_\_ feet of AWG # 12 four conductor, continuous length (non-spliced) underwater electric service cable.
- 13.2 The aerator manufacturer shall furnish the cable, with the motor end sealed into the motor terminal box, and wired for 230/460 volt service. The aerator manufacturer shall be responsible for this watertight seal and electrical connection. The other end of the cable will be wired into the power supply by the installing contractor.
- 13.3 Only flexible type copper stranded cable with four individually jacketed conductors bound together with a non-wicking filler and sheathed in a PVC, neoprene or approved equal over jacket will be approved.

## 14. INSTALLATION, OPERATING, AND MAINTENANCE MANUALS

- 14.1 The aerator manufacturer shall provide \_\_\_\_\_ copies of a detailed manual that shall include specific instructions for receiving and handling, assembly, mooring, wiring, installation, repair and service, storage, troubleshooting, detailed exploded drawings of the unit, and a full parts list.
- 14.2 In addition, the manual shall contain complete detailed instructions on the balancing procedure to be used for rebalancing to the propeller after it has been in service for an extended period of time. These instructions shall include, but not be limited to, a general procedural description, a detailed explanation of preparing the unit for balancing, for setting up the dynamic balancer, portable balancing technique, a detailed description of the vector chart method of single plane balancing and sample balancing record forms.

14.3 These manuals shall be submitted for review, along with other general submittal information, including detailed drawings, brochures, cut-sheets, motor data sheets, etc., as a part of the approval process.

15. MANUFACTURER

Aqua-Aerobic Systems, Inc.'s Aqua-Jet Aerator has been selected as a standard for comparison, and is viewed to be ideal for this application.

16. EQUIPMENT SELECTION - COMPLIANCE WITH THE SPECIFICATIONS

Detailed specifications have been set forth herein, and are to be adhered to in all respects. Absolutely no deviations from the specifications will be approved. Manufacturers wishing to submit equipment for consideration should furnish the general contractor with a statement as follows: "(Company Name) certifies that its offering is in full compliance with all details of the equipment specification and wishes to offer this equipment for considerations. Should the equipment be rejected as not complying with the specification, (Company Name) will be financially responsible for the difference between our quoted price and the next lowest responsible bid that meets the equipment specification." This document shall be furnished to all bidding contractors prior to the bid opening, and shall be duly signed by an officer of the company.

17. EXPERIENCE

17.1 Manufacturers proposing to furnish equipment for this project shall have three installations of similar equipment model and size in similar service for a period of three years.

17.2 Equipment manufacturers not meeting this requirement are invited to bid, provided they furnish an unconditional guarantee, underwritten by a bonding agent acceptable to the city for a period of three years. Equipment and/or components failing within this period due to deficiency in design, workmanship or material shall be replaced at no cost to the owner, and said replacement shall be guaranteed for three years continuous service.

18. PERFORMANCE

18.1 Each aerator shall be capable of transferring oxygen at the rate of 3.0 lbs./HP/hr as determined by the unsteady state test technique at the standard conditions of zero dissolved oxygen, 1 ATM pressure and 20°C.

18.2 Each aerator shall provide sufficient kinetic energy to the basin to provide uniform oxygen dispersion such that any given dissolved oxygen sample taken at random from the basin shall not vary more than 2 mg/l or 20% (whichever is greater) from the average of 10 samples simultaneously drawn at random from the basin.

18.3 Each aerator shall deliver a minimum of 88% and a maximum of 94% of nameplate horsepower as evidenced by measured operating amp load and voltage readings. Horsepower shall be computed by:

$$HP = \frac{(1.732) (amps) (volts) (E) (P.F.)}{746} \quad \text{Where:}$$

HP = Delivered horsepower

E = Efficiency of motor (nameplate rating)

P.F. = Power factor of motor (certified by motor manufacturer)

18.4 The aerator manufacturer shall certify that the nameplate data on the aerator motor is valid specific data pertinent to that particular motor and that such nameplate data originates from the motor manufacturer and that no nameplate data changes have been made subsequent to the motor being shipped from the original motor manufacturer.

1/1/89

WELLS & MANDE, P.A.

ATTORNEYS AT LAW  
301 GOLD S.W., SUITE 201  
P. O. BOX 1787

ALBUQUERQUE, N. M. 87103  
505-243-3727

OF COUNSEL  
RUSSELL W. RUUD

JOHN M. WELLS  
DEBORAH H. MANDE  
LINDA M. MATTEUCCI  
RICHMOND L. NEELY  
PETER H. PIEROTTI

January 5, 1989

Mr. Roger Anderson  
Oil Conservation Division  
Post Office Box 2088  
Santa Fe, NM 87501

Re: State of New Mexico, et al. v. Basin Disposal  
Inc.; San Juan County District Court Case  
No. CV 87-569-1107

Dear Roger:

Enclosed is Plaintiff's Exhibit 150A from the Basin  
case.

Thanks again.

Very truly yours,

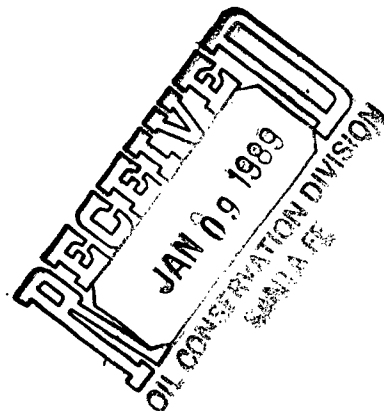
WELLS & MANDE, P.A.



Deborah H. Mande

DHM/ks

Enclosures



ENVIRONMENTAL IMPROVEMENT DIVISION

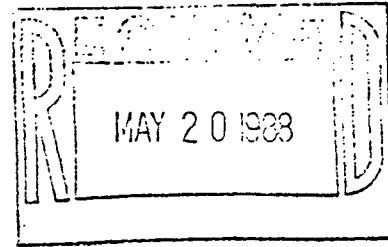
Michael J. Burkhardt  
Director

GARREY CARRUTHERS  
Governor

LARRY GORDON  
Secretary

CARLA L. MUTH  
Deputy Secretary

May 16, 1988



MEMORANDUM

TO: Michael Burkhardt  
FROM: <sup>cc</sup> Ron Conrad, Environmental Supervisor  
Superfund Section/Hazardous Waste Bureau  
THRU: <sup>cf</sup> Steve Cary, Program Manager  
Superfund Section/Hazardous Waste Bureau  
SUBJECT: BASIN DISPOSAL

PL. CIRCULATE  
Env. DS  
Env. Ray  
Env. CM  
Env. \_\_\_\_\_  
Env. \_\_\_\_\_  
Secty. \_\_\_\_\_

At your request, on May 10, 1988, I visited Basin Disposal located near Bloomfield, New Mexico. Also in attendance for the EID were Tito Madrid, Albert Dye, Dave Tomko, Bill Hargraves and Joe Labauve. Basin Disposal personnel included David Turner and Jerry Sandel, (2 of the owners), and several of the workers at the site. OCD was represented by Roger Anderson and Jamie Bailey.

As you are aware, H<sub>2</sub>S emissions have been emanating from the one acre lined pond during the warm months of the year since last year when the facility opened. During my visit I noticed little "rotten egg" odor although the temperature was in the mid 70s and winds were calm. However, the odors weren't obtrusive last year either when I visited, at the time when the citizens were vociferously complaining.

Several important changes have taken place at Basin since my visit last July.

- 1) The company has had an injection well in operation for 30 days and can discharge down this well as much as 1400 barrels of wastewater from the pond per day. At this rate, they can lower the pond level approximately 2 inches per day. The company stated the water was 9 feet deep and because of their pumping setup they could lower the pond only to an approximate depth of 5 feet. The company believes this will be sufficient to address the problem. This pond lowering rate does not take into account any additional fluids that are disposed into the pond or evaporation from the pond.



Michael Burkhardt  
May 16, 1988  
Page 2

- 2) No treatment of pond fluids is occurring and aeration by spraying only occurs for a few hours each morning when winds are calm.
- 3) If a tank truck comes in with fluids that Basin deems to contain significant  $H_2S$ , one ounce of a fluid called Bio Genesis is mixed with the load as it is introduced into the pond. Basin is convinced that Bio Genesis is solving (or has solved) its odor problems. This fluid purportedly contains bacteria that either prevent sulfur reducing bacteria from producing  $H_2S$  or other reduced sulfur species, or operate by some other mechanism that minimizes generation of  $H_2S$ . Bio Genesis is purchased from the "Environmental Correction Agency" in Chandler, Arizona, is supplied in 2.5 gal plastic jugs and evidently needs no refrigeration or special care. The company claims that since last year the  $H_2S$  levels in the pond have come down from 35 ppm to 4 ppm. Two pond samples we took yielded  $H_2S$  concentrations of 13.6 and 10.0 ppm. Very little documentation, however, is available to demonstrate the effectiveness of Bio Genesis other than the  $H_2S$  concentrations in samples of water taken from the top level of the pond.

The injection well is a plus. The treatment of incoming loads by Bio Genesis is of questionable value. Last year they were treating with hypochlorite, a proven oxidizing agent for reduced sulfur species. There are still at least approximately  $3 \times 10^6$  gallons of fluids in the pond. These fluids are segregated into the water portion at the top and an organic sludge layer along the sides and undoubtedly at the bottom. Except for the fluids at the top of the pond (which would be expected to contain the minimum concentration of  $H_2S$ ), the content of the ponds has not been characterized for total reduced sulfur species potential.

OCD does not plan on having the company take any actions of a preventive nature. They are in a wait-and-see mode until the pond is drawn down by the deep well injection. At that point they are assuming that the pond will be maintained in an aerobic condition and that the odor problems will cease.

I am pessimistic about the long term solution of the odor problem at Basin if operations proceed along the course that has been set by OCD and the company. The problems that I perceive are listed below:

- 1) No documentation is available that characterizes total reduced sulfur potential throughout the pond. Data exist for the top liquid levels, where  $H_2S$  concentrations should be low. It seems irresponsible to fail to characterize the pond-bottom sludge, where  $H_2S$  should be more concentrated.



Michael Burkhardt

May 16, 1988

Page 3

- 2) The only pre-treatment of loads coming is with the Bio Genesis preparation supplied to the company by the "Environmental Correction Agency". The effectiveness of these bugs has not been quantified. The bugs are evidently remarkably robust since they sit in gallon jugs in the company office and require no refrigeration or special preservation environment.
- 3) Should odor problems arise again, the company is not in a good position to quickly alleviate the problem. No contingency plan is in effect.
- 4) No chemical analysis is done on incoming loads to define reduced sulfur concentration. Only H<sub>2</sub>S gas coming off a load liquid is measured. Not having any other information, this gas reading is nevertheless equated to sulfide concentrations in solution and used as a qualitative measure of H<sub>2</sub>S.
5. The regulatory sentiment of OCD in this case is not one that affirms that prevention is the most cost-effective approach to the odor problems. To OCD's credit, they did require a double-lined pond to prevent ground water pollution. However, OCD is not prepared to require the company to pre-treat the incoming fluids to oxidize reduced sulfur species in order to minimize emissions of reduced sulfur gases, nor are any other actions planned to forestall emissions of malodorous gases. If odor problems are exacerbated during the warm months, OCD may ultimately be forced to compel Basin to chemically treat both pond fluids and incoming loads. Since Basin charges up to \$200 per load, several dollars for chemical treatment (a charge that could be assessed the disposer) would not be a debilitating charge to the disposers.

In closing, if I was regulating this facility through a ground water discharge plan process, I would require at a minimum, 1) testing of H<sub>2</sub>S in solution for each load, 2) treatment with a proven oxidizing agent each load, based on H<sub>2</sub>S concentration, 3) prior bench scale tests to illustrate effectiveness of any treatment utilized, and 4) routine testing of pond fluids for H<sub>2</sub>S. Basin Disposal is required by OCD to undertake task 4. However, without the authority to regulate the source of the problem, the pond, which has been delegated to OCD, the EID is limited to reliance on problematic nuisance statutes to effect a solution of the odor problem.

SC:RC:dlr

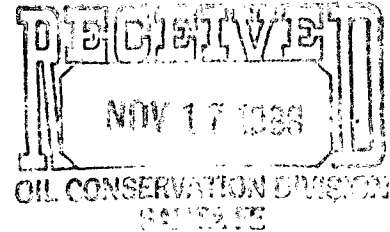
cc: Bill Hargraves  
Tito Madrid, District II

**WALSH**

ENGINEERING &amp; PRODUCTION CORP.

Petroleum Engineering Consulting  
Lease Management  
Contract Pumping3001 Northridge Drive  
P.O. Drawer 419  
Farmington, New Mexico 87401  
(505) 327-4892

November 3, 1988

Mr. Frank Chavez  
N.M. Oil Conservation Commission  
1000 Rio Brazod Road  
Aztec, New Mexico 87410

REF: Basin Disposal, Inc.

Dear Mr. Chavez:

Approval is requested for Basin Disposal, Inc., to accept the following for disposal:

1. Water removed from Underground Diesel Storage Tanks.
2. The underground tanks are being removed from the former NOWSCO yard, and facilities located on Southside River Road, Farmington, New Mexico.
3. The estimated volume of water to be accepted for disposal is 240 barrels (10,080 gallons) to 400 barrels (16,800 gallons).

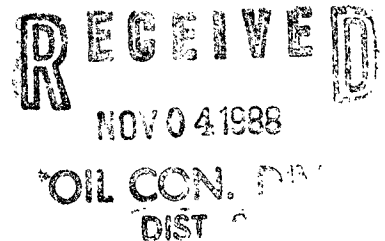
Verbal approval to accept the water for disposal received on November 3, 1988 from Mr. Frank Chavez.

Thank you for your cooperation in this matter.

Very truly yours,

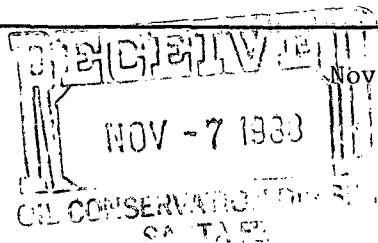
Ewell N. Walsh, P.E.  
President

ENW:rr

cc: Basin Disposal, Inc.  
Roger Anderson, OCD, Santa Fe, N.M.

**WALSH**

ENGINEERING &amp; PRODUCTION CORP.

Petroleum Engineering Consulting  
Lease Management  
Contract Pumping3001 Northridge Drive  
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November 3, 1988

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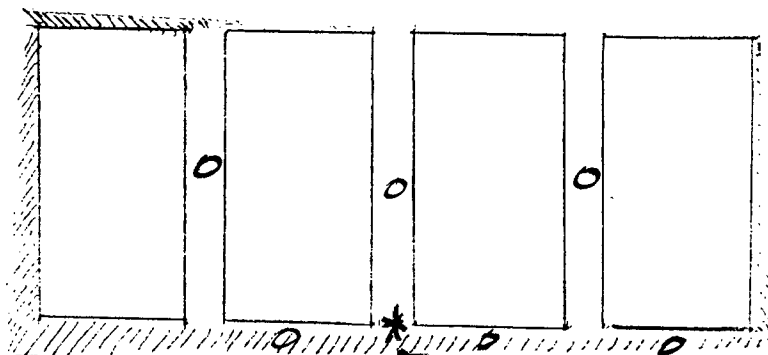
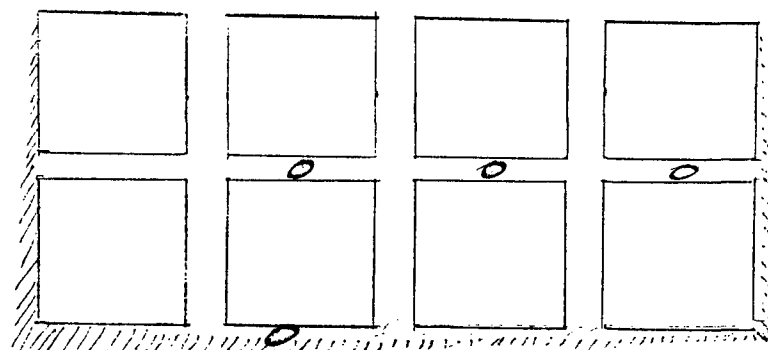
Ewell N. Walsh, P.E.  
President

ENW:rr

cc: Basin Disposal, Inc.  
Roger Anderson, OCD, Santa Fe, N.M.

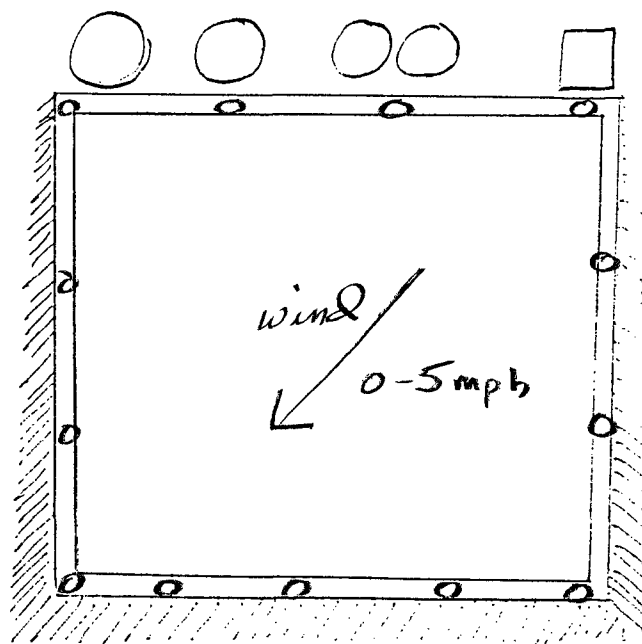


335-1  
16-0531



Trailer

Hydrocarbon odor



1000 hrs  
10/26/88

RAT

# IMPORTANT MESSAGE

FOR \_\_\_\_\_  
DATE 8/24 TIME 8:00 A.M.  
M Frank P.M.  
OF \_\_\_\_\_  
PHONE \_\_\_\_\_  
AREA CODE NUMBER EXTENSION

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

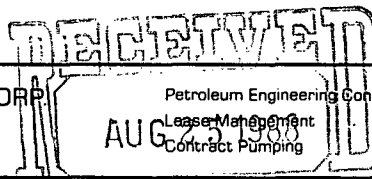
MESSAGE Basin has 1' of fluid,  
1' Sludge. No odor.  
Aeration in place.  
SWWD begins compaction  
today.

SIGNED \_\_\_\_\_  
LITHO IN U.S.A.



**WALSH**

ENGINEERING & PRODUCTION CORP.



3001 Northridge Drive  
P.O. Drawer 419  
Farmington, New Mexico 87401  
(505) 327-4892

OIL CONSERVATION DIVISION  
August 23, 1988 NTA FF

Mr. William J. Lemay  
Division Director  
Energy & Minerals Department  
Oil Conservation Commission  
P. O. Box 2088  
Santa Fe, New Mexico 87501

REF: Basin Disposal  
Disposal Pond

Dear Mr. Lemay:

This is to inform you that the aeration system of which you were informed by letter of August 8, 1988, was installed in the Disposal Pond on August 22, 1988.

Very truly yours,

Ewell N. Walsh, P.E.  
President

ENW:rr

cc: Frank Chavez, OCD, Aztec, N.M.  
Basin Disposal, Inc.

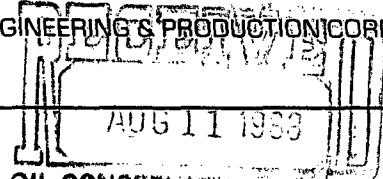


**WALSH**

ENGINEERING & PRODUCTION CORP.

Petroleum Engineering Consulting  
Lease Management  
Contract Pumping

3001 Northridge Drive  
P.O. Drawer 419  
Farmington, New Mexico 87401  
(505) 327-4892



OIL CONSERVATION DIVISION  
SANTA FE August 8, 1988

Mr. William J. Lemay, Division Director  
Energy & Minerals Department  
Oil Conservation Commission  
P. O. Box 2088  
Santa Fe, New Mexico 87501

Ref: Basin Disposal  
Disposal Pond

Dear Mr. Lemay:

This is to inform you that Basin Disposal has ordered and will install an aeration system in the disposal pond for produced water. The aeration system should be installed sometime during the week of August 15, 1988.

The installation will consist of the following:

1. 3/4 H.P., electric air compressor  
(capacity 9.0 to 10.0 cfm.)
2. Manifold to regulate air flow to diffusers.
3. Three (3) ceramic diffusers.
  - A. Diffusers will be installed on the bottom of the disposal pond equal distance from each other and equal distance from the ends and sides of the disposal pond.
4. Necessary plastic tubing and connections for installation.

Ewell N. Walsh  
President



# Memo

*From*

FRANK T. CHAVEZ  
District Supervisor

*To Dave Boyer*

*Note from Kaneji's vet on  
his dog's illness*



To whom it concerns.

Shorby was presented to us here at Angel Peak Vet. Services with vomiting and diarrhea. The odor of sulfur was noted on examination of oral cavity & stools. Blood work did not reveal sulfurs however this is not uncommon. Vomitus was greenish yellow & had a pungent odor. Lab personnel also indicated that sulfurs may have been present upon examination of blood. Blood work revealed no heavy metals, organophosphates, cyanide etc.. on a toxicity screen. For more information call 632-8081.

Mark L. Grzyb D.V.M.



STATE OF NEW MEXICO  
**ENERGY AND MINERALS DEPARTMENT**  
OIL CONSERVATION DIVISION  
AZTEC DISTRICT OFFICE

GARREY CARRUTHERS  
GOVERNOR

1000 RIO BRAZOS ROAD  
AZTEC, NEW MEXICO 87410  
(505) 334-6178

June 28, 1988

RECEIVED  
JUL 1 1988  
Mr. David Boyer  
Oil Conservation Division  
P.O. Box 2088  
Santa Fe, NM 87504-2088  
OIL CONSERVATION DIVISION  
SANTA FE

Re: Field Trip to Basin Disposal Area

Dear Dave:

On June 20 I received a phone call from Mr. Tim Payne at approximately 9:00 PM. He complained that the H<sub>2</sub>S odor was very strong and making them ill. I didn't arrive at his home until about 9:30 PM. The odor of hydrogen sulfide was strong and measured 0.6 PPM on our hand held monitor. Within about 5 minutes I developed a headache. I then drove to Basin Disposal. I measured levels as high as 1.8 PPM on our monitor at waist height and noticed that the levels were highest where I could feel a warm breeze coming off of the pit. My headache cleared up while I was driving home.

Sincerely,

Frank T. Chavez  
District Supervisor

FTC/dj

xc: File



MEMORANDUM OF MEETING OR CONVERSATION



Telephone



Personal

Time

10:00

Date

6/13/88

Originating Party

R. ANDERSON OCD

Other Parties

Red Walsh - Basin Disp.

Subject

REPORT FROM Frank Chavez on complaints he received concerning spraying at Basin's facility without regard to wind direction or speed.

Discussion

I informed Red of Frank's report. He said he will "motivate" the attendants to monitor the wind conditions more closely when the spray system is on. I also re-informed him of the requirement to remove the oil from the under pits. He will confer with Basins Principle on the best and most expeditious way to accomplish this and will get back

Conclusions or Agreements

with us

Distribution

File

Signed

R. Anderson



STATE OF NEW MEXICO  
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT  
OIL CONSERVATION DIVISION

GARREY CARRUTHERS  
GOVERNOR

POST OFFICE BOX 2088  
STATE LAND OFFICE BUILDING  
SANTA FE, NEW MEXICO 87504  
(505) 827-5800

May 31, 1988

Mr. Joseph Goldberg  
Carpenter and Goldberg, P.A.  
1600 University Blvd., N.E.  
Suite B  
Albuquerque, New Mexico 87102-2124

RE: Basin Disposal

Dear Mr. Goldberg:

I have received your letter dated May 3, 1986 regarding renewed H<sub>2</sub>S emissions at Basin Disposal. I have delayed answering until after a joint EID-OCD inspection trip. The inspection trip was conducted by my staff on May 10, 1988. I will address each of your concerns utilizing the information gained during the inspection and data in our files.

With the advent of warmer weather there has been a reoccurrence of low concentration emissions of H<sub>2</sub>S gas from the Basin Disposal pit. This year Frank Chavez has, however, monitored readings in the 0.1 ppm range in the area of one of your client's homes, not at the 1.0 ppm level in the home as you have been informed.

The highest reading reported this year was a one-time reading of 1.2 obtained on the pit berm and in the mist of the spray when the spray system was operating. The next highest reading was a one-time 0.2 to 0.3 ppm reading on the berm of the pit. The highest reading reported from a residence was 0.1 ppm.

The first monitor readings taken by the OCD were on June 2, 1987. The readings on that day indicated the H<sub>2</sub>S concentrations were in excess of 50.0 pm; however, they were obtained from a borrowed meter that was not calibrated by OCD personnel and are only an indication of H<sub>2</sub>S presence. Subsequent readings using a Gastech digital meter indicated a much lower concentration. The 50 ppm reading was a one-time, one-day reading, and not repeated during the two month period of June and July.

The facility operator has treated the pond water on three occasions and each treatment aided in reducing the H<sub>2</sub>S emissions appreciably. The results of the first two did not last long enough to call the treatments effective. Emissions were reduced to zero (0) after the third treatment and during the winter months. I am sure the cold weather aided in the reduction of emissions. Although the readings are very small, some emissions have returned with warmer weather.

There are significant checks in place at the facility to forewarn and prevent a possible repetition of last year's high level emissions. The upper numerical actions limits are one-half of those required by OSHA's standards. The final requirements, placed on the facility on November 23, 1987, are:

1. H<sub>2</sub>S monitor readings will be obtained every two (2) hours during operating hours.
2. Any two (2) consecutive readings of 1.0 ppm requires immediate notification of the OCD. Hourly monitoring 24 hours per day will be instituted immediately. The OCD may require treatment to reduce the emissions.
3. Any one reading in excess of 10.0 ppm requires the notification of public safety personnel.
4. OCD personnel will periodically monitor emission levels unannounced and at times unknown to the operator.

As you are aware, Basin Disposal has started injecting the pit water into their injection well. The surest way to eliminate H<sub>2</sub>S emissions is to remove the source. It is the OCD's position that the H<sub>2</sub>S is primarily being generated in situ in the pond by anaerobic bacteria. Reducing the fluid level can remove the source. The regulatory actions you have suggested have been carefully considered and are commented on individually:

1. "Shutting down the operations..." would also cause disposal into the injection well to cease. The fluid remaining in the pit would continue to create H<sub>2</sub>S gas and fail to solve the emission problem. As I stated previously, the final solution is to reduce the fluid level and turn the pit aerobic.
2. "An embargo on further deposits...". The facility is, at present, needed to legally dispose of the produced water from northwest New Mexico. Receipt of fluids is between 400 and 800 BPD and injection is 1400 BPD. At this rate difference the pond should have minimum liquids by mid-June.
3. "Close supervision and monitoring of deposits...". Each load brought to the facility is tested for H<sub>2</sub>S concentrations in the air space in the top of the tank truck. If the concentration measured is in excess of 10 ppm, the fluids are placed in a tank and, after solids settling time, are injected directly into the well. The water is not placed in the pit. If the concentration is below 10 ppm (the vast majority of loads) it is placed in a tank and treated prior to placement in the pit.
4. "Discontinuation of the spraying...". By OCD directive the use of the spray system is strictly controlled. The most recent conditions placed on the use of the spray system on November 23, 1987 are:
  - a. The spray system will not operate when winds are in excess of 15 mph, sustained or in gusts.

- b. The spray system will not be operated when the wind direction is to the Southeast, South, or Southwest.
- c. The spray system will be operated during daylight hours only.
- d. Individual sprayers in the system will be oriented to direct the fluid spray so that no direct spray or windblown drift will leave the confines of the lined portion of the pit.

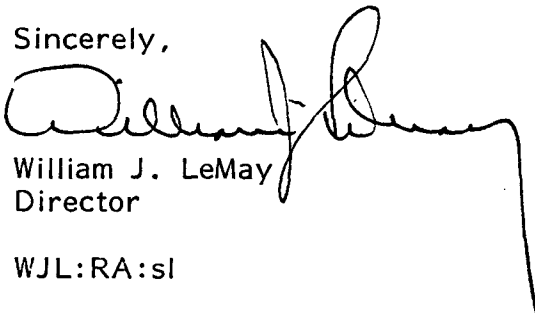
Once the pit is lowered to a permanent settling level the spray system will not be needed. At that time the injection rate will exceed receipts.

- 5. "More effective aeration...". Natural aeration may be accomplished by the lower fluid level. If the two to four feet remaining in the pit is not shallow enough to eliminate anaerobic conditions, an aeration system will be required by OCD directive to be installed in the bottom of the pit.

The OCD is aware of the hazards inherent in  $H_2S$  generation. Experience has been gained not only in the oil industry, but also in municipal waste treatment systems, sewer systems and even with individual septic tank systems. The standards used to regulate the facilities the OCD has jurisdiction over come from OSHA and NIOSH, the only known organizations that have placed health exposure limits on  $H_2S$  exposure. The OCD has placed stricter compliance limits on disposal facilities than either of these organizations.

It is our opinion that the problem will be resolved when the pit is lowered and the remaining water is aerated. The Basin Disposal principals have been fully cooperative in this effort.

Sincerely,



William J. LeMay  
Director

WJL:RA:sl

cc: OCD - Aztec  
M. J. Burkhardt - EID

Carpenter and Goldberg, P. A.

*Accidental Injury, Product Liability and Commercial Litigation*

WILLIAM H. CARPENTER  
JOSEPH GOLDBERG  
DAYMON B. ELY

1600 UNIVERSITY BLVD., N. E., SUITE B  
ALBUQUERQUE, NEW MEXICO 87102-2124  
(505) 243-1336

MAY 27 1988

May 24, 1988

OIL CONSERVATION DIVISION  
SANTA FE

Mr. Michael J. Burkhart, Director  
ENVIRONMENTAL IMPROVEMENT DIVISION  
P.O. Box 968  
Santa Fe, New Mexico 87504-0968

Re: Basin Disposal

Dear Mr. Burkhart:

I have received your letter of May 16, 1988. Unfortunately, I was out of the office until yesterday and therefore was delayed in responding. While I appreciate the problems arising from the respective jurisdictions of the Oil Conservation Division (OCD) and the Environmental Improvement Division (EID), it remains my belief that with respect to ambient air standards, the EID has regulatory jurisdiction. I also appreciate the problems in exercising this jurisdiction when the EID has no control over what goes into the disposal ponds. The EID, however, does have the power to regulate what comes out of the disposal ponds, specifically whether emissions coming out of the ponds exceed the EID's ambient air quality standards. My request is that EID exercise the regulatory functions as to Basin with the same vigor that it does as to Mr. Payne.

In your letter you advert to two "important measures" which you believe "will ultimately alleviate the odor problem." These measures are: (1) reducing the level of the disposal pit by utilization of the injection well, and (2) the fact that Basin is treating incoming loads with a biological agent. As to the first proposed measure -- reducing the pond level -- our experts are concerned that reduction of the pond level could easily exacerbate, rather than mitigate, the emission of hydrogen sulfide. I request that you require of Basin that it prepare a plan which will demonstrate that any reduction of the pond level not increase the hydrogen sulfide emissions. Such a plan should contain Basin's contingency plans in the event that reduction of pond level results in increasing hydrogen sulfide emissions. With respect to the second measure -- the biologic agent treatment -- it is clear from the current conditions that these treatments are not working. Indeed, what is happening at the disposal site is a repetition of what happened last year. With



Mr. Michael J. Burkhart, Director  
May 24, 1988  
Page Two

the coming of warmer weather and the summer atmospheric conditions, it is quite probable that the pond will be emitting high levels of hydrogen sulfide. This causes grave concern with respect to the health and safety of the surrounding neighbors.

You state in your letter that pond samples were taken and air quality monitoring was accomplished. Nowhere in your letter, however, do you state what were the results of those tests. I would appreciate it if you could provide me with information with respect to the pond sample analyses and what levels of hydrogen sulfide were monitored when the EID personnel visited the vicinity.

I very much appreciate your cooperation in this matter. I am confident that you are concerned about the health and safety of these residents, as am I.

Very truly yours,

  
Joseph Goldberg

JG/sls

cc: David Boyer, OCD



Post Office Box 968  
Santa Fe, New Mexico 87504-0968

ENVIRONMENTAL IMPROVEMENT DIVISION

Michael J. Burkhardt  
Director

GARREY CARRUTHERS  
Governor

LARRY GORDON  
Secretary

CARLA L. MUTH  
Deputy Secretary

MAY 20 1988  
OIL CONSERVATION DIVISION  
SANTA FE

May 16, 1988

Joseph Goldberg  
Carpenter and Goldberg  
1600 University Avenue NE, Suite B  
Albuquerque, New Mexico 87102-2124

Dear Mr. Goldberg:

Thank you for your letter of May 2, 1988, regarding the odor problems in the vicinity of Basin Disposal near Bloomfield, New Mexico.

Several staff members from the Environmental Improvement Division (EID) visited Basin Disposal on May 10, 1988. Pond samples were taken for analyses of reduced sulfur species, and air quality monitoring was accomplished around the vicinity of the pond. Representatives from the company and the Oil Conservation Division (OCD) were also present. They stated that several important measures have been taken which will ultimately alleviate the odor problem. Most importantly, an injection well is now in operation. This well can dispose on the average of 1400 barrels of fluid from the 1 acre pond each day. At this rate, and with a disposal slowdown into the pond during the warm months, the pond level can be decreased at the rate of 2 inches per day. Potentially the pond liquid level (now 9 feet) can be reduced to 5 feet within a month. The company and OCD are confident that with only 5 feet of liquids in the pond, aerobic conditions can then be achieved. This could minimize the activity of anaerobic sulfur reducing bacteria which the company and OCD believe causes the odor problem.

Additionally, Basin Disposal is treating incoming loads with a biological agent which the company asserts minimizes generation of constituents producing the odors.

As you are aware, Mr. Goldberg, OCD has the sole authority to regulate what is disposed at Basin Disposal and whether any pre-treatment of fluids before disposal is warranted. The nature of fluids disposed and the management of any treatment, aeration or other activities will determine the character and degree of the air emissions from the pond. Without the authority to regulate what goes into the pond and how the pond is managed, the EID is limited to an advisory capacity with respect to this site.

Joseph Goldberg  
May 16, 1988  
Page 2

The EID is sympathetic to the plight of the residents near Basin Disposal and hopes that a resolution of the odor problem is near, especially in light of the recent improvements the company has made.

Sincerely,

A handwritten signature in cursive script, appearing to read "Michael J. Burkhardt".

Michael J. Burkhardt

MJB:RC:dlr

cc: Dave Boyer, OCD

10:30 5/4/88

Bill - Mike Burkhardt E18

Director called. He's upset with Basin disposal issue and will send E18 staff up next week - says it really is our problem - They can't do more than ~~they are~~ on we can right now. Doubts that new air regs. would help. Wishes Frank wouldn't tell press it's E18's problem - it's both agencies responsibility. Doesn't need Goldberg stirring the pot - Governor directed agencies to solve problem.

last summer - don't need bad  
press and Gov.'s not going  
to like it. Talk to you later.

Have

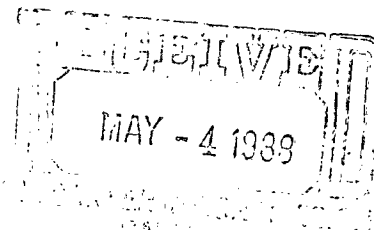
## Carpenter and Goldberg, P. A.

*Accidental Injury, Product Liability and Commercial Litigation*

WILLIAM H. CARPENTER  
JOSEPH GOLDBERG  
DAYMON B. ELY

1600 UNIVERSITY BLVD., N. E., SUITE B  
ALBUQUERQUE, NEW MEXICO 87102-2124  
(505) 243-1336

May 3, 1988



Mr. William J. Lemay, Director  
Oil Conservation Division  
P.O. Box 2088  
Santa Fe, New Mexico 87504-2088

Re: Basin Disposal

Dear Mr. Lemay:

This letter is to inform you of rising levels of hydrogen sulfide emissions from the Basin Disposal site and to request appropriate action from the Oil Conservation Division. It is my understanding that Frank Chavez of OCD has monitored readings in excess of one part per million of hydrogen sulfide emissions from the Basin Disposal site outside Bloomfield. At least one of these readings was taken in the home of one of my clients. I further understand that other similar readings have occurred recently.

As you may recall last year, emissions of hydrogen sulfide from the Basin Disposal site started increasing in April and May. In June and July, OCD was monitoring readings of 50 parts per million and possibly more. As you may further recall OCD took some remedial measures at that time, none of which, by our estimation, fully resolved the problem.

Some of our experts have predicted a repetition of last year's experience. Such a repetition would pose very substantial health risks to our clients, as well as to others in the vicinity. I am especially concerned that in certain circumstances and under certain unfavorable conditions, there is a potential for hydrogen sulfide emissions in amounts even higher than last year, posing extraordinarily grave health risks to people in the vicinity.

I would very much appreciate it if the Oil Conservation Division would continue to monitor the hydrogen sulfide emissions level with a view toward possible remedial action. I think it is essential that the regulatory authorities stay ahead of this situation, rather than being forced into a position of responding

Mr. William J. Lemay, Director  
May 3, 1988  
Page Three

to it, as was the case last year. I would suggest the following possible actions to consider:

1. Shutting down the operations at the Basin Disposal site until the cause of the emissions are clearly identified and remedial action is completed;
2. An embargo on any further deposits into the facilities;
3. Close supervision and monitoring of deposits in the site;
4. Discontinuation of the "spraying," which occurs persistently at the site and which exacerbates the problem;
5. More effective aeration of the lined pit, in order to create an aerobic layer in the pit.

I would very much appreciate your cooperation in this matter and look forward to your response indicating what the Division intends to do.

Very truly yours,

  
Joseph Goldberg

JG/sls  
Enclosure

cc: Environmental  
Improvement Division

Carpenter and Goldberg, P. A.

*Accidental Injury, Product Liability and Commercial Litigation*

WILLIAM H. CARPENTER  
JOSEPH GOLDBERG  
DAYMON B. ELY

1600 UNIVERSITY BLVD., N. E., SUITE 8  
ALBUQUERQUE, NEW MEXICO 87102-2124  
(505) 243-1336

May 2, 1988

Mr. Michael J. Burkhardt, Director  
Environmental Improvement Division  
Health and Environment Department  
P.O. Box 968  
Santa Fe, New Mexico 87504-0968

Re: Basin Disposal

Dear Mr. Burkhardt:

This will confirm our telephone conversation of Friday, April 29, 1988, in which I informed you that information received from my clients suggests that hydrogen sulfide emissions from the Basin Disposal site outside of Bloomfield, New Mexico are again beginning to reach intolerable levels. My understanding is that Frank Chavez from the Oil Conservation Division has monitored readings in excess of one part per million in the home of one of my clients. I further understand that other similar readings have occurred recently.

My concern is that these emissions are replicating the pattern that occurred last year. As you may recall, in 1987, emissions of hydrogen sulfide from the Basin Disposal site started increasing in April and May. In June and July, OCD was monitoring readings of 50 parts per million and possibly more. As you may further recall OCD took some remedial measures at that time, none of which, by our estimation, were fully satisfactory.

Some of our experts had predicted a repetition of last year's experience. Such a repetition would pose very substantial health risks to our clients, as well as to others in the vicinity. I am especially concerned that in certain circumstances and under certain unfavorable conditions, there is a potential for hydrogen sulfide emissions in amounts even higher than last year, posing extraordinarily grave health risks to people in the vicinity.

I would very much appreciate it if the Environmental Improvement Division would undertake a review of this situation with a view toward possible remedial action. I think it is essential that the regulatory authorities stay ahead of this situation, rather than being forced into a position of responding



Mr. Michael J. Burkhardt, Director  
May 2, 1988  
Page Two

to it, as was the case last year. Among the possible actions to consider, I would suggest, are the following:

1. Shutting down the operations at the Basin Disposal site until the cause of the emissions are clearly identified and remedial action is completed;
2. An embargo on any further deposits into the facilities;
3. Close supervision and monitoring of deposits in the site;
4. Discontinuation of the "spraying," which occurs persistently at the site and which exacerbates the problem;
5. More effective aeration of the lined pit, in order to create an aerobic layer in the pit.

I would very much appreciate your cooperation in this matter. I look forward to your response indicating what the Division intends to do.

Very truly yours,

  
Joseph Goldberg

cc: OCD

JG/sls  
Enclosure



MEMORANDUM OF MEETING OR CONVERSATION

☒ Telephone

☐ Personal

Time

Date

4/29/88

Originating Party

Other Parties

FRANK CHAVEZ

R. ANDERSON

Subject

H<sub>2</sub>S EMISSIONS AT BASIN DISPOSAL

Discussion

FRANK WAS AT THE PAYNE'S HOUSE WHEN CALLING. MONITOR READINGS AT THE HIGHWAY WERE 0.1 PPM. HE WAS GOING TO GET READINGS AT THE FENCE LINE AFTER LEAVING PAYNES. HE EXPECTS A BUSY WEEKEND OF COMPLAINTS AND WILL NOTIFY EID EACH TIME HE HAS TO INVESTIGATE ONE.

Conclusions or Agreements

Distribution

W.L. LEMAY  
FILE

Signed

R. Anderson

STATE OF  
NEW MEXICO

OIL  
CONSERVATION  
DIVISION



MEMORANDUM OF MEETING OR CONVERSATION

☒ Telephone

☐ Personal

Time

945

Date

4/21/88

Originating Party

Other Parties

Terry Sandel Basin Dup Robinson OCD

Subject

Discuss actions required with the reappearance of  $H_2S$  emissions

Discussion

Basin will take dissolved sulfides measurements. Injection will start on a 24 hr/day basis to lower the pond levels

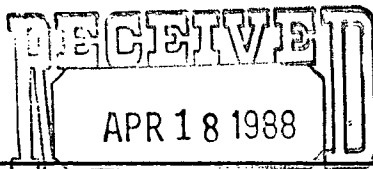
Conclusions or Agreements

Distribution

Fike

Signed

R. Anderson



**WALSH**

ENGINEERING & PRODUCTION CORP.

CONSERVATION DIVISION  
SANTA FE

Petroleum Engineering Consulting  
Lease Management  
Contract Pumping

3001 Northridge Drive  
P.O. Drawer 419  
Farmington, New Mexico 87401  
(505) 327-4892

April 15, 1988

Mr. Frank Chavez  
Oil Conservation Commission  
1000 Rio Brazos Road  
Aztec, New Mexico 87410

REF: Basin Disposal, Inc.  
Disposal No. 1  
Unit F, Section 3-T29N-R11W  
San Juan County, New Mexico

Dear Mr. Chavez:

Attached is data obtained during the injectivity test conducted April 14, 1988 on the above-referred-to well.

It is requested that the maximum injectivity pressure, at this time, be approved at 1870 psig.

The test was witnessed by Mr. Charley Gholson of your office.

Very truly yours,

Ewell N. Walsh, P.E.  
President

ENW:rr

cc: Basin Disposal, Inc.  
Roger Anderson, OCD, Santa Fe, New Mexico

Enclosures

46 1323

K-E 10 X 10 TO 1/2 INCH 7 X 10 INCHES  
KEUFFEL & ESSER CO. MADE IN U.S.A.

Pressure - Psig

BPM	PRESS. PSIG
0	640
0.5	1000
1.0	1400
1.5	1750
2.0	1940
2.5	2030
3.0	2140

BASTIN DISPOSAL, INC.  
DISPOSAL NO. 1  
Injectivity Test  
April 14, 1988

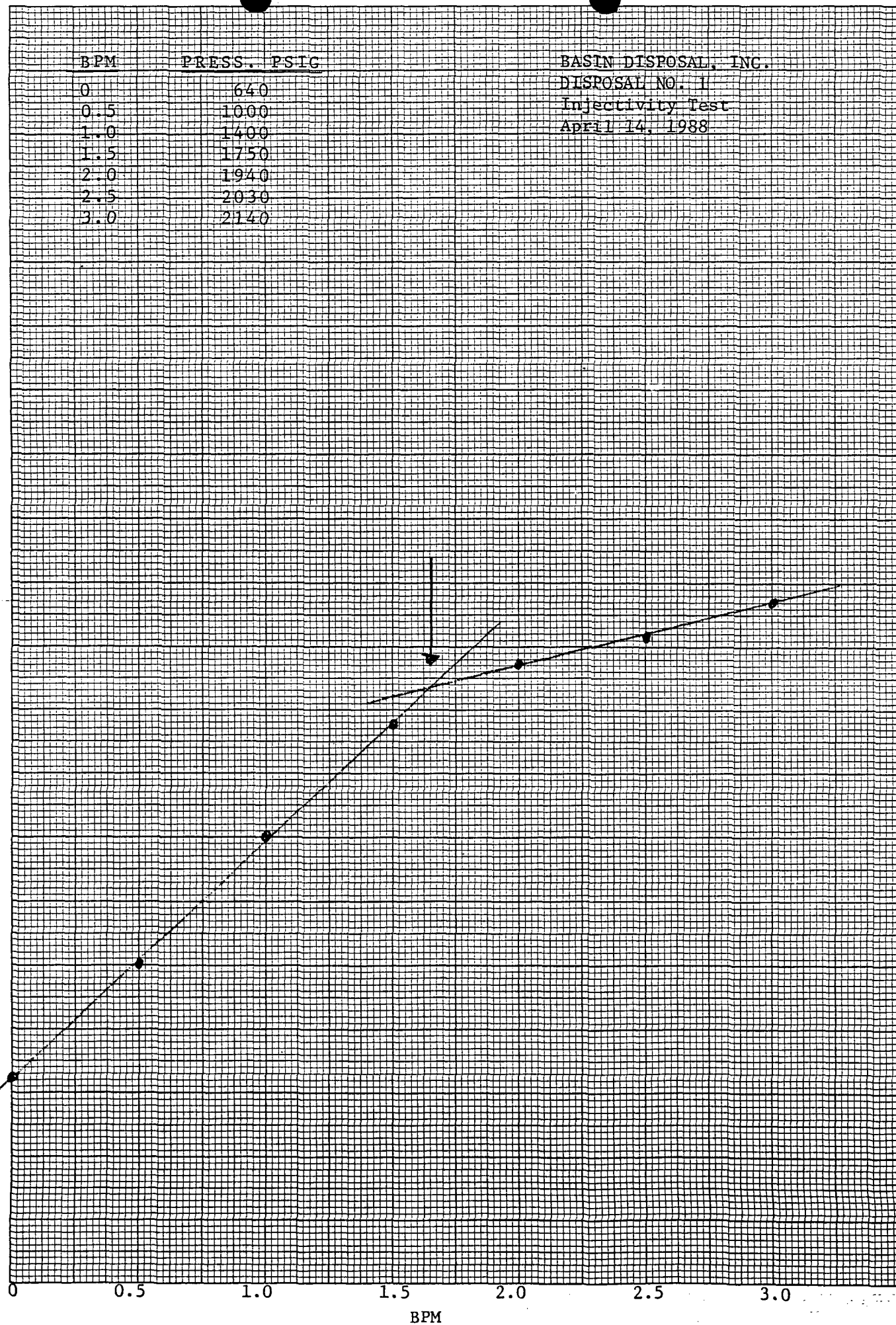
2100

2000

1500

1000

500



BPM



STATE OF NEW MEXICO  
**ENERGY AND MINERALS DEPARTMENT**  
OIL CONSERVATION DIVISION  
AZTEC DISTRICT OFFICE

GARREY CARRUTHERS  
GOVERNOR

1000 RIO BRAZOS ROAD  
AZTEC, NEW MEXICO 87410  
(505) 334-6178

March 7, 1988

Val R. Jolley  
P.O. Drawer 2364  
Farmington, NM 87499

Re: Seepage at Basin Disposal

Dear Mr. Jolley:

Our latest test of the seepage on the property owned by Good Samaritan indicates that there has been no more seepage occurring, and the water that had seeped has moved to a deeper area and stabilized.

At this time, it is too early to tell without more sophisticated testing than we are able to do what the final environmental effect will be although we do not suspect that it will be serious. The seepage left more minerals and organic material in the soil than were there before and may cause problems with deep rooted plants in the future.

I have forwarded a copy of your letter and this response to our Environmental Bureau in Santa Fe and they can give you a more technical reply.

Sincerely,

Frank T. Chavez  
District Supervisor

FTC/dj

xc: Dave Boyer, Santa Fe W/att.  
File

ROBERTS & JOLLEY

ATTORNEYS AT LAW

1115 NORTH AUBURN AVENUE • P. O. DRAWER 2364

FARMINGTON, NEW MEXICO 87499

(505) 326-4583

RANDALL S. ROBERTS  
A PROFESSIONAL CORPORATION

VAL R. JOLLEY  
A PROFESSIONAL CORPORATION

February 24, 1988

Frank D. Chavez  
District Supervisor  
Energy and Minerals Department  
1000 Rio Brazos Road  
Aztec, New Mexico 87410

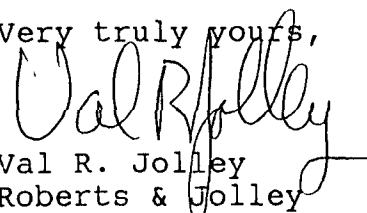
RE: Basin Disposal, Inc.

Dear Mr. Chavez:

Our law firm represents Four Corners Good Samaritan center and they have provided us with a copy of your letter to the center dated August 24, 1987 in regards to the seepage problem at the Basin Disposal site near Bloomfield. In that letter, you stated that your department would continue to monitor the seepage to see if it moves.

Would you please provide me with an update of the results of your monitoring, and whether you foresee any environmental problems at this time because of the seepage.

Very truly yours,

  
Val R. Jolley  
Roberts & Jolley

VRJ/sb  
xc: Michael R. Hynson

RECEIVED

FEB 25 1988

OIL CON. DIV.  
DIST. 3



MEMORANDUM OF MEETING OR CONVERSATION

☒ Telephone

☐ Personal

Time

11:20

Date

2/29/88

Originating Party

Other Parties

Frank Chavez

Jerri Bailey

Subject

Shamrock station <sup>gasoline</sup> spill disposal

Discussion

Frank received a call from Tim Payne that he smelled an odor of gasoline &/or sewage coming from Basin Disposal. Jerri Payne had seen trucks dumping something over at Basin. Frank wondered if possibly dirt from a gasoline spill at a Shamrock station was being disposed of at Basin. He was going to the station to see what was being done. Frank called back at 12:06 from the station & reported that so far in the cleanup, a tanker was 3/4 loaded with a mixture of water & gasoline. We agreed they should 1<sup>st</sup> try to dispose of the fluid at a refinery, & only if no refinery would accept it, should Basin be allowed to accept it <sup>in their separation tanks.</sup> The contaminated dirt was to be buried at the Shamrock site.

Conclusions or Agreements

Karl Souder (EIS UST program) said they do not treat <sup>spilled</sup> gasoline & water as hazardous

Distribution

File  
Boyer

Signed

Jerri Bailey





STATE OF NEW MEXICO  
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT  
OIL CONSERVATION DIVISION

GARREY CARRUTHERS  
GOVERNOR

POST OFFICE BOX 2088  
STATE LAND OFFICE BUILDING  
SANTA FE, NEW MEXICO 87504  
(505) 827-5800

December 30, 1987

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

Mr. Jerry Sandel, President  
Basin Disposal, Inc.  
P. O. Box 100  
Aztec, New Mexico 87410

Dear Mr. Sandel:

The Oil Conservation Division has received your request, dated December 28, 1987, to line one of your back mud pits and convert it to temporary produced water storage. The request is hereby approved provided the proposed injection well is drilled and equipped in a reasonably expeditious manner, and the water in the temporary storage is removed immediately upon completion of the well.

Care should be taken during installation of the liner to ensure its integrity. The liner shall be anchored on the edges to prevent movement. The lined pit can be used for drilling mud disposal after removal of the produced water provided the mud is in a semi-solid state and free fluids are not allowed to remain in the pit.

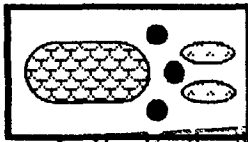
Sincerely,

A handwritten signature in cursive script, reading "Roger C. Anderson".

Roger C. Anderson  
Environmental Engineer

RCA:sl

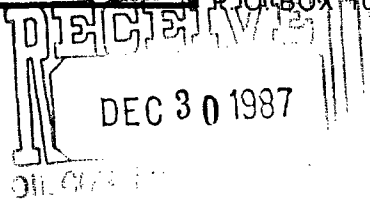
cc: Walsh Engineering



# BASIN DISPOSAL, INC.

"SPECIALIZING IN DISPOSAL OF PRODUCED WATER AND DRILLING MUD"

P.O. BOX 100 • AZTEC, NEW MEXICO 87410 • PHONE: (505) 334-3013



December 28, 1987

Energy, Minerals, and Natural Resources Department  
Oil Conservation Division  
P. O. Box 2088  
Santa Fe, NM 87504

Attn: Mr. Rodger Anderson


Dear Sir:

May this serve as a request to line one of our back mud pits with 10 mill lining to serve as a temporary emergency water storage until we get the disposal well drilled.

This is the same type lining which we are using for drilling mud disposal. After drilling the disposal well, we will remove the water and use the pit for drilling mud disposal.

We appreciate your consideration in this request.

Sincerely,

  
Jerry Sandel  
President

JS:tc



STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

GARREY CARRUTHERS  
GOVERNOR

POST OFFICE BOX 2088  
STATE LAND OFFICE BUILDING  
SANTA FE, NEW MEXICO 87504  
(505) 827-5800

December 15, 1987

The Honorable Jeff Bingaman  
United States Senator  
United States Senate  
Washington, D. C. 20510

Dear Senator Bingaman:

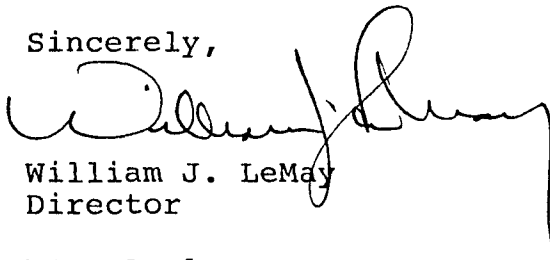
I received your letter of December 14, 1987 regarding problems at Basin Disposal in Bloomfield, New Mexico. The Oil Conservation Division (OCD) staff has been investigating the causes and a number of solutions to the hydrogen sulfide ( $H_2S$ ) emissions at the facility since May. I am enclosing a copy of a letter to Senator Domenici that explains conclusions and actions taken by the OCD through October 15, 1987.

The most recent monitor readings (enclosed) indicate that the cooler temperatures have in fact lowered  $H_2S$  emissions. Basin Disposal is required to monitor  $H_2S$  concentrations during operating hours.

Approval to construct an injection well was granted on October 16, 1986. To date, the well has not been drilled. An application for a hearing de novo before the Oil Conservation Commission was filed on behalf of the landowners who live adjacent to or in the vicinity of the Basin's facility.

The operator is still being fully cooperative in efforts to eliminate the problems at the facility.

Sincerely,

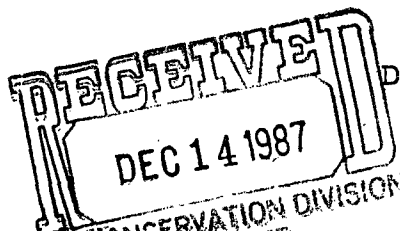


William J. LeMay  
Director

WLJ:RA:sl

cc: Tom Bahr, Secretary, EMNRD  
M. J. Burkhart, Director, Environmental Improvement Division

# United States Senate



December 3, 1987

*Dave TB -  
for your  
response  
B...*

Mr. William LeMay  
Oil Conservation Division  
P.O. Box 2088  
Santa Fe, New Mexico 87504-2088

Dear Mr. LeMay:

I have received the enclosed letter from Pat Hargis concerning the problems with Basin Disposal.

I would appreciate you looking into this matter and reporting back to me on your findings. Thank you for your assistance in this matter.

Sincerely,

*Jeff Bingaman*  
Jeff Bingaman  
United States Senator

JB/tmj  
Enclosure

DEAR U.S. SENATOR JEFF BINGAMAN,

We've formed a group called PHEW (Peoples' Health and Environmental Welfare). We are writing to you as we have had no satisfaction from OCD or EID concerning the problems with Basin Disposal. As of August 2, 1987 the latest readings from OCD were 2.5 PPM for at least 8 hours which greatly exceeds EID's air quality standard of 0.01 PPM. Basin Disposal was shut down by OCD for approximately one week while the produced waters were being treated, but the fact remains that the H2S is still present and growing and is making us sick. Is someone going to have to die before something is done? At least 12 people in the Basin Disposal area has had to seek medical attention, such as family doctors, emergency hospital treatment and paramedics.

We are writing to you to request your assistance in dealing with state agencies of OCD and EID. Neither agency will accept full responsibility. This is not just our interpretation of the situation. In the enclosed newspaper article you will find both the EID and the OCD passing the buck to each other. We think immediate action should be taken to close the waste site until the levels are brought down to EID's air quality standards.

Thank you,

Bill Williams  
Terry G. Crawford  
Judy Crawford  
Pat Hargis ←  
Judy Stolz  
Terri Payne  
Joy McDaniel  
Kenneth Raney, Jr.  
Traci Raney

Executive Committee of PHEW

PHEW  
c/o Pat Hargis  
P. O. Box 1714  
Bloomfield, NM 87413

# Basin Disposal May Treat Site Further 1/31

By Times Staff Writer

Basin Disposal Inc. may undergo another treatment process to try and alleviate problems of hydrogen sulfide gas coming from the gas and oil field waste dump.

Representatives of the Environmental Improvement Division and the Oil Conservation Division toured the dump Thursday. Area OCD representative Frank Chavez said this morning that it may be possible to stop the gas fumes by adding a "bactericide" to the facility's waste water holding pond. The holding pond had previously been treated with a chemical "bleach," a \$60,000 process that appears to have been unsuccessful. However, the level of hydrogen sulfide fumes coming from the pond are much lower now than before the treatment, according to Chavez.

The EID sent four representatives from its Santa Fe offices of epidemiology, ground water, air quality and hazardous waste to Basin Disposal Thursday. "We had been asking the EID from the beginning to become involved," said

Chavez. "Because a lot of it (problems at the dump) was out of our area of expertise and legislative mandate."

Although the EID has now taken a more active role in investigating complaints of hydrogen sulfide fumes coming from the dump, the EID will be acting only in an advisory capacity to the OCD, according to EID officials.

"The primary responsibility still rests with the OCD," said Dr. Millicent Eidson, an environmental epidemiologist with the EID's epidemiology office. "We are working in a consultative capacity to the OCD."

Dr. Millicent was among the state officials who visited Basin Disposal Thursday. "We did not find any high levels of hydrogen sulfide in the air while we were there," she said. The doctor said she distributed survey forms to people living in the area of the dump asking them to record "what kind of symptoms they've been suffering from."

Farlington Daily Times



STATE OF NEW MEXICO  
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT  
OIL CONSERVATION DIVISION

GARREY CARRUTHERS  
GOVERNOR

POST OFFICE BOX 2088  
STATE LAND OFFICE BUILDING  
SANTA FE, NEW MEXICO 87504  
(505) 827-5800

November 23, 1987

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

Basin Disposal, Incorporated  
C/O Walsh Engineering  
P. O. Drawer 419  
Farmington, New Mexico 87401

RE: H<sub>2</sub>S Contingency Plan

Dear Mr. Walsh:

The Oil Conservation Division has received and is in the process of reviewing your proposal dated September 28, 1987 for an H<sub>2</sub>S contingency plan for your Bloomfield disposal facility. After several discussions with you in person and by phone, the following clarifications or requirements are necessary for review to continue:

1. In Item 2 you state that H<sub>2</sub>S readings will be obtained every two (2) hours during normal operating hours, 7:00 AM to 7:00 PM, Monday through Saturday. As discussed in our phone conversations this proposal is acceptable provided a gradual phase out of the 24 hour monitoring schedule is performed. The 24 hour per day monitoring phase out schedule agreed to is:
  - a. Beginning November 1, 1987, obtain H<sub>2</sub>S monitor readings hourly for a 24 hour period three times a week. Obtain hourly readings during operating hours for the remaining four days in this week.
  - b. Beginning November 9, 1987, obtain H<sub>2</sub>S monitor readings hourly for a 24 hour period two time a week. Obtain hourly readings during operating hours for the remaining five days in this week.
  - c. Beginning November 16, 1987, obtain H<sub>2</sub>S monitor readings hourly for a 24 hour period once a week. Obtain hourly readings during operating hours for the remaining six days in this week.
  - d. Beginning November 30, 1987, obtain H<sub>2</sub>S monitor readings as proposed in your contingency plan.
2. pH will be obtained once each shift during normal operating days. If the pH of the pond falls below 8, immediate actions will be taken to raise it to 8.

3. The spray system operating requirements need clarification. The conditions which prohibit the operation of the spray system are:
- a. The spray system will not operate when winds are in excess of 15 mph, sustained or in gusts.
  - b. The spray system will not be operated when the wind direction is to the Southeast, South, or Southwest.
  - c. The spray system will be operated during daylight hours only.
  - d. Individual sprayers in the system will be oriented to direct the fluid spray so that no direct spray or windblown drift will leave the confines of the lined portion of the pit.
4. In Item 3 it is stated "In the event of accidental release of health threatening concentrations of  $H_2S$ ,...". "Health threatening" can be very ambiguous. Any release in excess of 10 ppm as measured at the fence line will require the notification of the public safety personnel listed in the plan.
5. Item 4 states that a "continual" release of  $H_2S$  in excess of 1.0 ppm will require the notification of Oil Conservation Division personnel. Continual does not identify a time period. Any two consecutive time periods where any monitoring readings at the fence line are in excess of 1.0 ppm will require the notification of Oil Conservation Division personnel. Consecutive readings do not have to occur at the same measuring point.
6. If consecutive readings of 1 ppm of  $H_2S$  are encountered, hourly monitoring 24 hours per day will be instituted immediately. In addition, pond samples will be analyzed daily for dissolved sulfides.

Please submit an amended contingency plan that includes these requirements. If you have any questions please call me at (505) 827-5885.

Sincerely,



Roger Anderson  
Environmental Engineer

cc: OCD - Aztec

RA:sl





EXHIBIT NO. 5

BASIN DISPOSAL, INC.  
H<sub>2</sub>S Contingency Plan

1. Incoming fluids will be monitored by H<sub>2</sub>S Monitor, the type currently being utilized, for presence of H<sub>2</sub>S.  
*pH < 6 - neutralize*  
Incoming fluids indicating, by monitor, H<sub>2</sub>S in excess of 10.0 ppm will be stored for treatment prior to disposal in disposal pond or in Salt Water Disposal Well.
  2. The current method of monitoring the levels of H<sub>2</sub>S leaving the boundaries of the facility, monitoring at the fence line, will be utilized. Monitor readings will be obtained every two (2) hours during the time the facility is manned or during normal operating hours. Normal operating hours, to be utilized, are from 7:00 AM to 7:00 PM, Monday through Saturday of each week.  
*family - 24 hrs/day H<sub>2</sub>S monitor - pH 2x/day*  
The spray system will only be utilized during normal operating hours. Also spray system will be utilized when winds are not in excess of 15 mph or from the southern direction or quadrants.
  3. In the event of accidental release of health threatening concentrations of H<sub>2</sub>S, the following public safety personnel will be notified by telephone:
    1. San Juan County Fire Marshall
    2. San Juan County Sheriffs Department
    3. New Mexico State Police
- Telephone numbers to contact the above will be posted at the Disposal Facility and employees instructed as to when and how to contact the above. In addition the Designated Representative or alternate will be available to contact the above.
4. In the event of continual H<sub>2</sub>S releases in excess of 1.0 ppm leaving the premises one of the following OCD personnel will be immediately notified by telephone.
    1. Frank Chavez
    2. Charley Gholson
    3. Ernie Busch

Telephone numbers to contact the above will be posted at the Disposal Facility and employees instructed as to when and how to contact the above. In addition the Designated Representative or alternate will be available to contact the above.

STATE OF  
NEW MEXICO

OIL  
CONSERVATION  
DIVISION



MEMORANDUM OF MEETING OR CONVERSATION

☒ Telephone ☐ Personal

Time  
2:00 PM

Date  
11/19/87

Originating Party

R.C. Anderson - OCD

Other Parties

Terry Payne - 632-9132

Subject

Mrs. Payne's call to the Governor's office.

Discussion

Mrs. Payne said she had called the Governor's office on 11/9/87 and Tom Bab's office on 11/10/87 to try to get legislation introduced in the '88 session to "control places like Basin Disposal". Neither office has called her back. She said the facility still emits odors but didn't know if it was H<sub>2</sub>S. All the families are moving out and she doesn't think anyone will be left if they have to wait until the '89 legislature.

Conclusions or Agreements

I told Mrs. Payne that only the Governor can introduce nonfiscal legislation in 1988.

Distribution

W.J. LeMay  
Basin file

Signed

Roger Anderson

# Memo

From

WILLIAM LEMAY  
Director

\* To Terry Pagnier 632-9132  
from Bloomfield N.M.  
called Governor's office and has called  
here many times

P General Order 44  
~~From a clear  
ability to have extract  
approved has extract  
20 pages of explanation~~

11/16 - 11:00 Y  
- 11:30 Y  
- 11:15 Y  
2:00  
3:00  
4:05  
11/17 9:00  
10:45 19  
11:30  
11/18 11:00

Only 1 call/day necessary



STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

GARREY CARRUTHERS  
GOVERNOR

POST OFFICE BOX 2088  
STATE LAND OFFICE BUILDING  
SANTA FE, NEW MEXICO 87504  
(505) 827-5800

M E M O R A N D U M

TO: WILLIAM J. LEMAY, Director, Oil Conservation Division

THROUGH: DAVID BOYER, Environmental Bureau Chief *DB*

FROM: ROGER ANDERSON, Environmental Engineer *RA*

SUBJECT: H<sub>2</sub>O INVESTIGATION AT BASIN DISPOSAL, INC.

DATE: NOVEMBER 23, 1987

---

The following is a summary of work performed by the OCD Environmental Bureau and actions taken by Basin Disposal Inc. from August 1, 1987 to October 31, 1987 to alleviate the H<sub>2</sub>S emissions from their lined evaporation pit. A previous summary dated September 3, 1987, lists activities from May 22 to July 31.

- 8/10/87 OCD Aztec office letter to Basin Disposal, Inc. instructing them to discontinue the use of the spray system until sulfide levels are reduced.
- 8/10/87 Complaint - From Ted Saiz about spraying causing headaches, sore throat and eye irritation at Lila Saiz home south of Basin Disposal.
- 8/11/87 EID letter to OCD summarizing the conclusions from their fact finding investigation conducted on July 30, 1987. They conclude that sulfides and sludges on bottom pose continuing H<sub>2</sub>S potential unless treated further.
- 8/12/87 Basin Disposal, Inc. submits application for a permit to drill a salt water disposal well.
- 8/14/87 Summary of Basin Disposal monitor readings for August 1 to August 14: Highest H<sub>2</sub>S reading 1.1 ppm at the fence line.
- 8/17/87 OCD and EID meeting with Basin Disposal, Inc. to discuss their proposed biological treatment plan for the pond.
- 8/19/87 Conversation with Jim Sterns, EPA Region VI concerning the events at Basin Disposal, actions taken by OCD and the results of the pond treatments.

8/21/87 Letter to Basin Disposal, Inc. from OCD approving the biological treatment plan and listing restrictions and monitoring requirements.

8/21/87 Letter to OCD from Basin Disposal, Inc. requesting an increase in the maximum approved water level.

8/26/87 Basin Disposal, Inc. treats the pond with the approved biological treatment.

8/26/87 Summary of Basin monitor readings August 15 to August 28: Highest H<sub>2</sub>S reading - 1.3 ppm; last dissolved sulfides - 40ppm.

8/28/87 Received letters addressed to EID dated May 14 and August 14 from Conoco. Letters indicate their Bloomfield Plant, located 1½ miles Southeast of Basin Disposal, has been discharging H<sub>2</sub>S gas in excess of the permittable 10ppm since startup in late 1986.

9/2/87 Basin Disposal, Inc. treated pond with second biological treatment.

9/2/87 Letter to OCD from the law firm of Carpenter and Goldberg requesting the disposal well hearing be conducted in the Farmington area. The request was denied.

9/4/87 Letter to Basin Disposal from OCD denying the requested maximum approved water level increase.

9/4/87 Letter to OCD from Senator Domenici requesting the background, investigation results and conclusions on the Basin Disposal, Inc. situation.

9/9/87 Letter to OCD from Basin Disposal, Inc. clarifying the use of the evaporation pond as a settling pond prior to injection or for emergency retention, after the injection well is in operation.

9/9/87 Pond treated with third biological treatment.

9/10/87 Pond treated with fourth biological treatment.

9/11/87 Summary of Basin Disposal monitor readings August 29 to September 11: Highest H<sub>2</sub>S reading - 1.4 ppm; pH - 8.5; last dissolved sulfides 24 ppm.

9/18/87 Letter to OCD from Representative Richardson requesting information on the Basin situation.

9/25/87 Summary of Basin Disposal monitor readings September 12 to September 25: Highest H<sub>2</sub>S reading - 0.5 ppm; pH - 8.5; last dissolved sulfides 15.6 ppm.

9/28/87 Basin submits H<sub>2</sub>S contingency plan.

- 10/9/87 Summary of Basin Dispsal monitor readings September 26 to October 9: Highest H<sub>2</sub>S reading - 0.3 ppm; pH - 8.5; Final dissolved sulfides 15 ppm.
- 10/15/87 Letters to Senator Domenici and Representative Richardson outlining the actions taken at Basin Disposal, Inc.
- 10/16/87 OCD issues Order #R-8524 approving the drilling of a saltwater disposal well at Basin Disposal.
- 10/19/87 OCD meeting with EID air quality on responsibility and regulation of low H<sub>2</sub>S emissions at oil field waste disposal facilities. After discussion with OCD Director, OCD notifies EID that the Oil and Gas Act does not allow OCD regulation of Air Quality and EID will need to develop rules under its authority.
- 10/23/87 Summary of Basin Disposal monitor readings October 10 to October 21: Highest H<sub>2</sub>S reading: 0.2 ppm; pH 8.5; last dissolved sulfides 14.5 ppm.

Carpenter and Goldberg, P. A.

Accidental Injury, Product Liability and Commercial Litigation

WILLIAM H. CARPENTER  
JOSEPH GOLDBERG  
DAYMON B. ELY

1600 UNIVERSITY BLVD., N. E., SUITE B  
ALBUQUERQUE, NEW MEXICO 87102-2124  
(505) 243-1336

November 16, 1987

RECEIVED

NOV 16 1987

OIL CONSERVATION DIVISION

Mr. William J. Lemay, Director  
Oil Conservation Division  
P.O. Box 2088  
Santa Fe, New Mexico 87504

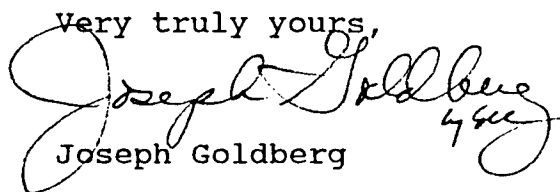
Re: Application of Basin Disposal Inc. for Salt Water  
Disposal, San Juan County, New Mexico, Case No. 9220

Dear Mr. Lemay:

Please consider this an application for a hearing de novo before the Oil Conservation Commission with respect to Order of the Division No. R-8524, dated October 16, 1987. This application is filed on behalf of the landowners and their families who live adjacent to or in the vicinity of the site of Basin Disposal, Inc.'s proposed injection well. The Order of the Division was entered pursuant to a hearing on September 23, 1987, before Examiner David R. Catanach and authorizes Basin Disposal, Inc., to use an injection well to dispose of produced salt water, subject to certain conditions set out in the Order.

The grounds for this application for a hearing de novo are as follows: (1) The Examiner's decision is not supported by clear and substantial evidence; and (2) based upon information and belief, there exist certain inaccuracies in Basin Disposal, Inc.'s Application for Authorization to Inject.

Very truly yours,

  
Joseph Goldberg

JG:ck

cc: David Catanach  
John A. Dean, Jr., Esq.  
Edmund H. Kendrick, Esq.  
Deborah H. Mande, Esq.  
F. Chester Miller III, Esq.  
✓ Jeffrey S. Taylor, Esq.

FACILITY HIGHLIGHTS FOR  
BASIN DISPOSAL, INC.  
BLOOMFIELD, NEW MEXICO

Prepared by:  
David Boyer, Oil Conservation Division, November 10, 1987

- \* Approval to operate given August 29, 1985. Approval was for use of double-lined synthetic membrane pond (approximate size 136 X 307 ft. X 12 ft. deep) with leak detection system. Subsequent approvals and dates were: Drilling mud disposal pits (unlined), 10/11/86; spray evaporation, 11/25/85; additional mud disposal pits, 10/15/86.
- \* Complaint from neighbor on 03/26/86 about salt spray drifting off site. As a result, Basin committed to limiting sprayer use to periods when wind speed is less than 15 mph.
- \* May 22 to June 1, 1987 - Three complaints to Oil Conservation Division (OCD) from neighbors about spray and sewage-like odors. Odors were said to cause headaches, nausea, and vomiting.
- \* Oil Conservation Division investigation began with site study on June 2, 1987. Additional Santa Fe staff site visits and measurements made on June 3-4, 17-19 and 22; July 8-10, 15-17, and 30. OCD Aztec office also responded to additional complaints at other times.
- \* Fluids seeped from the unlined pits to an adjacent arroyo where OCD documented their presence on June 19. Subsequently, OCD ordered the pits closed and fluids removed. Seepage did not impact ground water, and did not cause damage except for loss of some native brushes. Removal of fluids has stopped the moisture and salt migration.
- \* Prior to July 16, Basin unsuccessfully applied several chemical treatments to lower  $H_2S$  levels. July 16 treatment with bleach was only completely successful for approximately one week, but  $H_2S$  levels did not return to previously high levels.
- \* The OCD investigation concluded that  $H_2S$  gas had been present at potentially harmful levels on site. The cause was both receipt of  $H_2S$  gas dissolved in produced water, and in situ generation by anaerobic bacteria at the pit bottom.
- \* Oil Conservation Division approved a biological pond treatment on August 21, and also required Basin to monitor incoming produced water loads, and treat for  $H_2S$  if necessary.
- \* With only several exceptions  $H_2S$  hourly readings since the July 16 treatment through early September were less than 1 ppm. OSHA and industrial health levels of concern begin at the 10-20 ppm range.



- \* Basin Disposal applied for approval to construct an injection well at the facility, and a public hearing was held on September 23, 1987. It was approved on October 16, 1987. The injection well will be the primary disposal method at the facility, with the pond used for secondary settling of solids prior to injection and emergency retention of fluids during mechanical failures or well workovers. The volume of water in the pond will be reduced, allowing for clean-out.
- \* Oil Conservation Division continues to require that the company monitor H<sub>2</sub>S during operating hours. Maximum levels through October were in the 0.1 to 0.2 ppm range.

# EIO - OCD mts

10/19/87

Ron Conrad

CERCLA - EII)

Barbara Hargis

AQB

CUBIA CLAYTON

AQB

Louis W Rose

HED/DGC

Joe LaBarrere

AQB

Cynthia Wilkin

AQB

Bill Blankenship

AQB

DAVID BOYER

OCD

Jeff Taylor

OCD

Sammy Bailey

OCD

Roger Anderson

OCD

GARREY CARRUTHERS  
Governor



OFFICE of the GOVERNOR  
State of New Mexico  
Santa Fe 87503

October 15, 1987

Talmadge T. Hill  
P.O. Box 1996  
Bloomfield, NM 87413-1996

Dear Mr. Hill:

Thank you for your letter of September 19, 1987 concerning Jerry Finney's Sludge Pit and Basin Disposal which are both located in the Bloomfield area. In order for your concerns to be best addressed, I have asked Michael J. Burkhart, Director of the Environmental Improvement Division, to investigate the sludge pit operation and to report his findings directly to you. I am also requesting that William J. LeMay, Director of the Oil Conservation Division, investigate the concerns that relate to the Basin Disposal operation and to report his findings directly to you.

No doubt you will also want to contact the local Bloomfield and San Juan County Planning and Zoning Commissions concerning your complaints since local land use problems are involved.

Your interest and input concerning environmental issues are appreciated.

Sincerely,

A large, stylized handwritten signature of Garrey Carruthers, written in dark ink. The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Garrey Carruthers  
Governor

GC:LG/ps

cc: Larry Gordon, Secretary, Health and Environment Department  
Michael J. Burkhart, Director, Environmental Improvement Division  
William J. LeMay, Director, Oil Conservation Division

$$136 \times 307 \times 13\frac{1}{2}$$

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION



GARREY CARRUTHERS  
GOVERNOR

POST OFFICE BOX 2088  
STATE LAND OFFICE BUILDING  
SANTA FE, NEW MEXICO 87504  
(505) 827-5800

October 15, 1987

The Honorable Pete V. Domenici  
United States Senator  
United States Senate  
Washington, D.C. 20510

Attention: Richard Moore

Dear Senator Domenici:

The Oil Conservation Division (OCD) has received your letter of September 4, 1987, regarding problems at Basin Disposal in Bloomfield, New Mexico. I have delayed answering until recent information on the effect of their most recent H<sub>2</sub>S treatment became available.

This facility is the first and, to date, the only licensed surface disposal operation for oil field waste in the Farmington area. The double-lined waste disposal pond was permitted by OCD in August 1985 under our program to eliminate disposal of oil and gas wastes in areas where ground water could be contaminated. Under OCD rules, permitting review is limited to proposed measures for ground water protection, and general operating procedures to ensure that the facility is operated in a safe manner and receives only oil and gas waste fluids (eg. requirements include fencing, attendant on duty, record keeping, etc.) The Division does not involve itself in local zoning matters, or specific permitting that is the responsibility of other governmental agencies.

In late May of this year, complaints of strong odors (later verified as hydrogen sulfide gas) were made by nearby citizens. OCD's investigation found that the pond had received water with high amounts of the dissolved gas, and that additional gas was being generated in the pond by anaerobic sulfate-reducing bacteria. OCD took action to

require the company to treat both incoming disposal fluids and the pond bacteria, and further required them to monitor the facility so that appropriate action can be taken immediately in the event of re-occurrence of high gas levels. Several different treatments with varying effectiveness have been administered to the pond with the current treatment beginning August 26.

Most recent monitor readings (enclosed) show lowering of hydrogen sulfide levels to 0.3 milligrams per liter (mg/l) or below as recorded during the required day-night hourly monitoring. By comparison, the federal OSHA standard is set at 20 mg/l. However, the odor threshold for many people is below 0.1 mg/l, and the odor itself can be nauseous even though health related toxic effects are only documented at higher concentrations (10-50 ppm).

The OCD is requiring the company to continue monitoring to evaluate treatment effectiveness, and the advent of cooler weather will lower the pond temperature and should reduce the activity of bacteria causing the  $H_2S$ .

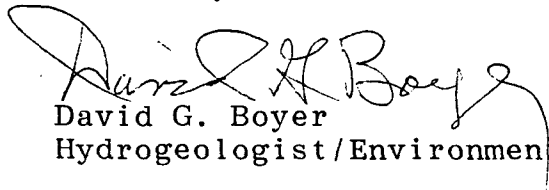
Basin Disposal applied for approval to construct an injection well at the facility and a public hearing was held on September 23, 1987. The application is expected to be approved shortly. The injection well will be the primary disposal method at the facility with the pond used for secondary settling of solids prior to injection and emergency retention of fluids during mechanical failures or well workovers. The volume of water in the pond will be reduced allowing for clean-out. These actions should alleviate the problem, and OCD-required monitoring and notification procedures will allow timely response in the event of re-occurrence of gas emissions.

A second issue concerning the nearby residents and OCD involves the release of fluids from several small drilling mud pits also located at the site. These unlined ponds were authorized to receive only heavy drilling muds, but also took other fluids including water and waste oil. Seepage from the ponds moved laterally and saturated the soil in a nearby arroyo with fluids containing salt and hydrocarbons. Sampling of the pits showed that no heavy metals were present except at trace levels. Some bushes and a small juniper tree were killed by the salt, but the impacts are limited to soil immediately adjacent to the unlined pits. Ground water at the site is at a depth of 250 feet, and would not have been impacted due to thick zones of clays and similar fine grained materials, and the relatively short time of subsurface discharge. OCD ordered the pits closed, required that oil be recovered, other

fluids be emptied to the main pond, and that all fluid recovery be completed by October 31. Further disposal will be authorized only in OCD-approved lined pits. To date, removal of most of the fluids has stopped the moisture migration and will trap the salts in place, except in the arroyo bottom. Hydrocarbon material in the soil will volatilize or biologically degrade. The area immediately adjacent to the site has naturally occurring alkali salts at, and on, the surface and OCD believes that the relatively small amounts of additional salt present in the arroyo will not have an impact beyond that naturally occurring.

The operator has been fully cooperative in the effort to eliminate the problem and is as anxious to eliminate this nuisance as is the OCD. We are confident that further emissions, if there are any, will be dealt with immediately. The disposal well, in our opinion, will eliminate the remaining gas problem.

Sincerely,



David G. Boyer

Hydrogeologist/Environmental Bureau Chief

Enc.

cc: W.J. LeMay, Director, OCD  
Tom Bahr, Secretary, EMNRD  
M.J. Burkhardt, Director, EID



STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

GARREY CARRUTHERS  
GOVERNOR

POST OFFICE BOX 2088  
STATE LAND OFFICE BUILDING  
SANTA FE, NEW MEXICO 87504  
(505) 827-5800

October 15, 1987

The Honorable Bill Richardson  
Member of Congress  
House of Representatives  
Washington, D.C. 20515

Dear Congressman Richardson:

The Oil Conservation Division (OCD) has received your letter of September 18, 1987, regarding problems at Basin Disposal in Bloomfield, New Mexico. I have delayed answering until recent information on the effect of their most recent  $H_2S$  treatment became available.

This facility is the first and, to date, the only licensed surface disposal operation for oil field waste in the Farmington area. The double-lined waste disposal pond was permitted by OCD in August 1985 under our program to eliminate disposal of oil and gas wastes in areas where ground water could be contaminated. Under OCD rules, permitting review is limited to proposed measures for ground water protection, and general operating procedures to ensure that the facility is operated in a safe manner and receives only oil and gas waste fluids (eg. requirements include fencing, attendant on duty, record keeping, etc.) The Division does not involve itself in local zoning matters, or specific permitting that is the responsibility of other governmental agencies.

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The OCD is requiring the company to continue monitoring to evaluate treatment effectiveness, and the advent of cooler weather will lower the pond temperature and should reduce the activity of bacteria causing the H<sub>2</sub>S.

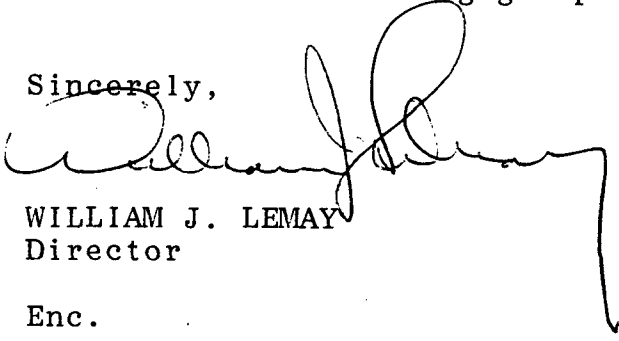
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at, and on, the surface and OCD believes that the relatively small amounts of additional salt present in the arroyo will not have an impact beyond that naturally occurring.

The operator has been fully cooperative in the effort to eliminate the problem and is as anxious to eliminate this nuisance as is the OCD. We are confident that further emissions, if there are any, will be dealt with immediately. The disposal well, in our opinion, will eliminate the remaining gas problem.

Sincerely,



WILLIAM J. LEMAY  
Director

Enc.

cc: Tom Bahr, Secretary, EMNRD  
M.J. Burkhardt, Director, EID

Form Radio Show - 10/13/87 - Basin Dis.

Terri Payne

Pheo

✓ Terry Crawford -  
Mick Crawford

No. ENV. Impact <sup>Study</sup> done - should have been done

Treatments were ineffective

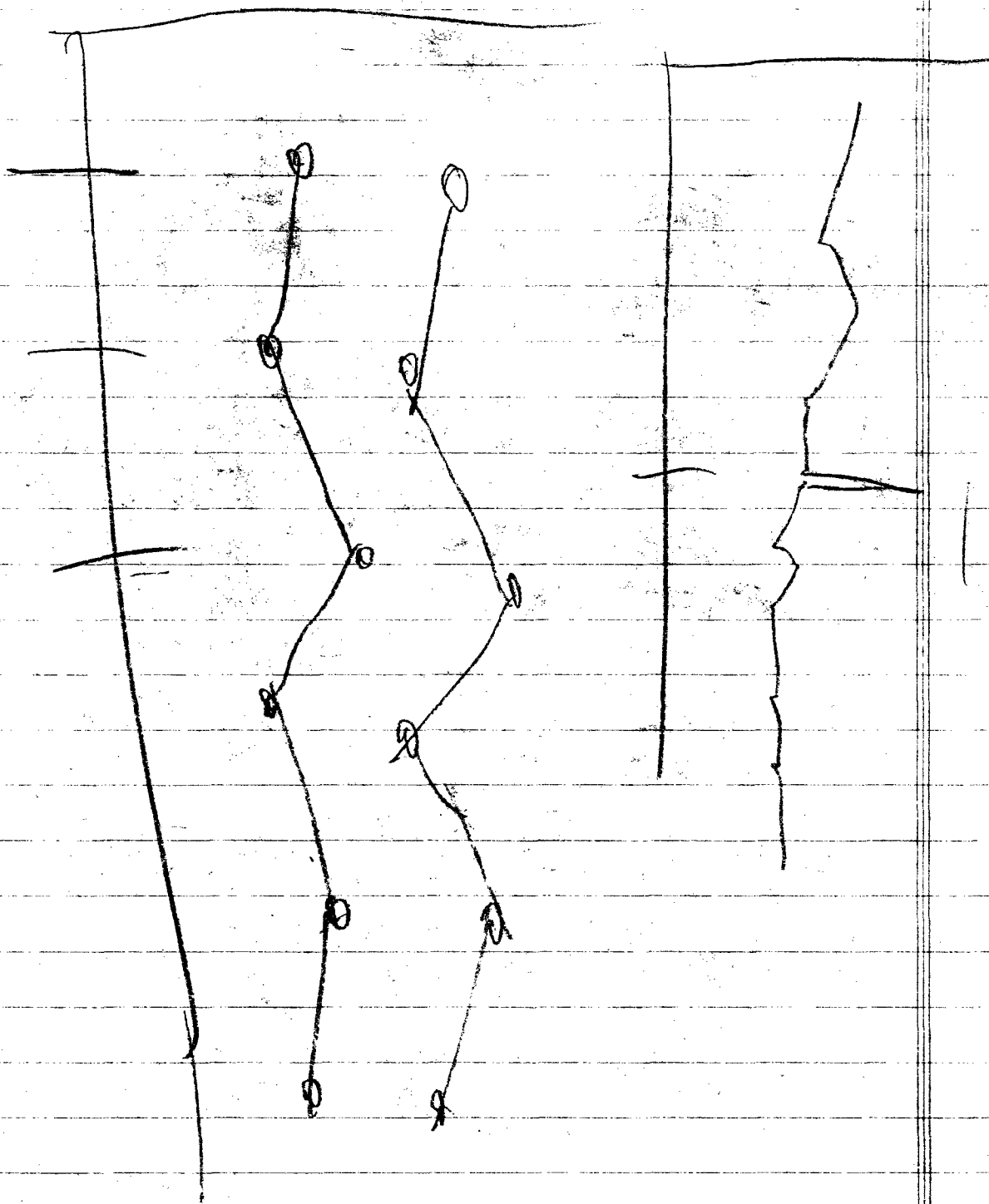
Good words for Frank - Notified Residents  
- Responded

22 May - Jami Bailey - Told residents - BD  
- Were following Rules  
- Shut down sprinklers

July 4, 5, 6 - Paramedics

called - Air Quality EID - NO response  
- Hay waster - Refers to acid

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**WALSH**

ENGINEERING & PRODUCTION CORP.

Petroleum Engineering Consulting  
Lease Management  
Contract Pumping

3001 Northridge Drive  
P.O. Drawer 419  
Farmington, New Mexico 87401  
(505) 327-4892

October 6, 1987

Mr. William J. LeMay  
Division Director  
Energy & Minerals Department  
Oil Conservation Commission  
P. O. Box 2088  
Santa Fe, New Mexico 87501

REF: Basin Disposal, Inc.  
Treatment of Disposal Pond  
with Bio-Genesis  
September 10, 1987

Dear Mr. LeMay:

Enclosed you will find a corrected report concerning the above-referred-to treatment. The amount of Bio-Genesis used in treatment was 20 gallons not 2 gallons.

Very truly yours,

Ewell N. Walsh, P.E.  
President

ENW:rr

cc: Frank Chavez, OCD, Aztec, N.M.  
Basin Disposal, Inc.

Enclosure



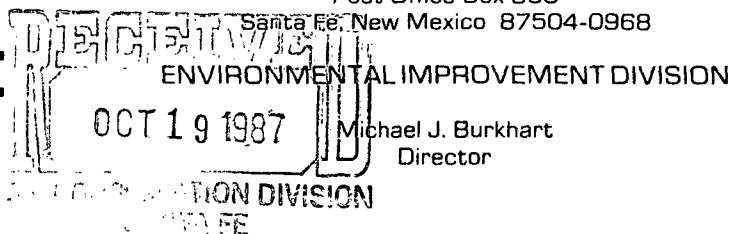
BASIN DISPOSAL, INC.

TREATMENT NO. 11

Treat disposal pond with 20 gallons Bio-Genesis. Treatment applied to pond through spray system.

Overall Time	-	2.95 hours
Pond Water	-	70,800 gallons
Proportion	-	1 gallon per 3,540 gallons

Treatment applied to pond through all stations with spray system.



GARREY CARRUTHERS  
Governor  
LARRY GORDON  
Secretary  
CARLA L. MUTH  
Deputy Secretary

October 16, 1987

Talmadge T. Hill  
P.O. Box 1996  
Bloomfield, New Mexico 87413

Dear Mr. Hill:

I have been asked, as Director of the Environmental Improvement Division (EID), to respond to aspects of your September 19, 1987 letter to Governor Carruthers concerning Jerry Finney's sludge pit operation outside of Bloomfield. EID staff reviewed a discharge plan (DP-453) for Environmental Maintenance Services to operate this site. That review was specific to water quality impacts.

The discharge plan was approved February 25, 1987. A public notice was prepared and published about December 6, 1986 which described the discharge plan. Subsequently, Environmental Maintenance Services requested a modification of the discharge plan. The public notice on the modification was published about March 9, 1987. The modified plan was approved April 29, 1987.

The modified plan allowed Mr. Finney to initially compost certain materials in windrows. However, a 28' by 32' concrete building was to be constructed and used for the composting operation six months after the date the modification was approved.

Based on your statement that "Jerry Finney is moving his sludge pit", it is apparent that you are aware that most, if not all of your concerns should be resolved very soon. Instead of constructing a building for composting at his present site (also his residence), Mr. Finney is leasing a new site that is isolated from residences. He has informed this office that he will be at the new location on or before November 1, 1987.

I appreciate your concerns about odor and fly problems. Public nuisance concerns such as these are usually best handled at the local level. You may want to talk with the local District Attorney and David Tomko of our staff in Farmington (Phone No. 327-9851) concerning odor and fly problems respectively if these problems continue to exist. Since local land use problems are involved, you may also want to contact the local Bloomfield and San Juan County Planning and Zoning Commission.

Talmadge T. Hill  
October 16, 1987  
Page -2-

If you have any additional questions, you may contact Richard Mitzelfelt of my staff (Phone No. 827-2919).

Sincerely,

A handwritten signature in dark ink, appearing to read "Michael J. Burkhart", with a long horizontal stroke extending to the right.

Michael J. Burkhart  
Director

MJB/RM/ps

cc: Governor Garrey Carruthers  
Richard Mitzelfelt, Chief, Ground Water Bureau

bcc: Tito Madrid  
David Tomko  
Dave Boyer  
Ernest C. Rebuck



STATE OF NEW MEXICO  
ENERGY, MINERALS, AND NATURAL RESOURCES DEPARTMENT  
OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING  
CALLED BY THE OIL CONSERVATION  
DIVISION FOR THE PURPOSE OF  
CONSIDERING:

CASE NO. 9220  
Order No. R-8524

APPLICATION OF BASIN DISPOSAL,  
INC. FOR SALT WATER DISPOSAL,  
SAN JUAN COUNTY, NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 8:15 a.m. on September 23, 1987, at Santa Fe, New Mexico, before Examiner David R. Catanach.

NOW, on this 16th day of October, 1987, the Division Director, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS THAT:

(1) Due public notice having been given as required by law, the Division has jurisdiction of this cause and the subject matter thereof.

(2) The applicant, Basin Disposal, Inc., seeks authority to dispose of produced salt water into the Point Lookout member of the Mesaverde formation in a perforated interval to be determined after drilling and running logs in its proposed disposal well to be located 2207 feet from the North line and 1870 feet from the West line (Unit F) of Section 3, Township 29 North, Range 11 West, NMPM, San Juan County, New Mexico.

(3) Meridian Oil, Inc. (Meridian), the leasehold operator of the acreage upon which the disposal well is to be located, entered an appearance in this case at the time of the hearing.

(4) At the time of the hearing the applicant agreed to abide by a request from Meridian to confine injection in the proposed disposal well to the Cliff House member of the Mesaverde formation located at a depth of approximately 3800

feet and to limit the total depth of the proposed well to 3900 feet.

(5) An appearance was also made at the hearing by Mr. Joseph Goldberg on behalf of a number of residents who reside in close proximity to the proposed disposal well site whose concern centers around the open air pits the applicant is currently utilizing at the site to dispose of produced water.

(6) By letter to the Division dated September 9, 1987, which has been entered as part of the record in this case, the applicant has stated that the proposed injection well will be utilized as the primary method of water disposal at the disposal site.

(7) Evidence presented at the hearing indicates that the Beta Development Company Martin 3 Well No. 1, located 1611 feet from the North line and 790 feet from the West line of Section 3, Township 29 North, Range 11 West, NMPM, which is currently a producing gas well in the Dakota formation, may not be cemented adequately to confine the injection fluid to the proposed injection formation.

(8) Prior to initiating injection operations into the proposed well, the applicant should be required to perform remedial cement operations on the Martin 3 Well No. 1, or to demonstrate to the supervisor of the Division's Aztec district office that said Martin 3 Well No. 1 is adequately constructed so as to confine the injection fluid to the proposed injection formation.

(9) Injection should be accomplished through 2 7/8-inch lined tubing installed in a packer set within 100 feet of the uppermost perforation; the casing-tubing annulus should be filled with an inert fluid; and a pressure gauge or approved leak-detection device should be attached to the annulus in order to determine leakage in the casing, tubing, or packer.

(10) Prior to commencing injection operations, the casing in the subject well should be pressure-tested throughout the interval from the surface to the proposed packer-setting depth to assure the integrity of such casing.

(11) The injection well or system should be equipped with a pressure-limiting switch or other acceptable device which will limit the wellhead pressure on the injection well

to no more than .2 psi per foot of depth to the uppermost perforation.

(12) The Director of the Division should be authorized to administratively approve an increase in the injection pressure upon a proper showing by the operator that such higher pressure will not result in migration of the injected waters from the Mesaverde formation.

(13) The operator should give advance notification to the supervisor of the Aztec district office of the Division of the date and time of the installation of disposal equipment and of the mechanical integrity test so that the same may be inspected and witnessed.

(14) The operator should take all steps necessary to ensure the injected water enters only the proposed injection interval and is not permitted to escape to other formations.

(15) Approval of the subject application will prevent the drilling of unnecessary wells and otherwise prevent waste due to premature abandonment of existing producing wells.

IT IS THEREFORE ORDERED THAT:

(1) The applicant, Basin Disposal, Inc., is hereby authorized to utilize a well to be drilled at a location 2207 feet from the North line and 1870 feet from the West line (Unit F) of Section 3, Township 29 North, Range 11 West, NMPM, San Juan County, New Mexico, to dispose of produced salt water into the Cliff House member of the Mesaverde formation, injection to be accomplished through 2 7/8-inch tubing installed in a packer to be set within 100 feet of the uppermost perforation.

PROVIDED HOWEVER THAT, injection shall be limited to the Cliff House member of the Mesaverde formation; the tubing shall be lined; the casing-tubing annulus shall be filled with an inert fluid; and a pressure gauge shall be attached to the annulus or the annulus shall be equipped with an approved leak-detection device in order to determine leakage in the casing, tubing, or packer.

PROVIDED FURTHER THAT, prior to commencing injection operations, the casing in the subject well shall be pressure-tested to assure the integrity of such casing in a manner

that is satisfactory to the supervisor of the Division's district office at Aztec.

PROVIDED FURTHER THAT, prior to commencing injection operations into the well, the applicant shall cement the production string in the Martin 3 Well No. 1, described in Finding No. (8) above, across, above, and below the injection zone or shall demonstrate to the supervisor of the Division's Aztec district office that said Martin 3 Well No. 1 is adequately constructed so as to confine the injection fluid to the proposed injection formation.

(2) The applicant shall be required to furnish the Santa Fe office of the Division a copy of the log run on the well and detailed information on the location and extent of perforations in the well.

(3) The injection well or system shall be equipped with a pressure-limiting switch or other acceptable device that will limit the wellhead pressure on the injection well to no more than .2 psi per foot of depth to the uppermost perforation.

(4) The Director of the Division may authorize an increase in injection pressure upon a proper showing by the operator of said well that such higher pressure will not result in migration of the injection fluid from the Cliff House member of the Mesaverde formation.

(5) The operator shall notify the supervisor of the Aztec district office of the Division of the date and time of the installation of disposal equipment and of the mechanical integrity test so that the same may be inspected and witnessed.

(6) The operator shall immediately notify the supervisor of the Division's Aztec district office of the failure of the tubing, casing, or packer, in said well or the leakage of water from or around said well and shall take such steps as may be timely and necessary to correct such failure or leakage.

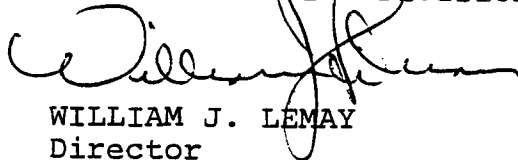
(7) The applicant shall conduct disposal operations and submit monthly reports in accordance with Rules 702, 703, 704, 705, 708, and 1120 of the Division Rules and Regulations.

(8) The applicant shall, insofar as is practical, utilize the disposal well as the primary means of disposing produced salt water at the site.

(9) Jurisdiction of this cause is retained for the entry of such further orders as the Division may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO  
OIL CONSERVATION DIVISION

  
WILLIAM J. LEMAY  
Director

S E A L

fd/



STATE OF NEW MEXICO  
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT  
OIL CONSERVATION DIVISION

GARREY CARRUTHERS  
GOVERNOR

October 28, 1987

POST OFFICE BOX 2088  
STATE LAND OFFICE BUILDING  
SANTA FE, NEW MEXICO 87504  
(505) 827-5800

Mr. Talmadge T. Hill  
P.O. Box 1996  
Bloomfield, NM 87413

Dear Mr. Hill:

Governor Carruthers has asked me, as Director of the Oil Conservation Division (OCD), to respond to the concerns stated in your letter of September 19, 1987 relating to Basin Disposal's oil field service facility.

Basin Disposal applied to the OCD to construct an oil field waste disposal facility in the summer of 1985. The double-lined waste disposal pond was permitted by OCD in August 1985 under our program to eliminate disposal of oil and gas wastes in areas where ground water could be contaminated. Under OCD rules, permitting review is limited to proposed measures for ground water protection and general operating procedures to ensure that the facility is operated in a safe manner and receives only oil and gas waste fluids.

In late May of this year, complaints of strong odors (later verified as hydrogen sulfide gas) were made by nearby citizens. OCD's investigation found that the pond had received water with high amounts of the dissolved gas, and that additional gas was being generated in the pond by anaerobic sulfate-reducing bacteria. OCD took action to require the company to treat both incoming disposal fluids and the pond bacteria, and further required them to monitor the facility so that appropriate action can be taken immediately in the event of recurrence of high gas levels.

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Basin Disposal applied for approval to construct an injection well at the facility, and a public hearing was held on September 23, 1987. It was approved on October 16, 1987. The injection well will be the primary disposal method at the facility, with the pond used for secondary settling of solids prior to injection and emergency retention of fluids during mechanical failures or well workovers. The volume of water in the pond will be reduced, allowing for clean-out. These actions should alleviate the problem, and OCD-required monitoring and notification procedures will allow timely response in the event of recurrence of gas emissions.

October 28, 1987

Page 2

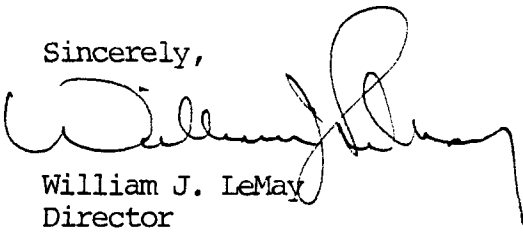
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Since local land use problems and zoning are involved, you may want to contact the local Bloomfield and San Juan County Planning and Zoning Commission regarding this matter.

If you have any additional questions, you may contact David Boyer of my staff at (505) 827-5812.

Sincerely,



William J. LeMay  
Director

cc: Governor Garrey Carruthers  
Michael Burkhart, Director, EID  
OCD Aztec District Office

10/5/87m

Need by

10/9

for Lois signature

September 19, 1978

Governor Garry Carruthers  
State Capitol Building  
Santa Fe, New Mexico 87501

Dear Governor Carruthers:

There is a business that moved in and started operating causing a very large increase in flies and putting out a very rank odor just behind my property and other neighbors, also causing property devaluation. The closer you live to this the worse it is.

This business is Jerry Finney's Sludge Pit, State Approved. I really couldn't believe this could happen here among residence so close, just South of Bloomfield (15) feet out of the City limits.

Then there is Basin Disposal with a terrible odor and making people and animals sick. This kind of problems could be stopped by the changing of the States Guidelines to restrict strong odor or high cause of flies businesses to be away from any residence or proposed residence by at least (2) miles.

I pray you can stop Basin Disposal now and return the ground to normal. Jerry Finney is moving his Sludge Pit. I hope no one else has to go through what I and my neighbors did because of it.

Thank you for any action you take on this with our welfare in mind.

Sincerely,

*Talmadge T. Hill*

Talmadge T. Hill  
Resident Property owner  
of each business

P.O. Box 1996  
Bloomfield, N. Mex.  
87413



GARREY CARRUTHERS  
*Governor*



OFFICE of the GOVERNOR  
State of New Mexico  
Santa Fe 87503

October 15, 1987

Talmadge T. Hill  
P.O. Box 1996  
Bloomfield, NM 87413-1996

Dear Mr. Hill:

Thank you for your letter of September 19, 1987 concerning Jerry Finney's Sludge Pit and Basin Disposal which are both located in the Bloomfield area. In order for your concerns to be best addressed, I have asked Michael J. Burkhardt, Director of the Environmental Improvement Division, to investigate the sludge pit operation and to report his findings directly to you. I am also requesting that William J. LeMay, Director of the Oil Conservation Division, investigate the concerns that relate to the Basin Disposal operation and to report his findings directly to you.

No doubt you will also want to contact the local Bloomfield and San Juan County Planning and Zoning Commissions concerning your complaints since local land use problems are involved.

Your interest and input concerning environmental issues are appreciated.

Sincerely,

Garrey Carruthers  
Governor

GC:LG/ps

cc: Larry Gordon, Secretary, Health and Environment Department  
Michael J. Burkhardt, Director, Environmental Improvement Division  
William J. LeMay, Director, Oil Conservation Division

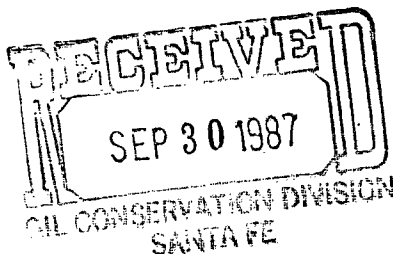
**WALSH**

ENGINEERING &amp; PRODUCTION CORP.

Petroleum Engineering Consulting  
Lease Management  
Contract Pumping3001 Northridge Drive  
P.O. Drawer 419  
Farmington, New Mexico 87401  
(505) 327-4892

September 28, 1987

Mr. William J. LeMay  
Division Director  
Energy & Minerals Department  
Oil Conservation Commission  
P. O. Box 2088  
Santa Fe, New Mexico 87501



REF: Basin Disposal Inc.  
H<sub>2</sub>S Contingency Plan

Dear Mr. LeMay:

This letter is in response to your letter of September 3, 1987 that stated that the above-referred-to contingency plan could be submitted September 30, 1987.

Please refer to page 2, Item 6 of letter dated July 14, 1987.

Enclosed you will find the following exhibits:

Exhibit No. 1

Tabulation of H<sub>2</sub>S Monitor Readings from August 26 through September 24, 1987. Please note that each page is for the same time period for the above dates.

The time periods commence at 7:00 PM (1900 hour) and are through 7:00 AM (0700 hour).

Exhibit No. 2

Tabulation of H<sub>2</sub>S Monitor Readings from August 26 through September 24, 1987. Please note that the readings are those with the wind moving from the southern quadrants.

Stations K, L, M and N are on the windward side of the fence line.

Exhibit No. 3

Tabulation of H<sub>2</sub>S Monitor Readings from August 26 through September 24, 1987. Please note that the readings are those with the wind moving from the northern quadrants.

Stations P, Q, R and S are on the windward side of the fence line.



Exhibit No. 4

Tabulation of H<sub>2</sub>S Monitor Readings from August 26 through September 24, 1987. Please note that the readings are those with the wind moving from the eastern quadrants.

Stations N, O and P are the windward side of the fence line.

Exhibit No. 5

Contingency Plan

The following are remarks concerning the Exhibits.

Exhibit No. 1

This Exhibit is presented to indicate that since the initial treatment with Bio-Genesis, August 26, 1987, that the readings during the time period 7:00 PM through 7:00 AM decreased in value and number of readings above zero.

The decrease in value and number of readings indicates that 24 hour monitoring, of H<sub>2</sub>S readings at the fence line should not be necessary.

Exhibit No. 2

This Exhibit is presented to indicate that readings on the windward side of the fence line, stations K, L, M and N indicate that the wind contains H<sub>2</sub>S from another source.

Also it can be noted that the value and number of readings, above zero, have decreased since the initial treatment with Bio-Genesis.

Exhibit No. 3

This Exhibit is presented to indicate that readings on the windward side of the fence line, Stations P, Q, R and S, indicate that the wind contains H<sub>2</sub>S from another source.

Also it can be noted that the value and number of readings, above zero, decreased since the initial treatment with Bio-Genesis.

Exhibit No. 4

This Exhibit is presented to indicate that readings on the windward side of the fence line, Stations N, O and P indicate that the wind contains H<sub>2</sub>S from another source.

Also it can be noted that the value and number of readings, above zero, have decreased since the initial treatment with Bio-Genesis.



Page No. 3  
William J. LeMay

Exhibit No. 5

As Presented.

Current Monitor readings indicate that the treatment of the Disposal Pond is successful and monitoring of levels of  $H_2S$  is not required during the time that the facility is unmanned or other than normal operating hours.

If you have any questions, please do not hesitate to call upon me.

Very truly yours,

A handwritten signature in black ink, appearing to read "Ewell N. Walsh", written in a cursive style.

Ewell N. Walsh, P.E.  
President

ENW:rr

cc: Basin Disposal, Inc.  
Frank Chavez, OCD, Aztec, N.M.

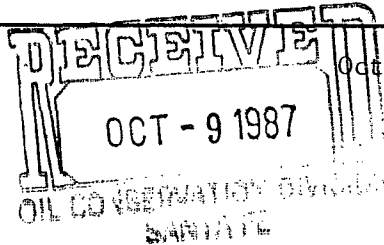


**WALSH**

ENGINEERING & PRODUCTION CORP.

Petroleum Engineering Consulting  
Lease Management  
Contract Pumping

3001 Northridge Drive  
P.O. Drawer 419  
Farmington, New Mexico 87401  
(505) 327-4892



October 6, 1987

Mr. William J. LeMay  
Division Director  
Energy & Minerals Department  
Oil Conservation Commission  
P. O. Box 2088  
Santa Fe, New Mexico 87501

REF: Basin Disposal, Inc.  
Treatment of Disposal Pond  
with Huma-Calcium  
on October 5, 1987

Dear Mr. LeMay:

Enclosed you will find the report concerning the above-referred-to treatment.

Very truly yours,

Ewell N. Walsh, P.E.  
President

ENW:rr

cc: Frank Chavez, OCD, Aztec, N.M.  
Basin Disposal, Inc.

Enclosure



BASIN DISPOSAL, INC.

TREATMENT NO. 12

10/5/87

Treat disposal pond with 45 gallons Huma-Calcium. Treatment applied to pond by circulating through spray system.

The 45 gallons Huma-Calcium proportioned into approximately 110,800 gallons of pond water during a 4.50 hour period. (Proportion 1 gallons Huma-Calcium to approximately 2,460 gallons of pond water)

The initial 30 gallons of Huma-Calcium treatment was circulated through stations: (See attached for stations)

N, 16-20 and

S, 12-19

(NOTE: Deeper portion of pond)

The remaining 15 gallons of Huma-Calcium was circulated through stations:

N, 8-10 and

S, 1-4 and

W, 7-10

(NOTE: Shallower portion of pond)



**THE REPRODUCTION OF**

**THE**

**FOLLOWING**

**DOCUMENT ( S )**

**CANNOT BE IMPROVED**

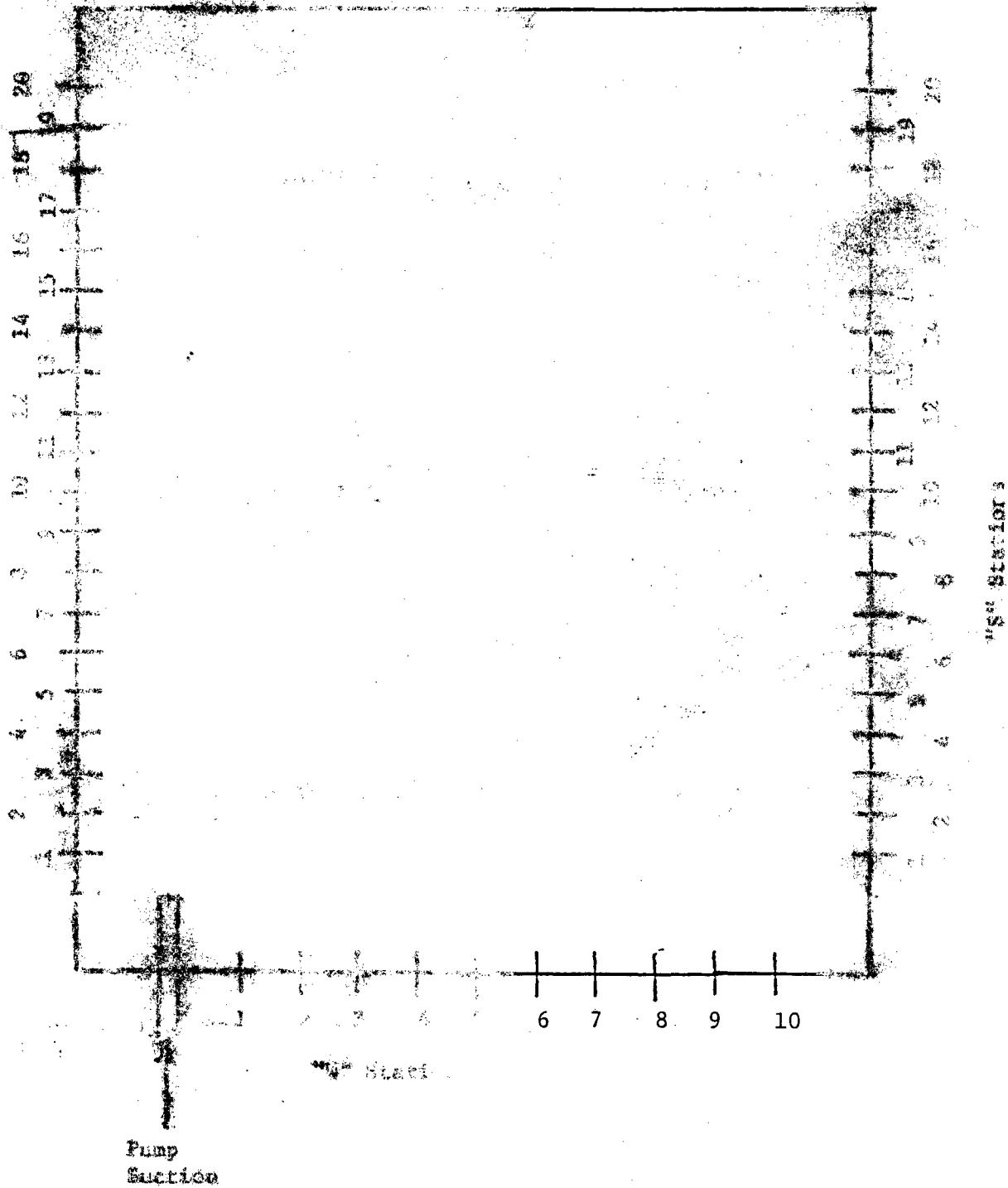
**DUE TO**

**THE CONDITION OF**

**THE ORIGINAL**

PROPOSAL, INC.

SYSTEM STATIONS



8/26/87



## EXHIBIT NO. 1

AREA	DATE, 1987	TIME	K	L	M	N	O	P	Q	R	S	WIND DIRECTION	WIND SPEED	Ph	REMARKS
FENCE LINE	8-26	8	0	0-0.1	0.5-0.9	0.1-0.2	0.1	0-0.1	0	0	0	NW	5-10	8.5+	
FENCE LINE	8-27	1900	0	0	0	0-0.2	0.2-0.3	0	0	0	0	N	5-10	8.5+	
FENCE LINE	8-28	1900	0	0-0.1	0.1	0	0	0	0	0	0	N TO W	0-2	8.5+	
FENCE LINE	8-29	1900	0	0-0.1	0.1-0.3	0.1-0.2	0.1	0	0	0	0	NW	5-10	8.5+	
FENCE LINE	8-30	1900	0-0.1	0-0.2	0.2	0	0	0	0	0	0	N	0	8.5+	
FENCE LINE	8-31	1900	0	0.1-0.4	0.3-0.4	0.1	0	0	0	0-0.1	0-0.1	N TO SW	0-5	8.5+	
FENCE LINE	9-1	1900	0.1-0.3	0.1-0.4	0.1-0.2	0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	NE	10-15	8.5+	
FENCE LINE	9-2	1900	0.1-0.2	0.1-0.3	0	0-0.1	0	0	0	0	0	N TO E	10-15	8.5+	
FENCE LINE	9-3	1900	0	0	0	0	0	0	0.2-0.3	0.4-0.5	0.1-0.2	SW TO S	0	8.5+	
FENCE LINE	9-4	1900	0.1	0.1	0.1	0.1	0.1	0.1	0.2-0.3	0.2-0.3	0.1	SW	5-10	8.5+	
FENCE LINE	9-5	1900	0	0.1-0.2	0.2-0.1	0.1-0	0	0	0	0	0	NW	0	8.5+	
FENCE LINE	9-6	1900	0-0.1	0.2	0.1	0	0	0	0	0	0	N TO NW	0-2	8.5+	
FENCE LINE	9-7	1900	0.2-0.3	0.2	0	0	0	0	0	0	0.1	N TO NE	0-5	8.5+	
FENCE LINE	9-8	1900	0	0.1	0-0.1	0	0	0	0	0	0	N	0-5	8.5+	
FENCE LINE	9-9	1900	0	0	0	0-0.1	0.1	0.1	0.1	0.1	0.1	N TO W	0-5	8.5+	
FENCE LINE	9-10	1900	0.2	0.1-0.2	0-0.1	0.1	0	0	0	0	0	N TO NW	5-11	8.5+	
FENCE LINE	9-11	1900	0.1-0.2	0-0.2	0-0.1	0	0	0	0	0	0	NE	5-10	8.5+	
FENCE LINE	9-12	1900	0	0	0	0	0	0	0.1	0.1-0.2	0.1-0.2	S	5-10	8.5+	
FENCE LINE	9-13	1900	0	0	0	0	0	0	0	0	0	NW	0-5	8.5+	
FENCE LINE	9-14	1900	0	0	0	0	0	0	0	0	0	N	10-15	8.5+	
FENCE LINE	9-15	1900	0	0	0	0-0.1	0-0.1	0	0	0	0	NW TO W	10-15	8.5+	
FENCE LINE	9-16	1900	0	0	0.1	0	0	0	0	0	0	NW TO W	0-5	8.5+	
FENCE LINE	9-17	1900	0	0	0	0	0	0	0	0	0	NW TO W	0	8.5+	
FENCE LINE	9-18	1900	0	0	0	0	0	0	0	0	0	N TO SW	0-5	8.5+	
FENCE LINE	9-19	1900	0	0	0	0	0	0	0	0	0	N	10-20	8.5+	
FENCE LINE	9-20	1900	0	0	0	0	0	0	0	0	0	SW	10-15	8.5+	
FENCE LINE	9-21	1900	0	0	0	0	0	0-0.1	0.1	0.1	0-0.1	SW	0	8.5+	
FENCE LINE	9-22	1900	0	0	0-0.1	0	0	0	0-0.1	0-0.1	0	N	0-2	8.5+	
FENCE LINE	9-23	1900	0	0	0	0	0	0	0	0	0-0.1	S TO W	0-5	8.5+	
FENCE LINE	9-24	1900	0	0	0	0	0	0	0	0	0	N	5-10	8.5+	

## REMARKS

AREA	DATE, 1987 TIME	K	L	M	N	O	P	Q	R	S	WIND DIRECTION	WIND SPEED	PH
FENCE LINE	8-26 2000	0	0	0.1-0.2	0.4-0.6	0	0	0	0	0	NW	0-5	8.5+
FENCE LINE	8-27 2000	0	0-0.3	0.5-0.7	0.1-0.2	0	0	0	0	0	W	0-2	8.5+
FENCE LINE	8-28 2000	0	0.3-0.4	0.1-0.2	0	0	0	0	0	0	N TO NW	0-2	8.5+
FENCE LINE	8-29 2000	0	0	0	0-0.1	0-0.1	0.2-0.3	0-0.1	0	0	W	5-10	8.5+
FENCE LINE	8-30 2000	0	0-0.2	0-0.1	0	0	0	0	0	0	NW	0-2	8.5+
FENCE LINE	8-31 2000	0	0	0.1-0.2	0-0.1	0	0	0	0	0	W	0-5	8.5+
FENCE LINE	9-1 2000	0.2-0.3	0-0.1	0	0	0	0	0	0	0	E TO NE	5-10	8.5+
FENCE LINE	9-2 2000	0.2-0.4	0.1-0.3	0-0.1	0.1	0-0.1	0	0	0-0.1	0.1	N	10-15	8.5+
FENCE LINE	9-3 2000	0	0	0-0.1	0.1-0.2	0.3-0.4	0.1-0.2	0-0.1	0	0-0.1	W	0-2	8.5+
FENCE LINE	9-4 2000	0	0	0	0-0.1	0.1-0.2	0-0.1	0.3-0.4	0.1-0.2	0.1-0.2	S TO W	5-10	8.5+
FENCE LINE	9-5 2000	0	0-0.1	0.2-0.1	0.1-0	0	0	0	0	0	NW	0	8.5+
FENCE LINE	9-6 2000	0	0	0-0.1	0	0	0	0	0	0	N	0-5	8.5+
FENCE LINE	9-6 2000	0	0	0-0.1	0.1	0-0.1	0-0.1	0-0.1	0.1	0.1-0.2	N TO NE	0-3	8.5+
FENCE LINE	9-8 2000	0	0.1-0.2	0-0.1	0	0	0	0-0.1	0	0	NW	0-5	8.5+
FENCE LINE	9-9 2000	0.1	0.1	0.1-0.2	0.2	0.2	0.2	0.3	0.3	0.3	N TO E	0	8.5+
FENCE LINE	9-10 2000	0	0	0.1	0-0.1	0	0	0	0	0	NW	0-5	8.5+
FENCE LINE	9-11 2000	0-0.1	0-0.1	0	0	0	0	0	0	0	N TO E	10-15	8.5+
FENCE LINE	9-12 2000	0	0	0	0	0	0	0-0.1	0.1	0-0.1	W	0-4	8.5+
FENCE LINE	9-13 2000	0	0	0	0	0	0	0	0	0	SE	0-5	8.5+
FENCE LINE	9-14 2000	0	0	0	0-0.1	0	0	0-0.1	0.1	0	NW	5-10	8.5+
FENCE LINE	9-15 2000	0	0	0	0	0	0	0	0	0	W TO SW	10-15	8.5+
FENCE LINE	9-16 2000	0	0	0	0	0	0	0	0	0	NW TO W	0	8.5+
FENCE LINE	9-17 2000	0-0.1	0.1	0	0	0	0	0	0-0.1	0.1	NW TO W	0	8.5+
FENCE LINE	9-18 2000	0	0	0	0	0	0-0.1	0.1	0.1-0.2	0.1	SW TO W	5-10	8.5+
FENCE LINE	9-19 2000	0.2	0.2	0.2	0.2	0.2-0.3	0.3	0.3	0.3	0.3	N TO W	0-5	8.5+
FENCE LINE	9-20 2000	0	0	0	0	0-0.1	0	0.1	0-0.1	0.1	SW TO W	5-10	8.5+
FENCE LINE	9-21 2000	0	0	0	0	0	0	0	0	0	NW TO W	0	8.5+
FENCE LINE	9-22 2000	0	0	0	0-0.1	0	0	0	0-0.1	0	W	0-5	8.5+
FENCE LINE	9-23 2000	0	0	0	0-0.1	0.1	0-0.1	0.1	0	0-0.1	W TO SW	5-10	8.5+
FENCE LINE	9-24 2000	0	0	0	0	0-0.1	0.1	0	0-0.1	0-0.1	W	10-5	8.5+

## REMARKS

AREA	DATE, 1987	TIME	K	L	M	N	O	P	Q	R	S	WIND DIRECTION	WIND SPEED	Ph
FENCE LINE	8-26	2100	0	0	0	0	0.1-0.2	0-0.4	0	0	0	W	0-2	8.5+
FENCE LINE	8-27	2100	0	0-0.4	0.4-0.9	0.2-0.3	0-0.1	0	0	0	0	N TO NW	0-5	8.5+
FENCE LINE	8-28	2100	0-0.1	0.2-0.4	0.1-0.3	0-0.2	0-0.1	0	0	0	0	N TO W	0-2	8.5+
FENCE LINE	8-29	2100	0	0-0.2	0.1-0.3	0.1-0.3	0-0.1	0-0.1	0	0	0	N TO W	5-10	8.5+
FENCE LINE	8-30	2100	0-0.1	0-0.1	0-0.3	0.1-0.3	0.1-0.4	0	0	0	0	N TO NW	0-2	8.5+
FENCE LINE	8-31	2100	0	0	0-0.1	0.1-0.3	0-0.1	0-0.1	0	0	0	W	0-5	8.5+
FENCE LINE	9-1	2100	0.1-0.2	0.1	0-0.1	0	0	0	0	0-0.1	0.1	E	5-10	8.5+
FENCE LINE	9-2	2100	0.2-0.3	0.1-0.2	0-0.1	0	0	0	0-0.1	0-0.1	0.1-0.2	E	0-5	8.5+
FENCE LINE	9-3	2100	0	0	0.1-0.2	0-0.1	0-0.1	0-0.1	0-0.1	0	0-0.2	W	0-5	8.5+
FENCE LINE	9-4	2100	0	0	0	0	0	0.1	0.2-0.3	0.2	0-0.1	S TO W	5-10	8.5+
FENCE LINE	9-5	2100	0.2-0.1	0.1-0	0	0	0	0	0	0-0.1	0.1	N	0	8.5+
FENCE LINE	9-6	2100	0.1	0.1	0.1	0	0	0	0	0	0	N TO NW	0-2	8.5+
FENCE LINE	9-7	2100	0	0	0	0	0	0	0-0.1	0.1-0.2	0.1-0.2	N TO NW	0-5	8.5+
FENCE LINE	9-8	2100	0	0-0.1	0	0	0	0	0	0	0	N TO NW	0-2	8.5+
FENCE LINE	9-9	2100	0	0-0.1	0.1-0.2	0	0	0	0	0	0	N TO W	0	8.5+
FENCE LINE	9-10	2100	0	0	0	0	0	0	0	0	0-0.1	N TO NW	0-5	8.5+
FENCE LINE	9-11	2100	0-0.1	0-0.1	0	0	0	0	0	0	0	N TO E	5-10	8.5+
FENCE LINE	9-12	2100	0-0.1	0.1	0-0.1	0	0	0	0	0	0	N	0	8.5+
FENCE LINE	9-13	2100	0	0	0	0-0.1	0.1	0-0.1	0	0	0	N	0	8.5+
FENCE LINE	9-14	2100	0-0.1	0	0	0	0	0-0.1	0.1	0	0	W	0-5	8.5+
FENCE LINE	9-15	2100	0	0	0	0-0.1	0	0-0.1	0-0.1	0.1	0	NW TO W	0-5	8.5+
FENCE LINE	9-16	2100	0-0.1	0	0	0	0-0.1	0-0.1	0	0	0	W	0	8.5+
FENCE LINE	9-17	2100	0	0	0	0-0.1	0.1	0.1	0	0	0	W	0-5	8.5+
FENCE LINE	9-18	2100	0	0	0	0-0.1	0	0	0	0-0.1	0.1	SW TO W	0-5	8.5+
FENCE LINE	9-19	2100	0	0	0	0	0	0	0	0	0	N TO W	5-10	8.5+
FENCE LINE	9-20	2100	0	0	0	0	0	0-0.1	0.1	0.1	0-0.1	W	0-5	8.5+
FENCE LINE	9-21	2100	0	0	0	0	0	0-0.1	0.1	0.1	0-0.1	SW	0	8.5+
FENCE LINE	9-22	2100	0	0	0-0.1	0	0	0	0	0	0-0.1	W	0-5	8.5+
FENCE LINE	9-23	2100	0	0	0	0	0	0-0.1	0.1	0-0.1	0.1	W TO SW	0-5	8.5+
FENCE LINE	9-24	2100	0	0	0-0.1	0.1	0.1	0.1	0-0.1	0	0	SW	5-10	8.5+

REMARKS

AREA	DATE, 1987 TIME	K	L	M	N	O	P	Q	R	S	WIND DIRECTION	WIND SPEED	PH
FENCE LINE 8-26	2200	0	0	0	0-0.1	0-0.1	0.2-0.6	0.5-0.6	0-0.1	0	W	0-2	8.5+
FENCE LINE 8-27	2200	0.2-0.4	0.3-0.8	0.1-0.8	0.1-0.4	0-0.2	0	0	0	0	N TO NW	0-5	8.5+
FENCE LINE 8-28	2200	0	0.1-0.2	0-0.1	0	0	0	0	0	0	N TO W	0-2	8.5+
FENCE LINE 8-29	2200	0	0-0.1	0-0.3	0-0.2	0-0.1	0.1	0	0	0	N TO W	5-10	8.5+
FENCE LINE 8-30	2200	0.1	0.1-0.2	0.2-0.4	0.1-0.2	0	0	0	0	0	N	0-2	8.5+
FENCE LINE 8-31	2200	0-0.1	0.1	0	0	0	0	0	0-0.1	0.1	E	0-5	8.5+
FENCE LINE 9-1	2200	0.2-0.3	0.1-0.4	0.1	0-0.1	0	0	0	0	0-0.1	NE TO E	5-10	8.5+
FENCE LINE 9-2	2200	0-0.2	0.1-0.3	0.1-0.4	0-0.1	0	0	0	0.1-0.2	0.1	E	0-5	8.5+
FENCE LINE 9-3	2200	0.1-0.2	0.1	0.1	0.3-0.1	0.2-0.1	0	0	0	0	N	0-5	8.5+
FENCE LINE 9-4	2200	0	0	0	0	0.1	0.2	0.3-0.4	0.1	0.1-0.2	SW	0-5	8.5+
FENCE LINE 9-5	2200	0	0.1	0.1	0.1-0	0	0	0	0	0	N TO W	0-5	8.5+
FENCE LINE 9-6	2200	0.2	0.1-0.2	0.1	0-0.1	0	0	0	0	0	N TO NE	0	8.5+
FENCE LINE 9-7	2200	0.2-0.3	0-0.1	0.1-0	0	0-0.1	0-0.1	0	0	0.1-0.2	N TO NE	0-5	8.5+
FENCE LINE 9-8	2200	0	0	0-0.1	0	0	0	0	0-0.1	0	N TO NW	0-4	8.5+
FENCE LINE 9-9	2200	0	0	0-0.1	0-0.1	0-0.1	0.2-0.1	0	0-0.2	0.1-0	NW	0	8.5+
FENCE LINE 9-10	2200	0.1	0-0.1	0	0	0	0	0	0-0.1	0.1-0.2	N TO NW	5-10	8.5+
FENCE LINE 9-11	2200	0-0.1	0-0.1	0	0	0	0	0	0	0	N TO E	5-10	8.5+
FENCE LINE 9-12	2200	0	0	0-0.1	0-0.1	0	0	0-0.1	0	0-0.1	SW TO W	0	8.5+
FENCE LINE 9-13	2200	0-0.1	0.1	0	0-0.1	0-0.1	0.1	0.1	0	0	N TO NE	0-5	8.5+
FENCE LINE 9-14	2200	0	0	0	0	0	0	0	0	0-0.1	W	0-5	8.5+
FENCE LINE 9-15	2200	0	0	0	0-0.1	0.1	0	0	0	0	NW TO W	5-10	8.5+
FENCE LINE 9-16	2200	0	0	0	0-0.1	0.1	0.1-0	0	0	0	W	0-3	8.5+
FENCE LINE 9-17	2200	0	0	0	0	0	0	0	0	0	NW	0	8.5+
FENCE LINE 9-18	2200	0	0	0	0	0	0-0.1	0	0	0	W	0-5	8.5+
FENCE LINE 9-19	2200	0	0	0	0	0	0	0	0	0	N TO W	5-10	8.5+
FENCE LINE 9-20	2200	0	0	0-0.1	0-0.1	0-0.1	0-0.1	0	0	0	S TO SE	0-5	8.5+
FENCE LINE 9-21	2200	0	0	0	0	0-0.1	0.1	0.1	0.1	0.1	W	0-5	8.5+
FENCE LINE 9-22	2200	0	0	0	0	0-0.1	0.1	0.1	0.1	0.1	NE	0	8.5+
FENCE LINE 9-23	2200	0	0	0	0	0	0	0	0-0.1	0-0.1	NW TO W	0	8.5+
FENCE LINE 9-24	2200	0	0	0	0	0	0-0.1	0.1-0.2	0.1	0.1	SW	0-5	8.5+

AREA	DATE, 1987	TIME	K	L	M	N	U	P	Q	R	S	WIND DIRECTION	WIND SPEED	PH	REMARKS
FENCE LINE 8-26	8-26	2300	0	0	0-0.1	0.1-0.2	0-0.3	0.1-0.4	0-0.2	0	0	W TO SW	0-2	8.5+	STOP CIRCULATING WITH PUMP
FENCE LINE 8-27	8-27	2300	0-0.1	0.3-0.9	0.2-0.4	0-0.2	0-0.1	0	0	0	0	N	0-2	8.5+	
FENCE LINE 8-28	8-28	2300	0-0.1	0.1	0-0.1	0-0.1	0	0	0	0	0	N	10-12	8.5+	
FENCE LINE 8-29	8-29	2300	0-0.1	0-0.1	0.1-0.4	0-0.3	0-0.2	0-0.1	0-0.1	0	0	N TO NW	0-5	8.5+	
FENCE LINE 8-30	8-30	2300	0-0.1	0-0.1	0.1-0.3	0.1-0.2	0.1	0	0	0	0	N TO NW	0	8.5+	
FENCE LINE 8-31	8-31	2300	0.1	0.1-0.3	0.1-0.2	0.1-0.3	0	0	0	0	0	N	0-2	8.5+	
FENCE LINE 9-1	9-1	2300	0.1-0.4	0.1-0.3	0.1-0.2	0.3-0.4	0-0.1	0	0	0	0	NE	0-5	8.5+	
FENCE LINE 9-2	9-2	2300	0.1-0.3	0.2-0.4	0.1-0.5	0.1-0.3	0-0.1	0-0.1	0	0	0-0.1	N	0	8.5+	
FENCE LINE 9-3	9-3	2300	0.2-0.4	0.1-0.3	0.1-0.2	0.1	0.1	0-0.1	0	0	0-0.1	N TO W	5-10	8.5+	
FENCE LINE 9-4	9-4	2300	0	0	0-0.1	0.1-0.2	0.1-0.2	0.2	0-0.2	0.1	0	SM TO W	0	8.5+	
FENCE LINE 9-5	9-5	2300	0.1	0.1-0.2	0.1	0.1-0.2	0	0	0	0	0	N TO NW	0-5	8.5+	
FENCE LINE 9-6	9-6	2300	0.1-0.2	0.1	0.1	0	0	0	0	0	0	N TO NW	0	8.5+	
FENCE LINE 9-7	9-7	2300	0	0-0.1	0.1-0.2	0	0	0	0	0-0.1	0.1-0.2	N TO NE	0	8.5+	
FENCE LINE 9-8	9-8	2300	0-0.1	0	0	0-0.1	0	0	0-0.1	0	0	N TO NW	0-5	8.5+	
FENCE LINE 9-9	9-9	2300	0	0	0	0-0.1	0	0.1	0	0	0	NW	0	8.5+	
FENCE LINE 9-10	9-10	2300	0.1-0.2	0-0.1	0	0-0.1	0	0	0	0	0	NW	0-5	8.5+	
FENCE LINE 9-11	9-11	2300	0-0.1	0.1-0.2	0	0	0	0	0	0	0	N	0-5	8.5+	
FENCE LINE 9-12	9-12	2300	0	0	0-0.1	0	0	0	0.1	0	0-0.1	W	0	8.5+	
FENCE LINE 9-13	9-13	2300	0	0-0.1	0-0.1	0.1	0-0.1	0-0.1	0	0	0	NE	0-5	8.5+	
FENCE LINE 9-14	9-14	2300	0	0	0	0	0	0-0.1	0-0.1	0-0.1	0	W	0-5	8.5+	
FENCE LINE 9-15	9-15	2300	0	0	0	0	0	0	0	0-0.1	0.1	NW	5-10	8.5+	
FENCE LINE 9-16	9-16	2300	0	0	0	0	0	0	0	0	0	NW TO W	0-5	8.5+	
FENCE LINE 9-17	9-17	2300	0-0.1	0	0	0-0.1	0.1	0	0	0	0	NW	0	8.5+	
FENCE LINE 9-18	9-18	2300	0	0	0	0-0.1	0	0	0-0.1	0.1	0.1	SW TO W	5-10	8.5+	
FENCE LINE 9-19	9-19	2300	0	0	0	0	0	0	0	0	0	N TO W	0-5	8.5+	
FENCE LINE 9-20	9-20	2300	0	0	0	0	0	0	0-0.1	0.1	0.1	S TO SW	0-5	8.5+	
FENCE LINE 9-21	9-21	2300	0	0	0	0	0	0-0.1	0.1	0.1	0-0.1	NW TO W	0	8.5+	
FENCE LINE 9-22	9-22	2300	0	0	0	0	0	0	0-0.1	0.1	0-0.1	NE	0-5	8.5+	
FENCE LINE 9-23	9-23	2300	0	0	0	0	0	0	0	0-0.1	0-0.1	NW TO W	0	8.5+	
FENCE LINE 9-24	9-24	2300	0	0	0	0	0	0-0.1	0-0.1	0	0	SW TO W	5-10	8.5+	

## REMARKS

AREA	DATE, 1987	TIME	K	L	M	N	O	P	Q	R	S	WIND DIRECTION	WIND SPEED	PH
FENCE LINE	8-26	2400	0	0-0.1	0-0.2	0.1	0.2-0.3	0.1-0.3	0.1-0.2	0-0.1	0	W TO S	0-2	8.5+
FENCE LINE	8-27	2400	0.1-0.2	0.3-0.4	0.1-0.2	0-0.1	0	0	0	0	0	N TO NE	0-2	8.5+
FENCE LINE	8-28	2400	0.1-0.3	0-0.2	0.1	0-0.1	0-0.1	0	0	0	0	N	5-10	8.5+
FENCE LINE	8-29	2400	0-0.2	0.1-0.3	0.1-0.3	0.2-0.4	0.1	0	0	0	0	N	0-5	8.5+
FENCE LINE	8-30	2400	0	0-0.1	0.2	0.3-0.4	0-0.1	0	0	0	0	NW	0	8.5+
FENCE LINE	8-31	2400	0.1-0.2	0	0	0	0	0	0	0	0.1	E	0-2	8.5+
FENCE LINE	9-1	2400	0.2-0.3	0.1-0.2	0.1-0.4	0.1	0	0	0	0-0.1	0.2-0.3	NE TO E	0-2	8.5+
FENCE LINE	9-2	2400	0-0.2	0.1-0.3	0.1-0.2	0.1	0	0	0	0	0.1	NE	0-2	8.5+
FENCE LINE	9-3	2400	0	0	0-0.1	0.1-0.3	0.1-0.2	0.2-0.4	0.1-0.2	0	0	W	0	8.5+
FENCE LINE	9-4	2400	0	0	0	0-0.1	0.1	0.1-0.2	0.1-0.2	0-0.1	0	SW	0	8.5+
FENCE LINE	9-5	2400	0.1	0.1	0.1	0.1	0	0	0	0	0	N TO NW	0-5	8.5+
FENCE LINE	9-6	2400	0.1	0.1-0.3	0.1-0.2	0-0.1	0	0	0	0	0	NW	0-2	8.5+
FENCE LINE	9-7	2400	0-0.1	0	0	0	0-0.1	0	0	0	0.1-0.2	N TO NE	0-5	8.5+
FENCE LINE	9-8	2400	0-0.1	0-0.1	0	0	0	0	0	0	0-0.1	NW	0	8.5+
FENCE LINE	9-9	2400	0	0-0.1	0.1	0-0.2	0	0.1	0-0.1	0.1-0	0-0.1	NW	1	8.5+
FENCE LINE	9-10	2400	0.1	0-0.1	0	0	0	0	0	0	0-0.1	NW	5-10	8.5+
FENCE LINE	9-11	2400	0-0.1	0.1	0	0	0	0	0	0	0	N	0	8.5+
FENCE LINE	9-12	2400	0-0.1	0	0	0	0	0-0.1	0	0.1	0-0.1	NW TO W	0-2	8.5+
FENCE LINE	9-13	2400	0	0-0.1	0	0.1-0	0	0	0-0.1	0	0	N	0	8.5+
FENCE LINE	9-14	2400	0	0-0.1	0	0	0	0	0-0.1	0.1-0	0.1	W	0-5	8.5+
FENCE LINE	9-15	2400	0	0	0	0-0.1	0.1	0	0	0	0-0.1	NW	5-10	8.5+
FENCE LINE	9-16	2400	0-0.1	0	0.1-0	0	0	0	0	0-0.1	0-0.1	NW	0-5	8.5+
FENCE LINE	9-17	2400	0	0-0.1	0	0	0	0	0-0.1	0.1	0.1	NW TO W	0-5	8.5+
FENCE LINE	9-18	2400	0	0	0	0-0.1	0	0-0.1	0	0	0	W	0-5	8.5+
FENCE LINE	9-19	2400	0	0	0	0	0	0	0-0.1	0.1	0.1	S	0-5	8.5+
FENCE LINE	9-20	2400	0	0	0	0-0.1	0-0.1	0-0.1	0.1	0-0.1	0-0.1	S	0-5	8.5+
FENCE LINE	9-21	2400	0	0	0	0	0	0-0.1	0.1	0-0.1	0-0.1	NW	0	8.5+
FENCE LINE	9-22	2400	0	0	0	0	0	0-0.1	0-0.1	0.1	0.1	N	0-5	8.5+
FENCE LINE	9-23	2400	0	0	0	0	0	0	0-0.1	0.1	0.1-0.2	NW TO W	0	8.5+
FENCE LINE	9-24	2400	0-0.1	0-0.1	0	0-0.1	0	0	0	0-0.1	0.1-0.2	SW	0-5	8.5+

AREA	DATE, 1987 TIME	K	L	M	N	O	P	Q	R	S	WIND DIRECTION	WIND SPEED	PH	REMARKS
FENCE LINE	8-27 0100	0	0-0.1	0-0.1	0.2-0.4	0.2-0.3	0-0.1	0	0	0	NW	0-2	8.5+	CIRCULATING WITH PUMP
FENCE LINE	8-28 0100	0.1-0.2	0.1-0.3	0.1	0-0.1	0	0	0	0	0	N TO NE	0-2	8.5+	
FENCE LINE	8-29 0100	0-0.2	0.1-0.3	0.2-0.4	0-0.1	0	0	0	0	0	NE	0-5	8.5+	
FENCE LINE	8-30 0100	0-0.1	0.1-0.4	0.2-0.3	0.1-0.2	0-0.1	0	0	0	0	N	0-2	8.5+	
FENCE LINE	8-31 0100	0-0.1	0-0.2	0.1-0.4	0.1-0.3	0	0	0	0	0	NW	0-2	8.5+	
FENCE LINE	9-1 0100	0.1-0.2	0.1	0	0	0	0	0	0	0.1-0.2	E	0-2	8.5+	
FENCE LINE	9-2 0100	0.1-0.2	0.1	0	0	0	0	0	0	0.1-0.2	E	0-5	8.5+	
FENCE LINE	9-3 0100	0.1-0.2	0.1	0.1-0.3	0.1	0	0	0	0	0-0.1	N	0-2	8.5+	
FENCE LINE	9-4 0100	0	0	0.2-0.3	0.1	0-0.3	0.4-0.5	0.1-0.2	0	0.1	NW TO W	0-2	8.5+	
FENCE LINE	9-5 0100	0-0.1	0.1	0.1-0.2	0.1	0-0.3	0.1-0.2	0.1	0-0.1	0	SW	0	8.5+	
FENCE LINE	9-6 0100	0-0.1	0.1	0.1-0.2	0.1-0.2	0	0	0	0	0	N	0-2	8.5+	
FENCE LINE	9-7 0100	0.1	0.1-0.2	0.1-0.2	0-0.1	0	0	0	0	0	NW	0-2	8.5+	
FENCE LINE	9-8 0100	0	0-0.1	0	0	0	0	0	0-0.1	0.1-0.2	N TO NE	0-5	8.5+	
FENCE LINE	9-9 0100	0-0.1	0-0.1	0.1	0	0	0-0.1	0.1	0-0.1	0.1-0.2	N TO NW	0-5	8.5+	
FENCE LINE	9-10 0100	0	0	0	0	0	0	0-0.1	0	0.1-0.2	NW	0	8.5+	PUMP OFF
FENCE LINE	9-11 0100	0-0.1	0	0	0	0	0	0	0	0	NW	0	8.5+	
FENCE LINE	9-12 0100	0.1	0	0	0	0	0	0	0	0	N	0	8.5+	
FENCE LINE	9-13 0100	0-0.1	0	0.1	0	0	0	0-0.1	0-0.1	0.1	SW	0	8.5+	
FENCE LINE	9-14 0100	0	0	0	0	0.1	0-0.1	0	0	0	NW	0	8.5+	
FENCE LINE	9-15 0100	0-0.1	0	0	0	0	0	0	0	0	W	0-2	8.5+	
FENCE LINE	9-16 0100	0	0	0	0	0-0.1	0.1	0	0	0	NW	0-5	8.5+	
FENCE LINE	9-17 0100	0	0	0	0	0.1	0.1	0	0	0	NW TO W	0	8.5+	
FENCE LINE	9-18 0100	0	0	0	0	0	0	0-0.1	0.1	0.1	NW	0-5	8.5+	
FENCE LINE	9-19 0100	0	0	0	0	0-0.1	0.1	0.1	0	0	SW	0	8.5+	
FENCE LINE	9-20 0100	0	0-0.1	0-0.1	0-0.1	0-0.1	0	0	0	0	N TO W	0	8.5+	
FENCE LINE	9-21 0100	0	0	0	0-0.1	0.1	0.1	0.1-0.2	0.1	0.1	SW TO W	0-5	8.5+	
FENCE LINE	9-22 0100	0	0	0	0	0	0-0.1	0-0.1	0.1	0.1	N TO NE	0-5	8.5+	
FENCE LINE	9-23 0100	0	0	0	0	0	0-0.1	0.1	0-0.1	0.1	NW	0-5	8.5+	
FENCE LINE	9-24 0100	0	0	0	0	0	0	0-0.1	0.1	0.1	W	0-5	8.5+	

REMARKS

AREA	DATE, 1987	TIME	K	L	H	N	U	P	Q	R	S	WIND DIRECTION	WIND SPEED	PH	REMARKS
FENCE LINE	8-26	0200	0	0	0-0.2	0.1-0.3	0.1-0.2	0-0.1	0-0.1	0	0	N TO W	0-2	8.5+	
FENCE LINE	8-27	0200	0	0	0-0.2	0-0.3	0.1-0.2	0.1	0-0.1	0	0	NW	0-2	8.5+	
FENCE LINE	8-28	0200	0-0.1	0.1-0.2	0.2-0.3	0-0.1	0-0.1	0	0	0	0	N	0-5	8.5+	
FENCE LINE	8-29	0200	0-0.1	0.1-0.2	0.1-0.3	0.1	0-0.1	0	0	0	0	N	0-2	8.5+	
FENCE LINE	8-30	0200	0.1	0.1	0.1-0.3	0-0.5	0.1-0.2	0.1	0	0	0	N TO NW	0-5	8.5+	
FENCE LINE	8-31	0200	0.1	0.1	0.1-0.3	0.1-0.2	0	0	0	0	0	NW	0-2	8.5+	
FENCE LINE	9-1	0200	0.1	0	0	0	0	0	0	0.1-0.2	0.1	E TO SE	0-5	8.5+	
FENCE LINE	9-2	0200	0.1-0.3	0.1	0	0	0	0	0	0-0.1	0.2-0.3	E	0-5	8.5+	
FENCE LINE	9-3	0200	0.2-0.3	0.1-0.2	0.1-0.2	0-0.1	0	0	0	0	0.1	N	0-2	8.5+	
FENCE LINE	9-4	0200	0-0.1	0-0.1	0.1-0.2	0.2-0.3	0.2	0.1-0.2	0	0	0-0.1	N TO W	0-2	8.5+	
FENCE LINE	9-5	0200	0	0	0-0.1	0.1-0.2	0.1	0-0.3	0.1-0.3	0.1-0.4	0	S TO W	0-2	8.5+	
FENCE LINE	9-6	0200	0-0.1	0.1-0	0.2-0.1	0.2-0.3	0	0	0	0	0	N	0-2	8.5+	
FENCE LINE	9-7	0200	0.2	0.1	0.2	0	0	0	0	0	0	N TO NW	0-2	8.5+	
FENCE LINE	9-8	0200	0.1	0-0.1	0	0	0	0	0	0	0-0.1	NW	0-3	8.5+	
FENCE LINE	9-9	0200	0.1-0.2	0-0.1	0-0.1	0	0	0-0.1	0	0-0.1	0.2-0.3	N TO NW	0-10	8.5+	
FENCE LINE	9-10	0200	0	0	0	0	0-0.1	0	0	0	0	NW	0	8.5+	
FENCE LINE	9-11	0200	0	0-0.1	0	0	0	0	0	0	0	NW	0	8.5+	
FENCE LINE	9-12	0200	0.1	0.1	0	0	0	0	0	0	0	N TO E	0-5	8.5+	
FENCE LINE	9-13	0200	0	0	0-0.1	0	0-0.1	0	0	0	0-0.1	N TO NW	0	8.5+	
FENCE LINE	9-14	0200	0	0	0	0-0.1	0-0.1	0	0-0.1	0-0.1	0.1	N TO NW	0	8.5+	
FENCE LINE	9-15	0200	0	0	0	0	0.1	0.1	0	0	0	W	5-10	8.5+	
FENCE LINE	9-16	0200	0-0.1	0.1	0	0	0	0	0	0	0	NW	0-5	8.5+	
FENCE LINE	9-17	0200	0	0	0	0	0	0.1	0-0.1	0	0	NW TO W	0	8.5+	
FENCE LINE	9-18	0200	0	0	0-0.1	0.1	0-0.1	0	0	0	0	N TO W	0	8.5+	
FENCE LINE	9-19	0200	0	0	0	0	0-0.1	0.1	0.1	0-0.1	0	W	0-5	8.5+	
FENCE LINE	9-20	0200	0	0-0.1	0-0.1	0	0	0	0	0	0	N	0	8.5+	
FENCE LINE	9-21	0200	0	0	0	0	0	0-0.1	0-0.1	0	0-0.1	W	0-5	8.5+	
FENCE LINE	9-22	0200	0	0	0	0	0	0	0-0.1	0-0.1	0-0.1	N TO NE	0-5	8.5+	
FENCE LINE	9-23	0200	0	0	0	0	0-0.1	0.1	0-0.1	0.1	0-0.1	W	0	8.5+	
FENCE LINE	9-24	0200	0	0	0	0	0-0.1	0.1	0	0	0	W	0-5	8.5+	



## REMARKS

AREA	DATE, 1987	TIME	K	L	M	N	O	P	Q	R	S	WIND DIRECTION	WIND SPEED	FA
FENCE LINE	8-27	0300	0	0	0	0	0	0	0	0.1	0.2-0.3	E TO SW	0-2	8.5+
FENCE LINE	8-28	0300	0-0.2	0.1-0.3	0.1-0.2	0.1	0	0	0	0	0	N	0-2	8.5+
FENCE LINE	8-29	0300	0.1-0.2	0.1-0.3	0.1-0.4	0.1-0.3	0.1	0	0	0	0	N TO NE	0-2	8.5+
FENCE LINE	8-30	0300	0-0.1	0.1-0.2	0.1-0.4	0.1	0	0	0	0	0	N	0-2	8.5+
FENCE LINE	8-31	0300	0	0.1	0.2	0.3-0.4	0	0	0	0	-0	NW	0-5	8.5+
FENCE LINE	9-1	0300	0.1-0.2	0.1-0.2	0.1	0	0	0	0	0	0-0.1	E	0-2	8.5+
FENCE LINE	9-2	0300	0.1-0.2	0.1-0.3	0.1-0.2	0	0	0	0	0	0	N TO E	0-5	8.5+
FENCE LINE	9-3	0300	0-0.1	0-0.3	0.2-0.3	0.1	0-0.1	0	0	0	0-0.1	N TO E	0-2	8.5+
FENCE LINE	9-4	0300	0.1-0.2	0.1-0.2	0.1-0.3	0.3-0.4	0.1	0-0.1	0.1	0-0.1	0	N TO NW	0-2	8.5+
FENCE LINE	9-5	0300	0	0	0.1-0.2	0.1-0.3	0.2	0.1-0.2	0.1	0	0	SW TO W	0-2	8.5+
FENCE LINE	9-6	0300	0.1	0.1	0.1	0.1	0	0	0	0	0	N TO W	0-2	8.5+
FENCE LINE	9-7	0300	0-0.1	0.1	0.1	0.1-0.2	0	0	0	0	0	NW	0	8.5+
FENCE LINE	9-8	0300	0-0.1	0	0-0.1	0	0	0	0	0	0-0.1	N TO NW	0	8.5+
FENCE LINE	9-9	0300	0.1-0.2	0-0.1	0	0	0-0.1	0	0	0-0.1	0	N	0	8.5+
FENCE LINE	9-10	0300	0	0	0	0	0	0	0	0	0	NW	0	8.5+
FENCE LINE	9-11	0300	0-0.1	0-0.1	0	0	0	0	0	0	0	NW	0	8.5+
FENCE LINE	9-12	0300	0.1-0.3	0.3	0.2	0.1	0.1	0	0	0	0	N TO E	0-3	8.5+
FENCE LINE	9-13	0300	0	0	0-0.1	0	0-0.1	0	0	0-0.1	0	NW	0-2	8.5+
FENCE LINE	9-14	0300	0-0.1	0	0	0	0-0.1	0.1	0	0-0.1	0	NW	0	8.5+
FENCE LINE	9-15	0300	0	0	0	0	0	0-0.1	0.1-0.2	0-0.1	0	N TO SW	0-5	8.5+
FENCE LINE	9-16	0300	0	0	0	0	0	0	0	0	0	N TO NW	0	8.5+
FENCE LINE	9-17	0300	0	0	0	0	0	0-0.1	0-0.1	0	0	NW TO W	0	8.5+
FENCE LINE	9-18	0300	0	0	0	0	0	0-0.1	0-0.1	0.1	0-0.1	N TO NW	0-5	8.5+
FENCE LINE	9-19	0300	0	0	0	0	0	0	0	0	0	NW TO W	0	8.5+
FENCE LINE	9-20	0300	0	0-0.1	0-0.1	0-0.1	0-0.1	0	0	0	0	N TO W	0	8.5+
FENCE LINE	9-21	0300	0	0	0	0	0-0.1	0-0.1	0.1	0-0.1	0-0.1	SW TO W	0-5	8.5+
FENCE LINE	9-22	0300	0	0	0	0	0	0.1	0.1	0.1	0-0.1	N TO NE	0	8.5+
FENCE LINE	9-23	0300	0	0	0	0	0	0	0-0.1	0-0.1	0	NW TO W	0	8.5+
FENCE LINE	9-24	0300	0	0	0	0	0	0	0	0	0-0.1	N	0	8.5+

## REMARKS

AREA	DATE, 1987 TIME	K	L	M	N	O	P	Q	R	S	WIND DIRECTION	WIND SPEED	PH
FENCE LINE 8-26	0400	0.2-0.3	0.1-0.3	0.1-0.4	0-0.2	0-0.1	0	0	0	0	N	0-2	8.5+
FENCE LINE 8-27	0400	0-0.1	0.2-0.3	0.1-0.2	0	0	0	0	0	0	NW	0-2	8.5+
FENCE LINE 8-28	0400	0.1	0.1	0.1-0.3	0.1-0.2	0-0.2	0	0	0	0	N	0-1	8.5+
FENCE LINE 8-29	0400	0-0.1	0.1-0.2	0.1-0.3	0.1-0.2	0-0.1	0	0	0	0	NE	0-2	8.5+
FENCE LINE 8-30	0400	0.1-0.3	0.2-0.3	0.1	0-0.2	0.1	0	0	0	0	N TO NW	0-2	8.5+
FENCE LINE 8-31	0400	0-0.2	0.1-0.2	0.1-0.3	0.1	0-0.1	0	0	0	0	N	0-5	8.5+
FENCE LINE 9-1	0400	0.1-0.3	0	0	0	0	0	0	0.2	0.1-0.3	E TO SE	0-2	8.5+
FENCE LINE 9-2	0400	0.2	0.2-0.4	0.1	0	0	0	0	0	0.1	NE TO E	0-2	8.5+
FENCE LINE 9-3	0400	0.1-0.2	0.1	0.1-0.2	0-0.1	0	0	0	0	0-0.1	N TO NE	0-2	8.5+
FENCE LINE 9-4	0400	0.2-0.3	0.2-0.4	0.1-0.2	0.1	0-0.1	0	0	0	0	N TO NW	0-2	8.5+
FENCE LINE 9-5	0400	0	0	0	0.2	0.1-0.2	0.1-0.3	0.1-0.2	0	0	N TO NW	0-2	8.5+
FENCE LINE 9-6	0400	0-0.1	0.1	0.2-0.3	0.1-0.2	0	0	0	0	0	N TO NW	0-2	8.5+
FENCE LINE 9-7	0400	0	0-0.1	0-0.1	0-0.1	0.1-0.2	0	0	0	0	N TO NW	0	8.5+
FENCE LINE 9-8	0400	0	0	0	0	0	0	0	0-0.1	0-0.1	N TO NW	0	8.5+
FENCE LINE 9-9	0400	0-0.1	0	0-0.1	0.1	0.1	0-0.1	0	0-0.1	0.1-0.2	N TO NW	0-4	8.5+
FENCE LINE 9-10	0400	0	0	0	0	0	0	0	0	0	NW	0-3	8.5+
FENCE LINE 9-11	0400	0-0.1	0	0-0.1	0	0	0	0	0	0-0.1	N TO NW	0	8.5+
FENCE LINE 9-12	0400	0.1	0.2	0.2	0.1	0-0.1	0	0	0	0	N TO N	0	8.5+
FENCE LINE 9-13	0400	0-0.1	0	0	0-0.1	0	0-0.1	0	0-0.1	0.1	N TO NW	0	8.5+
FENCE LINE 9-14	0400	0	0	0	0	0	0	0	0	0-0.1	N TO NW	0	8.5+
FENCE LINE 9-15	0400	0	0	0	0	0.1	0-0.1	0	0	0	N TO SW	0-5	8.5+
FENCE LINE 9-16	0400	0	0	0	0	0	0	0	0	0	N TO NW	0-5	8.5+
FENCE LINE 9-17	0400	0	0	0	0	0	0	0	0	0	N TO NW	0-5	8.5+
FENCE LINE 9-18	0400	0	0	0	0	0-0.1	0.1	0-0.1	0.1	0.1	N TO NW	0-5	8.5+
FENCE LINE 9-19	0400	0-0.1	0	0	0	0-0.1	0.1	0.1	0.1	0	SW TO W	0	8.5+
FENCE LINE 9-20	0400	0-0.2	0-0.2	0.2	0.1	0.1	0	0	0	0	N TO W	0	8.5+
FENCE LINE 9-21	0400	0	0	0	0	0-0.1	0-0.1	0.1-0.2	0.1-0.2	0.1	W	5-10	8.5+
FENCE LINE 9-22	0400	0	0-0.1	0.1	0.1	0.1	0-0.1	0.1	0.1	0.1	N TO E	0-5	8.5+
FENCE LINE 9-23	0400	0	0	0	0	0	0	0	0	0	W	0	8.5+
FENCE LINE 9-24	0400	0	0	0	0	0	0	0	0	0	NW	0-5	8.5+

AREA	DATE, 1987	TIME	K	L	M	N	O	P	Q	R	S	WIND DIRECTION	WIND SPEED	PH	REMARKS
FENCE LINE	8-27	0500	0	0	0	0	0	0	0.1-0.2	0.1-0.3	0-0.1	NW	0-2	8.5+	
FENCE LINE	8-28	0500	0.1-0.2	0-0.3	0.1-0.2	0.3-0.4	0-0.1	0	0	0	0	NW	0-2	8.5+	
FENCE LINE	8-29	0500	0.1-0.2	0.1-0.4	0.2-0.4	0.3-0.4	0-0.1	0	0	0	0	N	0-2	8.5+	
FENCE LINE	8-30	0500	0-0.2	0.2-0.4	0.1-0.2	0-0.3	0.1	0	0	0	0	N TO NW	0-2	8.5+	
FENCE LINE	8-31	0500	0.1	0-0.3	0.2-0.4	0-0.2	0	0	0	0	0	N	0-2	8.5+	
FENCE LINE	9-1	0500	0.1-0.2	0.2	0	0	0	0	0	0	0-0.1	E TO NE	0-2	8.5+	
FENCE LINE	9-2	0500	0.1-0.3	0.1-0.3	0-0.1	0	0	0	0	0	0	N TO E	0-2	8.5+	
FENCE LINE	9-3	0500	0-0.3	0.2-0.3	0.1-0.2	0.2	0	0	0	0.1	0	N TO NE	0-2	8.5+	
FENCE LINE	9-4	0500	0-0.4	0.1-0.5	0.1-0.3	0-0.2	0.1-0.2	0.1	0	0-0.1	0.1	N TO NW	0-2	8.5+	
FENCE LINE	9-5	0500	0	0	0	0.1-0.2	0.2-0.4	0.1-0.3	0.1-0.2	0	0	N TO SW	0-2	8.5+	
FENCE LINE	9-6	0500	0.1	0.1	0.1	0.2-0.3	0	0	0	0	0	N TO NW	0-2	8.5+	
FENCE LINE	9-7	0500	0-0.1	0.1-0.2	0.1	0.1-0.2	0	0	0	0	0	N TO NW	0-2	8.5+	
FENCE LINE	9-8	0500	0-0.1	0	0	0	0	0	0	0	0-0.1	N TO NW	0	8.5+	
FENCE LINE	9-9	0500	0.1-0.2	0.1	0-0.1	0-0.1	0	0	0	0-0.1	0.1-0.2	NW	0	8.5+	
FENCE LINE	9-10	0500	0	0	0	0	0	0	0	0	0	NW	0-3	8.5+	
FENCE LINE	9-11	0500	0	0-0.1	0	0	0	0	0	0	0-0.1	N TO NW	0	8.5+	
FENCE LINE	9-12	0500	0.2-0.3	0.2	0.1	0.1	0.1-0	0	0	0	0	N TO E	0-3	8.5+	
FENCE LINE	9-13	0500	0-0.1	0	0-0.1	0-0.1	0	0-0.1	0	0	0-0.1	NW	0	8.5+	
FENCE LINE	9-14	0500	0-0.1	0	0.1	0-0.1	0	0-0.1	0	0	0	NW	0-5	8.5+	
FENCE LINE	9-15	0500	0	0	0	0-0.1	0.1	0	0	0	0	N	0-5	8.5+	
FENCE LINE	9-16	0500	0	0	0	0-0.1	0.1	0	0-0.1	0	0	N	0	8.5+	
FENCE LINE	9-17	0500	0	0	0	0	0-0.1	0.1	0.1	0.1	0-0.1	N TO NW	0-5	8.5+	
FENCE LINE	9-18	0500	0	0	0	0	0	0-0.1	0.1	0	0-0.1	NW	0	8.5+	
FENCE LINE	9-19	0500	0	0	0	0	0	0	0	0	0	N TO NW	0	8.5+	
FENCE LINE	9-20	0500	0.3	0.3	0.2	0.1	0.1	0.1	0	0	0	N TO W	0	8.5+	
FENCE LINE	9-21	0500	0	0	0	0	0	0-0.1	0.1	0.1	0.1	SE TO E	0-5	8.5+	
FENCE LINE	9-22	0500	0	0	0	0	0	0-0.1	0.1	0.1	0.1	N	0	8.5+	
FENCE LINE	9-23	0500	0	0	0	0	0-0.1	0.1	0-0.1	0-0.1	0-0.1	NW TO W	0-5	8.5+	
FENCE LINE	9-24	0500	0	0	0	0	0	0	0	0	0	N	0	8.5+	

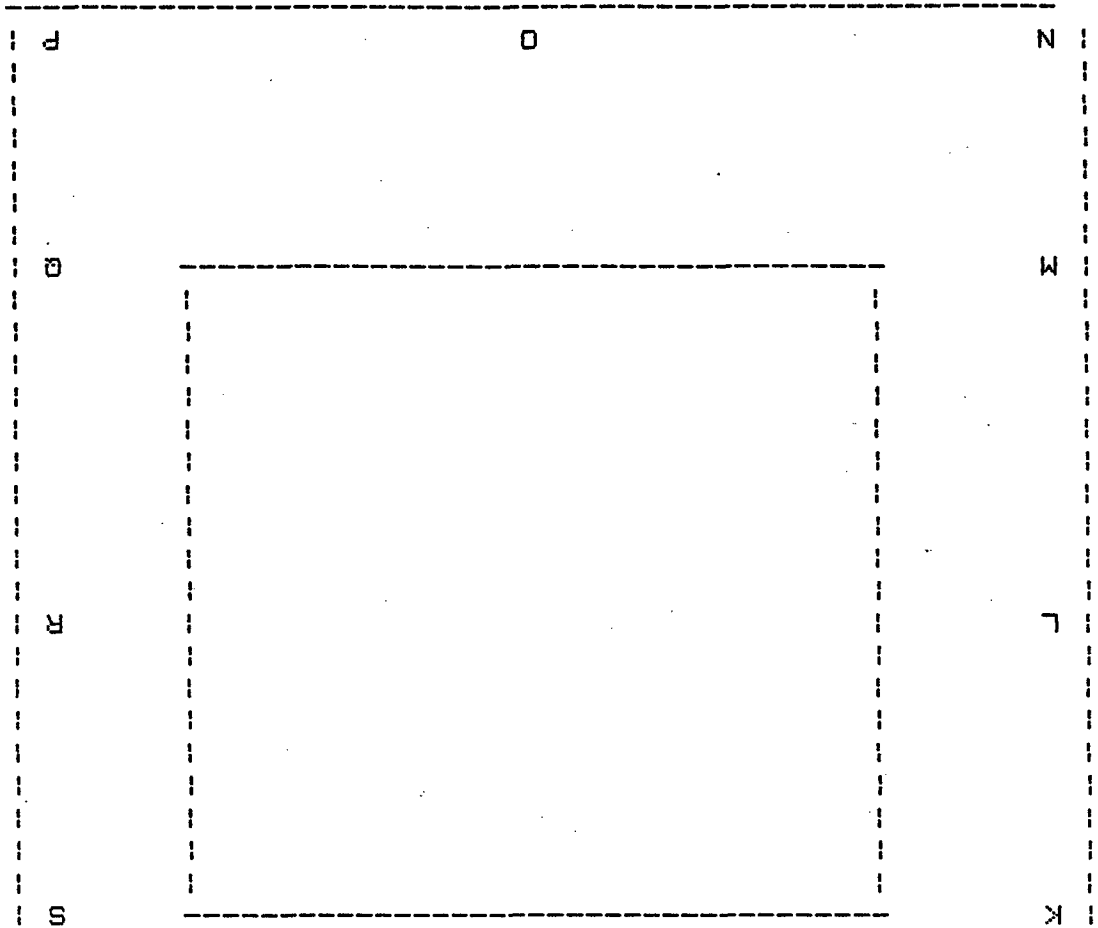
REMARKS

AREA	DATE, 1987	TIME	K	L	M	N	O	P	Q	R	S	WIND DIRECTION	WIND SPEED	PH	REMARKS
FENCE LINE	8-26	0600	0	0	0-0.1	0-0.1	0.1-0.3	0.1-0.4	0-0.2	0-0.1	0	N	0-2	8.5+	
FENCE LINE	8-27	0600	0	0	0	0	0	0.1-0.2	0-0.2	0.3-0.2	0.1	NW	0-2	8.5+	
FENCE LINE	8-28	0600	0.2-0.3	0.1-0.2	0.1-0.3	0.1	0.1	0	0	0	0	N TO E	0-2	8.5+	
FENCE LINE	8-29	0600	0-0.2	0.2-0.4	0-0.2	0-0.1	0	0	0	0	0	N	0-2	8.5+	
FENCE LINE	8-30	0600	0.1	0.1-0.3	0.1-0.4	0.2-0.4	0-0.1	0	0	0	0	N	0-2	8.5+	
FENCE LINE	8-31	0600	0	0.1-0.2	0.1-0.3	0.1-0.3	0	0	0	0	0	N	0-2	8.5+	
FENCE LINE	9-1	0600	0.1-0.2	0.2-0.4	0.1-0.2	0	0	0	0	0	0	NE	5-10	8.5+	
FENCE LINE	9-2	0600	0-0.2	0-0.4	0.1-0.4	0.1	0-0.1	0	0	0	0	N TO NW	0	8.5+	
FENCE LINE	9-3	0600	0.1	0.1-0.2	0.1-0.3	0.1-0.4	0-0.1	0	0	0	0-0.1	N	0-2	8.5+	
FENCE LINE	9-4	0600	0.1-0.3	0.1-0.2	0.2-0.4	0.1-0.3	0.1	0-0.1	0-0.1	0	0	N	0-2	8.5+	
FENCE LINE	9-5	0600	0	0-0.1	0-0.1	0.1-0.2	0.1-0.2	0.1-0.3	0.1-0.2	0.1-0.3	0-0.1	NW	0	8.5+	
FENCE LINE	9-6	0600	0.1	0.1-0.2	0.3-0.4	0.1-0.2	0	0	0	0	0	N	0-2	8.5+	
FENCE LINE	9-7	0600	0.1-0.3	0.1-0.2	0.2	0.1-0.2	0	0	0	0	0	N TO N	0-2	8.5+	
FENCE LINE	9-8	0600	0.1-0.2	0-0.1	0	0-0.1	0	0	0-0.1	0	0	N	0-5	8.5+	
FENCE LINE	9-9	0600	0.1-0	0	0	0	0	0	0	0-0.1	0.1	N TO NE	0	8.5+	
FENCE LINE	9-10	0600	0.1-0	0	0	0	0	0	0	0	0	NW	0-3	8.5+	
FENCE LINE	9-11	0600	0-0.1	0	0	0	0	0	0	0	0	N TO NW	0-5	8.5+	
FENCE LINE	9-12	0600	0.2	0.2	0.1	0.1	0.1	0	0	0	0	N TO E	0	8.5+	
FENCE LINE	9-13	0600	0-0.1	0	0	0	0	0	0	0	0	N TO NW	0	8.5+	
FENCE LINE	9-14	0600	0-0.1	0	0	0	0-0.1	0.1	0	0-0.1	0-0.1	NW	0-5	8.5+	
FENCE LINE	9-15	0600	0	0-0.1	0.1	0	0.1	0.1	0	0	0	N	0-5	8.5+	
FENCE LINE	9-16	0600	0-0.1	0.1	0.1	0	0	0	0	0-0.1	0-0.1	NW TO W	0	8.5+	
FENCE LINE	9-17	0600	0	0-0.1	0.1	0	0	0	0-0.1	0.1	0-0.1	E	0	8.5+	
FENCE LINE	9-18	0600	0	0	0	0	0-0.1	0.1	0.1	0	0	NW	0	8.5+	
FENCE LINE	9-19	0600	0	0	0	0	0-0.1	0	0	0	0	N TO NW	0	8.5+	
FENCE LINE	9-20	0600	0.1	0.1	0.1	0.1	0.1	0	0	0	0	N	0	8.5+	
FENCE LINE	9-21	0600	0	0	0	0	0-0.1	0.1	0.2	0.1-0.2	0.1	S TO E	10-15	8.5+	
FENCE LINE	9-22	0600	0	0	0	0	0	0	0	0	0	N TO W	0-5	8.5+	
FENCE LINE	9-23	0600	0	0	0	0-0.1	0.1	0-0.1	0-0.1	0	0	N TO NW	0-5	8.5+	
FENCE LINE	9-24	0600	0	0	0-0.1	0.1	0-0.1	0	0	0	0	NW TO W	0	8.5+	

AREA	DATE, 1987	TIME	K	L	M	N	D	P	Q	R	S	WIND DIRECTION	WIND SPEED	Ph	REMARKS
FENCE LINE	8-27	0700	0.2-0.3	0.3-0.4	0.3-0.9	0.1-0.2	0.1	0.1	0.1	0.1	0.1	N TO W	0-5	8.5+	START CIRCULATING WITH PUMP
FENCE LINE	8-28	0700	0.2-0.6	0.2-0.8	0.1	0	0	0	0	0	0	N TO E	10-15	8.5+	
FENCE LINE	8-29	0700	0.1	0.1	0-0.1	0	0	0	0	0	0	NW	0	8.5+	
FENCE LINE	8-30	0700	0.1-0.4	0-0.1	0	0	0	0	0	0	0	NE	0-8	8.5+	
FENCE LINE	8-31	0700	0.1-0.3	0-0.1	0	0	0	0	0	0	0	NE	5-10	8.5+	START TREATMENT OF 45 GALLONS HUMA-CALCIUM THRU
FENCE LINE	9-1	0700	0.2-0.3	0-0.1	0	0	0	0	0	0	0	NE	0-5	8.5+	
FENCE LINE	9-2	0700	0.1-0.2	0.1-0.3	0-0.3	0	0	0	0-0.1	0.1	0.1	N TO W	0-5	8.5+	
FENCE LINE	9-3	0700	0	0	0	0	0	0	0	0.1	0.2-0.3	N TO E	0-5	8.5+	
FENCE LINE	9-4	0700	0	0	0	0	0	0	0	0-0.1	0-0.1	SE	0	8.5+	SHOWERS
FENCE LINE	9-5	0700	0.1-0.2	0.1-0.2	0-0.1	0	0	0	0	0	0	NE	0	8.5+	
FENCE LINE	9-6	0700	0	0.1-0.2	0-0.1	0	0	0	0	0	0	N	0	8.5+	
FENCE LINE	9-7	0700	0-0.1	0-0.1	0-0.1	0	0	0	0	0	0	N	0	8.5+	
FENCE LINE	9-8	0700	0-0.1	0.1	0.1	0	0	0	0	0	0	N	0-5	8.5+	DISSOLVED SULPHIDES = 20 DISSOLVED SULPHIDES = 5
FENCE LINE	9-9	0700	0.1	0.1	0	0	0-0.1	0.1	0.1	0.1	0.2	S TO E	0-5	8.5+	
FENCE LINE	9-10	0700	0	0	0	0	0	0	0	0	0	N	0	8.5+	
FENCE LINE	9-11	0700	0-0.1	0	0	0-0.1	0-0.1	0	0	0	0	N TO NW	0	8.5+	
FENCE LINE	9-12	0700	0-0.1	0-0.1	0	0	0	0	0	0	0	E	5-10	8.5+	DISSOLVED SULPHIDES = 20 DISSOLVED SULPHIDES = 5
FENCE LINE	9-13	0700	0	0	0	0	0	0	0	0	0	SW	0	8.5+	
FENCE LINE	9-14	0700	0	0	0	0	0	0	0	0	0	W	0-5	8.5+	
FENCE LINE	9-15	0700	0	0	0	0	0-0.1	0.1	0-0.1	0.1	0-0.1	SW	0	8.5+	
FENCE LINE	9-16	0700	0	0	0	0	0	0	0	0	0	N TO W	0	8.5+	DISSOLVED SULPHIDES = 20 DISSOLVED SULPHIDES = 5
FENCE LINE	9-17	0700	0	0	0	0	0-0.1	0.1	0-0.1	0.1	0-0.1	N TO NW	0	8.5+	
FENCE LINE	9-18	0700	0	0	0-0.1	0.1	0.1	0.1	0-0.1	0	0	NW	0	8.5+	
FENCE LINE	9-19	0700	0	0	0	0	0	0	0	0	0	NW	0	8.5+	
FENCE LINE	9-20	0700	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0	W	0	8.5+	DISSOLVED SULPHIDES = 20 DISSOLVED SULPHIDES = 5
FENCE LINE	9-21	0700	0	0	0	0	0-0.1	0.1	0-0.1	0.1	0.1	NW TO W	0	8.5+	
FENCE LINE	9-22	0700	0	0	0	0	0	0-0.1	0.1-0	0.1	0-0.1	N TO NE	0	8.5+	
FENCE LINE	9-23	0700	0	0	0	0-0.1	0-0.1	0-0.1	0	0	0	N TO NW	0	8.5+	
FENCE LINE	9-24	0700	0	0	0	0	0-0.1	0.1	0.1-0.2	0.1	0-0.2	NW TO W	0-5	8.5+	

K THRU S = STATIONS FOR READINGS

-----> NORTH



GATE

FENCE READINGS

SCHEMATIC

HYDROGEN SULPHIDE MONITOR READINGS

BASIN DISPOSAL

AREA	DATE, 1987	TIME	K	L	M	N	O	P	B	R	S	WIND DIRECTION	WIND SPEED	Ph	REMARKS	
FENCE LINE	8-26	0900	0	0	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0.1-0.2	0.2-0.9	0.1-0.2	SW	0-2	8.5+	NO ODOOR. POND TEMPERATURE = 64 DEG. F.
FENCE LINE	8-26	1000	0	0-0.1	0-0.1	0.1	0.1	0.1	0.1	0.1-0.2	0.1-0.3	SW	0-5	8.5+	NO ODOOR	
FENCE LINE	8-26	1700	0	0	0	0	0-0.2	0.1-0.4	0.1-0.7	0.2-0.3	0.1-0.2	SW	10-15	8.5+	COMPLETION OF 100 GAL BIO-GENESIS	
FENCE LINE	8-27	0900	0	0	0	0	0	0	0	0	0.1-0.5	S TO E	0-5	8.5+	DISSOLVED SULPHIDES=40.	
FENCE LINE	8-27	1000	0	0	0	0	0	0	0	0-0.1	0.1-0.5	S TO E	0-5	8.5+		
FENCE LINE	8-27	1200	0	0	0-0.1	0-0.1	0-0.1	0	0	0.1-0.3	0.1-1.2	S TO E	0-5	8.5+		
FENCE LINE	8-28	0900	0	0	0	0	0	0	0	0.1	0.1	S TO E	10-15	8.5+		
FENCE LINE	8-28	1100	0	0	0	0	0	0	0	0.3-1.5	0.2-0.7	S TO E	10-15	8.5+		
FENCE LINE	8-28	1200	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0.5-1.7	0.2-0.3	S TO E	10-15	8.5+		
FENCE LINE	8-28	1300	0-0.1	0-0.1	0-0.1	0	0	0-0.1	0-0.1	0.4-0.9	0.2-0.4	S TO E	10-15	8.5+		
FENCE LINE	8-28	1400	0-0.1	0-0.1	0-0.2	0.2	0-0.3	0-0.3	0.3	0.3-0.4	0.3-0.4	S TO W	5-10	8.5+		
FENCE LINE	8-29	0800	0	0	0	0	0	0	0	0-0.1	0-0.1	SE	0	8.5+	POND NOT BUBBLING	
FENCE LINE	8-29	0900	0	0	0-0.1	0.1-0	0.1-0	0.1	0-0.3	0-0.3	0-0.3	SE	0-2	8.5+	SPRAY ON 9:30 AM	
FENCE LINE	8-29	1000	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0.1-0.2	0.3-0.4	0.3-0.6	SE	0-2	8.5+	DISSOLVED SULPHIDES = SAMPLE TEST INCONCLUSIVE.	
FENCE LINE	8-29	1200	0	0-0.1	0.1	0.1	0.1	0.1	0.1-0.2	0.2-0.4	0.2-0.4	S	0-5	8.5+	SPRAY ON 12:15	
FENCE LINE	8-29	1400	0	0-0.1	0.1	0.1	0.1	0.1	0.1-0.2	0.2-0.3	0.2	SW	10-15	8.5+		
FENCE LINE	8-30	1100	0-0.1	0.1	0.1	0.1	0.1	0.1-0.2	0.1-0.2	0.1-0.2	0.2-0.3	SE	0-5	8.5+		
FENCE LINE	8-31	1100	0.1-0.2	0.1	0.1	0.1	0.1	0.1	0.2-0.4	0.3-0.6	0.2	SE	0-5	8.5+		
FENCE LINE	8-31	1200	0-0.1	0-0.1	0.1	0.1	0.1	0.1	0.2	0.2-0.3	0.2-0.5	SE	0-5	8.5+	DISSOLVED SULPHIDES = 40	
FENCE LINE	8-31	1300	0	0-0.1	0.1	0.1	0.1	0.1	0.1-0.2	0.2	0.2-0.4	SE	0-2	8.5+		
FENCE LINE	8-31	1400	0	0-0.1	0-0.1	0.1	0.1	0.1	0.1-0.3	0.2-0.5	0.2-0.3	SE	0-5	8.5+		
FENCE LINE	8-31	1500	0	0-0.1	0.1	0.1	0.1	0.1	0.1-0.2	0.3-0.8	0.4-0.9	SE	8-10	8.5+		
FENCE LINE	9-1	1000	0-0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2-0.4	SE	0-5	8.5+	SPRAY ON 10:15	
FENCE LINE	9-1	1100	0	0	0.1	0.1	0.1	0.1	0.2-0.6	0.3-0.8	0.3-0.4	SW	0-5	8.5+	DISSOLVED SULPHIDES = 36	
FENCE LINE	9-1	1200	0	0-0.1	0.1	0.1	0.1	0.1	0.2-0.3	0.3-0.8	0.4-1.4	SE	5-10	8.5+		
FENCE LINE	9-1	1300	0	0-0.1	0.1	0.1	0.1	0.1	0.1-0.2	0.3-0.7	0.3-0.9	SE	0-5	8.5+		
FENCE LINE	9-1	1400	0	0-0.1	0.1	0.1	0.1	0.1-0.2	0.3-0.8	0.5-1.1	0.2-0.4	S	0-5	8.5+		
FENCE LINE	9-1	1500	0	0	0-0.1	0.1	0.1	0.1	0.3-0.7	0.4-0.7	0.2-0.3	SW	0-5	8.5+		
FENCE LINE	9-1	1500	0	0	0.1	0.1	0.1	0.1	0.2-0.6	0.3-0.8	0.3-0.4	SW	0-5	8.5+		
FENCE LINE	9-2	1000	0	0	0	0	0	0	0-0.1	0-0.1	0.1-0.2	S TO E	0-5	8.5+	SPRAY OFF 3:45	
FENCE LINE	9-2	1200	0.1	0	0.1-0.3	0.1	0-0.1	0.1	0.1	0.2-0.6	0.2-0.9	S TO W	0-5	8.5+	DISSOLVED SULPHIDES = 33	
FENCE LINE	9-2	1300	0-0.1	0.1-0.2	0.2	0	0	0	0	0.1-0.3	0.3-1.1	S TO E	0-5	8.5+	50 GALLONS BIO-GENESIS TREATMENT COMPLETE.	
FENCE LINE	9-2	1400	0	0	0	0	0-0.1	0.1	0.1	0.4-0.8	0.7-1.3	S TO W	5-10	8.5+		
FENCE LINE	9-2	1500	0	0.3-0.6	0-0.2	0.2	0.3	0.4	0.7-1.1	0.5-1.3	S TO W	10-15	8.5+			
FENCE LINE	9-2	1600	0	0.1	0.1	0.1-0.2	0.2	0.2	0.3	0.3	0.4	S TO W	5-10	8.5+		
FENCE LINE	9-2	1700	0	0	0	0	0	0.1-0.2	0.2-0.8	0.3-1.1	0.2-0.3	S TO W	5-10	8.5+		
FENCE LINE	9-3	1000	0	0	0	0	0	0	0	0.1-0.3	0.1-0.4	S TO E	5-10	8.5+	DISSOLVED SULPHIDES = 33	
FENCE LINE	9-3	1100	0	0	0	0	0	0-0.1	0.2-0.5	0.3-1.2	0.3-0.5	S TO E	0-5	8.5+	SPRAY ON	
FENCE LINE	9-3	1200	0	0	0	0	0	0.1	0.1-0.3	0.4-1.0	0.3	S TO W	5-10	8.5+	SPRAY ON	
FENCE LINE	9-3	1300	0	0	0-0.6	0.1	0.1-0.2	0.2	0.4-0.6	0.4-1.2	0.3-0.9	S TO W	5-10	8.5+	SPRAY ON	
FENCE LINE	9-3	1400	0	0	0	0.1	0.1	0.2	0.3	0.4-1.1	0.4-1.0	S TO W	5-10	8.5+	SPRAY ON	
FENCE LINE	9-3	1500	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.7-1.0	0.8-1.7	S TO W	5-10	8.5+	SPRAY ON	
FENCE LINE	9-3	1600	0	0	0	0	0.1	0.1	0.2-0.5	0.2-0.8	0.8-1.7	S TO W	5-10	8.5+	SPRAY ON	
FENCE LINE	9-3	1700	0	0	0	0	0	0	0.1	0.6-1.2	0.3-0.4	S TO W	5-10	8.5+	SPRAY ON	
FENCE LINE	9-3	1800	0	0	0	0	0	0	0.1	0.1-0.3	0.1-0.2	S TO W	10-15	8.5+	SPRAY OFF	
FENCE LINE	9-3	1900	0	0	0	0	0	0	0.2-0.3	0.4-0.5	0.1-0.2	SW TO S	0	8.5+		
FENCE LINE	9-4	0700	0	0	0	0	0	0	0	0-0.1	0-0.1	SE	0	8.5+	START TREATMENT OF 45 GALLONS HUMA-CALCIUM THRU	
FENCE LINE	9-4	1800	0	0-0.1	0.1	0.1-0.2	0.1-0.3	0.1-0.2	0.1-0.2	0.1	0.1	SW	5-10	8.5+		
FENCE LINE	9-4	1900	0.1	0.1	0.1	0.1	0.1	0.1	0.2-0.3	0.2-0.3	0.1	SW	5-10	8.5+		
FENCE LINE	9-4	2000	0	0	0	0	0	0-0.1	0.3-0.4	0.1-0.2	0.1-0.2	S TO W	5-10	8.5+		
FENCE LINE	9-4	2100	0	0	0	0	0	0.1	0.2-0.3	0.2	0-0.1	S TO W	5-10	8.5+		
FENCE LINE	9-4	2200	0	0	0	0	0	0.1	0.2	0.3-0.4	0.1	0.1-0.2	SW	0-5	8.5+	
FENCE LINE	9-4	2300	0	0	0-0.1	0.1-0.2	0.1-0.2	0.2	0-0.2	0.1	0	SW TO W	0	8.5+		
FENCE LINE	9-4	2400	0	0	0-0.1	0.1	0.1	0.1-0.2	0.1-0.2	0-0.1	0	SW	0	8.5+		
FENCE LINE	9-5	0100	0	0	0.2-0.3	0.1	0-0.3	0.1-0.2	0.1	0-0.1	0	SW	0	8.5+		
FENCE LINE	9-5	0200	0	0	0-0.1	0.1-0.2	0.1	0-0.3	0.1-0.3	0.1-0.3	0.1-0.4	0	S TO W	0-2	8.5+	
FENCE LINE	9-5	0300	0	0	0.1-0.2	0.1-0.3	0.2	0.1-0.2	0.1	0	0	SW TO W	0-2	8.5+		
FENCE LINE	9-5	1000	0	0-0.1	0-0.1	0.1	0.1	0.1	0.2	0.2-0.3	0.2-0.3	SE	0-2	8.5+		
FENCE LINE	9-5	1100	0	0-0.1	0.1	0.1	0.1	0.1	0.1-0.3	0.2-0.5	0.4-0.5	SE	0-5	8.5+	DISSOLVED SULPHIDES = 34	
FENCE LINE	9-5	1200	0	0	0.1	0.1	0.1	0.1	0.1-0.2	0.1-0.4	0.2-0.3	SE	0-2	8.5+		

AREA	DATE, 1987	TIME	K	L	M	N	O	P	Q	R	S	WIND DIRECTION	WIND SPEED	PH	REMARKS
FENCE LINE 9-5	1400	0	0-0.1	0.1	0.1	0.1	0.1	0.1	0.1-0.3	0.1-0.2	0.1	SW	5-10	8.5+	SPRAY ON
FENCE LINE 9-5	1700	0	0	0	0	0	0.1	0.1	0.1-0.3	0.1	0.1	SW	10-15	8.5+	
FENCE LINE 9-5	1800	0	0	0	0	0	0.1	0.1	0.2-0.3	0.1-0.2	0.1	SW	10-15	8.5+	
FENCE LINE 9-6	0800	0	0	0	0	0	0	0	0-0.1	0-0.1	0-0.1	SE	0	8.5+	
FENCE LINE 9-6	0900	0-0.1	0	0	0	0	0	0	0-0.1	0.1-0.2	0.2-0.3	SE	0-5	8.5+	SPRAY ON 9:15
FENCE LINE 9-6	1000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1-0.2	0.2-0.3	0.5-0.7	SE	0-5	8.5+	DISSOLVED SULPHIDES = 34
FENCE LINE 9-6	1100	0	0-0.1	0.1	0.1	0.1	0.1	0.1	0.1-0.2	0.3-0.4	0.2-0.5	SE	0-2	8.5+	
FENCE LINE 9-6	1200	0-0.1	0-0.2	0-0.2	0.2	0.2	0.2	0.2	0.2-0.7	0.2-0.6	0.2-0.3	SW	0-2	8.5+	
FENCE LINE 9-6	1300	0	0-0.1	0-0.1	0.1	0.1	0.1	0.2	0.3-0.4	0.3-0.5	0.1-0.3	SW	5-10	8.5+	
FENCE LINE 9-7	0800	0	0	0	0	0	0	0	0-0.1	0-0.1	0-0.1	SE	0-2	8.5+	
FENCE LINE 9-7	1000	0	0	0	0	0	0	0	0-0.2	0.2-0.3	0.3-0.6	SE	0-5	8.5+	SPRAY ON 9:30
FENCE LINE 9-7	1100	0	0-0.1	0.1	0.1	0.1	0.1	0.1	0.1-0.3	0.2-0.6	0.4-0.5	SE	0-5	8.5+	DISSOLVED SULPHIDES = 32
FENCE LINE 9-7	1200	0	0.1-0.2	0.1	0.1	0.1	0.1	0.1	0.1-0.2	0.2-0.3	0.1-0.4	SE	0-2	8.5+	SPRAY OFF 12:45
FENCE LINE 9-7	1400	0	0	0-0.1	0.1	0.1	0.1	0.1	0.1-0.3	0.1-0.2	0.2-0.3	SW	5-10	8.5+	SHIFTING NW
FENCE LINE 9-7	1700	0	0	0-0.1	0-0.1	0.1	0.1	0.1	0.1-0.2	0.1-0.3	0.1-0.2	SW	10-15	8.5+	
FENCE LINE 9-8	1100	0	0-0.1	0	0	0	0	0	0-0.1	0.1-0.4	0.2-0.7	SE	5-10	8.5+	
FENCE LINE 9-8	1200	0	0-0.1	0-0.1	0.1	0.1	0.1	0.1	0.2	0.2-0.3	0.3-0.5	SE	0-5	8.5+	
FENCE LINE 9-8	1300	0	0	0-0.1	0.1	0.1	0.1	0.1	0.2-0.4	0.2-0.4	0.1	S	0-5	8.5+	SPRAY OFF 2:00
FENCE LINE 9-9	0700	0.1	0.1	0	0	0	0-0.1	0.1	0.1	0.1	0.2	S TO E	0-5	8.5+	
FENCE LINE 9-9	0800	0	0	0	0	0	0	0	0	0.1	0.1	S TO E	0-5	8.5+	
FENCE LINE 9-9	1100	0	0-0.1	0	0	0	0.1	0.1	0.1	0.1	0.1	S TO E	0-5	8.5+	
FENCE LINE 9-9	1200	0	0	0	0	0	0	0	0-0.1	0.1-0.2	0.1	S TO E	5-10	8.5+	
FENCE LINE 9-9	1300	0	0	0	0	0	0	0-0.1	0-0.1	0.1-0.4	0.1	S TO W	10-15	8.5+	
FENCE LINE 9-10	1100	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1-0.2	0.2	S TO E	0-5	8.5+	
FENCE LINE 9-10	1200	0	0	0	0	0.1	0.1	0.1	0.1	0.1-0.2	0.3-0.6	S TO W	0-5	8.5+	
FENCE LINE 9-10	1300	0	0	0	0.1	0.1	0.1	0.1	0.1-0.2	0.2	0.2	S TO W	10-15	8.5+	
FENCE LINE 9-10	1400	0	0	0	0	0	0	0	0	0	0.1	S TO W	5-10	8.5+	
FENCE LINE 9-11	1000	0.1-0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1-0.2	0.3-0.6	SE	5-10	8.5+	SPRAY ON 9:15
FENCE LINE 9-11	1100	0-0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2-0.3	0.3-0.4	SE	0-5	8.5+	DISSOLVED SULPHIDES = 24
FENCE LINE 9-11	1400	0-0.1	0-0.1	0-0.1	0.1-0.2	0.2	0.2	0.2	0.3-0.4	0.3-0.5	0.3-0.4	SW	0-5	8.5+	SPRAY ON 1:30
FENCE LINE 9-11	1500	0	0	0	0-0.1	0.1	0.1	0.1	0.1-0.2	0.2-0.3	0.1-0.2	SW	15-25	8.5+	SPRAY OFF 2:30
FENCE LINE 9-11	1600	0	0	0-0.1	0.1	0.1	0.1	0.1	0.1	0.2-0.3	0.2	SE	10-20	8.5+	
FENCE LINE 9-11	1700	0	0	0-0.1	0.1	0.1	0.1	0.1	0.1-0.2	0.2	0.1-0.3	SW	10-15	8.5+	
FENCE LINE 9-12	1100	0	0	0	0	0	0	0	0	0-0.1	0-0.1	SE	0-2	8.5+	SPRAY ON 10:15
FENCE LINE 9-12	1200	0	0	0	0	0	0-0.1	0-0.1	0-0.2	0.2-0.5	0.1	SW	0	8.5+	
FENCE LINE 9-12	1300	0	0	0	0	0	0-0.1	0-0.1	0.1	0.1-0.2	0.1	SE	0-2	8.5+	
FENCE LINE 9-12	1400	0	0	0	0	0	0-0.1	0-0.1	0-0.1	0.1-0.3	0.1-0.3	SE	5-10	8.5+	
FENCE LINE 9-12	1700	0	0	0	0	0	0-0.1	0.1-0.2	0.2-0.3	0.2-0.3	0.1	SW	0-5	8.5+	
FENCE LINE 9-12	1800	0	0	0	0	0	0	0-0.1	0-0.1	0	0	SW	5-10	8.5+	
FENCE LINE 9-12	1900	0	0	0	0	0	0	0	0.1	0.1-0.2	0.1-0.2	S	5-10	8.5+	
FENCE LINE 9-12	2200	0	0	0-0.1	0-0.1	0	0	0	0-0.1	0	0-0.1	SW TO W	0	8.5+	
FENCE LINE 9-13	0100	0-0.1	0	0.1	0	0	0	0	0-0.1	0-0.1	0.1	SW	0	8.5+	
FENCE LINE 9-13	0700	0	0	0	0	0	0	0	0	0	0	SW	0	8.5+	SHOWERS
FENCE LINE 9-13	1100	0	0-0.1	0-0.1	0.1	0.1	0.1	0.1	0.1-0.2	0.1-0.2	0.1-0.3	SE	5-10	8.5+	DISSOLVED SULPHIDES = 28
FENCE LINE 9-13	1200	0	0	0	0	0	0	0	0	0-0.1	0.1-0.2	SE	0	8.5+	
FENCE LINE 9-13	1300	0	0	0	0-0.1	0.1	0.1	0.1	0.1-0.2	0.2-0.3	0.1-0.4	SE	5-10	8.5+	
FENCE LINE 9-13	1400	0	0	0	0	0	0-0.1	0-0.1	0.1-0.3	0.1-0.2	0-0.1	SE	15-20	8.5+	
FENCE LINE 9-13	2000	0	0	0	0	0	0	0	0	0	0	SE	0-5	8.5+	
FENCE LINE 9-14	0900	0	0	0	0	0	0	0	0.1-0.2	0.2-0.3	0.2-0.3	SE	0-5	8.5+	SPRAY ON 8:45
FENCE LINE 9-14	1200	0	0	0	0-0.1	0.1	0-0.1	0-0.1	0.1	0.1-0.3	0.2-0.4	SE	5-10	8.5+	DISSOLVED SULPHIDES = 26
FENCE LINE 9-14	1300	0	0	0-0.1	0.1	0.1	0.1	0.1	0.1-0.2	0.2-0.3	0.2-0.3	SE	0-5	8.5+	
FENCE LINE 9-14	1400	0	0	0	0	0	0	0-0.1	0.1-0.2	0.1-0.3	0.1-0.2	SW	5-10	8.5+	
FENCE LINE 9-14	1500	0	0	0	0	0	0	0	0.1-0.3	0.2	0.1-0.3	SW	5-10	8.5+	
FENCE LINE 9-15	0700	0	0	0	0	0	0-0.1	0.1	0-0.1	0.1	0-0.1	SW	0	8.5+	DISSOLVED SULPHIDES = 20
FENCE LINE 9-15	0800	0	0	0	0	0	0	0	0	0	0	SW	0	8.5+	
FENCE LINE 9-15	0900	0	0	0	0	0	0-0.1	0-0.1	0	0	0	SW	0-5	8.5+	SPRAY ON 8:15
FENCE LINE 9-15	1200	0	0	0	0-0.1	0.1	0.1	0.1	0.1	0-0.1	0	SW	10-20	8.5+	
FENCE LINE 9-16	1000	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	S TO E	0-5	8.5+	SPRAY ON
FENCE LINE 9-16	1100	0-0.1	0-0.1	0-0.1	0-0.1	0	0	0	0-0.1	0-0.1	0.2	S TO E	0	8.5+	SPRAY ON



AREA	DATE, 1987	TIME	K	L	M	N	O	P	Q	R	S	WIND DIRECTION	WIND SPEED	Ph	REMARKS
FENCE LINE	9-16	1200	0	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	S TO W	5-10	8.5+	SPRAY ON
FENCE LINE	9-16	1300	0	0	0.1	0.1	0.1	0.2	0.3	0.3	0.3	S TO W	5-10	8.5+	
FENCE LINE	9-17	0900	0	0	0	0	0	0	0	0	0	S TO E	0	8.5+	
FENCE LINE	9-17	1300	0	0	0	0.1	0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.1	S TO W	5-12	8.5+	SPRAY ON
FENCE LINE	9-17	1400	0	0	0	0.2	0.2	0.1-0.2	0-0.1	0.1	0.1	S TO W	5-12	8.5+	
FENCE LINE	9-17	1600	0	0	0	0	0	0.1-0	0.1-0	0.1	0.1	S TO W	10-20	8.5+	
FENCE LINE	9-17	1700	0	0	0	0.1	0.1	0.1	0-0.1	0	0	S TO W	10-20	8.5+	
FENCE LINE	9-18	0900	0	0	0	0	0	0	0	0	0.1	SE	0	8.5+	
FENCE LINE	9-18	1100	0	0	0	0	0	0	0	0-0.1	0.1	S	0	8.5+	SPRAY OFF 1:40
FENCE LINE	9-18	1400	0	0	0	0-0.1	0.1	0.1-0.2	0.1	0.1-0.2	0.1-0.2	SW	10-20	8.5+	SPRAY ON 2:30
FENCE LINE	9-18	1500	0	0	0	0	0-0.1	0.1	0.1-0.2	0.1-0.2	0-0.1	SW	5-10	8.5+	
FENCE LINE	9-18	2000	0	0	0	0	0	0-0.1	0.1	0.1-0.2	0.1	SW TO W	5-10	8.5+	
FENCE LINE	9-18	2100	0	0	0	0-0.1	0	0	0	0-0.1	0.1	SW TO W	0-5	8.5+	
FENCE LINE	9-18	2300	0	0	0	0-0.1	0	0	0-0.1	0.1	0.1	SW TO W	5-10	8.5+	
FENCE LINE	9-19	0100	0	0	0	0	0-0.1	0.1	0.1	0	0	SW	0	8.5+	
FENCE LINE	9-19	0400	0-0.1	0	0	0	0	0-0.1	0.1	0.1	0	SW TO W	0	8.5+	SPRAY ON 8:00
FENCE LINE	9-19	0800	0	0	0	0	0	0	0-0.1	0	0	SW	0	8.5+	
FENCE LINE	9-19	0900	0	0	0	0	0	0	0-0.1	0.1-0.2	0-0.1	S	0	8.5+	
FENCE LINE	9-19	1000	0	0	0	0	0	0	0-0.1	0.1-0.2	0.2	S TO E	0-5	8.5+	DISSOLVED SULPHIDES = 20.6
FENCE LINE	9-19	1100	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1-0.2	0.1-0.2	S	0-5	8.5+	
FENCE LINE	9-19	1200	0	0	0	0	0	0.1	0.1-0.2	0.2	0	SW	0-5	8.5+	
FENCE LINE	9-19	1300	0	0	0	0	0-0.1	0.1	0.1-0.2	0.1-0.2	0-0.1	SW	5-10	8.5+	
FENCE LINE	9-19	1500	0	0-0.1	0-0.1	0-0.1	0.1	0.1	0.1	0.1	0.1	SW	5-10	8.5+	
FENCE LINE	9-19	2400	0	0	0	0	0	0	0-0.1	0.1	0.1	S	0-5	8.5+	SPRAY ON
FENCE LINE	9-20	0800	0	0	0	0	0	0	0-0.1	0.1	0.1	SE	0	8.5+	
FENCE LINE	9-20	0900	0	0	0	0	0	0	0-0.1	0.1	0.1	SE	0	8.5+	
FENCE LINE	9-20	1000	0	0	0	0-0.1	0-0.1	0-0.1	0-0.1	0.1-0.2	0.2-0.3	SE	5-10	8.5+	DISSOLVED SULPHIDES = 19
FENCE LINE	9-20	1100	0	0	0	0	0	0	0-0.1	0-0.2	0.1-0.2	SE	0-5	8.5+	
FENCE LINE	9-20	1200	0	0	0-0.1	0-0.1	0-0.1	0.1	0.1-0.2	0.1-0.2	0.1-0.2	SW	0-5	8.5+	
FENCE LINE	9-20	1300	0	0	0	0-0.1	0-0.1	0.1	0.1-0.2	0.2	0.1-0.2	SW	0-5	8.5+	
FENCE LINE	9-20	1500	0	0	0	0	0-0.1	0.1	0.1-0.2	0.1	0.1	S TO W	5-10	8.5+	
FENCE LINE	9-20	1600	0	0	0	0-0.1	0.1	0.1	0.1	0.2	0-0.1	SW	5-13	8.5+	
FENCE LINE	9-20	1700	0	0	0	0	0-0.1	0-0.1	0.1-0.2	0.1-0.2	0	SW	5-10	8.5+	
FENCE LINE	9-20	2000	0	0	0	0	0-0.1	0-0.1	0.1	0-0.1	0-0.1	SW TO W	5-10	8.5+	
FENCE LINE	9-20	2200	0	0	0-0.1	0-0.1	0-0.1	0-0.1	0	0	0	S TO SE	0-5	8.5+	
FENCE LINE	9-20	2300	0	0	0	0	0	0	0-0.1	0.1	0.1	S TO SW	0-5	8.5+	
FENCE LINE	9-20	2400	0	0	0	0-0.1	0-0.1	0-0.1	0.1	0-0.1	0-0.1	S	0-5	8.5+	
FENCE LINE	9-21	0100	0	0	0	0-0.1	0-0.1	0.1	0.1-0.2	0.1	0.1	SW TO W	0-5	8.5+	
FENCE LINE	9-21	0300	0	0	0	0	0-0.1	0-0.1	0.1	0-0.1	0-0.1	SW TO W	0-5	8.5+	
FENCE LINE	9-21	0500	0	0	0	0	0	0-0.1	0.1	0.1	0.1	SE TO E	0-5	8.5+	
FENCE LINE	9-21	0600	0	0	0	0	0-0.1	0.1	0.2	0.1-0.2	0.1	S TO E	10-15	8.5+	DISSOLVED SULPHIDES = 16.5
FENCE LINE	9-21	1000	0	0-0.1	0.1	0.1	0.1	0.1	0.1-0.2	0.1-0.2	0.1-0.2	SE	5-10	8.5+	
FENCE LINE	9-21	1100	0-0.1	0.1	0.1	0.1	0.1	0.1	0.1-0.2	0.1-0.2	0.1-0.2	SE	5-10	8.5+	
FENCE LINE	9-21	1300	0	0	0	0-0.1	0-0.1	0-0.1	0.1	0.2-0.3	0.2-0.3	S TO E	5-10	8.5+	
FENCE LINE	9-21	1400	0	0-0.1	0-0.1	0.1	0.1	0.1	0.1	0.2	0.1-0.2	S TO E	5-10	8.5+	
FENCE LINE	9-21	1500	0	0	0-0.1	0.1	0.1-0.2	0.2-0.3	0.2-0.3	0.1	0	S TO W	0	8.5+	
FENCE LINE	9-21	1600	0	0	0	0	0	0	0-0.1	0.2	0.2	SE	0-5	8.5+	
FENCE LINE	9-21	1700	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1-0.2	SE	0-2	8.5+	SPRAY OFF 5:15
FENCE LINE	9-21	1800	0	0	0	0	0	0	0.1	0.1	0.1	SW	0	8.5+	
FENCE LINE	9-21	1900	0	0	0	0	0	0-0.1	0.1	0.1	0-0.1	SW	0	8.5+	
FENCE LINE	9-21	2100	0	0	0	0	0	0-0.1	0.1	0.1	0-0.1	SW	0	8.5+	
FENCE LINE	9-22	0900	0	0	0	0	0	0	0-0.1	0.1	0.1-0.2	SE	5-10	8.5+	
FENCE LINE	9-22	1100	0	0	0	0	0	0	0.1	0.1	0.1-0.2	SE	0-5	8.5+	
FENCE LINE	9-22	1200	0	0	0	0	0	0	0-0.1	0.1-0.2	0.1	SE	0-5	8.5+	
FENCE LINE	9-22	1300	0	0	0	0	0	0	0-0.1	0.1-0.2	0.1	SW	0-5	8.5+	
FENCE LINE	9-22	1400	0	0-0.1	0-0.1	0.1	0.1	0.1	0.1-0.2	0.2	0.2	SW	5-10	8.5+	
FENCE LINE	9-22	1500	0	0	0.1	0.1	0.1	0.1	0.1-0.2	0.1	0.1	SE	0-5	8.5+	
FENCE LINE	9-22	1700	0	0	0	0	0	0	0.1-0.2	0.2-0.3	0.1-0.2	S	0-2	8.5+	SPRAY OFF 6:00
FENCE LINE	9-22	1800	0	0	0	0	0	0	0.1	0.1	0.1-0.2	SW	0-2	8.5+	

AREA	DATE, 1987	TIME	K	L	M	N	O	P	B	R	S	WIND DIRECTION	WIND SPEED	Ph	REMARKS
FENCE LINE	9-23	1100	0.1	0.1	0.1-0	0	0	0	0	0	0	S 10 E	5-10	8.5+	SPRAY ON
FENCE LINE	9-23	1200	0	0	0	0	0-0.1	0.1	0.1	0.1-0.2	0.1-0.2	S 10 W	5-10	8.5+	DISSOLVED SULPHIDES = 14
FENCE LINE	9-23	1300	0	0	0	0	0-0.1	0.1	0.1-0.2	0.2	0.2	S 10 E	0	8.5+	
FENCE LINE	9-23	1400	0	0	0	0	0-0.1	0.1	0.1	0.1	0.2	S 10 W	5-10	8.5+	
FENCE LINE	9-23	1500	0	0	0	0	0	0	0	0	0.1	S 10 W	5-10	8.5+	
FENCE LINE	9-23	1600	0	0	0	0	0	0	0	0	0	S 10 W	0-5	8.5+	
FENCE LINE	9-23	1700	0	0	0	0	0	0	0	0	0	S 10 W	0-5	8.5+	
FENCE LINE	9-23	1800	0	0	0	0	0	0	0	0-0.1	0-0.1	S 10 W	0-5	8.5+	SPRAY OFF
FENCE LINE	9-23	1900	0	0	0	0	0	0	0	0	0-0.1	S 10 W	0-5	8.5+	
FENCE LINE	9-24	0900	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0	0.2	S 10 W	0	8.5+	
FENCE LINE	9-24	1000	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	S 10 W	0	8.5+	
FENCE LINE	9-24	1100	0	0	0	0	0	0	0	0	0	S 10 E	5-10	8.5+	DISSOLVED SULPHIDES = NO SAMPLE
FENCE LINE	9-24	1200	0.1	0.1	0.1	0.1	0.1	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	S 10 W	5-10	8.5+	
FENCE LINE	9-24	1300	0	0	0	0.1	0.1	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	S 10 W	5-10	8.5+	
FENCE LINE	9-24	1400	0	0	0	0	0-0.1	0-0.1	0	0	0	S 10 W	5-10	8.5+	
FENCE LINE	9-24	1500	0-0.1	0-0.1	0-0.1	0	0-0.1	0-0.1	0-0.1	0.1	0	S 10 W	5-12	8.5+	
FENCE LINE	9-24	1600	0	0	0	0	0	0-0.1	0-0.1	0-0.1	0-0.1	S 10 W	5-10	8.5+	
FENCE LINE	9-24	1700	0	0	0	0	0	0-0.1	0-0.1	0-0.1	0-0.1	S 10 W	5-10	8.5+	
FENCE LINE	9-24	1800	0	0	0	0	0	0	0	0	0	S 10 W	5-10	8.5+	SPRAY OFF
FENCE LINE	9-24	2100	0	0	0-0.1	0.1	0.1	0.1	0-0.1	0	0	SW	5-10	8.5+	
FENCE LINE	9-24	2200	0	0	0	0	0	0-0.1	0.1-0.2	0.1	0.1	SW	0-5	8.5+	
FENCE LINE	9-24	2300	0	0	0	0	0	0-0.1	0-0.1	0	0	SW 10 W	5-10	8.5+	
FENCE LINE	9-24	2400	0-0.1	0-0.1	0	0-0.1	0	0	0	0-0.1	0.1-0.2	SW	0-5	8.5+	

AREA	DATE, 1987	TIME	K	L	M	N	O	P	Q	R	S	WIND DIRECTION	WIND SPEED	FH	REMARKS
FENCE LINE	8-26	0800	0-0.2	0-0.1	0.1	0.1	0.1	0.1-0.2	0.2	0.2	0.2	E	0	8.5+	START TREATMENT WITH 100 GAL BIO-GENESIS AT 8:22 A
FENCE LINE	8-27	0300	0	0	0	0	0	0-0.1	0.1	0.1	0.2-0.3	E TO SW	0-2	8.5+	
FENCE LINE	8-28	1000	0	0	0	0	0	0	0	0	0.1-0.4	E	10-15	8.5+	DISSOLVED SULPHIDES = 40
FENCE LINE	8-30	0900	0-0.1	0-0.1	0	0	0	0	0-0.1	0-0.1	0-0.1	E	5-10	8.5+	
FENCE LINE	8-30	1000	0.1-0.2	0.1-0.3	0.1-0.2	0-0.1	0	0	0.1	0-0.2	0-0.2	E	5-10	8.5+	DISSOLVED SULPHIDES = SAMPLE TEST INCONCLUSIVE.
FENCE LINE	8-30	1200	0-0.3	0-0.2	0.1	0.1	0.1	0.1	0.2	0.2-0.3	0.2-0.4	E	5-10	8.5+	SHIFTING NE TO SE
FENCE LINE	8-30	1300	0-0.2	0	0-0.1	0.1	0.1	0.1	0.1-0.4	0.3-0.5	0.3-0.6	E	5-10	8.5+	SHIFTING NE TO SE
FENCE LINE	8-31	2200	0-0.1	0.1	0	0	0	0	0	0-0.1	0.1	E	0-5	8.5+	
FENCE LINE	8-31	2400	0.1-0.2	0	0	0	0	0	0	0	0.1	E	0-2	8.5+	
FENCE LINE	9-1	0100	0.1-0.2	0.1	0	0	0	0	0	0	0.1-0.2	E	0-2	8.5+	
FENCE LINE	9-1	0200	0.1	0	0	0	0	0	0	0.1-0.2	0.1	E TO SE	0-2	8.5+	
FENCE LINE	9-1	0300	0.1-0.2	0.1-0.2	0.1	0	0	0	0	0	0-0.1	E	0-2	8.5+	
FENCE LINE	9-1	0400	0.1-0.3	0	0	0	0	0	0	0.2	0.1-0.3	E TO SE	0-2	8.5+	
FENCE LINE	9-1	0500	0.1-0.2	0.2	0	0	0	0	0	0	0-0.1	E TO NE	0-2	8.5+	
FENCE LINE	9-1	0900	0.2-0.4	0.2	0.1	0	0	0	0	0.1	0.1-0.2	E	10-15	8.5+	SHIFTING TO NE
FENCE LINE	9-1	2000	0.2-0.3	0-0.1	0	0	0	0	0	0	0	E TO NE	5-10	8.5+	
FENCE LINE	9-1	2100	0.1-0.2	0.1	0-0.1	0	0	0	0	0-0.1	0.1	E	5-10	8.5+	
FENCE LINE	9-2	0100	0.1-0.2	0.1	0	0	0	0	0	0	0.1-0.2	E	0-5	8.5+	
FENCE LINE	9-2	0200	0.1-0.3	0.1	0	0	0	0	0	0-0.1	0.2-0.3	E	0-5	8.5+	
FENCE LINE	9-2	2100	0.2-0.3	0.1-0.2	0-0.1	0	0	0	0-0.1	0-0.1	0.1-0.2	E	0-5	8.5+	
FENCE LINE	9-2	2200	0-0.2	0.1-0.3	0.1-0.4	0-0.1	0	0	0	0.1-0.2	0.1	E	0-5	8.5+	SHIFTING SE - NE
FENCE LINE	9-7	0900	0.1-0.2	0-0.1	0-0.1	0.1	0.1	0.1	0-0.1	0.1-0.2	0.1-0.4	E	0-5	8.5+	
FENCE LINE	9-8	0900	0.1-0.2	0.1	0-0.1	0	0	0	0-0.1	0.1	0.1-0.2	E	5-10	8.5+	DISSOLVED SULPHIDES = 28
FENCE LINE	9-8	1000	0.1	0.1-0.2	0.1	0	0	0	0.1	0.1-0.3	0.2-0.3	E	5-10	8.5+	
FENCE LINE	9-9	0900	0	0	0	0	0	0	0	0	0	E	10-15	8.5+	DISSOLVED SULPHIDES = 23
FENCE LINE	9-9	1000	0.1	0	0	0	0	0	0	0	0	E	5-10	8.5+	
FENCE LINE	9-10	1000	0	0	0	0	0	0	0.1	0.1	0.1	E	5-10	8.5+	
FENCE LINE	9-12	0700	0-0.1	0-0.1	0	0	0	0	0	0	0	E	5-10	8.5+	
FENCE LINE	9-12	0900	0	0	0	0	0	0	0	0	0	E	10-15	8.5+	
FENCE LINE	9-12	1000	0-0.1	0	0	0	0	0	0	0	0-0.1	E	10-15	8.5+	
FENCE LINE	9-12	1500	0-0.1	0-0.1	0	0	0	0	0	0.1	0.1-0.2	E	0-5	8.5+	
FENCE LINE	9-13	1000	0.1-0.2	0.1-0.2	0.1	0-0.1	0-0.1	0-0.1	0.1-0.2	0.1-0.2	0.1-0.2	E	5-10	8.5+	SPRAY ON 10:00
FENCE LINE	9-14	1600	0-0.1	0	0	0	0	0	0	0	0	E	0	8.5+	
FENCE LINE	9-17	0600	0	0-0.1	0.1	0	0	0	0-0.1	0.1	0-0.1	E	0	8.5+	
FENCE LINE	9-18	0800	0	0	0	0	0	0	0	0	0	E	0	8.5+	SPRAY ON 8:30
FENCE LINE	9-21	0800	0-0.1	0-0.1	0	0	0	0	0-0.1	0-0.1	0-0.1	E	0-5	8.5+	
FENCE LINE	9-21	0900	0-0.1	0-0.1	0	0	0	0	0	0-0.1	0.1	E	5-10	8.5+	SPRAY ON 8:45
FENCE LINE	9-21	1200	0.1	0.1	0-0.1	0-0.1	0	0	0	0.1	0.1	E	0-5	8.5+	
FENCE LINE	9-22	1000	0	0	0	0	0	0	0	0.1-0.2	0-0.2	E	5-10	8.5+	DISSOLVED SULPHIDES = 22
FENCE LINE	9-22	1600	0	0-0.1	0-0.1	0-0.1	0.1	0.1	0.1	0.1	0.1	E	0-5	8.5+	

AREA	DATE, 1987	TIME	K	L	M	N	O	P	Q	R	S	WIND DIRECTION	WIND SPEED	FH	REMARKS
FENCE LINE	8-26	0200	0	0	0-0.2	0.1-0.3	0.1-0.2	0-0.1	0-0.1	0	0	N TO W	0-2		
FENCE LINE	8-26	0400	0.2-0.3	0.1-0.3	0.1-0.4	0.1-0.4	0-0.1	0	0	0	0	N	0-2		
FENCE LINE	8-26	1100	0	0.1	0.3-0.9	0.1-0.2	0.1-0.2	0.1	0-0.2	0	0-0.1	NW	0-5	8.5*	
FENCE LINE	8-26	1600	0-0.1	0.2-0.8	0.3-1.0	0.1-0.2	0.1	0.1	0.1	0.1	0.1	NW	10-15	8.5*	
FENCE LINE	8-26	1800	0.1-0.2	0.2	0.5-1.1	0.3-0.5	0.2	0.1-0.2	0	0	0	NW	10-15	8.5*	NO ODD
FENCE LINE	8-26	1900	0	0-0.1	0.5-0.9	0.1-0.2	0.1	0-0.1	0	0	0	NW	5-10	8.5*	
FENCE LINE	8-26	2000	0	0	0.1-0.2	0.4-0.6	0	0	0	0	0	NW	0-5	8.5*	
FENCE LINE	8-27	0100	0	0-0.1	0-0.1	0.2-0.4	0.2-0.3	0-0.1	0	0	0	NW	0-2	8.5*	CIRCULATING WITH PUMP
FENCE LINE	8-27	0200	0	0	0-0.2	0-0.3	0.1-0.2	0.1	0-0.1	0	0	NW	0-2	8.5*	
FENCE LINE	8-27	0400	0-0.1	0.2-0.3	0.1-0.2	0	0	0	0	0	0	NW	0-2	8.5*	
FENCE LINE	8-27	0500	0	0	0	0	0	0	0	0	0.1-0.2	0.1-0.3	0-0.1	0	
FENCE LINE	8-27	0600	0	0	0	0	0	0.1-0.2	0-0.2	0.1	0.1	N TO W	0-2	8.5*	
FENCE LINE	8-27	0700	0.2-0.3	0.3-0.4	0.3-0.9	0.1-0.2	0.1	0.1	0.1	0.1	0.1	N TO W	0-5	8.5*	
FENCE LINE	8-27	0800	0	0.1	0	0	0	0	0	0	0	N	0	8.5*	
FENCE LINE	8-27	1100	0	0	0	0-0.1	0	0	0	0	0	N TO E	0-5	8.5*	
FENCE LINE	8-27	1400	0	0	0.1-0.2	0.2-0.3	0.2	0	0	0	0	N TO W	5-10	8.5*	
FENCE LINE	8-27	1500	0-0.1	0.1-0.2	0.2-0.3	0.2-0.3	0.3-0.4	0.3	0.3	0.3	0.3	N TO W	10-15	8.5*	
FENCE LINE	8-27	1600	0-0.1	0.1-0.2	0.1-0.2	0.2-0.6	0.2-0.3	0.2	0.2	0.2	0.2	N TO W	15-20	8.5*	
FENCE LINE	8-27	1700	0	0	0-0.1	0	0.1	0.1-0.3	0.1	0.1	0.1	N TO W	10-15	8.5*	
FENCE LINE	8-27	1800	0-0.1	0-0.3	0.1-0.5	0.1	0.1-0.2	0.1-0.2	0	0	0	N TO W	10-15	8.5*	
FENCE LINE	8-27	1900	0	0	0	0-0.2	0.2-0.3	0	0	0	0	N	5-10	8.5*	
FENCE LINE	8-27	2200	0.2-0.4	0.3-0.8	0.1-0.8	0.1-0.4	0-0.2	0	0	0	0	N TO NW	0-5	8.5*	STOP CIRCULATING WITH PUMP
FENCE LINE	8-27	2300	0-0.1	0.3-0.9	0.2-0.4	0-0.2	0-0.1	0	0	0	0	N	0-2	8.5*	
FENCE LINE	8-27	2400	0.1-0.2	0.3-0.4	0.1-0.2	0-0.1	0	0	0	0	0	N TO NE	0-2	8.5*	
FENCE LINE	8-28	0100	0.1-0.2	0.1-0.3	0.1	0-0.1	0	0	0	0	0	N TO NE	0-2	8.5*	
FENCE LINE	8-28	0200	0-0.1	0.1-0.2	0.2-0.3	0-0.1	0-0.1	0	0	0	0	N	0	8.5*	
FENCE LINE	8-28	0300	0-0.2	0.1-0.2	0.1-0.2	0.1	0	0	0	0	0	N	0-2	8.5*	
FENCE LINE	8-28	0400	0.1	0.1	0.1-0.3	0.1-0.2	0-0.2	0	0	0	0	N	0-1	8.5*	
FENCE LINE	8-28	0500	0.1-0.2	0-0.3	0.1-0.2	0.3-0.4	0-0.1	0	0	0	0	N TO NE	0-2	8.5*	
FENCE LINE	8-28	0600	0.2-0.3	0.1-0.2	0.1-0.3	0.1	0.1	0	0	0	0	N TO E	10-15	8.5*	START CIRCULATING WITH PUMP
FENCE LINE	8-28	0700	0.2-0.6	0.2-0.8	0.1	0	0	0	0	0	0	N TO E	10-15	8.5*	
FENCE LINE	8-28	0800	0.2-0.3	0.2	0.2	0	0	0	0.2-0.4	0.2-0.4	0.2	N TO E	10-15	8.5*	
FENCE LINE	8-28	1500	0	0	0.3-1.0	0.3-1.0	0.2	0.2-0.4	0.2-0.4	0.2	0.2	N TO W	5-10	8.5*	
FENCE LINE	8-28	1900	0	0-0.1	0.1	0	0	0	0	0	0	N TO W	0-2	8.5*	
FENCE LINE	8-28	2000	0	0.3-0.4	0.1-0.2	0	0	0	0	0	0	N TO NW	0-2	8.5*	
FENCE LINE	8-28	2100	0-0.1	0.2-0.4	0.1-0.3	0-0.2	0-0.1	0	0	0	0	N TO W	0-2	8.5*	
FENCE LINE	8-28	2200	0	0.1-0.2	0-0.1	0	0	0	0	0	0	N TO W	0-2	8.5*	
FENCE LINE	8-28	2300	0-0.1	0.1	0-0.1	0-0.1	0	0	0	0	0	N	10-12	8.5*	
FENCE LINE	8-28	2400	0.1-0.3	0-0.2	0.1	0-0.1	0-0.1	0	0	0	0	N	5-10	8.5*	
FENCE LINE	8-29	0100	0-0.2	0.1-0.3	0.2-0.4	0-0.1	0	0	0	0	0	NE	0-5	8.5*	
FENCE LINE	8-29	0200	0-0.1	0.1-0.2	0.1-0.3	0.1	0-0.1	0	0	0	0	N	0-5	8.5*	
FENCE LINE	8-29	0300	0.1-0.2	0-0.3	0.1-0.4	0.1-0.3	0.1	0	0	0	0	N TO NE	0-2	8.5*	
FENCE LINE	8-29	0400	0-0.1	0.1-0.2	0.1-0.3	0.1-0.2	0-0.1	0	0	0	0	NE	0-2	8.5*	
FENCE LINE	8-29	0500	0.1-0.2	0.1-0.4	0.2-0.4	0.3-0.4	0-0.1	0	0	0	0	N	0-2	8.5*	
FENCE LINE	8-29	0600	0-0.2	0.2-0.4	0-0.2	0-0.1	0	0	0	0	0	N	0	8.5*	
FENCE LINE	8-29	0700	0.1	0.1	0-0.1	0	0	0	0	0	0	NW	0	8.5*	
FENCE LINE	8-29	1100	0.1-0.2	0.2-0.5	0.2-0.4	0.2	0.2	0.2	0.2	0.2	0.2	N	0	8.5*	SPRAY OFF 11:00 AM
FENCE LINE	8-29	1500	0	0	0.1-0.3	0.2	0.1-0.2	0	0	0	0	NW	5-10	8.5*	
FENCE LINE	8-29	1600	0	0.1-0.2	0.1-0.3	0.1	0.1	0-0.1	0	0	0	NW	5-10	8.5*	
FENCE LINE	8-29	1700	0	0.2-0.3	0.1-0.3	0.1-0.2	0-0.1	0-0.1	0	0	0	NW	5-10	8.5*	
FENCE LINE	8-29	1800	0	0-0.1	0.1-0.2	0.1-0.2	0-0.1	0	0	0	0	NW	0-5	8.5*	
FENCE LINE	8-29	1900	0	0-0.1	0.1-0.3	0.1-0.2	0.1	0	0	0	0	NW	5-10	8.5*	
FENCE LINE	8-29	2100	0	0-0.2	0.1-0.3	0.1-0.3	0-0.1	0-0.1	0	0	0	N TO W	5-10	8.5*	
FENCE LINE	8-29	2200	0	0-0.1	0-0.3	0-0.2	0-0.1	0.1	0	0	0	N TO W	5-10	8.5*	
FENCE LINE	8-29	2300	0-0.1	0-0.1	0.1-0.4	0-0.3	0-0.2	0-0.1	0-0.1	0	0	N TO NW	0-5	8.5*	
FENCE LINE	8-29	2400	0-0.2	0.1-0.3	0.1-0.3	0.2-0.4	0.1	0	0	0	0	N	0-5	8.5*	
FENCE LINE	8-30	0100	0-0.1	0.1-0.4	0.2-0.3	0.1-0.2	0-0.1	0	0	0	0	N	0-2	8.5*	
FENCE LINE	8-30	0200	0.1	0.1	0.1-0.3	0-0.5	0.1-0.2	0.1	0	0	0	N TO NW	0-2	8.5*	
FENCE LINE	8-30	0300	0-0.1	0.1-0.2	0.1-0.4	0.1	0	0	0	0	0	N	0-2	8.5*	

AREA	DATE, 1987 TIME	K	L	M	N	U	P	Q	R	S	WIND DIRECTION	WIND SPEED	Ph	REMARKS
FENCE LINE	B-30 0400	0.1-0.3	0.2-0.3	0.1	0-0.2	0.1	0	0	0	0	N TO NW	0-2	8.5+	
FENCE LINE	B-30 0500	0-0.2	0.2-0.4	0.1-0.2	0-0.3	0.1	0	0	0	0	N TO NW	0-2	8.5+	
FENCE LINE	B-30 0600	0.1	0.1-0.3	0.1-0.4	0.2-0.4	0-0.1	0	0	0	0	N	0-2	8.5+	
FENCE LINE	B-30 0700	0.1-0.4	0-0.1	0	0	0	0	0	0	0	NE	0-8	8.5+	
FENCE LINE	B-30 0800	0.1-0.3	0.1-0.2	0.1	0	0	0	0	0	0	NE	0-5	8.5+	
FENCE LINE	B-30 1400	0-0.1	0.1-0.2	0.1-0.2	0.1	0.1	0.1	0.1	0.1	0.1	N	0-2	8.5+	
FENCE LINE	B-30 1500	0	0.1-0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	N	0-2	8.5+	
FENCE LINE	B-30 1600	0	0-0.1	0.1-0.2	0.1	0.1	0.1	0.1	0.1	0.1	NW	5-10	8.5+	
FENCE LINE	B-30 1700	0-0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	N	0-2	8.5+	
FENCE LINE	B-30 1800	0-0.1	0.1-0.2	0-0.3	0-0.1	0	0	0	0	0	NW	5-10	8.5+	
FENCE LINE	B-30 1900	0-0.1	0-0.2	0.2	0	0	0	0	0	0	N	0	8.5+	
FENCE LINE	B-30 2000	0	0-0.2	0-0.1	0	0	0	0	0	0	NW	0-2	8.5+	
FENCE LINE	B-30 2200	0.1	0.1-0.2	0.2-0.4	0.1-0.2	0	0	0	0	0	N	0-2	8.5+	
FENCE LINE	B-30 2300	0-0.1	0-0.1	0.1-0.3	0.1-0.2	0.1	0	0	0	0	N TO NW	0	8.5+	
FENCE LINE	B-30 2400	0	0-0.1	0.2	0.3-0.4	0-0.1	0	0	0	0	NW	0	8.5+	
FENCE LINE	B-31 0100	0-0.1	0-0.2	0.1-0.4	0.1-0.3	0	0	0	0	0	NW	0-2	8.5+	
FENCE LINE	B-31 0200	0.1	0.1	0.1-0.3	0.1-0.2	0	0	0	0	0	NW	0-5	8.5+	
FENCE LINE	B-31 0300	0	0.1	0.2	0.3-0.4	0	0	0	0	0	NW	0-5	8.5+	
FENCE LINE	B-31 0400	0-0.2	0.1-0.2	0.1-0.3	0.1	0-0.1	0	0	0	0	N	0-5	8.5+	
FENCE LINE	B-31 0500	0.1	0-0.3	0.2-0.4	0-0.2	0	0	0	0	0	N	0-2	8.5+	
FENCE LINE	B-31 0600	0	0.1-0.2	0.1-0.3	0.1-0.3	0	0	0	0	0	N	0-2	8.5+	
FENCE LINE	B-31 0700	0.1-0.3	0-0.1	0	0	0	0	0	0	0	NE	5-10	8.5+	
FENCE LINE	B-31 0800	0.2-0.4	0.1-0.2	0-0.1	0	0	0	0	0	0	NE	8-12	8.5+	
FENCE LINE	B-31 0900	0.1-0.3	0.1-0.3	0	0	0	0	0	0	0	NE	10-15	8.5+	
FENCE LINE	B-31 1000	0.1-0.2	0.1-0.3	0.1-0.2	0	0	0	0	0	0	NE	5-10	8.5+	
FENCE LINE	B-31 1600	0	0-0.1	0.2-0.4	0.1	0.1	0.1	0.1-0.2	0.2	0.2	NW	0-5	8.5+	
FENCE LINE	B-31 1700	0	0-0.2	0.1-0.3	0.1-0.2	0.1	0.1	0.1	0.1	0.1	NW	0-5	8.5+	
FENCE LINE	B-31 1800	0-0.1	0.1-0.2	0.2-0.5	0.1-0.2	0.1	0.1	0.2	0.2	0.2	NW	0-5	8.5+	
FENCE LINE	B-31 2300	0.1	0.1-0.3	0.1-0.2	0.1-0.3	0	0	0	0	0	N	0-2	8.5+	
FENCE LINE	B-1 0600	0.1-0.2	0.2-0.4	0.1-0.2	0	0	0	0	0	0	NE	5-10	8.5+	
FENCE LINE	B-1 0700	0.2-0.3	0-0.1	0	0	0	0	0	0	0	NE	0-5	8.5+	
FENCE LINE	B-1 0800	0.2-0.3	0.2	0-0.1	0	0	0	0	0	0	NE	0-5	8.5+	
FENCE LINE	B-2 1600	0-0.1	0.1-0.5	0.1-0.3	0.1-0.2	0.1	0.1-0.2	0.2-0.3	0.3	0.1-0.2	NW	5-10	8.5+	
FENCE LINE	B-2 1700	0	0.2-0.4	0.2-0.5	0.2	0.1	0.1	0.1	0.1	0.1	NW	5-10	8.5+	
FENCE LINE	B-2 1800	0.1-0.4	0.1-0.5	0.1-0.5	0.1	0.1	0.1	0.1	0.1	0.1	NE	15-25	8.5+	
FENCE LINE	B-2 1900	0.1-0.3	0.1-0.4	0.1-0.2	0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	NE	10-15	8.5+	
FENCE LINE	B-2 2200	0.2-0.3	0.1-0.4	0.1	0-0.1	0	0	0	0	0	NE TO E	5-10	8.5+	
FENCE LINE	B-2 2300	0.1-0.4	0.1-0.3	0.1-0.2	0.3-0.4	0-0.1	0	0	0	0	NE	0-5	8.5+	
FENCE LINE	B-2 2400	0.2-0.3	0.1-0.2	0.1-0.4	0.1	0	0	0	0	0	NE TO E	0-2	8.5+	
FENCE LINE	B-2 0300	0.1-0.2	0.1-0.3	0.1-0.2	0	0	0	0	0	0	N TO E	0-5	8.5+	
FENCE LINE	B-2 0400	0.2	0.2-0.4	0.1	0	0	0	0	0	0	NE TO E	0-2	8.5+	
FENCE LINE	B-2 0500	0.1-0.3	0.1-0.3	0-0.1	0	0	0	0	0	0	N TO E	0-2	8.5+	
FENCE LINE	B-2 0600	0-0.2	0-0.4	0.1-0.4	0.1	0-0.1	0	0	0	0	N TO NW	0	8.5+	
FENCE LINE	B-2 0700	0.1-0.2	0.1-0.3	0-0.3	0	0	0	0-0.1	0.1	0.1	N TO W	0	8.5+	
FENCE LINE	B-2 0800	0.1-0.3	0	0	0	0	0	0	0	0	N TO E	0-5	8.5+	
FENCE LINE	B-2 0900	0.3-0.7	0.2-0.3	0.2	0	0	0	0	0	0	N TO E	5-10	8.5+	
FENCE LINE	B-2 1100	0	0	0	0	0	0	0-0.1	0.1-0.8	0.1-1.4	N TO W	5-10	8.5+	
FENCE LINE	B-2 1800	0.1	0.1-0.2	0	0	0	0	0	0	0	N TO E	15-20	8.5+	
FENCE LINE	B-2 1900	0.1-0.2	0.1-0.3	0	0-0.1	0	0	0	0	0	N TO E	10-15	8.5+	
FENCE LINE	B-2 2000	0.2-0.4	0.1-0.3	0-0.1	0.1	0-0.1	0	0	0	0	N	0	8.5+	
FENCE LINE	B-2 2300	0.1-0.3	0.2-0.4	0.1-0.5	0.1-0.3	0-0.1	0-0.1	0	0	0	N	0	8.5+	
FENCE LINE	B-2 2400	0-0.2	0.1-0.3	0.1-0.2	0.1	0	0	0	0	0	NE	0-2	8.5+	
FENCE LINE	B-3 0100	0.1-0.2	0.1	0.1-0.3	0.1	0	0	0	0	0	N	0-2	8.5+	
FENCE LINE	B-3 0200	0.2-0.3	0.1-0.2	0.1-0.2	0-0.1	0	0	0	0	0	N	0-2	8.5+	
FENCE LINE	B-3 0300	0-0.1	0-0.3	0.2-0.3	0.1	0-0.1	0	0	0	0	N TO E	0-2	8.5+	
FENCE LINE	B-3 0400	0.1-0.2	0.1	0.1-0.2	0-0.1	0	0	0	0	0	N TO NE	0-2	8.5+	
FENCE LINE	B-3 0500	0-0.3	0.2-0.3	0.1-0.2	0.2	0	0	0	0	0	N TO NE	0-2	8.5+	
FENCE LINE	B-3 0600	0.1	0.1-0.2	0.1-0.3	0.1-0.4	0-0.1	0	0	0	0	N	0-2	8.5+	
FENCE LINE	B-3 0700	0	0	0	0	0	0	0	0.1	0.2-0.3	N TO E	0-5	8.5+	

SPRAY ON 10:30  
SPRAY OFF 4:00

SHIFTING TO SW

START TREATMENT OF 50 GALLONS BIO-GENESIS

AREA	DATE, 1987	TIME	K	L	M	N	O	P	Q	R	S	WIND DIRECTION	WIND SPEED	PH	REMARKS
FENCE LINE 9-3	0800	0.1-0.3	0.1-0.3	0.1	0	0	0	0	0	0	0	N TO E	5-10	8.5+	
FENCE LINE 9-3	0900	0.2	0.2	0.2	0	0	0	0	0	0	0	N TO E	5-10	8.5+	
FENCE LINE 9-3	2200	0.1-0.2	0.1	0.1	0.3-0.1	0.2-0.1	0	0	0	0	0	N	5-10	8.5+	
FENCE LINE 9-4	0100	0.2-0.4	0.1-0.3	0.1-0.2	0.1	0.1	0-0.1	0	0	0	0	N TO W	5-10	8.5+	
FENCE LINE 9-4	0200	0	0	0-0.1	0.1-0.2	0.1-0.3	0.4-0.5	0.1-0.2	0	0	0	N TO W	0-2	8.5+	
FENCE LINE 9-4	0300	0.1-0.2	0.1-0.2	0.1-0.3	0.3-0.4	0.1	0-0.1	0.1	0-0.1	0	0	N TO W	0-2	8.5+	
FENCE LINE 9-4	0400	0.2-0.3	0.2-0.4	0.1-0.2	0.1	0-0.1	0	0	0	0	0	N TO W	0-2	8.5+	
FENCE LINE 9-4	0500	0-0.4	0.1-0.5	0.1-0.3	0-0.2	0.1-0.2	0.1	0	0-0.1	0.1	0	N TO W	0-2	8.5+	
FENCE LINE 9-4	0600	0.1-0.3	0.1-0.2	0.2-0.4	0.1-0.3	0.1	0-0.1	0-0.1	0	0	0	N	0-2	8.5+	
FENCE LINE 9-4	0900	0-0.1	0.3-0.5	0.6-0.7	0.1	0	0	0	0	0	0	N TO W	0-5	8.5+	
FENCE LINE 9-4	1000	0-0.1	0.1	0.1-0.3	0.2-0.4	0.4-0.5	0.1	0.1	0.1	0.1	0.1	NW	0	8.5+	
FENCE LINE 9-4	1200	0.1	0.1	0.1-0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	NW	0-5	8.5+	
FENCE LINE 9-4	1300	0.1	0.1-0.3	0.3-0.4	0.2-0.3	0.1	0	0	0	0	0	NW	0-5	8.5+	
FENCE LINE 9-4	1400	0-0.1	0.2-0.3	0.3-0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	NW	10-15	8.5+	
FENCE LINE 9-4	1500	0	0.1-0.3	0.3-0.4	0.1-0.2	0.1	0.1	0.1	0.1	0.1	0.1	NW	10-15	8.5+	
FENCE LINE 9-4	1600	0.1-0.2	0.1-0.2	0.1	0-0.1	0	0	0	0	0	0	NE	0-2	8.5+	
FENCE LINE 9-4	1700	0-0.1	0.1-0.2	0.1-0.3	0-0.1	0-0.1	0	0	0	0	0	NW	0-2	8.5+	
FENCE LINE 9-5	0600	0	0-0.1	0-0.1	0.1-0.2	0.1-0.2	0.1-0.3	0.1-0.2	0.1-0.3	0-0.1	0-0.1	NW	0	8.5+	
FENCE LINE 9-5	0700	0.1-0.2	0.1-0.2	0-0.1	0	0	0	0	0	0	0	NE	0	8.5+	
FENCE LINE 9-5	0800	0-0.1	0-0.2	0-0.2	0.1	0.1	0	0	0	0	0	NW	0	8.5+	
FENCE LINE 9-5	0900	0-0.1	0-0.1	0.1	0.1	0.1	0.1	0.1	0	0	0	NW	0	8.5+	
FENCE LINE 9-5	1300	0-0.1	0.1	0.1-0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	NW	5-10	8.5+	
FENCE LINE 9-5	1500	0	0-0.1	0.1-0.3	0.1-0.2	0.1	0.1	0.1	0.1	0.1	0.1	NW	10-15	8.5+	
FENCE LINE 9-5	1900	0	0.1-0.2	0.2-0.1	0.1-0	0	0	0	0	0	0	NW	0	8.5+	
FENCE LINE 9-5	2000	0	0-0.1	0.2-0.1	0.1-0	0	0	0	0	0	0	NW	0	8.5+	
FENCE LINE 9-5	2100	0.2-0.1	0.1-0	0	0	0	0	0	0	0-0.1	0.1	N	0	8.5+	
FENCE LINE 9-5	2200	0	0.1	0.1	0.1-0	0	0	0	0	0	0	N TO W	0-5	8.5+	
FENCE LINE 9-5	2300	0.1	0.1-0.2	0.1	0.1-0.2	0	0	0	0	0	0	N TO W	0-5	8.5+	
FENCE LINE 9-5	2400	0.1	0.1	0.1	0.1	0	0	0	0	0	0	N TO W	0-5	8.5+	
FENCE LINE 9-6	0100	0-0.1	0.1	0.1	0.1-0.2	0	0	0	0	0	0	N	0-2	8.5+	
FENCE LINE 9-6	0200	0-0.1	0.1-0	0.2-0.1	0.2-0.3	0	0	0	0	0	0	N	0-2	8.5+	
FENCE LINE 9-6	0300	0.1	0.1	0.1	0.1-0.2	0	0	0	0	0	0	N TO W	0-2	8.5+	
FENCE LINE 9-6	0400	0-0.1	0.1	0.2-0.3	0.1-0.2	0	0	0	0	0	0	N TO W	0-2	8.5+	
FENCE LINE 9-6	0500	0.1	0.1	0.1	0.2-0.3	0	0	0	0	0	0	N TO W	0-2	8.5+	
FENCE LINE 9-6	0600	0.1	0.1-0.2	0.3-0.4	0.1-0.2	0	0	0	0	0	0	N	0-2	8.5+	
FENCE LINE 9-6	0700	0	0.1-0.2	0-0.1	0	0	0	0	0	0	0	N	0	8.5+	
FENCE LINE 9-6	1700	0.1-0.2	0.1-0.2	0-0.2	0	0	0	0	0	0	0	N	15-25	8.5+	
FENCE LINE 9-6	1800	0-0.2	0.1-0.2	0-0.2	0	0	0	0	0	0	0	N	10-15	8.5+	
FENCE LINE 9-6	1900	0-0.1	0.2	0.1	0	0	0	0	0	0	0	N TO W	0-2	8.5+	
FENCE LINE 9-6	2000	0	0	0-0.1	0	0	0	0	0	0	0	N	0-2	8.5+	
FENCE LINE 9-6	2100	0.1	0.1	0.1	0.1	0	0	0	0	0	0	N TO W	0-2	8.5+	
FENCE LINE 9-6	2200	0.2	0.1-0.2	0.1	0-0.1	0	0	0	0	0	0	N TO W	0	8.5+	
FENCE LINE 9-6	2300	0.1-0.2	0.1	0.1	0	0	0	0	0	0	0	N TO W	0	8.5+	
FENCE LINE 9-7	0100	0.1	0.1-0.3	0.1-0.2	0-0.1	0	0	0	0	0	0	NW	0-2	8.5+	
FENCE LINE 9-7	0200	0.2	0.1	0.2	0	0	0	0	0	0	0	NW	0-2	8.5+	
FENCE LINE 9-7	0300	0-0.1	0.1	0.1	0.1-0.2	0	0	0	0	0	0	N TO W	0	8.5+	
FENCE LINE 9-7	0400	0	0-0.1	0-0.1	0-0.1	0.1-0.2	0	0	0	0	0	N TO W	0	8.5+	
FENCE LINE 9-7	0500	0-0.1	0.1-0.2	0.1	0.1-0.2	0	0	0	0	0	0	N TO W	0-2	8.5+	
FENCE LINE 9-7	0600	0.1-0.3	0.1-0.2	0.2	0.1-0.2	0	0	0	0	0	0	N TO W	0-2	8.5+	
FENCE LINE 9-7	0700	0-0.1	0-0.1	0-0.1	0	0	0	0	0	0	0	N	0	8.5+	
FENCE LINE 9-7	1500	0-0.1	0.1-0.3	0.1-0.3	0.1-0.2	0.1-0.2	0.1	0-0.1	0	0	0	N TO W	10-15	8.5+	
FENCE LINE 9-7	1600	0-0.1	0-0.1	0.1-0.2	0.1	0.1	0.1	0	0	0	0	NW	0-5	8.5+	
FENCE LINE 9-7	1900	0.2-0.3	0.2	0	0	0	0	0	0	0	0	N TO W	0-5	8.5+	
FENCE LINE 9-7	2000	0	0	0-0.1	0.1	0-0.1	0-0.1	0-0.1	0	0.1	0.1	N TO NE	0-3	8.5+	
FENCE LINE 9-7	2100	0	0	0	0	0	0	0	0	0	0	N TO NE	0-5	8.5+	
FENCE LINE 9-7	2200	0.2-0.3	0-0.1	0.1-0	0	0-0.1	0-0.1	0-0.1	0	0	0	N TO NE	0-5	8.5+	
FENCE LINE 9-7	2300	0	0-0.1	0.1-0.2	0	0	0	0	0	0-0.1	0.1-0.2	N TO NE	0	8.5+	

DISOLVED SULPHIDES = 34

45 GALLONS HUMA-CALCIUM TREATMENT COMPLETED.

SPRAY ON 9:45 AM

SPRAY OFF

SPRAY OFF

AREA	DATE, 1987	TIME	K	L	M	N	O	P	Q	R	S	WIND DIRECTION	WIND SPEED	Ph	REMARKS
FENCE LINE	9-7	2400	0-0.1	0	0	0	0-0.1	0	0	0-0.1	0.1-0.2	N TO NE	0-5	8.5+	
FENCE LINE	9-8	0100	0	0-0.1	0	0	0	0	0	0-0.1	0.1-0.2	N TO NE	0-5	8.5+	
FENCE LINE	9-8	0200	0.1	0-0.1	0	0	0	0	0	0	0-0.1	NW	0-3	8.5+	
FENCE LINE	9-8	0300	0-0.1	0	0-0.1	0	0	0	0	0	0-0.1	N TO NW	0	8.5+	
FENCE LINE	9-8	0400	0	0	0	0	0	0	0	0-0.1	0-0.1	N TO NW	0	8.5+	
FENCE LINE	9-8	0500	0-0.1	0	0	0	0	0	0	0	0-0.1	N TO NW	0	8.5+	
FENCE LINE	9-8	0600	0.1-0.2	0-0.1	0	0-0.1	0	0	0-0.1	0	0	N	0-5	8.5+	
FENCE LINE	9-8	0700	0-0.1	0.1	0.1	0	0	0	0	0	0	N	0-5	8.5+	
FENCE LINE	9-8	0800	0-0.1	0-0.2	0.1	0-0.1	0	0	0	0	0	N	0	8.5+	
FENCE LINE	9-8	1500	0	0-0.2	0.1-0.2	0.1	0.1	0-0.1	0	0	0	NW	0-5	8.5+	SPRAY ON 8:45
FENCE LINE	9-8	1600	0	0.1-0.2	0.1	0	0	0	0	0	0	NW	0-5	8.5+	SPRAY OFF 2:00
FENCE LINE	9-8	1700	0	0-0.2	0.1-0.2	0.1-0.2	0.1	0	0	0	0	NW	0-5	8.5+	
FENCE LINE	9-8	2000	0	0.1-0.2	0-0.1	0	0	0	0-0.1	0	0	NW	0-5	8.5+	
FENCE LINE	9-8	2100	0	0-0.1	0	0	0	0	0	0	0	N TO NW	0-2	8.5+	
FENCE LINE	9-8	2200	0	0-0.1	0	0-0.1	0	0	0	0-0.1	0	N TO NW	0-5	8.5+	
FENCE LINE	9-8	2300	0-0.1	0	0	0-0.1	0	0	0	0	0	N TO NW	0	8.5+	
FENCE LINE	9-8	2400	0-0.1	0-0.1	0	0	0	0	0	0	0-0.1	NW	0	8.5+	
FENCE LINE	9-9	0100	0-0.1	0-0.1	0.1	0	0	0-0.1	0.1	0-0.1	0.1-0.2	N TO NW	0-5	8.5+	
FENCE LINE	9-9	0200	0.1-0.2	0-0.1	0-0.1	0	0	0-0.1	0	0-0.1	0.2-0.3	N TO NW	0-10	8.5+	
FENCE LINE	9-9	0300	0.1-0.2	0-0.1	0	0	0-0.1	0	0	0-0.1	0-0.1	N	0	8.5+	
FENCE LINE	9-9	0400	0-0.1	0	0-0.1	0.1	0.1	0-0.1	0	0-0.1	0.1-0.2	N TO NW	0-4	8.5+	
FENCE LINE	9-9	0500	0.1-0.2	0.1	0-0.1	0-0.1	0	0	0	0-0.1	0.1-0.2	NW	0	8.5+	
FENCE LINE	9-9	0600	0.1-0	0	0	0	0	0	0	0-0.1	0.1	N TO NE	0	8.5+	SPRAY OFF
FENCE LINE	9-9	1400	0	0	0	0	0	0	0	0	0	N TO W	10-15	8.5+	
FENCE LINE	9-9	1500	0-0.1	0.1	0.1	0.1-0.2	0	0	0	0.1	0.1	N TO W	5-10	8.5+	
FENCE LINE	9-9	1600	0	0-0.1	0	0	0	0	0.1	0.1	0.1	N TO W	5-10	8.5+	
FENCE LINE	9-9	1700	0-0.1	0	0	0	0	0	0	0	0	N	10-15	8.5+	
FENCE LINE	9-9	1800	0	0	0	0	0	0	0	0	0	N TO W	5-10	8.5+	
FENCE LINE	9-9	1900	0	0	0	0-0.1	0.1	0.1	0.1	0.1	0.1	N TO W	0-5	8.5+	
FENCE LINE	9-9	2000	0.1	0.1	0.1-0.2	0.2	0.2	0.2	0.3	0.3	0.3	N TO E	0	8.5+	
FENCE LINE	9-9	2100	0	0-0.1	0.1-0.2	0	0	0	0	0	0	N TO W	0	8.5+	
FENCE LINE	9-9	2200	0	0	0-0.1	0-0.1	0-0.1	0.2-0.1	0	0-0.2	0.1-0	NW	0	8.5+	
FENCE LINE	9-9	2300	0	0	0	0-0.1	0	0.1	0	0.1	0	NW	0	8.5+	
FENCE LINE	9-9	2400	0	0-0.1	0.1	0-0.2	0	0.1	0-0.1	0.1-0	0-0.1	NW	1	8.5+	
FENCE LINE	9-10	0100	0	0	0	0	0	0	0-0.1	0	0.1-0.2	NW	0	8.5+	
FENCE LINE	9-10	0200	0	0	0	0	0-0.1	0	0	0	0	NW	0	8.5+	
FENCE LINE	9-10	0300	0	0	0	0	0	0	0	0	0	NW	0	8.5+	
FENCE LINE	9-10	0400	0	0	0	0	0	0	0	0	0	NW	0-3	8.5+	
FENCE LINE	9-10	0500	0	0	0	0	0	0	0	0	0	NW	0-3	8.5+	
FENCE LINE	9-10	0600	0.1-0	0	0	0	0	0	0	0	0	NW	0-3	8.5+	
FENCE LINE	9-10	0700	0	0	0	0	0	0	0	0	0	N	0	8.5+	
FENCE LINE	9-10	0800	0	0	0	0	0-0.1	0	0.1	0.1-0.3	0.1-0.4	N TO W	0	8.5+	PUMP OFF
FENCE LINE	9-10	0900	0	0.1-0.3	0.2-0.3	0.1	0	0	0	0	0	N TO W	0-5	8.5+	
FENCE LINE	9-10	1500	0.1	0.1	0	0	0	0	0	0	0	N TO W	10-15	8.5+	
FENCE LINE	9-10	1600	0	0.1	0.1	0.1	0	0	0	0	0	N TO W	10-15	8.5+	
FENCE LINE	9-10	1700	0	0	0.1	0.1	0	0	0.1	0.1	0.1	N TO W	10-15	8.5+	
FENCE LINE	9-10	1800	0-0.1	0-0.1	0.1	0	0	0	0	0	0	N TO W	10-15	8.5+	
FENCE LINE	9-10	2000	0	0	0.1	0-0.1	0	0	0	0	0	NW	0-5	8.5+	
FENCE LINE	9-10	2100	0	0	0	0	0	0	0	0	0-0.1	N TO NW	0-5	8.5+	
FENCE LINE	9-10	2300	0.1-0.2	0-0.1	0	0-0.1	0	0	0	0	0	NW	0-5	8.5+	
FENCE LINE	9-10	2400	0.1	0-0.1	0	0	0	0	0	0	0-0.1	NW	5-10	8.5+	
FENCE LINE	9-11	0100	0-0.1	0	0	0	0	0	0	0	0	NW	0	8.5+	
FENCE LINE	9-11	0200	0	0-0.1	0	0	0	0	0	0	0	NW	0	8.5+	
FENCE LINE	9-11	0300	0-0.1	0-0.1	0	0	0	0	0	0	0	NW	0	8.5+	
FENCE LINE	9-11	0400	0-0.1	0	0-0.1	0	0	0	0	0	0-0.1	N TO NW	0	8.5+	
FENCE LINE	9-11	0500	0	0-0.1	0	0	0	0	0	0	0-0.1	N TO NW	0	8.5+	
FENCE LINE	9-11	0600	0-0.1	0	0	0	0	0	0	0	0.1-0.2	N TO NW	0-5	8.5+	
FENCE LINE	9-11	0700	0-0.1	0	0	0-0.1	0-0.1	0	0	0	0	N TO NW	0	8.5+	
FENCE LINE	9-11	0800	0	0	0	0	0	0	0	0	0	NW	0	8.5+	

AREA	DATE, 1987	TIME	K	L	M	N	O	P	Q	R	S	WIND DIRECTION	WIND SPEED	PH	REMARKS
FENCE LINE	9-11	0900	0-0.1	0	0	0	0	0	0	0	0	NE	5-10	8.5+	SPRAY OFF 11:45 AIR CIRCULATING
FENCE LINE	9-11	1200	0-0.1	0-0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	N	0	8.5+	
FENCE LINE	9-11	1300	0-0.1	0.1	0.1	0.1	0.1-0.2	0.1-0.2	0.2	0.2	0.2	N	0	8.5+	
FENCE LINE	9-11	1800	0.1	0.1-0.2	0-0.1	0	0	0	0	0	0	NE	7-12	8.5+	
FENCE LINE	9-11	1900	0.1-0.2	0-0.2	0-0.1	0	0	0	0	0	0	NE	5-10	8.5+	
FENCE LINE	9-11	2000	0-0.1	0-0.1	0	0	0	0	0	0	0	N TO E	10-15	8.5+	SPRAY OFF 6:00
FENCE LINE	9-11	2100	0-0.1	0-0.1	0	0	0	0	0	0	0	N TO E	5-10	8.5+	
FENCE LINE	9-11	2200	0-0.1	0-0.1	0	0	0	0	0	0	0	N TO E	5-10	8.5+	
FENCE LINE	9-11	2300	0-0.1	0.1-0.2	0	0	0	0	0	0	0	N	0-5	8.5+	
FENCE LINE	9-11	2400	0-0.1	0.1	0	0	0	0	0	0	0	N	0	8.5+	
FENCE LINE	9-12	0100	0.1	0	0	0	0	0	0	0	0	N	0	8.5+	SHIMERS
FENCE LINE	9-12	0200	0.1	0.1	0	0	0	0	0	0	0	N TO E	0-5	8.5+	
FENCE LINE	9-12	0300	0.1-0.3	0.3	0.2	0.1	0.1	0	0	0	0	N TO E	0-3	8.5+	
FENCE LINE	9-12	0400	0.1	0.2	0.2	0.1	0.1	0	0	0	0	N TO W	0	8.5+	
FENCE LINE	9-12	0500	0.2-0.3	0.2	0.1	0.1	0.1-0	0	0	0	0	N TO E	0-3	8.5+	
FENCE LINE	9-12	0600	0.2	0.2	0.1	0.1	0.1	0	0	0	0	N TO E	0	8.5+	RAIN SHOWERS
FENCE LINE	9-12	0800	0-0.2	0-0.1	0	0	0	0	0	0	0	NE	0-5	8.5+	
FENCE LINE	9-12	2100	0-0.1	0.1	0-0.1	0	0	0	0	0	0	N	0	8.5+	
FENCE LINE	9-12	2400	0-0.1	0	0	0	0-0.1	0	0	0.1	0-0.1	NW TO W	0-2	8.5+	
FENCE LINE	9-13	0200	0	0	0-0.1	0	0	0	0	0-0.1	0	N TO NW	0	8.5+	
FENCE LINE	9-13	0300	0	0	0-0.1	0	0	0	0	0-0.1	0	NW	0-2	8.5+	SHIMERS
FENCE LINE	9-13	0400	0-0.1	0	0-0.1	0	0	0	0	0-0.1	0	N TO NW	0	8.5+	
FENCE LINE	9-13	0500	0-0.1	0	0-0.1	0-0.1	0	0-0.1	0	0-0.1	0	NW	0	8.5+	
FENCE LINE	9-13	0600	0-0.1	0	0	0	0	0	0	0	0	NW	0	8.5+	
FENCE LINE	9-13	0800	0-0.1	0-0.1	0	0	0	0	0	0	0	NW	0	8.5+	
FENCE LINE	9-13	0900	0	0-0.1	0-0.1	0	0	0	0	0	0	NE	0	8.5+	RAIN SHOWERS
FENCE LINE	9-13	1500	0	0-0.1	0-0.1	0-0.1	0-0.1	0	0	0	0	NW	10-25	8.5+	
FENCE LINE	9-13	1600	0	0	0-0.1	0-0.1	0-0.1	0-0.1	0	0	0	NW	10-15	8.5+	
FENCE LINE	9-13	1700	0	0-0.1	0-0.1	0	0	0	0	0	0	N	5-10	8.5+	
FENCE LINE	9-13	1800	0	0	0-0.2	0	0	0	0	0	0	NW	5-10	8.5+	
FENCE LINE	9-13	1900	0	0	0	0	0	0	0	0	0	NW	0-5	8.5+	SHIMERS
FENCE LINE	9-13	2100	0	0	0	0-0.1	0.1	0-0.1	0	0	0	N	0	8.5+	
FENCE LINE	9-13	2200	0-0.1	0.1	0	0-0.1	0-0.1	0.1	0.1	0	0	N TO NE	0-5	8.5+	
FENCE LINE	9-13	2300	0	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0	0	0	NE	0-5	8.5+	
FENCE LINE	9-13	2400	0	0-0.1	0.1-0	0.1	0	0	0-0.1	0	0	N	0	8.5+	
FENCE LINE	9-14	0100	0	0	0	0	0.1	0-0.1	0	0	0	NW	0	8.5+	SHIMERS
FENCE LINE	9-14	0200	0	0	0	0-0.1	0-0.1	0	0-0.1	0-0.1	0.1	N TO NW	0	8.5+	
FENCE LINE	9-14	0300	0-0.1	0	0	0	0-0.1	0.1	0	0-0.1	0	NW	0	8.5+	
FENCE LINE	9-14	0400	0	0	0	0	0	0	0	0	0	NW	0	8.5+	
FENCE LINE	9-14	0500	0-0.1	0	0.1	0-0.1	0	0-0.1	0	0	0	NW	0-5	8.5+	
FENCE LINE	9-14	0600	0-0.1	0	0	0	0-0.1	0.1	0	0-0.1	0-0.1	NW	0-5	8.5+	SHIMERS
FENCE LINE	9-14	0800	0-0.1	0	0	0	0	0	0	0	0	N	0	8.5+	
FENCE LINE	9-14	1800	0	0	0-0.1	0	0	0	0	0	0	NW	5-10	8.5+	
FENCE LINE	9-14	2000	0	0	0	0-0.1	0	0	0-0.1	0.1	0	NW	5-10	8.5+	
FENCE LINE	9-15	2100	0	0	0	0-0.1	0	0-0.1	0	0.1	0	NW TO W	0-5	8.5+	
FENCE LINE	9-15	2200	0	0	0	0-0.1	0.1	0	0	0	0	NW TO W	5-10	8.5+	SHIMERS
FENCE LINE	9-15	2300	0	0	0	0	0	0	0	0-0.1	0.1	NW	5-10	8.5+	
FENCE LINE	9-15	2400	0	0	0	0-0.1	0.1	0	0	0	0	NW	5-10	8.5+	
FENCE LINE	9-16	0100	0	0	0	0	0-0.1	0.1	0	0	0	NW	0-5	8.5+	
FENCE LINE	9-16	0200	0-0.1	0.1	0	0	0	0	0	0	0	NW	0-5	8.5+	
FENCE LINE	9-16	0300	0	0	0	0	0	0	0	0	0	N TO NW	0	8.5+	SHIMERS
FENCE LINE	9-16	0400	0	0	0	0	0	0	0	0	0	N TO NW	0	8.5+	
FENCE LINE	9-16	0500	0	0	0	0-0.1	0.1	0	0-0.1	0	0	N	0	8.5+	
FENCE LINE	9-16	0600	0-0.1	0.1	0	0	0	0	0	0-0.1	0-0.1	NW TO W	0	8.5+	
FENCE LINE	9-16	0700	0	0	0	0	0	0	0	0	0	N TO W	0	8.5+	
FENCE LINE	9-16	0800	0	0	0	0	0	0	0	0	0	N TO W	0	8.5+	SHIMERS
FENCE LINE	9-16	0900	0	0	0	0	0	0	0	0	0	N TO W	0	8.5+	
FENCE LINE	9-16	1400	0	0	0	0.1	0.1	0.1	0.1	0.1	0.1	N TO W	10-18	8.5+	
FENCE LINE	9-16	1500	0-0.1	0.1	0	0	0	0	0	0	0	N TO W	15-20	8.5+	

DISSOLVED SULPHIDES = 5

SPRAY ON  
SPRAY OFF



## REMARKS

AREA	DATE, 1987	TIME	K	L	M	N	O	P	Q	R	S	WIND DIRECTION	WIND SPEED	PH	REMARKS
FENCE LINE	9-16	1600	0	0.1-0	0	0	0	0	0	0	0	N TO W	15-25	8.5+	
FENCE LINE	9-16	1700	0	0	0	0	0	0	0	0	0	N TO W	15-20	8.5+	
FENCE LINE	9-16	1800	0	0	0	0	0	0	0	0	0	N TO W	10-15	8.5+	
FENCE LINE	9-16	1900	0	0	0.1	0	0	0	0	0	0	NW TO W	0-5	8.5+	
FENCE LINE	9-16	2000	0	0	0	0	0	0	0	0-0.1	0.1	NW TO W	0	8.5+	
FENCE LINE	9-16	2300	0	0	0	0	0	0	0	0	0	NW TO W	0-5	8.5+	
FENCE LINE	9-16	2400	0-0.1	0	0.1-0	0	0	0	0	0-0.1	0-0.1	NW TO W	0-5	8.5+	
FENCE LINE	9-17	0100	0	0	0	0	0.1	0.1	0	0	0	NW TO W	0	8.5+	
FENCE LINE	9-17	0200	0	0	0	0	0	0.1	0-0.1	0	0	NW TO W	0	8.5+	
FENCE LINE	9-17	0300	0	0	0	0	0	0-0.1	0-0.1	0	0	NW TO W	0	8.5+	
FENCE LINE	9-17	0400	0	0	0	0	0	0	0-0.1	0	0	N TO NW	0-5	8.5+	
FENCE LINE	9-17	0500	0	0	0	0	0-0.1	0.1	0.1	0.1	0-0.1	N TO NW	0-5	8.5+	
FENCE LINE	9-17	0700	0	0	0	0	0-0.1	0.1	0-0.1	0.1	0-0.1	N TO NW	0	8.5+	
FENCE LINE	9-17	0800	0	0	0	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1	N TO NW	0	8.5+	
FENCE LINE	9-17	1000	0	0	0	0	0	0	0	0	0	N TO E	5-10	8.5+	DISSOLVED SULPHIDES = 5
FENCE LINE	9-17	1100	0	0	0	0	0	0	0	0	0	N TO E	5-10	8.5+	
FENCE LINE	9-17	1200	0	0	0	0	0	0	0	0	0	N TO E	5-10	8.5+	
FENCE LINE	9-17	1500	0.1	0	0	0	0	0	0	0-0.1	0-0.1	N TO W	10-25	8.5+	
FENCE LINE	9-17	1800	0	0	0	0	0	0	0	0	0	N TO W	10-15	8.5+	
FENCE LINE	9-17	1900	0	0	0	0	0	0	0	0	0	NW TO W	0	8.5+	
FENCE LINE	9-17	2000	0-0.1	0.1	0	0	0	0	0	0	0	NW TO W	0	8.5+	
FENCE LINE	9-17	2200	0	0	0	0	0	0	0	0	0	NW	0	8.5+	
FENCE LINE	9-17	2300	0-0.1	0	0	0-0.1	0.1	0	0	0	0	NW	0	8.5+	
FENCE LINE	9-17	2400	0	0-0.1	0	0	0	0	0-0.1	0.1	0.1	NW TO W	0-5	8.5+	
FENCE LINE	9-18	0100	0	0	0	0	0	0	0-0.1	0.1	0.1	NW	0-5	8.5+	
FENCE LINE	9-18	0200	0	0	0-0.1	0.1	0-0.1	0	0	0	0	N TO W	0	8.5+	
FENCE LINE	9-18	0300	0	0	0	0	0-0.1	0.1	0-0.1	0.1	0-0.1	N TO NW	0-5	8.5+	
FENCE LINE	9-18	0400	0	0	0	0	0-0.1	0.1	0.1	0-0.1	0.1	N TO NW	0-5	8.5+	
FENCE LINE	9-18	0500	0	0	0	0	0-0.1	0.1	0.1	0	0-0.1	NW	0	8.5+	
FENCE LINE	9-18	0600	0	0	0	0	0-0.1	0.1	0.1	0	0	NW	0	8.5+	
FENCE LINE	9-18	0700	0	0-0.1	0.1	0.1	0.1	0.1	0-0.1	0	0	NW	0	8.5+	
FENCE LINE	9-18	1000	0-0.1	0-0.1	0	0	0	0	0	0	0	NE	0	8.5+	DISSOLVED SULPHIDES = 16.5
FENCE LINE	9-18	1300	0	0.1	0.1	0.1	0.1-0	0	0	0	0	NW	0-5	8.5+	
FENCE LINE	9-19	0300	0	0	0	0	0	0	0	0	0	NW TO W	0	8.5+	
FENCE LINE	9-19	0500	0	0	0	0	0	0	0	0	0	N TO NW	0	8.5+	
FENCE LINE	9-19	0600	0	0	0	0	0-0.1	0	0	0	0	N TO NW	0	8.5+	
FENCE LINE	9-19	0700	0	0	0	0	0	0	0	0	0	NW	0	8.5+	
FENCE LINE	9-19	2000	0.2	0.2	0.2	0.2	0.2-0.3	0.3	0.3	0.3	0.3	N TO W	0-5	8.5+	
FENCE LINE	9-19	2100	0	0	0	0	0	0	0	0	0	N TO W	5-10	8.5+	
FENCE LINE	9-19	2200	0	0	0	0	0	0	0	0	0	N TO W	5-10	8.5+	
FENCE LINE	9-19	2300	0	0	0	0	0	0	0	0	0.1	N TO W	0-5	8.5+	
FENCE LINE	9-20	0100	0	0-0.1	0-0.1	0-0.1	0-0.1	0	0	0	0	N	0	8.5+	
FENCE LINE	9-20	0200	0	0-0.1	0-0.1	0	0	0	0	0	0	N TO W	0	8.5+	
FENCE LINE	9-20	0300	0	0-0.1	0-0.1	0-0.1	0-0.1	0	0	0	0	N TO W	0	8.5+	
FENCE LINE	9-20	0400	0-0.2	0-0.2	0.2	0.1	0.1	0	0	0	0	N TO W	0	8.5+	
FENCE LINE	9-20	0500	0.3	0.3	0.2	0.1	0.1	0.1	0	0	0	N TO W	0	8.5+	
FENCE LINE	9-21	0700	0	0	0	0	0-0.1	0.1	0-0.1	0.1	0.1	NW TO W	0	8.5+	
FENCE LINE	9-21	2000	0	0	0	0	0	0	0	0	0	NW TO W	0	8.5+	
FENCE LINE	9-21	2300	0	0	0	0	0	0-0.1	0.1	0.1	0-0.1	NW TO W	0	8.5+	
FENCE LINE	9-21	2400	0	0	0	0	0	0-0.1	0.1	0-0.1	0-0.1	NW	0	8.5+	
FENCE LINE	9-22	0100	0	0	0	0	0	0-0.1	0-0.1	0.1	0.1	N TO NE	0-5	8.5+	
FENCE LINE	9-22	0200	0	0	0	0	0	0	0-0.1	0-0.1	0-0.1	N TO NE	0-5	8.5+	
FENCE LINE	9-22	0300	0	0	0	0	0.1	0.1	0.1	0.1	0-0.1	N TO NE	0	8.5+	
FENCE LINE	9-22	0400	0	0-0.1	0.1	0.1	0.1	0-0.1	0-0.1	0.1	0.1	N TO E	0-5	8.5+	
FENCE LINE	9-22	0500	0	0	0	0	0	0-0.1	0.1	0.1	0.1	N	0	8.5+	
FENCE LINE	9-22	0600	0	0	0	0	0	0-0.1	0.1	0	0	N TO W	0-5	8.5+	
FENCE LINE	9-22	0700	0	0	0	0	0	0-0.1	0.1-0	0.1	0-0.1	N TO NE	0	8.5+	
FENCE LINE	9-22	0800	0	0	0	0	0	0	0	0	0	NE	0-5	8.5+	SPRAY ON 8:15
FENCE LINE	9-22	2200	0	0	0	0	0-0.1	0.1	0.1	0.1	0.1	NE	0	8.5+	

[illegible]



EXHIBIT NO. 5

BASIN DISPOSAL, INC.  
H<sub>2</sub>S Contingency Plan

1. Incoming fluids will be monitored by H<sub>2</sub>S Monitor, the type currently being utilized, for presence of H<sub>2</sub>S.

Incoming fluids indicating, by monitor, H<sub>2</sub>S in excess of 10.0 ppm will be stored for treatment prior to disposal in disposal pond or in Salt Water Disposal Well.

2. The current method of monitoring the levels of H<sub>2</sub>S leaving the boundaries of the facility, monitoring at the fence line, will be utilized. Monitor readings will be obtained every two (2) hours during the time the facility is manned or during normal operating hours. Normal operating hours, to be utilized, are from 7:00 AM to 7:00 PM, Monday through Saturday of each week.

The spray system will only be utilized during normal operating hours. Also spray system will be utilized when winds are not in excess of 15 mph or from the southern direction or quadrants.

3. In the event of accidental release of health threatening concentrations of H<sub>2</sub>S, the following public safety personnel will be notified by telephone:

1. San Juan County Fire Marshall
2. San Juan County Sheriffs Department
3. New Mexico State Police

Telephone numbers to contact the above will be posted at the Disposal Facility and employees instructed as to when and how to contact the above. In addition the Designated Representative or alternate will be available to contact the above.

4. In the event of continual H<sub>2</sub>S releases in excess of 1.0 ppm leaving the premises one of the following OCD personnel will be immediately notified by telephone.

1. Frank Chavez
2. Charley Gholson
3. Ernie Busch

Telephone numbers to contact the above will be posted at the Disposal Facility and employees instructed as to when and how to contact the above. In addition the Designated Representative or alternate will be available to contact the above.

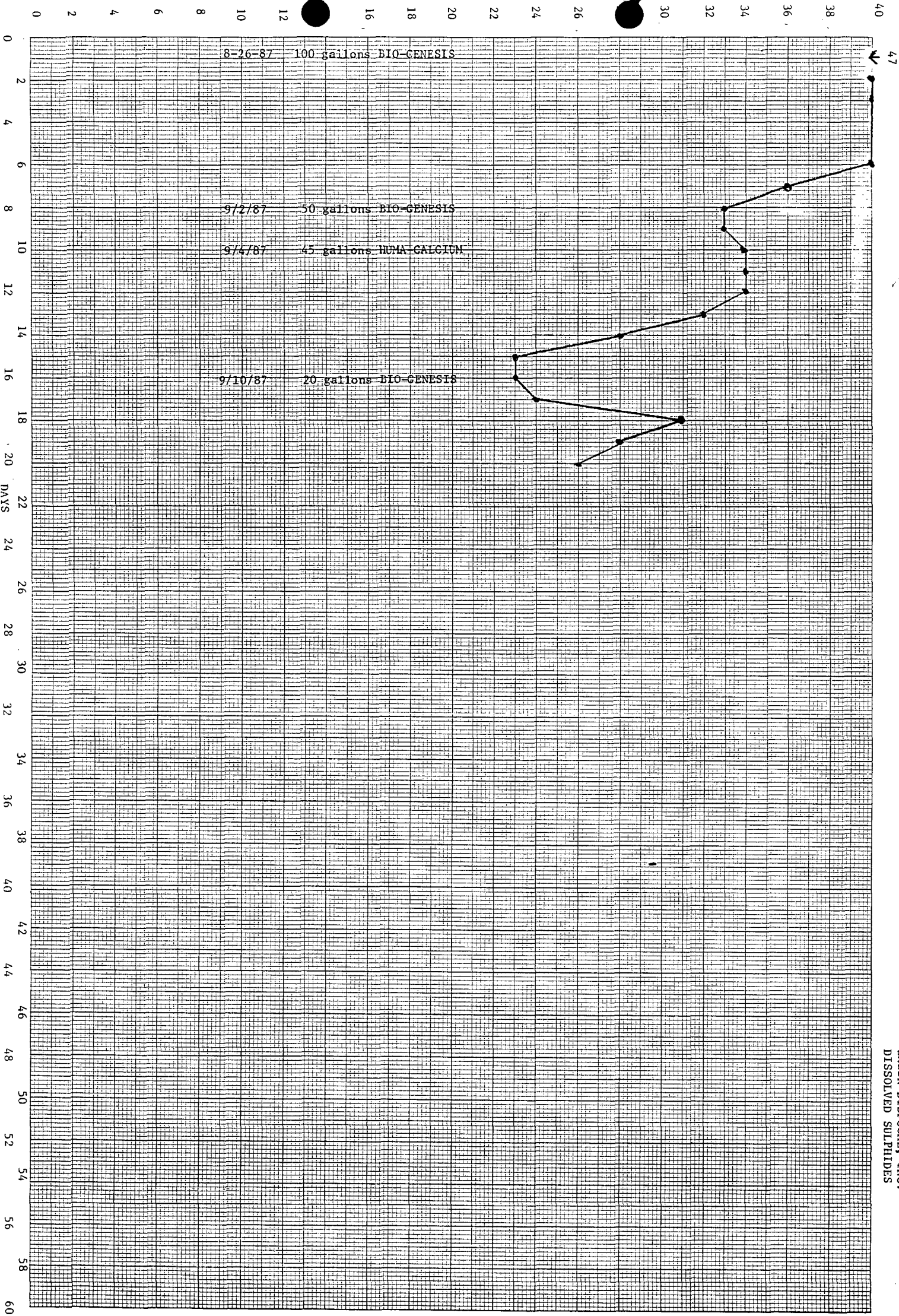
Submitted by Walsh Eng  
September 28, 1987

WFB

# BASIN DISPOSAL, INC

DISSOLVED SULPHIDES - ppm

DAYS	DATE 1987	DISSOLVED SULPHIDES	REMARKS
1	8-26	47	100 GALS. BIO-GENESIS TREATMENT.
2	8-27	40	(NOTE: WHEN TREATMENT INDICATED, DISSOLVED SULPHIDES ARE FROM WATER SAMPLE OBTAINED BEFORE TREATMENT.)
3	8-28	40	
4	8-29	INCONCLUSIVE	
5	8-30	INCONCLUSIVE	
6	8-31	40	
7	9-1	36	
8	9-2	33	50 GALS. BIO-GENESIS TREATMENT.
9	9-3	33	
10	9-4	34	45 GALS. HUMA-CALCIUM TREATMENT.
11	9-5	34	
12	9-6	34	
13	9-7	32	
14	9-8	28	
15	9-9	23	
16	9-10	23	20 GALS. BIO-GENESIS TREATMENT.
17	9-11	24	
18	9-12	31	
19	9-13	28	
20	9-14	26	
21	15	20	
22	16	5?	
23	17	5?	
24	18	16.5	
25	19	20.6	
26	20	19	
	21	16.5	





STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

GARREY CARRUTHERS  
GOVERNOR

POST OFFICE BOX 2088  
STATE LAND OFFICE BUILDING  
SANTA FE, NEW MEXICO 87504  
(505) 827-5800

MEMORANDUM

TO: Vic Lyon, Chief Engineer OCD

FROM: Roger Anderson, Environmental Engineer *RA*

SUBJECT: H<sub>2</sub>S Emissions at Basin Disposal Inc.

DATE: September 22, 1987

Basin Disposal Inc. obtained OCD permit approval for a lined evaporation pit for salt water disposal on August 29, 1985. In January 1987, the OCD received complaints from nearby residents about windblown spray and salt films from the spray evaporation system. The OCD placed limitations on Basin disposal that restricted their use of the spray system such that the spray does not leave the confines of the berm.

In June 1987, the OCD started receiving complaints of strong odors emanating from the facility. The odors were characterized as a strong sewage smell that causes headaches, nausea and vomiting. An investigation began on June 2, 1987 into the source and composition of the odors. The attached cronology lists the actions taken through July 30, 1987.

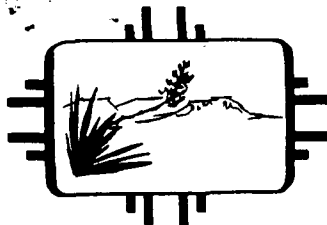
From the investigation, the OCD concluded the H<sub>2</sub>S gas is forming in situ at the bottom of the pit by anaerobic sulfate-reducing bacteria. Statements to support this conclusion are:

1. No reported emissions of H<sub>2</sub>S prior to June 1987.
2. The raising of the pH to 8.5 failed to reduce the H<sub>2</sub>S emissions.
3. The addition of 16,200 of 10% NaClO (Bleach) reduced the H<sub>2</sub>S emissions to zero by conversion to elemental sulfur. However, the emissions began increasing after one week despite the treatment of all incoming loads.

On August 8, 1987, the pond was treated with a biological treatment to destroy the anaerobic bacteria and eliminate the dissolved sulfide. Two remedial treatments have been conducted and each truckload is also treated. The dissolved sulfides have been on a general decrease since the initial treatment indicating the treatment has been successful to this point.

Basin Disposal Inc. has applied for approval to construct an injection well at the facility. The application is scheduled for hearing on September 23, 1987. The injection well will be the primary disposal method at the facility with the pond used for secondary settling of solids prior to injection and emergency retention of fluids during mechanical failures or well workovers. The volume of water in the pond will be reduced allowing for clean-out.

The operator has been fully cooperative in this effort and is as anxious to eliminate this nuisance as is the OCD. We are confident any further emissions, if there are any, will be dealt with immediately. The disposal well, in my opinion, will eliminate the problem.



NEW MEXICO  
HEALTH AND ENVIRONMENT  
DEPARTMENT

Post Office Box 968  
Santa Fe, New Mexico 87504-0968

GARREY CARRUTHERS  
Governor

LARRY GORDON  
Secretary

CARLA L. MUTH  
Deputy Secretary

MEMORANDUM

DATE: Sept. 25, 1987

TO: EID, ODD

FROM: Millie Eidson, Environmental Epidemiologist

SUBJECT: Preliminary Aztec H2S Questionnaire Results

I am attaching the preliminary frequency counts for most of the questions on the health questionnaire. Ninety-nine questionnaires were returned to me; I have not yet separated out the data from different groups of people such as close residents versus those employed in the area, etc. There was no mention of extreme symptoms such as unconsciousness, although 6 pets were reported to have died (mostly fish).

It is difficult for me to interpret these frequency counts for you because I don't have a comparison group to determine if these counts are unusual.

I don't see indications on the results so far that would necessitate me contacting physicians to verify medical records, but if you do see such indications based on these results, please let me know.

It will take me some time to perform more analyses on this data set. If you need them done quickly because they will affect some decision making process, call me and I will see what I can do.



# HEALTH QUESTIONNAIRE

Office of Epidemiology, New Mexico Health and Environment Dept., 827-0006

Because of health complaints in several neighborhoods, we are surveying your area. It is important that everyone who is given a copy of this questionnaire fill it out completely, even if you have not been experiencing health problems. Parents should complete a separate questionnaire for each child in the household. Mail the questionnaire back in the attached envelope by Aug. 15. Our Office will remove personal identifying information from this questionnaire after we have assigned our number to it.

As soon as we receive your completed questionnaire, we would be glad to mail you a Fact Sheet on any chemical exposures which may be occurring in your neighborhood, so that you can better understand your health risks.

If you would allow us to review your medical record, please sign the enclosed form.

Name: (First) \_\_\_\_\_ (Middle) \_\_\_\_\_ (Last) \_\_\_\_\_  
 Mailing Address: (#) \_\_\_\_\_ (Street name) \_\_\_\_\_  
 (City) \_\_\_\_\_ (Zipcode) \_\_\_\_\_  
 Actual Residence address (location): \_\_\_\_\_  
 Telephone: (home) \_\_\_\_\_ (office) \_\_\_\_\_

Ethnic group: (Circle one)  
 Anglo Hispanic Black Oriental Native American Other  
 Sex (circle one): male 69 female 28  
 Date of birth: (year) \_\_\_\_\_ (month) \_\_\_\_\_ (day) \_\_\_\_\_

Income per year: (circle one) <\$5,000 \$5,000-10,000  
 \$10,001-15,000 \$15,001-20,000 \$20,001-30,000  
 \$30,001-50,000 >\$50,000

Highest grade finished school (circle one):  
 grade school some high school completed high school  
 some college completed college

What is your occupation? \_\_\_\_\_  
 Who is your employer? \_\_\_\_\_

Do you smoke? yes 25 no \_\_\_\_\_ How many packs a day? \_\_\_\_\_  
 Did you smoke in the past? never 36 more than 1 yr ago \_\_\_\_\_ more than 5 yrs ago \_\_\_\_\_

The next question is about your general health, not about the last several months. Circle and list any chronic health problems you have had (lasting more than 6 months or occurring repeatedly in previous years):

pneumonia 2 emphysema 0 heart trouble 0 anxiety 1 depression 0  
 arthritis 6 other breathing problems 2 headaches 7 asthma 4  
 allergies, hay fever 20 cancer 3 (If cancer, are you on treatment? 0)  
 diabetes (sugar) 0 other: epilepsy (1), high blood pressure (5)

The questions on the back focus only on unusual exposures and symptoms during the last 2 months. Mark an X next to each exposure or symptom below "Yes" or "No" and write next to them the dates and times you experienced them if you can remember.

99 responses

EXPOSURES                      yes                      no                      Dates, Times  
 bad odors                      76  
 bad tasting water                      9  
 Other (list)                      none

SYMPTOMS                      yes                      no                      Dates, Times  
 nausea                      39 40  
 vomiting                      22  
 diarrhea                      23  
 blood in stools                      5  
 red eyes                      34 35  
 teary eyes                      37  
 problems with light                      11  
 eye pain                      25  
 runny nose                      26  
 breathing problems                      20  
 wheezing                      15  
 skin irritation                      34 15  
 rash                      12 13  
 numbness in extremities                      15  
 tingling in extremities                      18  
 irritability                      30 31  
 excitement                      15  
 dizziness                      33 34  
 headaches                      46 47  
 tiredness                      38 39  
 trouble sleeping                      31  
 bloody nose                      19  
 Other (list)                      plugged sinuses (1), nose epileptic seizures (1), hot + cold chills (2),  
 memory loss (1), ear ache (3), burning itchy eyes (4), pain (1), burning nasal passages (3),  
 sulfur taste in mouth (1), sore throat (3), stuffy nose (2), depression (1), tooth pain (1)  
 Have you contacted a physician or other health professional?                      yes (23)                      no

Name:                      Phone:                      23  
 Address:                      \_\_\_\_\_  
 Dates seen:                      \_\_\_\_\_  
 Diagnoses:                      pregnancy (1), H.S. exposure (1), eye pain (1), breathing problems (1), physical exam (3)  
 Laboratory tests:                      \_\_\_\_\_  
 \_\_\_\_\_ (4), vomiting (1), nausea (1), toxic exposure (3), flu (1), need vitamins (1)

SYMPTOMS IN PETS                      yes 14                      no                      Dates, Times  
 vomiting                      17  
 diarrhea                      7  
 breathing problems                      4  
 tiredness                      12  
 red eyes                      14  
 runny eyes                      16  
 runny nose                      13  
 excitement                      6  
 other (list)                      lack of appetite (3), hiccups (6), bloody nose (1), coughing (2),  
 getting spiny (1)

Have you seen a veterinarian?                      2 yes                      no  
 Name:                      Phone:                      \_\_\_\_\_  
 Address:                      \_\_\_\_\_  
 Dates seen:                      \_\_\_\_\_  
 Diagnoses:                      none  
 Laboratory tests:                      \_\_\_\_\_

# HEALTH QUESTIONNAIRE

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 (City) \_\_\_\_\_ (Zipcode) \_\_\_\_\_  
 Actual Residence address (location): \_\_\_\_\_  
 Telephone: (home) \_\_\_\_\_ (office) \_\_\_\_\_

Ethnic group: (Circle one)  
 Anglo Hispanic Black Oriental Native American Other  
 Sex (circle one): male 69 female 28  
 Date of birth: (year) \_\_\_\_\_ (month) \_\_\_\_\_ (day) \_\_\_\_\_

Income per year: (circle one) <\$5,000 \$5,000-10,000  
 \$10,001-15,000 \$15,001-20,000 \$20,001-30,000  
 \$30,001-50,000 >\$50,000

Highest grade finished school (circle one):  
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 some college completed college

What is your occupation? \_\_\_\_\_  
 Who is your employer? \_\_\_\_\_

Do you smoke? yes 25 no \_\_\_\_\_ How many packs a day? \_\_\_\_\_  
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 nausea                      39 40  
 vomiting                      22  
 diarrhea                      23  
 blood in stools                      5  
 red eyes                      34 35  
 teary eyes                      37  
 problems with light                      11  
 eye pain                      25  
 runny nose                      26  
 breathing problems                      20  
 wheezing                      15  
 skin irritation                      34 15  
 rash                      12 13  
 numbness in extremities                      15  
 tingling in extremities                      18  
 irritability                      30 31  
 excitement                      15  
 dizziness                      33 34  
 headaches                      46 47  
 tiredness                      38 39  
 trouble sleeping                      31  
 bloody nose                      19  
 Other (list)                      plugged sinuses (1), nose epileptic seizure (1), hot + cold chills (2),  
 memory loss (1), ear ache (3), burning itchy eyes (4), pain (1), burning nasal passages (3),  
 sulfur taste in mouth (1), sore throat (3), stuffy nose (2), depression (1), tooth pain (1)

Have you contacted a physician or other health professional?                      yes                      no

Name: \_\_\_\_\_

Phone: \_\_\_\_\_

Address: \_\_\_\_\_

Dates seen: \_\_\_\_\_

Diagnoses: pregnancy (1), H. S. exposure (1), eye pain (1), breathing problems (1), physical exam (3)

Laboratory tests: \_\_\_\_\_

Excretion (4), Vomiting (1), nausea (1), toxic exposure (3), flu (1), need vitamins (1)

SYMPTOMS IN PETS                      yes 14                      no                      Dates, Times  
 vomiting                      17  
 diarrhea                      7  
 breathing problems                      4  
 tiredness                      12  
 red eyes                      14  
 runny eyes                      16  
 runny nose                      13  
 excitement                      6  
 other (list)                      lack of appetite (3), death (6), bloody nose (1), coughing (2)

Have you seen a veterinarian?                      2 yes                      no

Name: \_\_\_\_\_

Phone: \_\_\_\_\_

Address: \_\_\_\_\_

Dates seen: \_\_\_\_\_

Diagnoses: none

Laboratory tests: \_\_\_\_\_

BILL RICHARDSON  
3d DISTRICT, NEW MEXICO

COMMITTEES:  
ENERGY AND COMMERCE  
INTERIOR AND INSULAR AFFAIRS  
EDUCATION AND LABOR  
HELSINKI COMMISSION  
ON HUMAN RIGHTS  
SELECT COMMITTEE ON AGING  
WHIP AT LARGE



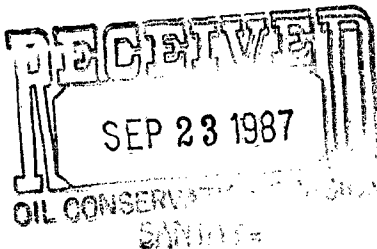
# Congress of the United States

## House of Representatives

Washington, DC 20515

September 18, 1987

Mr. Bill Le May  
Director  
Oil Conservation Division  
P.O. Box 2088  
Santa Fe, NM 87501



Dear Mr. Le May:

I am writing to ask your assistance on a matter of concern to several of my constituents.

As you know, the Basin Disposal facility is now in operation in San Juan County to dispose of waste water from oil drilling operations. As I understand it, the Oil Conservation Division has regulatory authority over the plant and has conducted tests which indicate the presence of hydrogen sulfide. Several people have written to me expressing their concern over the discovery of this chemical.

I am sure that you share my concern that the health and property of residents of San Juan County is not adversely affected. I would appreciate learning what actions you have taken to date in regard to this matter and what you plan to do in the future.

Please do not hesitate to contact me if I can be of assistance to you in any way. Thanking you in advance for your prompt attention to my request, I am

Sincerely yours,

*Bill*

BILL RICHARDSON  
Member of Congress

BR/rs

WASHINGTON OFFICE:

332 CANNON HOUSE OFFICE BUILDING  
WASHINGTON, DC 20515  
(202) 225-6190

DISTRICT OFFICES:

SANTA FE:  
U.S. COURTHOUSE B-26  
SOUTH FEDERAL PLACE  
SANTA FE, NM 87501  
(505) 988-6177

GALLUP:  
GALLUP CITY HALL  
SECOND AND AZTEC  
GALLUP, NM 87301  
(505) 722-6522

LAS VEGAS:  
SAN MIGUEL COUNTY COURTHOUSE  
P.O. Box 1805  
LAS VEGAS, NM 87701  
(505) 425-7270

BELEN:  
HARVEY HOUSE  
104 NORTH FIRST ST.  
BELEN, NM 87002  
(505) 864-1419

*David B.  
Please send him  
summary info (like to Pete D)  
if you haven't already.  
Thanks  
Paul*



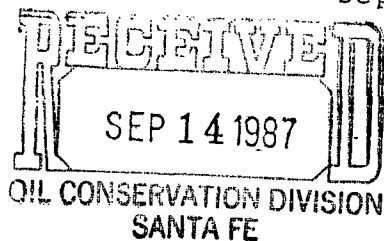
**WALSH**

ENGINEERING & PRODUCTION CORP.

Petroleum Engineering Consulting  
Lease Management  
Contract Pumping

3001 Northridge Drive  
P.O. Drawer 419  
Farmington, New Mexico 87401  
(505) 327-4892

September 10, 1987



*David B*

Mr. William J. LeMay  
Division Director  
Energy & Minerals Department  
Oil Conservation Commission  
P. O. Box 2088  
Santa Fe, New Mexico 87501

REF: Basin Disposal, Inc.  
Treatment of Disposal Pond  
with BIO-GENESIS  
September 10, 1987

Dear Mr. LeMay:

Enclosed you will find the report concerning the above-referred-to treatment.

Very truly yours,

Ewell N. Walsh, P.E.  
President

ENW:rr

cc: Frank Chavez, OCD, Aztec, N.M.

Basin Disposal, Inc.

Dr. Jordan Smith, Alpha Synetics, Chandler, AZ

Enclosure



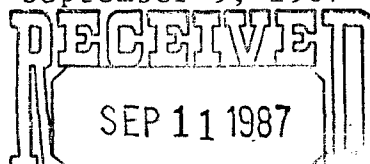
**WALSH**

ENGINEERING & PRODUCTION CORP.

Petroleum Engineering Consulting  
Lease Management  
Contract Pumping

3001 Northridge Drive  
P.O. Drawer 419  
Farmington, New Mexico 87401  
(505) 327-4892

September 9, 1987



OIL CONSERVATION DIVISION  
SANTA FE

*to: David B*

Mr. William J. LeMay  
Division Director  
Energy & Minerals Department  
Oil Conservation Commission  
P. O. Box 2088  
Santa Fe, New Mexico 87501

REF: Basin Disposal, Inc.  
Treatment of Disposal Pond  
with HUMA-Calcium  
September 4, 1987

Dear Mr. LeMay:

Enclosed you will find the report concerning the above-referred-to treatment.

Very truly yours,

Ewell N. Walsh, P.E.  
President

ENW:rr

cc: Frank Chavez, OCD, Aztec, N.M.

Basin Disposal, Inc.

Mr. John Dean

Dr. Jordon Smith, Alpha Synetics, Chandler, AZ

Enclosure



BASIN DISPOSAL, INC.

TREATMENT NO. 10

Treat disposal pond with 45 gallons HUMA-CALCIUM. Treatment applied to pond through spray system.

Overall Time - 3.63 Hours

Pond Water - 87,200 gallons

Proportion - 1 gallon per 1,940 gallons

Treatment applied to pond through all stations with spray system.





BASIN DISPOSAL, INC.

TREATMENT NO. 11

(207)

Treat disposal pond with 2 gallons BIO-GENESIS. Treatment applied to pond through spray system.

Overall Time	-	2.95 hours
Pond Water	-	70,800 gallons
Proportion	-	1 gallon per 3,540 gallons

Treatment applied to pond through all stations with spray system.

2. Lookover?

**WALSH**

ENGINEERING &amp; PRODUCTION CORP.

Petroleum Engineering Consulting

Lease Management

Contract Pumping

3001 Northridge Drive  
P.O. Drawer 419  
Farmington, New Mexico 87401  
(505) 327-4892September 9 1987  
SEP 11 1987

Mr. Roger Anderson  
Energy & Minerals Department  
Oil Conservation Commission  
P. O. Box 2088  
Santa Fe, New Mexico 87501

REF: Basin Disposal, Inc.  
Application for Proposed  
Salt Water Disposal Well

Dear Mr. Anderson:

The following is as per our telephone conversation of September 8, 1987.

Upon completion of the proposed disposal well, the well will be utilized as the primary method of disposing produced water.

The present facilities, at the Produced Water and Drilling Fluid Disposal Facility, will be utilized as:

1. Skimmer Facility

- A. Separation of hydrocarbons from incoming produced water.
- B. Separation of solids and trash from incoming produced water.
- C. Initial treatment, if necessary, of incoming produced water.

2. Disposal Pond

- A. Holding pond, prior to injection into proposed disposal well, for additional settling of solids in incoming produced water.
- B. Holding pond, prior to injection into proposed disposal well, for retention time for treatment, if necessary, of incoming produced water.
- C. Holding pond in the event that incoming produced water cannot be injected into proposed disposal well due to facilities for the disposal well not operating because of mechanical repairs or downhole treatments or repairs to the disposal well.



Page 2

Mr. Roger Anderson

As the above indicates, the proposed disposal well will be the Primary method utilized to dispose of produced water. The disposal pond will be utilized as a Secondary method of handling the incoming produced water until the water is disposed of in the proposed injection well.

If you have any additional questions, please do not hesitate to call upon me.

Very truly yours,

A handwritten signature in black ink, appearing to read 'Ewell N. Walsh', written in a cursive style.

Ewell N. Walsh, P.E.  
President

ENW:rr

cc: Basin Disposal, Inc.

Frank Chavez, OCD, Aztec, N.M.

Mr. John Dean

Mr. Perry Pierce, Montgomery Law Firm, Santa Fe, N.M.

33521  
330053

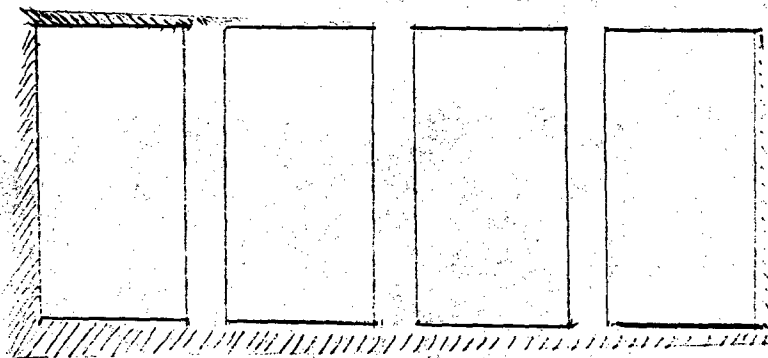
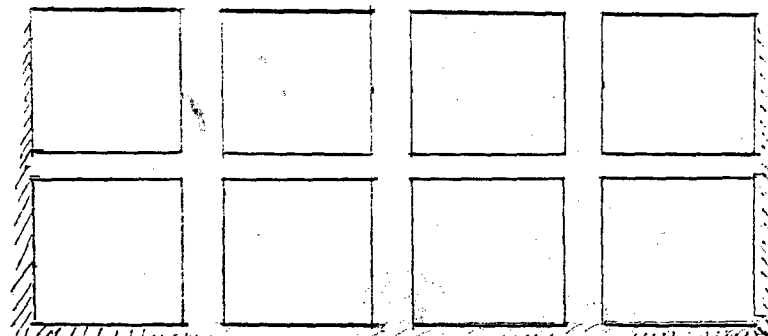
H<sub>2</sub>S Measurements (ppm)

9/3/87

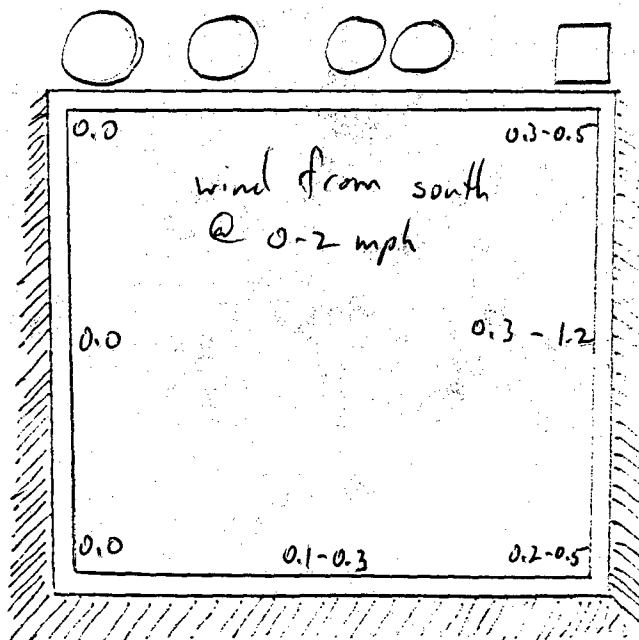
time = 1100

sprayers on

WQ



Trailer



RECEIVED

SEP 03 1987

September 2, 1987

AIR QUALITY BUREAU

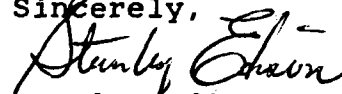
Bill Hargraves  
EID - Air Quality Bureau  
P.O. Box 968  
Santa Fe, NM 87504

Dear Mr. Hargraves:

Pursuant to your request enclosed are two copies of the Nageezi Chapter Resolution which was submitted to the Navajo Environmental Protection Administration. The first copy contains the official signatures from the Nageezi Chapter and the second copy is a retype of the original for better reading.

If you should require additional information or have any questions please contact me at 602/871-6631 or 6639.

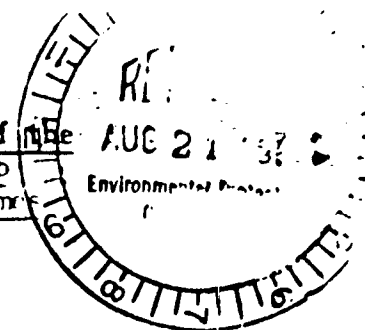
Sincerely,



Stanley Edison, ES I  
Navajo Air Quality Program  
Division of Resources

RESOLUTION OF THE NAGEEZI CHAPTER

Requesting the Department of Environmental Protection of the  
Navajo Tribe to Provide Assistance to Several Navajo  
Families Who are Confronted with Hydrogen Sulfide Fumes  
Coming From the Fume



WHEREAS:

1. The Nageezi Chapter is a certified Chapter of the Navajo Tribe;  
and
2. Five Navajo families purchased land between Bloomfield and  
Aztec, New Mexico, approximately five (5) miles north of Bloomfield towards  
Aztec, New Mexico; and
3. When these Navajo families moved into this area and made their  
homes, there was no such thing as waste disposal being dried in the  
surrounding area; and
4. Recently, the Oil and Gas company established gas and oil field  
waste disposal sites within 300 yards away from where the Navajo families  
live which has created problems for the families affected by the hydrogen  
sulfide fumes coming from the disposal site.

NOW THEREFORE BE IT RESOLVED THAT:

The Nageezi Chapter hereby respectfully requests the Department of  
Environmental Protection of the Navajo Tribe to do any and all things  
necessary and advisable to resolve the fumes from the hydrogen sulfide  
disposal that's causing human suffering immediately.

CERTIFICATION

We hereby certify that the foregoing resolution was duly considered  
by the Nageezi Chapter at a duly called meeting at Nageezi, Navajo Nation  
(New Mexico), at which a quorum was present and that same was passed by a  
vote of 34 in favor and 0 opposed, this 15th day of August 1987.

WITNESSES: Johnnie E. Paul, Chairman; SECCAD: Joe Kattison, Sr.

*[Signature]*  
Chapter President

*[Signature]*  
Chapter Vice President

*[Signature]*  
Chapter Secretary

CONCURRENCE:

*[Signature]*  
Henry Paul Hasuse, Council Delegate  
Nageezi Chapter

These are listing of the families that live on County Road 5042 near the Basin Disposal and that are affected by the Hydrogen Sulfide Fumes :

1. Lott L. Chatley and family (Cora L, wife and children: Farrell, Delauren, Velorse and Larral).
2. Lucy L. Large and Carolina Large.
3. Harold Pacheco and family (Bessie, wife and children: Darral, Julius, and Patrick).
4. Danny Harrison, Stanley and Velores King and Tony.
5. Margaret Harrison and son, Joe Harrison, Jr.

They are members of the Nageezi Chapter and have come to the Chapter for support and the attached papers are some information related to this.

RESOLUTION OF THE NAGEEZI CHAPTER

Requesting the Department of Environmental Protection of the  
Navajo Tribe to Provide Assistance to Several Navajo Families  
Who are Confronted with Hydrogen Sulfide Fumes Coming from the Pond

WHEREAS:

- and
1. The Nageezi Chapter is a certified Chapter of the Navajo Tribe;
  2. Five Navajo families purchased land between Bloomfield and Aztec, New Mexico, approximately five (5) miles north of Bloomfield towards Aztec, New Mexico.
  3. When these Navajo families moved into this area and made their homes, there was no such thing as waste disposal being dumped in the surrounding area; and
  4. Recently, the Oil and Gas Company established gas and oil field waste disposal sites within 300 yards away from where the Navajo families live which has created problems for the families affected by the hydrogen sulfide fumes coming from the disposal site.

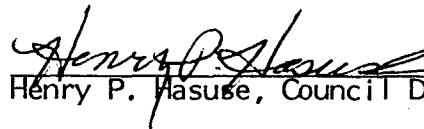
NOW THEREFORE BE IT RESOLVED THAT:

The Nageezi Chapter hereby respectfully requests the Department of Environmental Protection of the Navajo Tribe to do any and all things necessary and advisable to resolve the fumes from the hydrogen sulfide disposal that is causing human suffering immediately.

C E R T I F I C A T I O N

We hereby certify that the foregoing resolution was duly considered by the Nageezi Chapter at a duly called meeting at Nageezi, (Navajo Nation), New Mexico, at which a quorum was present and that same was passed by a vote of 36 in favor and 0 opposed, this 13th day of August, 1987.

CONCURRENCE:

  
Henry P. Masuse, Council Delegate

\_\_\_\_\_  
Chapter President

\_\_\_\_\_  
Chapter Vice-President

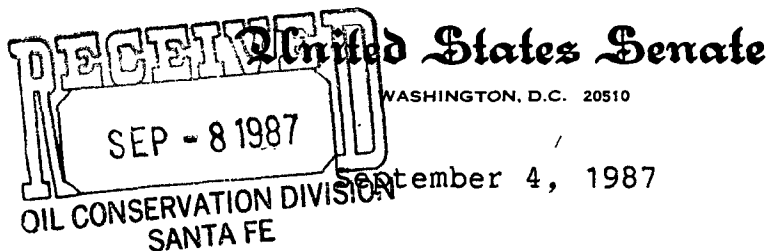
\_\_\_\_\_  
Chapter Secretary



These are the listing of the families that live on County Road 5042 near the Basin Disposal and that are affected by the Hydrogen Sulfide Fumes:

1. Larry L. Charley and family (Cora L., wife and children: Farrell, Delauren, Delorse, and Larrial)
2. Lucy L. Largo and Carolina Largo
3. Harold Pacheco and family (Bessie, wife and children: Darrial, Julis, and Darrick)
4. Danny Harrison, Stanley and Vinceen King and Toni
5. Margaret Harrison and son, Joe Harrison, Jr.

They are members of the Nageezi Chapter and have come to the Chapter for support and the attached papers are some information related to this.



Mr. David G. Boyer  
Environmental Bureau Chief  
Energy & Minerals Department  
Oil Conservation Division  
Post Office Box 2088  
Santa Fe, New Mexico 87501

Dear Dave:

Because of my desire to be responsive to all inquiries and communications directed to this office, and knowing that your objectives are similar in this regard, the attached communications are referred to you for consideration. I would very much appreciate your evaluating the information presented and taking whatever action is required to resolve the situation. At your earliest convenience, I would be grateful for your findings and views, in duplicate form.

I am also forwarding copies of the enclosed letters to Michael Burkhart at:

Environmental Improvement Division  
Post Office Box 968  
Santa Fe, New Mexico 87504-0968

Thank you in advance for your assistance in this matter. Please send your response to the attention of Richard Moore.

My warmest personal regards.

Sincerely,

Pete V. Domenici  
United States Senator

PVD/ram  
Enclosure

DEAR SENATOR PETE DOMENICI,

We've formed a group called PHEW (Peoples' Health and Environmental Welfare). We are writing to you as we have had no satisfaction from OCD or EID concerning the problems with Basin Disposal. As of August 2, 1987 the latest readings from OCD were 2.5 PPM for at least 8 hours which greatly exceeds EID's air quality standard of 0.01 PPM. Basin Disposal was shut down by OCD for approximately one week while the produced waters were being treated, but the fact remains that the H2S is still present and growing and is making us sick. Is someone going to have to die before something is done? At least 12 people in the Basin Disposal area has had to seek medical attention, such as family doctors, emergency hospital treatment and paramedics.

We are writing to you to request your assistance in dealing with state agencies of OCD and EID. Neither agency will accept full responsibility. This is not just our interpretation of the situation. In the enclosed newspaper article you will find both the EID and the OCD passing the buck to each other. We think immediate action should be taken to close the waste site until the levels are brought down to EID's air quality standards.

Thank you,

Bill Williams  
Terry G. Crawford  
Judy Crawford  
Pat Hargis  
Judy Stolz  
Terri Payne  
Joy McDaniel  
Kenneth Ramey, Jr.  
Traci Ramey

Executive Committee of PHEW

PHEW  
c/o Pat Hargis  
P. O. Box 1714  
Bloomfield, NM 87413

1987 AUG 24 PM 3:12

Jerry & Lenise Knutson  
P.O. Box 826  
Bloomfield, NM 87413  
August 18, 1987

U.S. Senator Pete Domenici  
4239 Dirksen Senate Office Bldg.  
Washington, D.C. 20510

Dear Senator Domenici:

We are very concerned about the Hydrogen Sulfide ( $H_2S$ ) air pollution and the chemical ground pollution being caused by the Oilfield Disposal Company, Basin Disposal, just North of Bloomfield, NM.

We live West of Highway 44 between Bloomfield and Basin Disposal, and the high concentrations of  $H_2S$  found in the air on the properties closest to Basin Disposal is very distressing. Also, the high incidence of illness among the people who live next to Basin Disposal is alarming. Several have had to call ambulances and paramedics.

I also live very close to an elementary school, where prior to the end of the school year, my son and other children I have spoken with, have stated that the smell was very strong at times at the school. This is a health hazard not only to my family and my neighbors, but all third and fourth grade children of Bloomfield and the surrounding areas.

The State Agencies that have been notified of the problems, Oil Conservation Division (OCD) and Environmental Improvement Division (EID) have been of little or no help in kidding our area of this hazardous problem. No one wants to claim jurisdiction in the case.

I urge you strongly to investigate this matter before lives are lost or irreversible damage is done to our health.

Thank you for your kind consideration.

Respectfully,  
Jerry & Denise Knutson

August 10, 1987

Dear Senator Domenici:

We are members of a family of Bloomfield, New Mexico. We have grown very concerned about a poisonous gas called hydrogen sulfide. The  $H_2S$  is coming from an oilfield waste dump called Basin Disposal Inc. It is owned by State Representative Jerry Sandel, D.C. Turner, and his son David Turner.

The waste dump was closed July 6 by the Oil Conservation Division when  $H_2S$  levels were too high. Three of our neighbors passed out because of the fumes, and all of us living near the dump have been affected. The waste water from unlined pits has also been leaking out into an arroyo outside the waste dump. This same arroyo runs into a larger arroyo which runs into Bloomfield.

Basin Disposal put us up in motels while the dump was being treated with chemicals. When the problem was supposedly eliminated, we returned to our homes and the Basin Disposal resumed business.

The problem has not been solved. The levels of  $H_2S$  are still too high and some of our symptoms still persist. We have contacted several agencies and no one wants to claim responsibility or get involved.

The Environmental Improvement Division claimed that they were too busy with the plague, and didn't know enough about  $H_2S$ , when first contacted. After about two months, the EID finally sent some people here to do a report. These people decided the levels of  $H_2S$  weren't high enough to be doing any damage to the residents living here. Of course they didn't measure the gas at night when the levels are highest. The State Office of Epidemiology also did a report on our symptoms. They tell us that if we wish to avoid symptoms from  $H_2S$ , we should avoid being around it whenever we smell it. Maybe they have forgotten that this is our home, and we were here before the waste dump. Yet we should leave whenever we smell it..

Another concern is the fact that hazardous waste dumps such as Basin Disposal can be put in residential areas without any knowledge or approval of people already living there. The county commission says there is nothing they can do unless this area is zoned. We moved to the country because we wanted country living, not zoning laws and rotten egg smell, especially when the smell is making us sick.

We realize that there is a great need for legal dumps for hazardous waste, but would you or your family want to live next to them? Hazardous waste dumps need to be built in secluded areas, or the oilfield waste can be injected back into non-productive wells.

As for Basin Disposal, we would like to see it completely closed down. This area is still growing and we wouldn't want to see any more families suffer because of  $H_2S$ . No matter what treatments the owners of the dump come up with, we would always be concerned that something else will go wrong, and maybe someone will die the next time.

We are asking you to help us close down Basin Disposal and put a stop to hazardous waste dumps in residential areas, whether they are zoned or not. Enclosed is some material on  $H_2S$ .

Thank You,

*Mr. and Mrs. Jerry W. Beal*  
Mr. and Mrs. Jerry W. Beal  
P.O. Box 2852  
Bloomfield, NM 87413

3. Saline catharsis, e.g., 15 to 30 gm. sodium sulfate with 6 to 8 oz. of water.
4. Avoid epinephrine and oil laxatives.
5. A rapidly acting barbiturate may aid in controlling convulsions, but care must be taken not to augment respiratory depression. See p. IV-30.
6. Oxygen therapy and artificial respiration may be necessary (p. IV-11 and 4).
7. Supportive measures (prophylactic and therapeutic) for possible hepatic injury. See pp. IV-48-52.
8. Since no specific antidotes are known, symptomatic therapy must be accompanied by complete rest.

**Laboratory:** Periodic examination for incipient liver injury (e.g., liver function tests).

#### References:

- CONNEY, A. H., R. M. WELCH, R. KUNTZMAN AND J. J. BURNS. Effects of pesticides on drug and steroid metabolism. *Clin. Pharmacol. Ther.* 8: 2-10 (1967).
- DAVIDOW, B. AND J. L. RADOMSKI. Isolation of an epoxide metabolite from fat tissues of dogs fed heptachlor. *J. Pharmacol. Exp. Ther.* 107: 259-265 (1953).
- DAVIDSON, B., J. L. RADOMSKI AND R. ELAY. Excretion of heptachlor epoxide in milk of a dairy cow fed heptachlor. *Science* 118: 383-384 (1953).
- LEHMAN, A. J. Chemicals in food. Part II. Pesticides. *Q. Bull. Assoc. Food Drug Officials* 15: 122-123 (1951).
- RADOMSKI, J. L. AND B. DAVIDOW. The metabolite of heptachlor, its estimation, storage, and toxicity. *J. Pharmacol. Exp. Ther.* 107: 266-272 (1953).
- VON OETTINGEN, W. F. The halogenated hydrocarbons, toxicity and potential dangers. U.S. Public Health Serv. Publ. No. 414 (1955).

### HYDROGEN SULFIDE

Hydrogen sulfide ( $H_2S$ ) is a colorless gas, heavier than air, possessing the odor of rotten eggs. It is a rapid and powerful systemic poison. It is generated in several industries, and is present in sewers and cesspools and among the products of putrefaction everywhere (Mitchell and Davenport, 1924). Moreover, it may be formed within the gastrointestinal tract after the ingestion of inorganic sulfide salts or elemental sulfur due to the actions of gastric acid and of colonic bacteria, respectively (Division of Industrial Hygiene, 1941). Barium and strontium sulfides have been used as depilatories. In large amounts calcium sulfide has been tried as a food preservative. Calcium polysulfide is sometimes employed as an agricultural insecticide and fungicide. Sodium sulfide has many industrial uses. Azide (see below) may produce similar systemic toxic effects.

**Toxicology of sulfide:** Vapor concentrations of  $H_2S$  as low as 0.005% (50 p.p.m.) in air may cause toxic symptoms, and 0.1 to 0.2% is usually fatal within a few minutes (Ahlborg, 1951; American Petroleum Institute, 1948; Manufacturing Chemists' Association, Inc., 1950; Smith and Gosselin, 1964). Because the body has an inherently large capacity for detoxifying sulfide (Haggard, 1925; Weber and Lendle, 1965), the toxicity of gas mixtures is more closely related to concentration than to length of exposure (O'Donoghue, 1961; Smith and Gosselin, 1964). Odor is not a dependable way to detect this gas because in dangerous concentrations it is said to produce a rapid paralysis of the olfactory nerve

endings (American Petroleum Institute, 1948). Susceptibility to hydrogen sulfide may vary among individuals, and it has been suggested that sensitivity may be increased by previous exposure (Ahlborg, 1951; American Petroleum Institute, 1948) although others deny that either tolerance or sensitivity can be acquired (Poda, 1966).

At low concentrations of hydrogen sulfide (e.g., 50-200 p.p.m.) the toxic symptoms are due to local tissue irritation rather than to systemic actions. The most characteristic effect is on the eye, where the superficial injury to the conjunctiva and cornea is known to workers in tunnels, caissons and sewers as "gas eye." This keratoconjunctivitis is manifested after several hours or days of exposure as a scratchy, irritated sensation with tearing or burning. Recovery is almost always complete and spontaneous unless secondary infection occurs (Grant, 1972).

More prolonged or intensive exposures may lead to involvement of the respiratory tract with cough, dyspnea and perhaps pulmonary edema (Haggard, 1925). Evidence of severe pulmonary edema has been found at autopsy and in survivors of massive respiratory exposures (Adelson and Sunshine, 1966; Breysse, 1961; Kemper, 1966; Kleinfeld *et al.*, 1964; Simson and Simpson, 1971; Winek *et al.*, 1968), but pulmonary involvement does not appear to be a regular feature of even intensive exposure to this gas (Ahlborg, 1951; Mulby, 1962). Except for those cases with lung edema, the tissue pathology in victims of  $H_2S$  poisoning may be limited to



petechial hemorrhages and congestion of brain and lungs, greyish-green cyanosis, and green to purple discoloration of blood, viscera and cerebral cortex (Adelson and Sunshine, 1966; Bryesse, 1961; Freireich, 1946; Simson and Simpson, 1971).

Soluble salts of sulfides are alkaline, and sodium sulfide may produce caustic burns (see also LYE, p. III-206). Sodium and other soluble sulfides are promptly and completely hydrolyzed in body fluids (Haggard, 1921) so that in terms of their systemic effects no toxicological distinctions are recognized between them and hydrogen sulfide. Several reported cases of intoxication by commercial products containing barium sulfide suggest prominent contributions of sulfide to the intoxication, although concomitant barium poisoning cannot be ruled out (Gould *et al.*, 1973; Jobba and Rengei, 1971).

The first acid dissociation constant of hydrogen sulfide is about  $10^{-7}$  M so that in body fluids dissociated and undissociated hydrogen sulfide exist in about equal proportions. The undissociated acid, however, penetrates biological membranes more rapidly than the hydrosulfide ( $\text{HS}^-$ ) anion (Beerman, 1924). Indeed, under appropriate circumstances hydrogen sulfide can penetrate the intact skin to produce signs of systemic intoxication (Walton and Witherspoon, 1925). Systemic poisonings in workers wearing protective masks have been traced to perforated ear drums (Poda, 1966). Several deaths have followed the application of ammonium sulfide permanent wave solutions (Bunce *et al.*, 1941; Laug and Draize, 1942), and systemic poisonings are said to have resulted from the cutaneous application of salves containing elemental sulfur (Basch, 1926).

Evidence has been obtained for the presence of a sulfide oxidase in mammalian liver (Baxter and Van Reen, 1958a; Sörbo, 1960), but important nonenzymatic mechanisms for sulfide detoxication are also recognized. Sulfide tends to undergo spontaneous oxidation to nontoxic products such as polysulfides, thiosulfate or sulfate, and these reactions are catalyzed by heavy metals particularly in the presence of protein (Baxter and Van Reen, 1958b; Denis and Reed, 1927). A reaction with endogenous disulfide bonds may constitute an important detoxication mechanism, and a potential antidotal approach is the administration of oxidized glutathione (Smith and Abbanat, 1966). Apparently by complex formation, cobaltous chloride also significantly protects mice against death by sulfide or cyanide (Smith, 1969). Finally, excretion by the lungs may also play a significant role in decreasing hydrogen sulfide

toxicity in nonrespiratory exposures (Atkinson and Fitzpatrick, 1911-12).

Sulfide and cyanide produce similar effects on the chemoreceptors of the carotid body and are about equipotent in producing respiratory stimulation. In addition to increasing ventilation, small parenteral doses of sulfide in laboratory animals produce a fleeting rise followed by a profound (perhaps irreversible) fall in blood pressure. Death, however, is invariably a result of central respiratory paralysis (Haggard *et al.*, 1922; Heymans *et al.*, 1932; Owen and Gesell, 1931; Winder and Winder, 1933). The latter process may be accelerated in respiratory exposures because of the initial stimulation of breathing mediated through the carotid body (Yant, 1930). There are also at least two reports of myocardial involvement, one of them with persistent atrial fibrillation (cited in Simson and Simpson, 1971).

Humans exposed to high concentrations of hydrogen sulfide experience headache, nausea, dizziness, confusion and weakness of the extremities, followed by a precipitous lapse into unconsciousness. Because sulfide is so rapidly detoxified in the body, any decrease in the exposure intensity may result in a rapid and spontaneous revival. Thus, highly labile states of consciousness have characterized many poisoning episodes (Adelson and Sunshine, 1966; Ahlborg, 1951; Freireich, 1946; Kleinfeld *et al.*, 1964; McCabe and Clayton, 1952; Milby, 1962; Poda, 1966). If the exposure is sufficiently intense and sustained, victims rapidly become apneic and exhibit anoxic convulsions, perhaps with opisthotonos and risus sardonicus (Hurwitz and Taylor, 1954; Kemper, 1966).

Survivors of acute toxic episodes sometimes show neurologic sequelae such as amnesia, intention tremor, neurasthenia, disturbance of equilibrium or more serious brain stem and cortical damage (Ahlborg, 1951; Aufdermaur and Tonz, 1970; Hurwitz and Taylor, 1954; Kemper, 1966; McCabe and Clayton, 1952; Poda, 1966; Zeyer, 1955), but complete recovery is the general rule (Kleinfeld *et al.*, 1964). No truly cumulative effects are recognized (Manufacturing Chemists Assoc., Inc., 1950), but adequate precedents exist to predict that recurrent, acute but mild exposures may summate in terms of hypoxic tissue damage to produce neurologic deficits like those occurring in survivors of other severe asphyxiant poisonings (see also CARBON MONOXIDE, p. III-86 and CYANIDE, p. III-105).

The toxicity of hydrogen sulfide, its speed of action, the clinical picture of intoxications, its potentiation by other asphyxiants (Hofer, 1926), together with certain enzymatic studies

(Slater, 1950), all suggest that the hydrosulfide anion, like cyanide, produces its major toxic effects through inhibition of cytochrome oxidase. Furthermore, hydrosulfide also forms stable complexes with heme-type porphyrinic structures when the iron is in the trivalent state. Thus animals can be protected against sulfide poisoning by the prior induction of methemoglobinemia (Smith and Gosselin, 1964). Injections of sodium nitrite similarly antidoted sulfide poisoning as demonstrated in mice (Scheler and Kabisch, 1963). The mechanism of these effects is attributed to a competition for free sulfide between tissue cytochrome oxidase and circulating methemoglobin, the latter binding sulfide in an inactive form and slowly releasing it to endogenous detoxication processes (Scheler and Kabisch, 1963; Smith and Gosselin, 1964).

The ferric heme groups of methemoglobin bind hydrosulfide less tenaciously than cyanide (Smith and Gosselin, 1966). In mice with a 33% methemoglobinemia, the  $LD_{50}$  of cyanide is 3.3 times greater than in normal mice, whereas the  $LD_{50}$  of sulfide is 2.4 times greater (Smith and Gosselin, 1966; Smith, 1967). Because methemoglobinemia is effective prophylactically and therapeutically in experimental sulfide poisoning, its induction deserves a clinical trial (Smith and Gosselin, 1964, 1966).

Although artificial respiration and oxygen therapy probably should not be neglected as therapeutic adjuncts, significant protective or antidotal effects of oxygen have not been demonstrated. Sulfhemoglobin (in contrast to the complex above called sulfmethemoglobin) has never been encountered in those who survived hydrogen sulfide poisoning, but its post-mortem formation is probably responsible for

sulfide or cyanide is direct vasodilatation. In this respect it is said to be more potent than sodium nitrite (Graham, 1949).

Workers exposed for many years to azide salts exhibited no pathological signs, although many had experienced episodes with rapid and severe falls in both systolic and diastolic blood pressure with associated headache (Graham *et al.*, 1948). An adult laboratory technician who accidentally swallowed 150 mg. of sodium azide in aqueous solution experienced breathlessness and tachycardia within 5 minutes. Nausea, vomiting, headache, restlessness and diarrhea ensued within 15 minutes. Later polydipsia, ECG changes and leukocytosis occurred. Complete recovery required more than 10 days (Burger and Bauer, 1965). "Several grams" produced collapse and death within 40 minutes in another adult. Pathologic findings were limited to swelling of the brain and lungs and mild fatty degeneration of liver (Kozlicka-Gajdzinska and Brzyski, 1966). In a single clinical case of acute azide poisoning, nitrite-induced methemoglobinemia had no discernible beneficial effect (personal communication, E. A. Emmett, 1972).

#### Symptomatology:

##### A. Subacute poisoning

###### 1. Irritant actions.

**Eyes:** painful conjunctivitis, photophobia, lacrimation, and corneal opacity.

**Respiratory tract:** rhinitis with anosmia, tracheobronchitis with pain and cough, pulmonary edema with dyspnea, sometimes late bronchopneumonia.

**Skin:** direct contact (as a solution) may produce erythema and pain.

**2. Gastrointestinal effects:** profuse salivation, nausea, vomiting, diarrhea.

**3. Central nervous effects:** giddiness, headache, vertigo, amnesia, confusion, and unconsciousness.

**4. Miscellaneous:** tachypnea, palpitations, tachycardia, arrhythmia, sweating, weakness, and muscle cramps.

##### B. Acute poisoning

**1. Sudden collapse and unconsciousness,** with or without a warning cry.

**2. Death from prompt respiratory paralysis,** usually with a terminal asphyxial convulsion.

**3. After sublethal exposures recovery is** usually slow; the patient may have a residual cough, cardiac dilatation, slow pulse, peripheral neuritis, albuminuria.

**Toxicology of azide:** Methemoglobinemia also confers in experimental animals a slight degree of protection against poisoning by sodium azide (Abbanat and Smith, 1964; but see below). As with cyanide each ferric heme group can trap one azide ion, but the latter is bound 700 times less tightly than cyanide (Smith and Gosselin, 1966). In other respects azide salts and hydrazoic acid are similar to cyanide and sulfide: in each case the acid is volatile; azide stimulates carotid body chemoreceptors (Anichkov and Belen'kii, 1963); and azide inhibits heme type enzymes such as catalase, peroxidase and cytochrome oxidase (Keilin (1936-37)). Azide and sulfide are about equitoxic on a molar basis (Smith and Gosselin, 1966), and in large doses both produce apnea, convulsions and sudden death (Graham, 1949). A unique action of azide not shared by either

and some degree of amblyopia or of psychic disturbance. Recovery is eventually complete in most nonfatal cases.

#### Treatment:

1. Remove immediately to fresh air. Keep at rest and comfortably warm.
2. If respirations are depressed, artificial respiration without interruption until normal breathing is restored. See p. IV-4.
3. Administer oxygen (p. IV-11) and continue even after spontaneous breathing is established. If pulmonary edema ensues, see p. IV-12.
4. In severe poisonings treat with amyl nitrite and sodium nitrite as for cyanide poisoning (p. III-108), but omit sodium thiosulfate injection. This therapy has had no clinical trials in sulfide poisoning, but is effective in animals.
5. Atropine sulfate (0.0006 gm. intramuscularly) may contribute some symptomatic relief.
6. Conjunctivitis may be relieved by the instillation of 1 drop of olive oil in each eye and sometimes by 3 to 4 drops of epinephrine solution (1:1000) at frequent intervals (e.g., 5 minutes). Occasionally local anesthetics and hot or cold compresses are necessary to control the pain.
7. Antibiotics at the first hint of pulmonary infection. See pp. IV-70.

**Laboratory:** Urine may contain albumin, casts, and a few red blood cells. No simple chemical test is diagnostic of poisoning by hydrogen sulfide, but the odor is sometimes recognizable in the victim's breath. The presence of  $H_2S$  in air can be detected by lead-acetate test paper.

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19 Road 5219  
Bloomfield, N. M.  
Aug. 17, 1981-81413

1987 AUG 21 AM 9 41

Senator Pete Domenici  
4239 Dirksen Senate Office Bldg.  
Washington, D.C. 20510

Dear Senator Domenici:

I write you because I think  
you are on a Senate Committee  
that will be concerned  
about the following problem:

Two disposal services have  
been started very near the  
town limits of Bloomfield:  
Environmental Maintenance Services  
and Basin Disposal. Neither should  
have been permitted in the  
residential areas. Environmental  
services is a quarter of a  
mile from homes and  
businesses. This are nuisance

health hazard up to a mile away. Ammonia fumes burn the eyes as one drives past on New Mexico 44. Basin Rippool is a quarter of a mile from homes and less than a mile from a school and several churches. Here the fumes of hydrogen sulfide are so toxic that it is a danger to just drive past, much less live there.

Both drain into washes that drain directly into the San Juan River, not more than a mile away. At this point the problem becomes a federal problem. In fact the oil well wastes are mostly generated on federal lands. A year ago the Bureau of Land Management closed all disposal sites forcing any sort of disposal onto

cleared lands, of which  
San Juan County has little.  
It is impossible to buy  
much land that is not  
in residential development;  
because federal lands reach  
the outskirts of all of  
the towns in the county.

Some sort of disposal sites  
need to be provided away  
from the towns.

Yours truly

Neda H. Grunby

3 clippings enclosed

# Basin Disposal May Treat Site Further

By Times Staff Writer

Basin Disposal Inc. may undergo another treatment process to try and alleviate problems of hydrogen sulfide gas coming from the gas and oil field waste dump.

Representatives of the Environmental Improvement Division and the Oil Conservation Division toured the dump Thursday. Area OCD representative Frank Chavez said this morning that it may be possible to stop the gas fumes by adding a "bactericide" to the facility's waste water holding pond. The holding pond had previously been treated with a chemical "bleach," a \$60,000 process that appears to have been unsuccessful. However, the level of hydrogen sulfide fumes coming from the pond are much lower now than before the treatment, according to Chavez.

The EID sent four representatives from its Santa Fe offices of epidemiology, ground water, air quality and hazardous waste to Basin Disposal Thursday. "We had been asking the EID from the beginning to become involved," said

Chavez. "Because a lot of it (problems at the dump) was out of our area of expertise and legislative mandate."

Although the EID has now taken a more active role in investigating complaints of hydrogen sulfide fumes coming from the dump, the EID will be acting only in an advisory capacity to the OCD, according to EID officials.

"The primary responsibility still rests with the OCD," said Dr. Millicent Eidson, an environmental epidemiologist with the EID's epidemiology office. "We are working in a consultative capacity to the OCD."

Dr. Millicent was among the state officials who visited Basin Disposal Thursday. "We did not find any high levels of hydrogen sulfide in the air while we were there," she said. The doctor said she distributed survey forms to people living in the area of the dump asking them to record "what kind of symptoms they've been suffering from."

ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

September 4, 1987



GARREY CARRUTHERS  
GOVERNOR

POST OFFICE BOX 2088  
STATE LAND OFFICE BUILDING  
SANTA FE, NEW MEXICO 87501  
(505) 827-5800

Carpenter and Goldberg, P.A.  
1600 University Blvd. N.E.  
Suite B  
Albuquerque, New Mexico 87102-2124

Re: Examiner Hearing, September 23, 1987  
Case No. 9220, Basin Disposal, Inc.

Dear Mr. Goldberg:

We are in receipt of your letter dated September 2, 1987 whereby you have requested that the subject case be heard by the Division at a location in Farmington, Bloomfield, or Aztec, New Mexico. It is our understanding that such a location change would be more convenient to your clients and would enable more of them to attend the hearing in order to express their views and concerns. We understand and appreciate your concern, however, it has been the policy of the Division for many years now to conduct hearings in Santa Fe for several reasons, among them being the central statewide location of Santa Fe, and the fact that the hearing staff, engineering and legal bureaus are located in Santa Fe. In addition, granting your request would require that the Division also grant any future requests for hearing location changes which would be impractical for the Division and would be very difficult to implement in view of current budget restraints. For these reasons, we cannot grant your request.

I would like to further address at this time some concerns the Division has regarding the subject hearing. The application of Basin Disposal, Inc. is for authorization to construct and operate a salt water disposal well. While the Division understands that much of the public concern stems from problems arising from the surface disposal pits at the site, this particular case will be limited to testimony by the applicant and by the opposition that deals solely with the disposal well itself, as any testimony regarding the surface pits are beyond the scope of the hearing.

If you should have further questions or concerns, please contact myself or Mr. Jeff Taylor in our Santa Fe office.



Sincerely,

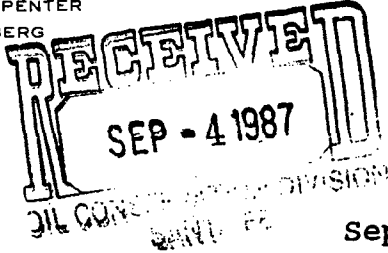
William J. LeMay  
Director

Carpenter and Goldberg, P. A.

*Accidental Injury, Product Liability and Commercial Litigation*

WILLIAM H. CARPENTER  
JOSEPH GOLDBERG  
DAYMON B. ELY

1600 UNIVERSITY BLVD., N. E., SUITE B  
ALBUQUERQUE, NEW MEXICO 87102-2124  
(505) 243-1336



September 2, 1987

Mr. William J. Lemay, Director  
Oil Conservation Division  
P.O. Box 2088  
Santa Fe, New Mexico 87504

Re: Injection Well Application of Basin Disposal Inc.

Dear Mr. Lemay:

This office represents a large number of landowners and their families who live adjacent to or in the vicinity of the existing produced water disposal pits operated by Basin Disposal outside Bloomfield, New Mexico. We have noted Basin Disposal's application for a permit to construct an injection well on the site. My understanding is that the Oil Conservation Division has scheduled a hearing on this application, to be held in Santa Fe, New Mexico, on September 23, 1987.

The permit application proposes to put an injection well right in the middle of an area where a large number of families reside, some of whom have residences within 300 feet of the disposal site. The adjoining landowners have an intense concern about the health and safety effects on them and their families of Basin Disposal's application, as well as the effect on the value of the land surrounding the proposed disposal site. These concerns are heightened by the substantial and sustained adverse health effects arising from Basin Disposal's operation of the open air pits that presently exist on the site. OCD is well aware of those concerns. In addition, I am well aware that many others in the community, both in Bloomfield and in Aztec are quite concerned about the existing disposal pits, as well as Basin Disposal's application for a well permit. The great majority of my clients, as well as the people in the community, are working men and women who cannot afford to take a full day's work off to travel to Santa Fe in order to make their views known at the permit hearing. Holding this hearing in Santa Fe, in my estimation, effectively forecloses my clients, as well as others in the community, from having their views presented to and considered by OCD.

Mr. William J. Lemay  
Page Two  
September 2, 1987

In light of the circumstances surrounding Basin Disposal's application for an injection well permit, as well as the continuing problems arising from the operation of the open air pits, I request that OCD reschedule the hearing on Basin Disposal's permit application to a location in Farmington or Aztec or Bloomfield, so that my clients and the citizens in these communities may have their views effectively presented to OCD on this permit application.

I appreciate your consideration in this matter and I look forward to an early response from you on this request.

Very truly yours,

CARPENTER & GOLDBERG, P.A.

  
Joseph Goldberg

JG:ck

cc: John A. Dean, Jr., Esq.  
Edmund H. Kendrick, Esq.  
Deborah H. Mande, Esq.  
F. Chester Miller III, Esq.  
Jeffrey S. Taylor, Esq.



STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

GARREY CARRUTHERS  
GOVERNOR

POST OFFICE BOX 2088  
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SANTA FE, NEW MEXICO 87504  
(505) 827-5800

September 3, 1987

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

Basin Disposal, Inc.  
c/o Walsh Engineering  
P.O. Drawer 419  
Farmington, NM 87401

RE: Produced Water and Drilling Fluid Disposal  
Facility, San Juan County, New Mexico.

Dear Mr. Walsh:

The OCD has received your request, dated August 21, 1987, to increase the maximum approved water level in the lined evaporation pond located in Units E and F, Section 3, Township 29 North, Range 11 West, San Juan County, New Mexico. Approval for a still-water elevation of 5721 feet is hereby denied. All stipulations in the November 27, 1985 correspondence on maximum pond levels remain in effect.

Additional requests were made by you, as representative of Basin Disposal, Inc., for extension of the September 15, 1987 deadline for submission of an H<sub>2</sub>S contingency plan and for additional time to remove free fluids from the unlined upper mud pits.

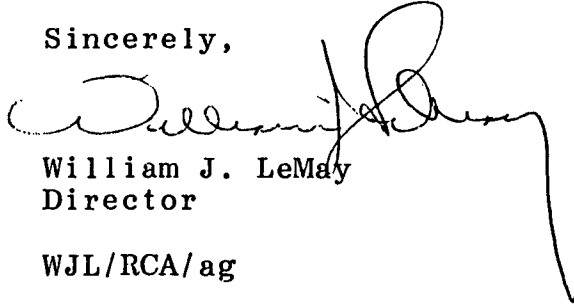
An extension to September 30, 1987 for the submission of an H<sub>2</sub>S contingency plan is hereby approved. The extension will allow a more thorough evaluation and inclusion in the plan of the current method of treating the pond.

Your proposed deadline of October 31, 1987 for the complete removal of all free fluids from the unlined pits is hereby approved. The additional time will prevent a decrease in the effectiveness of the pond treatment by allowing stabilization of the pond prior to the addition of the mud pit waters. By the October 31, 1987 deadline, all waters from the mud pits that are not disposed of elsewhere will be contained in a plastic lined pit. Prior to the use of the plastic lining, the Aztec District Supervisor must approve the lining and its installation.

Page 2  
Basin Disposal, Inc.

If you have any questions or comments, contact Roger  
Anderson at (505) 827-5885.

Sincerely,

A handwritten signature in dark ink, appearing to read 'William J. LeMay', with a long, sweeping horizontal stroke extending to the right.

William J. LeMay  
Director

WJL/RCA/ag

cc: OCD - Aztec  
Barbara Hargis - EID  
Ron Conrad - EID  
Johnson & Goldberg - Albuquerque



STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

GARREY CARRUTHERS  
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MEMORANDUM

TO: William J. LeMay, Director OCD

THROUGH: David Boyer, Environmental Bureau Chief, OCD *DB*

FROM: Roger Anderson and William Olson, Environmental Bureau Staff *RA WO*

SUBJECT: H<sub>2</sub>S Emissions at Basin Disposal, Inc. North of Bloomfield, N.M.

DATE: ~~August~~ *September* 3, 1987 *AB*

The following is a summary of the work performed by the OCD Environmental Bureau and actions taken by Basin Disposal, Inc. thru July 30, 1987 to alleviate H<sub>2</sub>S emissions from the lined evaporation pit operated by Basin Disposal, Inc.

- 5/22/87 Complaint from Tim & Terry Payne concerning spray from Basin Disposal. Complaint states oil is floating on horse trough and kids' swimming pool. Complaint was discussed with Red Walsh of Basin Disposal.
- 6/01/87 Complaint from Ms. DeHerrera concerning odor from disposal pond. Strong sewage smell causes headaches and is so bad they can't open windows.
- 6/01/87 Complaint from Tim & Terry Payne concerning odors from the evaporation pond. Family is complaining of headaches and nausea. Teenage son became ill while inside house the night of 5/30/87.
- 6/02/87 Investigation initiated into the source and composition of odor. On arrival at the facility, measurements for the presence of H<sub>2</sub>S 6/04/87 were conducted utilizing a Drager tube. Concentrations in a confined space after shaking a water sample indicated a potential of 200+ppm. Following the initial tests the complainants were interviewed to ascertain the exact nature of their complaints. Following the interviews, an H<sub>2</sub>S meter was borrowed from EPNG. Concentration readings were obtained at various points on and around the facility. All readings are documented in the file. Maximum readings obtained were 50+ppm at the south fence line.

While taking readings in the vicinity of the mud ponds, salt deposits were observed on the sides of berms and in the arroyo south of the facility. Investigation into the source of the salts discovered water in the arroyo down-gradient of the mud ponds but no water upgradient. Black zones were also seen in the arroyo. It was concluded the mud ponds are seeping.

6/08/87      OCD letter to Basin Disposal summarizing the OCD conclusions from the 6/02/87 investigation and placing the following restrictions on the facility:

1.    Shut down of the spray system until the H<sub>2</sub>S levels reach a safe level.
2.    Requirement to comply with OCD Rule 118 (H<sub>2</sub>S).
3.    Maintenance of the one and one-half feet free board.
4.    The closure of the mud pits to all fluids except muds and cuttings. Submittal of a schedule for the removal of all free fluids .
5.    No receipts to the facility when operator is not present.
6.    Requirement to comply with OCD Rule 312 (Treating Plant).

6/11/87      Complaint from Mr. Crawford about the odor and contamination of the arroyo south of the mud pits. He took samples of the contamination.

6/11/87      Problem solving and analysis undertaken to obtain  
to            solution to H<sub>2</sub>S emissions.  
6/16/87

6/17/87      OCD receives copy of residents' petition against Basin Disposal.

6/17/87      OCD measurement of H<sub>2</sub>S levels using Gas Tech HS-82 meter borrowed from Amoco. Levels of 0.2 to 0.4 ppm at residences after odor complaints were received.

6/18/87      Complaint from Mr. Rainey about "sour smell" coming from pit. He said he didn't notice the smell until the petition that is circulating came to his attention. Since then he has noticed the odor and occasional headaches. They have a 2-month old baby with a heat rash and wondered if it was due to the disposal pond.

- 6/19/87 Augered holes West and North of facility to determine extent of ground contamination, from mud pits. Remeasured  $H_2S$  levels around pond with sprayers on.
- 6/19/87 Letter to Basin Disposal barring the mudpits from receiving any substances and issuing deadlines for removing all fluids from the unlined pits.
- 6/22/87 Received copy of letter from Jerry Sandel to Rep. Bill Richardson commenting on petition sent to Richardson's office.
- 7/01/87 OCD measurements of  $H_2S$  levels and observation of first bleach treatment. 540 gallons of 10%  $NaClO$  added to pond. Little to no effect noticed. Conclusion was that not enough bleach was used.
- 7/03/87 Additional treatment of pond with 2916 gallons 10%  $NaClO$ . Initial report from field office was that the treatment worked .
- 7/06/87 Increased complaints - San Juan County Fire Marshal measurements using Drager tubes were 2 to 5 ppm at the Hargis residence and 10 ppm at the Payne residence obtained by another fireman. Readings were obtained by OCD in phone conversation with Fire Marshal on 7/08/87.
- 7/07/87 - Phone conversation with Basin Disposal concerning elevated concentrations of  $H_2S$ . Closed facility from receipt of incoming loads.
- Enforcement letter to Basin Disposal requiring immediate action to reduce the  $H_2S$  concentrations to a safe level or to evacuate the residents.
  - Basin Disposal treats pond with 8200 lbs.  $NaOH$  at the request of the OCD. Raising the pH will convert the  $H_2S$  to  $HS^-$  and remain in solution until a method to remove is found.
- 7/08/87 Basin treats pond with an additional 24,200 lbs.  $NaOH$ . Started offering residents alternate housing until problem is solved. Raising the pH is having little effect.
- 7/09/87 Basin circulates pond for 11 hours (628,000gal.) to attempt to obtain uniform mixing of the  $NaOH$ .



7/08/87     OCD observed the addition of NaOH and circulation of pond. Numerous to complaints received during and after operations. H<sub>2</sub>S emissions 7/10/87 lowered initially but did not remain low.

7/10/87     OCD request that EID Epidemiology interview residents to document possible health effects. Epidemiology said it would be impossible to establish a cause and effect relationship without a control group and very little is known about low level H<sub>2</sub>S exposure.

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7/17/87     treatment.

7/16/87     Basin treats pond with 16,200 gal 10% NaClO injected into 551,000 gal. of pond water. Treatment lowered the H<sub>2</sub>S levels. Dissolved H<sub>2</sub>S concentration in pond reached zero. Treatment lasted approx. one week when H<sub>2</sub>S levels began increasing again.

7/27/87     Contact from EID Epidemiology requesting update. OCD informed that residents have retained Joe Goldberg, former HED Secretary, as attorney.

7/30/87     OCD accompanies EID on fact finding tour of Basin Disposal.



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Petroleum Engineering Consulting  
Lease Management  
Contract Pumping

3001 Northridge Drive  
P.O. Drawer 419  
Farmington, New Mexico 87401  
(505) 327-4892

September 2, 1987

CERTIFIED-RETURN RECEIPT

Mr. Allen Alexander  
District Land Manager  
Meridian Oil, Inc.  
P. O. Box 4289  
Farmington, New Mexico 87499

REF: Basin Disposal, Inc.  
Application for Proposed  
Salt Water Disposal Well

Dear Mr. Alexander:

This is to advise you that the Energy and Minerals Department,  
Oil Conservation Commission of the State of New Mexico has set an  
Examiner Hearing date for the above-referred-to application.

The Examiner Hearing will be held as follows:

Date: September 23, 1987  
Time: 8:15 AM  
Place: Room 205  
State Land Office Building  
Santa Fe, New Mexico

If you have any questions, please do not hesitate to call me.

Very truly yours,

Ewell N. Walsh, P.E.  
President

ENW:rr

cc: William J. LeMay, OCD, Santa Fe, N.M.  
Frank Chavez, OCD, Aztec, N.M.  
Basin Disposal, Inc.  
Perry Pierce, Montgomery Law Firm, Santa Fe, N.M.

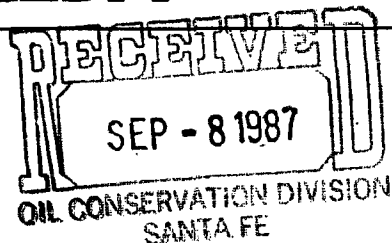


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Farmington, New Mexico 87401  
(505) 327-4892



September 2, 1987

*TO  
David B.*

Mr. William J. LeMay  
Division Director  
Energy & Minerals Department  
Oil Conservation Division  
P. O. Box 2088  
Santa Fe, New Mexico 87501

REF: Basin Disposal, Inc.  
Treatment of Disposal Pond  
with BIO-GENESIS  
September 2, 1987

Dear Mr. LeMay:

Enclosed you will find the report concerning the above-referred-to treatment.

Very truly yours,

Ewell N. Walsh, P.E.  
President

ENW:rr

cc: Frank Chavez, OCD, Aztec, N.M.

Basin Disposal, Inc.

Mr. John Dean

Dr. Jordan Smith, Alpha Synetics, Chandler, Az.

Enclosure



BASIN DISPOSAL, INC.

TREATMENT NO. 9

9/2/87

Treat disposal pond with 50 gallons BIO-GENESIS. Treatment applied to pond by circulating through spray system.

Overall Time - 3.84 hours

Pond Water - 92,400 gallons

Proportion - 1 gallon per 1,850 gallons

Treatment applied to pond through same stations as Treatment No. 8.

25 gallons in deeper portion of pond

15 gallons in shallower portion of pond

Commence spraying after treatment completed.



STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

GARREY CARRUTHERS  
GOVERNOR

POST OFFICE BOX 2088  
STATE LAND OFFICE BUILDING  
SANTA FE, NEW MEXICO 87504  
(505) 827-5800

MEMORANDUM

TO: William J. LeMay, Director OCD

THROUGH: David Boyer, Environmental Bureau Chief, OCD *AYB*

FROM: Roger Anderson and William Olson, Environmental Bureau Staff *RA WO*

SUBJECT: H<sub>2</sub>S Emissions at Basin Disposal, Inc. North of Bloomfield, N.M.

DATE: August 3, 1987

The following is a summary of the work performed by the OCD Environmental Bureau and actions taken by Basin Disposal, Inc. thru July 30, 1987 to alleviate H<sub>2</sub>S emissions from the lined evaporation pit operated by Basin Disposal, Inc.

- 5/22/87 Complaint from Tim & Terry Payne concerning spray from Basin Disposal. Complaint states oil is floating on horse trough and kids' swimming pool. Complaint was discussed with Red Walsh of Basin Disposal.
- 6/01/87 Complaint from Ms. DeHerrera concerning odor from disposal pond. Strong sewage smell causes headaches and is so bad they can't open windows.
- 6/01/87 Complaint from Tim & Terry Payne concerning odors from the evaporation pond. Family is complaining of headaches and nausea. Teenage son became ill while inside house the night of 5/30/87.
- 6/02/87 Investigation initiated into the source and composition of odor. On arrival at the facility, measurements for the presence of H<sub>2</sub>S 6/04/87 were conducted utilizing a Drager tube. Concentrations in a confined space after shaking a water sample indicated a potential of 200+ppm. Following the initial tests the complainants were interviewed to ascertain the exact nature of their complaints. Following the interviews, an H<sub>2</sub>S meter was borrowed from EPNG. Concentration readings were obtained at various points on and around the facility. All readings are documented in the file. Maximum readings obtained were 50+ppm at the south fence line.

While taking readings in the vicinity of the mud ponds, salt deposits were observed on the sides of berms and in the arroyo south of the facility. Investigation into the source of the salts discovered water in the arroyo down-gradient of the mud ponds but no water upgradient. Black zones were also seen in the arroyo. It was concluded the mud ponds are seeping.

6/08/87     OCD letter to Basin Disposal summarizing the OCD conclusions from the 6/02/87 investigation and placing the following restrictions on the facility:

1.     Shut down of the spray system until the H<sub>2</sub>S levels reach a safe level.
2.     Requirement to comply with OCD Rule 118 (H<sub>2</sub>S).
3.     Maintenance of the one and one-half feet free board.
4.     The closure of the mud pits to all fluids except muds and cuttings. Submittal of a schedule for the removal of all free fluids .
5.     No receipts to the facility when operator is not present.
6.     Requirement to comply with OCD Rule 312 (Treating Plant).

6/11/87     Complaint from Mr. Crawford about the odor and contamination of the arroyo south of the mud pits. He took samples of the contamination.

6/11/87     Problem solving and analysis undertaken to obtain  
to  
6/16/87     solution to H<sub>2</sub>S emissions.

6/17/87     OCD receives copy of residents' petition against Basin Disposal.

6/17/87     OCD measurement of H<sub>2</sub>S levels using Gas Tech HS-82 meter borrowed from Amoco. Levels of 0.2 to 0.4 ppm at residences after odor complaints were received.

6/18/87     Complaint from Mr. Rainey about "sour smell" coming from pit. He said he didn't notice the smell until the petition that is circulating came to his attention. Since then he has noticed the odor and occasional headaches. They have a 2-month old baby with a heat rash and wondered if it was due to the disposal pond.

6/19/87 Augered holes West and North of facility to determine extent of ground contamination, from mud pits. Remeasured  $H_2S$  levels around pond with sprayers on.

6/19/87 Letter to Basin Disposal barring the mudpits from receiving any substances and issuing deadlines for removing all fluids from the unlined pits.

6/22/87 Received copy of letter from Jerry Sandel to Rep. Bill Richardson commenting on petition sent to Richardson's office.

7/01/87 OCD measurements of  $H_2S$  levels and observation of first bleach treatment. 540 gallons of 10%  $NaClO$  added to pond. Little to no effect noticed. Conclusion was that not enough bleach was used.

7/03/87 Additional treatment of pond with 2916 gallons 10%  $NaClO$ . Initial report from field office was that the treatment worked .

7/06/87 Increased complaints - San Juan County Fire Marshal measurements using Drager tubes were 2 to 5 ppm at the Hargis residence and 10 ppm at the Payne residence obtained by another fireman. Readings were obtained by OCD in phone conversation with Fire Marshal on 7/08/87.

7/07/87 - Phone conversation with Basin Disposal concerning elevated concentrations of  $H_2S$ . Closed facility from receipt of incoming loads.

- Enforcement letter to Basin Disposal requiring immediate action to reduce the  $H_2S$  concentrations to a safe level or to evacuate the residents.

- Basin Disposal treats pond with 8200 lbs.  $NaOH$  at the request of the OCD. Raising the pH will convert the  $H_2S$  to  $HS^-$  and remain in solution until a method to remove is found.

7/08/87 Basin treats pond with an additional 24,200 lbs.  $NaOH$ . Started offering residents alternate housing until problem is solved. Raising the pH is having little effect.

7/09/87 Basin circulates pond for 11 hours (628,000gal.) to attempt to obtain uniform mixing of the  $NaOH$ .

7/08/87    OCD observed the addition of NaOH and circulation of pond. Numerous to complaints received during and after operations.  $H_2S$  emissions 7/10/87 lowered initially but did not remain low.

7/10/87    OCD request that EID Epidemiology interview residents to document possible health effects. Epidemiology said it would be impossible to establish a cause and effect relationship without a control group and very little is known about low level  $H_2S$  exposure.

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7/30/87    OCD accompanies EID on fact finding tour of Basin Disposal.



---

~~1984~~

June

1985 to 1997  
June



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Petroleum Engineering Consulting  
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Contract Pumping



3001 Northridge Drive  
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Farmington, New Mexico 87401  
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## BASIN DISPOSAL, INC

### COMMENTS

#### RULE 118. HYDROGEN SULFIDE GAS - PUBLIC SAFETY

##### SECTION A.

NO COMMENT.

##### SECTION B.

1. TRAINING OPERATORS EMPLOYEES. - EMPLOYEES ARE AWARE OF PROBLEMS IN RELATION TO LEVELS OF H<sub>2</sub>S IN PIT.
2. POSTING OF WARNING SIGNS. - CONSIDERED NECESSARY IF CONCENTRATIONS IN AIR SURROUNDING PIT INCREASE TO LEVEL OF BEING DANGEROUS.
3. FENCING OF SURFACE INSTALLATION. - ENTIRE FACILITY IS CURRENTLY FENCED WITH GATE LOCKED WHEN EMPLOYEE IS NOT ON FACILITY.
4. SAFETY DEVICES AND WIND DIRECTION INDICATORS. - OPERATOR IS PURCHASING A HAND HELD H<sub>2</sub>S DETECTOR TO DETERMINE LEVEL OF H<sub>2</sub>S IN AIR. THE DETECTOR WILL ALSO BE UTILIZED TO CHECK FLUIDS IN TRUCKS, PRIOR TO UNLOADING FLUID, TO DETERMINE IF FLUIDS CONTAIN WATER WITH H<sub>2</sub>S. OPERATOR HAS WIND SPEED AND DIRECTION INDICATOR INSTALLED AT FACILITY.
5. MAINTAINING TANKS AND ETC. - THE WATER FROM THE SKIMMER TANKS WAS TESTED BY O. C. D. PERSONNEL AND TESTS INDICATED THAT NO H<sub>2</sub>S WAS PRESENT IN THE WATER IN THE TANKS.
6. BURNING OR VENTING OF GAS. - NO GAS IS PRESENT TO VENT, THEREFORE, NO GAS IS BURNED OR VENTED.

##### SECTION C.

FACILITY IS NOT A WELL, THEREFORE. THIS DOES NOT APPLY.

SECTION D.

1. FACILITY IS NOT A WELL.
2. TESTING HAS BEEN PERFORMED BY O. C. D. PERSONNEL.
3. IF NINETY (90) DAYS IS TO APPLY, TIME AT WHICH THE NINETY (90) DAYS TO COMMENCE?

SECTION E. 1.

INDICATED H<sub>2</sub>S IS NOT 500 PPM OR MORE. NOT APPLICABLE.

SECTION E. 2.

INDICATED H<sub>2</sub>S IS NOT 1,000 PP OR MORE. NOT APPLICABLE.

SECTION E. 3.

H<sub>2</sub>S CONCENTRATION AND VOLUME DOES NOT EQUATE TO  
10 MCF PER DAY. NOT APPLICABLE.

SECTION E. 4.

NOT APPLICABLE.

substantial damage to property, shall be "immediate notification" as described below. If the loss is, or it appears that the loss will be at least 5 barrels but less than 25 barrels, notification shall be "subsequent notification" described below.

6. Drilling Pits, Slush Pits, and Storage Pits and Ponds. Notification of breaks and spills from any drilling pit, slush pit, or storage pit or pond in which any hydrocarbon or hydrocarbon waste or residue, strong caustic or strong acid, or other deleterious chemical or harmful contaminant endangers human health or does substantial surface damage, or reaches a watercourse or enters a stream or lake in such quantity as may with reasonable probability endanger human health or result in substantial damage to such watercourse, stream, or lake, or the contents thereof, shall be "immediate notification" as described below. Notification of breaks or spills of such magnitude as to not endanger human health, cause substantial surface damage, or result in substantial damage to any watercourse, stream, or lake, or the contents thereof, shall be "subsequent notification" described below, provided however, no notification shall be required where there is no threat of any damage resulting from the break or spill.

IMMEDIATE NOTIFICATION. "Immediate Notification" shall be as soon as possible after discovery and shall be either in person or by telephone to the district office of the Division district in which the incident occurs, or if the incident occurs after normal business hours, to the District Supervisor, the Oil and Gas Inspector, or the Deputy Oil and Gas Inspector. A complete written report ("Subsequent Notification") of the incident shall also be submitted in duplicate to the appropriate district office of the Division within ten days after discovery of the incident.

SUBSEQUENT NOTIFICATION. "Subsequent Notification" shall be a complete written report of the incident and shall be submitted in duplicate to the district office of the Division district in which the incident occurred within ten days after discovery of the incident.

CONTENT OF NOTIFICATION. All reports of fires, breaks, leaks, spills, or blowouts, whether verbal or written, shall identify the location of the incident by quarter-quarter, section, township, and range, and by distance and direction from the nearest town or prominent landmark so that the exact site of the incident can be readily located on the ground. The report shall specify the nature and quantity of the loss and also the general conditions prevailing in the area, including precipitation, temperature, and soil conditions. The report shall also detail the measures that have been taken and are being taken to remedy the situation reported.

WATERCOURSE. For the purpose of this rule, is defined as any lake-bed or gully, draw, stream bed, wash, arroyo, or natural or man-made channel through which water flows or has flowed.

#### RULE 117. WELL LOG, COMPLETION AND WORKOVER REPORTS

Within 20 days after the completion of a well drilled for oil or gas, or the recompletion of a well into a different common source of supply, a completion report shall be filed with the Division on Form C-105. For the purpose of this rule, any hole drilled or cored below fresh water or which penetrates oil or gas-bearing formations or which is drilled by an "owner" as defined herein shall be presumed to be a well drilled for oil or gas.

#### RULE 118. HYDROGEN SULFIDE GAS - PUBLIC SAFETY

A. The intent of this rule is to provide for the protection of the public's safety in areas where hydrogen sulfide ( $H_2S$ ) gas in concentrations greater than 100 parts per million (PPM) may be encountered.

B. Producing operations should be conducted with due consideration and guidance from American Petroleum Institute (API) publication "Conducting Oil and Gas Production Operations Involving Hydrogen Sulfide" (RP-55). The operator of a lease producing, or a gas processing plant handling, or any other related facility where  $H_2S$  gas is present in concentrations of 100 PPM or more shall take reasonable measures to forewarn<sup>2</sup> and safeguard persons having occasion to be on or near the property. In addition to training operator's employees in  $H_2S$  safety such measures may include, but are not necessarily limited to, posting of warning signs<sup>2</sup>, fencing of surface installations, installation of safety devices and wind direction indicators, and maintaining tanks, thief hatches and gaskets, valves and piping in condition so as to prevent avoidable loss of vapors. Where release of hydrogen sulfide is unavoidable, the operator shall burn or vent the gas stream in such a manner as to avoid endangering human life.

C. Wells drilled in known  $H_2S$  gas producing areas, or where there is substantial probability of encountering  $H_2S$  gas in concentrations of 100 PPM or more, should be planned and drilled with due regard to and guidance from API RP-49 "Recommended Practices for Safe Drilling of Wells Containing Hydrogen Sulfide", latest edition. Wells completed and serviced by well servicing units where there is substantial probability of encountering  $H_2S$  gas in concentrations of 100 PPM or more should be worked on with due regard to the latest industry accepted practices. These practices may include, but are not necessarily limited to, the proper training of personnel in  $H_2S$  safety and the use of  $H_2S$  safety equipment as listed for safe operations by the American Petroleum Institute draft report for "Land, Oil and Gas Well Servicing and Workover Operations Involving Hydrogen Sulfide."\*

D. Within ninety (90) days after completion of the first well on a lease, or within ninety (90) days after  $H_2S$  is discovered in a gas stream, each operator shall submit in writing to the Division's district office having jurisdiction, on a form acceptable to the Division, for each lease in each pool in production at that time, the  $H_2S$  concentration from an analysis of a representative sample of the gas stream. The analysis shall be performed by an industry-recognized method and procedure. The measurement report shall specify the name of the operator, lease or facility name, pool, testing point, tester, test method, and the measured  $H_2S$  concentration. Tests within the past three (3) years and which are still representative may be utilized for submittal from previously producing leases. NOTE: Owners or operators of existing wells and facilities shall have until July 1, 1987, to come into compliance with this paragraph of these rules.

E. 1. Any well, lease, processing plant or related facility handling  $H_2S$  gas with a concentration of 500 PPM (0.05%) or more shall have a warning sign at the entrance.<sup>2</sup> The sign, as a minimum, shall be legible from at least fifty (50) feet, and contain the words "poison gas." The use of existing signs will meet the requirements of this section providing they convey the intended safety message.

E. 2. Any lease producing gas or related facility having storage tanks containing gas with a  $H_2S$  concentration of 1,000 PPM (0.1%) or more shall have, in addition to the sign required in subparagraph E.1., a sign at the foot of the battery stairway that shall accomplish the requirements of E.1., plus specify any protective measures that may be necessary. This paragraph does not apply to gas processing plants.

E. 3. Any well, lease or processing plant handling gas with  $H_2S$  concentration and volume such that the  $H_2S$  fraction equates to 10 MCF per day or more of  $H_2S$  and which is located within one-fourth ( $1/4$ ) mile of a dwelling, public place or highway shall install safety devices and maintain them in operable condition or shall establish safety procedures designed to prevent the undetected continuing escape of  $H_2S$ . Wind direction indicators shall be installed at at least one strategic location at or near the site and shall be readily visible throughout the site. Also, unattended surface facilities or plants within one-fourth ( $1/4$ ) mile of a dwelling or public meeting place shall be protected from public access by fencing and locking, or other equivalent security means. In addition, the operator shall prepare a contingency plan to be carried out should the

public be threatened by a release. The plan shall provide for notification of endangered parties, as well as public safety personnel, for evacuation of threatened parties as warranted, and institution of measures for closing in the flow of gas. Contingency plans shall be available for Division inspection and shall be retained at the location which lends itself best to activation of any such plan. The operator, as an alternative, may utilize Figure 4.1 of API (RP-55) Revised March, 1983 and if the 100 PPM radius of exposure includes a dwelling, public place or highway, the operator must meet the public safety requirements as specified in this section.

E. 4. The provisions of this section shall be applicable within 30 days after the filing of sample data showing the existence and concentration of  $H_2S$  gas described in Paragraphs E.1 through E.3 above. In unusual circumstances guidance on placement and content of signs may be obtained from the supervisor of the appropriate Division District Office.

F. The Director of the Division may administratively grant exceptions or extensions to the requirements of this rule for good cause shown and where such exception will not result in a threat to human life.

\*At such time as the American Petroleum Institute adopts the "Recommended Practice for Land Oil and Gas Well Servicing and Workover Operations on Involving Hydrogen Sulfide", it shall take the place of any previous draft reports.



**WALSH**

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(505) 327-4892

BASIN DISPOSAL, INC

COMMENTS

RULE NO. 312 - TREATING PLANTS

SECTION (a)

(1)

PRESENTED WITH ORIGINAL APPLICATION, APPROVED BY O. C. D.,  
PRIOR TO CONSTRUCTION OF DISPOSAL PIT.

(2)

BASIC INFORMATION, IN RELATION TO CONSTRUCTION OF PIT,  
SKIMMER, OR OIL WATER SEPARATION, TANKS AND RELATED  
FACILITIES FOR DEPOSAL PIT OPERATION PRESENTED WITH ORIGINAL  
APPLICATION.

(3)

BASIC INFORMATION PRESENTED WITH ORIGINAL APPLICATION. AN  
EXCEPTION IS THE LOCATION OF CATTLE GUARDS.

(4)

PRESENTED WITH ORIGINAL APPLICATION, APPROVED BY O. C. D.,  
PRIOR TO CONSTRUCTION OF DISPOSAL PIT.

(5)

LIQUIDS, WATER, AFTER SEPARATION IN SKIMMER TANKS OR AFTER HOT OIL OF OIL IN STORAGE TANK ARE PUT INTO THE PRODUCED WATER DISPOSAL PIT, AN DIVISION APPROVED SITE.

NO UNMERCHANTABLE SOLIDS HAVE RESULTED FROM THE OPERATION OF THE FACILITY. THIS IS DUE TO THE FACT THAT ONLY PRODUCED WATER, WHICH CAN HAVE SMALL QUANTITIES OF OIL, IS ALLOWED TO BE DISPOSED OF AT THE FACILITY.

NO TANK BOTTOMS, SEDIMENT OIL OR MISCELLANEOUS HYDROCARBONS ARE PROCESSED AT THE PRODUCED WATER FACILITY.

(6)

NO SURETY OR CASH BOND WAS REQUIRED AT THE TIME THE O. C. D. APPROVED THE FACILITY AS PRODUCED WATER DISPOSAL SITE.

(7)

SEE SECTION (b)

#### SECTION (b).

THE ORIGINAL APPLICATION, APPROVED BY THE O. C. D., DID NOT HAVE TO MEET THE REQUIREMENTS OF THIS SECTION. THEREFORE, THIS SECTION SHOULD NOT BE APPLICABLE.

#### SECTION (c).

THE FACILITY IS NOT A TREATING PLANT. ANY OIL THAT IS RECOVERED IS INCIDENTAL TO THE NORMAL OPERATION OF THE PRODUCED WATER DISPOSAL OPERATION.

THEREFORE, NO TREATING PLANT PERMIT SHOULD BE REQUIRED.



SECTION (d).

THE FACILITY IS NOT A TREATING PLANT. ANY OIL THAT IS RECOVERED IS INCIDENTAL TO THE NORMAL OPERATION OF THE PRODUCED WATER DISPOSAL OPERATION.

THEREFORE, AN APPROVED FORM C-104 SHOULD NOT BE REQUIRED.

SECTION (e).

THE PRODUCED WATER FACILITY DOES NOT ACCEPT SEDIMENT OIL.

SECTION (f).

THE PRODUCED WATER FACILITY DOES NOT ACCEPT TANK BOTTOMS FROM PIPELINE STATIONS, CRUDE OIL STORAGE TERMINALS OR REFINERIES, PIPELINE BREAK OIL OR OTHER MISCELLANEOUS HYDROCARBONS.

THE PRODUCED WATER FACILITY DOES NOT MIX THE INCIDENTAL RECOVERED OIL WITH RECOVERED PIPELINE OIL.

SECTION (g).

NOT APPLICABLE. THE PRODUCED WATER DISPOSAL FACILITY DOES NOT ACCEPT SEDIMENT OIL.

SECTION (h).

NOT APPLICABLE THE PRODUCED WATER FACILITY IS NOT A TREATING PLANT.

SECTION (i).

NOT APPLICABLE.



STATE OF NEW MEXICO  
ENERGY AND MINERALS DEPARTMENT  
OIL CONSERVATION DIVISION

BRUCE KING  
GOVERNOR  
LARRY KEHOE  
SECRETARY

P.O. BOX 1980  
HOBBS, NEW MEXICO 88240  
(505) 393-6161

MEMO TO: OPERATORS, TRANSPORTERS, AND OTHER INTERESTED PARTIES  
FROM: Jerry Sexton and Bill Gressett, OCD District Supervisors  
SUBJECT: IMPLEMENTATION OF COMMISSION ORDER R-6881  
DATE: March 1, 1982

The following guidelines have been compiled in response to the many questions that arose concerning certain procedures and requirements in the several meetings that were held in the first part of February 1982, and are submitted so that uniformity in administering these changes can be achieved.

I. Salt Water Disposal Wells

- A. All water disposed of shall be metered or load volumes of trucks will be used so that an accurate volume can be reported to the Division on Form C-120-A. A beginning and ending meter reading for the month should be reported on C-120-A.
- B. Oil in the amount of 2/10 of 1% of the volume of water disposed of and reported to the Division may be sold without documentation. Any amount larger than this must be documented and credited back to the leases or origin for allowable and royalty accounting by the operating companies.
- C. Any oil removed from a salt water disposal system and used for mud oil must be accounted for on Form C-117-A and approved prior to removal of said oil. Emergencies that may arise, due to stuck pipe or sticking problems, can be expedited by telephoning prior to moving oil.
- D. Any truck hauling water with more than 2.5 barrels of oil must be documented.
- E. Prior to oil being sold to a pipeline company from a salt water disposal collection tank an approved Form C-104 must be obtained from the Division stating who the purchaser is. If more than one purchaser is utilized an approved Form C-104 must be filed for each purchaser. Oil sold to treating plants from salt water disposal collection tank must have an approved C-117-A prior to moving said oil.
- F. All trucks engaged in hauling produced water must have an approved Form C-133 by April 1, 1982.
- G. A Form C-117-B shall be filed with the appropriate Division office by anyone, other than a treating plant operator, who utilizes a Form C-117-A to move any materials containing hydrocarbons.

## II. Hot Oil Units

- A. Operators and/or owners of hot oil units will not be assigned a C-104 to sell oil to anyone.
- B. Hot oil units that are utilized to treat tanks may have up to 2 barrels of oil without documentation on it.
- C. Hot oil units engaged in hauling produced water must have an approved C-133 by April 1, 1982.

## III. Frac and/or Test Tanks

- A. Any oil or bottoms that are removed from a lease or well will not be sold or moved without an approved C-117-A showing company, lease, well where these hydrocarbon containing materials originated, so that it may be properly credited for allowable and royalty accounting.

## IV. Treating Plants

- A. Beginning with February 1982, the Monthly Treating Plant Report, Form C-118, must show both the treated and untreated volumes of hydrocarbon containing material on hand, received, and sold for the month.
- B. Any oil, distillates, or material containing any oil moved from another state must be documented by the state of origin. These volumes must be identified on Division Form C-118.
- C. No treating plant shall accept any material containing hydrocarbons without a C-117-A or an approved document (out-of-state letter of authority).

## V. Transports/Truckers

- A. Transports being used in a third party status; i.e. hauling for pipeline companies or under contract to other transportation companies, shall have a run ticket stating origin of oil and destination of oil as well as volume of oil being moved. This would also apply to moving oil from a pipeline break.
- B. All Transports, vacuum trucks, or any other method of transporting produced water other than a gathering system shall have an approved copy of Division Form C-133 on it. If any of these conveyances have more than 2.5 barrels of oil in it tank it must be documented.

VI. Gas Gathers and Drip Haulers

- A. In order that the Division can up-date the handling of drip, any person or company involved in picking up and transporting drip must file an up-dated C-104. These C-104's should show the drip collection stations and the location of storage facilities where drip is to be sold.
- B. Every person transporting drip within the State of New Mexico shall file, as soon as practical, the yearly Drip Disposition Report along with the required drip location map as required by Division Rule 314. If this report is being filed with the Santa Fe Office, a copy must also be filed with the appropriate District Office. In researching our files it has been noted that many operators of gathering systems have failed to comply with this rule.
- D. A study of the accounting problem of drip removal and sale is being made and a further directive will be issued in the future.

VII. It is incumbent upon all producing, operating companies and operators of gathering systems, treating plants, and disposal systems to familiarize themselves with Commission Order R-6881 and comply with its directives.

STATE OF NEW MEXICO  
ENERGY AND MINERALS DEPARTMENT  
OIL CONSERVATION COMMISSION

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION ON ITS OWN MOTION TO CONSIDER THE DESIGNATION OF TWO CRUDE PETROLEUM OIL PRODUCING AREAS AND THE AMENDMENT OF THE OIL CONSERVATION DIVISION'S RULES AND REGULATIONS GOVERNING THE ACQUISITION, MOVEMENT, AND DISPOSITION OF CRUDE OIL AND CONDENSATE, SEDIMENT OIL, TANK BOTTOMS AND OTHER MISCELLANEOUS HYDROCARBONS AS WELL AS PRODUCED WATERS.

CASE NO. 7433  
Order No. R-6881

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9:00 a.m. on December 3 and 22, 1981, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this 13th day of January, 1982, the Commission, a quorum being present, having considered the testimony presented and the exhibits received at said hearing, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That pursuant to Chapter 257, Laws of 1981, the Anti-Crude Oil Theft Act now contained in Sections 30-16-46 through 30-16-48, NMSA 1978 Compilation, the Oil Conservation Division, hereinafter referred to as the Division, is required to:

- (a) specify documentation to be possessed by persons transporting, by motor vehicle, crude petroleum oil, and any sediment or water or brine produced in association with the production of oil or gas, or both, from or to storage, disposal, processing or refining; and
- (b) designate any geographical area of the State as a crude petroleum oil producing area wherein such documentation, on a reasonable request, must be produced for any State Police Officer or other law enforcement officer.

(3) That said Act requires that the documentation contain information as to the identity of the operator or owner, the originating lease or facility, the nature and volume of the transported fluids including percentage of crude petroleum oil, and such other information as the Division finds necessary or convenient.

(4) That two crude petroleum oil producing areas consisting of producing counties and nearby counties with potential for production or where stolen oil may be expected to be transported should be designated as follows:

Southeast Crude Petroleum Oil Producing Area  
Chaves, DeBaca, Eddy, Lea, and Roosevelt Counties

Northwest Crude Petroleum Oil Producing Area  
Cibola, McKinley, Rio Arriba, Sandoval, San Juan, and Valencia Counties

(5) That to facilitate the identification of lease tanks and other facilities from which fluids affected by this order may be moved, appropriate signs should be required.

(6) That owners and operators should be given a reasonable period of time in which to acquire and place identification signs at affected lease tanks and facilities, and six months is a reasonable period of time in which to do so.

(7) That Division Rule 310 should be amended to read in its entirety as shown on Exhibit "A" attached to this order.

(8) That with respect to sediment oil, tank bottoms, other miscellaneous hydrocarbons, and treating plants, the Division's Rules and Regulations should be amended to:

- (a) prohibit tank cleaning and/or sediment oil movement from leases without prior Division approval, to provide for record keeping and reporting of sediment oil volumes moved, proper sampling of sediment oil prior to movement, to provide a definition of miscellaneous hydrocarbons and in like manner, except in emergency, control of its movement and provide for sampling and reporting thereof;
- (b) prohibit the taking by treating plants of sediment oil and, except in emergencies, miscellaneous hydrocarbons without proper documentation, and recognize modern sampling and testing procedures; and

- (c) clarify permit number information required to be filed on Division Form C-118, Treating Plant Operator's Monthly Report.

(9) That the foregoing changes, additions, prohibitions, and clarifications should be accomplished by adopting proposed amended Division Rules 311, 312, and 1118, respectively, as shown on Exhibit "B" attached to this order.

(10) That in order to effectuate the proposed provisions of said amended Rules 311, 312, and 1118, Division Form C-117-A should be amended to become a Tank Cleaning, Sediment Oil Removal, Transportation of Miscellaneous Hydrocarbons and Disposal Permit, and Division Form C-117-B should be amended to become a Monthly Sediment Oil Disposal Statement, and Division Rule 1117 should be amended to reflect these changes all as shown on Exhibits "C-1", "C-2", and "C-3", respectively, attached to this order.

(11) That with respect to the transportation by motor vehicle of crude oil or liquids which may contain crude oil, lease condensate, sediment oil, or miscellaneous hydrocarbons, a new rule should be adopted requiring possession of documentation which identifies the transporter, identifies the lease or facility from which the liquid was removed including its location, identifies the operator or owner thereof, gives the date of removal of the fluids, and gives a description of the fluid including volume.

(12) That the foregoing requirements should be accomplished by adopting a new Division Rule 804 as shown on Exhibit "D" attached to this order.

(13) That with respect to the transportation by motor vehicle of water produced in conjunction with oil and/or natural gas the Division's Rules and Regulations should:

- (a) provide a definition of such waters and prohibit their movement without Division approval;
- (b) prohibit the disposition of such transported waters in any manner which would constitute a hazard to fresh water supplies; and
- (c) provide a form for authorizing vehicular movement of such waters and an appropriate cover rule.

(14) That the foregoing requirements should be accomplished by adopting new Division Rules 709, 710, and 1133, respectively, as shown on Exhibit "E" and new Division Form C-133, Authorization to Move Produced Water, as shown on Exhibit "F", both attached to this order.

(15) That Division Rule 1100 D should be amended to reflect the amended titles of the proposed new Form C-117-A and Form C-117-B and the addition of new Form C-133.

(16) That the effective date of the proposed rule amendments, new rules, form amendments and new form contained in this order should be February 1, 1982.

(17) That the proposed rule amendments, new rules, form amendments, and new form contained in this order are necessary to meet the requirements of the aforesaid Anti-Crude Oil Theft Act as well as other statutory authority granted the Division.

(18) That the proposed rule amendments, new rules, form amendments, and new form will not cause waste nor violate correlative rights and should be adopted.

IT IS THEREFORE ORDERED:

(1) That two crude petroleum oil producing areas in New Mexico are hereby designated as follows:

Southeast Crude Petroleum Oil Producing Area  
Chaves, DeBaca, Eddy, Lea, and Roosevelt Counties

Northwest Crude Petroleum Oil Producing Area  
Cibola, McKinley, Rio Arriba, Sandoval, San Juan, and Valencia Counties

(2) That Rule 310 of the Division's Rules and Regulations is hereby amended to read in its entirety as shown on Exhibit "A" attached to this order.

(3) That Rules 311, 312, and 1118 of the Division's Rules and Regulations are hereby amended to read in their entirety as shown on Exhibit "B" attached to this order.

(4) That Division Form C-117-A and Form C-117-B are hereby amended and adopted as shown on Exhibits "C-1" and "C-2", respectively, attached to this order.

(5) That Rule 1117 of the Division's Rules and Regulations is hereby amended to read in its entirety as shown on Exhibit "C-3" attached to this order.

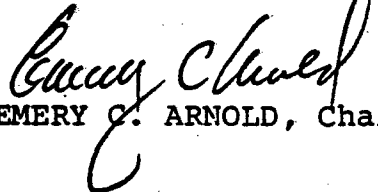


- (6) That new Division Rule 804 as shown on Exhibit "D" to this order is hereby promulgated.
- (7) That new Division Rules 709, 710, and 1133 as shown on Exhibit "E" to this order are hereby promulgated.
- (8) That new Division Form C-133, Authorization to Move Produced Water, as shown on Exhibit "F" attached to this order is hereby adopted.
- (9) That Rule 1100 D of the Division Rules and Regulations is hereby amended to reflect the new titles of Form C-117-A and Form C-117-B and the addition of new Form C-133 all heretofore referenced.

IT IS FURTHER ORDERED:

- (1) That the effective date of this order and of all rule amendments, new rules, form amendments, and new form contained herein shall be February 1, 1982.
- (2) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.
- (3) DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO  
OIL CONSERVATION COMMISSION

  
EMERY C. ARNOLD, Chairman

ALEX J. ARMIJO, Member

  
JOE D. RAMEY, Member & Secretary

S E A L

RULE 310. TANKS, OIL TANKS, FIRE WALLS, AND TANK IDENTIFICATION

Oil shall not be stored or retained in earthen reservoirs, or in open receptacles. Dikes or fire walls shall not be required except such fire walls must be erected and kept around all permanent oil tanks, or battery of tanks that are within the corporate limits of any city, town, or village, or where such tanks are closer than 150 feet to any producing oil or gas well or 500 feet to any highway or inhabited dwelling or closer than 1000 feet to any school or church, or where such tanks are so located as to be deemed an objectionable hazard within the discretion of the Division. Where fire walls are required, fire walls shall form a reservoir having a capacity one-third larger than the capacity of the enclosed tank or tanks.

After August 1, 1982, all oil tanks, tank batteries, automatic custody transfer systems, tanks used for salt water collection or disposal, and tanks used for sediment oil treatment or storage shall be identified by a sign posted on or not more than 50 feet from the tank, tank battery, or system. Such signs shall be of durable construction and the lettering thereon shall be kept in a legible condition and shall be large enough to be legible under normal conditions at a distance of 50 feet and shall identify the name of the operator, the name of the lease(s) being served by the tank(s) or system, if any, and the location of such tank(s) or system by unit letter, section, township, and range.

**RULE 311. SEDIMENT OIL, TANK CLEANING, AND TRANSPORTATION OF MISCELLANEOUS HYDROCARBONS**

(a) "Sediment Oil" is defined as tank bottoms and any other accumulations of liquid hydrocarbons on an oil and gas lease, which hydrocarbons are not merchantable through normal channels.

(b) No tank shall be cleaned of sediment oil nor shall sediment oil be removed from any lease without prior approval of the appropriate Division district office. Authorization for tank cleaning may be received by the operator of the lease or by the company contracted or otherwise authorized to perform the tank cleaning by obtaining approval on Form C-117-A (Tank Cleaning, Sediment Oil Removal, Transportation Of Miscellaneous Hydrocarbons and Disposal Permit). No operator, contractor, or other party shall engage in the cleaning of any tank of sediment oil or the removal of sediment oil from any lease without an approved copy of Form C-117-A at the site.

(c) No sediment oil shall be destroyed unless and until the appropriate Division district office has approved an application to destroy the same on Form C-117-A (Tank Cleaning, Sediment Oil Removal, Transportation Of Miscellaneous Hydrocarbons and Disposal Permit). Unless the authorization to destroy sediment oil is utilized within ten (10) days after approval of the Form C-117-A such authorization is automatically revoked. However, the District Supervisor may approve one ten (10) day extension for good cause shown.

(d) Any operator, contractor, or party, other than a treating plant operator, who cleans any tank of sediment oil and removes sediment oil from any lease shall file Form C-117-B (Monthly Sediment Oil Disposal Statement) setting out all information required thereon.

(e) A representative sample of sediment oil from any source shall be tested in a manner designed to accurately estimate the percentage of good oil expected to be recovered therefrom. Such test shall be performed prior to transport and prior to commingling with sediment oil from other leases or sources and the results recorded on the appropriate Form C-117-A.

The Division recommends the standard centrifugal test prescribed by API Manual of Petroleum Measurement Standards, Chapter 10, Section 4. Other test procedures may be used if such procedures reliably predict the percentage of good oil to be recovered from sediment oil.

(f) All sediment oil removed from storage shall be reported on Form C-115 (Operator's Monthly Report) together with the Form C-117-A (Tank Cleaning, Sediment Oil Removal, Transportation Of Miscellaneous Hydrocarbons and Disposal Permit) permit number.

(g) "Miscellaneous Hydrocarbons" are defined as tank bottoms occurring at pipeline stations, crude oil storage terminals, or refineries, pipeline break oil, catchings collected in traps, drips, or scrubbers by operators of gasoline plants in such plants or in the gathering lines serving such plants, the catchings collected in private, community, or commercial salt water disposal systems, or any other liquid hydrocarbon which is not lease crude or condensate.

(h) Except in case of emergency, no miscellaneous hydrocarbons shall be delivered to a treating plant or other facility until Division approval is obtained on Form C-117-A (Tank Cleaning, Sediment Oil Removal, Transportation Of Miscellaneous Hydrocarbons and Disposal Permit).

Whenever an emergency exists which requires delivery of miscellaneous hydrocarbons to a treating plant or other facilities prior to approval of Form C-117-A, the transporter of such hydrocarbons shall notify the supervisor of the appropriate Division district office of the nature and extent of such emergency on the first working day following the emergency and shall file Form C-117-A within two working days following the emergency. For prolonged emergencies, the district supervisor may authorize the extended movement of miscellaneous hydrocarbons to a treating plant or other facilities during the period of the emergency and shall approve a Form C-117-A filed subsequent to the conclusion of such emergency covering the entire volume of miscellaneous hydrocarbons transported.

#### RULE 312. TREATING PLANTS

No treating plant shall operate except in conformity with the following provisions:

(a) Prior to the construction of a treating plant, a written application shall be filed for a treating plant permit stating in detail the location and type and capacity of the plant contemplated. The Division will set such application for hearing to determine whether the proposed plant and method of processing will efficiently process, treat, and reclaim sediment oil. Before beginning actual operations, any permittee shall file with the Division a performance bond in the amount of \$10,000, conditioned upon substantial compliance with applicable statutes of the State of New Mexico and all rules, regulations, and orders of the Oil Conservation Division of New Mexico.

(b) Such permit shall entitle the treating plant operator to an approved Form C-104, Request for Allowable and Authorization to Transport Oil and Natural Gas, for the total amount of products secured from sediment oils and miscellaneous hydrocarbons processed by the operator. All permits shall be revocable, after notice and hearing, upon showing of good cause.

(c) No treating plant operator may accept sediment oil at or into the treating facility unless the same is accompanied by an approved Form C-117-A (Tank Cleaning, Sediment Oil Removal, Transportation Of Miscellaneous Hydrocarbons and Disposal Permit).

(d) Except as provided under Rule 311(h), no treating plant operator may accept tank bottoms from pipeline stations, crude oil storage terminals or refineries, pipeline break oil or other miscellaneous hydrocarbons for processing or mixing with recovered pipeline oil unless the same is accompanied by an approved Form C-117-A.

(e) All treating plant operators shall file a monthly report which shall detail the net oil recovered and sold during the preceding month. See Rule 1118.

The operator of each lease from which sediment oil is removed for reclamation shall be promptly notified by the treating plant operator of the amount of pipeline oil recovered therefrom. In the event sediment oil from two or more separate leases is to be commingled prior to treating, the treating plant operator shall determine the amount of pipeline oil attributable to each lease by testing a representative sample of the sediment oil from said lease in accordance with the standard centrifugal test prescribed by the API Manual of Petroleum Measurement Standards, Chapter 10, Section 4. Other test procedures may be used if such procedures reliably predict the percentage of good oil to be recovered from sediment oil.

**RULE 1118. TREATING PLANT OPERATOR'S MONTHLY REPORT (Form C-118)**

Form C-118 shall be submitted in DUPLICATE to the appropriate District Office of the Division in accordance with Rule 312, and shall contain all the information required thereon. Column 1 of Sheet 1-A of Form C118 entitled "Permit Number," has reference to the Tank Cleaning, Sediment Oil Removal, Transportation Of Miscellaneous Hydrocarbons and Disposal Permit, Form C-117-A, for each lot of oil picked up for processing.

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OIL CONSERVATION DIVISION

P. O. BOX 2088

SANTA FE, NEW MEXICO 87501

Form C-117 A  
Revised 2-1-82

TANK CLEANING, SEDIMENT OIL REMOVAL, TRANSPORTATION  
OF MISCELLANEOUS HYDROCARBONS AND DISPOSAL PERMIT

PERMIT NUMBER \_\_\_\_\_

(Operator or Owner) \_\_\_\_\_ (Address) \_\_\_\_\_

(Lease Name if Sediment Oil) \_\_\_\_\_ (Location - UL Sec. Twp. Rge.) \_\_\_\_\_

OPERATION TO BE PERFORMED:

☐ Tank Cleaning ☐ Sediment Oil Removal ☐ Transportation of Miscellaneous Hydrocarbons

Operator or Owner Representative authorizing work \_\_\_\_\_

Date Work to be Performed: \_\_\_\_\_

TANK CLEANING DATA

Tank Number \_\_\_\_\_ Volume \_\_\_\_\_

Tank Type \_\_\_\_\_ Volume Below Load Line \_\_\_\_\_

SEDIMENT OIL OR MISCELLANEOUS HYDROCARBON DATA

Sediment Oil From: ☐ Pit ☐ Cellar ☐ Other\*

Miscellaneous Oil

Tank Bottoms From: ☐ Pipeline Station ☐ Crude Terminal ☐ Refinery ☐ Other\*

Catchings From: ☐ Gasoline Plant ☐ Gathering Lines ☐ Salt Water Disposal System

☐ Other\*

Pipeline Break Oil or Spill ☐

\*Other (Explain) \_\_\_\_\_

VOLUME AND DESTINATION

Estimated Volume \_\_\_\_\_ Bbls. Field test volume of good oil \_\_\_\_\_ Bbls.

[Not required prior to Division approval.]

Destination (Name and Location of treating plant or other facility) \_\_\_\_\_

DESTRUCTION OF SEDIMENT OIL

Destruction by: ☐ Burning ☐ Pit Disposal ☐ Use on Roads or Firewalls. ☐ Other

(Explain) \_\_\_\_\_

Location of Destruction \_\_\_\_\_

Justification of Destruction \_\_\_\_\_

APPLICATION MAY BE MADE BY EITHER OF THE FOLLOWING:

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

Owner \_\_\_\_\_ Transporter \_\_\_\_\_

By \_\_\_\_\_ By \_\_\_\_\_

Title \_\_\_\_\_ Title \_\_\_\_\_

Date \_\_\_\_\_ Date \_\_\_\_\_

NEW MEXICO OIL CONSERVATION COMMISSION

Approved By \_\_\_\_\_ Title \_\_\_\_\_ Date \_\_\_\_\_

A COPY OF THIS FORM MUST BE ON LOCATION DURING TANK CLEANING, REMOVAL OF SEDIMENT OIL OR MISCELLANEOUS HYDROCARBONS, AND MUST BE PRESENTED WITH TANK BOTTOMS, SEDIMENT OIL, MISCELLANEOUS HYDROCARBONS AT THE TREATING PLANT TO WHICH IT IS DELIVERED.

EXHIBIT "C-1"  
Order No. R-6881

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MONTHLY SEDIMENT OIL DISPOSAL STATEMENT

Company Name \_\_\_\_\_

MONTH \_\_\_\_\_

YEAR \_\_\_\_\_

Tank or Pit  
Cleaning  
Permit  
No. \_\_\_\_\_

Date of  
Cleaning \_\_\_\_\_

Volume  
Sediment  
Oil  
Recovered \_\_\_\_\_

Disposal method or Name and location  
of Reclamation Plant to which Sediment  
Oil was Delivered \_\_\_\_\_

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

To be completed monthly by any operator, contractor, or party other than a treating plant operator which cleans any tank sediment oil and removes such oil from a lease.

By \_\_\_\_\_  
Title \_\_\_\_\_  
Date \_\_\_\_\_

Distribution: Original to Santa Fe, carbon copy to district office.

EXHIBIT "C-2"  
Order No. R-6881

**RULE 1117. TANK CLEANING, SEDIMENT OIL REMOVAL, TRANSPORTATION  
OF MISCELLANEOUS HYDROCARBONS AND DISPOSAL PERMIT  
(Form C-117-A), AND MONTHLY SEDIMENT OIL DISPOSAL  
STATEMENT (Form C-117-B)**

(a) Form C-117-A, Tank Cleaning, Sediment Oil Removal, Transportation Of Miscellaneous Hydrocarbons and Disposal Permit, shall be submitted to the appropriate District Office of the Division in QUINTUPLICATE and in accordance with Rule 311 (b), (c), and (h).

(b) Form C-117-B, Monthly Sediment Oil Disposal Statement, shall be submitted both to the Santa Fe office and the appropriate District Office(s) of the Division in accordance with Rule 311 (d).



**RULE 804. DOCUMENTATION REQUIRED**

A. All off-lease transportation of crude oil or lease condensate by motor vehicle shall be pursuant to an approved Form C-104 and shall be accompanied by a run ticket or equivalent document. The documentation shall identify the name and address of the transporter, the name of the operator and of the lease or facility from which the oil was taken, the date of removal, the API gravity of the oil, the observed percentage of BS and W, the volume of oil or opening and closing tank gauges or meter readings, and the signature of the driver. The document shall provide space for recording of the lease number and for signature of the operator or his representative.

After August 1, 1982, all such transportation must be accompanied by documentation sufficient to verify the location of the tanks or facility from which the liquid was removed. The location may be shown on the run ticket or equivalent document or may be carried separately.

B. All off-lease transportation of liquids which may contain crude oil, lease condensate, sediment oil, or miscellaneous hydrocarbons shall be accompanied by a run ticket, work order, or equivalent document, i.e., Form C-117-A. The documentation shall identify the name and address of the transporter, the name of the operator and of the lease or facility from which the liquid was removed, the nature of the liquid removed including the observed percentage of liquid hydrocarbons, the volume or estimated volume of liquids, and the destination.

After August 1, 1982, all such transportation must be accompanied by documentation sufficient to verify the location of the tanks or facility from which the liquid was removed. The location may be shown on the run ticket or equivalent document or may be carried separately.

C. The documentation required under A. and B. above shall be carried in the vehicle during transportation and shall be produced for examination and inspection by any employee of the Division, any State Police officer, or any other law enforcement officer upon identification and request.

Except where the owner and the transporter are the same, one copy of such documentation shall be left at the facility from which the oil or other liquids were removed.

**RULE 709. REMOVAL OF PRODUCED WATER FROM LEASES AND FIELD FACILITIES**

(a) "Produced Water" is defined as those waters produced in conjunction with the production of crude oil and/or natural gas and commonly collected at field storage or disposal facilities including: lease tanks, commingled tank batteries, burn pits, LACT units, and community or lease salt water disposal systems.

(b) Transportation of any produced water by motor vehicle from any lease, central tank battery, or other facility, without an approved Form C-133 (Authorization to Move Produced Water) is prohibited.

(c) Authorization to transport produced water may be obtained by filing three copies of Form C-133 with the Director of the Division in Santa Fe.

(d) No owner or operator shall permit produced water to be removed from its leases or field facilities by motor vehicle except by a person possessing an approved Form C-133.

**RULE 710. DISPOSITION OF TRANSPORTED PRODUCED WATER**

(a) No person transporting produced water may dispose of such water on the surface of the ground, or in any pit, pond, lake, depression, draw, streambed, or arroyo, or in any watercourse, or in any other place or in any manner which will constitute a hazard to any fresh water supplies.

Delivery of produced water to approved salt water disposal facilities, secondary recovery or pressure maintenance injection facilities, or to a drillsite for use in drilling fluid will not be construed as constituting a hazard to fresh water supplies provided the produced waters are placed in tanks or other impermeable storage at such facilities.

(b) The supervisor of the appropriate district office of the Division may grant temporary exceptions to paragraph (a) above for emergency situations, for use of produced water in road construction or maintenance or for use of produced waters for other construction purposes upon request and a proper showing by a holder of an approved Form C-133 (Authorization to Move Produced Water).

(c) Vehicular movement or disposition of produced water in any manner contrary to these rules shall be considered cause, after notice and hearing, for cancellation of Form C-133.

**RULE 1133. AUTHORIZATION TO MOVE PRODUCED WATER**

Each person who is a transporter of produced water shall obtain approval of Form C-133, Authorization to Move Produced Water, in accordance with Rule 709 (c) prior to any such transportation.

Approval of a single Form C-133 is valid for all leases served by such transporter.

AUTHORIZATION TO MOVE PRODUCED WATER

Transporter Name \_\_\_\_\_

Address \_\_\_\_\_ Office Location (If different) \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Phone Number(s) \_\_\_\_\_

State Corporation Commission Permit No. \_\_\_\_\_

NOTE: It is the responsibility of each holder of an approved Form C-133 to familiarize its personnel with the content of Division Rules 709 and 710 and to assure operations in compliance therewith. Failure to move and dispose of produced water in accordance with Division Rules 709 and 710 are cause for cancellation of Form C-133 and the authority to move produced water.

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

Signed \_\_\_\_\_ Title \_\_\_\_\_

Date \_\_\_\_\_

\_\_\_\_\_  
(This space for State Use)

Approved by \_\_\_\_\_ Title \_\_\_\_\_

Date \_\_\_\_\_

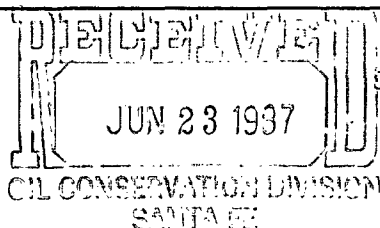


**WALSH**

ENGINEERING & PRODUCTION CORP.

Petroleum Engineering Consulting  
Lease Management  
Contract Pumping

3001 Northridge Drive  
P.O. Drawer 419  
Farmington, New Mexico 87401  
[505] 327-4892



June 22, 1987

Mr. William J. LeMay  
Director  
Energy and Minerals Department  
Oil Conservation Division  
P. O. Box 2088  
Santa Fe, New Mexico 87502-2088

REF: Basin Disposal, Inc.  
Produced Water and Drilling Fluid Disposal Facility  
San Juan County, New Mexico

Dear Mr. LeMay:

This is to confirm my telephone conversation with Ms. Florene Davidson on this date.

I requested a conference with you and your staff at 10:00 A. M., Thursday, June 25, 1987.


The purpose of requesting a conference is to review the situation of the pit and review Rule No. 118 and Rule No. 312, of the O. C. D. Rules and Regulations.

The opportunity to review Rule No. 118 and No. 312 could prevent a problem with interpretation of the Rules in relation to a disposal pit operation.

I will contact Ms. Davidson Wednesday afternoon to determine if the indicated time and date is satisfactory with you or if you would desire another time.

Yours very truly,

WALSH ENGINEERING & PRODUCTION CORP.

  
Ewell N. Walsh  
President

ENW/jr

cc: Basin Disposal, Inc.

TO \_\_\_\_\_  
DATE 6/23/87 TIME 10:45

WHILE YOU WERE OUT

MR. Chris Dean

OF \_\_\_\_\_

PHONE 841-2555 AREA CODE \_\_\_\_\_

TELEPHONED	<input checked="" type="checkbox"/>	PLEASE PHONE	<input type="checkbox"/>
CALLED TO SEE YOU	<input type="checkbox"/>	WILL CALL AGAIN	<input type="checkbox"/>
WANTS TO SEE YOU	<input type="checkbox"/>	RETURNED YOUR CALL	<input type="checkbox"/>

MESSAGE About sample from Basin Disposal  
65 ppm H<sub>2</sub>S in sample  
Will run additional tests on  
duplicate to see how much  
levels have come down in  
24 hrs

MESSAGE TAKEN BY Bill Olson

TO \_\_\_\_\_  
DATE \_\_\_\_\_ TIME \_\_\_\_\_

WHILE YOU WERE OUT

MR. Chris Dean

OF State Lab

PHONE \_\_\_\_\_ AREA CODE \_\_\_\_\_

TELEPHONED	<input checked="" type="checkbox"/>	PLEASE PHONE	<input type="checkbox"/>
CALLED TO SEE YOU	<input type="checkbox"/>	WILL CALL AGAIN	<input type="checkbox"/>
WANTS TO SEE YOU	<input type="checkbox"/>	RETURNED YOUR CALL	<input type="checkbox"/>

MESSAGE H<sub>2</sub>S analysis yields  
total Sulfides including  
H<sub>2</sub>S. He states that they  
do not have a method to  
distinguish between them

MESSAGE TAKEN BY \_\_\_\_\_

INCIDENT

Hydrogen Sulfide

630

INITIALS	INFORMATION RECEIVED, DIRECTIONS PROVIDED, PERSONS(S) CONTACTED	DATE	TIME
CKC	<p>Dr Fisk, Farmington 327-9626 is treating local patients for <math>H_2S</math> exposure. This is part of a general complaint.</p> <p>Will EPI please contact Dr. Fisk to determine any possible health problem to which EID may have to respond?</p> <p>Crossman x 2923</p> <p>air std 10 ppm detected here 1 ppm</p>	6/24	8 AM

INCIDENT

Hydrogen Sulfide

630

INITIALS	INFORMATION RECEIVED, DIRECTIONS PROVIDED, PERSONS(S) CONTACTED	DATE	TIME
JK	at Hammock EPA. Emergency Response 214 655 2222 (2270 office)	6/23/87	9:25 pm
	Received call from National Response Center on Bloomfield Hydrogen Sulfide problem - Basin Disposal Co. Ken Payne, P.O. Box 305, Bloomfield 87413 ph 505 632-9132		
	Kenneth Raney, P.O. Box 4, Bloomfield ph 505 632-1789		
	Both parties were called back and promised that we would keep them informed.		
	Ms Payne reported that wastes were overflowing and running off the property.		



INCIDENT

Hydrogen Sulfide

630.

INITIALS	INFORMATION RECEIVED, DIRECTIONS PROVIDED, PERSONS(S) CONTACTED	DATE	TIME
AKC			
Kathy	(Poison Center) 800-432-6866	6/18/87	1045 AM
Dr Fisk	- Farmington H <sub>2</sub> S hydrogen sulfide poisoning 327-9626		
Family	near oil field dump site exposed		
OCD	measured levels in the home at 5 ppm H <sub>2</sub> S.		
Did we have any reports?			
Possibly related to report 616	but can't find copy of report + Ray is at the round house. Will check later.	6/18/87	11 AM
Checked with Ray Sisneros		6/19/87	8:00 AM
This is a different report from 616.	Action is by OCD. Info only.		

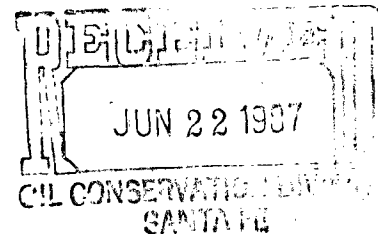
JERRY SANDEL  
SAN JUAN COUNTY  
District 1  
716 ROSA ST.  
Home Telephone: (505) 325-8759  
FARMINGTON, NEW MEXICO 87401



COMMITTEES:  
Chairman:  
APPROPRIATIONS & FINANCE  
Member:  
TRANSPORTATION  
INTERIM COMMITTEE:  
LEGISLATIVE FINANCE COMMITTEE

State of New Mexico  
**House of Representatives**  
THIRTY-SEVENTH LEGISLATURE  
Santa Fe

June 18, 1987



*Mr. LEMAY - David*

The Honorable Bill Richardson  
1610 Longworth House Office Building  
Washington, D.C. 20515

Dear Congressman Richardson:

I received a copy of a petition which is addressed to you, and I felt like it deserved some explanation.

As you know, we both get various petitions which are signed by people who may not know what they are signing, but they sign it because it is laying around somewhere. We were able to contact one person on the petition and he stated he didn't know anything about the content of the petition.

Since this is a state problem, I can assure you that the New Mexico O.C.D. in Santa Fe is staying close to the problem and monitoring the operation.

The background on Basin Disposal is important for your information. It is an approved O.C.D. disposal site for produced oil and gas water. It is the only commercial disposal site in San Juan County. Each gas well producing gas also makes some water with the production. This produced water is the water that is being disposed. If a commercial disposal system is not in operation, the companies would be dumping the water in our irrigation ditches, rivers and washes which could cause a pollution problem of our fresh water supply.

Approximately three weeks ago, a small amount of hydrogen sulfide water from some well was dumped into the disposal water holding pond. It gave off a foul odor but the levels were not at a health hazard level. The O.C.D. from Santa Fe has been testing the hydrogen sulfide level and it has decreased to less than six parts per million according to the tests taken today at the pit site. Most of the readings indicated a range of .1 to 2.2 parts per million.

The Honorable Bill Richardson  
June 18, 1987  
Page 2

It has been suspected that the produced water that contained the hydrogen sulfide came from a well in the Barker Dome field which is located Northwest of Farmington. As a precaution, Basin Disposal is not going to accept any more produced water from the Barker Dome area.

With the above background I would like to address a few erroneous statements included in the petition:

1. There is no proof that the disposal site has eaten paint off of any car or mobile home.
2. One person complained of a breathing problem and when the O.C.D. staff member took level readings in his mobile home, the instrument recorded a 0 reading. It is questionable whether or not all of the complaints of headaches, dizziness and irritation are correct.
3. The original 50 parts per million was recorded within a week after the load was dumped from Barker Dome and it has been reducing since then to the current readings.

The O.C.D. and the owners of Basin Disposal are working closely to resolve any potential problem, and it appears the initial problem will be cleared up in a short period of time. I am also one of the owners in the project.

There are approximately 8 neighbors in the vicinity of the disposal site and all but three have moved into the area after the disposal site was built. Of course, the neighbors are trying to see the facility closed. They are not considering the potential of illegal dumping and pollution of the rest of the county water systems.

I wanted to make you aware of the full situation since you will be receiving the same petition that was delivered to me. I would hope you will investigate the situation with the New Mexico O.C.D. prior to taking any type of Federal action. They are the regulatory in charge of this situation.

Sincerely,

Jerry Sandel

SJ/sm

The Honorable Bill Richardson  
June 18, 1987  
Page 3

cc: The Honorable Jeff Bingaman  
9017 New Federal Building  
500 Gold S.W.  
Albuquerque, NM 87102

Mr. Bill LeMay, Director  
Oil Conservation Division  
P.O. Box 2088  
Santa Fe, NM 87501

Dear Senator Richardson,

We are writing to you in regards to the waste disposal plant located between Bloomfield and Aztec. We live approximately  $\frac{1}{4}$  mile from it. We know that there are pits which are unlined and leaking. The smell is terrible. We've had headaches and dizziness. We've been sick to our stomachs, our eyes water and mat. Even our animals have irritated eyes.

There is also damage to our car paint, vinyl tops, and mobile homes. Last summer O C D in Aztec was called about a salty looking film on the cars. It has since eaten the paint off of our cars and is cracking the vinyl tops.

We have called Oil Conservation Division in Aztec and Santa Fe. We believe they are working on the problem, but can action be taken quickly enough? The reports on television and in the news paper say this problem started last week, the problems started the first week Basin Disposal was in operation. It has been unbearable for several months, but until June 1st when we called Jamie Baily at O C D in Santa Fe for the second time in two weeks no action was taken. The next morning two people from O C D in Santa Fe started testing. They confirmed Hydrogen Sulfide to be one of the chemicals involved. It has been found in excess of 50 parts per million in the area. How high in excess of 50 ppm is unknown because the meter O C D borrowed only went to 50 ppm. Attached is a chart showing the toxicity of Hydrogen Sulfide.

We're afraid to stay in our homes, but where can we go?

Below are signatures of people directly affected or concerned about those who are affected by the smell and the film coming from Basin Disposal Inc., County Road 5046.

We would greatly appreciate some action concerning this matter.

Jack T. Hilt  
Charles D. Adams

632-2437

Dean Lewis 632-3746

Frank R. Shindler

James C. Sack 632-3880

Irene Webber

Lester Webber

632-8249 - DONT KNOW  
NOTHING

~~XXXXXXXXXX~~

TABLE - 1.2  
TOXICITY OF HYDROGEN SULFIDE

PPM L <sub>1</sub> (PARTS PER MILLION)	0.5 - 1 MINUTES	1.2 - 15 MINUTES	15 - 30 MINUTES	30 MINUTES TO ONE HOUR	1 - 4 HOURS	4 - 8 HOURS	8 - 48 HOURS
5 - 100				Mild conjunctivitis; respiratory tract irritation			
150	Coughing; Irritation of eyes; loss of sense of smell.	Disturbed respiration; pain in eyes; sleepiness	Throat irritation	Salivation and mucous discharge; sharp pain in eyes; coughing	Increased symptoms. <sup>A</sup>	Hemorrhage and death <sup>A</sup>	
150 - 200	Loss of sense of smell.	Throat and eye irritation.	Throat and eye irritation	Difficult breathing; blurred vision; along; light shy.	Serious irritation effect. <sup>A</sup>	Hemorrhage and death <sup>A</sup>	
250 - 350	Irritation of eyes; loss of sense of smell.	Irritation of eyes.	Painful secretion of tears; watering.	Light shy; nasal catarrh; pain in eyes; difficult breathing; conjunctivitis.	Hemorrhage and death. <sup>A</sup>		
350 - 450	Irritation of eyes; loss of sense of smell.	Difficult respiration; coughing; irritation of eyes.	Increased irritation of eyes and nasal tract; dull pain in head; watering; light shy.	Dizziness; weakness; increased irritation; death.	Death. <sup>A</sup>		
600	Coughing; collapse and unconsciousness. <sup>A</sup>	Respiratory disturbances; irritation of eyes; collapse. <sup>A</sup>	Serious eye irritation; light shy palpitation of heart; a few cases of death.	Severe pain in eyes and head; dizziness; trembling of extremities; great weakness and death. <sup>A</sup>			
600 or greater	Collapse; unconsciousness; death.						

Data secured from experiments on dogs which have a susceptibility similar to men.  
Source: National Safety Council data sheet D-chem. 16

THE ASSOCIATED PRESS

Frank Chavez, district supervisor for the Oil Conservation Division of the state Energy and Minerals Department, said Friday that the federal Environmental Protection Agency determines what substances are considered hazardous waste. He said hazardous waste should not be used as a generic term.

He said that oil field waste dumped at the site is not potentially hazardous, although it could be considered potentially polluting because if not disposed of properly it could contaminate ground water.

The Oil Conservation Division has determined that a small amount of hydrogen sulfide gas and water mix were dumped in the holding pond at the Basin Disposal Inc. waste disposal site north of Bloomfield.

6D... DI...



WELL SERVICE COMPANY INSPECTION

NAME OF COMPANY: Basin Disposal

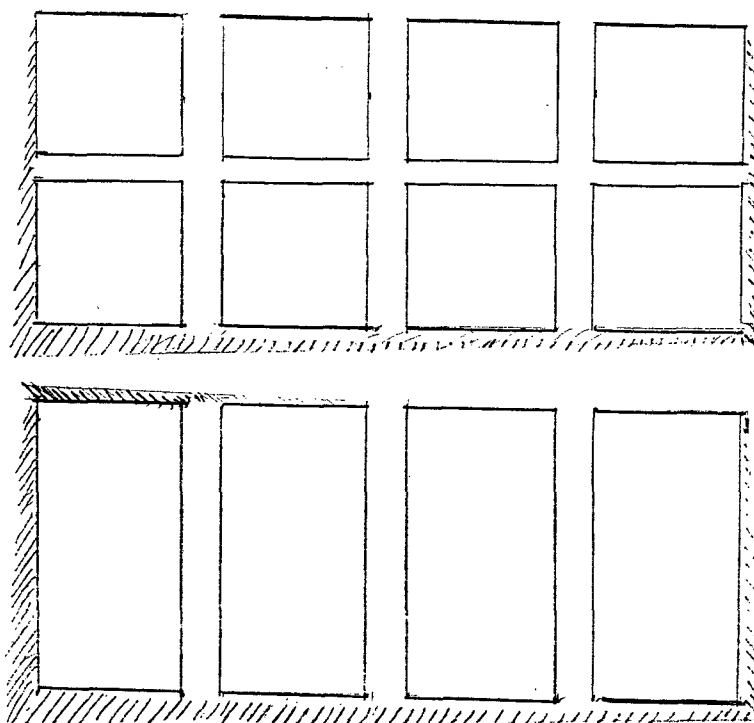
LOCATION: 29N 11W Sec 3

INSPECTION DATE: 6/17/87 and 6/19/87

REPORT: 6/17/87 : Measured background  $H_2S$  levels  
(see attached sheets) using Gastech personal  $H_2S$  meter then  
turned on sprayers on evap. pond and measured  $H_2S$   
levels every hour. Measured  $H_2S$  levels at private residence  
(0.2 - 0.4 ppm) after complaint of odors.

6/19/87 : Hand augered boreholes West and North  
of Basin Disposal fence lines in adjacent arroyo's. Augered  
up to 20 feet in Northern hole and no groundwater  
was found. ~~Dug~~ Dug holes in arroyo South of Basin Disposal  
fence line to determine extent of black zones in near  
surface soils. Black zones extend approximately 25' down  
arroyo (East) from sample hole Shovel Hole #1 which  
was sampled on 1<sup>st</sup> week of June. Remeasured  $H_2S$   
levels with sprayers on and sampled main pit  
water for  $H_2S$  levels

Readings by Olson, Oct  
WJK



Trailer

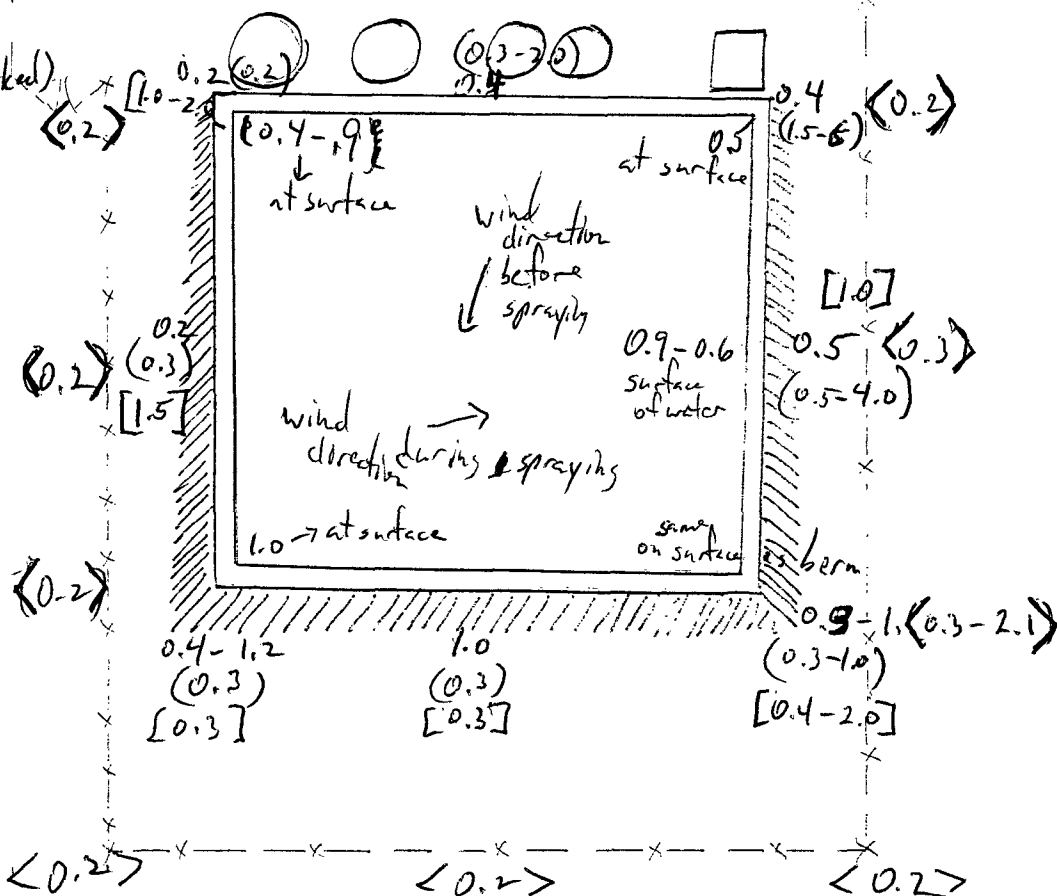
~~Q~~ before spraying

0.2 - on term & surface (as marked)  
before spraying

during ~~spraying~~

{ ( ) top of berm  
 { < > outside fence  
 { [ ] base of berm

One wants to use meter  
on Noon Monday ~~also~~



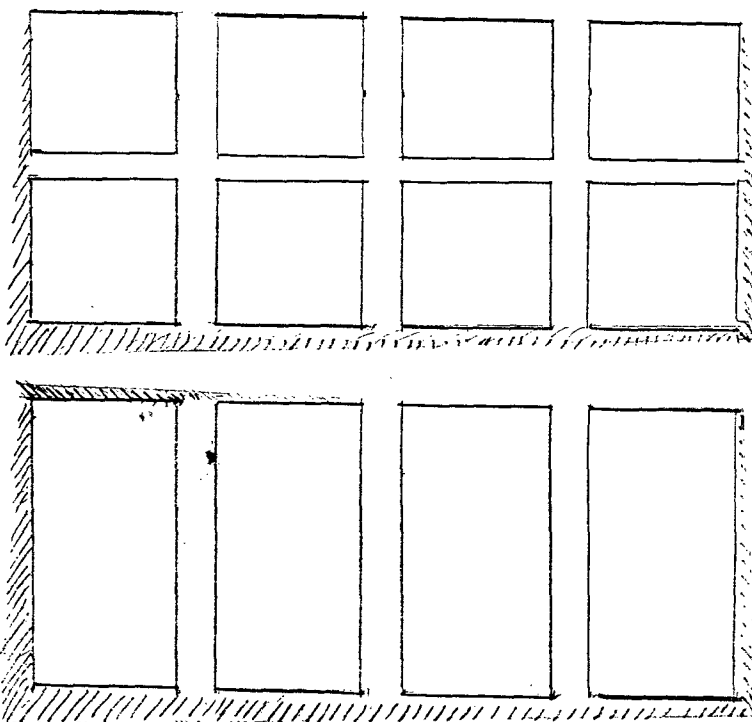
NOT TO SCALE

Biasini  
Disposal

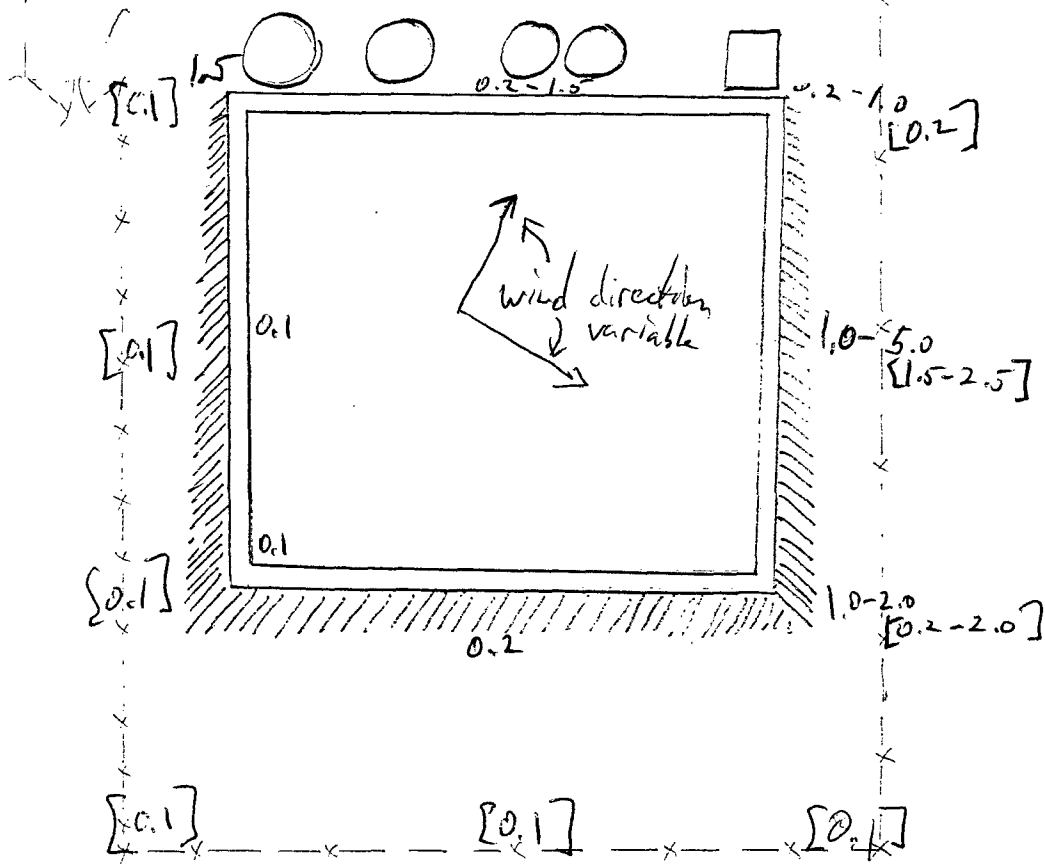
H<sub>2</sub>S readings  
(ppm)  
6/17/87

Readings by Olson, OCB  
ASB

Time = 201400



Trailer — 0.2



Payne residence  
0.2-0.4

[ ] reading at fence.  
0.1 - reading on berm

NOT TO SCALE

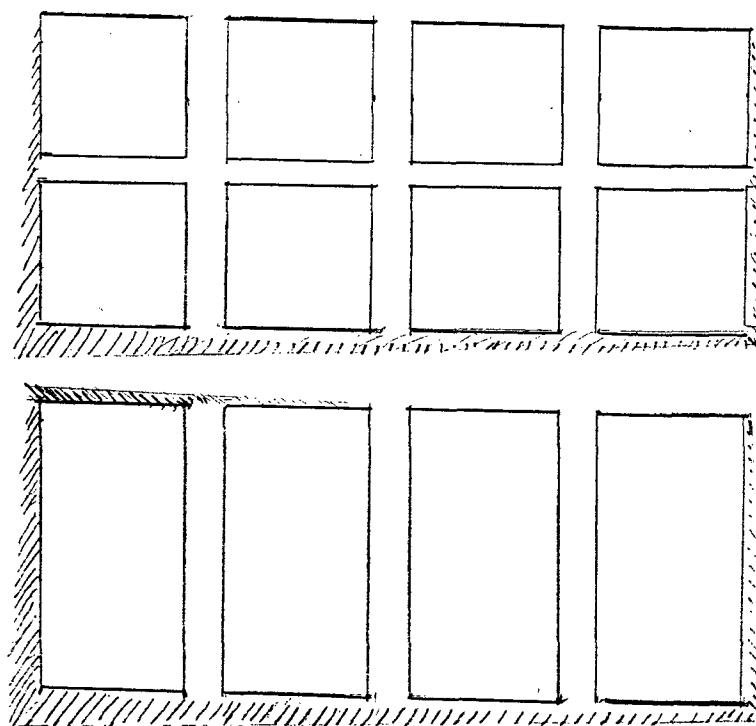
Basin:  
Disposal

H<sub>2</sub>S readings (ppm)

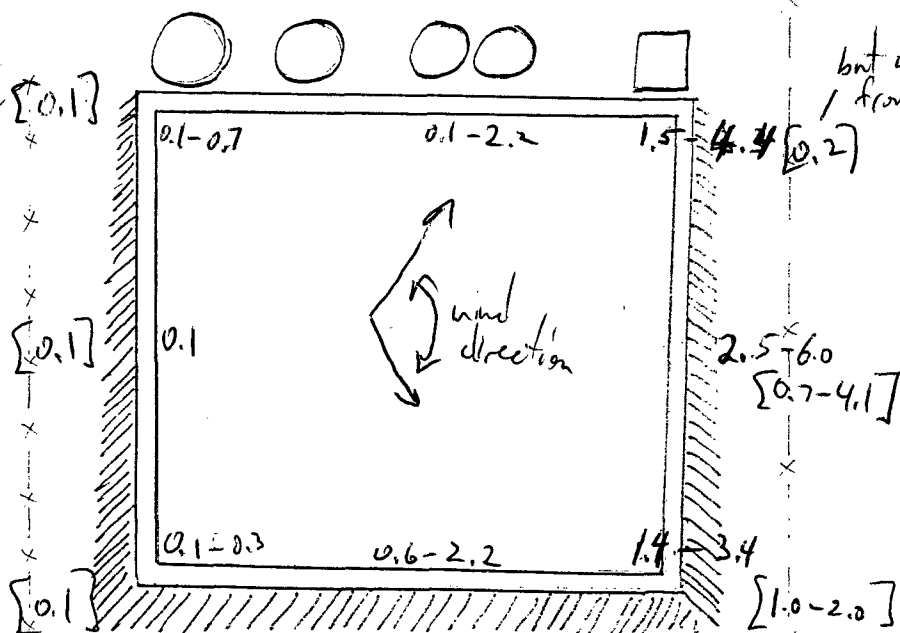
6/17/87

Time: 1500

Readings by  
Olson, DCS  
RYS



Trailer



but wind  
from west

[ ] - reading at fence  
0.1-0.7 - reading on berm

NOT TO SCALE

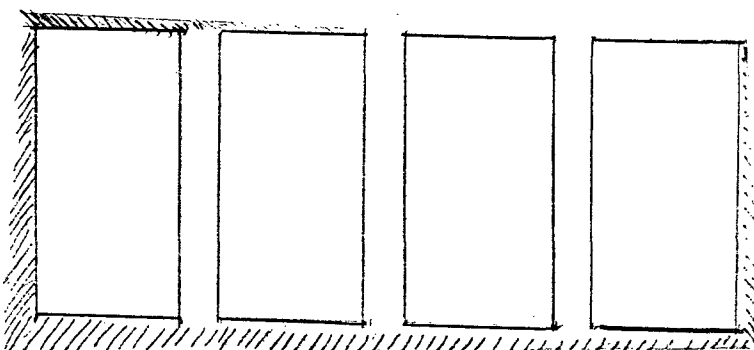
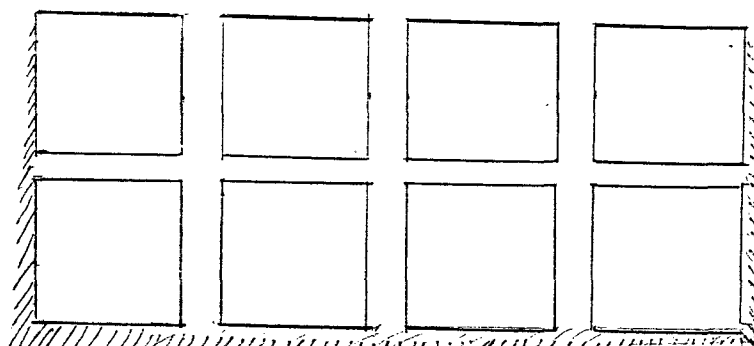
Basin  
Disposal

H<sub>2</sub>S readings (ppm)

6/17/87

Time: 1600

Readings by Olson, OCS  
ARR



Trailer

[0.1]



0.1

0.1

0.1

[0.2]

[0.1]

0.1

mostly from south

1.5-3.6

[1.5-4.0]

wind direction

[0.1]

0.1

0.2-1.3

0.6-3.4

[0.5-3.2]

[0.1]

[0.1]

[0.1]

0.1 - reading on berm  
[ ] - reading at fence

NOT TO SCALE

Basin  
Disposal

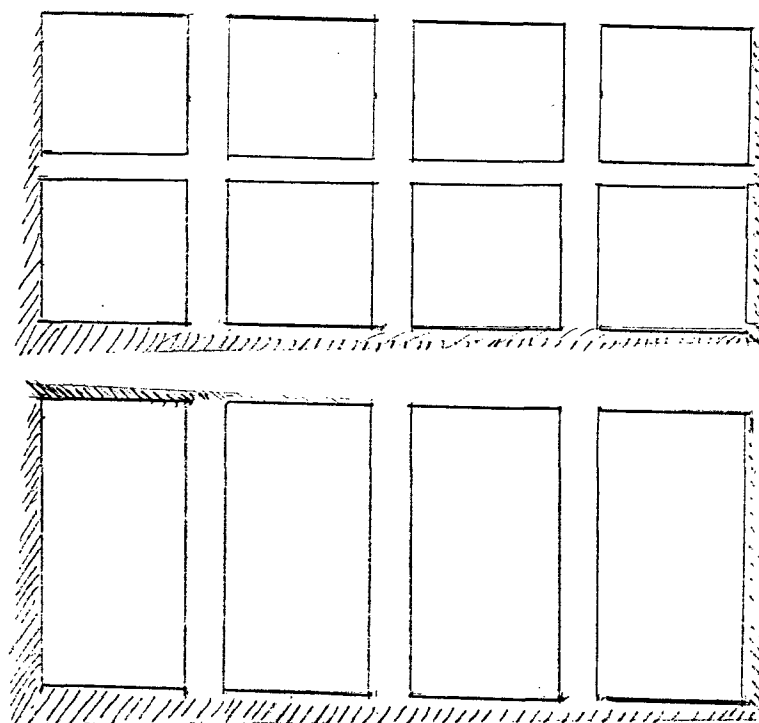
$H_2S$  readings (ppm)  
6/17/87

Time: 1700

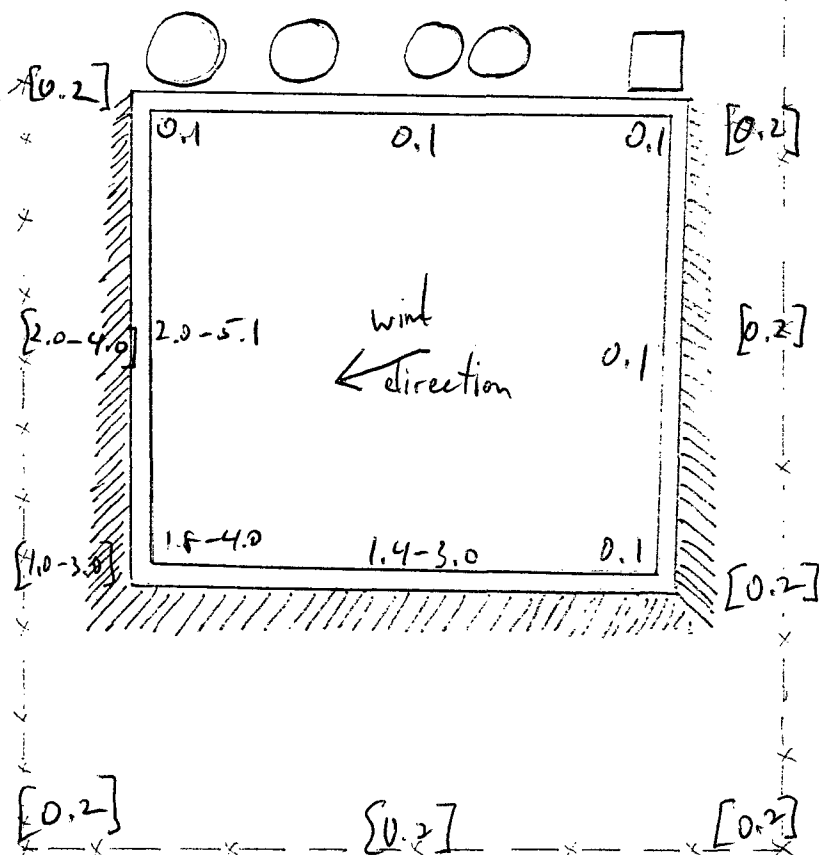
Readings by Olson, OLS  
RSG

Water temp =  $20^{\circ}F$   
(in pond)

0.1 - reading on berm  
[ ] - " " fence



Trailer



NOT TO SCALE

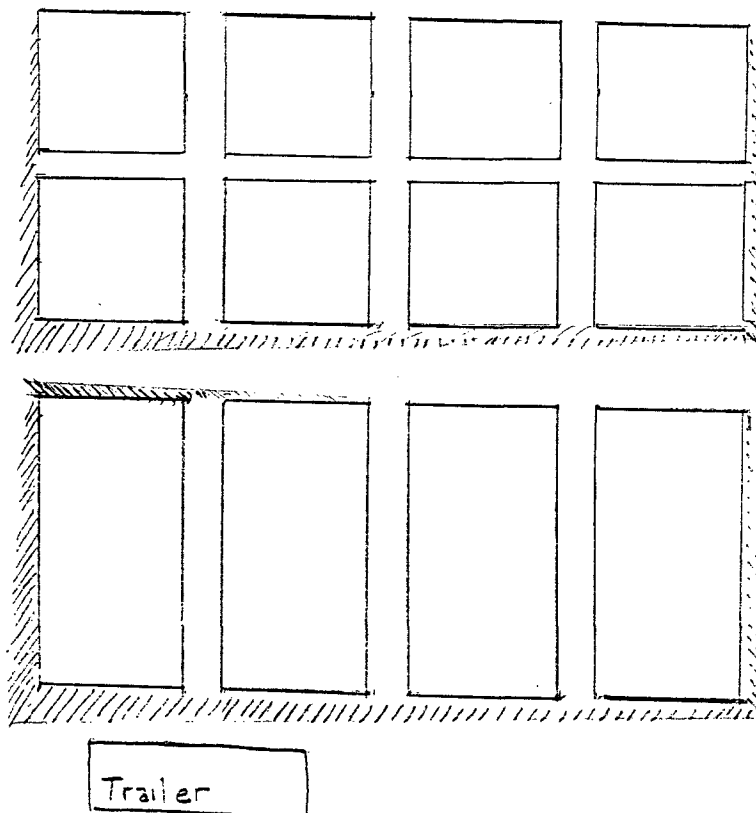
Basin  
Disposal

H<sub>2</sub>S Readings (ppm)

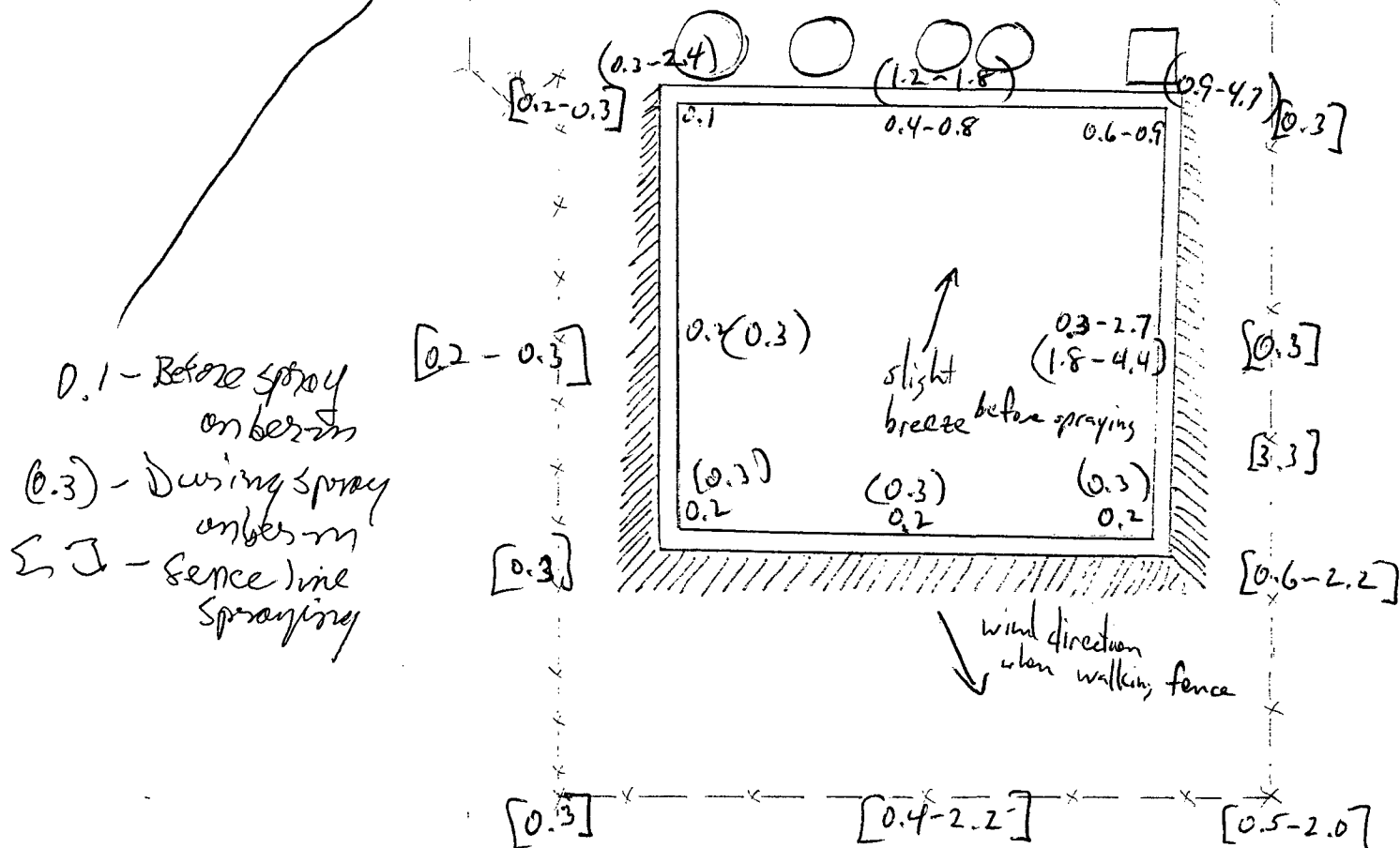
8/06/19

1015

Readings by Boyer/  
Olson, OLP  
AGB



Trailer



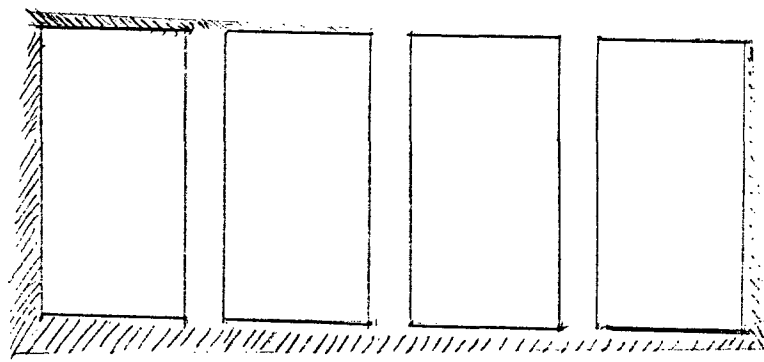
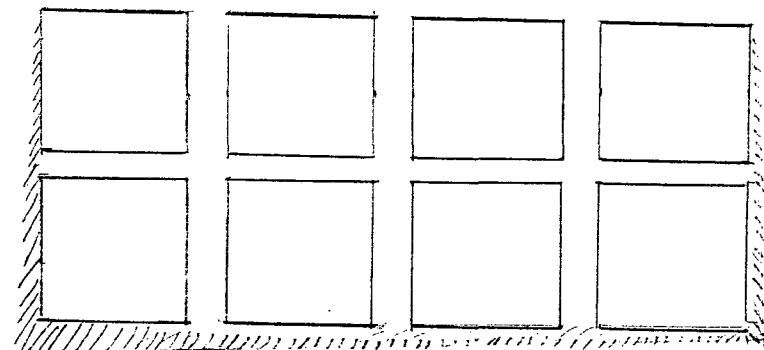
NOT TO SCALE

ESS10  
DISPOS3

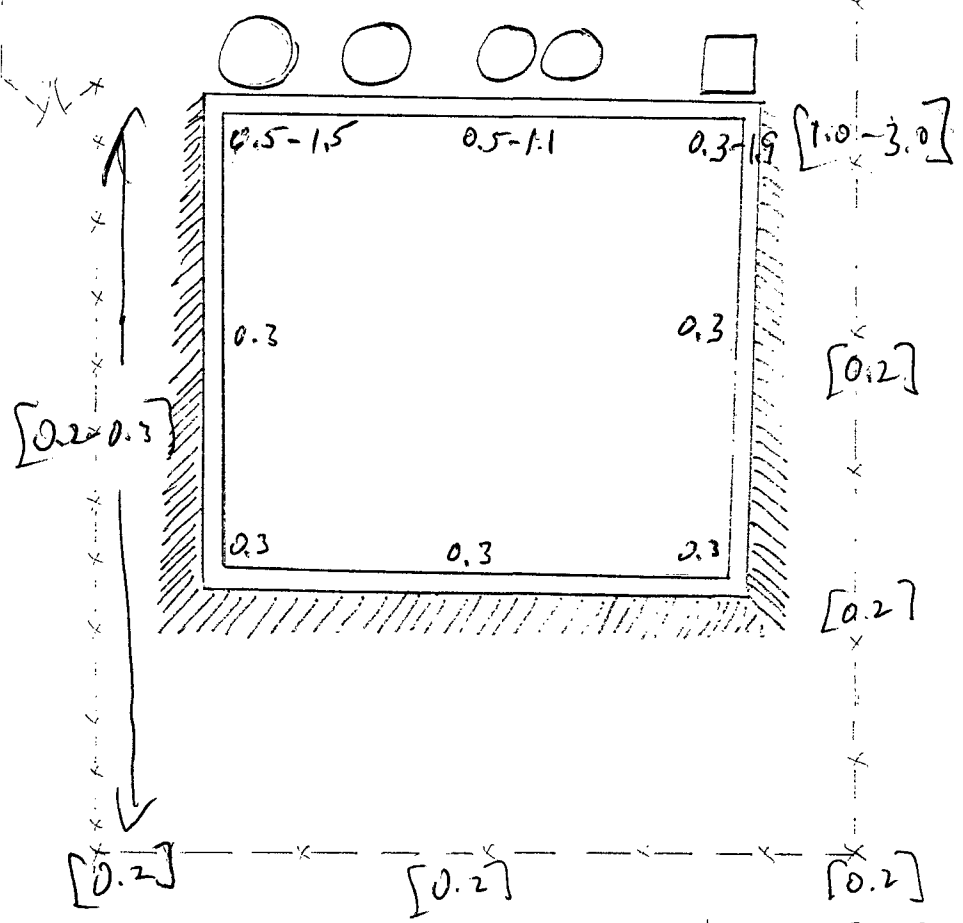
# H<sub>2</sub>S Readings (ppm)

6/19/87  
1115

wind variable + slight  
throughout test  
Readings by Olson, OLS



Trailer



NOT TO SCALE



ENERGY AND MINERALS DEPARTMENT  
OIL CONSERVATION DIVISIONGARREY CARRUTHERS  
GOVERNOR

June 19, 1987

POST OFFICE BOX 2088  
STATE LAND OFFICE BUILDING  
SANTA FE, NEW MEXICO 87501  
(505) 827-5800CERTIFIED MAIL  
RETURN RECEIPT REQUESTEDBasin Disposal, Inc.  
c/o Walsh Engineering  
P.O. Drawer 419  
Farmington, NM 87401RE: Produced Water and Drilling Fluid Disposal Facility  
San Juan County, NM.

Dear Mr. Walsh:

On June 8, 1987, you and Mr. David Turner received correspondence concerning the above referenced facility. In that letter, restrictions were placed on your facility based on an investigation of citizen complaints of odors originating at the evaporation pond. A copy of that letter is enclosed.

On June 15, 1987, OCD personnel observed a SSS tank truck discharging its load of gelled KCl water in one of the unlined mud disposal pits. Disposing of any materials other than drilling muds and cuttings in these pits is a violation of restriction number 4 of the June 8, 1987 letter.

On June 12 and 13, 1987, OCD personnel were at the facility investigating additional odor complaints. It was determined that these odors were being caused by the volatilization of the oil present in the mud pits.

Based on the observations and the conclusions reached in the June 8, 1987 letter, namely that the fluids in the unlined mud pits are seeping offsite, the following actions must be taken in the indicated time frames.

- 1) All oil will be removed from the unlined mud pits and stored or disposed of in a manner approved by the OCD. Removal will begin no later than Friday June 19, 1987, and be completed no later than Friday June 26, 1987.
- 2) All other liquids will be removed from the unlined mud pits and stored or disposed of in a manner

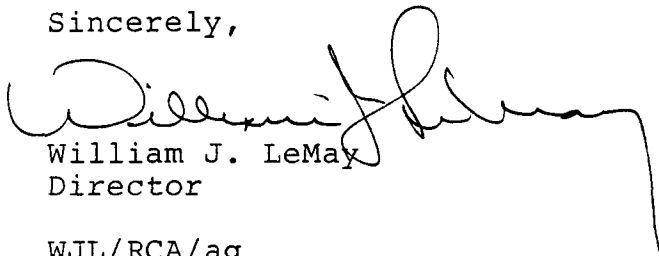
approved by the OCD. Removal will begin no later than Friday, June 19, 1987 and be completed within 30 days from receipt of this letter.

- 3) No fluids, muds or other materials will be placed in the unlined mud pits until such a time as it is determined by this office that no further seepage will occur. Upgrading and/or repair of the pits will be required before approval for use will be allowed.

All other conditions and restrictions previously placed on the facility and its operations remain in effect unless specifically altered above. Copies of previous correspondence concerning the mud pits are enclosed for your information.

If there are any questions please do not hesitate to contact David Boyer at (505) 827-5812 or Roger Anderson at (505) 827-5885.

Sincerely,



William J. LeMay  
Director

WJL/RCA/ag

cc: Jerry Sandel, Aztec  
OCD, Aztec

Enclosures



MEMORANDUM OF MEETING OR CONVERSATION

<input checked="" type="checkbox"/> Telephone <input type="checkbox"/> Personal	Time 2:30	Date 6/18/87
Originating Party		Other Parties
Kenneth Rainey 632-1789 632-1310 Automotive Shop		Janis Bailey
Subject: Brown Disposal Complaint		

Discussion  
Rainey complained of sour smell that comes + goes, but stronger in the evening. His house is across the road from B.D., but he hasn't noticed if the sprayers have been off or on. The last 2 mornings he woke up with headaches. He never noticed the smell before the petition that is circulating came to his attention, + then he noticed the smell + occasional headaches. They have a 2 month old baby with heat rash + wondered if it was due to B.D.

Rainey owns an automotive shop, works with degreaser "Varool" all the time

Conclusions or Agreements  
I assured him we were working on the problem, that DCO personnel were there again today, testing. If he has any other problems, call us not EID. His name + # were forwarded to us by EID John Nelson.

Distribution File  
Signed Janis Bailey



**CHIEF TRANSPORT CO.**

WATER AND OIL HAULING  
P.O. BOX 358 -- PH. 325-2396  
FARMINGTON, NEW MEXICO 87401

From the Desk of ..... D. C. TURNER

ENERGY AND MINERALS DEPT  
OIL CONSERVATION DIVISION

P.O. BOX 2088  
STATE LAND OFFICE BLDG  
SANTA FE NM 87501

ATT ROGER ANDERSON

Dear Senator Richardson,

RECEIVED  
JUN 17 1987  
June 12, 1987

We are writing to you in regards to the waste disposal plant located between Bloomfield and Aztec. We live approximately  $\frac{1}{4}$  mile from it. We know that there are pits which are unlined and leaking. The smell is terrible. We've had headaches and dizziness. We've been sick to our stomachs, our eyes water and mat. Even our animals have irritated eyes.

There is also damage to our car paint, vinyl tops, and mobile homes. Last summer O C D in Aztec was called about a salty looking film on the cars. It has since eaten the paint off of our cars and is cracking the vinyl tops.

We have called Oil Conservation Division in Aztec and Santa Fe. We believe they are working on the problem, but can action be taken quickly enough? The reports on television and in the news paper say this problem started last week, the problems started the first week Basin Disposal was in operation. It has been unbearable for several months, but until June 1st when we called Jamie Baily at O C D in Santa Fe for the second time in two weeks no action was taken. The next morning two people from O C D in Santa Fe started testing. They confirmed Hydrogen Sulfide to be one of the chemicals involved. It has been found in excess of 50 parts per million in the area. How high in excess of 50 ppm is unknown because the meter O C D borrowed only went to 50 ppm. Attached is a chart showing the toxicity of Hydrogen Sulfide.

We're afraid to stay in our homes, but where can we go?

Below are signatures of people directly affected or concerned about those who are affected by the smell and the film coming from Basin Disposal Inc., County Road 5046.

We would greatly appreciate some action concerning this matter.

Jack T. Hulf  
Euler D. Adams

Oscar Lewis

Joseph R. Shindler

James C. Smith

Ebenezer Webber

Lester Webber

~~\_\_\_\_\_~~

TABLE - 1.2  
TOXICITY OF HYDROGEN SULFIDE

PPM L <sub>1</sub> (PARTS PER MILLION)	0.5 - 1 MINUTES	1.5 - 3 MINUTES	30 MINUTES TO ONE HOUR	1 - 4 HOURS	4 - 8 HOURS	8 - 48 HOURS
5 - 100			Mild conjunctivitis; respiratory tract irritation			
100 - 150	Coughing; Irritation of eyes; loss of sense of smell.	Disturbed respiration; pain in eyes; sleepiness	Throat irritation	Salivation and mucous discharges; sharp pain in eyes; coughing	Increased symptoms. <sup>a</sup>	Hemorrhage and death
150 - 200	Loss of sense of smell.	Throat and eye irritation.	Throat and eye irritation	Difficult breathing; blurred vision; light shy.	Serious irritating effect. <sup>a</sup>	Hemorrhage and death
250 - 350	Irritation of eyes; loss of sense of smell.	Irritation of eyes.	Painful secretion of tears; watering.	Light shy; nasal catarrh; pain in eyes; difficult breathing; conjunctivitis.	Hemorrhage and death. <sup>a</sup>	
350 - 450	Irritation of eyes; loss of sense of smell.	Difficult respiration; coughing; irritation of eyes.	Increased irritation of eyes and nasal tract; dull pain in head; watering; light shy.	Dizziness; weakness; increased irritation; death. <sup>a</sup>	Death. <sup>a</sup>	
500 - 600	Coughing; collapse and unconsciousness. <sup>a</sup>	Respiratory disturbance; irritation of eyes; collapse. <sup>a</sup>	Serious eye irritation; light shy palpitation of heart; a few cases of death.	Severe pain in eyes and head; dizziness; trembling of extremities; great weakness and death. <sup>a</sup>		
600 or Greater	Collapse; unconsciousness; <sup>a</sup> death.					

Data secured from experiments on dogs which have a susceptibility similar to men.  
Source: National Safety Council data sheet D-chem. 16



MEMORANDUM OF MEETING OR CONVERSATION

<input checked="" type="checkbox"/> Telephone	<input type="checkbox"/> Personal	Time 11:45	Date 6/11/87
<u>Originating Party</u>		<u>Other Parties</u>	
James Bailey		Mr. Terry Crawford #16 City Rd 44 250 yds South of Broom, on Hwy	
<u>Subject</u>		598-6611-214 402	
Broom Disposal complaint			

Discussion

Crawford complained about the smell & also said that he had taken dirt samples <sup>on 5/27/87</sup> from the arroyo on the south side of the pit, outside the fence. He did not have them analyzed, but described them as oily, & with the same smell as the pit fluids. Roger Anderson said that when he & Bill Olson took <sup>OCO</sup> samples from the arroyo last week, they had seen feces & litter, & evidence of Crawford's digging around in the arroyo.

I told Crawford that OCO was aware of the arroyo & had taken samples to be analyzed.

Conclusions or Agreements

Distribution

Signed

James Bailey



ENERGY AND MINERALS DEPARTMENT  
OIL CONSERVATION DIVISION



GARREY CARRUTHERS  
GOVERNOR

POST OFFICE BOX 2088  
STATE LAND OFFICE BUILDING  
SANTA FE, NEW MEXICO 87501  
(505) 827-5800

June 8, 1987

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

Basin Disposal, Inc.  
c/o Walsh Engineering  
P.O. Drawer 419  
Farmington, NM 87401

RE: Produced Water and Drilling Fluid Disposal Facility  
San Juan County, NM.

Dear Mr. Walsh:

On June 1, 1987 several complaints were registered with this office by residents living in the vicinity of the above-referenced facility concerning a chemical odor coming from the evaporation pond. One complainant stated their family is suffering from headaches, nausea, etc, and that their teen-age son became ill while inside the home the night of May 30, 1987. Members of the Division staff began an investigation on June 2, 1987 to determine the source and composition of the odor.

It was determined that the odor is from hydrogen sulfide being released from the water in the pit. Concentrations of H<sub>2</sub>S around the pit were obtained using a meter that registered in parts per million (ppm) with a maximum reading of 50 ppm. When the sprayers are not in use the H<sub>2</sub>S concentration ranged from 0 ppm to 2.5 ppm depending on wind direction. When the sprayers were in use the concentration of H<sub>2</sub>S was 50+ ppm (maximum meter reading) down wind of the pit. In an effort to ascertain the maximum level of H<sub>2</sub>S possible, a sample container was half filled with pit water, capped and shaken. A Drager Tube, with a maximum range of 200 ppm, was used to sample the air space above the water. A reading of over 200 ppm was obtained indicating still higher concentrations possible.

While testing the remainder of the facility for possible H<sub>2</sub>S sources, salt deposits were observed on the sides of the berms of the three south mud pits and in the arroyo south of your property. Subsequent augering in the arroyo revealed dark, hydrocarbon stained soil from approximately one inch below the surface with a thickness of from one to three feet. Water

level was approximately one foot below the surface. An auger hole was placed upgradient and to the west with no water found and bedrock encountered at approximately eight feet. The mud pits contained high TDS water and oil, and from the observations in the arroyo, are seeping offsite.

From the above observations and preliminary tests the following restrictions will be placed on the facility and operations:

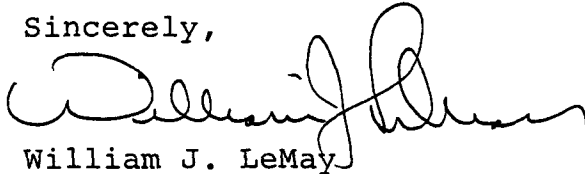
- 1) The spray evaporation system will not be operated until such time as the  $H_2S$  concentrations are at safe levels. If the spray system is to be placed back in operation, chemical treatment to reduce the  $H_2S$  concentration and demonstration that safe levels have been achieved will be required. Additionally, a testing and monitoring plan to prevent reoccurrence must be submitted.
- 2) Based on testing results, the potential concentration of  $H_2S$  is in excess of 100 ppm, therefore the facility must comply with Rule 118 of the OCD Rules and Regulations (enclosed). Appropriate signs, safety devices, contingency plans and training must be employed.
- 3) The one and one-half foot freeboard level must be maintained in the evaporation pit. If fluids will continue to be received during this period, enough tankage will be in place to maintain minimum freeboard.
- 4) Only Drilling muds and cuttings will be placed in the mud pits. The fluids in the mud pits will be removed as soon as possible. Once the fluids now present are removed, any fluids received with drilling muds or cuttings or separated during the drying process will be removed promptly. Basin Disposal must submit for approval a reasonable schedule for the removal of these fluids.
- 5) There will be no offloading of any substance in the pits or tanks when the facility is not manned.
- 6) Oil is being physically treated for separation at the facility. This places the facility under the definition of a treating plant. If oil separation of any type is to continue an application for a treating plant permit must be submitted to the Director for his evaluation. (Rule 312 enclosed.)

All other conditions and restrictions previously placed on the facility and its operations remain in effect unless specifically altered above.

The OCD appreciates the cooperation we have received by you, your staff and others involved in Basin Disposal. We will continue to work with you in any way possible to find a solution to this existing problem.

If there are any questions please do not hesitate to contact David Boyer at (505) 827-5812 or Roger Anderson at (505) 827-5885.

Sincerely,



William J. LeMay  
Director

WJL/RCA/ag

cc: Jerry Sandel, Aztec  
OCD, Aztec

David C. Turner  
6/10/87

CITIZEN COMPLAINT INVESTIGATION  
~~WELL SERVICE COMPANY INSPECTION~~

NAME OF COMPANY: BASIN DISPOSAL

LOCATION: SAN JUAN COUNTY

INSPECTION DATE: 6/2/87 - 6/4/87

REPORT: An investigation into the composition of an odor was initiated in response to complaints from residents adjacent to Basin Disposal's facility. On arrival at the facility on 6/2/87 initial measurements were taken for the presence of  $H_2S$  using a Dräger tube. The sprayers were not in operation and there was no indication of  $H_2S$  present at the top of the leach. A  $\frac{1}{2}$  gal sample of the pit water was placed in a 1 gal container, capped and shaken. The air in the container was then tested for  $H_2S$ . The concentration exceeded the 200ppm detection <sup>limit</sup> of the Dräger tube.  
~~The residents were interviewed~~

Following the initial tests, the complainants were interviewed to ascertain the exact nature of their complaints and the conditions that prompted the complaints. The primary complaint of strong odor causing illness occurs primarily when the spray system is in operation. The

residents stated that the spray system has <sup>been</sup> operating in the evening and through weekends when the facility is unmanned.

Following the interviews, an  $H_2S$  meter was borrowed to better determine the level of  $H_2S$  under spray and non-spray conditions. The attached ~~figures~~ <sup>ed</sup> figures indicate the observed ~~the~~  $H_2S$  meter readings at various points within the facility and the conditions existing at the observation times. The meter was calibrated from 0 to 50 ppm in increments of 2.5 ppm.

While taking  $H_2S$  readings in the area of the upper mud ponds, salt deposits were observed on the sides of the berms of the three south mudpits and in the arroyo south of the facility fence. Six shovel and/or auger holes were placed in the arroyo in positions indicated on the attached ~~figure~~ <sup>figure</sup>. (Hole #1 had black stained sand with an HC odor from 1/4" to 6". Water level was about one foot. Just west of hole 1 was a

red seep from the side of the  
array. Sp Cond. 20500 @ 14.2°C

Hole #1A - in a branch off the  
main array - no stain  
encountered.

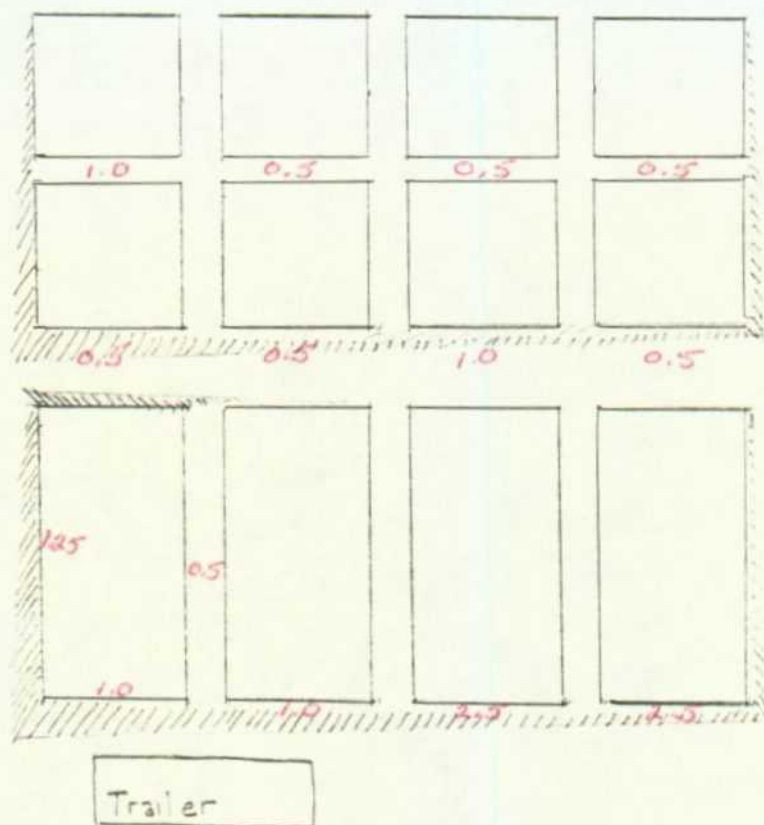
Hole #2. - Block stained <sup>sand</sup> ~~soil~~ with  
HC odor from 6" to 2 feet.  
H<sub>2</sub>O level about 1½ feet.  
Sp Cond 22000 @ 16.5°C

Hole #3 ~~23A~~ - Block stained sand ~~soil~~ <sup>with</sup>  
HC odor from ½" to 2½ ft  
Samples very foamy.  
Sp Cond 19,000 @ 16.5°C  
~~data~~

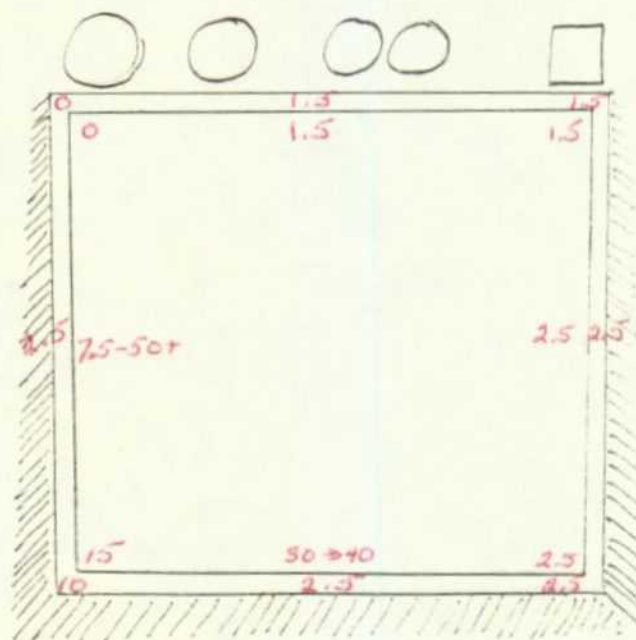
Hole 3A - 1 ft west of #3. Used  
for soil sample only.

Hole #4 - Appx 20 ft west (upgrading  
of facility fence, Augered  
to bed rock at 7'. No  
groundwater. No block  
stained zones.

Basin  
Disposal



WIND direction  
10 mph  
GUSTING TO  
20 mph



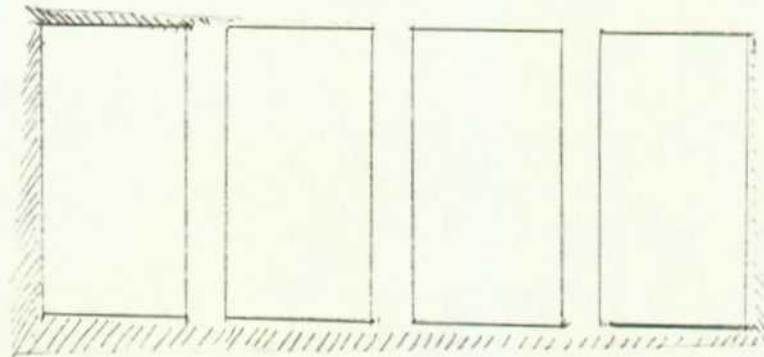
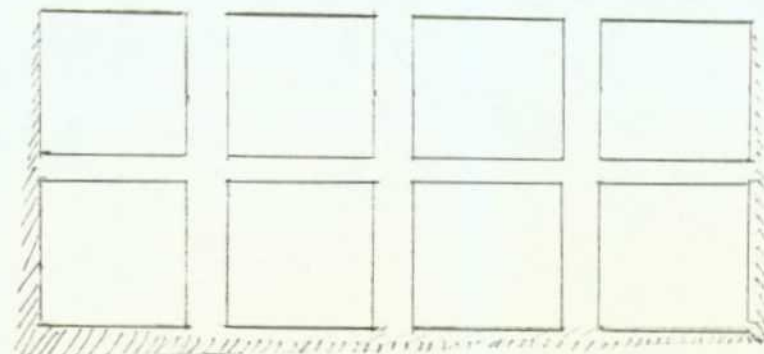
H<sub>2</sub>S meter readings (ppm)

6/2/87 1530 hrs

SPRAYERS NOT OPERATING

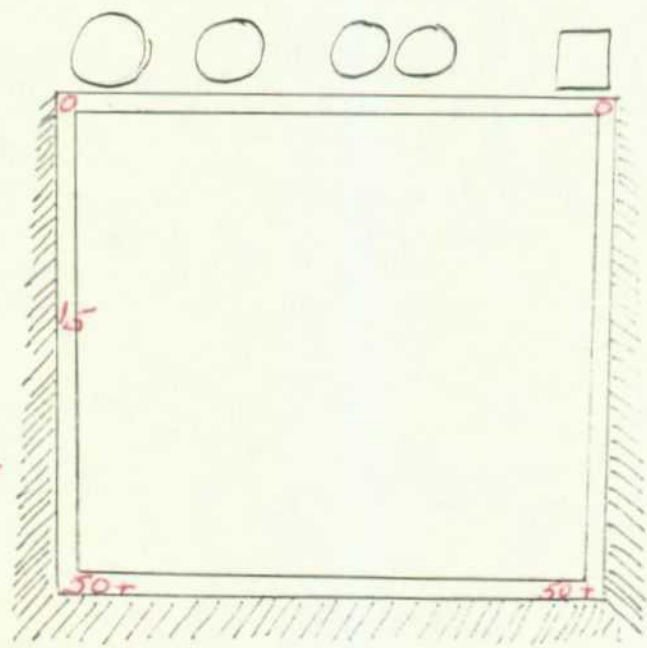
NOT TO SCALE

Basin  
Disposal



Trailer

WIND  
10 mph  
Gust to 20 mph



H<sub>2</sub>S meter readings (ppm)

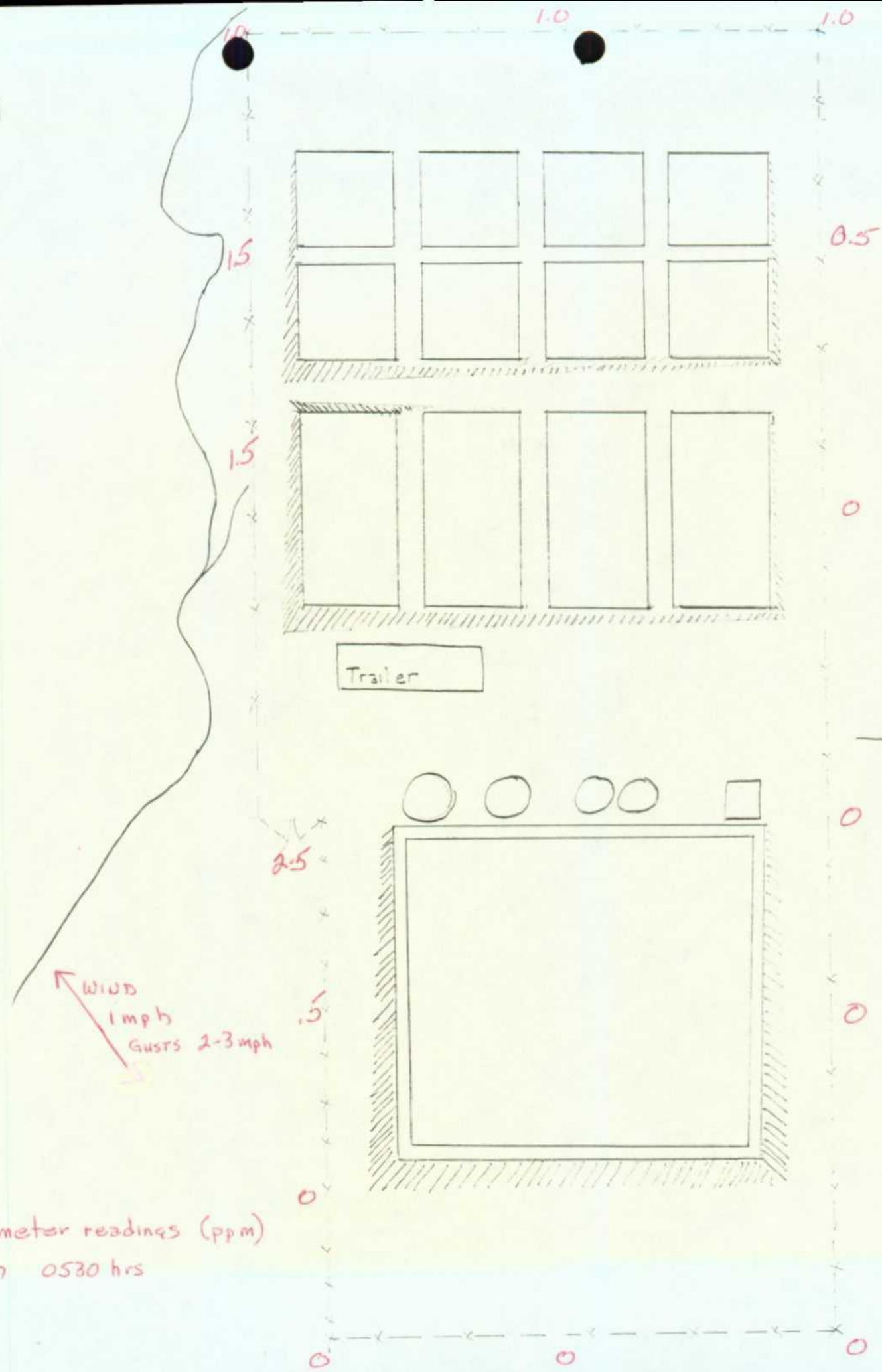
6/2/87 1600 hrs

Sprayers Operating

NOT TO SCALE

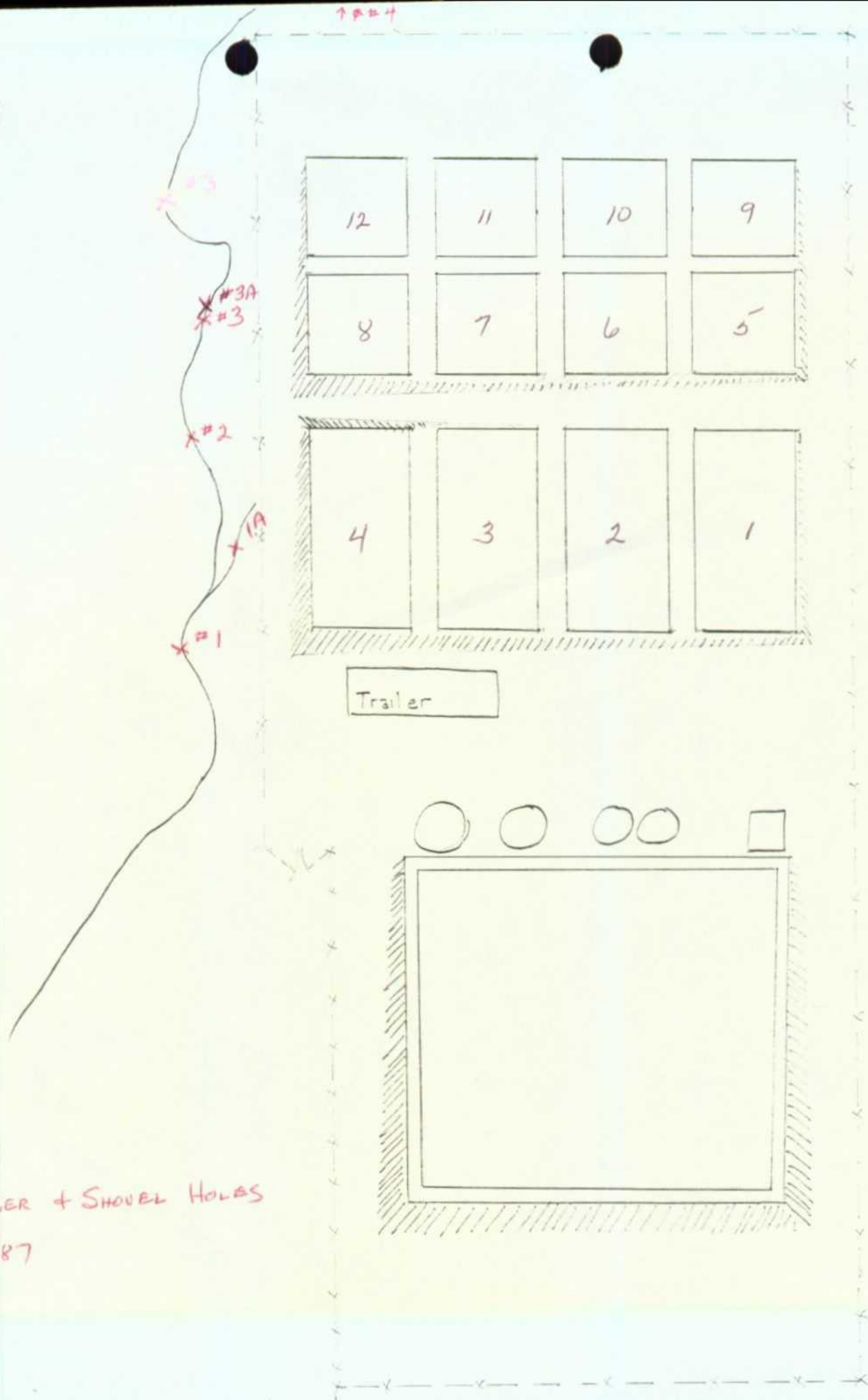


Basin  
Disposal



H<sub>2</sub>S meter readings (ppm)  
6/3/87 0530 hrs

Basin  
Disposal



AUGER + SHOVEL HOLES  
6/3/87



MEMORANDUM OF MEETING OR CONVERSATION

<input checked="" type="checkbox"/> Telephone	<input type="checkbox"/> Personal	Time	Date 6/1/87
<u>Originating Party</u>		<u>Other Parties</u>	
TMM Mrs. + Payne		Jamie Bailey	
<u>Subject</u> Basin Disposal			
<u>Discussion</u> The complaint was made about odors coming from Basin Disposal evaporation pond. The family is suffering from headaches, nausea, etc. The teenage son got sick while inside his trailer the night of 5/30/87. I told Mrs. Payne that DCS personnel were on their way to Bloomfield, described the vehicle & told them they would be contacted the next day.			
<u>Conclusions or Agreements</u>			
<u>Distribution</u>			
Signed			Jamie Bailey



MEMORANDUM OF MEETING OR CONVERSATION

<input checked="" type="checkbox"/> Telephone	<input type="checkbox"/> Personal	Time 10:50	Date 6/1/87
<u>Originating Party</u> Dorothy de Herrera 632-8094 632-3344		<u>Other Parties</u> Janis Bailey	
<u>Subject</u> Complaint of smell from Basin Disposal			
<u>Discussion</u> Ms de Herrera lives on east side of Hwy 1/2 mi north of facility. Last year there was a slight chemical smell coming from pit. This year a very strong smell of sewage coming from pit. Odor causes headaches, is so bad they can't open their windows.			
<u>Conclusions or Agreements</u> I told her OCS people would sample pit tomorrow & see what lab says. We will work on alleviating smell.			
<u>Distribution</u> File		Signed Janis Bailey	



MEMORANDUM OF MEETING OR CONVERSATION

☒ Telephone

☐ Personal

Time

2:00

Date

5/22/87

Originating Party

Other Parties

Tim + Terri Payne 632-9132

Janis Bailey

P.O. Box 305 Bloomfield 87413

Subject

Complaint of spray at Basin Disposal

Discussion

The Paynes live in the trailer closest to the Hwy. There is oil floating on the horse trough + in the kids' swimming pool. The sprayers are left on all weekend + spray goes everywhere.

Conclusions or Agreements

I talked to Red Walsh who said they work 7AM - 7PM + the sprayers are only on during working hours. They will monitor wind speed + spray more closely.

Distribution

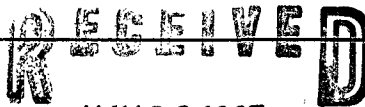
file

Signed

Janis Bailey

## NEW MEXICO OIL CONSERVATION COMMISSION

## NOTIFICATION OF FIRE, BREAKS, SPILLS, LEAKS, AND BLOWOUTS

NAME OF OPERATOR TENNECO OIL COMPANY				ADDRESS P.O. BOX 3249, ENGLEWOOD, CO 80155			
REPORT OF	FIRE	BREAK	SPILL X	LEAK	BLOWOUT	OTHER*	
TYPE OF FACILITY	DRLG WELL	PROD WELL X	TANK BTY	PIPE LINE	GASO PLNT	OIL REY	OTHER*
NAME OF FACILITY FIELDS LS 2A							
LOCATION OF FACILITY (QUARTER/QUARTER SECTION OR FOOTAGE DESCRIPTION) NE/SE				SEC. 25	TWP. 32N	RGE. 11W	COUNTY SAN JUAN
DISTANCE AND DIRECTION FROM NEAREST TOWN OR PROMINENT LANDMARK							
DATE AND HOUR OF OCCURENCE 5/9/87 at 7:15 AM				DATE AND HOUR OF DISCOVERY 5/9/87 at 7:15 AM			
WAS IMMEDIATE NOTICE GIVEN?	YES X	NO	NOT REQUIRED		IF YES, TO WHOM CHARLES GHOLSON		
BY WHOM MARTY BUYS				DATE AND HOUR 5/9/87 at 6:50 PM			
TYPE OF FLUID LOST CRUDE OIL				QUANTITY OF LOSS 230 bbls.		VOLUME RECOVERED 175 bbls.	
DID ANY FLUIDS REACH A WATERCOURSE?		YES	NO X	QUANTITY			
IF YES, DESCRIBE FULLY **							
 MAY 22 1987 OIL CON. DIV. DIST. 3							
DESCRIBE CAUSE OF PROBLEM AND REMDIAL ACTION TAKEN **							
The tank drain valve was not closed when the tank went back into service.							
DESCRIBE AREA AFFECTED AND CLEANUP ACTION TAKEN**							
175 bbls. were recovered. 55 bbls. of waste oil were disposed of at Basin Disposal. The tank fire walls were rebuilt.							
DESCRIPTION OF AREA	FARMING		GRAZING X		URBAN		OTHER*
SURFACE CONDITIONS	SANDY	SANDY LOAM	CLAY X	ROCKY	WET	DRY X	SNOW
DESCRIBE GENERAL CONDITIONS PREVAILING (TEMPERATURE, PRECIPITATION, ETC.)**							
68°F, light winds, sunny							
I HEREBY CERTIFY THAT THE INFORMATION ABOVE IS TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF.							
SIGNED <i>Martin W. Buys</i>				Staff Environmental/ Safety Coordinator			
TITLE				DATE 5/18/87			

\*SPECIFY

\*\* ATTACH ADDITIONAL SHEETS IF NECESSARY



MEMORANDUM OF MEETING OR CONVERSATION

☒ Telephone ☐ Personal

Time 2 PM

Date 2/18/87

Originating Party

JAMI BAILEY

Other Parties

RED WALSH - BASIN DISPOSAL

Subject  
COSTS OF PRODUCED WATER DISPOSAL

Discussion  
CHARGE FOR DISPOSING PRODUCED WATER: \$50/LOAD;  
FOR DRILLING MUD: \$75/LOAD. CLOSEST TRUCKING CO:  
(4 MI. SOUTH OF AZTEC)  
SSS TRUCKING - SSS CHARGES \$38.25 + TAX/HOUR. DISPOSAL  
REQUIRES ABOUT 1/2 HOUR.

Conclusions or Agreements

Distribution

FILE

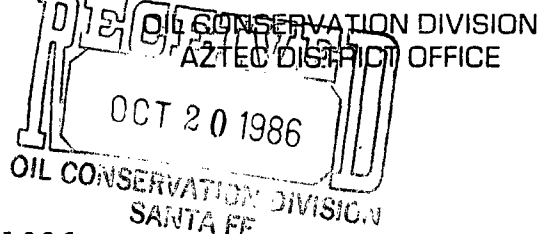
Signed

Jami Bailey



TONEY ANAYA  
GOVERNOR

STATE OF NEW MEXICO  
ENERGY AND MINERALS DEPARTMENT



1000 RIO BRAZOS ROAD  
AZTEC, NEW MEXICO 87410  
(505) 334-6178

October 15, 1986

Basin Disposers, Inc.  
c/o Walsh Engineering  
P.O. Box 419  
Farmington, NM 87499

Re: Request for mud pit construction

Dear Red:

Your request to expand your mud disposal facility is approved on condition that free water is removed from the existing pits in a timely manner. Also, more care needs to be taken to remove the oil from these pits and not allow any more oil to be placed in them.

Sincerely,

Frank T. Chavez  
District Supervisor

FTC/dj

xc: Jamie Bailey  
Operator File





STATE OF NEW MEXICO  
ENERGY AND MINERALS DEPARTMENT  
OIL CONSERVATION DIVISION

TONY ANAYA  
GOVERNOR

October 6, 1986

POST OFFICE BOX 2088  
STATE LAND OFFICE BUILDING  
SANTA FE, NEW MEXICO 87501-2088  
(505) 827-5800

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

Mr. E. N. Walsh, P.E.  
Walsh Engineering & Production Corp.  
P. O. Drawer 419  
Farmington, New Mexico 87401

Dear Mr. Walsh:

On October 2, 1986, OCD personnel, namely, Frank Chavez, Jami Bailey and I, visited the Basin Disposal facility. Upon arrival, the wind was constant at 15 miles per hour, gusting to 18 miles per hour. The wind was carrying spray not only outside the pit berms, but outside the fenced property line. The wind increased while we were there and we requested the sprayers be turned off. The Basin Disposal supervisor on duty indicated that as long as the wind direction was away from the neighboring trailers, he was allowed to operate the spray system.

To reaffirm the "Instructions to Supervisors" which you submitted to us with your March 27, 1986, letter, "If windspeed reaches 15 miles per hour (13 knots), constant or in gusts, shut down the spray system until wind is constant at 10 miles per hour (8.5 knots)."

Spray from the pond will not be allowed to drift beyond the bermed area of the lined pit. Approval for use of the spray system was conditioned upon shut down of sprayers "if problems arise with wind carrying spray outside the berm" (OCD approval letter dated December 16, 1985). Continued use of the spray system when winds carry spray outside the pit berms may result in withdrawal of OCD approval for use of the spray system.

In addition, free floating fluid was observed on all the drilling mud pits. This fluid shall be removed from the surface of these unlined pits, and these pits shall be maintained in such a manner as to prevent, as much as is practicable, the accumulation of fluid on the surface of the pits.

If you have any comments or questions, please contact Jami Bailey at 827-5884.

Sincerely,

R. L. STAMETS  
Director

RLS:JB:dp

cc: Frank Chavez, Aztec District Office



ENGINEERING & PRODUCTION CORP.

Petroleum Engineering Consulting  
Lease Management  
Contract Pumping

3001 Northridge Drive  
P.O. Drawer 419  
Farmington, New Mexico 87401  
(505) 327-4892

October 3, 1986

Mr. Frank Chavez  
N.M. Oil Conservation Commission  
1000 Rio Brazos Road  
Aztec, New Mexico 87410

REF: Drilling Mud Disposal Pits  
Basin Disposal, Inc.  
Unit E & F, Section 3-T29N-R11W  
San Juan County, New Mexico

Dear Mr. Chavez:

Approval is requested, on behalf of Basin Disposal, Inc., for additional pits, at the produced water disposal site, for disposing of drilling mud.

The geological study prepared for the area, and has been previously accepted, indicated the following:

1. The surface soil, 0 to 15 feet in thickness, is underlain and separated from any apparent water table by approximately 250 feet of grey, sandy, clayey shale containing thin, scattered, discontinuous sand and silt lenses (Vadose Zone).
2. No successful water wells have been drilled within a three mile radius of the site.
3. The area has been approved for septic systems and such systems are being utilized on adjacent properties.

The drilling muds that will be put in the pits will be the normal drilling muds of this area and should not propose a problem to the environment.

The pits will be approximately 40 feet wide and 220 feet long with 10 foot (plus) wide berms. The berm height varies, due to terrain, however, the minimum berm is 4 feet to prevent surface flowing waters to flow into pit. Construction will be to the west of the present pits.



-2-

It is intended to initially construct two (2) pits. However, the area of the pits is sufficient to allow construction of four (4) pits. Therefore, approval is requested for construction of four (4) pits.

The pits will be enclosed by extending the fence that encloses the produced water disposal pit and present mud disposal pits.

Unloading of drilling mud into the pits will only occur when the full facility is open and supervised by personnel on the site.

Your consideration and cooperation in approval of this request would be greatly appreciated.

Very truly yours,

ORIGINAL SIGNED BY  
EWELL N. WALSH

Ewell N. Walsh, P.E.  
President

ENW:rr

cc: Basin Disposal, Inc.  
Jamie Bailey, OCD  
Santa Fe, NM



STATE OF NEW MEXICO  
ENERGY AND MINERALS DEPARTMENT  
OIL CONSERVATION DIVISION

TONEY ANAYA  
GOVERNOR

September 12, 1986

POST OFFICE BOX 2088  
STATE LAND OFFICE BUILDING  
SANTA FE, NEW MEXICO 87501-2088  
(505) 827-5800

Mr. E. N. Walsh  
Walsh Engineering & Production  
Corporation  
3001 Northridge Dr.  
P. O. Drawer 419  
Farmington, N.M. 87401

Dear Mr. Walsh:

Enclosed are copies of analyses of samples taken at Basin Disposal in late June. The dichloromethane reported on the organics form is due to lab contamination.

If you have any questions, please call Dave Boyer at 827-5812.

Sincerely,

A handwritten signature in cursive script, appearing to read "Jami Bailey".

JAMI BAILEY  
Field Representative

JB:dp

Enc.



STATE OF NEW MEXICO  
ENERGY AND MINERALS DEPARTMENT  
OIL CONSERVATION DIVISION

TONEY ANAYA  
GOVERNOR

July 30, 1986

POST OFFICE BOX 2088  
STATE LAND OFFICE BUILDING  
SANTA FE, NEW MEXICO 87501-2088  
(505) 827-5800

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

Mr. E. N. Walsh  
Walsh Engineering Production  
Corporation  
P. O. Drawer 419  
Farmington, New Mexico 87401

RE: BASIN DISPOSAL, INC., REQUIRED MONTHLY WATER DISPOSAL REPORT

Dear Mr. Walsh:

It has come to my attention that Basin Disposal, Inc., a commercial salt water disposal system, is subject to Oil Conservation Division Rule 1120. As a regulated facility, Basin Disposal is required to file monthly, Form C-120-A in duplicate with the Santa Fe office and one copy with the Aztec District Office. This requirement will not be retroactive, but with this official notification, will commence September 1, 1986.

A copy of Rule 1120 and several copies of Form C-120-A are enclosed for your convenience. If you have any questions concerning this matter, please contact Jami Bailey at 827-5884.

Sincerely,

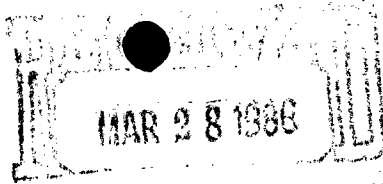
A handwritten signature in dark ink, appearing to read "R. L. Stamets", written over a horizontal line.

R. L. STAMETS  
Director

RLS:JB:dp

Enc.

cc: Aztec District Office



**WALSH**

ENGINEERING & PRODUCTION CORP.

Petroleum Engineering Consulting  
Lease Management  
Contract Pumping

3001 Northridge Drive  
P.O. Drawer 419  
Farmington, New Mexico 87401  
(505) 327-4892

March 27, 1986

Ms. Jamie Bailey  
State of New Mexico  
Oil Conservation Division  
P.O. Box 2088  
Santa Fe, New Mexico 87501

RE: Basin Disposal, Inc.  
Produced Water Disposal Pit  
San Juan County, NM

Dear Ms. Bailey:

This letter is a follow-up of our telephone conversation of March 26, 1986. During the conversation, you stated that a complaint had been given to you, by the Hargis family, concerning the deposits, presumed to come from the spray system at the pit, on objects at the Hargis house.

At approximately 2:00 pm, I met Frank Chavez at the disposal pit site. We went to the Hargis house and examined a black motorcycle. There were apparent deposits of solids on the motorcycle. The deposits would be considered minor.

The area of the house is approximately 1,000 feet to 1,200 feet southeast of the disposal pit.

During the conversation with Mr. Charles Hargis, he stated that a deposit had occurred before on objects and cars at the house. The deposits seem to occur after a night in which the wind blew with some strength.

Based upon the assumption that the deposits were due to the utilization of the spray system at the disposal pit, the following instructions were given to the persons supervising the pit operation:

1. If the wind seems to increase to a strong velocity, shut the spray system down.

Page 2  
March 27, 1986  
Ms. Jamie Bailey



The owners of the pit will install a windspeed and direction indicator as soon as such a device is purchased.

After installation, the persons supervising the pit operation will be instructed as follows:

1. If windspeed reaches 15 miles per hour (13 knots), constant or in gusts, shut down the spray system.
2. Observe the effect of wind on spray at different levels of windspeed.
3. Depending upon observed effect of wind on spray at different levels of windspeed, the above maximum level of 15 miles per hour may be increased or decreased.

The windspeed and direction indicator should be installed, depending upon availability, by April 7, 1986.

If you have any questions, please do not hesitate to contact me.

Very truly yours,

A handwritten signature in black ink, appearing to read 'Ewell N. Walsh', written in a cursive style.

Ewell N. Walsh, P.E.  
President

ENW:blk  
cc: Basin Disposal, Inc.  
Jerry Sandel  
David & D. C. Turner  
Frank Chavez, NMOCD, Aztec, NM

BASIN DISPOSAL, INC.  
PRODUCED WATER DISPOSAL PIT



INSTRUCTIONS TO SUPERVISORS

1. Until windspeed and direction indicator is installed:
  - A. If windspeed seems to increase to a strong velocity, day or night, shut down the spray system until wind speed decreases.
2. After installation of windspeed and direction indicator:
  - A. If windspeed reaches 15 miles per hour (13 knots), constant or in gusts, shut down the spray system until wind is constant at 10 miles per hour (8.5 knots).
  - B. At different levels of windspeed, observe the effect of wind on spray.
  - C. Depending upon observed effect of wind on spray, at different levels of windspeed, the above maximum level of 15 miles per hour may be increased or decreased.





MEMORANDUM OF MEETING OR CONVERSATION

☒ Telephone ☐ Personal

Time 9:30 AM

Date 3/26/86

Originating Party

Other Parties

FRANK CHAVEY

Dave Boyer

Subject

Basin Disposal - Spray drifting off site  
Complainant - Pat Hargis 334-2780 (W)  
632-2850 (H)

Discussion

Frank called to relay a complaint from Pat Hargis, a neighbor to the South of Basin Disposal, regarding spray mist drifting off-site. Hargis says at night (centes?) sprayer on which causes mist to drift and deposit salts on cars, buildings, animals and plants. Family dogs had white powder in AM. They are worried about health as well as property effects. Spray is not causing direct damage. Frank visited home and confirmed report.

Conclusions or Agreements

Frank asked ENV. Bureau to handle. We discussed calling Basin and telling them off-site drifting was at least a nuisance, and they could be liable.

Distribution

Basin Disposal file

Signed

D. H. Boyer



MEMORANDUM OF MEETING OR CONVERSATION

☒ Telephone ☐ Personal

Time 3:45

Date 3/26/86

Originating Party

Other Parties

Red Walsh - Consultant for  
Basin Disposal

Jim Bailey

Subject

Basin Disposal - Spray drifting off-site.

Discussion

Frank Chavez + Red Walsh met at the site + Walsh was shown salt deposits on neighbor's motorcycles + other property. Red Walsh talked to pit owners + they will install a wind speed + direction indicator with gauge readouts in the trailer office. All sprayers will be shut down when wind speed equals or exceeds 15mph, but the situation will be closely monitored + sprayers may be shut down to prevent spray leaving bermed area at lower wind speeds. Letters to this effect will be sent to Aztec + S.F. offices. I told Walsh they were responsible for spray or solids leaving their <sup>pit</sup> property.

Conclusions or Agreements

Distribution

File  
D. Boyer

Signed

Jim Bailey

50 YEARS



TONY ANAYA  
GOVERNOR

STATE OF NEW MEXICO  
ENERGY AND MINERALS DEPARTMENT  
OIL CONSERVATION DIVISION



1935 - 1985

December 16, 1985

POST OFFICE BOX 2088  
STATE LAND OFFICE BUILDING  
SANTA FE, NEW MEXICO 87501  
(505) 827-5800

Mr. E. N. Walsh, PE  
Walsh Engineering & Production Corp.  
P.O. Drawer 419  
Farmington, NM 87401

Re: Use of Spray Evaporation  
System at Basin Disposal,  
Inc. Evaporation Pit

Dear Mr. Walsh:

To confirm your conversation with Jami Bailey requesting use of a spray evaporation system on a 24 hour/day basis at the Basin Disposal, Inc. produced water disposal pit, it is our understanding that:

- a) Basin Disposal personnel will be on the premises and will monitor effects of the spray system at all times;
- b) Individual arrays of sprayers can be shut down if problems arise with winds carrying spray outside the berm;
- c) The spray system is currently operating at 40% capacity;
- d) Berms will be maintained so that erosion from the spray will be kept at a minimum and berm integrity will not be decreased.

On those premises, approval for use of the spray system on a 24 hour basis is hereby given.

Sincerely,

A handwritten signature in dark ink, appearing to read "R. L. Stamets", written over a horizontal line.

R. L. STAMETS  
Director

RLS/JB/dp



TONEY ANAYA  
GOVERNOR

STATE OF NEW MEXICO  
ENERGY AND MINERALS DEPARTMENT  
OIL CONSERVATION DIVISION

50 YEARS



1935 - 1985

November 27, 1985

POST OFFICE BOX 2088  
STATE LAND OFFICE BUILDING  
SANTA FE, NEW MEXICO 87501  
(505) 827-5800

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

Mr. E. N. Walsh, PE  
Walsh Engineering &  
Production Corp.  
P. O. Drawer 419  
Farmington, NM 87401

Re: Request for Approval of  
Increased Maximum Water  
Level in Basin Disposal,  
Inc. Water Disposal Pit,  
San Juan County, New Mexico

Dear Mr. Walsh:

We have received your request dated November 25, 1985, for approval to increase the maximum water level in the Basin Disposal, Inc. produced water disposal pit located in Units E and F, Section 3, Township 29 North, Range 11 West, San Juan County, New Mexico. Approval for a still-water elevation of 5720.5 feet (an increase of one (1) foot over original elevation approval) is hereby given.

The amount of free board remaining with the fluid elevation of 5720.5 feet will be 1.5 feet. This maximum elevation will also be allowed during the spray evaporation process, and supercedes Stipulation #3 on the approval dated November 25, 1985, for the Basin Disposal, Inc. spray system installation.

If we may be of further assistance, contact Jami Bailey in Santa Fe at 827-5884.

Sincerely,

R. L. STAMETS  
Director

RLS/JB/dp

Enc.

cc: OCD Office - Aztec

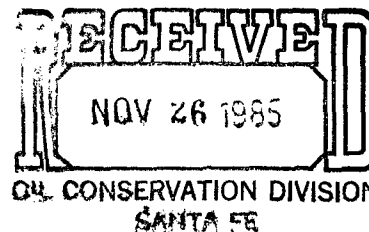


ENGINEERING & PRODUCTION CORP.

Petroleum Engineering Consulting  
Lease Management  
Contract Pumping

3001 Northridge Drive  
P.O. Drawer 419  
Farmington, New Mexico 87401  
(505) 327-4892

November 25, 1985



Mr. Richard L. Stamets  
Director  
New Mexico Energy & Minerals Department  
Oil Conservation Commission  
P. O. Box 2088  
Santa Fe, New Mexico 87504-2088

REF: Basin Disposal, Inc.  
Water Disposal Pit  
San Juan County, New Mexico

Dear Mr. Stamets:

On behalf of Basin Disposal, Inc., this is a request for approval to increase the maximum approved water level in the above-referred-to pit from an elevation of 5719.5 feet to 5720.5 feet. An increase of one (1) foot.

The amount of free board remaining with an elevation of 5720.5 feet will be 1.5 feet. SEE CALCULATIONS Pg. 2  
0.94 w/ WAVE CREST

Enclosed you will find calculations indicating that the berm around the pit has the strength to withstand the additional pressure and has a sufficient safety factor.

Also the calculated maximum wave height, with water level at the requested height, will be below the top of the berm with sufficient free board clearance.

The purpose of this request is due to more water being put into the pit than previously anticipated causing the water level to rise at a faster rate than previously anticipated.

Your approval will allow the disposal pit to continue operation during the period of installation of proposed spray system to increase evaporation of water.



Page 2  
Richard L. Stamets

Thank you for your consideration and cooperation in this matter.

Very truly yours,

A handwritten signature in black ink, appearing to read 'Ewell N. Walsh', written in a cursive style.

Ewell N. Walsh, P.E.  
President

ENW:rr

cc: Frank Chavez, OCD, Aztec, N.M. w/encl

Basin Disposal, Inc.

Jerry Sandel, w/encl.

David Turner, w/encl.

BASIN DISPOSAL, INC.  
PRODUCED WATER DISPOSAL PIT  
San Juan County, New Mexico

November 25, 1985

WAVE CALCULATION  
(ALL REFERENCES--SHORE PROTECTION MANUAL)

WINDSPEED,  $U_a$  = 50 M.P.H. : FETCH,  $F$  = 403 FT. (AT 5720.5' ELEV.)

DEPTH OF WATER,  $D$  = 12.00 FEET SLOPE OF SIDE = 3:1

WAVE HEIGHT AND PERIOD.

FOR  $D$  = 0.1 TO 5.0 FT., Pg. 3-56, Fig. 3-27 (UPPER)

FOR  $D$  = 5.1 TO 10.0 FT., Pg. 3-57, Fig. 3-28 (UPPER)

WAVE HEIGHT,  $H$  = 0.40 FEET  
PERIOD,  $T$  = 0.8 SECONDS

CALCULATE BREAKING WAVE HEIGHT,  $H_b$  (Pg. 7-7, Fig. 7-3)

$$\frac{H}{g \times T^2} = 0.0194 \quad g = 32.2$$

(Fig. 7-3)  $\frac{H_b}{H} = 1.0$  NOTE: UTILIZE ( $m = 0.1$ ) FOR SLOPE OF  
SIDE = 10:1 OR LESS.

$$H_b = H \times \frac{H_b}{H} = 0.4$$

$$\frac{H_b}{g \times T^2} = 0.0194$$

Pg. 7-6, Fig. 7-2 (UTILIZING  $m = 0.10$  (1:10))

$a = 1.6$   $a = \text{alpha, upper limit}$   
 $b = 1.5$   $b = \text{beta, lower limit}$

BREAKING HEIGHT, ft, MAX. =  $a \times H_b = 1.6 \times 0.4 = 0.64$

BREAKING HEIGHT, ft, MIN. =  $b \times H_b = 1.5 \times 0.4 = 0.60$

COMMENTS:

$D$  = 12.00 feet is average depth of water in pond.  
(ELEVATION-5720.5')

NON-BREAKING WAVE FORCE AND MOMENTS  
(ASSUMING A VERTICAL WALL)  
(ALL REFERENCES SHORE PROTECTION MANUAL)

Pg. 7-161

$$\begin{aligned} X &= 1.0 \text{ (ASSUME SMOOTH WALL)} \\ H_i = H &= 0.4 \\ d &= 13.5 \text{ FEET} \\ T &= 0.80 \text{ SECONDS} \end{aligned}$$

$$\frac{H_i}{d} = \frac{0.4}{13.5} = 0.0296$$

$$\frac{H_i}{g \times T^2} = 0.0194$$

$$g = 32.2$$

Pg. 7-164, Fig. 7-90

$$\frac{H_o}{H_i} = 0.41$$

$$H_o = \frac{H_o}{H_i} \times H_i = 0.164 \text{ FEET}$$

Pg. 7-161, Equations 7-73 and 7-74 and  
Pg. 7-162, Fig. 7-88

HEIGHT OF CREST ABOVE BOTTOM

$$Y_c = d + H_o + \left( \frac{1 + X}{2} \right) \times H_i = 14.06 \text{ FEET}$$

(ELEV. - 5721.06')

$$\begin{aligned} d &= 13.5 \\ H_o &= 0.164 \\ X &= 1.0 \\ H_i &= 0.4 \end{aligned}$$

HEIGHT OF TROUGH ABOVE BOTTOM

$$Y_t = d + H_o - \left( \frac{1 + X}{2} \right) \times H_i = 13.26 \text{ FEET}$$

(ELEV. - 5720.26')

$$14.06 + 5707 = 5721.06'$$

.94' FREEBOARD

COMMENTS:

d = 13.50 feet is at the east end or deepest portion  
of the pond. (ELEVATION - 5720.5')



NONBREAKING WAVE FORCE  
(AT WAVE CREST)

Pg. 7-165, Fig. 7-91

$$\frac{F_c}{w \times d^2} = 0.001$$

$$\frac{H_i}{g \times T^2} = 0.0194$$

$$\frac{H_i}{d} = 0.0296$$

$$F_c = 0.001 \times w \times d^2 = 12.17 \text{ lb./ft}$$

$$w = 66.8 \text{ lbs./ft}^2$$

$$d = 13.5 \text{ FEET}$$

COMMENTS:

force is considered negligible.

# BERM CALCULATIONS

MAXIMUM HEIGHT = 11 FEET      INSIDE SLOPE = 3 :1      SOIL DENSITY = 100 Lbs./Ft.<sup>3</sup>  
 TOP WIDTH = 12 FEET      OUTSIDE SLOPE = 3 :1      FRICTION FACTOR = 0.4  
 MAX. WATER DEPTH = 10 FEET  
 ( ON BERM )

## STATIC PRESSURE - Lbs./Ft.<sup>2</sup>

WATER DEPTH - FT.	1	2	3	4	5	6	7	8	9	10	11	12
DEPTH BELOW SURFACE - Ft.												
1	67	67	67	67	67	67	67	67	67	67	0	0
2	0	134	134	134	134	134	134	134	134	134	0	0
3	0	0	200	200	200	200	200	200	200	200	0	0
4	0	0	0	267	267	267	267	267	267	267	0	0
5	0	0	0	0	334	334	334	334	334	334	0	0
6	0	0	0	0	0	401	401	401	401	401	0	0
7	0	0	0	0	0	0	468	468	468	468	0	0
8	0	0	0	0	0	0	0	534	534	534	0	0
9	0	0	0	0	0	0	0	0	601	601	0	0
10	0	0	0	0	0	0	0	0	0	668	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0
STATIC PRESSURE PER LINEAR FOOT - Lbs./Ft. = Fh	67	201	401	668	1002	1403	1871	2405	3006	3674	0	0

## WEIGHT OF BERM PER LINEAR FOOT

## SHEARING FORCE, F<sub>s</sub>

DEPTH FROM TOP OF BERM Ft.	Lbs.	DEPTH FROM TOP OF BERM Ft.	F <sub>s</sub>
1	1500	1	600
2	3600	2	1440
3	6300	3	2520
4	9600	4	3840
5	13500	5	5400
6	18000	6	7200
7	23100	7	9240
8	28800	8	11520
9	35100	9	14040
10	42000	10	16800
11	49500	11	19800
12	0	12	0

NOTE: COMPACTION TESTS DURING CONSTRUCTION OF DISPOSAL PIT  
 RESULTED IN SOIL DENSITY 100+ Lbs./Ft.<sup>3</sup>

SAFETY FACTORS -  $F_s/F_h$ 

WATER DEPTH - FT.	1	2	3	4	5	6	7	8	9	10	11	12
BERM HEIGHT - Ft.												
1	8.96											
2	21.49	7.16										
3	37.61	12.54	6.28									
4	57.31	19.10	9.58	5.75								
5	80.60	26.87	13.47	8.08	5.39							
6	107.46	35.82	17.96	10.78	7.19	5.13						
7	137.91	45.97	23.04	13.83	9.22	6.59	4.94					
8	171.94	57.31	28.73	17.25	11.50	8.21	6.16	4.79				
9	209.55	69.85	35.01	21.02	14.01	10.01	7.50	5.84	4.67			
10	250.75	83.58	41.90	25.15	16.77	11.97	8.98	6.99	5.59	4.57		
11	295.52	98.51	49.38	29.64	19.76	14.11	10.58	8.23	6.59	5.39	0.00	
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

NOTE: TOP OF BERM - ELEVATION, 5722'.

MAXIMUM WATER LEVEL - ELEVATION, 5720.5.

BASIN DISPOSAL, INC.  
PRODUCED WATER DISPOSAL PIT  
San Juan County, New Mexico

November 25, 1985

WAVE CALCULATION  
(ALL REFERENCES-SHORE PROTECTION MANUAL)

WINDSPEED,  $U_a$  = 50 M.P.H. : FETCH,  $F$  = 403 FT. (AT 5720.5' ELEV.)

DEPTH OF WATER,  $D$  = 12.00 FEET SLOPE OF SIDE = 3:1

WAVE HEIGHT AND PERIOD.

FOR  $D$  = 0.1 TO 5.0 FT., Pg. 3-56, Fig. 3-27 (UPPER)

FOR  $D$  = 5.1 TO 10.0 FT., Pg. 3-57, Fig. 3-28 (UPPER)

WAVE HEIGHT,  $H$  = 0.40 FEET  
PERIOD,  $T$  = 0.8 SECONDS

CALCULATE BREAKING WAVE HEIGHT,  $H_b$  (Pg. 7-7, Fig. 7-3)

$$\frac{H}{g \times T^2} = 0.0194 \quad g = 32.2$$

(Fig. 7-3)  $\frac{H_b}{H} = 1.0$  NOTE: UTILIZE ( $m = 0.1$ ) FOR SLOPE OF SIDE = 10:1 OR LESS.

$$H_b = H \times \frac{H_b}{H} = 0.4$$

$$\frac{H_b}{g \times T^2} = 0.0194$$

Pg. 7-6, Fig. 7-2 (UTILIZING  $m = 0.10$  (1:10))

$a = 1.6$   $a = \text{alpha, upper limit}$   
 $b = 1.5$   $b = \text{beta, lower limit}$

BREAKING HEIGHT, ft, MAX. =  $a \times H_b = 1.6 \times 0.4 = 0.64$

BREAKING HEIGHT, ft, MIN. =  $b \times H_b = 1.5 \times 0.4 = 0.60$

COMMENTS:

$D$  = 12.00 feet is average depth of water in pond.  
(ELEVATION-5720.5')

NON-BREAKING WAVE FORCE AND MOMENTS  
(ASSUMING A VERTICAL WALL)  
(ALL REFERENCES SHORE PROTECTION MANUAL)

Pg. 7-161

$$\begin{aligned} X &= 1.0 \text{ (ASSUME SMOOTH WALL)} \\ H_i = H &= 0.4 \\ d &= 13.5 \text{ FEET} \\ T &= 0.80 \text{ SECONDS} \end{aligned}$$

$$\frac{H_i}{d} = \frac{0.4}{13.5} = 0.0296$$

$$\frac{H_i}{g \times T^2} = 0.0194$$

$$g = 32.2$$

Pg. 7-164, Fig. 7-90

$$\frac{H_o}{H_i} = 0.41$$

$$H_o = \frac{H_o}{H_i} \times H_i = 0.164 \text{ FEET}$$

Pg. 7-161, Equations 7-73 and 7-74 and  
Pg. 7-162, Fig. 7-88

HEIGHT OF CREST ABOVE BOTTOM

$$Y_c = d + H_o + \left( \frac{1 + X}{2} \right) \times H_i = 14.06 \text{ FEET} \\ \text{(ELEV. - 5721.06')}$$

$$\begin{aligned} d &= 13.5 \\ H_o &= 0.164 \\ X &= 1.0 \\ H_i &= 0.4 \end{aligned}$$

HEIGHT OF TROUGH ABOVE BOTTOM

$$Y_t = d + H_o - \left( \frac{1 + X}{2} \right) \times H_i = 13.26 \text{ FEET} \\ \text{(ELEV. - 5720.26')}$$

COMMENTS:

d = 13.50 feet is at the east end or deepest portion  
of the pond. (ELEVATION - 5720.5')

NONBREAKING WAVE FORCE  
(AT WAVE CREST)

Pg. 7-165, Fig. 7-91

$$\frac{F_c}{w \times d^2} = 0.001$$

$$\frac{H_i}{g \times T^2} = 0.0194$$

$$\frac{H_i}{d} = 0.0296$$

$$F_c = 0.001 \times w \times d^2 = 12.17 \text{ lb./ft}$$

$$w = 66.8 \text{ lbs./ft}^2$$

$$d = 13.5 \text{ FEET}$$

COMMENTS:

force is considered negligible.

# BERM CALCULATIONS

MAXIMUM HEIGHT = 11 FEET      INSIDE SLOPE = 3 :1      SOIL DENSITY = 100 Lbs/Ft.<sup>3</sup>  
 TOP WIDTH = 12 FEET      OUTSIDE SLOPE = 3 :1      FRICTION FACTOR = 0.4  
 MAX. WATER DEPTH = 10 FEET  
 ( ON BERM )

## STATIC PRESSURE - Lbs./Ft.<sup>2</sup>

WATER DEPTH - FT.	1	2	3	4	5	6	7	8	9	10	11	12
DEPTH BELOW SURFACE - Ft.												
1	67	67	67	67	67	67	67	67	67	67	0	0
2	0	134	134	134	134	134	134	134	134	134	0	0
3	0	0	200	200	200	200	200	200	200	200	0	0
4	0	0	0	267	267	267	267	267	267	267	0	0
5	0	0	0	0	334	334	334	334	334	334	0	0
6	0	0	0	0	0	401	401	401	401	401	0	0
7	0	0	0	0	0	0	468	468	468	468	0	0
8	0	0	0	0	0	0	0	534	534	534	0	0
9	0	0	0	0	0	0	0	0	601	601	0	0
10	0	0	0	0	0	0	0	0	0	668	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0
STATIC PRESSURE PER LINEAR FOOT - Lbs./Ft. = Fh	67	201	401	668	1002	1403	1871	2405	3006	3674	0	0

## WEIGHT OF BERM PER LINEAR FOOT

## SHEARING FORCE, F<sub>s</sub>

DEPTH FROM  
TOP OF  
BERM  
Ft.

Lbs.

DEPTH FROM  
TOP OF  
BERM  
Ft.

F<sub>s</sub>

1	1500	1	600
2	3600	2	1440
3	6300	3	2520
4	9600	4	3840
5	13500	5	5400
6	18000	6	7200
7	23100	7	9240
8	28800	8	11520
9	35100	9	14040
10	42000	10	16800
11	49500	11	19800
12	0	12	0

NOTE: COMPACTION TESTS DURING CONSTRUCTION OF DISPOSAL PIT  
 RESULTED IN SOIL DENSITY 100+ Lbs./Ft.<sup>3</sup>

SAFETY FACTORS -  $F_s/F_h$ 

WATER DEPTH - FT.	1	2	3	4	5	6	7	8	9	10	11	12
BERM HEIGHT - Ft.												
1	8.96											
2	21.49	7.16										
3	37.61	12.54	6.28									
4	57.31	19.10	9.58	5.75								
5	80.60	26.87	13.47	8.08	5.39							
6	107.46	35.82	17.96	10.78	7.19	5.13						
7	137.91	45.97	23.04	13.83	9.22	6.59	4.94					
8	171.94	57.31	28.73	17.25	11.50	8.21	6.16	4.79				
9	209.55	69.85	35.01	21.02	14.01	10.01	7.50	5.84	4.67			
10	250.75	83.58	41.90	25.15	16.77	11.97	8.98	6.99	5.59	4.57		
11	295.52	98.51	49.38	29.64	19.76	14.11	10.58	8.23	6.59	5.39	0.00	
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

NOTE: TOP OF BERM - ELEVATION, 5722'.

MAXIMUM WATER LEVEL - ELEVATION, 5720.5.



BASIN DISPOSAL, INC.  
PRODUCED WATER DISPOSAL PIT  
San Juan County, New Mexico

November 25, 1985

WAVE CALCULATION  
(ALL REFERENCES-SHORE PROTECTION MANUAL)

WINDSPEED,  $U_a =$  50 M.P.H. : FETCH,  $F =$  403 FT. (AT 5720.5' ELEV.)

DEPTH OF WATER,  $D =$  12.00 FEET SLOPE OF SIDE  $= 3:1$

WAVE HEIGHT AND PERIOD.

FOR  $D = 0.1$  TO  $5.0$  FT., Pg. 3-56, Fig. 3-27 (UPPER)  
FOR  $D = 5.1$  TO  $10.0$  FT., Pg. 3-57, Fig. 3-28 (UPPER)

WAVE HEIGHT,  $H =$  0.40 FEET  
PERIOD,  $T =$  0.8 SECONDS

CALCULATE BREAKING WAVE HEIGHT,  $H_b$  (Pg. 7-7, Fig. 7-3)

$$\frac{H}{g \times T^2} = 0.0194 \quad g = 32.2$$

(Fig. 7-3)  $\frac{H_b}{H} = 1.0$  NOTE: UTILIZE ( $m = 0.1$ ) FOR SLOPE OF SIDE  $= 10:1$  OR LESS.

$$H_b = H \times \frac{H_b}{H} = 0.4$$

$$\frac{H_b}{g \times T^2} = 0.0194$$

Pg. 7-6, Fig. 7-2 (UTILIZING  $m = 0.10(1:10)$ )

$a = 1.6$   $a = \text{alpha, upper limit}$   
 $b = 1.5$   $b = \text{beta, lower limit}$

BREAKING HEIGHT, ft, MAX.  $= a \times H_b = 1.6 \times 0.4 = 0.64$

BREAKING HEIGHT, ft, MIN.  $= b \times H_b = 1.5 \times 0.4 = 0.60$

COMMENTS:

$D = 12.00$  feet is average depth of water in pond.  
(ELEVATION-5720.5')

NON-BREAKING WAVE FORCE AND MOMENTS  
(ASSUMING A VERTICAL WALL)  
(ALL REFERENCES SHORE PROTECTION MANUAL)

Pg. 7-161

$$\begin{aligned} X &= 1.0 \text{ (ASSUME SMOOTH WALL)} \\ H_i = H &= 0.4 \\ d &= 13.5 \text{ FEET} \\ T &= 0.80 \text{ SECONDS} \end{aligned}$$

$$\frac{H_i}{d} = \frac{0.4}{13.5} = 0.0296$$

$$\frac{H_i}{g \times T^2} = 0.0194$$

$$g = 32.2$$

Pg. 7-164, Fig. 7-90

$$\frac{H_o}{H_i} = 0.41$$

$$H_o = \frac{H_o}{H_i} \times H_i = 0.164 \text{ FEET}$$

Pg. 7-161, Equations 7-73 and 7-74 and  
Pg. 7-162, Fig. 7-88

HEIGHT OF CREST ABOVE BOTTOM

$$Y_c = d + H_o + \left( \frac{1 + X}{2} \right) \times H_i = 14.06 \text{ FEET} \quad \text{(ELEV. - 5721.06')}$$

$$\begin{aligned} d &= 13.5 \\ H_o &= 0.164 \\ X &= 1.0 \\ H_i &= 0.4 \end{aligned}$$

HEIGHT OF TROUGH ABOVE BOTTOM

$$Y_t = d + H_o - \left( \frac{1 + X}{2} \right) \times H_i = 13.26 \text{ FEET} \quad \text{(ELEV. - 5720.26')}$$

COMMENTS:

d = 13.50 feet is at the east end or deepest portion  
of the pond. (ELEVATION - 5720.5')

NONBREAKING WAVE FORCE  
(AT WAVE CREST)

Pg. 7-165, Fig. 7-91

$$\frac{F_c}{w \times d^2} = 0.001$$

$$\frac{H_i}{g \times T^2} = 0.0194$$

$$\frac{H_i}{d} = 0.0296$$

$$F_c = 0.001 \times w \times d^2 = 12.17 \text{ lb./ft}$$

$$w = 66.8 \text{ lbs./ft}^2$$

$$d = 13.5 \text{ FEET}$$

COMMENTS:

force is considered negligible.

# BERM CALCULATIONS

MAXIMUM HEIGHT = 11 FEET      INSIDE SLOPE = 3 :1      SOIL DENSITY = 100 Lbs./Ft.<sup>3</sup>  
 TOP WIDTH = 12 FEET      OUTSIDE SLOPE = 3 :1      FRICTION FACTOR = 0.4  
 MAX. WATER DEPTH = 10 FEET  
 ( ON BERM )

## STATIC PRESSURE - Lbs./Ft.<sup>2</sup>

WATER DEPTH - FT.	1	2	3	4	5	6	7	8	9	10	11	12
DEPTH BELOW SURFACE - Ft.												
1	67	67	67	67	67	67	67	67	67	67	0	0
2	0	134	134	134	134	134	134	134	134	134	0	0
3	0	0	200	200	200	200	200	200	200	200	0	0
4	0	0	0	267	267	267	267	267	267	267	0	0
5	0	0	0	0	334	334	334	334	334	334	0	0
6	0	0	0	0	0	401	401	401	401	401	0	0
7	0	0	0	0	0	0	468	468	468	468	0	0
8	0	0	0	0	0	0	0	534	534	534	0	0
9	0	0	0	0	0	0	0	0	601	601	0	0
10	0	0	0	0	0	0	0	0	0	668	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0
STATIC PRESSURE PER LINEAR FOOT - Lbs./Ft. = Fh	67	201	401	668	1002	1403	1871	2405	3006	3674	0	0

## WEIGHT OF BERM PER LINEAR FOOT

## SHEARING FORCE, F<sub>s</sub>

DEPTH FROM  
TOP OF  
BERM  
Ft.

Lbs.

DEPTH FROM  
TOP OF  
BERM  
Ft.

F<sub>s</sub>

1	1500
2	3600
3	6300
4	9600
5	13500
6	18000
7	23100
8	28800
9	35100
10	42000
11	49500
12	0

1	600
2	1440
3	2520
4	3840
5	5400
6	7200
7	9240
8	11520
9	14040
10	16800
11	19800
12	0

NOTE: COMPACTION TESTS DURING CONSTRUCTION OF DISPOSAL PIT  
 RESULTED IN SOIL DENSITY 100+ Lbs./Ft.<sup>3</sup>

SAFETY FACTORS -  $F_s/F_h$ 

WATER DEPTH - FT.	1	2	3	4	5	6	7	8	9	10	11	12
BERM HEIGHT - Ft.												
1	8.96											
2	21.49	7.16										
3	37.61	12.54	6.28									
4	57.31	19.10	9.58	5.75								
5	80.60	26.87	13.47	8.08	5.39							
6	107.46	35.82	17.96	10.78	7.19	5.13						
7	137.91	45.97	23.04	13.83	9.22	6.59	4.94					
8	171.94	57.31	28.73	17.25	11.50	8.21	6.16	4.79				
9	209.55	69.85	35.01	21.02	14.01	10.01	7.50	5.84	4.67			
10	250.75	83.58	41.90	25.15	16.77	11.97	8.98	6.99	5.59	4.57		
11	295.52	98.51	49.38	29.64	19.76	14.11	10.58	8.23	6.59	5.39	0.00	
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

NOTE: TOP OF BERM - ELEVATION, 5722'.

MAXIMUM WATER LEVEL - ELEVATION, 5720.5.

50 YEARS



1935 - 1985

POST OFFICE BOX 2088  
STATE LAND OFFICE BUILDING  
SANTA FE, NEW MEXICO 87501  
(505) 827-5800



TONEY ANAYA  
GOVERNOR

STATE OF NEW MEXICO  
ENERGY AND MINERALS DEPARTMENT  
OIL CONSERVATION DIVISION

November 25, 1985

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

Mr. E. N. Walsh, P.E.  
Walsh Engineering & Production Corp.  
P.O. Drawer 419  
Farmington, NM 87401

Re: Request for Sprayer  
Installation at Basin  
Disposal, Inc. Facility

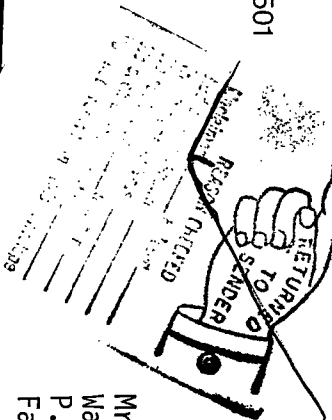
Dear Mr. Walsh:

We have received your request dated November 21, 1985, for approval to install a spray system at the Basin Disposal, Inc. produced water disposal pit located in Units E and F, Section 3, Township 29 North, Range 11 West, San Juan County, New Mexico. Approval for this spray system is hereby given, with the following stipulations:

- 1) Berms of the pit will be maintained so that any erosion from the spray will be kept at a minimum and berm integrity will not be decreased.
- 2) Until sufficient information on the effects of prevailing winds carrying the spray outside the berm has been compiled, this approval is based on 12 hours/day spraying time, monitored by Basin Disposal personnel. Approval for use of the system on a 24 hour basis will be considered upon your application for such use after sufficient information has been gathered, or after January 25, 1986.
- 3) At no time shall the minimum freeboard for fluid level (maximum elevation 5719.5') established in the Basin Disposal, Inc. evaporation pit approval be violated.

# ENERGY and MINERALS DEPARTMENT

Oil Conservation Division  
P.O. Box 2088  
Santa Fe, New Mexico 87501



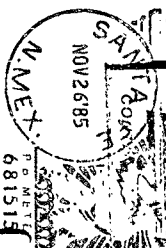
OIL CONSERVATION

1935-1985

50 YEARS OF 1985



Mr. E. N. Walsh, PE  
Walsh Engineering & Prod. Corp.  
P.O. Drawer 419  
Farmington, NM 87401



839460

DATE

☐ HOLD

NOV 27 1985

1ST NOTICE

2ND NOTICE

REMARKS

MAIL

P 505 905 885

CERTIFIED

RETURN RECEIPT REQUESTED

POSTAGE DUE

# Memo

*From*

JAMI BAILEY  
Field Representative

*To*

*Hand delivered to*

*Mr. Walsh at*

*his request between 12/3 - 12/5/85*



If you have any questions concerning this approval, feel free to contact Jami Bailey at 827-5884.

Sincerely,

A handwritten signature in dark ink, appearing to read "R. L. Stamets", with a stylized flourish at the end.

R. L. STAMETS  
Director

RLS/JB/dp

cc: OCD Office - Aztec

**WALSH**

ENGINEERING &amp; PRODUCTION CORP.

Petroleum Engineering Consulting  
Lease Management  
Contract Pumping3001 Northridge Drive  
P.O. Drawer 419  
Farmington, New Mexico 87401  
(505) 327-4892

November 21, 1985

RECEIVED

NOV 22 1985

OIL CONSERVATION DIVISION

Mr. Richard L. Stamets  
Director  
New Mexico Energy and Minerals  
Oil Conservation Division  
P.O. Box 2088  
Santa Fe, New Mexico 87504-2088

RE: Basin Disposal, Inc.  
Produced Water Disposal Pit  
San Juan County, New Mexico

Dear Mr. Stamets:

On behalf of Basin Disposal, Inc., a request is being submitted for approval to install a spray system, at the above-referred-to disposal site, to increase evaporation of water disposed in pit.

The input, currently 1000 to 1500 barrels per day, has exceeded previous projections. It has been determined that, in order to maintain the water level below approved maximum water level, it will be necessary to increase the evaporation rate of the disposed water.

The current water level is approximately 4-1/2 feet below the approved level. However, due to the current input exceeding projections, it will be necessary to increase the evaporation rate of the water to prevent closing of the facility due to reaching maximum approved water level.

Enclosed you will find three (3) copies of supporting data concerning the installation of the spray system.

Due to the current situation, your earliest approval of this request would be appreciated.



Page 2  
Mr. Richard L. Stamets  
November 21, 1985

Thank you for your cooperation in this matter.

Very truly yours,

A handwritten signature in black ink, appearing to read "Ewell N. Walsh", written in a cursive style.

Ewell N. Walsh, P.E.  
President

ENW:blk

cc: Frank Chavez, NMOCD, Aztec, New Mexico  
w/ 2 enc.

Basin Disposal, Inc., w/1 enc.

Enc.



**WALSH**

ENGINEERING & PRODUCTION CORP.

Petroleum Engineering Consulting  
Lease Management  
Contract Pumping

3001 Northridge Drive  
P.O. Drawer 419  
Farmington, New Mexico 87401  
(505) 327-4892

BASIN DISPOSAL, INC.  
PRODUCED WATER EVAPORATION PIT  
PROPOSED  
WATER SPRAY SYSTEM  
SAN JUAN COUNTY, NEW MEXICO

November 21, 1985

Ewell N. Walsh, P.E.  
State of New Mexico  
Registration No. 4324



## INDEX

	<u>PAGE NO.</u>
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Summary	2
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Design and Construction	3
Motor and Pump	3
Motor and Pump Location	3
Spray System	3
Mainline	3
Spray System	3 and 4

	<u>FIGURE NO.</u>
Schematic - Perimeter Spray System	1
Spray Array	2

	<u>TABLE NO.</u>
Evaporation Rate Vs. G.P.M. - 24 Hrs.	1
Evaporation Rate Vs. G.P.M. - 12 Hrs.	2



## PREFACE

The purpose of installing a spray system at the disposal pit is to increase evaporation rate, into the air, and maintain a water level below approved maximum water level.



SUMMARY

Installation of the proposed spray system will prevent the water level from increasing to the approved water level for the pit.

Installation of the system in the top of the berm will not affect the stability of the berm to contain disposed water.

It is anticipated, depending upon temperature and relative humidity, to evaporate 500 to 2500 barrels per day.



### LOCATION

The approved water disposal pit is located in an area of Units E and F, Section 3-T29N-R11W, San Juan County, New Mexico.

The area is located adjacent to State Highway 44, approximately three miles north of Bloomfield, New Mexico.

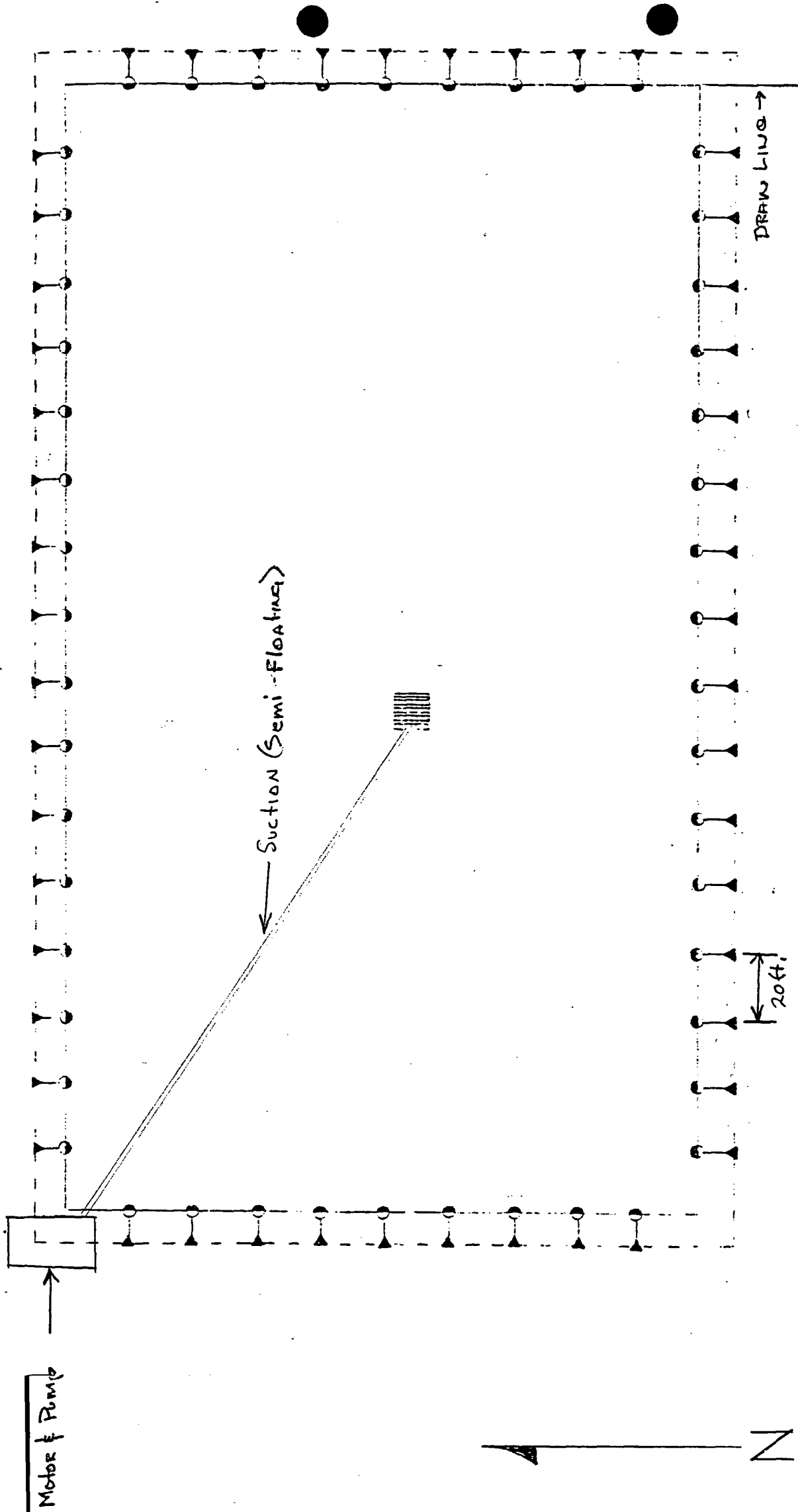
### DESIGN AND CONSTRUCTION

1. Motor and Pump:
  - A. Fifty (50) horsepower electric motor.
  - B. Two stage centrifugal pump.  
Rated Capacity - 600 gallons per minute at 70 to 75 psi.
  - C. Installed on concrete base.
  - D. Enclosed for weather protection and heated to prevent freezing.
2. Motor and Pump Location:
  - A. Installation is proposed on top of berm at northwest corner of disposal pit.
3. Spray System:
  - A. Mainline:
    1. Mainline, 4", Class 200, P.V.C. pipe, to be installed on top of berm at 2 foot depth, for the full circumference of pit.
    2. Mainline drain will be installed at southwest corner of pit to drain system to prevent freezing of main line during shut down periods.
    3. Water drained from system, to be contained in above ground, plastic or similar material, tank or container.
    4. Mainline to be installed a minimum of 2 feet outside of trench containing pit lining anchor.
  - B. Spray System:
    1. Fifty (50) individual spray arrays will be installed around top of disposal pit.
    2. Spacing between arrays will be 20 feet.
    3. Each array will connect to mainline with 3/4 inch diameter, schedule 80 P.V.C. or 3/4 inch galvanized pipe.
    4. Each array will have control valve for shut off if wind direction and velocity will have an effect on spray blowing outside of pit.





5. The spray array will consist of <sup>15'</sup> six (6) half-circle spray heads to spray towards center of disposal pit. Each spray head is rated at 2 gallons per minute at 70 to 75 psi.
6. The spray array will be installed so that the array will be 5 to 6 feet, from the pit side of berm, inside the area of lined pit.
7. The connecting line will either drain into the mainline and/or into the disposal pit when pump is shut off.

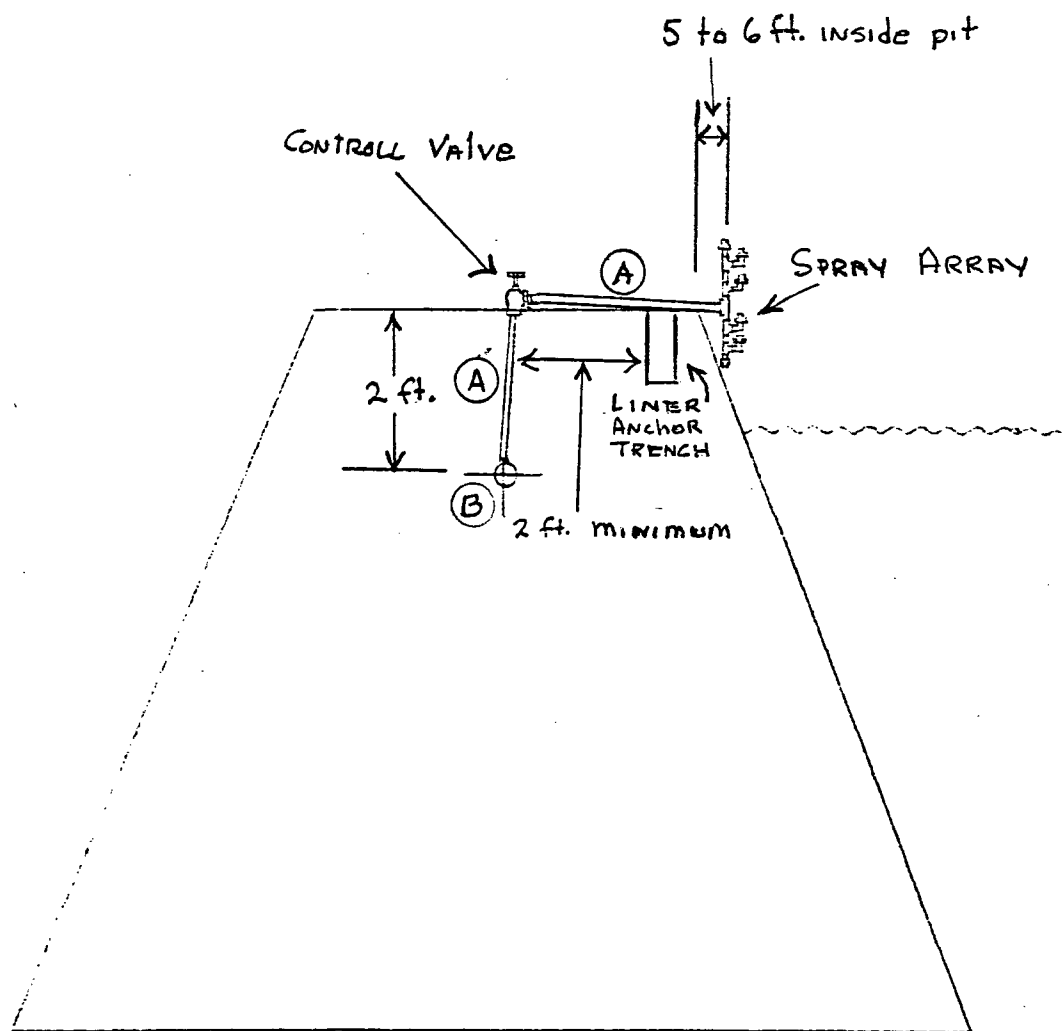


SCALE 1" = 40'

LEGEND

- ▲ 3/4" MAJOR ANGLE VALVE
- 520 SERIES SPRINKLER HEAD ASSY.
- 4" CLASS 200 PVC MAINLINE PIPE

FIGURE NO. 1  
Schematic  
Perimeter Spray System



N.T.S.

- ① 3/4" Sched. 80 P.V.C OR GALVANIZED PIPE
- ② 4" CLASS 200 P.V.C.

FIGURE NO. 2  
Spray Array

TABLE NO. 1

## EVAPORATION RATE - BARRELS PER DAY (24 HRS.)

## EVAPORATION RATE - %

GPM	5	10	15	20	25	30	35
100	171	343	514	686	857	1029	1200
200	343	686	1029	1371	1714	2057	2400
300	514	1029	1543	2057	2571	3086	3600
400	686	1371	2057	2743	3429	4114	4800
500	857	1714	2571	3429	4286	5143	6000
600	1029	2057	3086	4114	5143	6171	7200
700	1200	2400	3600	4800	6000	7200	8400
800	1371	2743	4114	5486	6857	8229	9600
900	1543	3086	4629	6171	7714	9257	10800
1000	1714	3429	5143	6857	8571	10286	12000
1100	1886	3771	5657	7543	9429	11314	13200
1200	2057	4114	6171	8229	10286	12343	14400
1300	2229	4457	6686	8914	11143	13371	15600
1400	2400	4800	7200	9600	12000	14400	16800
1500	2571	5143	7714	10286	12857	15429	18000
1600	2743	5486	8229	10971	13714	16457	19200
1700	2914	5829	8743	11657	14571	17486	20400
1800	3086	6171	9257	12343	15429	18514	21600
1900	3257	6514	9771	13029	16286	19543	22800
2000	3429	6857	10286	13714	17143	20571	24000

TABLE NO. 2

EVAPORATION RATE - BARRELS PER DAY (12 HRS.)

EVAPORATION RATE - %

GPM	5	10	15	20	25	30	35
100	86	171	257	343	429	514	600
200	171	343	514	686	857	1029	1200
300	257	514	771	1029	1286	1543	1800
400	343	686	1029	1371	1714	2057	2400
500	429	857	1286	1714	2143	2571	3000
600	514	1029	1543	2057	2571	3086	3600
700	600	1200	1800	2400	3000	3600	4200
800	686	1371	2057	2743	3429	4114	4800
900	771	1543	2314	3086	3857	4629	5400
1000	857	1714	2571	3429	4286	5143	6000
1100	943	1886	2829	3771	4714	5657	6600
1200	1029	2057	3086	4114	5143	6171	7200
1300	1114	2229	3343	4457	5571	6686	7800
1400	1200	2400	3600	4800	6000	7200	8400
1500	1286	2571	3857	5143	6429	7714	9000
1600	1371	2743	4114	5486	6857	8229	9600
1700	1457	2914	4371	5829	7286	8743	10200
1800	1543	3086	4629	6171	7714	9257	10800
1900	1629	3257	4886	6514	8143	9771	11400
2000	1714	3429	5143	6857	8571	10286	12000



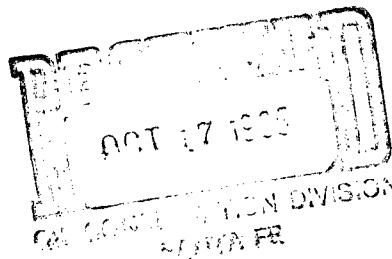
STATE OF NEW MEXICO  
**ENERGY AND MINERALS DEPARTMENT**  
OIL CONSERVATION DIVISION  
AZTEC DISTRICT OFFICE

TONEY ANAYA  
GOVERNOR

1000 RIO BRAZOS ROAD  
AZTEC, NEW MEXICO 87410  
(505) 334-6178

October 11, 1985

Mr. E. N. Walsh  
Basin Disposal, Inc.  
P.O. Drawer 419  
Farmington, NM 87401



Re: Drilling Mud Disposal Pits  
E&F-3-29N-11W

Dear Red:

Your use of the refernced site is hereby approved, subject to the following conditions:

- 1) No oil base drilling fluids will be disposed of in these pits.
- 2) No drilling fluids containing materials designated as hazardous by New Mexico Water Quality Control Commission regulations shall be disposed of in these pits.

If you have any questions, please contact this office.

Sincerely,

Frank T. Chavez  
District Supervisor

FTC/dj

xc: Dave Boyer, Santa Fe  
Well File  
Operator File



**WALSH**

ENGINEERING & PRODUCTION CORP.

Petroleum Engineering Consulting  
Lease Management  
Contract Pumping

3001 Northridge Drive  
P.O. Drawer 419  
Farmington, New Mexico 87401  
(505) 327-4892

October 4, 1985

OCT 07 1985

Mr. Phil Bacca  
N.M. Oil Conservation Commission  
P. O. Box 2088  
Santa Fe, New Mexico 87501

REF: Basin Disposal, Inc.  
Produced Water Disposal Pit

Dear Mr. Bacca:

As per our telephone conversation on October 4, 1985, disposal of water in the above-referred-to pit should commence on Saturday, October 5, 1985.

Thank you for your cooperation in this matter.

Very truly yours,

Ewell N. Walsh, P.E.  
President

ENW:rr

cc: Basin Disposal, Inc.



STATE OF NEW MEXICO  
**ENERGY AND MINERALS DEPARTMENT**  
OIL CONSERVATION DIVISION

September 12, 1985

TONY ANAYA  
GOVERNOR

POST OFFICE BOX 2088  
STATE LAND OFFICE BUILDING  
SANTA FE, NEW MEXICO 87501  
(505) 827-5800

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

Basin Disposal Inc.  
P.O. Box B  
Farmington, New Mexico 87410

Attn: Mr. J. Sandel

Dear Mr. Sandel:

On August 29, 1985, your application (WP-2) to construct a lined evaporation pond was approved by the OCD. Please be advised that such approval was based on the premise that the pond will receive only produced water and salt solutions (e.g., KCL solution) which are non-acidic. If, in the future, you wish to dispose of other types of waste such as spent acid or septage, the OCD must be notified and prior approval obtained before such a practice commences.

If you have any questions concerning this matter, please feel free to contact Phil Baca at 827-5885.

Sincerely,

R. L. STAMETS  
Director

RLS/et

cc: Oil Conservation Division - Aztec



STATE OF  
NEW MEXICO

OIL  
CONSERVATION  
DIVISION



MEMORANDUM OF MEETING OR CONVERSATION

☒ Telephone

☐ Personal

Time

Date

10:45

9/9/85

Originating Party

Other Parties

ANONYMOUS COMPLAINT

OCD - D. BOYER

P. BACA

Subject

AZTEC WELL SERVICES POND TO BE BUILT NEAR  
BLOOMFIELD

Discussion

Complainant was concerned about the pond design. I gave him a summary of the pond design and assured him that it met OCD criteria for groundwater protection. Complainant was also concerned about the potential for ~~odor~~ odor. I suggested that he contact local city and county officials.

Conclusions or Agreements

Distribution

Signed

P. L. Baca



MEMORANDUM OF MEETING OR CONVERSATION

☒ Telephone ☐ Personal

Time 11:40

Date 9/9/85

Originating Party

Other Parties

Jack Ward - Superintendent, Bloomfield Schools.  
632- 3316 / 325 Bergin Lane, Bloomfield 87413

David Boyer - OC &

Subject

Discussion

Ward called about the siting of Basin Disposal Facility in Bloomfield - was worried about proximity of elementary school (Naaba ANI Elementary School ~ 1 mile). Also has friends that live in area.

Conclusions or Agreements

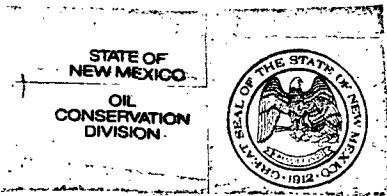
I told Ward that our authority was limited to water quality issues, and that nothing should be addressed by local city or county agencies as appropriate.

Distribution

Basin Disposal File  
Jeff Taylor  
Dick Stamets

Signed

W. J. Boyer



## MEMORANDUM OF MEETING OR CONVERSATION

☒ Telephone ☐ Personal

Time 8:30 AM

Date 9/9/85

Originating PartyJimmy Brockwell, P.O. Box 745  
Bloomfield (632-9100)Other Parties

David Boyer O&amp;G

SubjectBasin Disposal / Jerry Sandel Produced water,  
Disposal N. of BloomfieldDiscussion

Brockwell called to protest O&G approval of application saying there are homes within 700 feet of site and no public notice was given about application and no opportunity to protest. He says they began work last weekend and work and such is disruptive. Brockwell says area is residential (3 homes @ 666 ft, 4th @ 800 ft) has city water and operation will lower property values. I informed him that our approval only went to ground water protection (and prevention of surface spills) and that authority is only very recent.

Conclusions or Agreements

I told him moving and siting of such operations is up to local authority such as the county commission, etc. He says he is going to get court injunction to stop it. (As a result of this call, our site approvals will be specific to water protection, and I will explore the possibility of giving public notice for these.)

Signed

David Boyer

Dick Stamets, Jess Taylor, Basin Disposal File



TONEY ANAYA  
GOVERNOR

STATE OF NEW MEXICO  
ENERGY AND MINERALS DEPARTMENT  
OIL CONSERVATION DIVISION

50 YEARS



1935 - 1985

August 29, 1985

POST OFFICE BOX 2088  
STATE LAND OFFICE BUILDING  
SANTA FE, NEW MEXICO 87501  
(505) 827-5800

CERTIFIED MAIL

RETURN RECEIPT REQUESTED

Walsh Engineering and Production Corp.  
P. O. Drawer 419  
Farmington, New Mexico 87401

Attn: Mr. E. N. Walsh

Re: Application for Lined Evaporation Pit to be located  
in Units E & F, Section 3, Township 29 North, Range  
11 West, NMPM, San Juan County, New Mexico.

Dear Mr. Walsh:

We have reviewed the plans and specifications in your application (WP-2) for the above referenced lined evaporation pit. The design specifications submitted are acceptable and your application is hereby approved with the provision that the design specifications for your proposed spray evaporation system are submitted for approval prior to system installation.

The approved application consists of the application dated August 14, 1985, and the materials dated August 16, 1985, and August 19, 1985, submitted as supplements to the application. Approval of this application allows for the disposal of produced water from the vulnerable area as outlined in Oil Conservation Commission Order No. 7940. Please be advised that the approval of this application does not relieve you of liability should your operation result in actual pollution of surface or groundwaters which may be actionable under laws and/or regulations.

There will be no routine monitoring requirements other than those outlined in your application. Any design change or increase in the design disposal rate (750 Bbl/day) shall be reported to the Division.

The OCD District Office in Aztec shall be notified at least 24 hours in advance of primary and secondary liner installation to allow for the opportunity of an OCD representative to witness the installation.

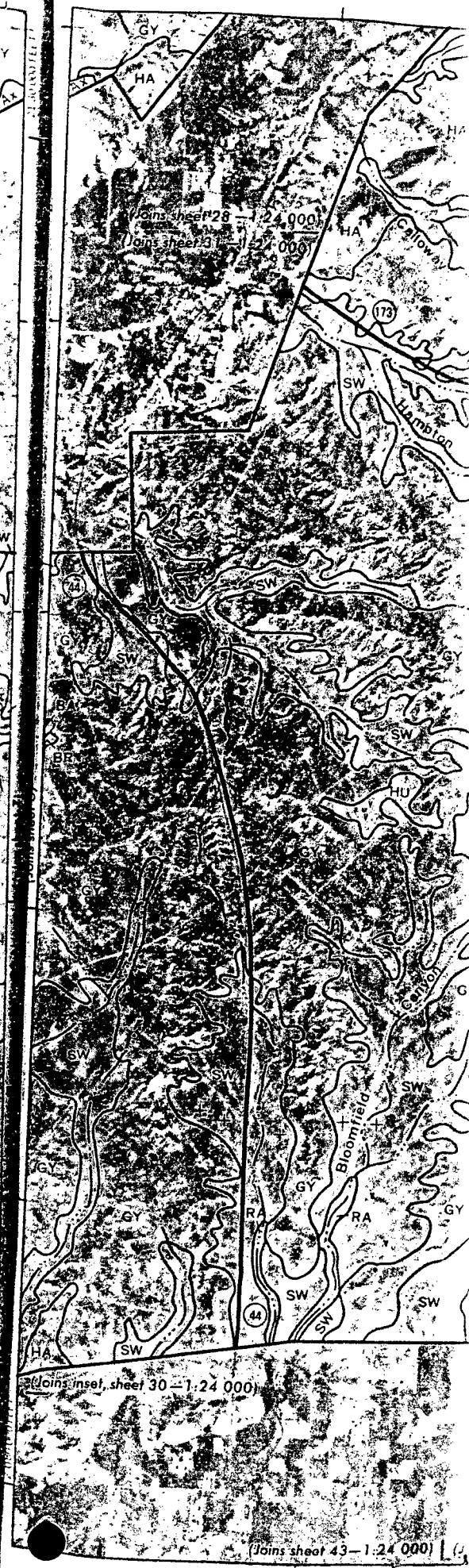
On behalf of the staff of the Oil Conservation Division, I wish to thank you (and your staff and/or consultants) for your cooperation during this application review.

Sincerely,

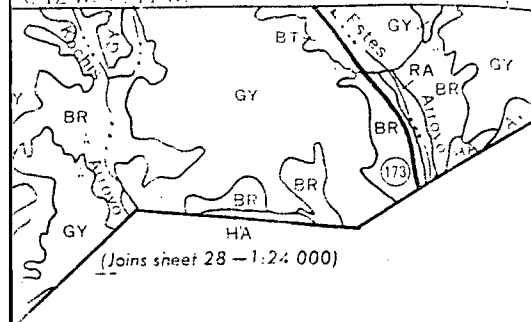
A handwritten signature in cursive script, appearing to read "R. L. Stamets".

R. L. STAMETS  
Director

cc: OCD-Aztec Office

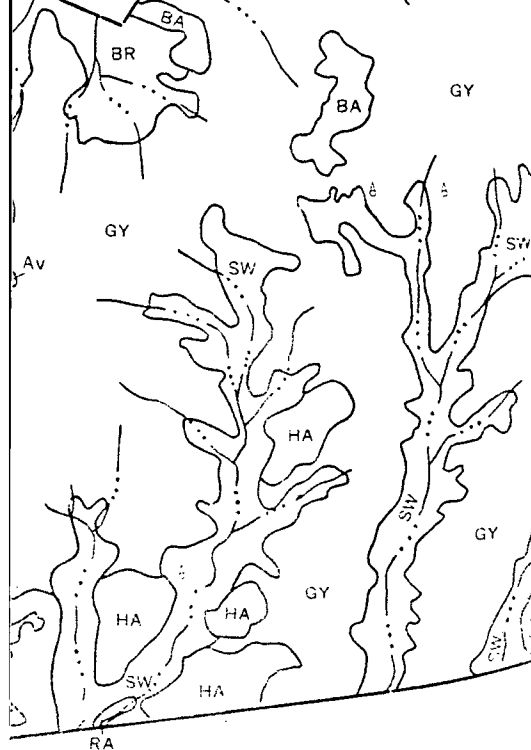


R. 12 W. P. 11 W.

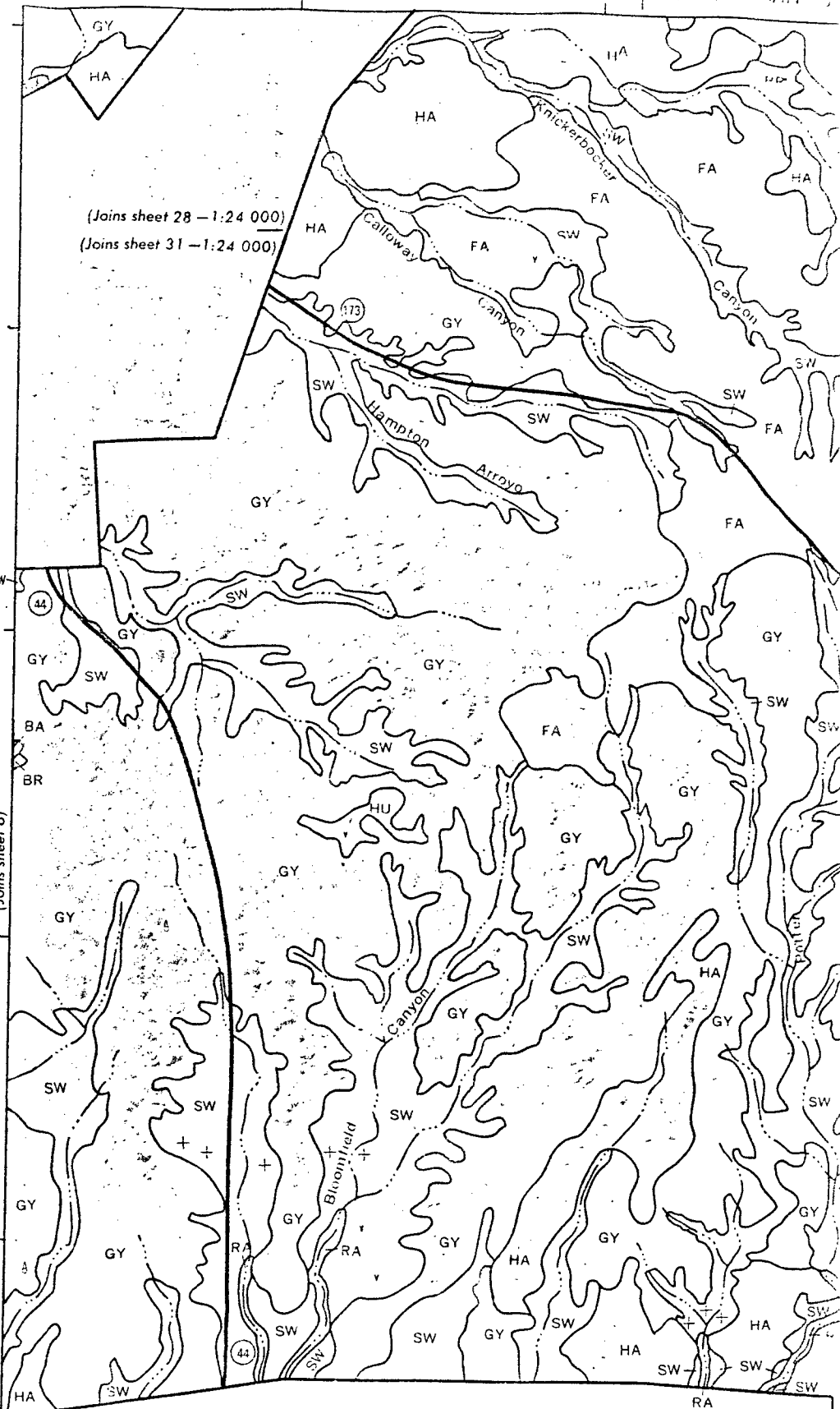


Joins sheet 31  
- 1:24 000)

(Joins inset,  
sheet 30)



P. 11 W. P. 10 W. (A1)



(Joins sheet 43 - 1:24 000)

(Joins sheet 44 - 1:24 000)

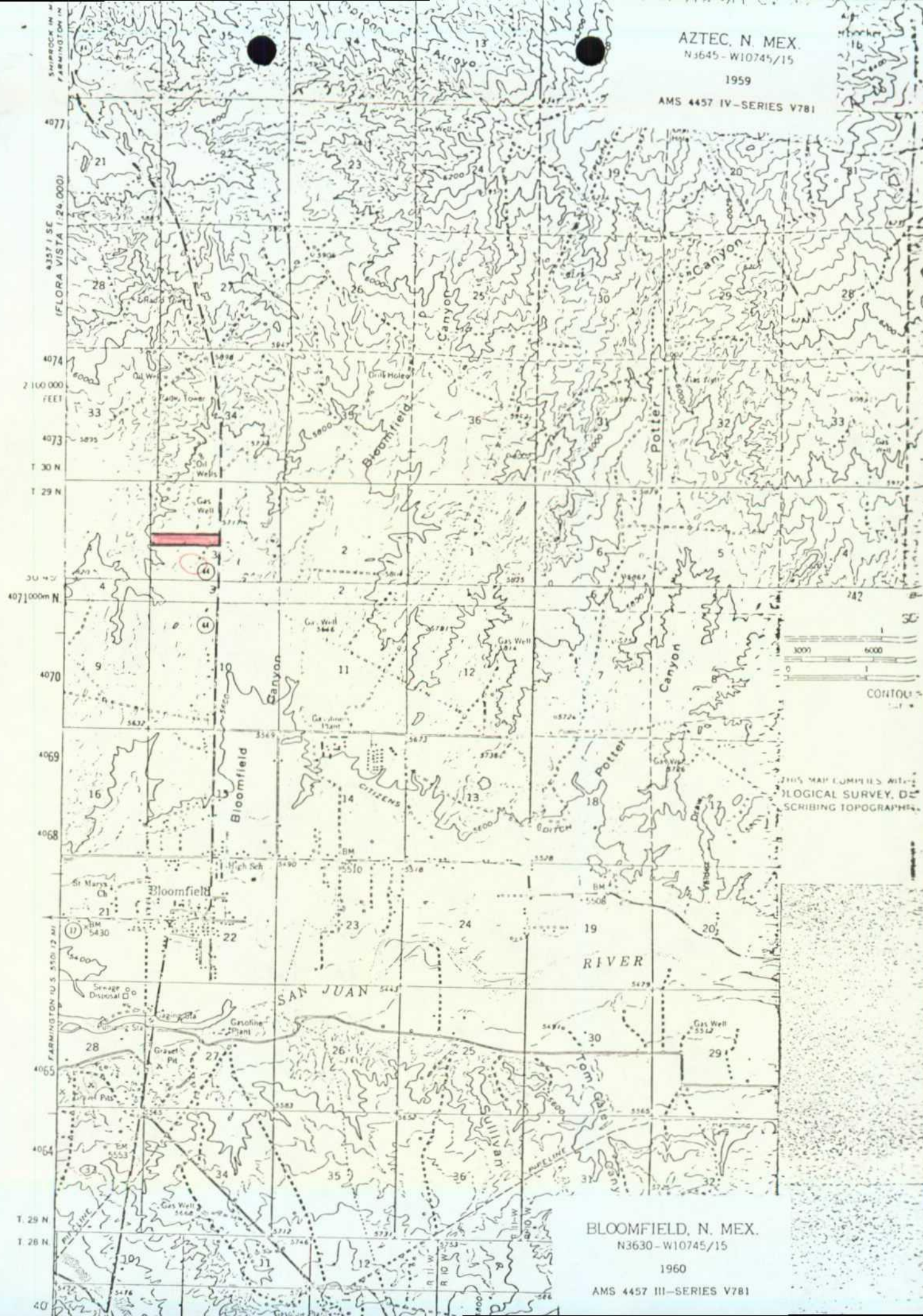


AZTEC, N. MEX.

N3645-W10745/15

1959

AMS 4457 IV-SERIES V781



BLOOMFIELD, N. MEX.

N3630-W10745/15

1960

AMS 4457 III-SERIES V781



or the second part hereinafter called the Purchaser.

WITNESSETH:

1. That the said Owner, in consideration of the covenants and agreements on the part of the said Purchaser, hereinafter contained, agrees to sell and convey unto the said Purchaser the following real estate situate, lying and being in the County of

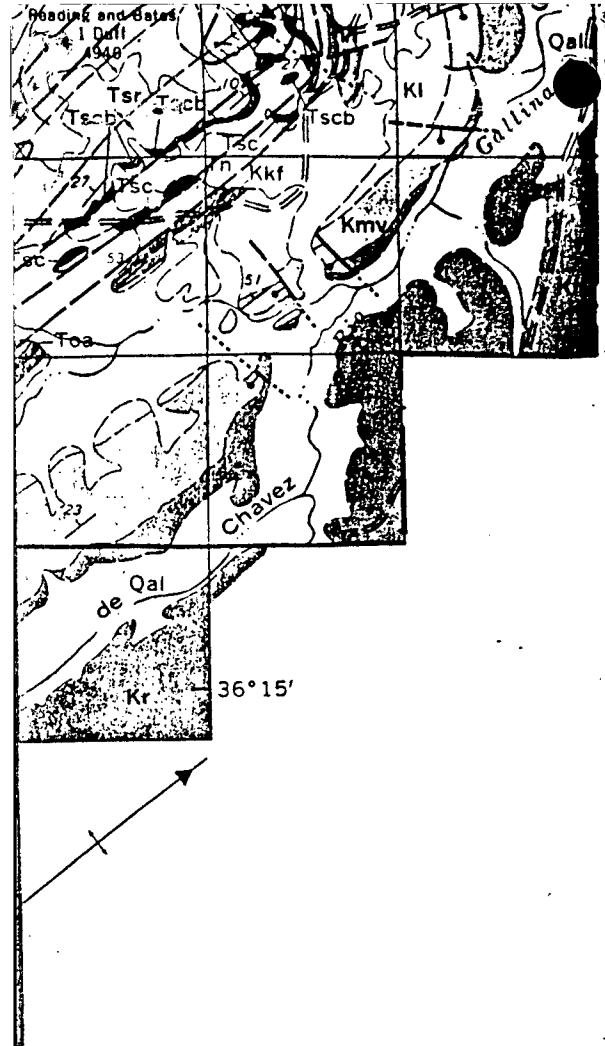
San Juan

and State of New Mexico, to-wit:

The South 330 feet of the Northwest Quarter (NW $\frac{1}{4}$ ) of Section Three (3), in Township Twenty-Nine (29) North of Range Eleven (11) West, N.M.P.M.;

RESERVING to Owner herein, their heirs and/or assigns, an easement for utility and access over the South 30 feet of subject property, and the right to extend a water line across subject property;

SUBJECT TO mineral reservations and/or conveyances heretofore made; and any and all easements and servitudes, public or private, of whatsoever kind or nature, in existence at the date hereof;



Miocene

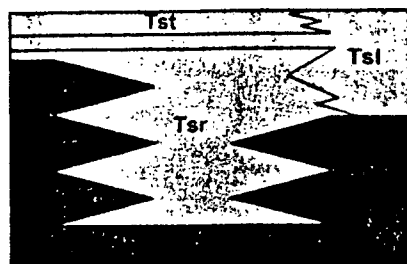
Eocene

Paleocene

Lower Cretaceous

**Intrusive igneous rocks**  
Mafic dikes. Locally contain agglomerate of igneous and sedimentary rocks. Yield no water

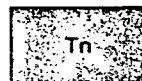
UNCONFORMITY



### San Jose Formation

**Tst, Tapicitos Member, red shale and interbedded white, tan, and red sandstone**  
**Tsl, Llaves Member, massive red to buff conglomeratic sandstone and interbedded sandy shale**  
**Tsr, Regina Member, variegated shale and interbedded thin to thick white to tan sandstone**  
**Tsc, Cuba Mesa Member, thick buff to tan conglomeratic sandstone and some interbedded shale. Where the Cuba Mesa Member intertongues with the Regina Member, Tsca, Tscb, and Tsc are tongues of the Cuba Mesa Member**  
Sandstone beds in the Tapicitos Member yield small to moderate amounts of water to domestic and stock wells. Llaves Member yields moderate amounts of water to domestic and stock wells and springs. Sandstone beds in the Regina Member yield small amounts of water to domestic and stock wells. Cuba Mesa Member yields small to moderate amounts of water to domestic and stock wells and springs

UNCONFORMITY



### Nacimiento Formation

Gray to olive-gray shale containing interbedded thin to thick sandstone and conglomeratic sandstone. Locally yields small to moderate amounts of water to domestic, stock, and industrial wells



### Ojo Alamo Sandstone

Buff to light-brown thick crossbedded sandstone containing lenses of conglomerate and thin lenses of olive-gray and gray shale. Yields moderate to large amounts of water to domestic and stock wells and springs

UNCONFORMITY



**Kirtland Shale and Fruitland Formation undivided**  
Dark-gray to olive-gray shale and interbedded buff, brown, and white sandstone. Contains local lenses of pebble conglomerate and coal. Yields a small amount of water to one well

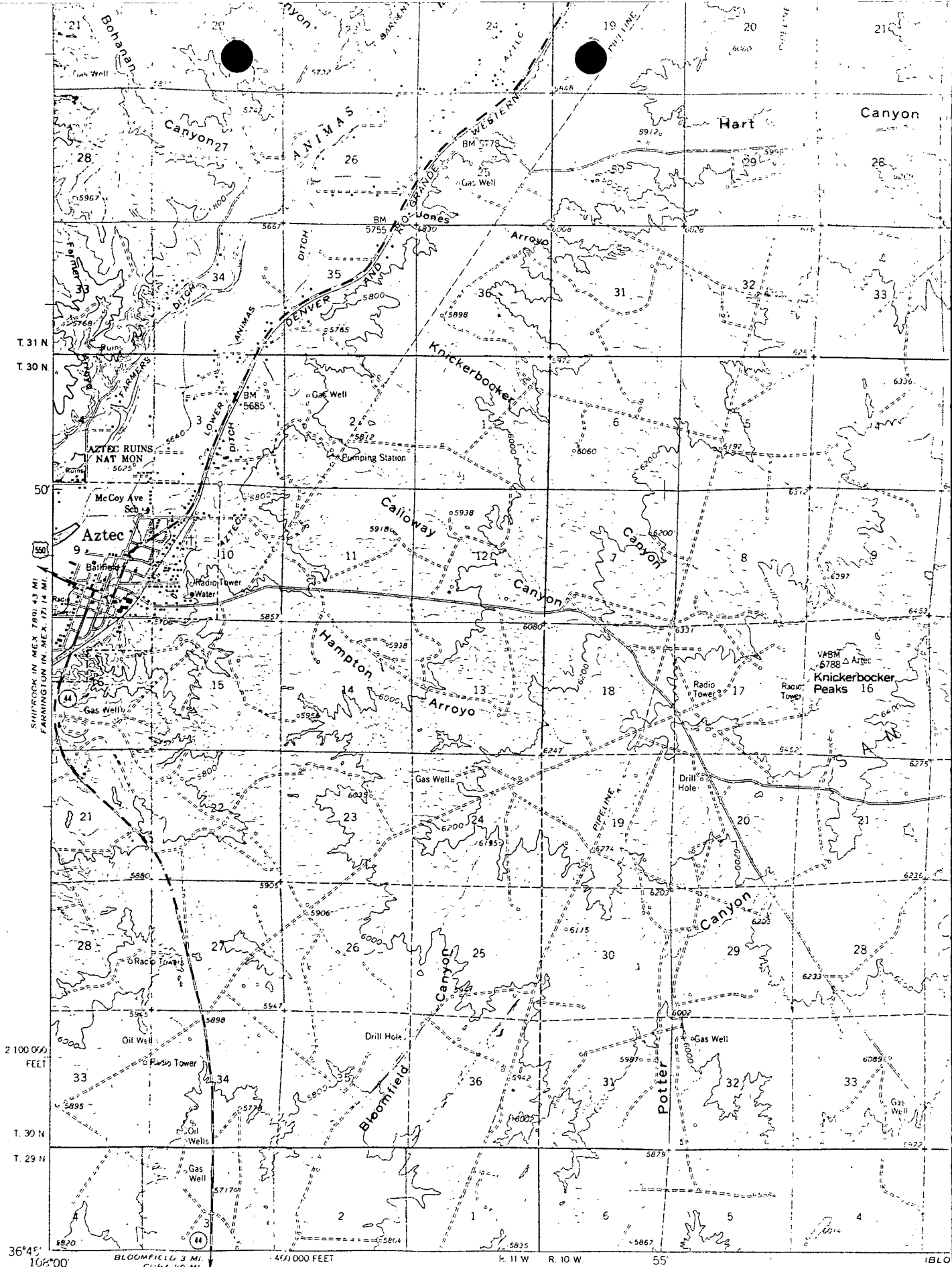


### Pictured Cliffs Sandstone

Gray to light-brown sandstone and interbedded gray shale. Upper part is mostly soft sandstone. Lower part is mostly sandy silty shale containing interbedded thin sandstone. From sec. 23, T. 21 N., R. 1 W., to sec. 4, T. 25 N., R. 1 E., the Pictured Cliffs Sandstone is mapped with the undivided Kirtland Shale and Fruitland Formation. North of sec. 4, T. 25 N., R. 1 E., the Pictured Cliffs grades laterally into the upper part of the Lewis Shale. Yields no water to domestic or stock wells in this area

TERTIARY

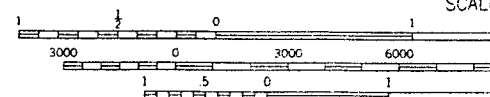
CRETACEOUS



Mapped, edited, and published by the Geological Survey  
Control by USGS and USCGS

Topography by photogrammetric methods from aerial  
photographs taken 1955. Field checked 1959

Polyconic projection 1:27 North American datum  
10,000-foot grid based on New Mexico coordinate system,  
west zone  
1000-meter Universal Transverse Mercator grid ticks,  
zone 13, shown in blue



*Aztec Quad*



Figure 15—CONTACT BETWEEN NACIMIENTO FORMATION (Tn) AND OVERLYING SAN JOSE FORMATION (Tsj), 2.5 mi north-northeast of Cedar Hill. View to east in sec. 22, T. 32 N., R. 10 W.

Baltz and West (1967, p. 65) that a well open to all sandstones in the formation might yield 1,440 gpm.

**WATER QUALITY AND USE**—The specific conductance of water from wells and springs ranges from 320 to 5,000  $\mu\text{mhos}$ , averaging about 2,000  $\mu\text{mhos}$  (fig. 16). Although supporting data are not available, specific conductance may increase with depth in most localities (a characteristic common of other aquifers in this area). The San Jose Formation yields water to numerous wells and springs used for stock and domestic supplies.

### Nacimiento/Animas Formations (Paleocene)

The Nacimiento Formation lies at the surface in a broad belt at the western and southern edges of the central basin and dips beneath the San Jose Formation in the basin center (fig. 17, sheet 5, pocket). To the north

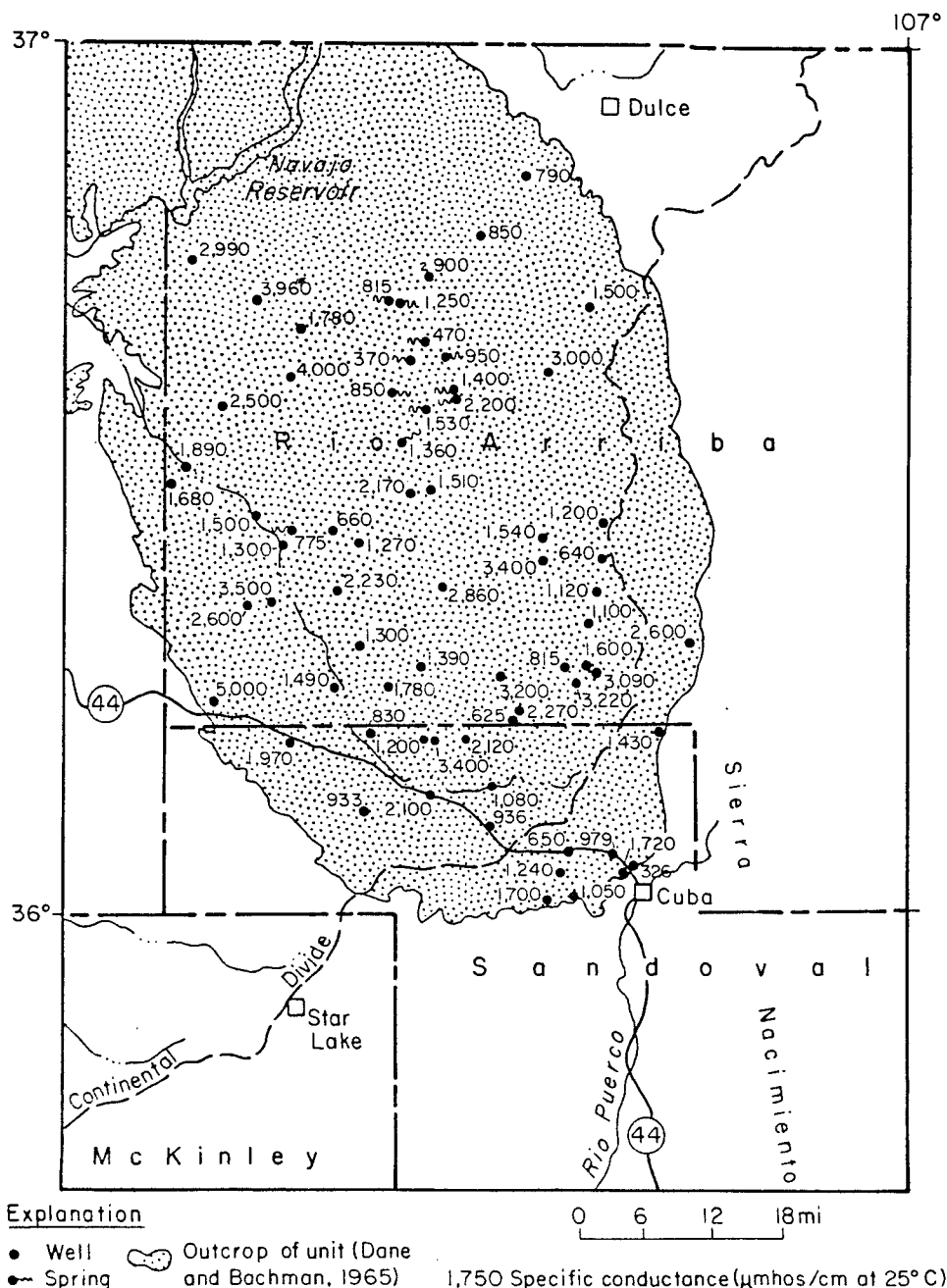


Figure 16—SPECIFIC CONDUCTANCE FROM SELECTED WELLS AND SPRINGS IN SAN JOSE FORMATION.

and northeast, the Nacimiento grades into the Animas Formation. The Animas Formation is exposed only in a narrow belt around the northeast part of the study area and along the La Plata River valley near the Colorado border.

Because these units occupy essentially the same stratigraphic interval, they are treated together. This aquifer lies at a depth of 2,660 ft in the basin center (fig. 18, sheet 5, pocket).

**GEOLOGIC CHARACTERISTICS**—The Nacimiento Formation was named by Keyes (1906) for exposures near the town of Cuba (formerly Nacimiento). Although no attempt at subdivision of this unit has been successful, one gets an impression from exposures at the southern end of Cuba Mesa that the lower part of the Nacimiento is characterized by interbedded black, carbonaceous mudstones and white, coarse-grained sandstones (fig. 19), whereas the upper part of the formation is dominated by more somber beds of mudstone and sandstone. Although there is an area along NM-44 north of Cuba where the Nacimiento is black and white as at the base of Cuba Mesa, poor exposures of the lower part of the formation in the intervening area prohibit lateral tracing and make this correlation uncertain.

Because of its slope-forming habit (fig. 20), the Nacimiento is often assumed to be mainly a mudstone unit; however, close inspection reveals that sandstone makes up many of the slope-forming beds. These sandstones are medium to very coarse grained, immature to sub-mature arkose (tables 7 and 8). The mudstones display the popcorn weathering characteristic of swelling clays. Thickness of the Nacimiento ranges from 418 to 2,232 ft (fig. 21, sheet 5, pocket).

The Animas Formation was named by Cross (Emmons and others, 1896) and Gardner (1917) for exposures along the Animas River below Durango, Colorado. Reeside (1924) divided this sequence into the McDermott Formation (below) and the Animas Formation (above). Barnes and others (1954) redefined the Animas as consisting of two members: the McDermott (Late Cretaceous) at the base and an unnamed upper member (Paleocene) at the top. The McDermott is restricted to the northwest part of the basin and in this study area is exposed only in the La Plata River valley

near the Colorado border. In that area, it lies below the Ojo Alamo Sandstone and is ultimately cut out by erosion at the base of this unit. Although the upper member of the Animas does not extend into New Mexico in this northwest area, it appears to constitute the entire Animas section exposed near Dulce in the northeast part of the basin. At the type area, the McDermott Member is 127 ft thick and the upper member is 106 ft thick (Barnes and others, 1954).

The Nacimiento conformably overlies the Ojo Alamo Sandstone. Locally the two units can be shown to inter-tongue (sheet 3). The McDermott Member of the Animas Formation is generally disconformable on the Kirtland Shale.

**HYDROLOGIC PROPERTIES**—The potentiometric surface of ground water in the Ojo Alamo is shown in within the Nacimiento Formation. Brimhall (1973, p. 201-202) described one of these sandstone bodies in the western part of Rio Arriba County near Cañon Largo where several flowing wells occur. Brown (1976, p. 44) reported that from 16 to 100 gpm are produced by wells constructed by El Paso Natural Gas Company. Although no aquifer tests are available for the Nacimiento Formation, transmissivities of as much as 100 ft<sup>2</sup>/d may be expected in some of the coarser and more continuous sandstone bodies, based on tests of similar aquifers.

**WATER QUALITY AND USE**—Water in some of the more extensive sandstones has a specific conductance of less than 1,500  $\mu$ mhos; however, specific conductance exceeds 2,000  $\mu$ mhos in the finer grained Nacimiento strata (fig. 22, sheet 5, pocket). The specific conductance of water in the Nacimiento along the San Juan River commonly exceeds 4,000  $\mu$ mhos. The Nacimiento provides water for domestic and stock use on ranches in its outcrop area.

### Ojo Alamo Sandstone (Paleocene)

The Ojo Alamo Sandstone is the lowest Tertiary rock unit in the San Juan Basin. From its narrow outcrop belt, the Ojo Alamo dips toward the basin center to a maximum depth of 3,645 ft (figs. 23 and 24, sheet 5, pocket).

**GEOLOGIC CHARACTERISTICS**—This sequence of



Figure 19—LOWER PART OF NACIMIENTO FORMATION AT SOUTH END OF MESA DE CUBA. View to north in sec. 11, T. 20 N., R. 2 W.



Figure 20—NACIMIENTO FORMATION EXPOSED IN KUTZ CANYON as seen looking east from Angel Peak overlook, east of NM-44, 11 mi southeast of Bloomfield.

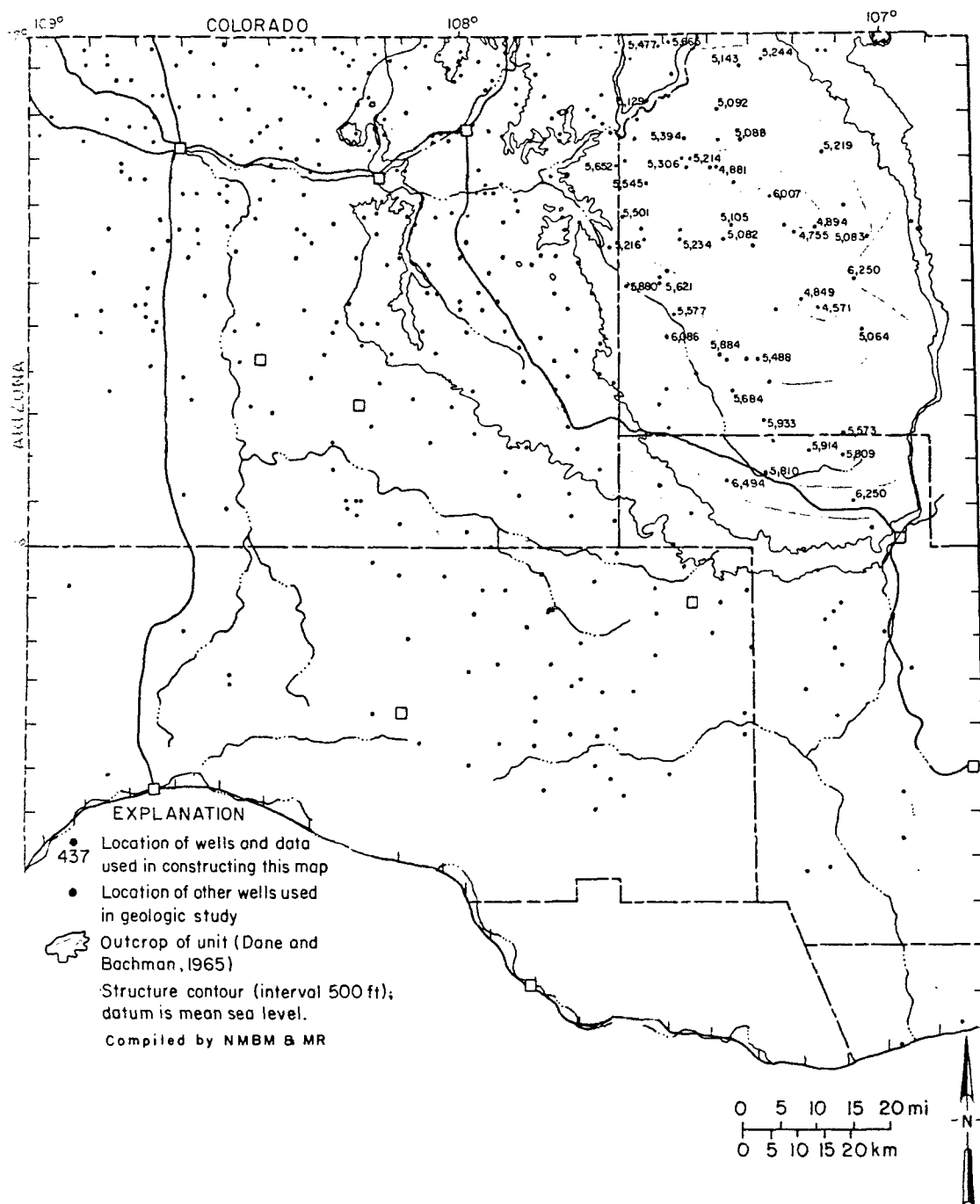


Figure 17—ELEVATION OF TOP (STRUCTURE) OF NACIMIENTO/ANIMAS FORMATIONS.

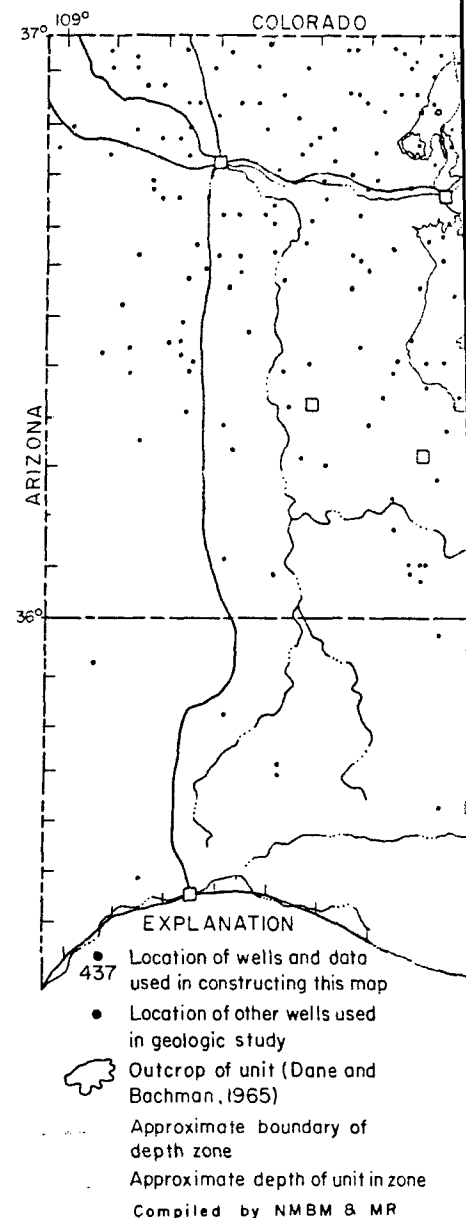


Figure 18—DEPTH TO TOP OF NACIMIENTO/ANIMAS FORMATIONS.

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

SUBMIT IN DUPLICATE\*

(See other  
instructions  
reverse side)

Form approved.  
Budget Bureau No. 42-R555.5.

WELL COMPLETION OR RECOMPLETION REPORT AND LOG\*

1a. TYPE OF WELL: OIL WELL <input checked="" type="checkbox"/> GAS WELL <input type="checkbox"/> DRY <input type="checkbox"/> Other <input type="checkbox"/>		b. TYPE OF COMPLETION: NEW WELL <input checked="" type="checkbox"/> WORK OVER <input type="checkbox"/> DEEP-EN <input type="checkbox"/> PLUG BACK <input type="checkbox"/> DIFF. RESVR. <input type="checkbox"/> Other <input type="checkbox"/>		RECEIVED SEP 23 1983 OIL CON. DIST. 3 SEP 15 1983	
2. NAME OF OPERATOR Union Texas Petroleum Corporation					
8. ADDRESS OF OPERATOR P.O. Box 808, Farmington, NM 87499					
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements) At surface 2127 ft./South 1931 ft./West At top prod. interval reported below Same as above At total depth Same as above					
15. DATE SPUDDED 5-7-83		16. DATE T.D. REACHED 5-14-83		17. DATE COMPL. (Ready to prod.) 6-15-83	
20. TOTAL DEPTH, MD & TVD 6150'		21. PLUG, BACK T.D., MD & TVD 6110'		22. IF MULTIPLE COMPL., HOW MANY*	
24. PRODUCING INTERVAL(S), OF THIS COMPLETION—TOP, BOTTOM, NAME (MD AND TVD)* 5648'-5808' Gallup 5419'-5585' Gallup		23. INTERVALS DRILLED BY 10-6150'		25. WAS DIRECTIONAL SURVEY MADE No	
26. TYPE ELECTRIC AND OTHER LOGS RUN IEL - GR, CDL-GR		27. WAS WELL CORED No		14. PERMIT NO. DATE ISSUED	
18. ELEVATIONS (OF, R&B, RT, GR, ETC.) 5530' RKB		19. ELEV. CASINGHEAD 5517' GR		12. COUNTY OR PARISH San Juan	
13. STATE New Mexico		11. SEC., T., R., M., OR BLOCK AND SURVEY Sec. 27, T29N-R11W		10. FIELD AND POOL OR WILDCAT Undesignated Gallup	
28. CASING RECORD (Report all strings set in well)					
CASING SIZE	WEIGHT, LB./FT.	DEPTH SET (MD)	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED
8-5/8"	24.00	309'	12-1/4"	354 cu.ft.	
5-1/2"	17.00 & 15.50	6150'	7-7/8"	4327 cu.ft. (2 Stage)	
See Attachment					
29. LINER RECORD			30. TUBING RECORD		
SIZE	TOP (MD)	BOTTOM (MD)	SACKS CEMENT*	SCREEN (MD)	SIZE
					2-3/8"
31. PERFORATION RECORD (Interval, size and number)			32. ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC.		
5648'-5808' 16-0.29" holes			DEPTH INTERVAL (MD)		
5419'-5585' 20-0.29" holes			5648'-5808'		
			See Attachment		
			5419'-5585'		
			See Attachment		
33. PRODUCTION					
DATE FIRST PRODUCTION 7-8-83		PRODUCTION METHOD (Flowing, gas lift, pumping—size and type of pump) Pumping		WELL STATUS (Producing or shut-in) Pumping	
DATE OF TEST 7-20-83	HOURS TESTED 24	CHOKE SIZE 1-1/4"	PROD'N. FOR TEST PERIOD →	OIL—BBL. 10	GAS—MCF. 51
WATER—BBL. 0	GAS-OIL RATIO 15,100				
FLOW. TUBING PRESS. 40	CASING PRESSURE 139	CALCULATED 24-HOUR RATE →	OIL—BBL. 10	GAS—MCF. 151	WATER—BBL. 0
34. DISPOSITION OF GAS (Sold, used for fuel, vented, etc.) Sold			TEST WITNESSED BY Bennie Brown		
35. LIST OF ATTACHMENTS Cement and Stimulation Record					
36. I hereby certify that the foregoing and attached information is complete and correct as determined from all available records					
SIGNED J.A. Edmister		TITLE Engineering Analyst			

\*(See Instructions and Spaces for Additional Data on Reverse Side) FARMINGTON RESOURCE AREA

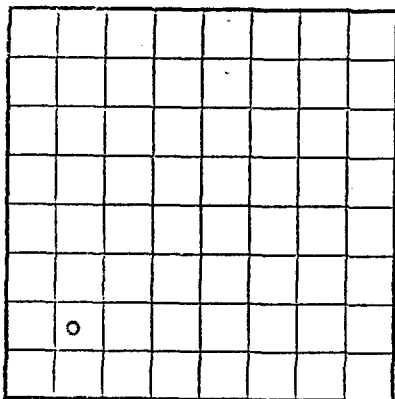
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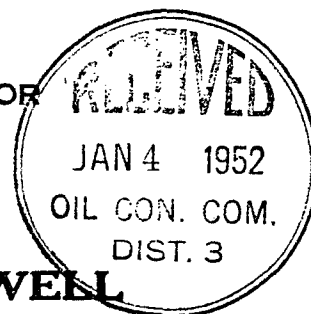


LOCATE WELL CORRECTLY

U.S. LAND OFFICE Santa FeSERIAL NUMBER 047020-b

LEASE OR PERMIT TO PROSPECT \_\_\_\_\_

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

**LOG OF OIL OR GAS WELL**

Company Congress Oil Company Address 1104 Burt Bldg., Dallas 1, Texas  
 Lessor or Tract Garland Field Fulcher-Kutz State New Mexico  
 Well No. 1-B Sec 27 T. 29N R. 11W Meridian N.M.P.M. County San Juan  
 Location 990 ft. {N.} of S. Line and 990 ft. {E.} of W. Line of section 27 Elevation 5526  
(Derrick floor relative to sea level)

The information given herewith is a complete and correct record of the well and all work done thereon so far as can be determined from all available records.

Signed Van ThompsonDate January 2, 1952

Title \_\_\_\_\_

The summary on this page is for the condition of the well at above date.

Commenced drilling November 30, 1951, 19\_\_\_\_ Finished drilling December 15, 19 51

**OIL OR GAS SANDS OR ZONES**

(Denote gas by G)

No. 1, from 1648 to 1740 G No. 4, from \_\_\_\_\_ to \_\_\_\_\_  
 No. 2, from \_\_\_\_\_ to \_\_\_\_\_ No. 5, from OIL CONCENTRATION TO COMMISSION  
SANTA FE, NEW MEXICO. to \_\_\_\_\_  
 No. 3, from \_\_\_\_\_ to \_\_\_\_\_ No. 6, from \_\_\_\_\_ to \_\_\_\_\_

**IMPORTANT WATER SANDS**

No. 1, from \_\_\_\_\_ to \_\_\_\_\_ No. 3, from JAN 7 1952 to \_\_\_\_\_  
 No. 2, from \_\_\_\_\_ to \_\_\_\_\_ No. 4, from \_\_\_\_\_ to \_\_\_\_\_

**CASING RECORD**

Size casing	Weight per foot	Threads per inch	Make	Amount	Kind of shoe	Cut and pulled from	Perforated		Purpose
							From—	To—	
8-5/8"	32#		H40	128'					Surface
5 1/2"	14#		H40	1658'-4"					Production
1" siphon line				1722'					

**MUDDING AND CEMENTING RECORD**

Size casing	Where set	Number sacks of cement	Method used	Mud gravity	Amount of mud used
8-5/8"	128	70	Halliburton		
5 1/2"	1653	282 76	"		

PLUGS AND ADAPTERS

Heaving plug—Material ..... Length ..... Depth set .....

Adapters—Material ..... Size .....

## SHOOTING RECORD

Size	Shell used	Explosive used	Quantity	Date	Depth shot	Depth cleaned out
	Shot with	200 quarts nitro	200	12/12	1747-1664	1747

## TOOLS USED

Rotary tools were used from 0 feet to 1747 feet, and from ..... feet to ..... feet

Cable tools were used from to complete ~~feet~~ well only, feet, and from ..... feet to ..... feet

## DATES

December 15, 1951 Put to producing ..... 19.....

The production for the first 24 hours was ..... barrels of fluid of which ..... % was oil; ..... % emulsion; ..... % water; and ..... % sediment. Gravity, °Bé. ....

If gas well, cu. ft. per 24 hours 1100 MCF Gallons gasoline per 1,000 cu. ft. of gas .....

Rock pressure, lbs. per sq. in. 330/

## EMPLOYEES

Denman Drilling Company, Contractor Driller Mike Cronley (SUC) Driller

, Driller , Driller

## FORMATION RECORD

FROM—	TO—	TOTAL FEET	FORMATION
0	35	35	Sand
35	90	55	Rock bed <i>NACIMICITO</i>
90	135	45	Sand
135	575	440	Sand and shale
575	655	80	Alamo <i>OJO ALAMO</i>
655	750	105	Shale <i>KIRTLAND</i>
750	1430	680	Sand and shale <i>FRUITLAND</i>
1430	1645	215	Sand, shale and coal
1645	1747 T.D.	101	Sand
FORMATION TOPS			
Top Pictured Cliffs - 1648'			

10—

100 FT. LIFT

(OVER)

10—13094-2

16—13094-2

FORMATION RECORD—Continued

# Typical Physical Properties of BFGoodrich Flexseal Liners

## Unsupported Membrane Liner

Property:	Test Method:	10 Mil PVC Requirements:	20 Mil PVC Requirements:	30 Mil PVC Requirements:	Oil-resist. 30 Mil PVC Requirements:	CP-UR 30 Mil CPE Requirements:
Tensile Strength	ASTM D882	2300 psi, Min.	2300 psi, Min.	2300 psi, Min.	2300 psi, Min.	1900 psi, Min.
100% Modulus	ASTM D882	1000-1600 psi	1000-1600 psi	1000-1600 psi	900-1500 psi	600 psi, Min.
Elongation at Break	ASTM D882	300%, Min.	350%, Min.	350%, Min.	300%, Min.	400%, Min.
Elmendorf Tear	ASTM D689	180 Gms/Mil, Minimum	180 Gms/Mil, Minimum	180 Gms/Mil, Minimum	150 Gms/Mil, Minimum	150 Gms/Mil, Minimum
Graves Tear	ASTM D1004	300 lb./in. Minimum	300 lb./in. Minimum	300 lb./in. Minimum	270 lbs./in. Minimum	250 lb./in. Minimum
Water Extraction	ASTM D1239	0.30%, Max.	0.30%, Max.	0.30%, Max.	0.30%, Max.	0.30%, Max.
Volatility	ASTM D1203	1.0%, Max.	0.90%, Max.	0.70%, Max.	0.70%, Max.	0.20%, Max.
Cold Crack	ASTM D1790	-10° F	-15° F	-20° F	+15° F, Max.	-20° F
Hardness, Shore A Durometer	ASTM D676	94, Av.	94, Av.	94, Av.	92+5	
Dimensional Stability	ASTM D1204 242° F/1 hr.	±5% Max.	±5% Max.	±5% Max.	±5% Max.	±8% Max.
Oil Extraction	Immerse 7 days at 75°F. Wash w/1% soap solution, rinse, wipe, dry				Neatsfoot oil: 1.0%, Max. Gulf Harmony #3: 0.5%, Max. Corn Oil: 0.8%, Max.	

## Supported 3-Ply Membrane Liner

Property:	Test Method:	30CP6 CPE Requirements:	30CP10 CPE Requirements:	30HP6 Hypalon Requirements:	30HP10 Hypalon Requirements:	45HP10 Hypalon Requirements:
Tensile Strength	ASTM D 412	1000 psi, Min.	1000 psi, Min.	1000 psi, Min.	1000 psi, Min.	1000 psi, Min.
Elongation at Break	ASTM D 412	250%, Min.	250%, Min.	250%, Min.	250%, Min.	250%, Min.
Water absorption (7 days at 70° F)	ASTM D 471	7% Max. by weight	7% Max. by weight	5% Max. by weight	5% Max. by weight	5% Max. by weight
Cold bend test	ASTM D 2136 (1/8 inch mandrel)	-30°F, no cracks	-30°F, no cracks	-30°F, no cracks	-30°F, no cracks	-30°F, no cracks
Brittleness point	ASTM D 746 (Procedure "B")	-45°F, no failures	-45°F, no failures	-45°F, no failures	-45°F, no failures	-45°F, no failures
Ozone Resistance 7 days @300 pphm @140°F with 20% strain	ASTM D 1149	No cracks visible under 7 times magnification	No cracks visible under 7 times magnification	No cracks visible under 7 times magnification	No cracks visible under 7 times magnification	No cracks visible under 7 times magnification
*Breaking Strength, Grab Method	ASTM D 751	120 lb., Min.	200 lb., Min.	120 lb., Min.	200 lb., Min.	200 lb., Min.
*Tear Strength, Tongue Tear	ASTM D 751	25 lb., Min.	70 lb., Min.	25 lb., Min.	70 lb., Min.	70 lb., Min.
*Puncture Resistance	FTMS 101 B (Method 2031)	130 lb., Min.	170 lb., Min.	130 lb., Min.	170 lb., Min.	170 lb., Min.
*Factory and field seam strength Grab Method	ASTM D 751 except with 6" plus seam width jaw separation	96 lb., Min.	160 lb., Min.	96 lb., Min.	160 lb., Min.	160 lb., Min.

# Unsupported Liners from ENVIRONMENTAL LINERS, INC.

## Typical Physical Properties

Property:	PVC 20 mil	PVC 30 mil	CPEU 20 mil	CPEU 30 mil	OR PVC* 30 mil	ASTM Test method
Tensile Strength	2400	2400	1700	1900	2400	D882
100% Modulus	1000	1000	400	600	1200	method A
Thickness, Mils	20±5%	30±5%	20±5%	30±5%	30±5%	D1593
Elongation at Break	300%	300	250	350	300	Method A
Tear Resistance						
Elmendorf	200	200	150	150	150	D1922 gms/mil, min
Graves	300	275	175	250	270	D 1004 lbs/in, min
Low Temperature Impact °F	-20	-20	-20	-20	-0	D1790
Volatility	1.0	.75	.70	.50	.50	D1203-A %loss max
						%loss max
Water Extraction	±03	± 15	±1.0	±1.0	± 0.1	D1239
Specific Gravity, min.	1.2	1.2	1.25	1.25	1.3	0792 A
						%change max
Dimensional Stability	5	5	±16	±16	5	D1204
Resistance to	tensile strength 5	5	5	5	5	%loss max
Soil Burial	elongation 20	20	20	20	20	D3083 120 day %of original
Bonded Seam strength	90	90	90	90	90	tensile D3083

\* Must be protected from UV exposure

## Chemical Resistance \*\*

	E-excellent	G-good	F-fair	P-poor	N-not recommended
	PVC 20	PVC 30	CPEU 20	CPEU 30	OR PVC 30
Acids	G-E	G-E	E	E	G-E
Bases	F-G	F-G	G-E	G-E	F-G
Metallic salts	E	E	E	E	E
Solvents	P	P	P-F	P-F	F
Glycols	G	G	E	E	G
Alcohols	N	N	E	E	F
Fuels	N	N	F-G	F-G	G
Oils	F-P	F-P	G	G	G-E
Water	E	E	E	E	E
Brine	G	G	E	E	-
Domestic Sewage	E	E	E	E	-

For information only and no warranty expressed or implied is made.

\*\*Data based on tests believed to be reliable. However, these are laboratory conditions.

### 1. Specification

This specification describes Environmental Liners, Inc.

\_\_\_\_\_ lining of a nominal \_\_\_\_\_ mil thickness.

### 2. Liner Requirements

The material will be specifically formulated and have prior use demonstrated for the containment of \_\_\_\_\_.

### 3. Material Description

The liner shall be of single ply construction having polyvinyl chloride or chlorinated polyethylene as its principal polymer and shall be so produced to be free of holes, undispersed raw materials or blisters. Any such defects shall be repaired using the thermoplastic sheeting and the manufacturer's approved adhesive.

The materials shall be new, first quality materials with no regrind materials allowed to be used in the manufacture of the sheeting. The physical characteristics shall meet the requirements set forth in this specification.

### 4. Factory Fabrication of Blankets:

The finished roll goods shall be factory fabricated into panels up to 25,000 sq. ft. in size in order to reduce the amount of field seaming required. All seams shall be dielectric heat welded a minimum lap width of ½" and shall provide a film tearing bond.

### 5. Field Seaming

Field seaming shall be performed using only the manufacturer's approved adhesive and application directions. The minimum width of field seam shall be two inches. All field seams should be visually inspected and any loose edge repaired. Any folds in the material at the seam shall be sealed down and patched with thermo plastic liner material and approved adhesive.



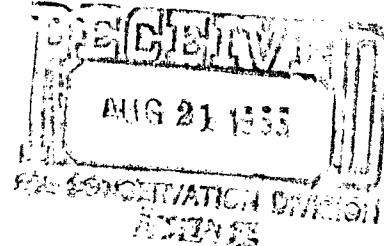
**WALSH**

ENGINEERING & PRODUCTION CORP.

Petroleum Engineering Consulting  
Lease Management  
Contract Pumping

3001 Northridge Drive  
P.O. Drawer 419  
Farmington, New Mexico 87401  
(505) 327-4892

August 19, 1985



Mr. Phil Bacca  
Environmental Engineer  
Oil Conservation Commission  
P. O. Box 2088  
Santa Fe, New Mexico 87501

REF: Basin Disposal, Inc.  
Proposed Disposal Pit  
Unit E & F, Section 3-T29N-R11W  
San Juan County, New Mexico

Dear Mr. Bacca:

The enclosed revised Figure No. 12, Leak Detection System, is being submitted for your approval as per our telephone conversation on this date.

I believe the revision, dated August 19, 1985, will meet the requirements as to 20 feet distance of leak detection system from any portion of bottom of pit.

Thank you for your consideration in this matter.

Very truly yours,

Ewell N. Walsh, P.E.  
President

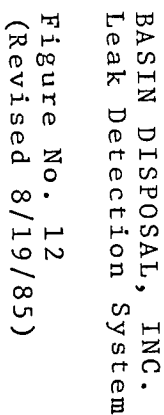
ENW:rr

cc: Frank Chavez, OCD, Aztec, N.M.  
Basin Disposal, Inc.

Jerry Sandel, D. C. Turner and David Turner

Enclosure

RECEIVED



WALSH ENGR. POND APPLICATION -  
CONSIDERATION OF REQUESTS IN 8/16/85  
LETTER

REQUEST #1 : SECONDARY LINER TO BE 20 mil  
INSTEAD OF 30 mil THICKNESS.

THE PHYSICAL PROPERTIES COMPARING TWO BRANDS  
OF 30 mil AND 20 mil PVC LINERS SHOW THAT  
FOR OUR CONDITIONS IT WOULD BE ACCEPTABLE  
TO USE A 20 mil PVC SECONDARY LINER.

REQUEST #2 : SLOPE OF GRADE TO BE 6" PER  
100' INSTEAD OF 6" PER 50'

FROM PERRY PG. 5-57 (5<sup>TH</sup> ED.) :

$$V = \frac{g(p_s - p_c) m^2 \sin \phi}{3\mu}$$

WHERE V IS AVG. VELOCITY OF FLUID FLOWING  
DOWN AN INCLINED PLATE.

$V_1$  = VELOCITY WITH 6"/50' GRADE

$V_2$  = VELOCITY WITH 6"/100' GRADE

LET  $\mu_1 \approx \mu_2$  (O.K. FOR NEWTONIAN FLUID)

$$\frac{V_2}{V_1} = \frac{\sin \phi_2}{\sin \phi_1}$$

$$\phi_2 = \tan^{-1}\left(\frac{0.5}{100}\right) = 0.29^\circ$$

$$\phi_1 = \tan^{-1}\left(\frac{0.5}{50}\right) = 0.57^\circ$$

$$\frac{V_2}{V_1} = \frac{\sin 0.29^\circ}{\sin 0.57^\circ} = 0.51$$

NEW VELOCITY WILL BE  $\frac{1}{2}$  THAT OF THE VELOCITY IF THE GRADE IS 6"/50'.

FIND  $V_2$  TO DETERMINE RISK.

$$\rho_s \equiv \text{fluid density} = 68 \text{ lb/ft}^3$$

$$\rho_c \equiv \text{density of air} \approx 0.77 \text{ lb/ft}^3$$

$$g \equiv \text{gravity} = 32.2 \text{ ft/s}^2$$

$$\mu \equiv \text{fluid viscosity} \approx 0.002 \text{ lb/ft}\cdot\text{s}$$

$$m \equiv \text{film thickness} \approx 0.021 \text{ ft}$$

$$\phi \equiv \text{angle of incline from horizontal} = 0.29^\circ$$

$$V_2 = \frac{32.2 (68 - 0.77) (0.021)^2 \sin 0.29^\circ}{3 (0.002)}$$

$$V_2 = 0.8 \text{ ft/s} = 2880 \text{ ft/hr}$$

THIS VALUE DOES NOT INCLUDE FRICTION

$V'_2 \equiv$  VELOCITY WITH FRICTION

$$V'_2 = V_2 \sqrt{\frac{f}{2}}$$



FROM PERRY, PG. 5-22  
 $f \approx 0.012$

$$V_2' \approx 2880 \sqrt{\frac{0.012}{2}} = 223 \text{ ft/hr}$$

$V_2'$  VALUE IS STILL ACCEPTABLE

CONCLUSION: O.K. TO DECREASE GRADE TO 6"/100'.

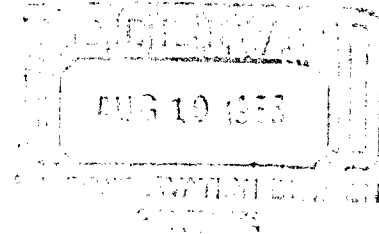
**WALSH**

ENGINEERING &amp; PRODUCTION CORP.

Petroleum Engineering Consulting  
Lease Management  
Contract Pumping3001 Northridge Drive  
P.O. Drawer 419  
Farmington, New Mexico 87401  
(505) 327-4892

August 16, 1985

Mr. Phil Bacca  
Environmental Engineer  
Oil Conservation Division  
P. O. Box 2088  
Santa Fe, New Mexico 87501



REF: Basin Disposal, Inc.  
Proposed Water Disposal Pit  
Unit E & F, Section 3-T29N-R11W  
San Juan County, New Mexico

Dear Mr. Bacca:

Enclosed you will find, as per your request during our meeting August 15, 1985, three copies (3) of revised Contingency Plan and drawing of Leak Detection System, Figure No. 12.

In addition, as discussed during our meeting, the following changes are requested to be approved:

1. Secondary liner to be 20 mil. thickness instead of 30 mil.
2. Slope of grade for Leak Detection System to be 6" per 100 feet instead of 6" per 50 feet. Note: 6" per 100 feet is approved by the Texas Railroad Commission for Leak Detection Systems.

Also you indicated that you would advise as to type or degree of water analysis you would require concerning the analysis of water detected in detection sump.

Thank you for your consideration and cooperation in these matters.

Very truly yours,

Ewell N. Walsh, P.E.  
President

ENW:rr

cc: Frank Chavez, OCD, Aztec, N.M. w/encl.

Basin Disposal, Inc. w/encl

Jerry Sandel, D. C. Turner and David Turner



## CONTINGENCY PLAN

1. If fluid is found in detection sump a sample will be obtained and analyzed to determine if the fluid is the same fluid that is in the disposal pit. The O.C.D. District Office, Aztec, New Mexico, will be immediately notified of the detection of fluid in the detection sump and will be furnished a copy of analysis of fluid.
2. If fluid is determined to be the same as in the disposal pit:
  - a. No additional water will be put in disposal pit.
  - b. The spray evaporative system will be utilized to evaporate water as fast as possible.
  - c. If spray evaporative system is not removing fluid at a sufficient rate, frac water storage tanks will be utilized as storage for removal of water from pit.
  - d. When water has been removed the pit and liner will be inspected and any repairs will be made as per liner manufacturer recommendations.

**DIL CONSERVATION DIVISION**

**AUG 19 1985**

**RECEIVED**



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**DIL CONSERVATION DIVISION**

**AUG 19 1985**

**RECEIVED**



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**WATER CONSERVATION DIVISION**

**Aug 19 1985**

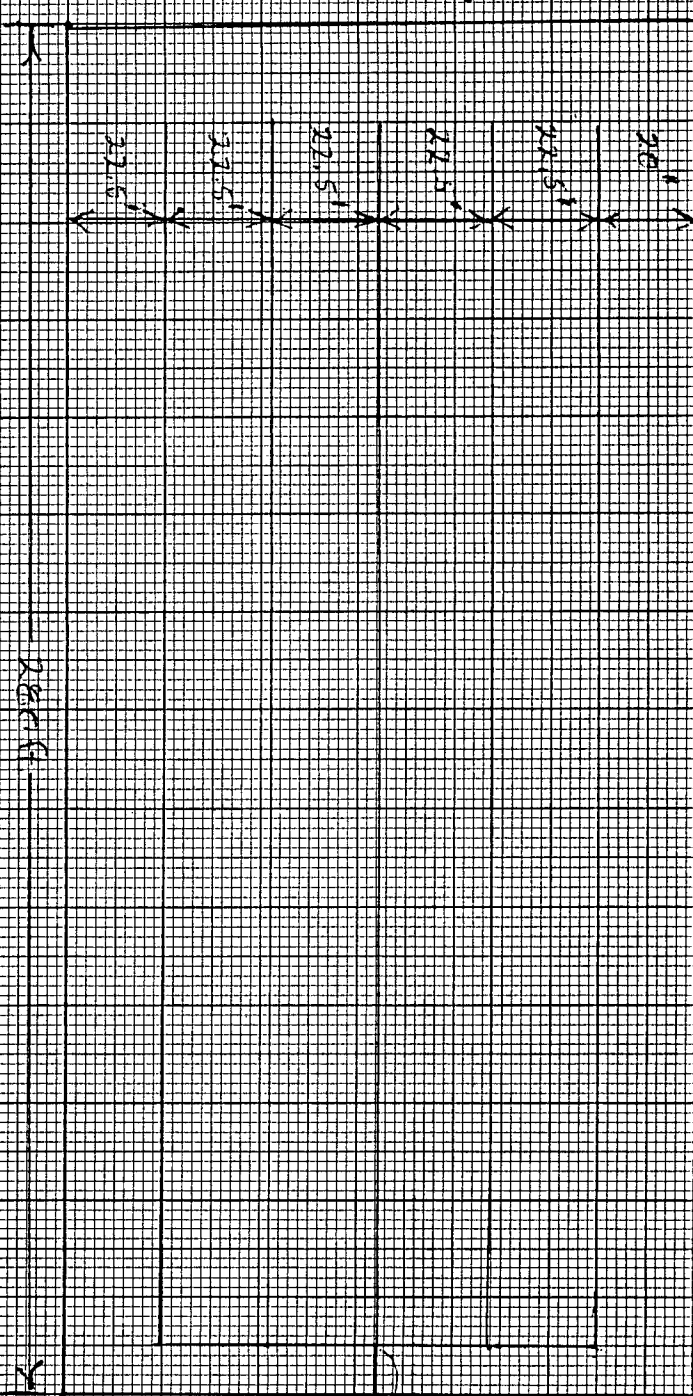
**RECEIVED**

OIL CONSERVATION DIVISION

AUG 19 1985

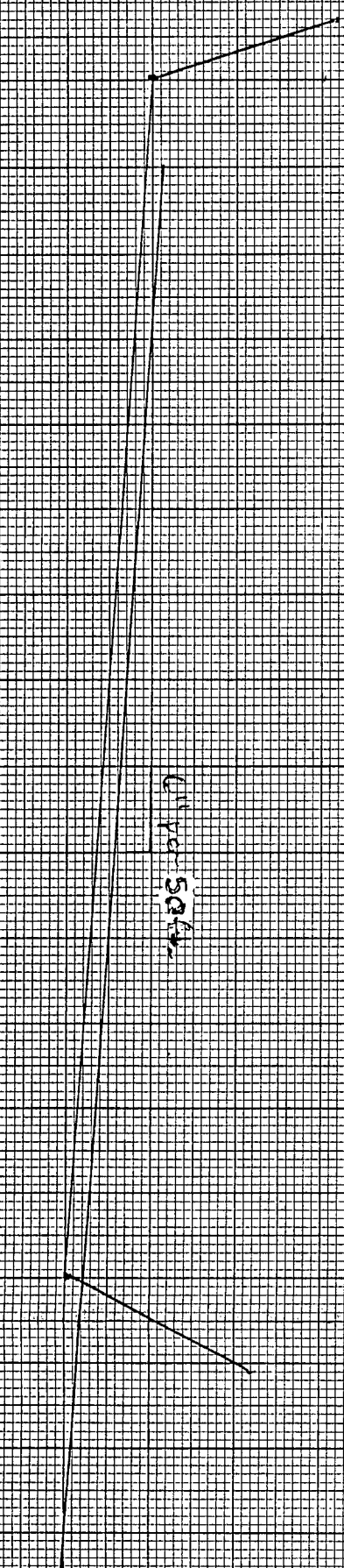
RECEIVED

ALL LATERALS  
AND MAINFIELD  
DETERMINED  
PIC. 42

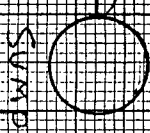


PLAN VIEW

ELEVATION



NON-DETERMINED  
PVE - 41



100' (3)

Sump  
(Outside of  
edge of beam)  
see exhibit  
No. 1 for  
Detail

BASIN DISPOSAL, INC.  
Leak Detection System  
Figure No. 12  
(Revised 8/16/85)



**WALSH**

ENGINEERING & PRODUCTION CORP.

Petroleum Engineering Consulting  
Lease Management  
Contract Pumping

3001 Northridge Drive  
P.O. Drawer 419  
Farmington, New Mexico 87401  
(505) 327-4892

August 14, 1985

OIL CONSERVATION DIVISION

AUG 15 1985

RECEIVED

Mr. R. L. Stamets  
Director  
State of New Mexico  
Energy and Minerals  
Oil Conservation Division  
P. O. Box 2088  
Santa Fe, New Mexico 87501

REF: Basin Disposal, Inc.  
Proposed Water Disposal Pit  
Unit E & F, Section 3-T29N-R11W  
San Juan County, New Mexico

Dear Mr. Stamets:

This is a request on behalf of Basin Disposal, Inc., for approval of the above-referred-to water disposal pit.

Enclosed you will find three (3) copies of report containing data in support of the proposal.

The area location of the land upon which the pit is proposed to be built has been approved by your office and the Aztec District Office.

Your consideration for approval of this request would be appreciated. It is proposed, after your approval, to attempt to have the pit in operation in October, 1985.

Very truly yours,

Ewell N. Walsh, P.E.  
President

ENW:rr

cc: Frank Chavez, OCD, Aztec, New Mexico  
Basin Disposal, Inc.

Jerry Sandel, D. C. Turner and David Turner



STATE OF NEW MEXICO  
**ENERGY AND MINERALS DEPARTMENT**  
OIL CONSERVATION DIVISION

August 1, 1985

TONY ANAYA  
GOVERNOR

POST OFFICE BOX 2088  
STATE LAND OFFICE BUILDING  
SANTA FE, NEW MEXICO 87501  
(505) 827-5800

Mr. Jerry Sandel  
P.O. Box B  
Aztec, New Mexico 87401

Dear Mr. Sandel:

The site proposed by you for a commercial evaporation pit located west of Highway 44 in Section 3, Township 29 North, Range 11 West, and inspected by Field Representative Jami Bailey on July 24, 1985 is acceptable for the activities proposed. Design and construction specifications of the pit(s), including the suitability of native materials to perform as a secondary liner, must be approved before work is commenced, as well as any future enlargement of the original pit(s).

For OCD to continue with the review of the proposed facility please provide us with the following information:

- A. The name of owner or legally responsible party. Include address and telephone number.
- B. Name of contact person (if different from above).
- C. A topographic map of the site area with a 5 feet contour line specifying the point of diversion of the smaller drainage arroyo at the west end of the property.

In addition, before final approval is given for operation of the project, the following topics must be addressed:

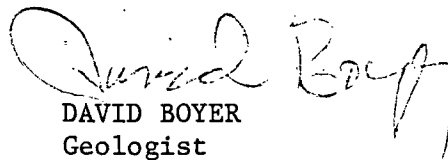
- 1) Plans and specifications for the skimmer pond(s) and evaporative pit(s).
- 2) A system and procedures for monitoring the leak detection system of the pit(s).
- 3) Contingency plans to cope with the failure of liners.
- 4) Procedures on notification of OCD in the event of detecting leaks or failure of liners.



Mr. Jerry Sandel (con  
Page 2

If you have any questions, feel free to contact our staff in Santa Fe.

Sincerely

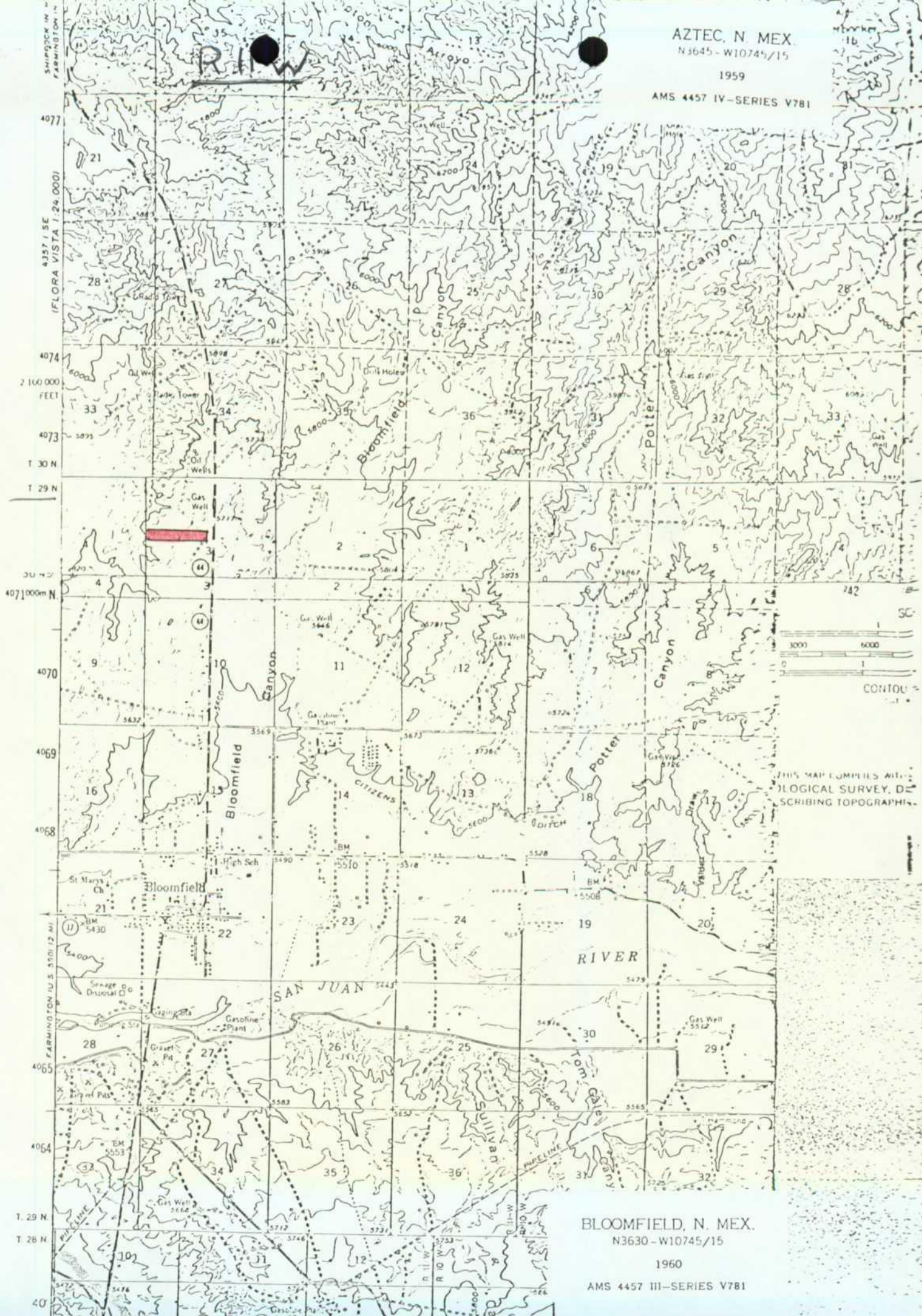
  
DAVID BOYER  
Geologist

DB/JB/et

AZTEC, N. MEX.  
N3645-W10745/15

1959

AMS 4457 IV-SERIES V781



BLOOMFIELD, N. MEX.  
N3630-W10745/15

1960

AMS 4457 III-SERIES V781

or the second part hereinafter called the Purchaser.

**WITNESSETH:**

1. That the said Owner, in consideration of the covenants and agreements on the part of the said Purchaser, hereinafter contained, agrees to sell and convey unto the said Purchaser the following real estate situate, lying and being in the County of

**San Juan**

and State of New Mexico, to-wit:

The South 330 feet of the Northwest Quarter (NW $\frac{1}{4}$ ) of Section Three (3), in Township Twenty-Nine (29) North of Range Eleven (11) West, N.M.P.M.;

RESERVING to Owner herein, their heirs and/or assigns, an easement for utility and access over the South 30 feet of subject property, and the right to extend a water line across subject property;

SUBJECT TO mineral reservations and/or conveyances heretofore made; and any and all easements and servitudes, public or private, of whatsoever kind or nature, in existence at the date hereof;





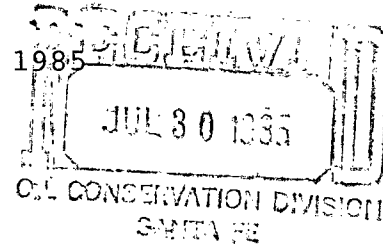
**WALSH**

ENGINEERING & PRODUCTION CORP.

Petroleum Engineering Consulting  
Lease Management  
Contract Pumping

3001 Northridge Drive  
P.O. Drawer 419  
Farmington, New Mexico 87401  
(505) 327-4892

July 29, 1985



Mr. Phil Bacca  
NM Oil Conservation Division  
P.O. Box 2088  
Santa Fe, NM 87501

RE: Sample Calculation

Dear Phil:

Enclosed you will find a sample of a computer print-out that was prepared on the basis of the sample you gave me.

The blue highlight indicates the variables that are entered from data, charts or graphs.

I would appreciate your comments concerning the computer printout.

Very truly yours,

Ewell N. Walsh, P.E.  
President

ENW:blk  
Enc.

WAVE CALCULATION  
(ALL REFERENCES-SHORE PROTECTION MANUAL)

WINDSPEED,  $U_a =$  50 M.P.H. : FETCH,  $F =$  500 FEET

DEPTH OF WATER,  $D =$  8.00 FEET SLOPE OF SIDE  $= 2:1$

WAVE HEIGHT AND PERIOD.

FOR  $D = 0.1$  TO  $5.0$  FT., Pg. 3-56, Fig. 3-27(UPPER)

FOR  $D = 5.1$  TO  $10.0$  FT., Pg. 3-57, Fig. 3-28(UPPER)

WAVE HEIGHT,  $H =$  0.50 FEET  
PERIOD,  $T =$  0.9 SECONDS

CALCULATE BREAKING WAVE HEIGHT,  $H_b$  (Pg. 7-7, Fig. 7-3)

$$\frac{H}{g \times T^2} = 0.0192 \quad g = 32.2$$

(Fig. 7-3)  $\frac{H_b}{H} = 1.0$  NOTE: UTILIZE ( $m = 0.1$ ) FOR SLOPE OF SIDE  $= 10:1$  OR LESS.

$$H_b = H \times \frac{H_b}{H} = 0.5$$

$$\frac{H_b}{g \times T^2} = 0.0192$$

Pg. 7-6, Fig. 7-2 (UTILIZING  $m = 0.10(1:10)$ )

$a = 1.6$        $a =$  alpha, upper limit  
 $b = 1.05$        $b =$  beta, lower limit

BREAKING HEIGHT, ft, MAX.  $= a \times H_b = 1.6 \times 0.5 = 0.80$

BREAKING HEIGHT, ft, MIN.  $= b \times H_b = 1.05 \times 0.5 = 0.53$

COMMENTS:

NON-BREAKING WAVE FORCE AND MOMENTS  
(ASSUMING A VERTICAL WALL)  
(ALL REFERENCES SHORE PROTECTION MANUAL)

Pg. 7-161

$$\begin{aligned} X &= 1.0 \text{ (ASSUME SMOOTH WALL)} \\ H_i = H &= 0.5 \\ d &= 8.0 \text{ FEET} \\ T &= 0.90 \text{ SECONDS} \end{aligned}$$

$$\frac{H_i}{d} = \frac{0.5}{8.0} = 0.0625$$

$$\frac{H_i}{g \times T^2} = 0.0192$$

$$g = 32.2$$

Pg. 7-164, Fig. 7-90

$$\frac{H_o}{H_i} = 0.21$$

$$H_o = \frac{H_o}{H_i} \times H_i = 0.105 \text{ FEET}$$

Pg. 7-161, Equations 7-73 and 7-74 and  
Pg. 7-162, Fig. 7-88

HEIGHT OF CREST ABOVE BOTTOM

$$Y_c = d + H_o + \left( \frac{1 + X}{2} \right) \times H_i = 8.61 \text{ FEET}$$

$$\begin{aligned} d &= 8.0 \\ H_o &= 0.105 \\ X &= 1.0 \\ H_i &= 0.5 \end{aligned}$$

HEIGHT OF TROUGH ABOVE BOTTOM

$$Y_t = d + H_o - \left( \frac{1 + X}{2} \right) \times H_i = 7.61 \text{ FEET}$$

COMMENTS:

NONBREAKING WAVE FORCE  
(AT WAVE CREST)

Pg. 7-165, Fig. 7-91

$$\frac{F_c}{w \times d^2} = 0.001$$

$$F_c = 0.001 \times w \times d^2 = 4.28 \text{ lb./ft}$$

$$w = 66.8 \text{ lbs./ft}^3$$

$$d = 8.0 \text{ FEET}$$

COMMENTS:

AVERAGE STATIC PRESSURE ON WALL

$$F_h = 0.5 \times H \times w = 267 \text{ lb./ft}^2$$

$$H = 8.00 \text{ FEET}$$

$$w = 66.8 \text{ lb./ft}^3$$

PER LINEAR FOOT

$$F_h = 1 \text{ lb./ft}^2 \times d = 2,138 \text{ lbs./ft.}$$

COMMENTS:

SHEARING FORCES ( $F_s$ )  
CALCULATED BY ED REED & ASSOCIATES  
(FRICTION FACTOR = 0.4)

$$F_s = 12,055 \text{ lb./ft.}$$

$$\text{SAFETY FACTOR} = \frac{F_s}{F_h} = \frac{12,055}{2,138} = 5.64$$

COMMENTS:

$$\text{WIND SPEED} = U_A = 50 \text{ MPH}$$

$$\text{FETCH} = F = 500 \text{ ft.}$$

$$\text{DEPTH OF WATER} = D = 5 \text{ ft}$$

FROM SHORE PROTECTION MANUAL, Pg. 3-56, FIG 3-27c

$$\text{WAVE HEIGHT} = H = 0.5 \text{ ft}$$

$$\text{PERIOD} = T = 0.9 \text{ sec.}$$

FIND BREAKING WAVE HEIGHT,  $H_b$ ,

FROM FIG 7-3 Pg. 7-7

$$\frac{H}{32.2 T^2} = \frac{0.5}{32.2 (0.9)^2} = .0192$$

$$\text{THUS } \frac{H_b}{H} = 1.0 \quad \text{FOR } 1:10 \text{ SLOPE}$$

$$H_b = H = 0.5 \text{ ft}$$

$$\frac{H_b}{32.2 T^2} = \frac{H}{32.2 T^2} = .0192$$

FROM FIG 7-2 Pg. 7-6 USING A SLOPE OF 1:10

$$\alpha \approx 1.6$$

$$\beta = \frac{d_B}{H_B} = 1.05$$

$$d_{B \text{ max}} = \alpha H_B = 1.6 (0.5) = 0.8$$

$$d_{B \text{ min}} = \beta H_B = 1.05 (0.5) = 0.53$$

∴ THUS WITH A SLOPE OF 1:10 BREAKING  
COULD OCCUR WITH A DIKE TOE DEPTH BE-  
TWEEN 0.53 - 0.8 ft.



5/4

OUR DEPTH IS 8' SO ASSUME NON-BREAKING WAVE.

NOW FIND NON-BREAKING WAVE FORCE & MOMENTS  
ASSUMING A VERTICAL WALL

USE METHODS DESCRIBED ON PG. 7-161

ASSUME SMOOTH WALL  $\chi = 1.0$

$$H_i = H = 0.5 \text{ ft}$$

$$d = 8 \text{ ft}$$

$$T = 0.9 \text{ s}$$

$$\frac{H_i}{d} = \frac{0.5}{8} = 0.0625$$

$$\frac{H_i}{gT^2} = \frac{0.5}{(32.2)(0.9)^2} = .0192$$

FROM FIG. 7-30 FOR  $\frac{H_i}{gT^2} = .0192$

$$\frac{h_o}{H_i} \approx 0.21$$

$$h_o = 0.21 H_i = 0.21 (0.5) = 0.105 \text{ ft}$$

FROM EQS. 7-73 & 7-74 ON PG. 7-161 AND  
FIG. 7-88 ON PG. 7-162

$$y_c = d + h_o + \left( \frac{1 + \lambda}{2} \right) H_i \quad (7-73)$$

$$y_c = 8 + 0.105 + \left( \frac{1 + 1}{2} \right) 0.5$$

$$y_c = 8.6 \text{ ft}$$

$$y_t = d + h_o - \left( \frac{1 + \lambda}{2} \right) H_i$$

$$y_t = 8 + 0.105 - \left( \frac{1 + 1}{2} \right) 0.5$$

$$y_t = 7.6 \text{ ft}$$

∴ THE WALL HAS TO BE ABOUT 8.6 ft TO PREVENT OVERTOPPING (WE ARE O.K.)

FROM FIG 7-91 ON PG 7-165, THE DIM.-LESS FORCE IS FOUND TO BE (AT WAVE CREST)

$$\frac{F_c}{\rho d^2} = .001$$

$$F_c = .001 \rho d^2 = .001 (66.8 \frac{\text{lb}}{\text{ft}^3}) (8 \text{ ft})^2$$

$$F_c = 4.2 \text{ lb/ft}$$

∴ HYDRODYNAMIC FORCES ARE NEGLIGIBLE

14

THE AVE. STATIC PRESSURE ON THE WALL IS  
 $F_H = \frac{1}{2} H W = \frac{1}{2} (85t) (66.8 \frac{lb}{ft^2}) = 267 \frac{lb}{ft^2}$

or per linear ft

$$F_H = 267 (85t) = 2138 \frac{lb}{ft}$$

COMPARING THIS TO THE SHEARING FORCES ( $F_s$ )  
CALCULATED BY ED REED & ASSOC.

(FRICTION FACTOR OF 0.4 O.K.)

$$F_s = 12,055$$

$$\text{SAFETY FACTOR} = \frac{F_s}{F_H} = \frac{12,055}{2138} = 5.64$$

MY CALCULATIONS CONCUR.



MEMORANDUM OF MEETING OR CONVERSATION

☐ Telephone ☒ Personal

Time 8:15 AM

Date 7/11/85

Originating Party

Other Parties

JERRY SANDEL 334-6194

DAVE BOYER

Subject

Construction of evaporation pits north of Bloomfield.

Discussion

met with Sandel in Conference Room. He intends to construct 3 acre evaporation pit similar to Cedar Hill on 20 acres west of Hwy 44 between Bloomfield + Aztec. Design consultant to be Red Walsh of Walsh Engineering. He was told that depending on the geology of the area, a secondary liner of compacted natural materials may be adequate with a porous layer of sand or other material between the liners for drainage + leak detection. He was provided with the enclosed list of needed information, + a request to have some of the info ready for my inspection trip week of 7/22-7/26. He was also given guidelines for lined pits + for tanks.

Conclusions or Agreements

I will call him next week to set appt. for site inspection 7/22-7/26

Distribution

Signed

Janis Bailey

EVAPORATION PIT  
GEOLOGICAL REPORT  
SECTION 3-T29N-R11W  
SAN JUAN COUNTY, NEW MEXICO  
JULY 23, 1985

OIL CONSERVATION DIVISION

JUL 15 1985

RECEIVED

R. Tucker Attebery  
R. Tucker Attebery, Geologist  
ATTEBERY GEOLOGICAL SERVICES, INC.  
3005 Northridge Drive - Suite L  
Farmington, New Mexico 87401  
505-327-4039

EVAPORATION PIT GEOLOGICAL REPORT  
for the south 330 feet of the northwest quarter  
of Section 3-T29N-R11W, San Juan County, New Mexico

---

The property is located two and one-half miles north of Bloomfield, New Mexico along the west flank of the valley bisected by Highway 44. Due to the gentle slope, surface drainage is primarily a sheetwash from an elevation of approximately 5740 feet to 5720 feet in a south-southwest direction.

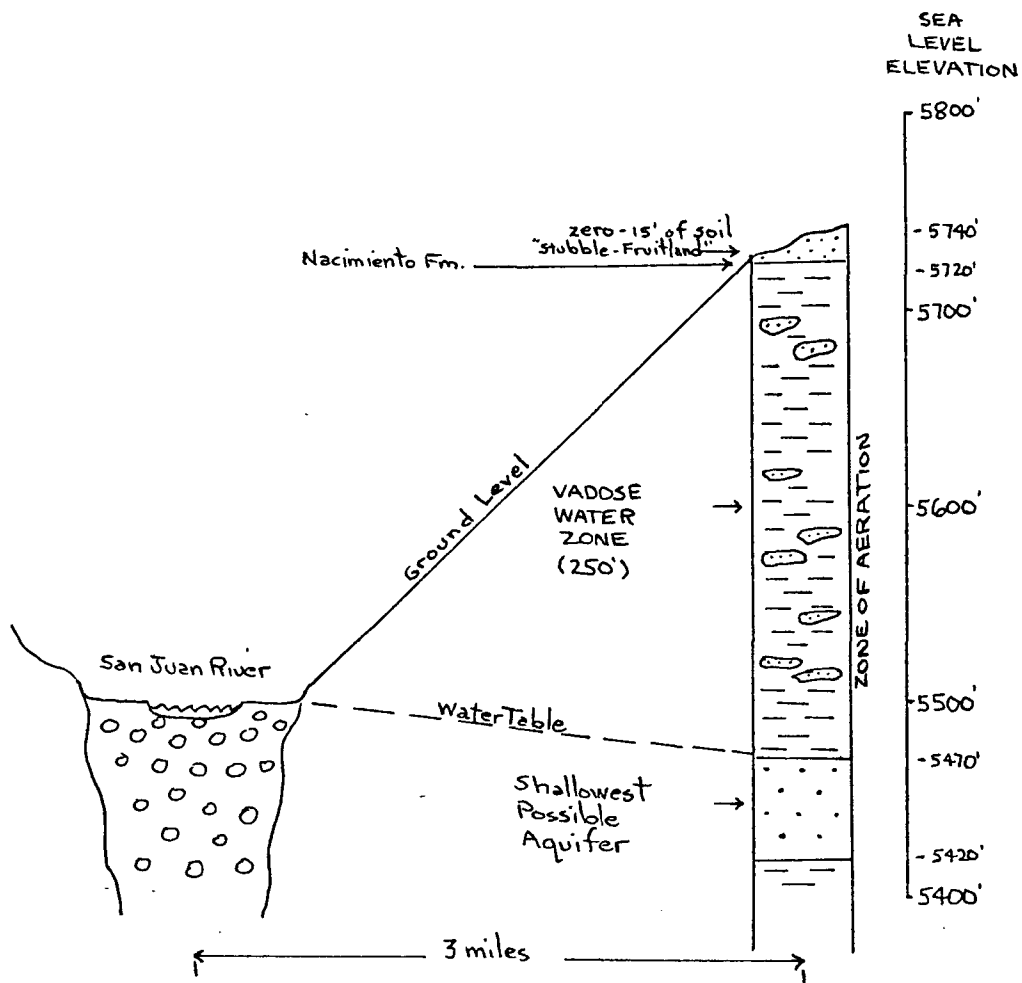
Three miles south, at an elevation of approximately 5500 feet, the San Juan River Valley represents the closest vulnerable ground-water system and floodplain. Drillers logs from the 1920's indicate reaching a water table below 250-290 feet in wells drilled just north of the property. This apparent aquifer or saturated zone probably coincides with the mean water level of the San Juan River.

No successful water wells have been drilled within a three mile radius according to the 1984 publication "Availability of Hydrologic Data in San Juan County, New Mexico". The area has been approved for septic systems and successful systems surround the property.

The soil cover is zero to 15 feet of well drained, sandy loam on gently sloping topography. This soil is classified as "Stubble-Fruitland" in the 1980 publication "Soil Survey of San Juan County, New Mexico". The soil cover is underlain by and separated from the apparent water table by about 250 feet of gray, sandy, clayey shale containing thin, scattered, discontinuous, sand and silt lenses. It is the weathered and erosion thinned top of the Nacimiento Formation of Tertiary Age. The limited permeability of this unit provides a thick vadose water zone.

The vadose water zone is defined as a zone periodically containing suspended water in the zone of aeration, and is above the zone of saturation (water table). Because of its thickness, in this case, any organic or inorganic contamination will be reduced in strength by a delay in movement and therefore, are subject to dilution, mixing sorption, volatilization and microbiological degradation.

In our opinion, the property is acceptable for evaporation pit usage because of the surface stability and isolation from surface and subsurface waters. It is several miles from any area, considered by the state, to have vulnerable ground waters. The vadose zone isolates the shallowest possible aquifer and already is part of an approved septic system zone.



Schematic section from San Juan River floodplain to property  
 Vert. scale 1" = 100' Horizontal scale - none

oo Cobbles    ÷ Soil    ☐ Sand lenses    ... Water sand    -- shale



**WALSH**

ENGINEERING & PRODUCTION CORP.

Petroleum Engineering Consulting  
Lease Management  
Contract Pumping

3001 Northridge Drive  
P.O. Drawer 419  
Farmington, New Mexico 87401  
(505) 327-4892

BASIN DISPOSAL, INC.  
PROPOSED  
PRODUCED WATER  
EVAPORATION PIT  
SAN JUAN COUNTY, NEW MEXICO

August 14, 1985

OIL CONSERVATION DIVISION

AUG 15 1985

RECEIVED

Ewell N. Walsh, P.E.  
State of New Mexico  
Registration No. 4324





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Skimmer Tanks	4
Fence and Sign	4
Maintenance	4
Contingency Plan	5

## CALCULATIONS

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Wave Calculations	4
Non-Breaking Wave Force and Moments	5 & 6
Berm and Levee Calculations	7 & 8



## FIGURES

### FIGURE NO.

Plat of Acreage for disposal pit with topography, outline of pit area and profile lines (Pocket Back of Report)	1
North-South Profile A-A'	2
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## PREFACE

The purpose of the disposal pit is to provide a means of oil and gas producers to dispose of produced water in an approved disposal pit. The disposal pit will also be made available to industries or persons that have to dispose of water.



### LOCATION

It is proposed to construct a disposal water pit in an area of Units E and F, Section 3-T29N-R11W, San Juan County, New Mexico.

The area is located adjacent to State Highway 44 approximately three miles north of Bloomfield, New Mexico.

### DESIGN AND CONSTRUCTION

1. Anticipated Disposal Volume:

The estimated amount of water that will be made available is unknown. However, it is proposed to install a spray evaporative system, if necessary, to increase the amount of evaporation of the water to prevent the pit from becoming too full for normal and safe operations. The water volumes anticipated are as indicated in calculations.

2. Pit will be of rectangular configuration, (Figure No. 1), and berm or levees constructed as indicated in Figures No. 2 through Figure No. 9.
3. Freeboard allowance will be 2.5 feet. Maximum water elevation 5719.5 feet with berm or levee elevation 5722 feet. Wave action was calculated to have a crest of elevation 5720.02 feet and a trough of elevation 5719.22 feet. See calculations.
4. The berm or levees will be constructed with an inside slope of 3:1 and outside slope of 3:1.
5. Top of levee is to be 12 feet wide.
6. The pit will incorporate a double liner system with leak detection system installed between primary (top) and secondary (bottom) liner. See Figures No. 12 through 14.



### MATERIALS

It is proposed to utilize a flexible membrane for the primary and secondary liners.

#### Primary Liner:

Shelter-Rite XR5 8130 geomembrane. Resistant to deterioration from exposure to sunlight and also resistant to hydrocarbons. Thickness - 36 mils.

#### Secondary Liner:

Polyvinyl Chloride (PVC) geomembrane. Thickness - 20 mils.

### LEAK DETECTION SYSTEM

The leak detection system will be a drainage and sump system. See Figures No. 12 through 14.

### INSTALLATION OF FLEXIBLE MEMBRANE LINERS

1. The Aztec, New Mexico OCD District Office will be notified a minimum of 24 hours in advance of installation of secondary line.
2. Pit liner will be installed and joints sealed according to manufacturers specifications and with approval of Division representative.
3. Liner will install on top of berm or levee as indicated in Figure No. 10.
4. Vents, 16 to 20, will be installed for venting of air or gas that may accumulate beneath liner Geotextile padding (Grade 200, thickness - 60 mils) will be put on slopes, between liners. See Figure No. 11.



#### SKIMMER TANKS

Two 400 barrel skimmer tanks will be installed on West end of pond. See Figure No. 15 for skimmer tank design.

The tanks will be installed above ground with elevation sufficient to allow gravity flow of water into the pond.

The tanks, and also the slope oil tank, will have berms around tanks to contain spill or leakage of tank.

#### FENCE AND SIGN

1. A fence will be constructed around all facilities, outside of berm or levee area, to prevent livestock from entering the facility area.
2. A sign, 12" x 24", will be installed at the facility for identification as to Operator and legal locations.

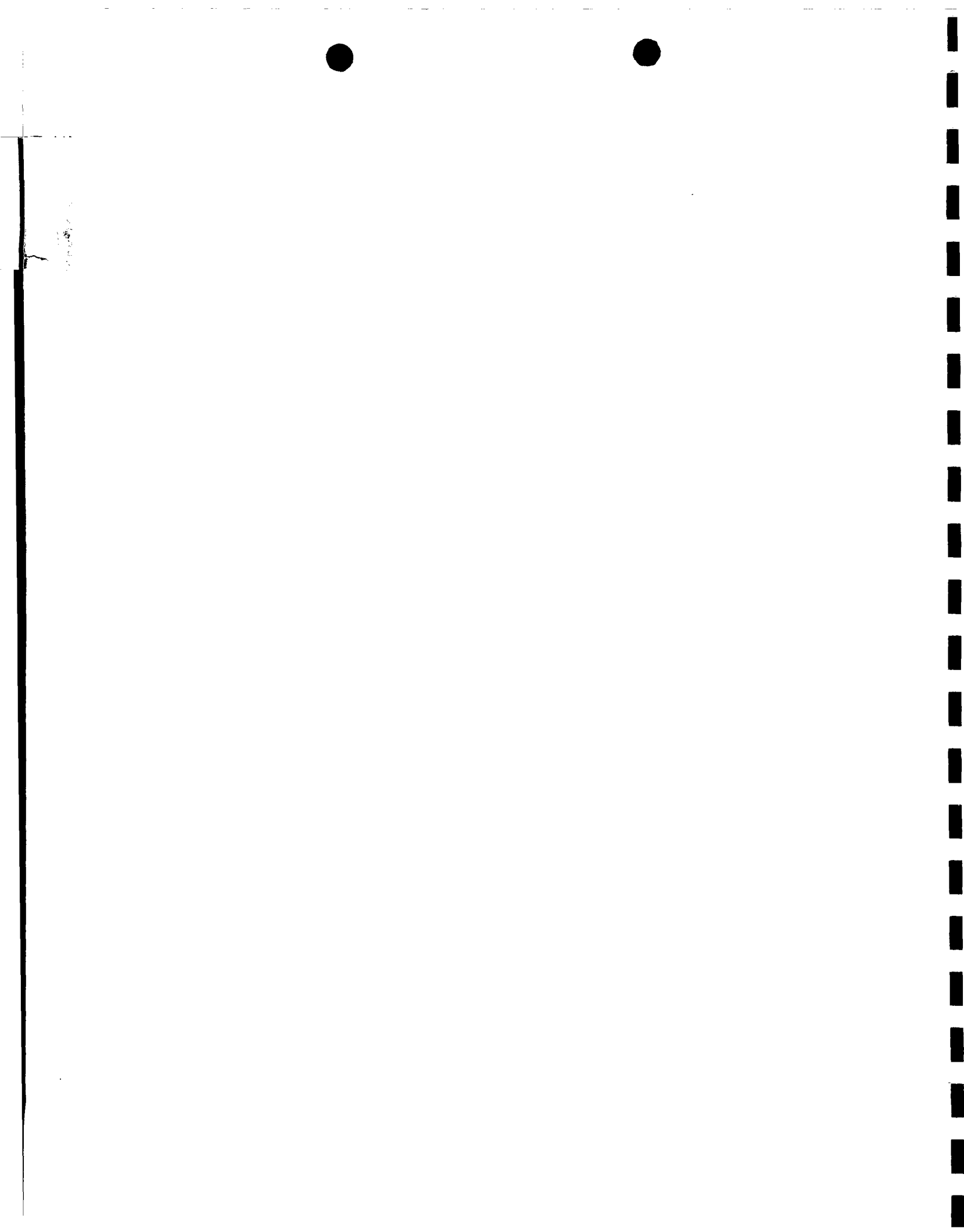
#### MAINTENANCE

1. Leak detection sump will be inspected at least once a week.
2. The outside walls of the levee will be maintained in such a manner to prevent erosion and will be inspected after heavy rainfall.



CONTINGENCY PLAN

1. If fluid is found in detection sump a sample will be obtained and analyzed to determine if the fluid is the same fluid that is in the disposal pit.
2. If fluid is determined to be the same as in the disposal pit:
  - a. No additional water will be put in disposal pit.
  - b. The spray evaporative system will be utilized to evaporate water as fast as possible.
  - c. If spray evaporative system is not removing fluid at a sufficient rate, frac water storage tanks will be utilized as storage for removal of water from pit.
  - d. When water has been removed the pit and liner will be inspected and any repairs will be made as per liner manufacturer recommendations.





11

COMPANY: BASIN DISPOSAL, INC.

DATE 08-13-85

LOCATION: UNIT: E & F SECTION: 3 TOWNSHIP: 29N RANGE: 11W

COUNTY: SAN JUAN

STATE: NEW MEXICO

WELL NAME: NONE

SIZE: DEPTH-FT:TOT.(AV)- 13.5 CUT- 7 TO 12 BERM- 3 TO 11

MID-POINT-FEET: WIDTH- 136 LENGTH- 307 FETCH- 336

AREA: 41752 FT^2

VOLUME: AVERAGE FLUID HT. 10.5 FT.; FT^3- 438396 Bbls- 78076

DISPOSAL RATE, Bbls/D

ANNUAL--- 750.00 START MONTH NO.- 10

JAN-----	APR-----	JUL-----	OCT-----	250.00
FEB-----	MAY-----	AUG-----	NOV-----	400.00
MAR-----	JUN-----	SEP-----	DEC-----	600.00

SPRAY EVAPORATION  
(ESTIMATED % EVAPORATION)

PUMP  
GPM

JAN-----	0.5	APR-----	2.0	JUL-----	3.0	OCT-----	2.0
FEB-----	1.0	MAY-----	2.0	AUG-----	3.0	NOV-----	0.5
MAR-----	1.0	JUN-----	3.0	SEP-----	2.0	DEC-----	0.5

2000

YEAR  
1

MONTH	DAYS/MO	PRECIP- ITATION IN/MO	LAKE EVAP. IN/MO	DISPOSAL WATER BBLs/DA	DEPTH FEET	CUM. DEPTH FEET	SPRAY LOSS FEET	EVAP. CUM. DPTH. FEET
CUM.						0.00		0.00
JAN	31	0.52	0.96	0.00	0.00	0.00	0.00	0.00
FEB	28	0.55	1.56	0.00	0.00	0.00	0.00	0.00
MAR	31	0.61	3.79	0.00	0.00	0.00	0.00	0.00
APR	30	0.58	6.34	0.00	0.00	0.00	0.00	0.00
MAY	31	0.46	8.01	0.00	0.00	0.00	0.00	0.00
JUN	30	0.40	8.83	0.00	0.00	0.00	0.00	0.00
JUL	31	0.91	8.73	0.00	0.00	0.00	0.00	0.00
AUG	31	1.01	7.38	0.00	0.00	0.00	0.00	0.00
SEP	30	0.96	5.71	0.00	0.00	0.00	0.00	0.00
OCT	31	0.99	3.79	250.00	0.81	0.81	0.00	0.81
NOV	30	0.45	2.03	400.00	1.48	2.29	0.00	2.29
DEC	31	0.63	0.99	600.00	2.47	4.76	0.00	4.76

TOTAL 365 8.07 58.12

PAGE NO. 1 OF 8

YEAR 2		PRECIP- ITATION	LAKE EVAP.	DISPOSAL WATER	DEPTH	CUM. DEPTH	SPRAY LOSS	EVAP. CUM. DPTH.
MONTH	DAYS/MO	IN/MO	IN/MO	BBLs/DA	FEET	FEET	FEET	FEET
CUM.						4.76		4.76
JAN	31	0.52	0.96	750.00	3.09	7.85	0.00	7.85
FEB	28	0.55	1.56	750.00	2.74	10.59	0.00	10.59
MAR	31	0.61	3.79	750.00	2.86	-	-2.86	10.60
APR	30	0.58	6.34	750.00	2.55	-	-5.53	7.61
MAY	31	0.46	8.01	750.00	2.50	-	-5.72	4.39
JUN	30	0.40	8.83	750.00	2.32	-	-8.30	0.00
JUL	31	0.91	8.73	750.00	2.48	-	-8.58	0.00
AUG	31	1.01	7.38	750.00	2.60	-	-8.58	0.00
SEP	30	0.96	5.71	750.00	2.63	-	-5.53	0.00
OCT	31	0.99	3.79	750.00	2.89	-	-8.58	0.00
NOV	30	0.45	2.03	750.00	2.89	-	-1.38	1.51
DEC	31	0.63	0.99	750.00	3.10	-	-1.43	3.18
TOTAL	365	8.07	58.12					

NOTE: Commence spray evaporation February or March.

YEAR 3		PRECIP- ITATION	LAKE EVAP.	DISPOSAL WATER	DEPTH	CUM. DEPTH	SPRAY LOSS	EVAP. CUM. DPTH.
MONTH	DAYS/MO	IN/MO	IN/MO	BBLs/DA	FEET	FEET	FEET	FEET
CUM.						-		3.18
JAN	31	0.52	0.96	750.00	3.09	-	-1.43	4.84
FEB	28	0.55	1.56	750.00	2.74	-	-2.58	5.00
MAR	31	0.61	3.79	750.00	2.86	-	-2.86	5.00
APR	30	0.58	6.34	750.00	2.55	-	-5.53	2.01
MAY	31	0.46	8.01	750.00	2.50	-	-5.72	0.00
JUN	30	0.40	8.83	750.00	2.32	-	-8.30	0.00
JUL	31	0.91	8.73	750.00	2.48	-	-8.58	0.00
AUG	31	1.01	7.38	750.00	2.60	-	-8.58	0.00
SEP	30	0.96	5.71	750.00	2.63	-	-5.53	0.00
OCT	31	0.99	3.79	750.00	2.89	-	-8.58	0.00
NOV	30	0.45	2.03	750.00	2.89	-	-1.38	1.51
DEC	31	0.63	0.99	750.00	3.10	-	-1.43	3.18
TOTAL	365	8.07	58.12					

YEAR 4		PRECIP- ITATION	LAKE EVAP.	DISPOSAL WATER	DEPTH	CUM. DEPTH	SPRAY LOSS	EVAP. CUM. DPTH.
MONTH	DAYS/MO	IN/MO	IN/MO	BBLS/DA	FEET	FEET	FEET	FEET
CUM.						-		3.18
JAN	31	0.52	0.96	750.00	3.09	-	-1.43	4.84
FEB	28	0.55	1.56	750.00	2.74	-	-2.58	5.00
MAR	31	0.61	3.79	750.00	2.86	-	-2.86	5.00
APR	30	0.58	6.34	750.00	2.55	-	-5.53	2.01
MAY	31	0.46	8.01	750.00	2.50	-	-5.72	0.00
JUN	30	0.40	8.83	750.00	2.32	-	-8.30	0.00
JUL	31	0.91	8.73	750.00	2.48	-	-8.58	0.00
AUG	31	1.01	7.38	750.00	2.60	-	-8.58	0.00
SEP	30	0.96	5.71	750.00	2.63	-	-5.53	0.00
OCT	31	0.99	3.79	750.00	2.89	-	-8.58	0.00
NOV	30	0.45	2.03	750.00	2.89	-	-1.38	1.51
DEC	31	0.63	0.99	750.00	3.10	-	-1.43	3.18
TOTAL	365	8.07	58.12					

YEAR 5		PRECIP- ITATION	LAKE EVAP.	DISPOSAL WATER	DEPTH	CUM. DEPTH	SPRAY LOSS	EVAP. CUM. DPTH.
MONTH	DAYS/MO	IN/MO	IN/MO	BBLS/DA	FEET	FEET	FEET	FEET
CUM.						-		3.18
JAN	31	0.52	0.96	750.00	3.09	-	-1.43	4.84
FEB	28	0.55	1.56	750.00	2.74	-	-2.58	5.00
MAR	31	0.61	3.79	750.00	2.86	-	-2.86	5.00
APR	30	0.58	6.34	750.00	2.55	-	-5.53	2.01
MAY	31	0.46	8.01	750.00	2.50	-	-5.72	0.00
JUN	30	0.40	8.83	750.00	2.32	-	-8.30	0.00
JUL	31	0.91	8.73	750.00	2.48	-	-8.58	0.00
AUG	31	1.01	7.38	750.00	2.60	-	-8.58	0.00
SEP	30	0.96	5.71	750.00	2.63	-	-5.53	0.00
OCT	31	0.99	3.79	750.00	2.89	-	-8.58	0.00
NOV	30	0.45	2.03	750.00	2.89	-	-1.38	1.51
DEC	31	0.63	0.99	750.00	3.10	-	-1.43	3.18
TOTAL	365	8.07	58.12					

WAVE CALCULATION  
(ALL REFERENCES-SHORE PROTECTION MANUAL)

WINDSPEED,  $U_a =$  50 M.P.H. : FETCH,  $F =$  336 FEET

DEPTH OF WATER,  $D =$  11.00 FEET SLOPE OF SIDE  $= 3:1$

WAVE HEIGHT AND PERIOD.

FOR  $D = 0.1$  TO  $5.0$  FT., Pg. 3-56, Fig. 3-27(UPPER)

FOR  $D = 5.1$  TO  $10.0$  FT., Pg. 3-57, Fig. 3-28(UPPER)

WAVE HEIGHT,  $H =$  0.40 FEET  
PERIOD,  $T =$  0.8 SECONDS

CALCULATE BREAKING WAVE HEIGHT,  $H_b$  (Pg. 7-7, Fig. 7-3)

$$\frac{H}{g \times T^2} = 0.0194 \quad g = 32.2$$

(Fig. 7-3)  $\frac{H_b}{H} = 1.0$  NOTE: UTILIZE ( $m = 0.1$ ) FOR SLOPE OF SIDE  $= 10:1$  OR LESS.

$$H_b = H \times \frac{H_b}{H} = 0.4$$

$$\frac{H_b}{g \times T^2} = 0.0194$$

Pg. 7-6, Fig. 7-2 (UTILIZING  $m = 0.10(1:10)$ )

$a = 1.6$        $a =$  alpha, upper limit  
 $b = 1.05$       $b =$  beta, lower limit

BREAKING HEIGHT, ft, MAX.  $= a \times H_b = 1.6 \times 0.4 = 0.64$

BREAKING HEIGHT, ft, MIN.  $= b \times H_b = 1.05 \times 0.4 = 0.42$

COMMENTS:

$D = 11.00$  feet is average depth of water in pond.  
(ELEVATION-5719.5')

NON-BREAKING WAVE FORCE AND MOMENTS  
(ASSUMING A VERTICAL WALL)  
(ALL REFERENCES SHORE PROTECTION MANUAL)

Pg. 7-161

$$\begin{aligned} X &= 1.0 \text{ (ASSUME SMOOTH WALL)} \\ H_i = H &= 0.4 \\ d &= 12.5 \text{ FEET} \\ T &= 0.80 \text{ SECONDS} \end{aligned}$$

$$\frac{H_i}{d} = \frac{0.4}{12.5} = 0.0320$$

$$\frac{H_i}{g \times T^2} = 0.0194$$

$$g = 32.2$$

Pg. 7-164, Fig. 7-90

$$\frac{H_o}{H_i} = 0.30$$

$$H_o = \frac{H_o}{H_i} \times H_i = 0.120 \text{ FEET}$$

Pg. 7-161, Equations 7-73 and 7-74 and  
Pg. 7-162, Fig. 7-88

HEIGHT OF CREST ABOVE BOTTOM

$$Y_c = d + H_o + \left( \frac{1 + X}{2} \right) \times H_i = 13.02 \text{ FEET} \\ \text{(ELEV. - 5720.02')}$$

$$\begin{aligned} d &= 12.5 \\ H_o &= 0.120 \\ X &= 1.0 \\ H_i &= 0.4 \end{aligned}$$

HEIGHT OF TROUGH ABOVE BOTTOM

$$Y_t = d + H_o - \left( \frac{1 + X}{2} \right) \times H_i = 12.22 \text{ FEET} \\ \text{(ELEV. - 5719.22')}$$

COMMENTS:

d = 12.50 feet is at the east end or deepest portion  
of the pond. (ELEVATION - 5719.5')

NONBREAKING WAVE FORCE  
(AT WAVE CREST)

Pg. 7-165, Fig. 7-91

$$\frac{F_c}{w \times d^2} = 0.001$$

$$\frac{H_i}{g \times T^2} = 0.0194$$

$$\frac{H_o}{H_i} = 0.30$$

$$F_c = 0.001 \times w \times d^2 = 10.44 \text{ lb./ft}$$

$$w = 66.8 \text{ lbs./ft}^3$$

$$d = 12.5 \text{ FEET}$$

COMMENTS:

force is considered negligible.

# BERM CALCULATIONS

MAXIMUM HEIGHT = 11 FEET      INSIDE SLOPE = 3 : 1      SOIL DENSITY = 80 Lbs/Ft.<sup>3</sup>  
 TOP WIDTH = 12 FEET      OUTSIDE SLOPE = 3 : 1      FRICTION FACTOR = 0.4  
 MAX. WATER DEPTH = 9 FEET  
 ( ON BERM )

STATIC PRESSURE - Lbs./Ft.<sup>2</sup>

WATER DEPTH - FT.	1	2	3	4	5	6	7	8	9	10	11	12
DEPTH BELOW SURFACE - Ft.												
1	67	67	67	67	67	67	67	67	67	0	0	0
2	0	134	134	134	134	134	134	134	134	0	0	0
3	0	0	200	200	200	200	200	200	200	0	0	0
4	0	0	0	267	267	267	267	267	267	0	0	0
5	0	0	0	0	334	334	334	334	334	0	0	0
6	0	0	0	0	0	401	401	401	401	0	0	0
7	0	0	0	0	0	0	468	468	468	0	0	0
8	0	0	0	0	0	0	0	534	534	0	0	0
9	0	0	0	0	0	0	0	0	601	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0
STATIC PRESSURE PER LINEAR FOOT - Lbs./Ft. = Fh	67	201	401	668	1002	1403	1871	2405	3006	0	0	0

WEIGHT OF BERM  
PER LINEAR FOOT

SHEARING FORCE, F<sub>s</sub>

DEPTH FROM  
TOP OF  
BERM  
Ft.

Lbs.

DEPTH FROM  
TOP OF  
BERM  
Ft.

F<sub>s</sub>

1	1200
2	2880
3	5040
4	7680
5	10800
6	14400
7	18480
8	23040
9	28080
10	33600
11	39600
12	0

1	480
2	1152
3	2016
4	3072
5	4320
6	5760
7	7392
8	9216
9	11232
10	13440
11	15840
12	0

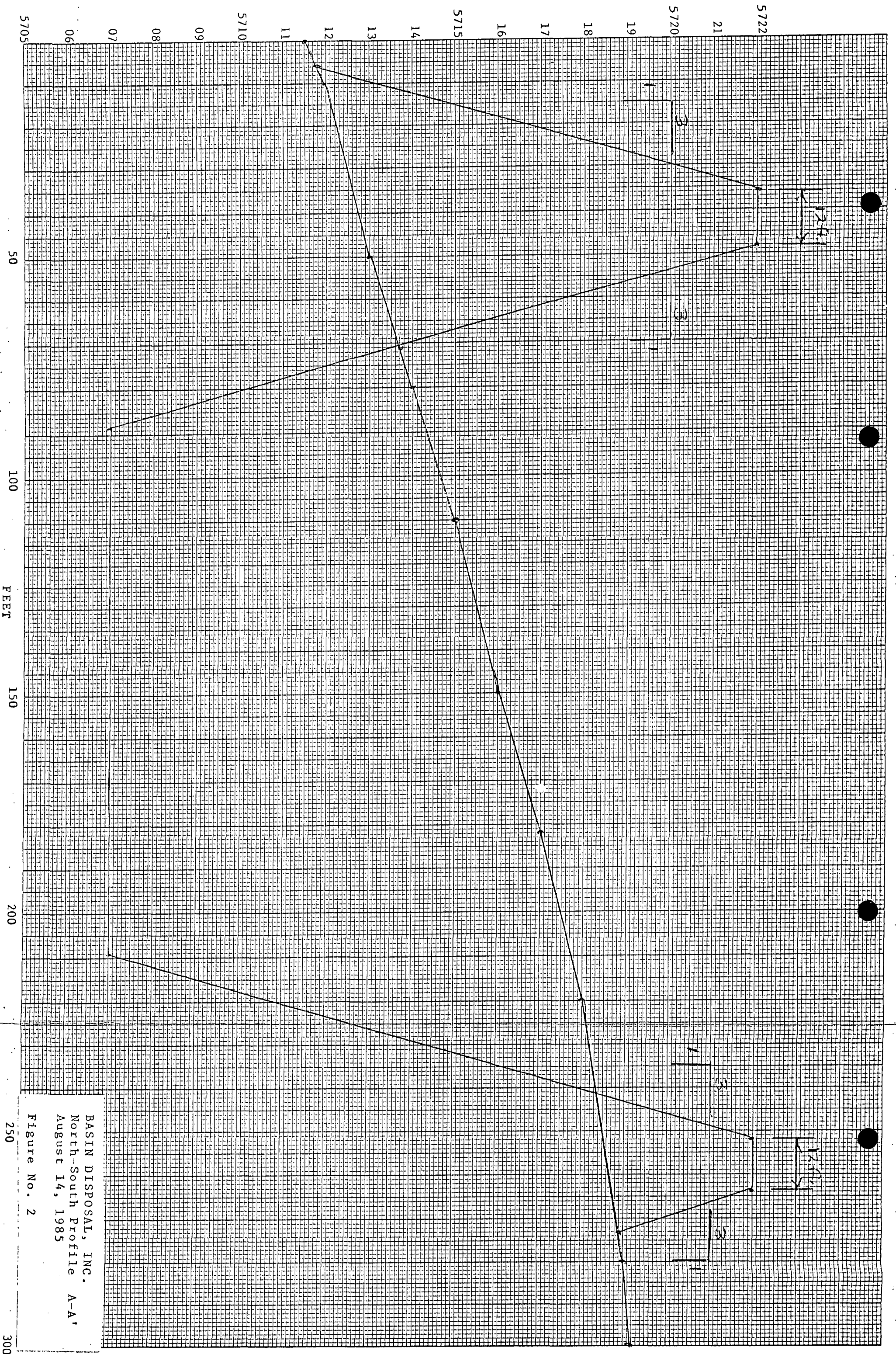


SAFETY FACTORS -  $F_s/F_h$ 

WATER DEPTH - FT.	1	2	3	4	5	6	7	8	9	10	11	12
BERM HEIGHT - Ft.												
1	7.16											
2	17.19	5.73										
3	30.09	10.03	5.03									
4	45.85	15.28	7.66	4.60								
5	64.48	21.49	10.77	6.47	4.31							
6	85.97	28.66	14.36	8.62	5.75	4.11						
7	110.33	36.78	18.43	11.07	7.38	5.27	3.95					
8	137.55	45.85	22.98	13.80	9.20	6.57	4.93	3.83				
9	167.64	55.88	28.01	16.81	11.21	8.01	6.00	4.67	3.74			
10	200.60	66.87	33.52	20.12	13.41	9.58	7.18	5.59	4.47	0.00		
11	236.42	78.81	39.50	23.71	15.81	11.29	8.47	6.59	5.27	0.00	0.00	
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

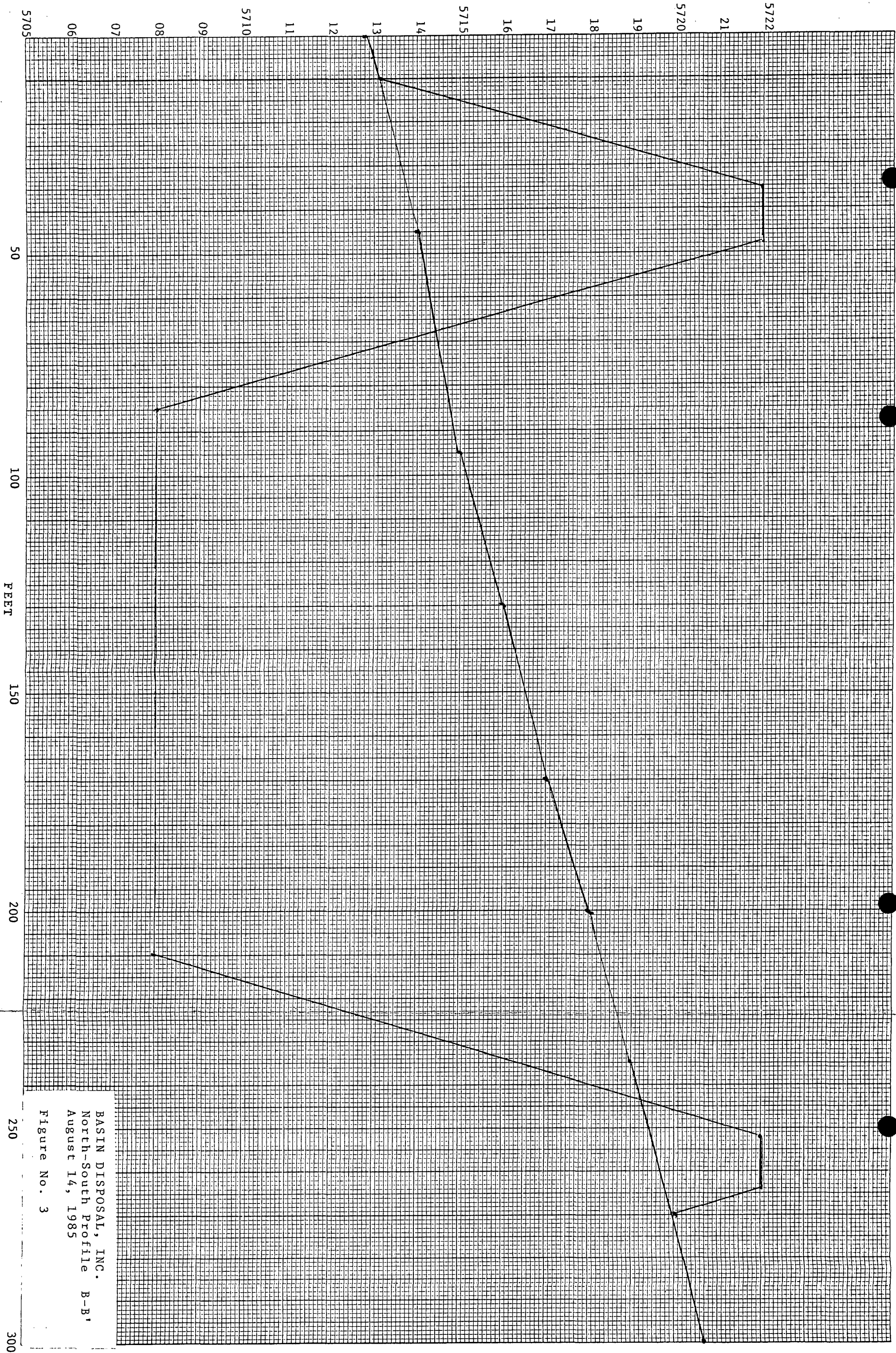
NOTE: TOP OF BERM - ELEVATION, 5722'.  
 MAXIMUM WATER LEVEL - ELEVATION, 5719.5.





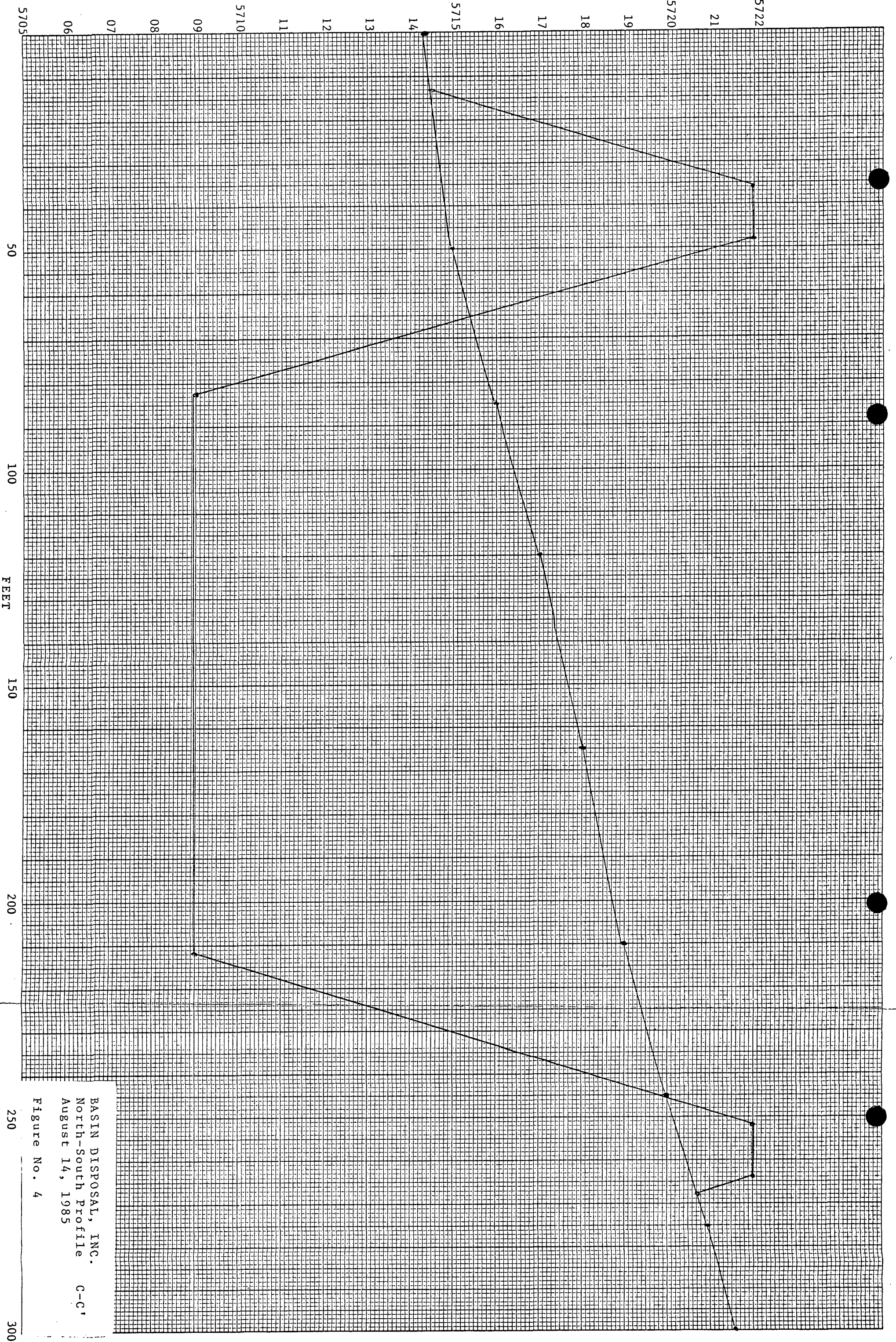
BASIN DISPOSAL, INC.  
North-South Profile A-A'  
August 14, 1985  
Figure No. 2





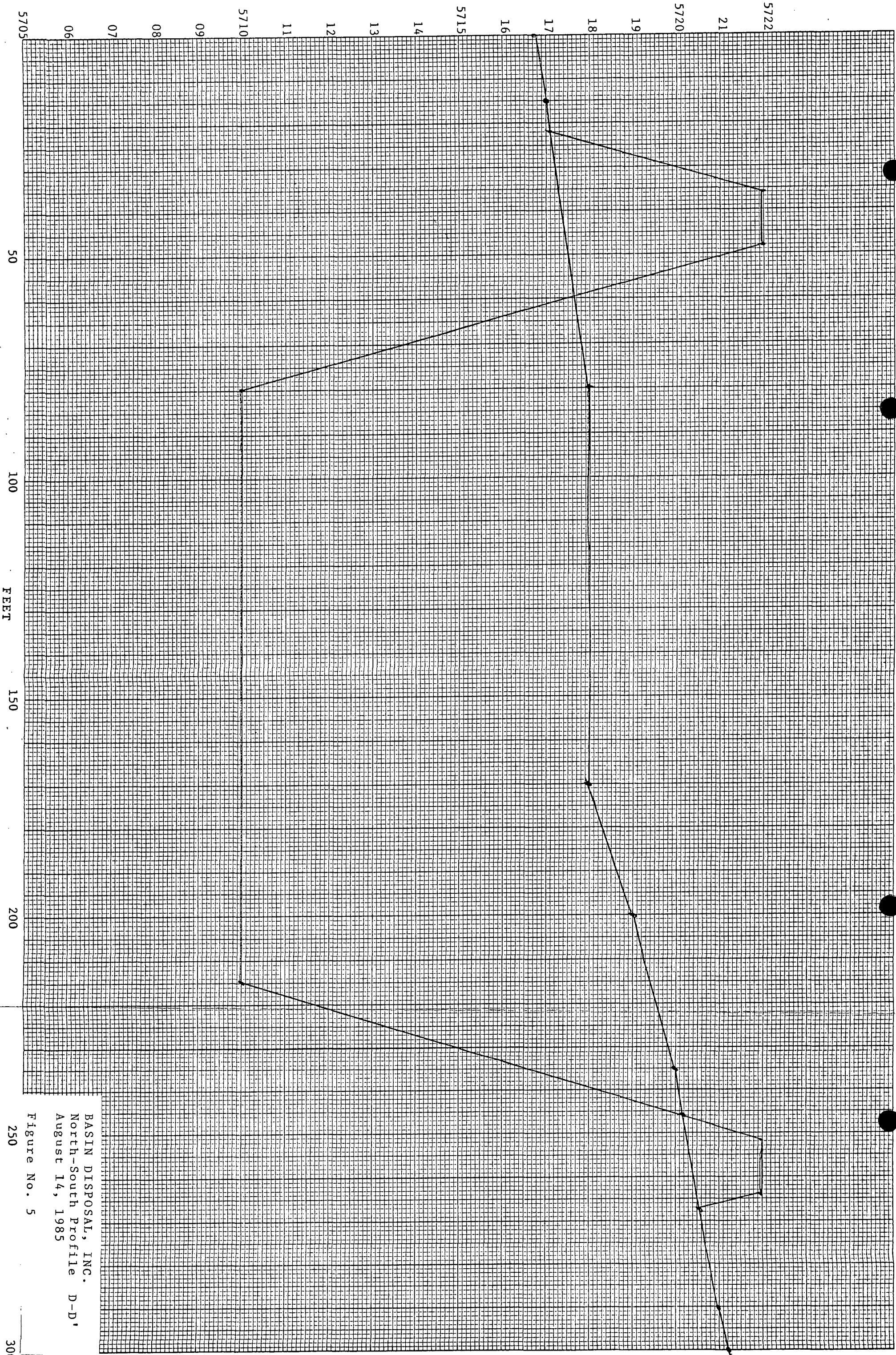
BASIN DISPOSAL, INC.  
North-South Profile B-B'  
August 14, 1985  
Figure No. 3





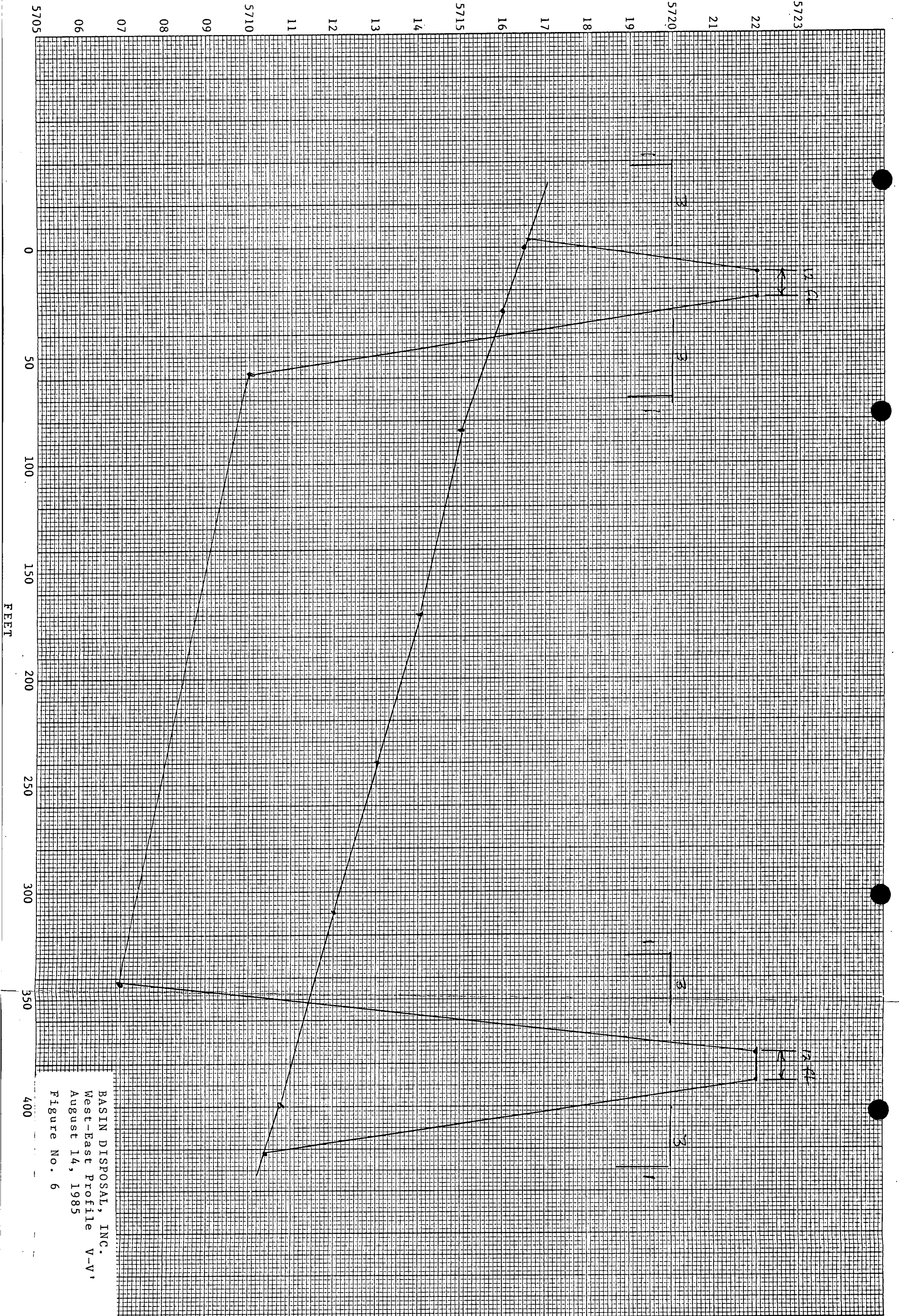
BASIN DISPOSAL, INC.  
North-South Profile C-C'  
August 14, 1985  
Figure No. 4





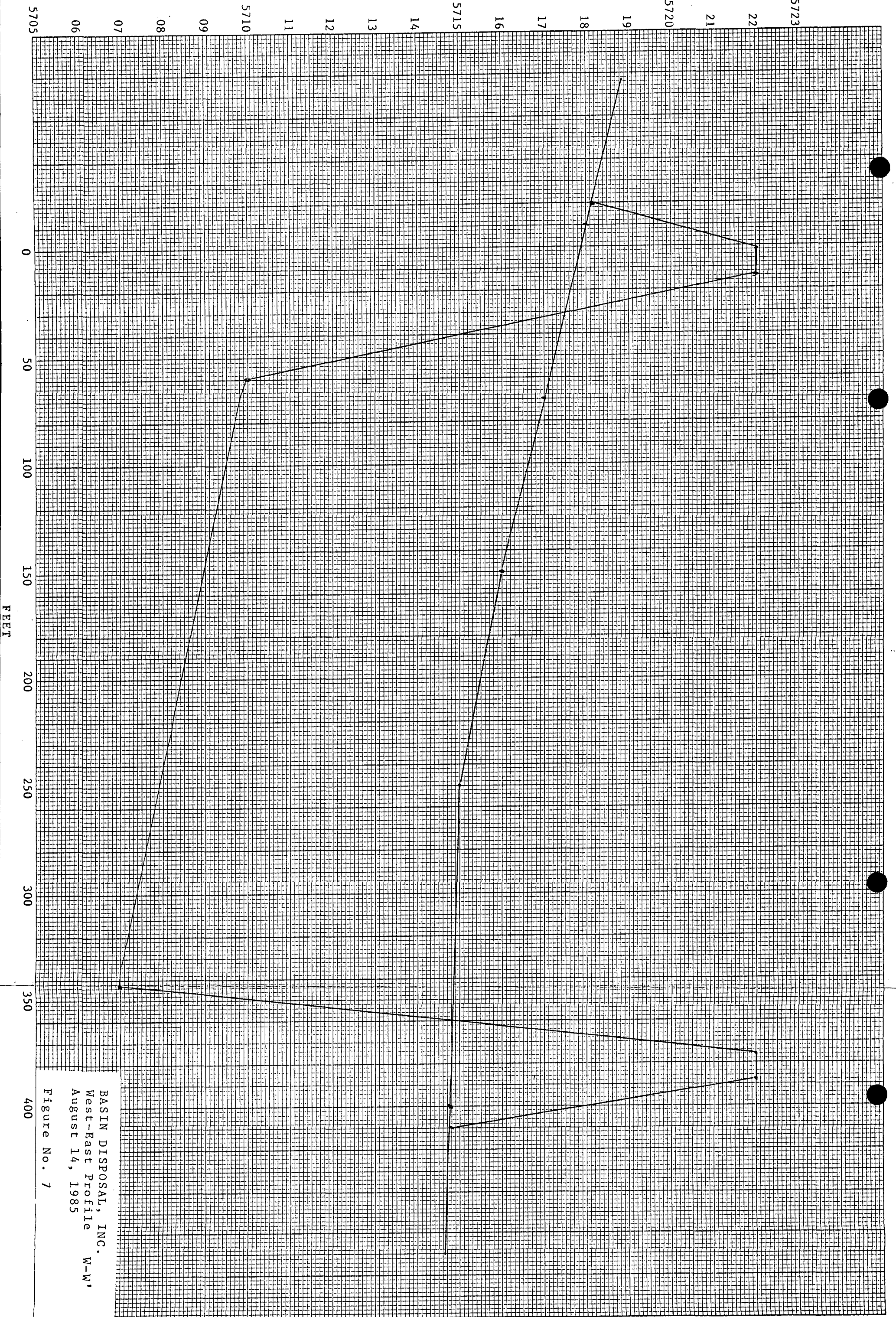
BASIN DISPOSAL, INC.  
North-South Profile D-D'  
August 14, 1985  
Figure No. 5





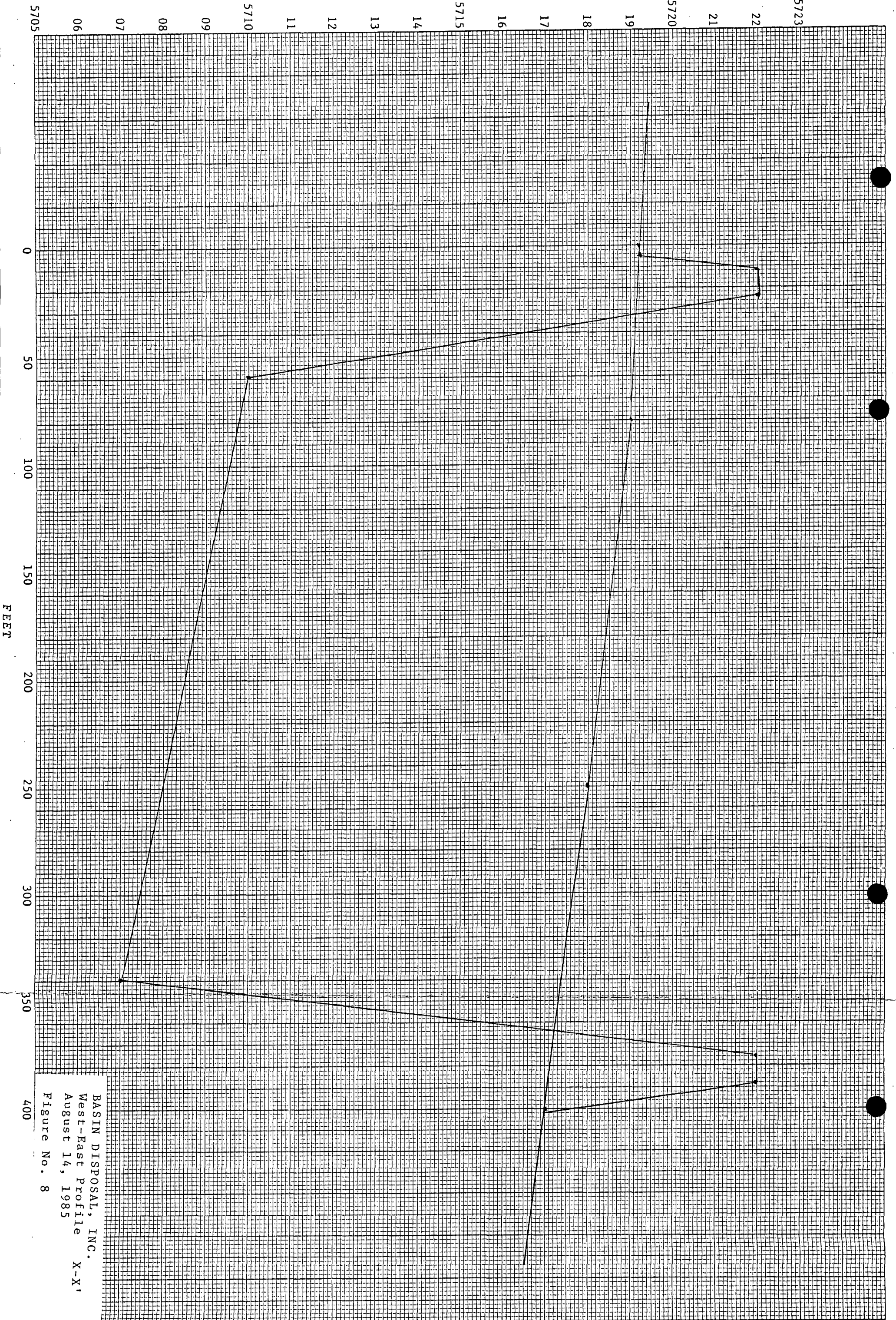
BASIN DISPOSAL, INC.  
West-East Profile V-V'  
August 14, 1985  
Figure No. 6





BASIN DISPOSAL, INC.  
West-East Profile W-W'  
August 14, 1985  
Figure No. 7

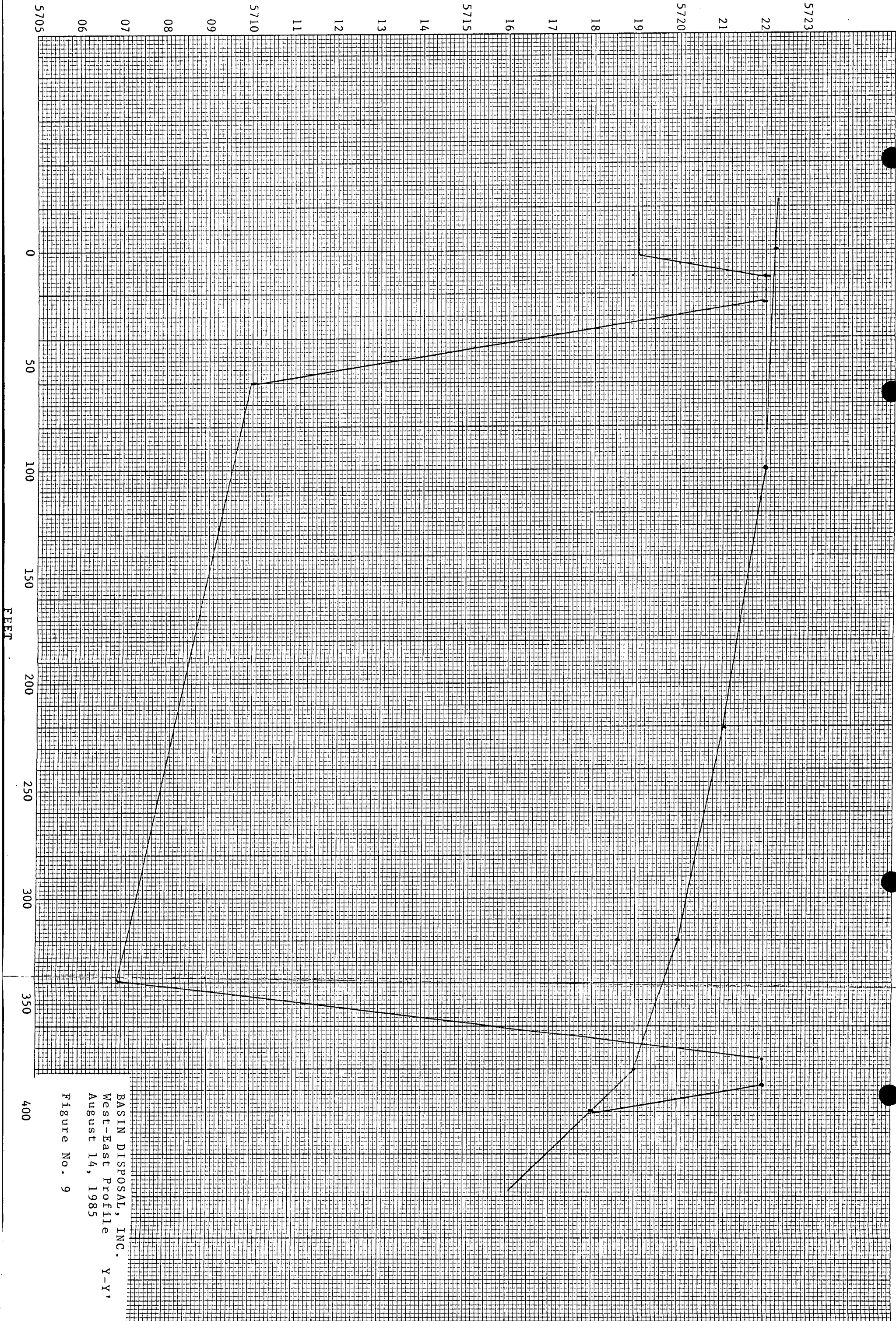




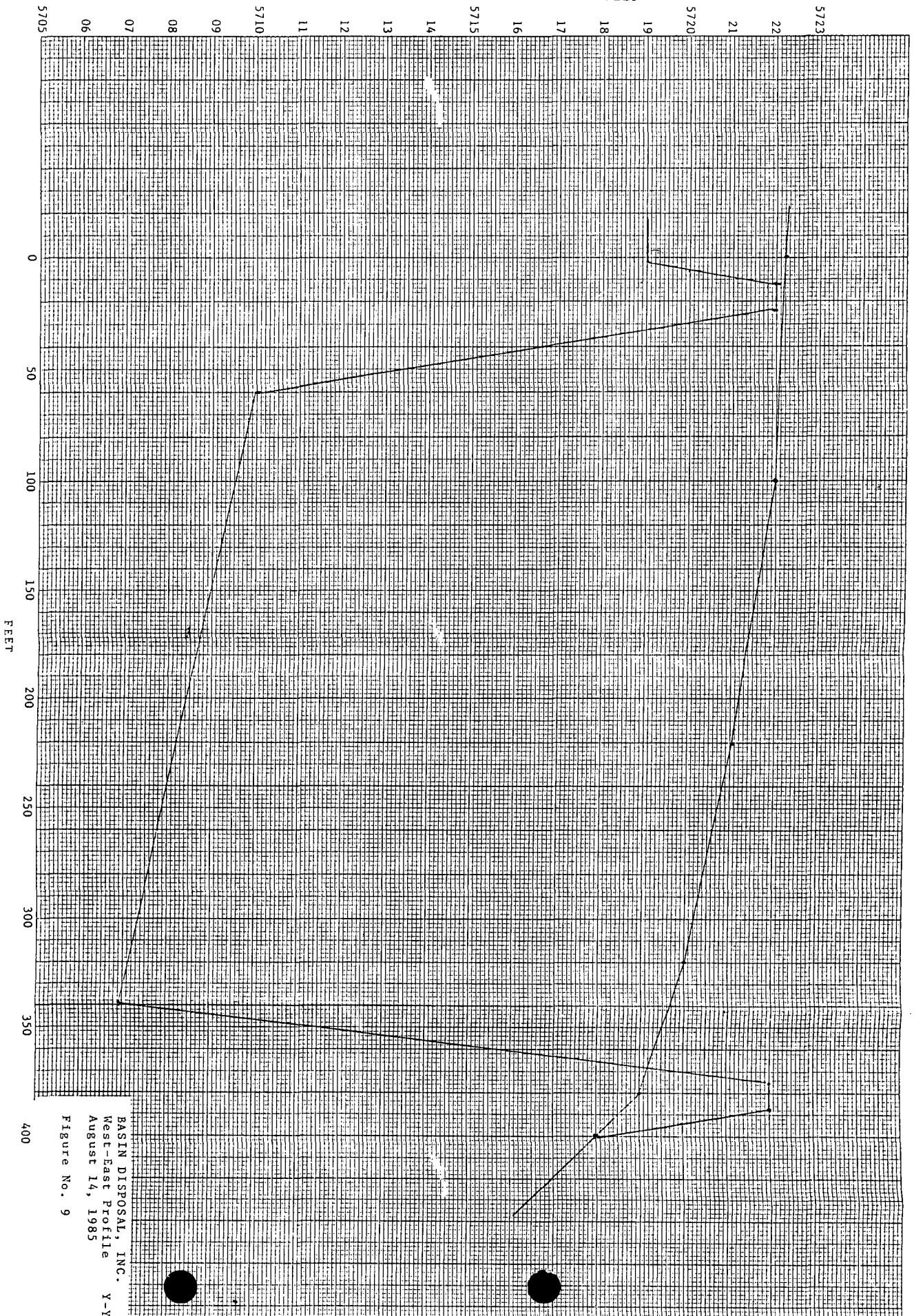
BASIN DISPOSAL, INC.  
West-East Profile X-X'  
August 14, 1985  
Figure No. 8



ELEVATION - FEET

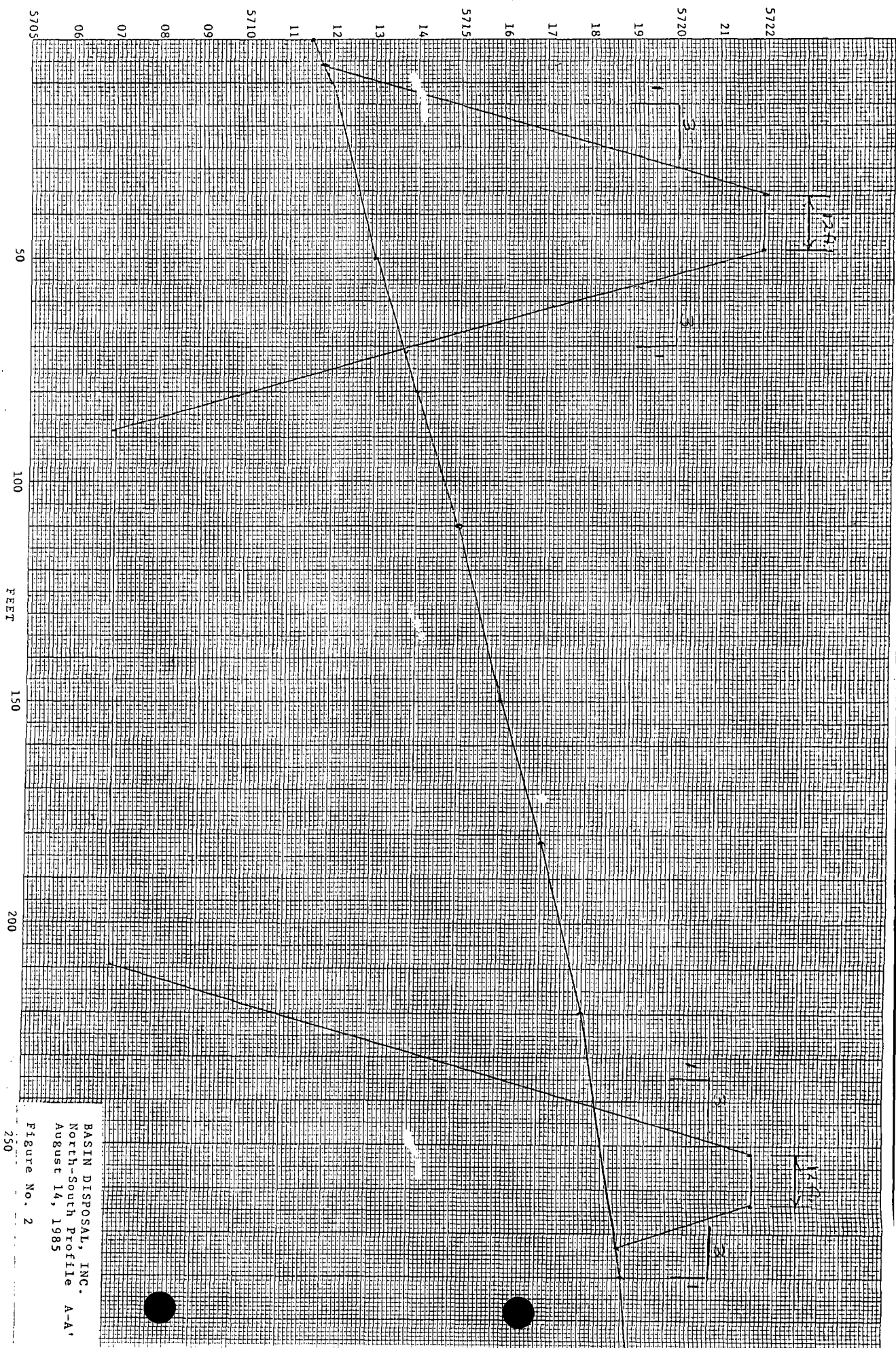


BASIN DISPOSAL, INC.  
West-East Profile Y-Y'  
August 14, 1985  
Figure No. 9

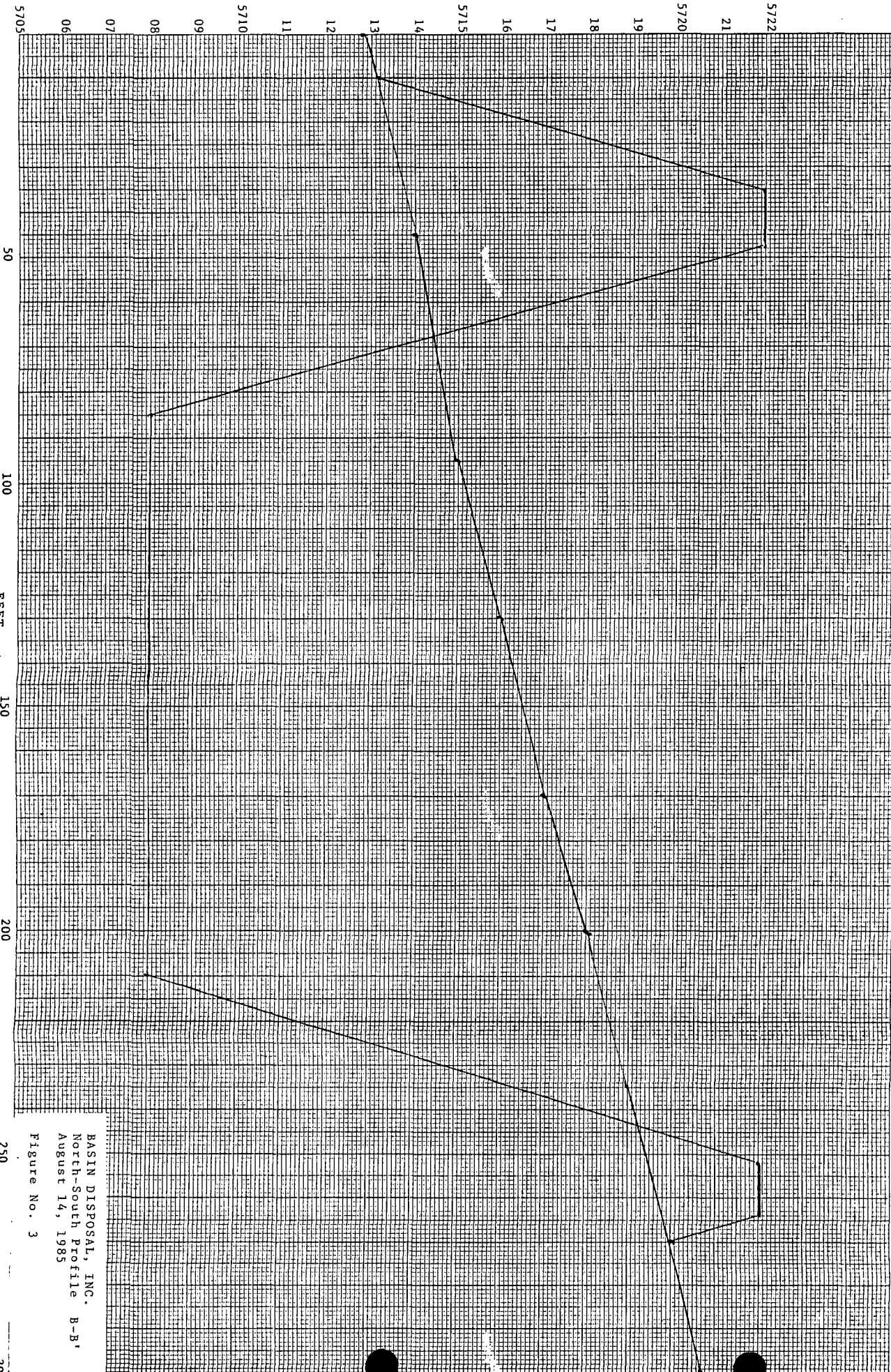


BASIN DISPOSAL, INC.  
West-East Profile Y-Y  
August 14, 1985  
Figure No. 9

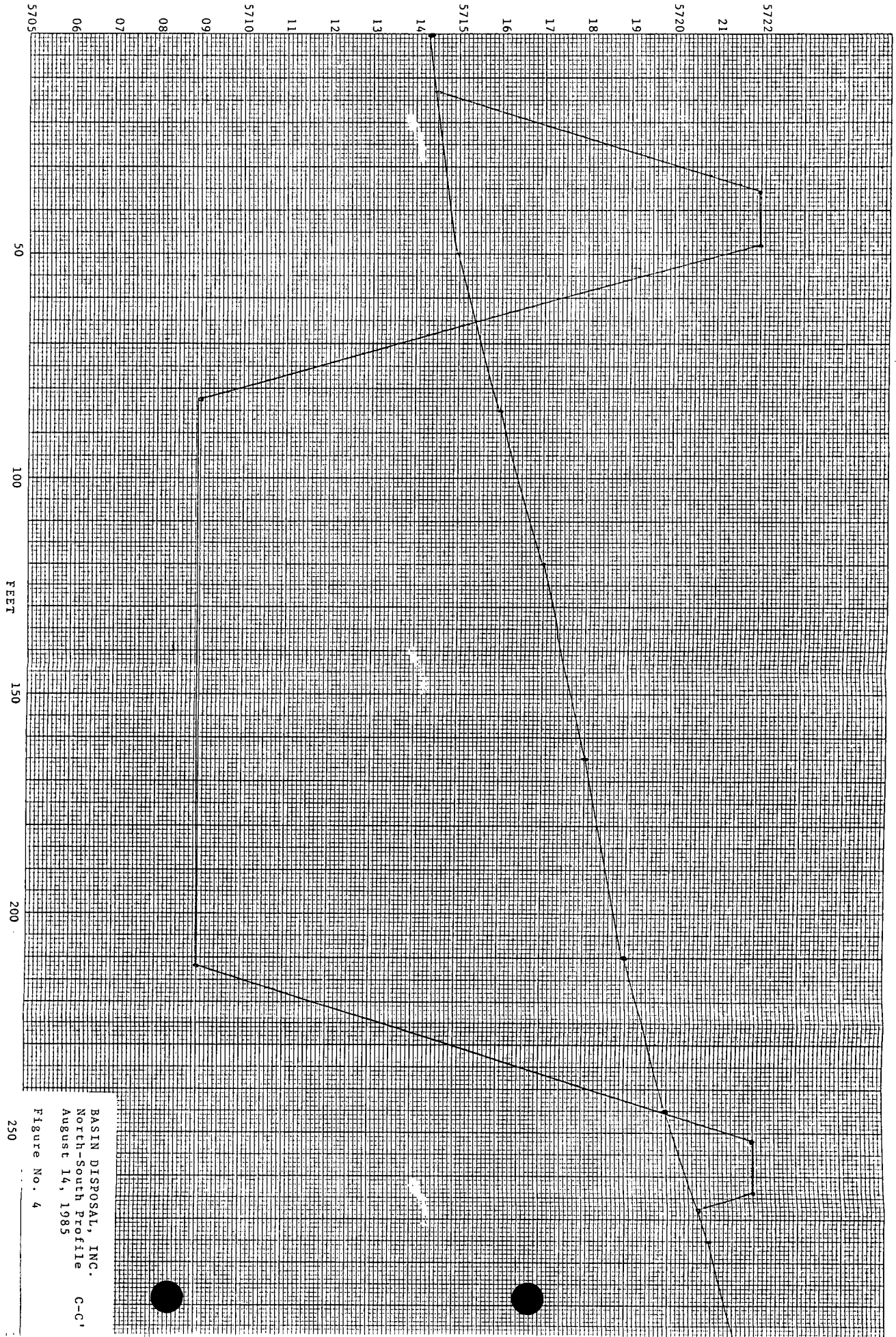




BASIN DISPOSAL, INC.  
North-South Profile A-A'  
August 14, 1985  
Figure No. 2

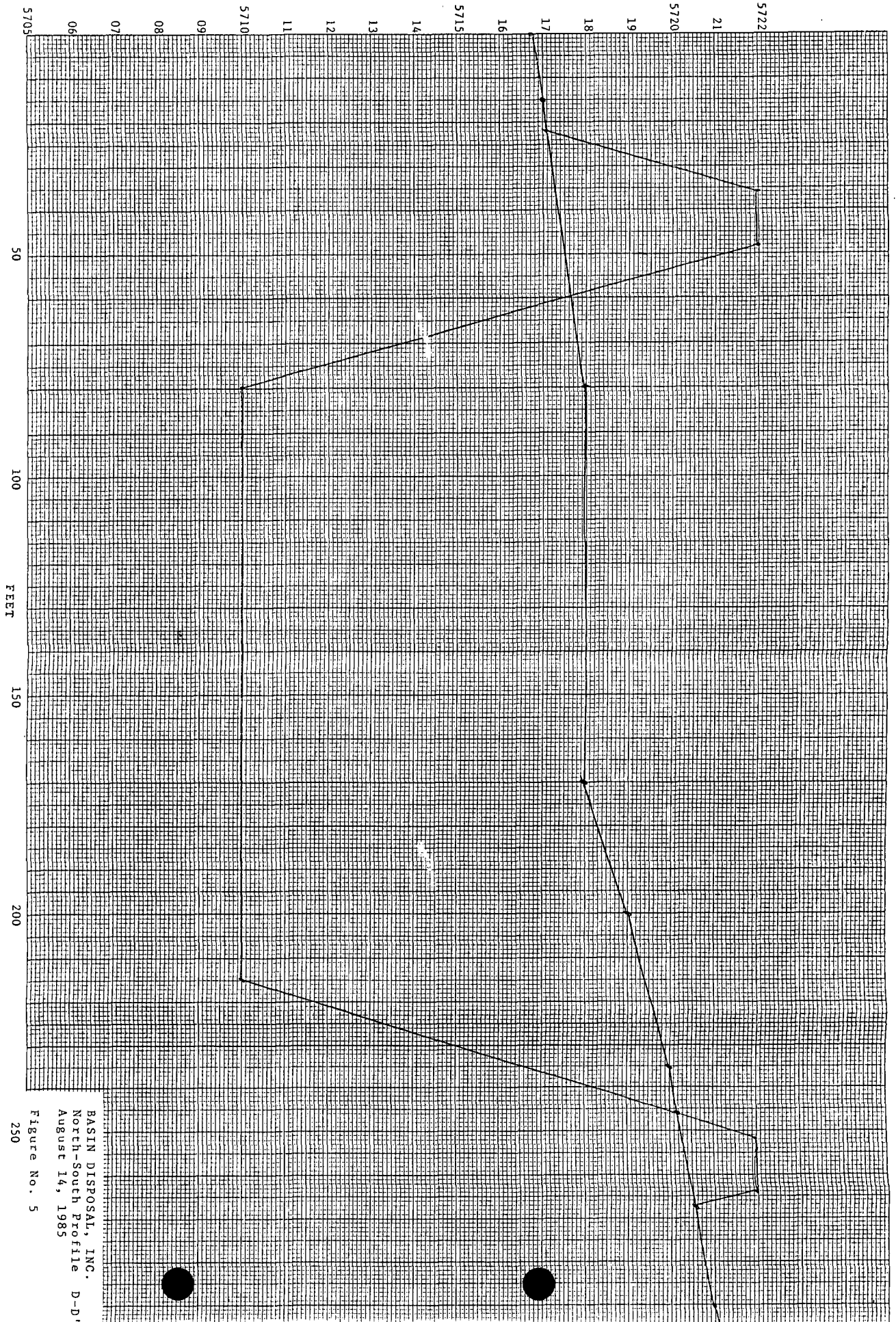


BASIN DISPOSAL, INC.  
North-South Profile B-B'  
August 14, 1985  
Figure No. 3

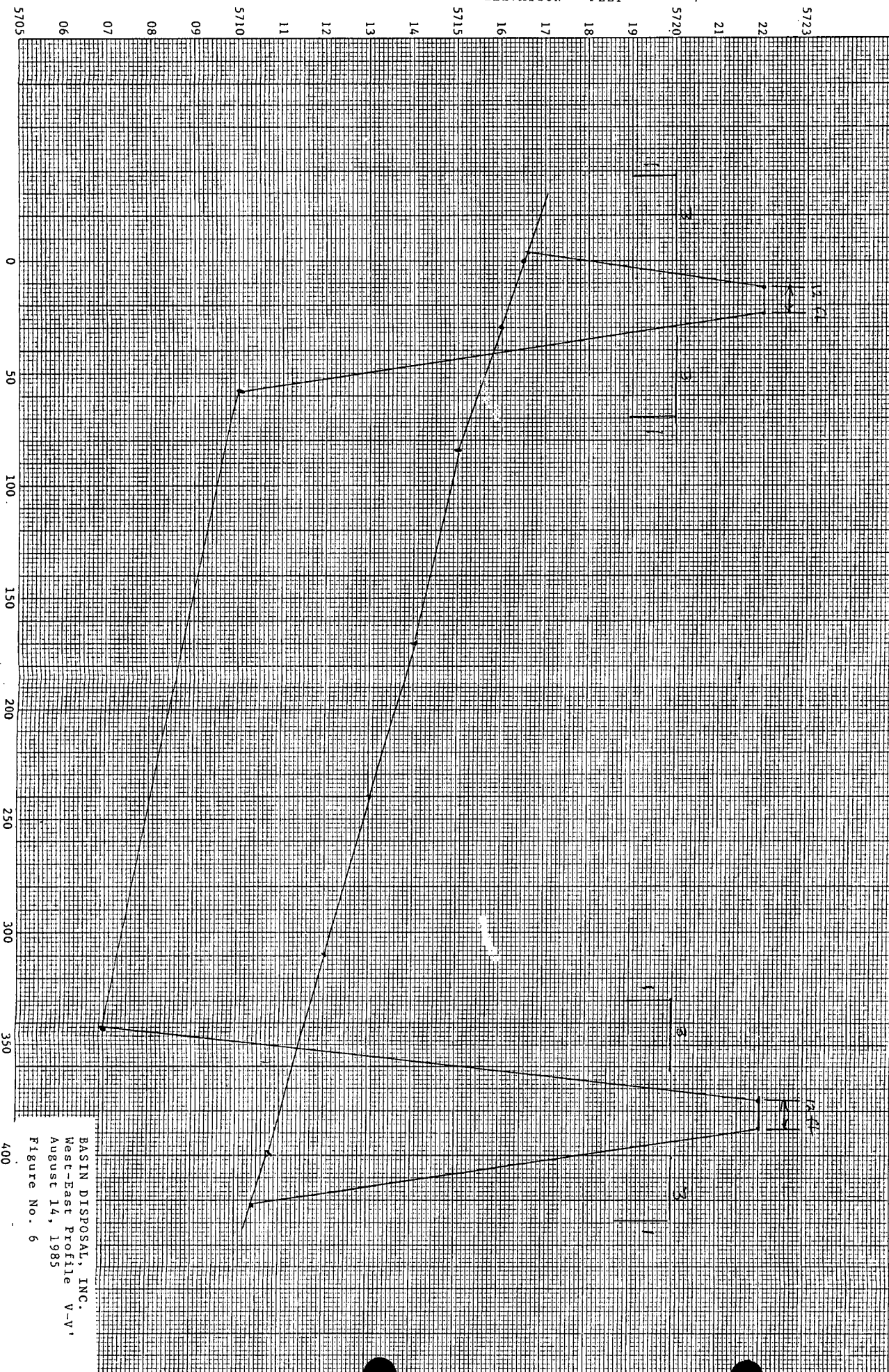


BASIN DISPOSAL, INC.  
North-South Profile C-C'  
August 14, 1985  
Figure No. 4



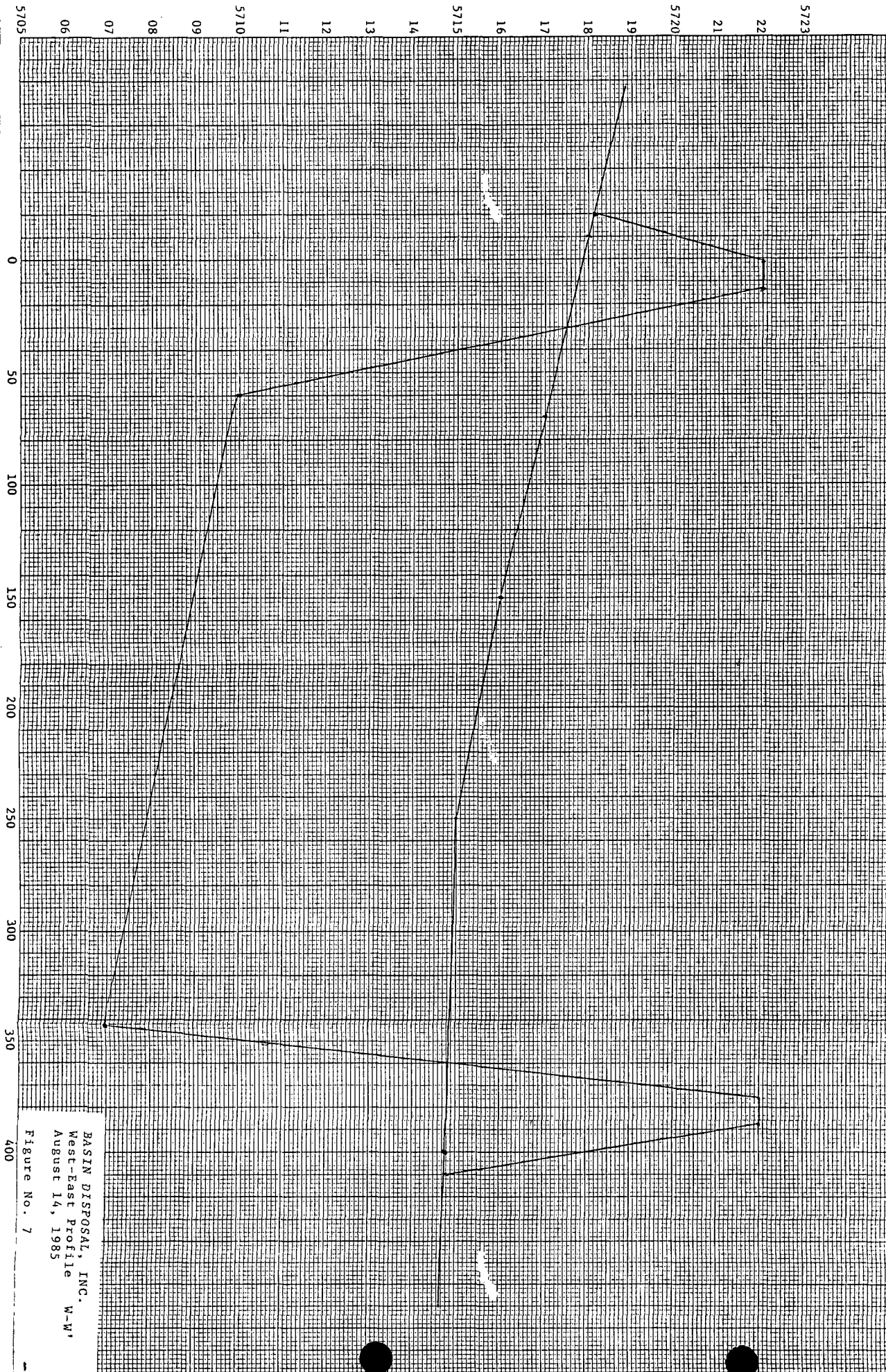


BASIN DISPOSAL, INC.  
North-South Profile D-D'  
August 14, 1985  
Figure No. 5  
250

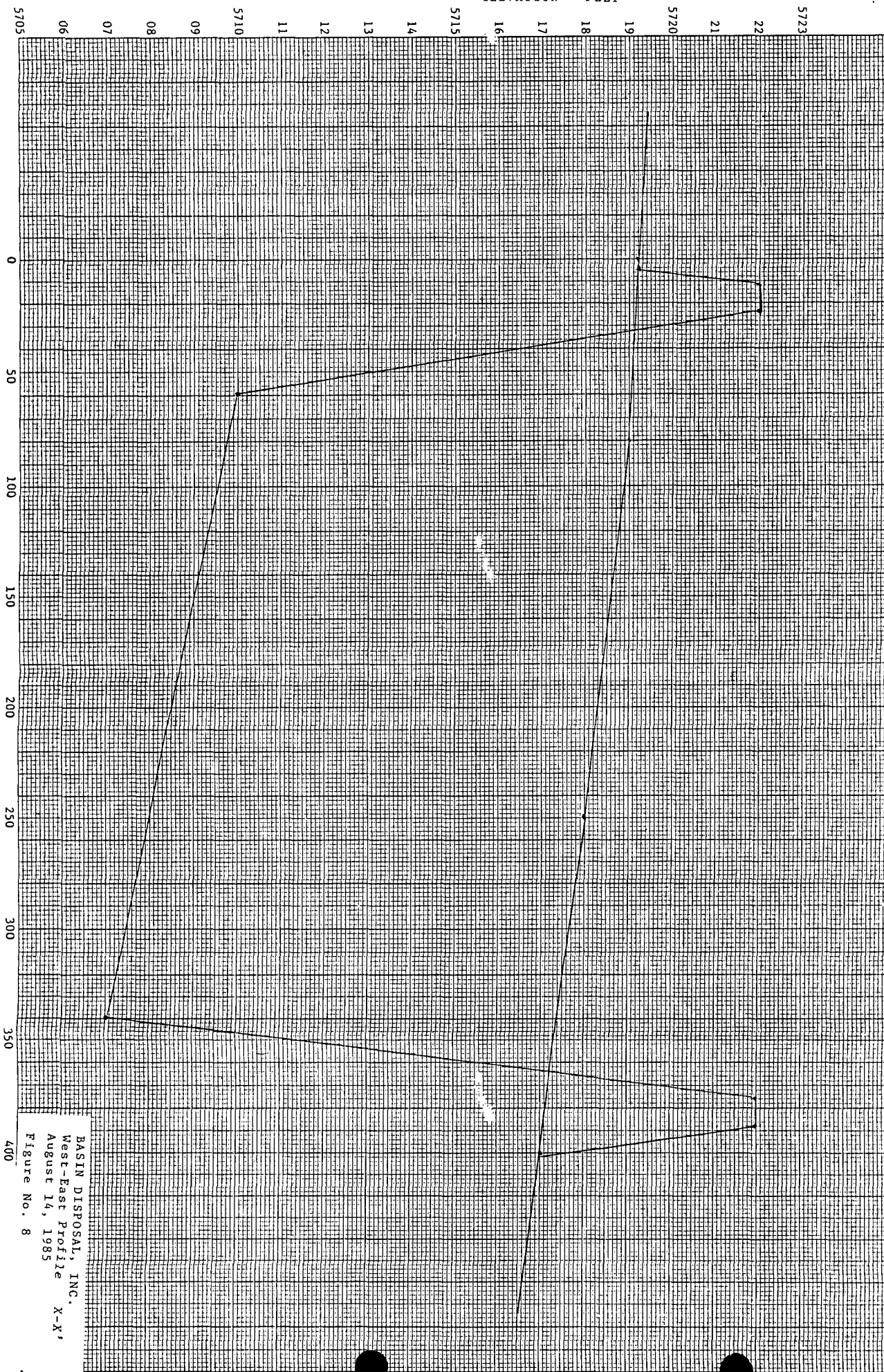


BASIN DISPOSAL, INC.  
West-East Profile V-V'  
August 14, 1985  
Figure No. 6

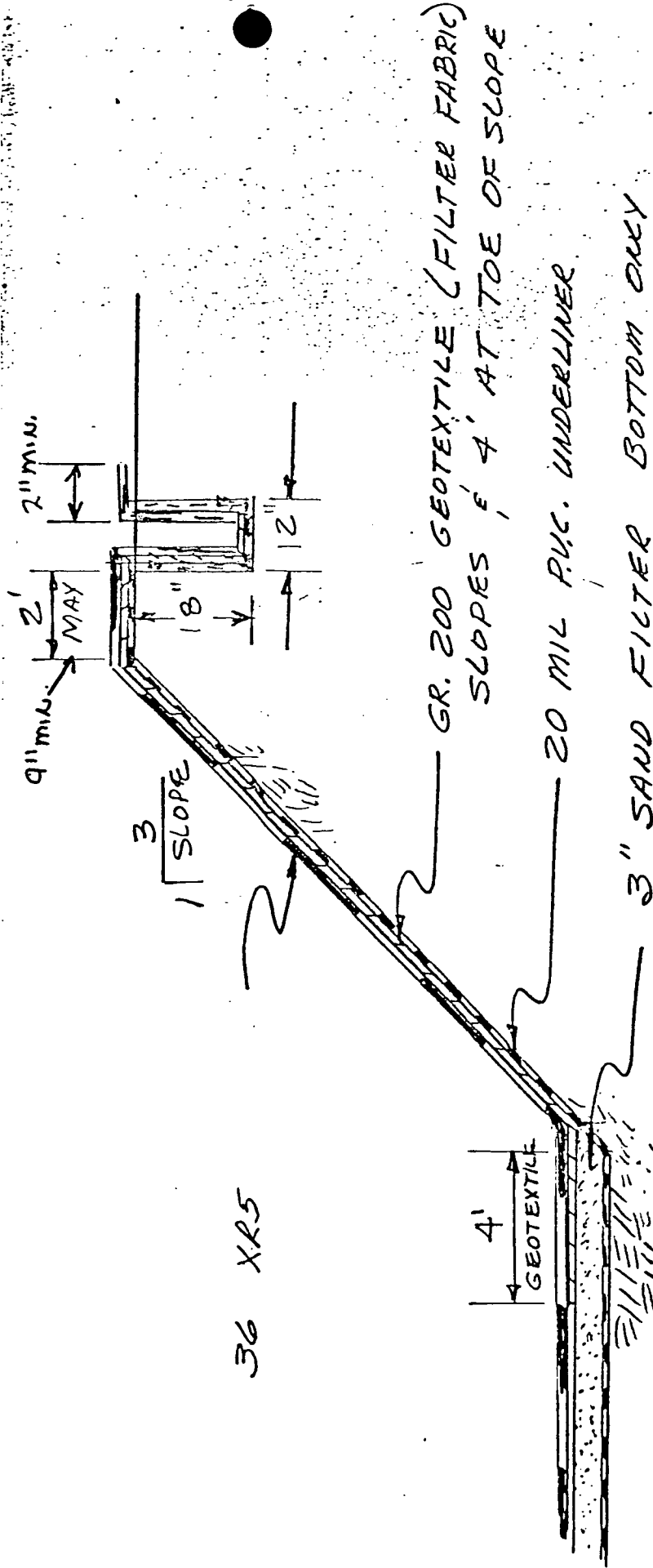




BASIN DISPOSAL, INC.  
West-East Profile W-W'  
August 14, 1985  
Figure No. 7

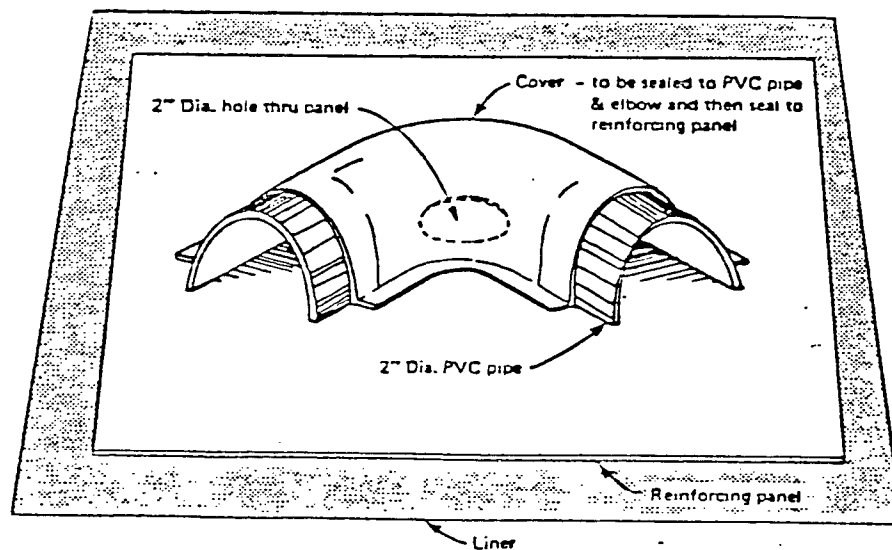


BASIN DISPOSAL, INC.  
West-East Profile X-X,  
August 14, 1985  
Figure No. 8



TYP. ANCHOR DETAIL DOUBLE LINER  
NO SCALE

BASIN DISPOSAL, INC.  
Slope Protection and  
Liner Anchor



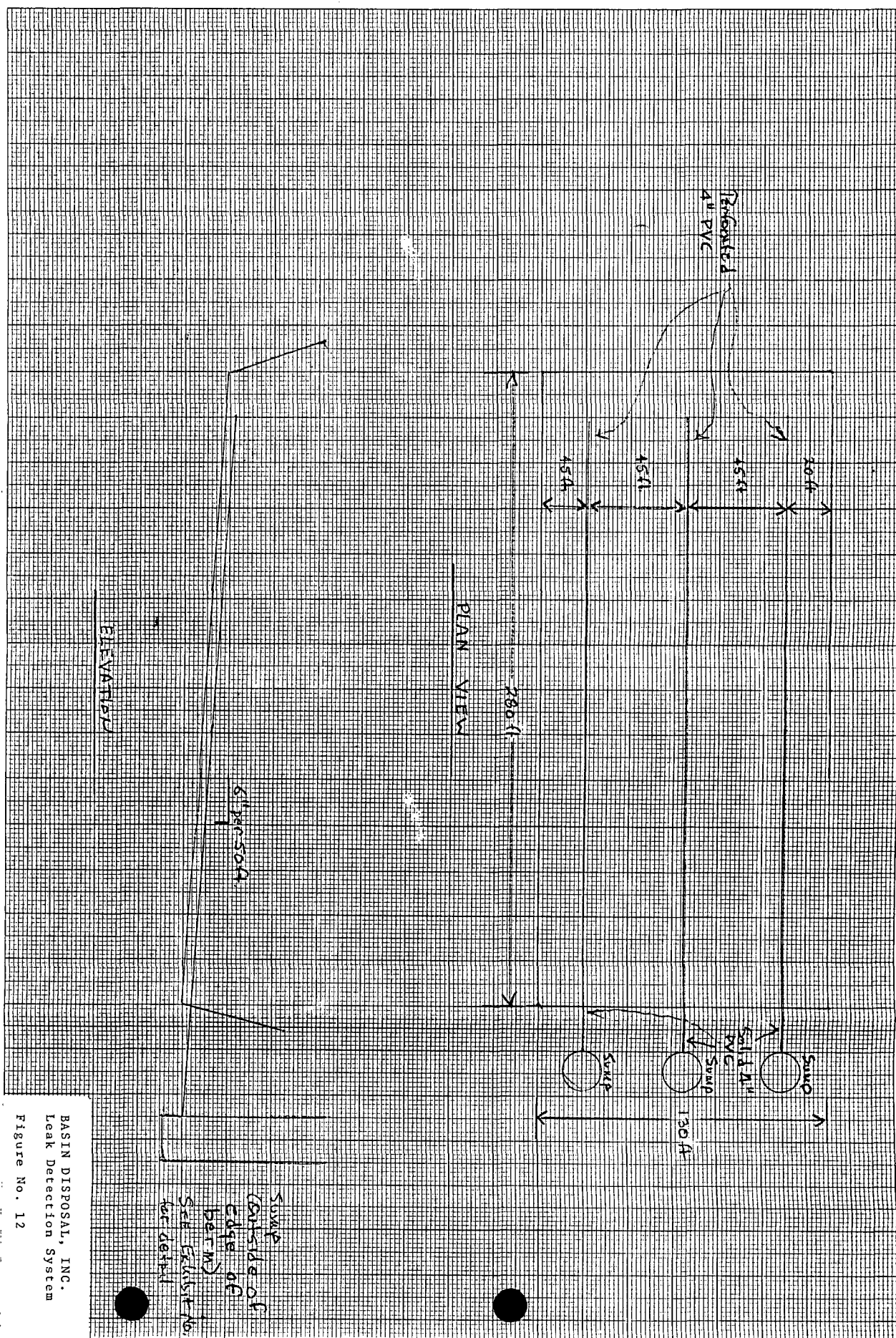
BASIN DISPOSAL, INC.  
Vents

Figure No. 11





BASIN DISPOSAL, INC.  
Leak Detection System  
Figure No. 12



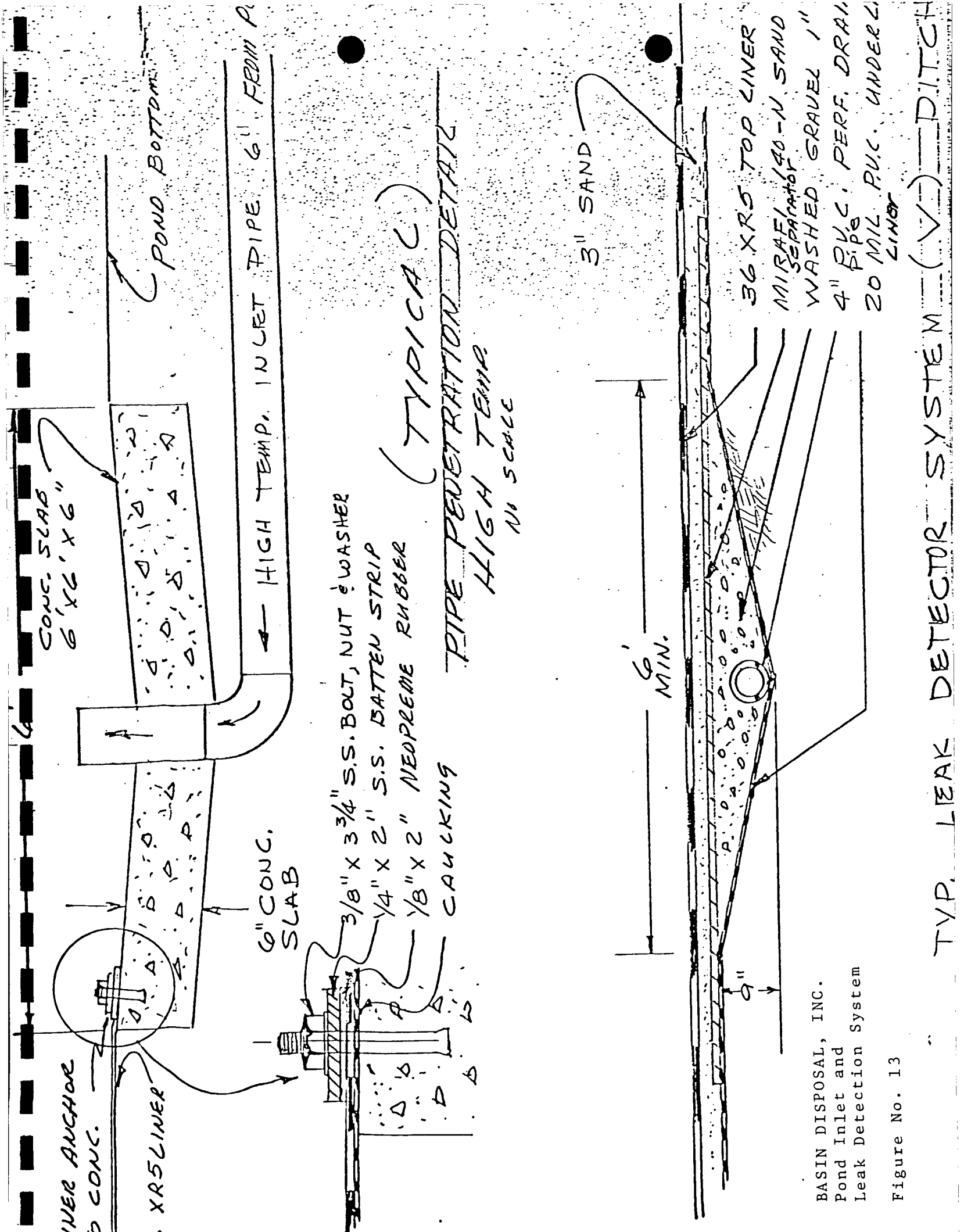
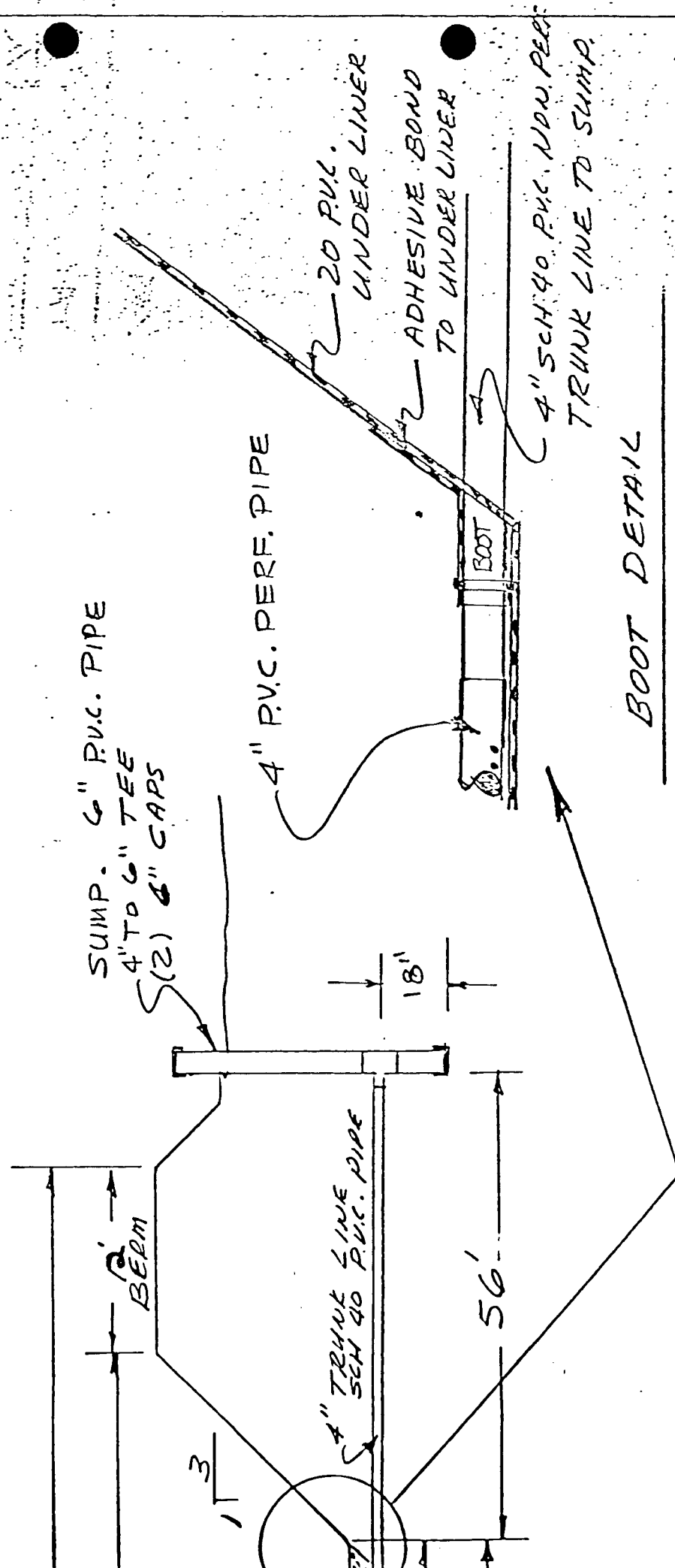


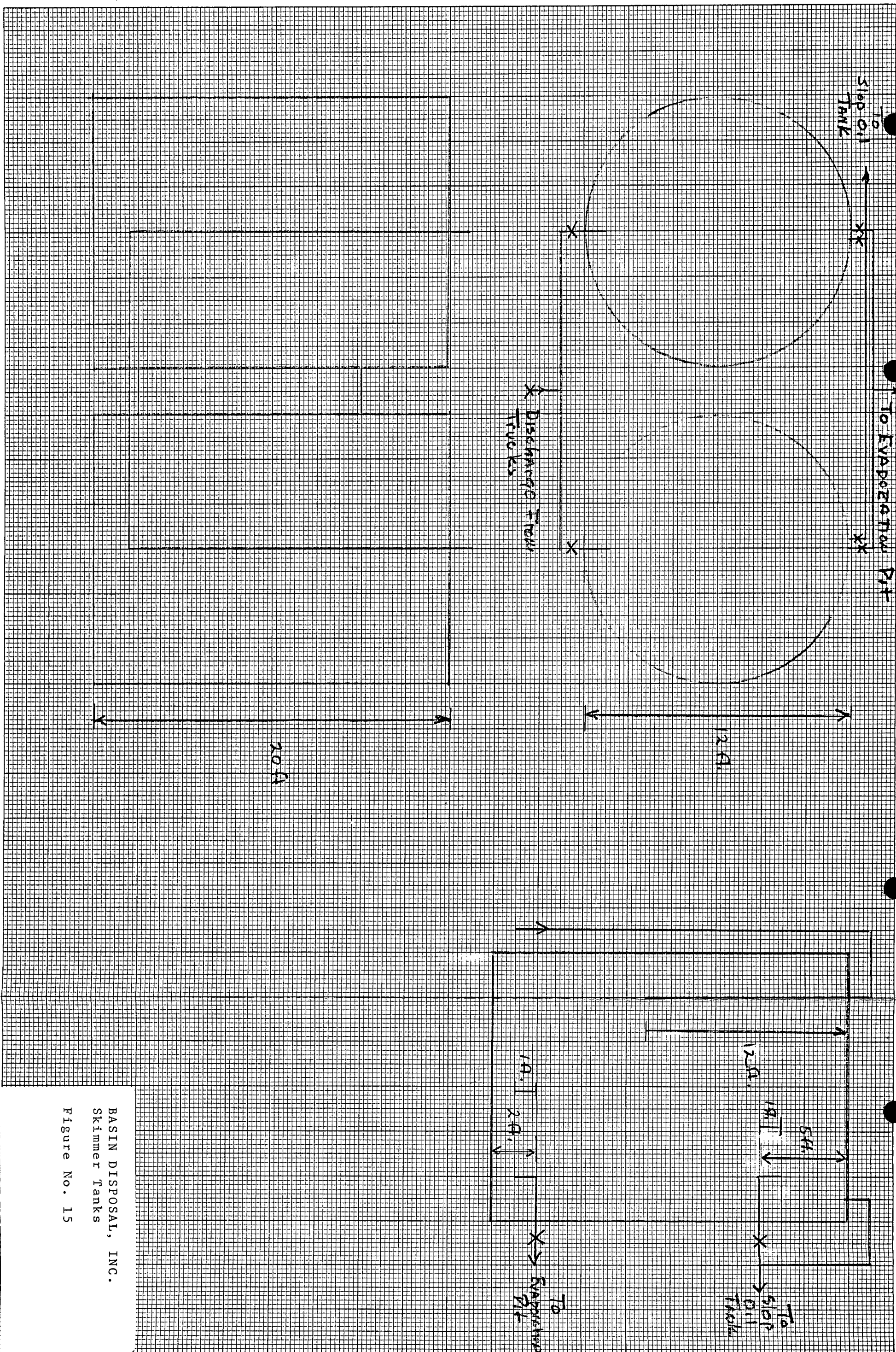
Figure No. 13

BASIN DISPOSAL, INC.  
Leak Detection System  
Thru Berm and Sump

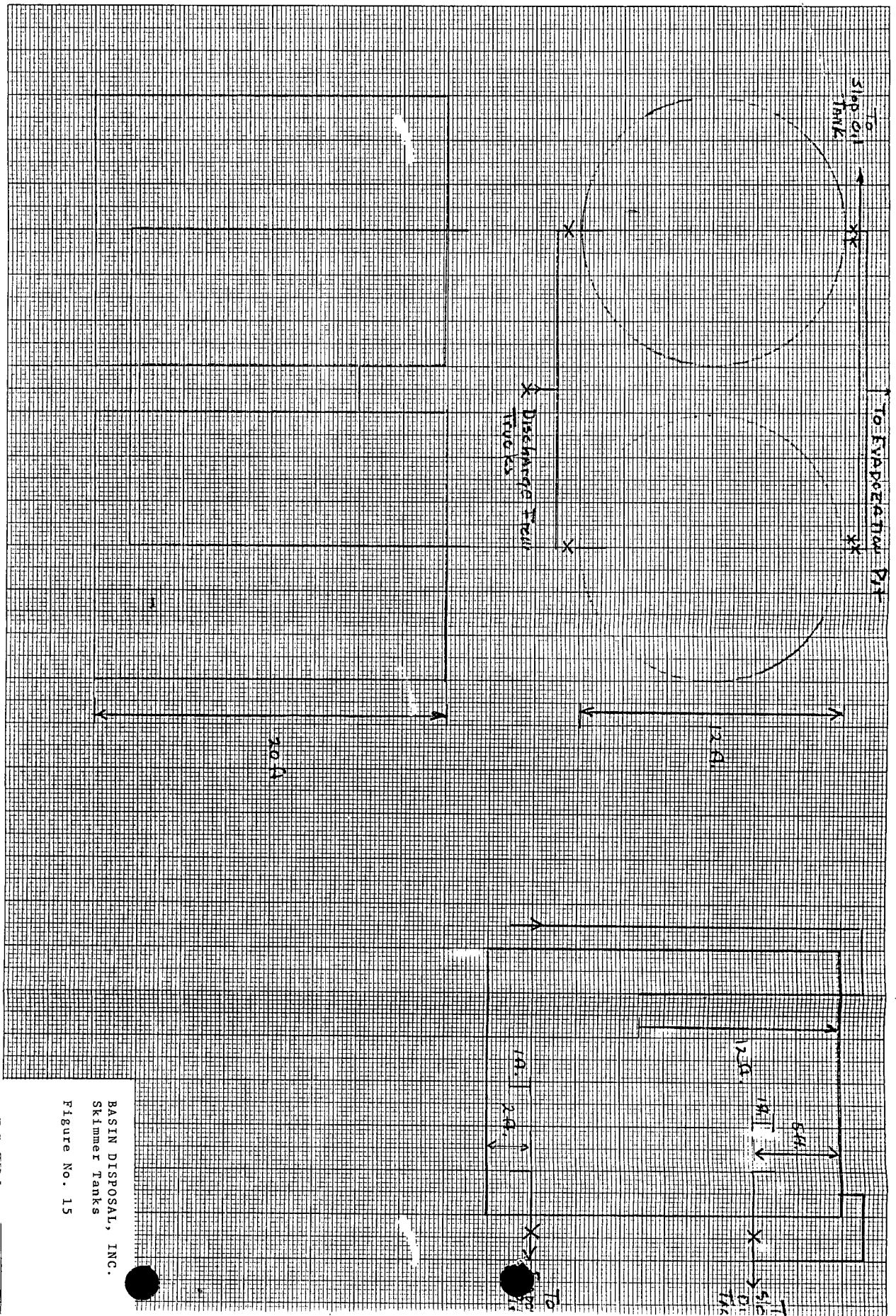
Figure No. 14





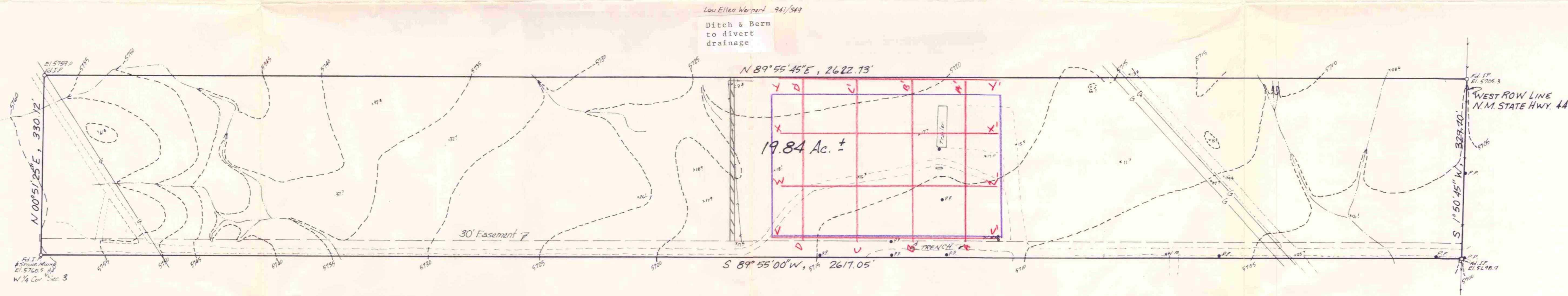
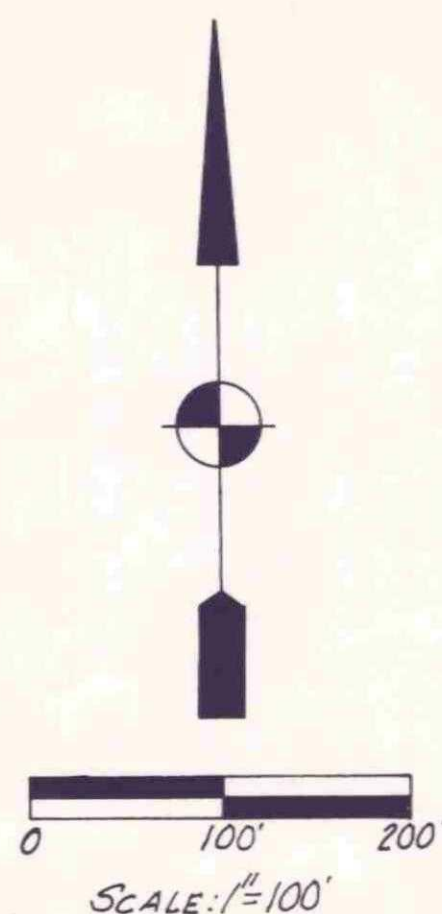


BASIN DISPOSAL, INC.  
Skimmer Tanks  
Figure No. 15



BASIN DISPOSAL, INC.  
Skimmer Tanks  
Figure No. 15





BASIN DISPOSAL, INC.  
Plat of Acreage with  
Topography, outline of  
Pit and Profile Lines  
August 14, 1985

DESCRIPTION

A tract of land being the South 330 feet of the Northwest Quarter of Section 3, T29N, R11W, N.M.P.M., San Juan County, New Mexico, less and except any and all easements or reservations of record or in existence.

CERTIFICATION

I, William E. Mahnke II, do hereby certify that I am a Professional Land Surveyor duly Registered under the Laws of the State of New Mexico, and that I prepared this plat at the direction of the Owners from field notes of an actual survey, and that the representations hereon are true and correct to the best of my knowledge and belief.

*William E. Mahnke II* 8-1-85  
William E. Mahnke II  
N.M. P.L.S. No. 8166

BASIN DISPOSAL, INC.			
TRACT SURVEY		SCALE 1"=100'	DRAWN BY WEM II
SEC. 3, T29N, R11W, N.M.P.M.			
DATE 8-6-85	KERR LAND SURVEYING		DRAWING NUMBER

DATE SURVEYED: 8-1-85  
BASIS OF BEARINGS: G.L.O.