

COMPLIANCE INVESTIGATION REPORT
DIVISION OF COMPLIANCE

Region IV

Subject: Petrotomics Company
P. O. Drawer 2450
Casper, Wyoming 82601

Source Material License No. SUA-551
(Docket No. 40-6639)

Fire in solvent extraction building.

Period of Investigation: November 13, 1968

	ORIGINAL SIGNED by JAMES E. HYDER	DEC 16 1968
<u>Investigator:</u>	James E. Hyder	Date
	ORIGINAL SIGNED BY	
<u>Reviewer:</u>	G. D. BROWN	DEC 16 1968
	Glen D. Brown	Date

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REASON FOR INVESTIGATION

From a newscast on a local television station, Region IV, Division of Compliance, learned of a fire at Petrotonomics Company, Shirley Basin facility. A telephone call to the licensee on the morning of November 12, 1968, revealed the following:

A fire had started at approximately 1:00 p.m., on November 10, 1968, in a building housing one of two solvent extraction circuits. This building had been completely destroyed and another solvent extraction circuit housed in an adjoining building had been damaged.

By telegram dated November 12, 1968, the licensee reported as follows:

" AS PER LICENSE REQUIREMENTS WE WISH TO REPORT A FIRE IN THE SX SECTION OF OUR SHIRLEY BASIN MILL. THERE WAS NO RELEASE OF RADIOACTIVE MATERIAL. OPERATIONS OF THE MILLING FACILITY WILL BE AFFECTED APPROXIMATELY THREE WEEKS. DAMAGE TO THE PROPERTY IS AT THIS TIME ESTIMATED AT 3000,000 DOLLARS THERE WERE NO INJURIES INVOLVED FIRE STARTED APPROXIMATELY 1PM NOV 10 EXTINGUISHED 9PM NOV 10
PETROTOMICS CO J H WHITMAN "

Investigation was conducted on November 13, 1968, by a visit to the mill site to review possible exposures of fire fighters to concentrations of licensed material and to determine the possible extent of potential releases of source material to the environment by this fire.

SUMMARY OF FACTS

The fire started at 1:10 p.m., November 10, 1968, by welding sparks, was under control by 6:30 p.m., and considered completely extinguished at 9:00 p.m., on November 10, 1968. Five individuals were in the solvent extraction building at the time the fire started and all escaped safely. Approximately 40 individuals, including 30 Petrotonomics employees, participated in the fire fighting. There were no injuries to any individual. At the time of the fire, the solvent extraction circuit, which was completely destroyed, contained an estimated 2,000 pounds of U₃O₈. None of the vats containing the uranium slurry evaporated to complete dryness and the licensee stated that very little, if any, uranium had been lost as a result of the fire.

Most of the fire fighting was conducted from upwind. Fire fighting from downwind of the fire was restricted to that necessary to wet down tanks and small buildings located on that side of the fire.

The licensee stated that damage was estimated at \$300,000. It was expected that the damaged solvent extraction circuit could be back in operation in approximately three weeks and that the destroyed circuit would be replaced and it is expected to be back in operation in late spring of 1969.

There is no evidence to indicate personnel engaged in fighting the fire were exposed to excessive concentrations of licensable material and there is no evidence to indicate that an appreciable amount of licensable material was released to the environment as a result of this fire. There are no items of noncompliance.

Persons contacted:

Mr. C. E. Wolff, Mill Superintendent
Mr. J. H. Whitman, Acting Project Manager

Persons accompanying investigator:

Mr. Robert Sundin, Wyoming State Department of Health

DETAILS

1. From a telecast on a local television station, Region IV, Division of Compliance, Denver, learned of a fire at Petrotonics Company, Shirley Basin area, Wyoming. A telephone call to the licensee, on the morning of November 12, 1968, revealed that a fire indeed had occurred in their solvent extraction building on the afternoon of November 10, 1968. By TWX dated November 12, 1968, the licensee advised Region IV of the occurrence of the fire, the estimated damage affect on the overall milling operation, that there had been no release of radioactive material, and had been no injuries as a result of the fire.
2. The Shirley Basin facility was visited by a CO:IV representative, accompanied by the Wyoming State Health Department representative, on November 13, 1968. During this visit, it was established that the fire had started at 1:10 p.m., November 10, 1968, as a result of sparks from a welding operation in the solvent extraction building.
3. Mr. Wolff stated that the fire had been brought under control at approximately 6:30 p.m., and was considered to be fully extinguished at 9:00 p.m., on November 10, 1968. Mr. Wolff stated there were approximately 40 persons engaged in the fire fighting operation; of these 30 were Petrotonics employees. The others consisted of two individuals who brought equipment from Natrona County Fire Department from Casper, two individuals who brought equipment from the Carbon County Fire Department in Rawlins, and two individuals each from Halliburton, Byron Jackson, and Dowell. These latter three companies are oil well logging service companies, having mobile fire fighting equipment.
4. Mr. Wolff stated that at the time of the fire, the meteorological conditions were a clear sky and slightly windy, estimated at from 20 to 25 mph winds. Mr. Whitman stated that this, in essence, was a petroleum (kerosene) fire and that it resulted in a great volume of very intense smoke which rose from the facility at an approximately 45° angle and included flames estimated at 100 to 150 feet in height.
5. Mr. Wolff emphasized that it is believed there was no appreciable release of licensable material to the unrestricted environment. He estimated that the half of the solvent extraction system which had been completely destroyed had contained approximately 2,000 pounds of uranium oxide at the time of the fire. He stated, and a tour of the location revealed, that none of the large vats containing the uranium slurry had been burned to complete dryness; thus, the licensee expects to recover all of the uranium within the solvent extraction circuit at the time of the fire.
6. Mr. Wolff emphasized that although there had been five individuals in the solvent extraction building at the time the fire started, all had escaped safely and that there had been no injuries other than sore muscles as a result of the fire fighting. Mr. Wolff stated that the fire had been prevented from spreading into the second solvent extraction building by using a spray of water to produce a fog barrier between the two buildings. Mr. Wolff stated that fire had essentially been brought under control several times during the afternoon utilizing chemicals; however, on each occasion, the chemical supply had been exhausted and they had been forced to wait for a new supply which was brought from Rawlins and Casper, Wyoming. He stated that although the State Highway Patrol had not actually participated in the fire fighting, several cars had been at the site and that the State Highway Patrol radio system had been utilized to request additional supplies of the fire fighting chemicals.
7. Mr. Wolff also stated that an attempt was made to fight the fire utilizing fire fighting airplanes to drop loads of slurry on the burning building and at the time felt that this had not produced any worthwhile results. He added, however, in retrospect, that he did feel that the single hit had assisted in collapsing the roof of the burning building and, in essence, helped in establishing a heat barrier between the burning solvent extraction building and the adjoining solvent extraction circuit.
8. Mr. Whitman estimated the damage to the mill facility at approximately \$300,000. He stated that he anticipated having the damaged solvent extraction circuit returned to operation in early December, and he indicated the destroyed circuit would be repaired, but probably could not be returned to operation before late spring, 1969. Mr. Wolff stated that during the fire no air samples had been collected. However, on the following date, air samples were collected at several locations in and around the burned-out building and radiation measurements were made; a copy of this survey is attached as Exhibit A.

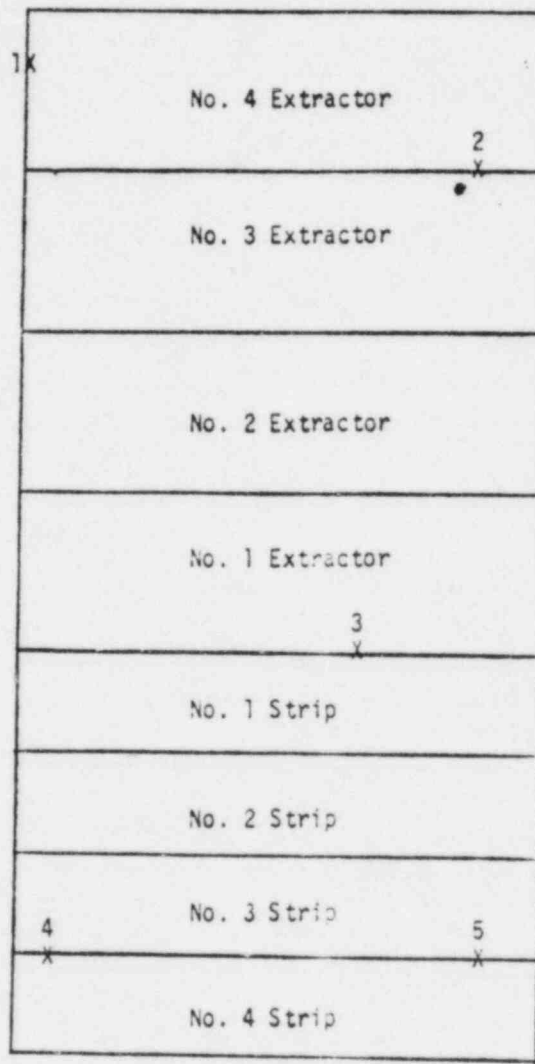
9. During a tour of the solvent extraction area, several photographs of the destroyed solvent ~~extraction building~~ were made; these are attached as Exhibit B. The mill yard area is covered with oversize from the ball mill and is expected to contain some natural uranium ore. Alpha activity was checked at several locations in the mill yard, particularly in the vicinity of the solvent extraction building, and no unusual or high levels of alpha activity were detected. The entire area has a background of several hundred counts per minute of alpha activity.
10. Mr. Whitman stated that the fire had received publicity from local newspapers, radio stations and television stations and that one television camera crew had been at the mill site during the fire fighting. He emphasized, however, that he felt that none of the publicity would be considered adverse to the nuclear industry. He stated that the primary area of interest of the news media related to the potential economic impact this fire might have upon communities. Mr. Whitman provided copies of newspaper reports to the investigator. Copies of these are attached as Exhibit C.
11. Mr. Whitman apologized for the delay in reporting this incident to the Commission and stated that Petrotomics would submit a written report to the Commission within the allotted 30 day period.
12. The licensee did collect samples of the carbon material, primarily the soot, which had settled out in areas adjacent to the solvent extraction building and did assay this material for uranium content. These samples were found to contain less than 0.00% U_3O_8 . It should be emphasized that this sample could have been contaminated with uranium dust deposited prior to the time of the fire. No items of noncompliance were identified during this investigation of the fire which occurred on November 10, 1968, at the Petrotomics Shirley Basin uranium mill.

AIRBORNE RADIATION STUDY OF BURNED SOLVENT EXTRACTION CIRCUIT

PETROATOMICS COMPANY SHIRLEY BASIN, WYOMING

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N

Sample No.	Assay
1	0.26 uCi/ml x 10 ⁻¹¹ 0.09 mr/hr
2	1.30 uCi/ml x 10 ⁻¹¹ 0.09 mr/hr
3	0.32 uCi/ml x 10 ⁻¹¹ 0.06 mr/hr
4	0.11 uCi/ml x 10 ⁻¹¹ 0.07 mr/hr
5	0.28 uCi/ml x 10 ⁻¹¹ 0.08 mr/hr
6	0.15 uCi/ml x 10 ⁻¹¹ 0.05 mr/hr



REMARKS:

- (1) X denotes sample location
- (2) Wind gusting 20-30 mph from the west
- (3) Samples collected by P. J. Thornburg, Chemist
- (4) Sketch not to scale
- (5) Sampled at 12:00 noon, November 11, 1968

H. G. Cooley

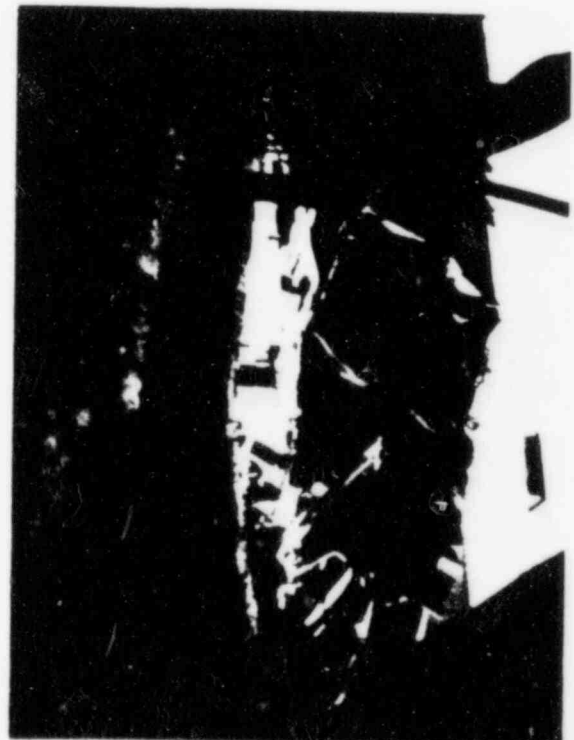
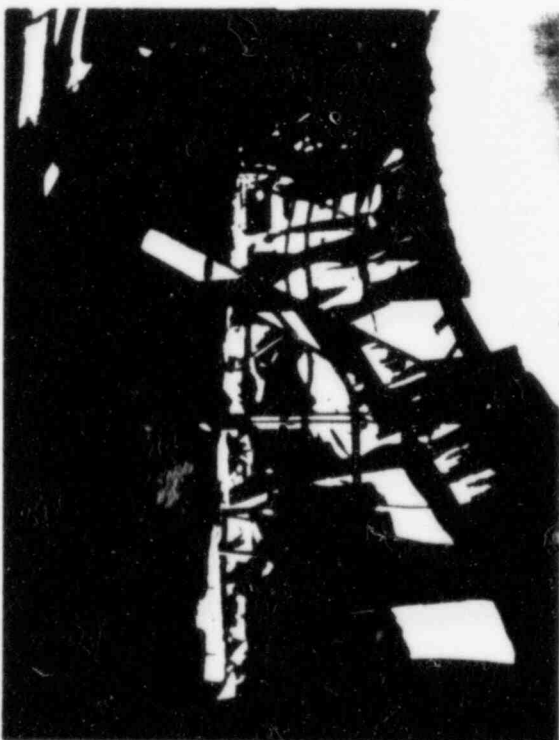
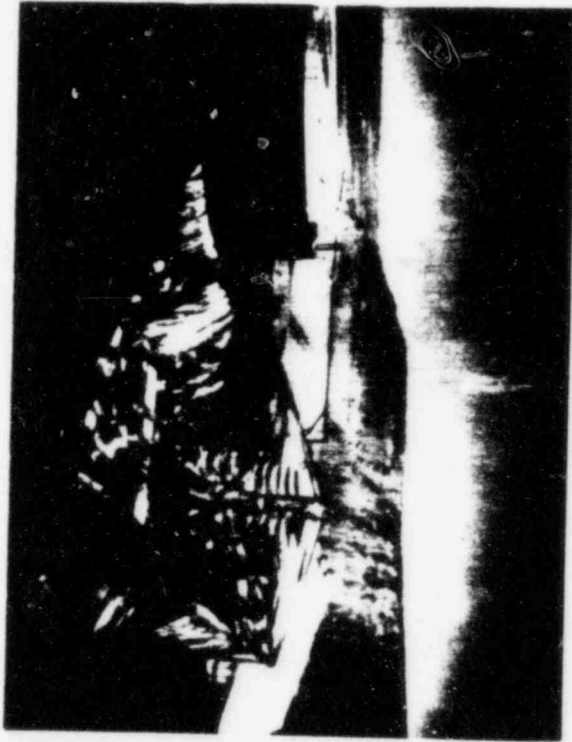
H. G. Cooley
Mill Metallurgist

EXHIBIT A

PETROTOMICS COMPANY
CASPER, WYOMING

LICENSE NO. SUA-551

FIRE IN SOLVENT EXTRACTION BUILDING



COMPLIANCE INVESTIGATION REPORT
DIVISION OF COMPLIANCE

Region IV

Subject: Petrotomics Company
P. O. Drawer 2450
Casper, Wyoming 82601

Source Material License No. SUA-551
(Docket No. 40-6659)

Fire in solvent extraction building.

Period of Investigation: November 13, 1968

Investigator:

James E. Hyder
James E. Hyder

12-16-68
Date

Reviewer:

Glen D. Brown
Glen D. Brown

12-16-68
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Most of the fire fighting was conducted from upwind. Fire fighting from downwind of the fire was restricted to that necessary to wet down tanks and small buildings located on that side of the fire.

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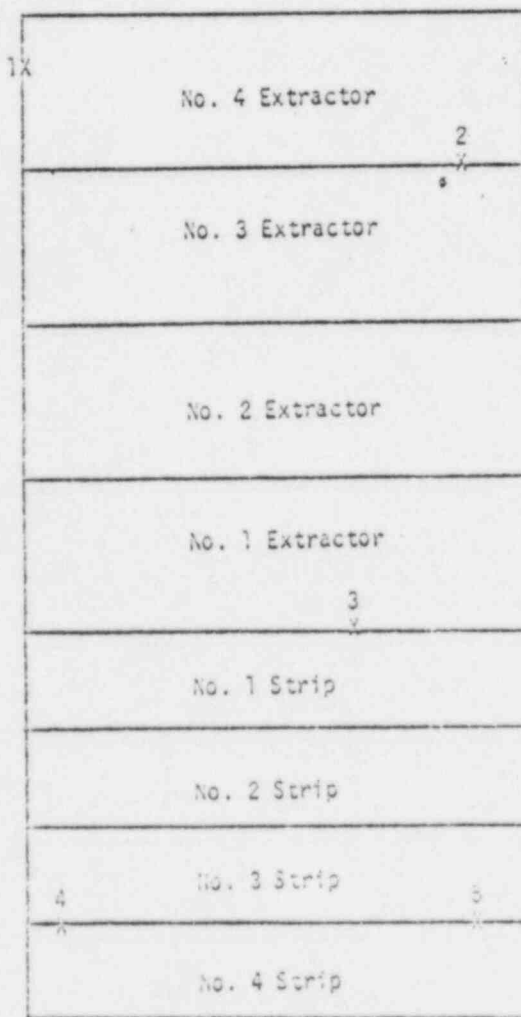
Nov 17, 1968

AIRBORNE RADIATION STUDY OF BURNED SOLVENT EXTRACTION CIRCUIT

PETROTONICS COMPANY SHIRLEY BASIN, WYOMING

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SA 100
6

NOTES:

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21 20 4 4
P. J. Thornburg

A spill from a well's backflow County Fire Department, pm Sunday in the morning took toll from the well's vicinity enough to send all by the highway, the located at a large fire at the Carbon County Fire Station of the solvent extraction torch, according to Judd "Shore" the well's backflow.

PETROTOMICS COMPANY
CASPER, WYOMING

LICENSE NO. SUA-551

FIRE IN SOLVENT EXTRACTION BUILDING

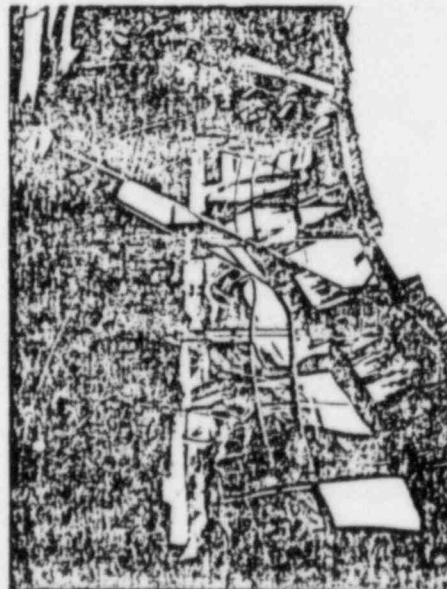


EXHIBIT B

A spark from a welder's torch started off a large fire at the Carbon County Fire Department, Medicine Bow Fire Department, and several other service companies. The fire began about 12:45 p.m. Sunday in the negative section of the solvent extraction plant at the Petrochemics Co. mill.

A spark fell from the welder's torch, according to Judd Whitham, general manager. A man who was watching for leaking pipes in the vicinity of some benzene tanks, when a leading under on the spark, and

By the highway, the Petrochemics Co. plant is 5 miles from Casper. However, the black, billowing smoke from the kerosene fire was visible almost as soon as it started and got off the ground at Casper.

The smoke extended to at least 1,000 feet above the ground, and stretched out for more than five miles southward. The fire was hot enough to cause the roof of the solvent extraction building to collapse.

The fire did not spread to the main milling building, Whitham said.

Two fire fighting PBM airplanes from Air Tankers, Inc., in Casper were sent to the fire with loads of slurry. Sunday afternoon, according to Tom Sorley, owner of Air Tankers, Inc.

The planes each dropped one load of slurry on the fire and building but it continued to burn.

The fire was actually under control, said two firefighters, but each time it got out of control, the supply of foam was all run out, and firefighters had to use water.

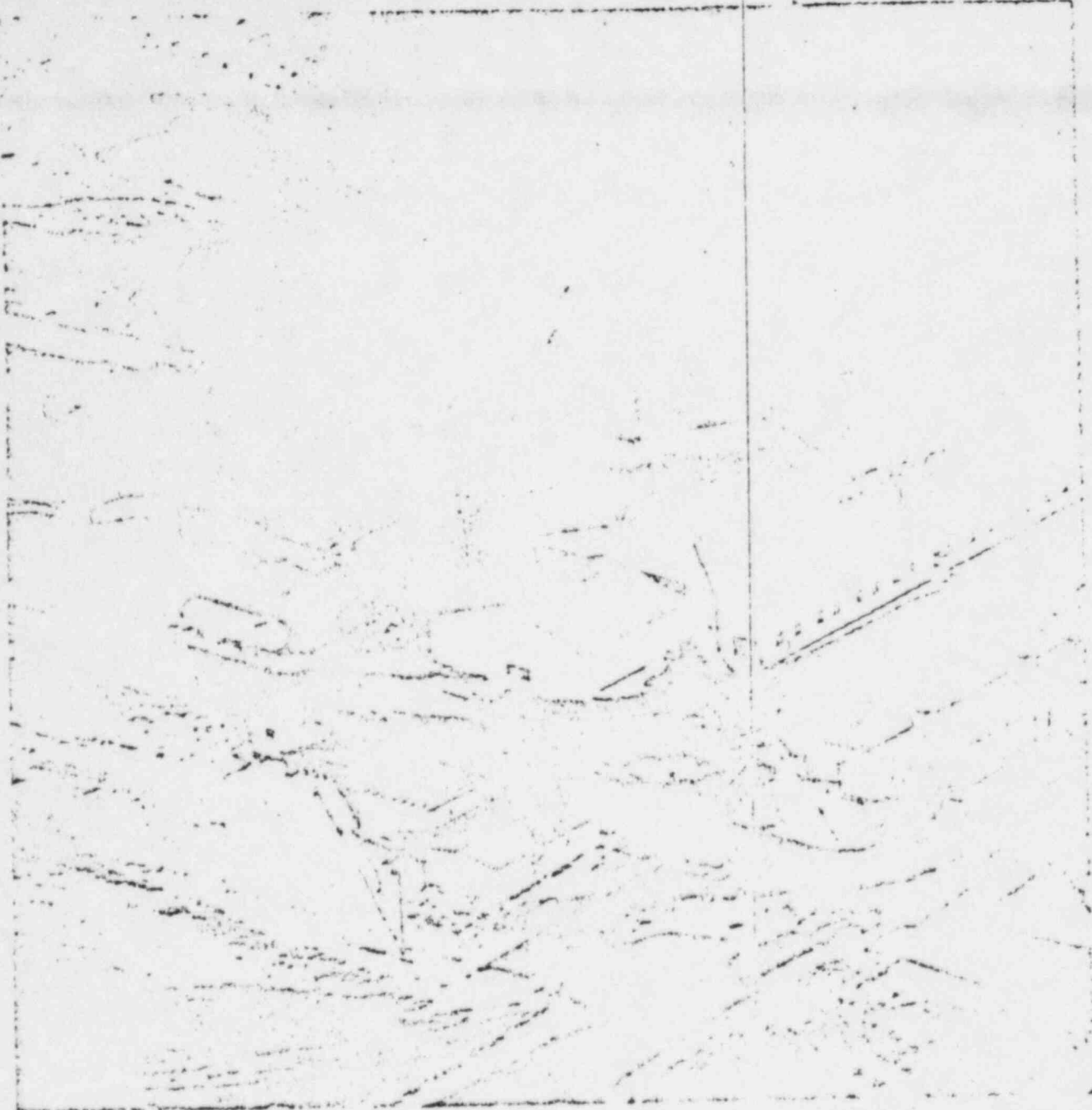
At 8:45 p.m., the fire was out, and firefighters were able to remove the slurry and sludge. The fire was actually under control, said two firefighters, but each time it got out of control, the supply of foam was all run out, and firefighters had to use water.

The burning of vapors from the fire was a major problem, said Judd Whitham.



SMOKE BILLOWS SEYWARD. A kerosene fire at building at the mill, which kerosene is used in preparing the uranium ore. Casper Air Service pilot Wayne Wertz flew the photograph to the fire. Additional photo on page 8. Photo by Leon Campbell.

[Faint, illegible text, possibly a newspaper clipping or a large headline.]



KEROSENE FIRE: Huge rolls of ugly black smoke pour from the precipitate shed of Petrotonics, Inc., as kerosene used in the final step of refining "yellow cake" uranium burned Sunday. The large building at right center is the grinding and leaching plant and the final packaging department of the uranium ore processing complex. Offices of Petrotonics are in

the low, flat roofed building at right center. The huge circular tanks at upper left are thickening tanks. The kerosene is used to form the "yellow cake" from a solution and is near the end of a complex procedure used to separate the uranium from the ore—(Photo by Leon Campbell).

CASPER STAR-TRIBUNE

November 11, 1968

Petrochemicals Officials Assess Fire Damage

Officials at the fire-ravaged Petrochemicals plant in Shirley Basin said Tuesday night they hadn't finished assessing the damage in Sunday's conflagration, but milling operations would be halted for awhile.

Julson Whitman, general manager of the plant, said engineers from Denver arrived in Casper Monday afternoon and would appraise the extent of the damage. Meanwhile, Whitman said, employees at the mill would be put to work helping to clean up the debris caused Sunday when sparks from a welding torch ignited a kerosene tank. The fire burned out of control for at least six hours.

Most of the damage, Whitman said, was to pumps, electric motors, and piping which were in the section of the plant where the fire started. Wooden tanks,

which were used in the thickening process, were also charred by the blaze. Insurance adjusters will also look over the damage on Tuesday, Whitman said.

"But, after the mill is back in operation," Whitman said, "we'll be processing uranium there for at least another five years."

Firefighters overpowered the fire with foam and kept it from spreading to other buildings. The firefighting planes from Casper dropped loads of the liquid fire-fighting slurry in the blazing building which apparently did no good.

The fire began about 1 p.m. when a spark from a welder's torch ignited some kerosene. The National Guard, Casper, Cheyenne and Montana fire departments, plus several oil service companies helped fight the fire.

The fire raged for six hours before being brought under control about 6 p.m. Sunday and finally extinguished after 9 p.m. Smoke from the blaze rose about 1,000 feet into the air and drifted south for more than five miles.

Most of the fire caused the roof of the building to collapse.

CASPER STAR-TRIBUNE

November 12, 1968

EXHIBIT C