Leo Dubinski, Assistant Director
for Materials, Division of Compliance,
AEC Headquarters
Donald I. Walker, Director, Idaho
Compliance Area, Division of Compliance

DEC 2 1 1961

ORIGINAL SIGNED BY
DONALD I. WALKER

FOLLOW-UP INSPECTION REPORT, PHILLIPS PETROLEUM COMPANY URANIUM MILL, GRANTS, NEW MEXICO - SOURCE MATERIAL LICENSE NO. S-216

CO-ID:WCP

Transmitted herewith are four (4) copies of the subject report.

The items of noncompliance observed or otherwise noted during the course of the inspection are as follows:

10 CFR 20.201 Surveys.

(b) in that the licensee's survey program in the crushing and sampling plant from January 1, 1961, to the time of the inspection, is inadequate to determine the concentrations of airborne uranium which exist in those areas.

(b) in that no breathing zone samples had been collected, to the time of the inspection, to determine the concentrations of airborne uranium to which personnel are being exposed during operations which involve the direct handling of ore samples and uranium concentrates.

10 CFR 20.401 Records of surveys, radiation monitoring and disposal.

(b) in that records of surveys from January 1, 1961, to the date of the inspection were not complete because determinations of weighted exposures of operators to airborne uranium in areas which were found to be in excess of permissible limits were not made.

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The licensee has made considerable progress in their air sampling program since the last inspection in that they have collected a large number of samples with a sequential sampler and have, consequently, determined average concentrations which exist in most of the areas of the mill which are quite representative of the conditions which exist in these areas. However, several evident inadequacies still exist in the licensee's air sampling program.

One inadequacy exists in the sampling of the crushing and sampling plant, an area which, at various times during the course of the subject inspection and of the last previous inspection, was so filled with airborne dust that it was difficult to see from one side of the plant to the other. The biggest difficulty in this area seems to lie in the fact that the ore which is processed by the Phillips mill is so wet when it is received that it is necessary to dry it. Apparently, the ore drying process is not controlled well enough and the feed to the crushing plant, on occasion, becomes so dry that a great deal of dust is created at each transfer point in the crushing and sampling plant. The airborne dust, in turn, falls out in the crushing plant and is constantly stirred up by personnel when they walk through the plant and by the high winds which blow in New Mexico, thereby creating an ever-present dusty condition. It is our opinion that the dusty conditions in the sampling and crushing plant at the Phillips mill could be considerably improved by more careful control of the moisture content of the ore entering the plant and by better housekeeping methods. Dust collection equipment has been previously installed in the crushing plant but it does not appear to be adequate when the ore becomes too dry and heavy dusting occurs. During telephone conversations with representatives of the licensee, since the time of the subject inspection, it has been indicated by them that they plan to attempt to reduce the dusty conditions by allowing the ore to enter the crushing plant at a higher moisture content, even though more cleanup in the plant is involved due to the sticking of ore to the conveyor belts and the eventual release of this ore from the underside of the belts. They indicated that they will amplify their cleanup program in the crushing area to control the dust which collects on equipment and which is continually moved by operating personnel and by high winds.

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It is the opinion of this office that, because of the dusty conditions, the licensee's sampling program in the crushing and sampling plant should most certainly include the collection of air dust samples more often than twice in eight months, which was the extent of the licensee's sampling in that area at the time of the subject inspection. Samples collected by the inspector indicate that, over a twelve-hour period, the average concentration of airborne uranium in the crushing plant was about 3.5 x MPC. Since the time of the subject inspection, the licensee has reported to this office that they have collected three sequences of samples over a 36-hour period and that the average concentration of airborne uranium determined by them during this period was approximately 3 x MPC. Hence, the licensee's survey in the crushing and sampling plant prior to the subject inspection was not adequate to indicate the representative condition which exists in that area.

A second inadequacy which exists in the licensee's survey program to determine concentrations of airborne uranium, is the fact that not one breathing zone sample had been collected at the Phillips mill, to the time of the subject inspection, according to their survey records. There are several operations at the mill which involve the actual handling of source material by personnel and which, by their nature, are quite dusty operations. We feel that the most representative sample of the air to which the individuals accomplishing these operations are exposed is the breathing zone sample, since the operations usually take up a relatively short part of the operator's total working time and his operations are usually confined to a rather limited area. Because the final product drier was in a state of repair at the time of the inspection and no yellow cake was being barreled, no breathing zone samples were collected by the inspector during the time when yellow cake operators were changing and weighing drums. Since that time, the licensee has reported that they collected three breathing zone samples during these operations, and that the average concentration of airborne uranium was determined by them to be approximately 9 x MPC.

The biggest problem the licensee has had with the barrel changing and weighing operation is their insistence on a final weight of yellow cake in the drums of 1000 pounds. This involves the use of a small scoop by the operator with which he either adds or takes out yellow cake to adjust the weight.

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Although the licensee provides an airline respirator for the operator's use during this operation, the fact remains that the operator is being exposed to concentrations of airborne uranium in excess of permissible limits during an operation which could probably be eliminated. The licensee has indicated to this office that they will attempt to minimize the yellow cake operator's exposure by installing a level-determining device in the barrel filling apparatus and by allowing a more reasonable weight range of product which can be packed into the barrels.

Additionally, certain operations performed by ore sample preparation technicians were notably dusty and breathing zone samples taken concurrently by the inspector and the licensee revealed that the concentrations of airborne uranium which were present during these operations were in excess of the MPC. The concentrations of airborne uranium which occur during these operations could most certainly be reduced by providing adequate ventilation equipment for the various pieces of apparatus which are used during these operations.

The licensee has submitted to this office the air sampling schedules which they allegedly intend to follow in the future and which appear to us to be adequate to determine the concentrations of airborne uranium which exist in the various areas of the mill. These schedules have been discussed or presented as appendices to the subject report.

As a result of weighted exposures which were made shortly after the time of the subject inspection by W. A. Starkovich, Safety Director at the Phillips mill, it first appeared to us that yellow cake operators and yellow cake "A" operators had not been exposed to concentrations of airborne uranium in excess of permissible limits. However, from determinations made by this office using data collected at the time of the inspection and data sent to this office by Mr. Starkovich, it appeared that the licensee's determinations were in error and that the above-mentioned operators had been exposed to concentrations of airborne uranium in excess of permissible limits during March, 1961. It was determined by telephonic conversation with Mr. Starkovich that he had, by mistake, failed to use all of the air sampling data collected by them to calculate the average concentration of airborne uranium to which operators were exposed while performing operations on the bottom floor of the yellow cake area during March, 1961; this resulted in the difference in the exposure determinations made by Mr. Starkovich and by this office. Subse-

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quently, this office was notified by Mr. Lucian Renes, Chief Industrial Hygienist, Phillips Petroleum Company, Bartlesville, Oklahoma, that he and Mr. Starkovich had reevaluated the exposures of yellow cake operators to airborne uranium and that they had determined that there were actually no exposures of yellow cake operators to concentrations of airborne uranium in excess of permissible limits, during any period in 1961. A copy of the records showing the results of the reevaluations was sent to this office. The results were reviewed by us and, in our opinion, the weighted exposures which were determined by Mr. Renes and Mr. Starkovich are more realistic than ours because they more correctly relate the exposure of yellow cake operators to airborne uranium while they were performing various duties on the first floor of the yellow cake area; hence, we agree with the licensee's determination that there were no overexposures of personnel to airborne uranium during any period in 1961.

Although, since the time of the subject inspection, the licensee has completed the determination of weighted exposures for all operators who occupy areas which have been found to contain concentrations of airborne uranium in excess of permissible limits, and the results of these determinations have been sent to this office, their survey records were incomplete at the time of the inspection in that weighted exposure determinations had not been made at that time. It is our opinion that the licensee should be notified that failure to maintain complete survey records constitutes noncompliance with 10 CFR 20.401(b).

At the time of the last previous inspection of the licensee, it was noted that a survey program to determine the concentrations of airborne radioactivity to the unrestricted area had just been commenced by them. Since that time, the licensee has procured a high-volume air sampler and has collected downwind samples (exclusively) on the roof of the building housing the yellow cake drier stacks, in the yard, at the periphery fence which surrounds the mill yard and in the surrounding area within 1.0 - 1.5 miles of the mill. Although the licensee has not collected any samples in the area west of the mill, we feel that the licensee's present survey program is adequate since the area west of the Phillips mill is in the prevailing downwind direction from the uranium mill operated by Kermac Nuclear Fuels Corporation.

Some comment was also made by this office, in the memorandum accompanying the report of the last previous inspection, concerning the licensee's method of analysis for determining the

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uranium content of air samples. We did not feel that the particular alpha counting technique used by the licensee at that time was reliable enough to accurately determine concentrations in the restricted area nor sensitive enough to determine concentrations in the unrestricted area. The licensee has since changed their method of analysis from the alpha counting technique to the fluorimetric technique and we feel that this is a definite improvement in their survey program. Mr. Starkovich expressed the feeling that they were much more satisfied with the reliability of the fluorimetric technique and that they would continue to analyze their samples using this technique.

Although there were several glaring deficiencies in the licensee's survey program at the time of the subject inspection, the licensee has since notified this office of the changes which they have made in their survey program and which we feel will correct these deficiencies. Since the time of the inspection, we have noted increased interest and concern on the part of licensee management in Bartlesville, Oklahoma. Mr. Remes has called this office twice since the time of the inspection and he has remarked that he has now been given the authority to oversee the radiation safety program at the Phillips uranium mill by T. M. Hipp, Manager, Mining and Milling Department, Phillips Petroleum Company. He has indicated that Mr. Starkovich will remain in charge of the radiation safety program at the mill, but that he will be required to make a quarterly report to Bartlesville informing them (Mr. Hipp and Mr. Remes), of the results of all surveys and of the current status of the program. On the other hand, during telephonic conversations with Mr. Starkovich, he has indicated that he is now receiving the support from management in Bartlesville which he needs to conduct an adequate survey program at the mill. We feel that licensee management is now aware of the deficiencies in the radiation survey program at their uranium mill and that they have outlined a satisfactory program to correct these deficiencies. A follow-up inspection of the licensee's survey program should reveal whether or not the licensee has complied with their expressed intent.

The licensee can be contacted through Mr. T. M. Hipp, Manager, Mining and Milling Department, Phillips Petroleum Company, Bartlesville, Oklahoma.

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This office will schedule a follow-up inspection of the licensee as soon as correspondence between A.E.C. and the licensee has been completed.

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Enclosure:
Phillips Petroleum Company Uranium Mill Inspection Report
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