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TO

FROM ORO Contracts

NY 22

FROM

PREGEL (1943-1947)

September 17, 1942

This report summarizes the trip made September 16 to New York by Capt. J. R. Ruhoff of the Corps of Engineers and Dr. R. L. Geddes of Stone & Webster. Discussions were had with the following people:

1. Mr. E. Sengier of the African Metals Co.,  
41 Broad St., New York, N.Y.
2. Mr. Pregel, Canadian Radium and Uranium Corp.,  
630 5th Avenue, New York, N. Y.

The primary object of the trip was to discuss with Mr. Sengier his application to the State Department for permission to export from this country 500 tons of uranium ore to be sold to Eldorado Gold Mines, Ltd., Port Hope Refinery, Canada. At the same time it was desired to obtain as much direct information as possible regarding the amounts and qualities of available raw ores or finished oxides owned or controlled by Mr. Sengier's company.

In the course of the discussions with Mr. Sengier it developed that the export license for 500 tons was related in some manner with the fulfillment of our current order with Canadian Radium and Uranium Corp. for 350 tons of D-1 grade oxide. We therefore arranged a meeting with Mr. Pregel of the latter company (Mr. Boris Pregel had undergone an operation that day and was unavailable). Mr. C. Vanden Bulck accompanied Ruhoff and Geddes to the latter meeting.

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I - Visit to Mr. E. Sengier of the African Metals, Inc.

A. Mr. Sengier has the following:

1. In United States

a. 1200 tons 65%  $U_3O_8$  ore which is reported to be stored at a warehouse belonging to Archer Daniels Midland on Staten Island. (Note: This is pitch blend ore and contains the normal amount of radium.) An average analysis of this material follows:

|               |       |
|---------------|-------|
| $SiO_2$       | 10.42 |
| $FeO$         | 0.66  |
| $Al_2O_3$     | 2.12  |
| $CaO$         | 1.70  |
| $MgO$         | 2.86  |
| $PbO$         | 6.27  |
| $CuO$         | 0.16  |
| $U_3O_8$      | 68.21 |
| $U_2O_5$      | nil   |
| $Mo_2O_3$ (?) | 1.06  |
| $P_2O_5$      | 0.19  |
| Co + Ni       | 0.11  |

b. 140 tons of sodium uranate in someone's hands in the vicinity of New York City. This material is apparently under the immediate control of the Central Trading Corporation which, however, is responsible to African Metals, Inc. This sodium uranate is of two grades; 66 tons of orange material and 80 tons of yellow material. The orange material assays approximately 1% higher in  $U_3O_8$  content than the yellow material. Average analysis of this material follows:

|                     |            |
|---------------------|------------|
| $U_3O_8$            | 84 to 86%  |
| $Fe_2O_3 + Al_2O_3$ | .15 to .19 |
| $Na_2SO_4$          | 2 - 3.8    |
| $Na_2CO_3$          | 2%         |
| Sodium uranate      | 95.5       |

## 2. In Canada

- a. 60 tons of crude sodium uranate at Port Hope being converted to commercial grade  $U_3O_8$ . This material is to be returned to Mr. Sengier for his account at the rate of 3 tons per month. (Note: It seems quite likely that what will actually happen with this material is that it will be converted to  $U_3O_8$  at Port Hope promptly, and the  $U_3O_8$  sent to Mallinckrodt Chemical Works at St. Louis. Then as Port Hope during the next twenty months can spare relatively small amounts of  $U_3O_8$  from time to time, which  $U_3O_8$  will be produced from their own ore, they will return it to Mr. Sengier.)

## 3. In Belgium Congo

- a. 1,000 tons of ore containing approximately 65%  $U_3O_8$ .
  - b. 2,000 tons of ore containing approximately 20%  $U_3O_8$ . (Note: Both of these raw ores contain the normal amount of radium. The material is reported to have been already mined and is ready for immediate shipment.)
- B. Mr. Sengier says he is not anxious to sell any of this material to anybody but would much prefer to hang on to it and refine it in his own plant in Belgium after the war is over. However, if these ores and the sodium uranate are needed by the Allies in connection with the prosecution of the war, he will be very glad to cooperate in making them available. (Note: Mr. Sengier did not state specifically that he would be willing to sell all of the ore in this country and in the Belgium Congo. However, by implication, he will be willing to do so.)
- C. Mr. Sengier has discussed with the Eldorado Gold Mines, Ltd. the sale of 500 tons of the 65% ore which is now stored on Staten Island. He states that he feels that he is morally obligated in view of his previous negotiations to sell this material to Eldorado. However, no contract has been signed. Mr. Sengier stated that he only considered this sale because the Eldorado Gold Mines stated they needed it in order to fulfil a contract with the United States Government on vital war work.

Mr. Sengier briefly summarized his proposed contract with Eldorado Gold Mines. It appears that his company (African Metals, Inc.) will receive a price for its ore which is the difference between what Eldorado receives for the purified oxide and the Port Hope refining costs (\$0.60 per lb), with African Metals retaining ownership of the radium recovered from the raw ore. In effect, the value of African Metals'

raw ore will be established in line with the cost of mining and refining the lower grade ore from the Eldorado Gold Mines property at Great Bear Lake.

In any event, Mr. Sengier will do nothing without the consent of the United States Government (State Department).

- D. Price - Mr. Sengier would not quote prices on any materials over which he has jurisdiction. He requested that a letter be written to him asking for prices. Mr. Sengier explained that it is very difficult for him to compute a fair price for the 65% ore since its value to him depends largely upon the fact that it contains radium and that he wants to get the radium out of it.

He is apparently very reluctant to sell the radium content of the ore and is quite anxious that complete recovery shall be made on the radium. He implied doubt that anyone except Port Hope was skillful enough and sufficiently well-versed in the technology of radium recovery to do a good job on recovering the radium. It should be borne in mind, however, that Mr. Sengier apparently has almost reached a satisfactory agreement with Eldorado for terms of refining material. In effect, he would obtain abstraction of the radium content free of cost to him and would, in addition, be able to sell the  $U_3O_8$  at a very favorable price.

- E. Samples - Mr. Sengier said it was not possible for him to obtain samples of this material except with considerable effort on September 15. However, he agreed to attempt to obtain samples if they were requested by letter. (Note: It is recommended that some representative of the project visit State Island to inspect the stock pile and be present when the samples were taken.)

F. Miscellaneous

1. It came out during the discussion that within the past two weeks, African Metals sold to Eldorado approximately 23,000 lb of commercial grade  $U_3O_8$ . This is apparently the material which Eldorado recently shipped to Mallinckrodt Chemical Works. Mr. Sengier stated that he no longer had available any supply whatever of  $U_3O_8$  commercial grade. (Note: It would seem advisable for Mallinckrodt to check very carefully the quality of this 11 ton shipment since there is a strong possibility that it was made from Belgian ore and, moreover, that it may have been refined abroad and shipped to this country after refining.)

2. Mr. Sengier seemed to know a great deal about the earlier phases of the development of the general problem including its direct importance to the war effort, the names of the personnel involved, the objects of the project, and some of the earlier supplies of uranium compounds which were to have been used for development work in Europe. It was not considered expedient to question Mr. Sengier in detail at our meeting of September 15; it appears that further discussion and questioning of Mr. Sengier might be very worthwhile.
3. Mr. Sengier has at his disposal approximately 150 grams of radium, which would normally fulfil his sale requirements for approximately five years.

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In general, the discussion with Mr. Sengier indicated a desire on his part to maintain the direct ownership of the unprocessed raw ore on the basis that it would have of more value to him subsequently in peace times. His statements in this regard were somewhat inconsistent and it is apparent that he has some willingness to enter into normal commercial relations among the group of companies who are interested in processing and sale of products made from the raw ore.

He will undoubtedly be reluctant to sell his entire holdings of raw ore to the United States Government, no doubt due to his primary interest in the radium content of the ore. However, in view of his stated desire to cooperate fully in the war effort or related phases, he can very likely be persuaded to dispose of it to the United States Government.

## II - Visit to Canadian Radium & Uranium Corporation

On the afternoon of September 15, Messrs. Ruhoff, Geddes and Vanden Bulck called on Mr. Pregel of the Canadian Radium & Uranium Corporation.

### A. Summary of pertinent history prior to September 15.

1. Canadian Radium & Uranium Corporation agreed to contract with Eldorado to open the Eldorado Mines on Great Bear Lake provided Canadian Radium was given an order for 350 tons of material.
2. Boris Pregel told Messrs. Geddes, Klein and LaCrosse on July 15 that a sufficient quantity of ore was available during the winter (presumably at Edmonton - which is the rail head - and at Port Hope) to complete the 350 tons ordered at the rate of 1 ton of D1 oxide per day. There appears to be some question as to exactly the words Boris Pregel used but, in any event, both Mr. Klein and Dr. Geddes very definitely came away from the meeting with the impression that it would not be necessary for Eldorado to purchase ore.
3. Prior to August 31, Dr. Doan was under the impression that Port Hope could supply one or two tons a day of commercial oxide in addition to 1 ton a day of D1 oxide which they had been making. In view of the fact that one ton per day of D1 oxide at that time was not sufficient to permit the continuous full scale operation of the Mallinckrodt plant, Drs. Ruhoff and Doan called on Boris Pregel and \_\_\_\_\_ Pregel on August 31 to request that arrangements be made to supply some commercial oxide in addition to the D1 which was being shipped. At that time Boris Pregel stated plainly that there was not a supply of commercial oxide at the refinery and that, furthermore, deliveries could not be accelerated by the substitution of commercial oxide for D1. However, he asked how much oxide the project could use at that time. It was thought that the project could use 43 tons per month. He agreed to undertake to supply oxide - either D1 or commercial - at that rate.

### B. Conference of September 15

1. \_\_\_\_\_ Pregel states that they do not have sufficient ore of their own which can be brought to the refinery during the winter to complete the present order for 350 tons of black oxide. (Apparently the impression which was given to Mr. Klein, Dr. Geddes and Mr. LaCrosse in A-2 was not correct so far as Eldorado Gold Mines having available sufficient of their own ore to maintain a desired refining and shipping schedule.)

Mr. \_\_\_\_\_ Pregel stated that Eldorado would need approximately 250 tons of ore assaying 65% U<sub>3</sub>O<sub>8</sub> to complete the 350 ton order for commercial oxide.

2. Mr. \_\_\_\_\_ Pregel stated that Eldorado would need this extra ore very soon in order to maintain production at the rate of 1 ton per day since Eldorado's own ore which, now available, is quite lean - containing perhaps 10 to 15% U<sub>3</sub>O<sub>8</sub>. Mr. \_\_\_\_\_ Pregel explained this by saying that the ore which was now being refined was tailings - the last material they had, and had been accumulated over a considerable period of past operations. Apparently, the refining equipment does not have sufficient capacity to turn out one ton per day of finished product from ore containing 10 to 15% U<sub>3</sub>O<sub>8</sub>.
3. Mr. Pregel was asked why he had requested 500 tons of 65% concentrate from African Metals when, by his own statement, he needed only 250 tons. His answer to this was that he anticipated subsequent orders for us in excess of the 350 tons now outstanding and wanted to be in a position to supply these anticipated requirements properly.  
  
In other words, the additional 250 tons was a hedge against anticipated demands.
4. Mr. Pregel stated that ore taken out of the mine after it had been reopened at the request of the project would not be available for use at the refinery at Port Hope until September 1, 1943; that is, they can not begin shipment of the winter accumulation of ore from Great Bear Lake on to Edmonton, Canada, until the summer months.
5. Mr. Pregel asked for release by the United States Government (State Department) of enough of the 65% Belgian ore to complete the 350 ton order. He stated that this material would be needed at the refinery within thirty days and suggested that steps be taken within the next ten days to effect the release in order that the ore would not be late in arriving at the refinery. We expressed preference that they use up all of Eldorado Mines' available raw oxide and that we would then permit them to use sufficient 65% raw oxide from this country to complete their operations prior to September 1, next year (1943). Mr. Pregel stated their operations could not be carried out on this basis, but that they would require a continuous supply of 65% raw ore for enriching their available low grade ore.

6. Mr. Pregel will send to Mr. Klein a statement of how much ore they have which can be used in filling the 350 ton order, how much 65% Belgian ore they need and will also give Mr. Klein a schedule of when they need this Belgian ore.
7. It was suggested that Mr. Pregel replace whatever 65% Belgian ore they now take from Staten Island with Great Bear Lake ore containing an equivalent amount of  $U_3O_8$ ; this replacement to be made by September 1, 1943. Mr. Pregel talked at great length, attempting to explain why this was not practical. His reasons did not appear to be very convincing, and it was apparent that he would prefer to replace Belgian ore by an equivalent amount of refined commercial oxide prepared in their Port Hope plant. Replacement of Belgian material with commercial oxide could not be effected, however, until September 1, 1944. As to the possibility of replacing the 65% raw ore with commercial grade  $U_3O_8$ , Mr. Pregel seemed very willing to agree to almost any procedure we might suggest for carrying this out.
8. Mr. Pregel stated that \$1.55 per lb is the established price for sodium uranate in large amounts. This price apparently has been the standard market quotation on this item for the past several years. It should be borne in mind, however, that relatively small quantities (of the order of perhaps 30 tons per year) of sodium uranate have been manufactured heretofore. Using \$1.55 per lb as a base price for sodium uranate, the price of commercial grade  $U_3O_8$  should be something in the neighborhood of \$1.85 per lb plus the process cost of converting sodium uranate to  $U_3O_8$ .



The discussions with Mr. Sengier and Mr. Pregel above summarized were discussed in Boston on September 16 between Messrs. Ruhoff, Hadlock, Geddes and Klein. The consensus of opinion was as follows:

1. Flow of oxide from Port Hope must be maintained at the required rate. If it is necessary to supply Port Hope with 65% Belgian ore from Staten Island to maintain this rate of production, it should be done. Someone connected with the project should keep in touch with the refining operation at Port Hope and with the shipment of Belgian ore to be sure that something unforeseen does not take place.
2. United States Government should obtain the control of the 65% Belgian ore in this country and of the 146 tons of sodium uranate in New York. Suitable steps should be taken to see that this material is properly safeguarded.
3. In order to protect our future interests and requirements, the United States Government should take immediate steps to obtain title and possession of the 1,000 tons of 65% ore and the 2,000 tons of 20% ore now owned and stored by African Metals in Belgian Congo.
4. Some discussion was given to having a man from our project inspect the quantities and obtain samples of the raw ore now being stored at Edmonton and Port Hope refineries. This was not considered fool-proof and we recommend that the Canadian Radium & Uranium Corporation provide us with a sworn and notarized statement as to the inventories and qualities of the raw ore in their possession at points from which the ore can be made available to the Port Hope refinery before the first shipment of freshly mined ore arrives from Great Bear Lake next year.