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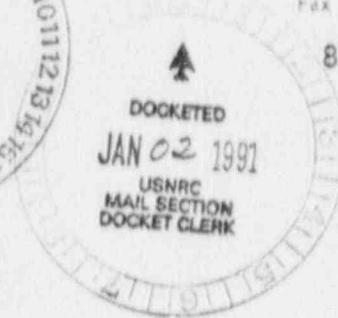
# Canonie Environmental

RETURN ORIGINAL TO PDR, HQ.

December 28, 1990

Canonie Environmental Services Corp.  
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86-060-24



Mr. Juan R. Velasquez  
President  
United Nuclear Corporation  
1700 Louisiana Blvd. NE  
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Albuquerque, NM 87110

Request for Additional Cost Details  
December 1990 Response to Comments  
Church Rock Reclamation Plan

Dear Juan:

This letter presents Canonie Environmental Services Corp.'s (Canonie) response to a verbal request by Paul Michaud of the Nuclear Regulatory Commission (NRC) for additional cost details related to United Nuclear Corporation's (United Nuclear) proposed design modifications for reclamation of the Church Rock site as presented in the December 1990 Response to Comments submittal. The following paragraphs present Canonie's understanding of Paul Michaud's questions, as described to us by you, and our corresponding responses.

Question No. 1

The December 1990 submittal indicates that a \$492,000 savings would be realized by implementing the proposed design modifications in Pipeline Arroyo. The 1988 NRC Reclamation Cost Estimate identifies a cost of \$474,106 to excavate Pipeline Arroyo to the original design grades. How can savings with the proposed design modifications be larger than the original costs?

Response to Question No. 1

The 1988 NRC Reclamation Cost Estimate included excavation of 263,700 cubic yards (cy) of soil from the Pipeline Arroyo at a unit cost of \$1.80 per cubic yard for a total of \$474,106. Survey data of the bottom of Pipeline Arroyo, obtained by United Nuclear in 1990, was used in the December 1990 submittal to refine estimates of excavation quantities from the arroyo. This updated information indicates that 381,000 cy of material would be excavated within the arroyo for the original design, and 118,000 cy of material would be excavated for the proposed modified design presented in the December 1990 submittal. Therefore, the original design includes 381,000 cy of material excavated from within the arroyo at a unit cost of

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\$2.00 per cy (1990 dollars) for a total of \$762,000. The proposed modified design includes 118,000 cy of excavated material within the arroyo at \$2.00 per cy (\$236,000) and 1360 cy of rock for the jetty at \$25.00 per cy (\$34,000) for a total of \$270,000. The cost savings for the proposed modified design is then \$762,000 minus \$270,000, or \$492,000.

#### Question No. 2

Page 12 of the December 1990 submittal states that construction of a "flat table top" design would cost approximately \$4 million. This is based on excavation and placement of 776,500 cy of soil at \$3.00 per cy (\$2.33 million) and placement of 31,300 cy of riprap on the bench downslopes at \$54.00 per cy (\$1.69 million). Explain the use of the \$3.00 per cy and \$54.00 per cy unit costs where other unit costs (\$2.00 per cy for soil and \$25.00 per cy for rock) are used elsewhere in the estimate.

#### Response to Question No. 2

A unit cost of \$2.00 per cy was used for soil cover excavation and placement in both the original design and proposed modified design in the December 1990 submittal. However, because the table top design requires excavation of the previously regraded and covered north and central cell tailings, additional costs would be incurred due to double handling and staging of the tailings and soil cover. Additionally, the large quantity of soil required to achieve the table top design (776,500 cy versus 118,000 cy for the proposed modified design) would require utilization of borrow sources farther from the tailings impoundment. The increased haul distances increase borrow material costs. Finally, additional costs would be realized by the extra grade control and fine grading required to obtain the shallow slopes (0.2 percent) required for erosional stability. All three factors increase the price of the earth moving for the table top design. Therefore, an average unit price of \$3.00 per cy was used for earth moving.

Canonie has located a rock source capable of providing smaller rock mulch and small riprap, which is substantially closer to the site than the quarry assumed to provide rock in the 1988 estimate. This results in a lower unit price for rock obtained from the new source; however, the new source is limited to the size of rock available by the bedding thickness and lamination of the rock formation being mined. Therefore, only rock that is less than approximately 12 inches in diameter is available from this source. Larger riprap must still be obtained from the quarry located farther away. For this reason, the December 1990 submittal utilized two unit costs for rock (riprap and rock mulch). Small riprap and rock mulch (i.e., less than 12 inches in diameter) was priced at \$25.00 per cy. The cost for large riprap (greater than 12 inches) was revised to \$54.00 per cy, based on quotes from the more distant quarry.

The large drainage areas and steep downslopes associated with the table top design require large riprap to provide erosional stability. The \$54.00 per cy unit price for large riprap includes an inflation escalation factor on the \$41.36 per cy price used in the 1988 estimate and consideration that only large riprap will now be obtained from the more distant quarry. The unit price of \$41.36 per cy used in the 1988 estimate was an average cost for all rock for the site. This included gravel-sized filter material as

well as the large diameter riprap. Larger riprap is difficult to handle and, therefore, more expensive than small rock. Therefore, obtaining and placing only large riprap from the more distant quarry costs more than \$41.36 per cy adjusted for inflation, and use of \$54.00 per cy is appropriate.

Questions No. 3 and 4

The 1988 NRC Cost Estimate identified a cost for the runoff control ditch of \$43,537. The December 1990 submittal indicates a cost of \$95,000. Explain the difference.

Response to Questions No. 3 and 4

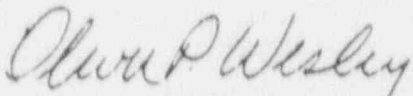
The December 1990 submittal indicates a cost increase of \$95,000 for protection of the embankment sideslopes. This cost increase is for providing a 3-inch-thick rock mulch and protective bench for the embankment side-slope. The cost for the runoff control ditch is the same for both the original design and the proposed modified design.

The 1988 estimate contained a line item for the runoff control ditch excavation including 13,520 cy of excavation at \$3.22 per cy for a total cost of \$43,537. The estimate also provided for 6,000 cy of riprap for armoring the runoff control ditch under another line item ("Place Riprap"), which includes all riprap (20,960 cy) for reclamation.

The December 1990 submittal also included 6,000 cy of small riprap for the original design. This was priced at a unit price of \$25.00 per cy for a total cost of \$150,000. The proposed modified design cost included 6,000 cy of small riprap and 9.4 acres of 3-inch-thick rock mulch erosion protection (3,800 cy) over the tailings embankment at \$25.00 per cy for a total cost of \$245,000. Therefore, an additional cost, not a total cost, of \$95,000 (\$245,000 minus \$150,000) would be incurred by implementing the proposed modified design. Riprap costs used in the December 1990 submittal are described in the Response to Question No. 2.

Please call if you have any questions or comments regarding this letter.

Very truly yours,



Oliver P. Wesley  
Regional Operations Manager

OPW/lr

cc: Mr. Paul Michaud, Nuclear Regulatory Commission