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MEMORANDUM

To: T.C. Greengard
From: B.P. Doty
Date: August 22, 1989

1801-03

Subject: DOE Comments on EA
881 Hillside Interim Remedial Action

As requested, this memo presents responses to two DOE questions on the 881 Hillside interim action Environmental Assessment.

Hydrologic Impacts on Woman Creek

The interim action at the 881 Hillside is expected to have minimal impacts on Woman Creek. Although the french drain is expected to intercept all of the colluvial flow from the hillside area, the water will be returned to the hillside by means of surface discharge (after treatment) to the South Interceptor Ditch. The point of discharge will be at the west end of the hillside area (upstream) and the discharged water will flow along the ditch to Pond C-2. The treated water is expected to return to the ground-water system by infiltration from the South Interceptor Ditch and Pond C-2.

Losses from the ground-water system resulting from the interim action are expected to be as follows.

- o It is possible that a certain diminution of flow in the creek will occur directly downhill of the area because not all of the discharge will infiltrate from the South Interceptor Ditch. However, this possible diminution is expected to be negligible because the hillside area only amounts to about 10 percent of the recharge area to the creek (total length of both banks is approximately 20,000 feet from the hillside to the headwaters of the creek, while the cut-off length at the hillside is approximately 2,000 feet). In any event, the creek will be nearly fully recharged by infiltration from Pond C-2.
- o Some evaporation will occur from both the South Interceptor Ditch and Pond C-2.

ADMIN RECORD

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The impacts of the losses are expected to be negligible because the total flow currently recharging the ground-water system of the Woman Creek Valley Fill Alluvium is a small proportion of the total flow and most of the intercepted ground water will return to the system in any event. The losses are expected to have no noticeable impact on the availability of water off-site because the vast majority of the ground water in the Alluvium is currently consumed by evapotranspiration within the plant boundary.

Recharge and Discharge of Local Streams

The local stream in the vicinity of the 881 Hillside is Woman Creek. The creek has its headwaters on the terrace of Rocky Flats Alluvium west of the plant and runs through the buffer zone south of the operations areas (and the 881 Hillside). It discharges to off-site property near the south-east corner of the buffer zone. The creek receives recharge from precipitation events within its drainage basin and is both recharged by and provides recharge to the various alluvial materials over which it flows.

Woman Creek is generally an ephemeral stream, i.e., flowing only in response to precipitation events. However, during most of the year, there are reaches of the creek where intermittent flow occurs, i.e., the ground surface drops below the water table and the creek flows to a downstream point where the ground surface rises above the water table and the surface flow ceases. During the driest portions of the year, the reaches of intermittent flow often become dry because of consumption of the ground water by evapotranspiration. Even during periods of continuous flow along the reaches within the plant boundaries, evapotranspirative losses are high. Hurr (1976) notes that as much as 0.25 cubic feet per second was lost to evapotranspiration along Woman Creek during the period July to September, 1974.

Precipitation incident on approximately the southern half of the plant operations areas flows toward Woman Creek following the natural drainage patterns. Plant run-off is captured by the South Interceptor Ditch before it reaches Woman Creek and is directed to Pond C-2 in the Woman Creek drainage. Woman Creek flow is diverted around Pond C-2 in a canal. Thus, there is no direct commingling of Woman Creek flow and plant run-off until Pond C-2 waters are analyzed and released to the drainage in accordance with the NPDES permit.

Mr. Thomas C. Greengard

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REFERENCES

Hurr, R.T., 1976, Hydrology of a Nuclear-Processing Plant Site, Rocky Flats, Jefferson County, Colorado, U.S. Geological Survey Open-File Report 76-268, March.