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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

JUN 29 1979

WMRU:RC
40-8714

MEMORANDUM FOR: Docket File 40-8714

THROUGH: R. A. Scarano, Section Leader, Uranium Recovery Branch
Division of Waste Management

FROM: R. Cooperstein, Ph.D
Project Manager, WMRU

SUBJECT: SAFETY/ENVIRONMENTAL EVALUATION REPORT: CLEVELAND-
CLIFFS IRON COMPANY'S APPLICATION FOR A SOURCE
MATERIAL LICENSE TO AUTHORIZE RESEARCH AND DEVELOPMENT
STUDIES ON URANIUM SOLUTION EXTRACTION AND RECOVERY
AT THE COLLINS DRAW SITE, CAMPBELL COUNTY, WYOMING

Background:

By letter dated November 6, 1978, Cleveland-Cliffs Iron Company (CCIC) submitted an application for a Source Material License to receive, possess, use and transfer source material in the course of an R & D in situ uranium solution extraction (in situ leaching) program. The program's aims are (1) demonstrate the ability to successfully extract and recover uranium from an ore deposit located at a depth of about 450 + 25 feet at the Collins Draw site in Campbell County, Wyoming and (2) restore the groundwater quality of the leached ore zone to the level for its premining use.

Proposed Activities:

CCIC proposes to conduct a test in situ uranium solvent extraction program utilizing a dilute ammonium carbonate/bicarbonate and hydrogen peroxide lixiviant to dissolve and mobilize the uranium from a mineralized sand at the Collins Draw site (Pumpkin Buttes area) of Campbell County, Wyoming.

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Discussion:

CCIC plans to investigate the amenability of applying a uranium solution extraction technique (in situ leaching) in a geologic setting at its Collins Draw site by using a specific process design and monitoring program. Depending upon the results from its R & D activities, variations in well field spacings and completion techniques, water quality determinations, well field and plant radiological monitoring, equipment modification and improvement of groundwater quality restoration techniques after solution extraction activities are terminated, may also be undertaken to establish the engineering, economic and environmental data for a commercial-scale uranium recovery operation.

Site Location:

The proposed studies will be performed in a project area located in southwestern Campbell County, Wyoming. The actual project site is included in Township 43N, Sections 35 and 36, Range 76W. The site is located near the Pumpkin Buttes. No communities exist within 30 miles of the project area. The communities of Midwest (population 400) and Edgerton (population 600) are located about 35 miles southwest of the project in Natrona County. The community of Wright, in Campbell County, is located about 40 miles east of the project area. Gillette, the county seat of Campbell County is about 65 miles northeast of the site and Casper, the county seat of Natrona County is about 85 miles southwest of the project area.

Well Field and Plant Site:

The total proposed permit area is 23 acres (9.31 hectares). The direct surface area to be disturbed will be approximately three acres (1.21 hectares) and approximately 6 acres will be fenced. The well field areas will encompass one to one and one-quarter acres (0.51 hectares) for this program (see Figure 1). The well field areas will be comprised of several pattern areas. Each pattern area will be a square area of about 100 ft x 100 ft with the wells located within an 80 ft x 80 ft zone. The number of wells in any pattern area will vary according to well spacings. Initially well spacings of 20-40 feet arranged in a staggered line drive geometry will be used.

Fluid control inside the pattern areas will be achieved by close control of flow rates into and out of each well (total flow of up to 100 gpm to the recovery plant). Periodic use of standard computer programs which simulate fluid movements through sand will be performed as an auxiliary control measure.

The 1.25-acre well field area will be encircled with strategically placed monitor wells that will be sampled every two weeks and analyzed for uranium, sulfate, bicarbonate, pH, total dissolved solids (TDS) or conductivity and ammonia. Static water levels in the wells will also be measured for preliminary indications of potential external leachant flow patterns from the well field (see Condition No. 15).

Upper control limits (UCLs) for the latter parameters have been established and corrective actions to maintain acceptable parametric values for the monitor well samples have been specified (see Condition Nos. 16 and 17). There will be no reason to operate outside the fenced area (about 6 acres) except to draw monitor well samples (see Condition No. 22).

The proposed recovery plant will operate at a 100 gpm capacity (see Condition No. 24). This R & D plant will be designed to assess the technical viability and economic feasibility of in situ uranium solution extraction at the site. Plant equipment will be modular and require minimum foundations which will be designed for personnel safety and rapid dismantling where possible.

Due to the scale of the operation and the nature of the process, the potential radioactive exposure and waste generation/accumulation should be very small and readily manageable. The staff concludes that it should pose no hazard for either operating personnel and/or the public. However, license conditions e.g. Nos. 19, 20, 21, 23, 26, 27 and 30 have been incorporated to ensure the correctness of the conclusion.

The staff also concludes that the site layout and its areal size will have an insignificant impact on the current land use.

The applicant's proposed radiation safety and monitoring programs to monitor the health and safety of the workers, the public and the environment are considered to be adequate for the proposed operation. To provide data for possible future commercial-scale activities, the applicant will develop a measurement program for radon released to the atmosphere from the uranium solution extraction activities (see Condition Nos. 26 and 29-31).

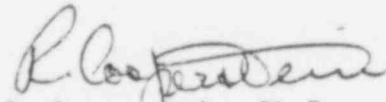
Conclusion:

From the information submitted by CCIC and discussions with the Company's personnel it is noted that:

1. The site is located in a sparsely populated area. Land in the site area is semi-arid and used primarily for grazing. The operational areas will be fenced and posted.
2. Liquid wastes will be contained in storage containments on the site. Monitoring for any leakage from the containers will be performed by the applicant.
3. Atmospheric effluents from the processing plant will be sampled and monitored for radioactivity levels in the entire circuit and within the enclosing structure by responsible safety personnel using adequate instrumentation and in conformance with required NRC procedures.
4. The proposed monitoring program is adequate for this type of operation. Periodic water samples will be taken from monitor wells surrounding the well field, at the waste storage facilities, and from nearby potable water supplies to assure that solution extraction activities do not adversely impact the existing water quality.
5. After solution extraction studies are completed, groundwater quality restoration and surface reclamation will be effected to comply with the rules and regulations of the Wyoming Department of Environmental Quality - Land Quality Division and the NRC. A reverse-osmosis system in a recycle mode will be used for groundwater quality restoration.
6. Cleveland-Cliffs Iron Company's management appears to be capable of enforcing an adequate radiation safety program, and the individuals assigned the responsibility for conducting this program are technically qualified to do so. Site employees are provided adequate instruction and safeguards for radiation protection.

The issuance of this license is not deemed to be a major Federal action significantly affecting the quality of the human environment. Thus pursuant to 10 CFR Part 51, Section 51.5 (d) (4), an environmental impact statement, negative declaration, or an environmental appraisal need not be prepared.

Approval of the requested license is therefore recommended.



R. Cooperstein, Ph.D
Uranium Recovery Branch
Division of Waste Management

Approval



R. A. Scarano, Section Leader
Uranium Recovery Branch
Division of Waste Management

