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R. E. Cunningham, Assistant Director for Fuel Cycle, L

EVALUATION OF TAILINGS RETENTION SYSTEM - TAR 1329

PLANT NAME: East Gas Hills Mine
LICENSING STAGE: OL
DOCKET NUMBER: 40-293
RESPONSIBLE BRANCH: Technical Support Branch
REQUESTED COMPLETION DATE: January 20, 1975
REVIEW STATUS: Site Analysis Branch - Awaiting Responses

Enclosed are a hydrologic and a foundation engineering summary, prepared by T. L. Johnson and L. White. We conclude that the embankments will require modifications, unless it can be substantiated that no flooding or radiological hazards will result from an embankment failure. The applicant's groundwater monitoring program is adequate.

Signed by
H. R. Denton

Harold R. Denton, Assistant Director
for Site Safety
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DATE ▶	1/21/75	1/22/75	1/22/75	1/22/75	1/23/75	1/23/75

HYDROLOGIC ENGINEERING SUMMARY
EAST GAS HILLS MINE
DOCKET NO. 40-293

The applicant proposes to construct an additional upstream tailings embankment and raise an existing embankment to provide additional capacity to the present tailings retention system. Two additional monitor wells are proposed to determine seepage effects. We find the rationale for and placement of monitor wells to be acceptable, due to low soil permeabilities, which allows time for removal of potential harmful contaminants. The applicant's monitoring program is also acceptable. Although no direct runoff enters the tailings system, the applicant has neglected to consider potential flooding problems that may arise due to possible embankment erosion by East Canyon Creek, a nearby wash situated apparently near the toe of the embankment.

Sufficient information has not been provided to determine the exact location of the toe of the embankment, but it appears that a flood occurring in East Canyon Creek could possibly erode the toe of embankment, causing failure to occur. We have no basis for concluding that the embankment is safe from an erosion-type failure. Therefore, the staff concludes that the applicant should provide erosion protection for that portion of the embankment that could be affected. Unless it can be demonstrated that failure will result in no severe flooding or radiological consequences downstream, we conclude that the embankment should be designed to resist flow velocities produced by the runoff from the probable maximum precipitation (PMP).

If failure of the embankment will result in no flooding or radiological problems downstream, a lesser design-basis flooding event may be postulated. The applicant should provide information concerning the drainage area of East Canyon Creek, vegetative cover in the basin, cross-sections of the stream near the embankment toe, and sufficient information to substantiate his selection of erosion protection. If the applicant chooses to show that no hazards will result due to failure, he should substantiate his conclusion by providing sufficient information to show elevations of property downstream, profile of the flood wave as it propagates downstream, and other pertinent details of his analysis.

EAST GAS HILLS MINE
DOCKET NO. 40-293
FOUNDATION ENGINEERING SUMMARY

1. Unless it can be demonstrated that failure of the tailings embankment will not result in loss of life or a significant amount of property due to flooding or radiological consequences, then the embankment design and construction procedures should be at least equivalent to standards established by the Corps of Engineers. Their guidelines may be found in the Federal Register, Vol. 39, No. 168 (Part I) "National Dam Safety Program".

2. We are concerned about the density and strength parameters selected for tailings and embankment materials. The tailings, having been deposited as sediments, will have a very loose structure with a relative density of about 20% (ref. page A-5). It is doubtful that satisfactory undisturbed soil samples of this consistency may be obtained or that triaxial specimens may be prepared and loaded successfully and in a acceptable fashion. Little, if any, credit for shear strength should be given to the tailings since it is highly likely from historical observations that they would readily liquefy. In consideration thereof, the starter embankment should be constructed with a wider crest so that future dike raisings may be founded and constructed on compacted engineered fill in lieu of loose tailing material.

3. All embankment fill should be constructed to some standards that will guarantee the in place density and strength of materials assumed in the stability calculations. Standards should include an acceptable range of material type and gradation, placement lift thickness, moisture control, and compaction requirements. Provide guidelines and standard specifications to be used.

GUIDELINES FOR DECONTAMINATION OF FACILITIES AND EQUIPMENT

PRIOR TO RELEASE FOR UNRESTRICTED USE

OR TERMINATION OF LICENSES FOR BYPRODUCT, SOURCE, OR SPECIAL NUCLEAR MATERIAL

MAY 3 1973

The instructions in this guide in conjunction with Tables I and II specify the radioactivity and radiation exposure rate limits which should be used in accomplishing the decontamination and survey of sufaces of premises and equipment prior to abandonment or release for unrestricted use. The limits in Tables I and II do not apply to premises, equipment, or scrap containing induced radioactivity for which the radiological considerations pertinent to their use may be different. The release of such facilities or items from regulatory control will be considered on a case-by-case basis.

1. The licensee shall make a reasonable effort to eliminate residual contamination.

2. Radioactivity on equipment or surfaces shall not be covered by paint, plating, or other covering material unless contamination levels, as determined by a survey and documented, are below the limits specified in Tables I or II prior to applying the covering. A reasonable effort must be made to minimize the contamination prior to use of any covering.

3. The radioactivity on the interior surfaces of pipes, drain lines, or ductwork shall be determined by making measurements at all traps, and other appropriate access points, provided that contamination at these locations is likely to be representative of contamination on the interior of the pipes, drain lines, or ductwork. Surfaces of premises, equipment, or scrap which are likely to be contaminated but are of such size, construction, or location as to make the surface inaccessible for purposes of measurement shall be presumed to be contaminated in excess of the limits.

4. Upon request, the Commission may authorize a license to relinquish possession or control of premises, equipment, or scrap having surfaces contaminated with materials in excess of the limits specified. This may include, but would not be limited to, special circumstances such as razing of buildings, transfer of premises to another organization continuing work with radioactive materials, or conversion of facilities to a long-term storage or standby status. Such requests must:

   a. Provide detailed, specific information describing the premises, equipment or scrap, radioactive contaminants, and the nature, extent, and degree of residual surface contamination.

   b. Provide a detailed health and safety analysis which reflects that the residual amounts of materials on surface areas, together with other considerations such as prospective use of the premises, equipment or scrap, are unlikely to result in an unreasonable risk to the health and safety of the public.

5. Prior to release of premises for unrestricted use, the licensee shall make a comprehensive radiation survey which establishes that contamination is within the limits specified in Tables I and II. A copy of the survey report shall be filed with the Deputy Director for Fuels and Materials, Directorate of Licensing, USAEC, Washington, D. C. 20545, and also the Director of the Regional office of the Directorate of Regulatory Operations having jurisdiction. The report should be filed at least 30 days prior to the planned date of abandonment. The survey report shall:

    a. Identify the premises.

    b. Show that reasonable effort has been made to eliminate residual contamination.

    c. Describe the scope of the survey and general procedure followed.

    d. State the findings of the survey in units specified in the instruction.

Following review of the report, the AEC will consider visiting the facilities to confirm the survey.

SURFACE CONTAMINATION LEVELS[1]

ISOTOPE[2]	TABLE I TOTAL[3]	TABLE I REMOVABLE[3] [4]	TABLE II TOTAL[3]	TABLE II REMOVABLE[3] [4]
U-nat, U-235, U-238, Th-nat, Th-232, and associated decay products	10,000 dpm α/100 cm^2	1,000 dpm α/100 cm^2	Average[6] 5,000 dpm α/100 cm^2 Maximum 25,000 dpm α/100 cm^2	1,000 dpm α/100 cm^2
Other isotopes which decay by alpha emission or by spontaneous fission	1,000 dpm α/100 cm^2	100 dpm α/100 cm^2	Average[6] 500 dpm α/100 cm^2 Maximum 2,500 dpm α/100 cm^2	100 dpm α/100
Beta-gamma emitters (isotopes with decay modes other than alpha emission or spontaneous fission)	0.4 mrad/hr at 1 cm[5]	1,000 dpm β-γ/100 cm^2	Average[6] 0.2 mrad/hr at 1 cm[5] Maximum 1.0 mrad/hr at 1 cm[5]	1,000 dpm β-γ/100^2

(1) Either Table I or Table II may be used. For example, if all beta-gamma readings were less than 0.4 mrad/hr at 1 cm, Table I could be used; but if the maximum reading were 0.8 mrad/hr, material could be released under Table II providing the average was less than 0.2 mrad/hr.

(2) Where surface contamination by both alpha and beta-gamma emitting isotopes exists, the limits established for alpha and beta-gamma emitting isotopes shall apply independently.

(3) As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector and count rate meter for background, efficiency, and geometric factors associated with the instrumentation.

(4) The amount of removable radioactive material per 100 cm^2 of surface area shall be determined by wiping that area, with dry filter or soft absorbent paper and with the application of moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. In determining removable contamination on objects of lesser surface area, the pertinent levels shall be reduced proportionally, and the entire surface shall be wiped.

(5) Measured through not more than 7 milligrams per square centimeter of total absorber.

(6) Measurements of total contaminant shall not be averaged over more than 10 square meters. For objects of lesser surface area, the average shall be derived for each such object.