Department of Energy

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SEP 0 1 1993

93-DOE-10266

Mr. Gary Baughman
Hazardous Waste Facilities Unit Leader
Colorado Department of Health
4300 Cherry Creek Drive South
Denver, Colorado 80222-1530

Dear Mr. Baughman:

This letter is written in response to your letter of August 20, 1993, RE: Building 910 Process Re-Qualification Testing. In the referenced letter the Colorado Department of Health (CDH) queried into the results of our evaluation as to whether of not a re-qualification of the Building 910 evaporator process would be necessary should the contingency of having to process pond water in the B910 evaporators be required.

The enclosed document was prepared by EG&G in response to a Building 910 Readiness Assessment Finding. This enclosure outlines the tasks that would need to be completed in order to be able to start processing pond water through the B910 Evaporators should it be necessary. The subject of re-qualification is addressed in this plan under Section IV, Regulatory Preparations. In short, RFO has determined that re-qualification would not be necessary for the processing of pond water. The details of this determination are contained in the enclosure.

Should you have any questions or require additional information please contact Frazer Lockhart at 966-7846.

Sincerely,

Richard J. Schassburger
Acting Director
Environmental Restoration Division

Enclosure

cc w/o Enclosure:
H. Belencan, EM-453
J. Hartman, AMTER , RFO
E. O'Toole, ERD, RFO

cc w/ Enclosure:
F. Dowsett, CDH
H. Ainscough, CDH
M. Hestmark, EPA
A. Duran, EPA

PREPARING B910 TO ACCEPT POND WATER
7/19/93

I. GENERAL

Prior to initiating use of pond water, several items (as described below) must be accomplished. To ensure successful completion of these items, preliminary tasks would be needed: Assign a staff-member to lead the effort, assemble the necessary support commitments, and obtain Change Control approval for use of funds on the activities.

A schedule for the preparations is attached. Review, revision, and commitment to the schedule would be part of initiating the use of pond water in Building 910. The attached schedule shows elapsed-time, with a start-date shown for illustration only. The schedule is not in-work, and an actual start-date would need to be inserted to obtain tentative completion dates.

II. EQUIPMENT AND OPERATIONAL PREPARATIONS

- Prepare Nitric Acid System
  - Resolve need for double block and bleed valves (per HazRap comment).
  - Replace or repair pH sensor at D-56.
  - Cold Test system, resolve any deficiencies.

- Reconnect pond pumps to allow pond water to be fed to B910.

- Complete B910 Power Reallocation Study (in progress, activity WBS 133600): resolve power needs, install any new equipment found to be needed.

- Test/check all new installations or maintenance items arising from the above list.

- Two additional items remain to be completed from the original scope of work relating to processing pond water in Building 910. These items may not be needed or may be addressed via administrative compensatory measures if the proposed treatment of pond water is short-term:
  - Complete heat trace of lines to ponds. (Successful completion of this task depends on the results of the Power reallocation Study mentioned above.)
  - Fix leak detection system on pond water lines: review existing design to ensure meets requirements as of date pond water use is identified, modify design as needed, install fix.

III. PROCEDURAL AND DOCUMENTATION PREPARATIONS

Since B910 was initially expected to treat pond water, procedures, safety analyses, and related documentation included pond water in those assessments. No additional documentation will be needed.

Since operations is likely to increasingly tailor B910 procedures to the current operation, a block of time has been inserted into the schedule to allow operations staff to review procedures, make any changes needed, and update training as appropriate.

IV. REGULATORY PREPARATIONS

Water in the Solar Ponds for future treatment will come from two sources:

(1) Water resulting from past operations, including process waste and contaminated ground water previously placed in the ponds, was characterized in the Interim Measure/Interim Remedial Action Decision Document for the Solar Evaporation Ponds Operable Unit No. 4 (IM/IRA), April, 1992. The characterization data came from 1988, 1989, 1990, and 1991. Since the characterization, pond contents have been partly consolidated (consolidation continues) and trench water was added until April, 1993. The volumes of the various waters is not available. Table 1 is an estimate of the composition of the remaining pond water.

(2) Water accumulating in the empty ponds from incidental precipitation will contain constituents dissolved into the water from the sides and bottom of the impoundments. While there is insufficient data to formally characterize this incidental precipitation water, the ponds were cleaned of visible sludge, and contaminate levels are expected to be low. Thus, entering precipitation should represent clean water contacting very small amounts of sludge dust. The estimate of pond water composition in Table 1 should provide a conservative, bounding estimate of incidental water in the ponds.

The estimated pond water and ITS water are compared with reuse-standards, per CDH direction to use 40 CFR 141 Subpart B, in Table 2. (Note that the key criterion by which distillate is shipped into the raw water system, conductivity, is continuously measured in the B910 evaporator system, regardless of the feed in use.) Only four constituents are expected to exceed the reuse standards: gross alpha, gross beta, nitrate, and fluoride. The evaporators are designed to treat these constituents, and the range of levels of these constituents is also shown in Table 2.

Levels of alpha, beta, and fluoride in the pond water are estimated to exceed levels in the ITS water. These four constituents were all included in the qualification sampling completed in June, 1993, and are included in the production-phase sampling program for monthly analysis. In addition, gross alpha, gross beta, and nitrate are included in the production-phase weekly analysis, so Waste Operations will receive prompt feed-back on the levels of these constituents. No additional sampling or analysis is needed to document the treatment of the water for these compounds in B910.

Based on this comparison of ITS water and estimated pond water feeds, no additional testing or sampling is recommended to qualify B910 for the treatment of pond water.

TABLE 1

ESTIMATE OF POND WATER COMPOSITION:

Compound	A-Pond	B-North	B-Center	B-South	Trench Water	Estimate
Arsenic	ND	ND	0.014	0.0164	ND	0.003
Barium	NA	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium	ND	ND	0.094	0.0228	ND*	0.010
Mercury	ND	ND	ND	0.001	ND	ND
Nickel	ND	ND	ND	0.040	ND	0.003
Selenium	0.015	0.008	ND	ND	0.013**	0.011
Gross Alpha / Beta	300 930	59 110	2400 3900	1600 2300	67 131	460 860
Tritium	NA	NA	NA	NA	2280	2280
Nitrate as N	1000	39	1600	1800	2532	1750
Fluoride	ND	ND	73	72.5	0.93	13.0

Table 1 Notes:

- Compounds listed are designated for analysis in IM/IRA Appendix B, Table 2, for which there are 40 CFR 141 Subpart B standards, plus tritium (selected as a tracer).
- Concentrations shown for the ponds are from the IM/IRA, § 2.3, 1991 composite sample-event. Concentrations shown for ITS water are averages of data in the IM/IRA Appendix A (covers 1988, '89, and '90).
- Concentrations are in pCi/l for radioisotopes, ppm for all others.
- Concentration estimates are calculated based on assumed water ratios, as shown below.

* Nine "hits" averaging 0.020 ppm out of 36 samples; rest ND.

** Shows average of 15 "hits" out of 36 samples; rest ND.

ESTIMATION OF WATER RATIOS:

If all A/B Ponds were half full, that would be about :

6 acres pond area x 4 feet deep = 24 acre-ft

24 acre-ft x 326,000 gal/acre-ft = 8 million gallons

A Pond = 4 million gal

Each B Pond = 1.3 million gal

ITS flow estimated since 1991 is about:

3.5 million/yr x 2 years = 7 million gallons

So if model as an average of those total waters, current pond water average would be:

[(4 x A-Pond) + (1.3 x B-N) + (1.3 x B-C) + (1.3 x B-S) + (7 x ITS)] / 15

(Neglect NA, use "0" for ND)

TABLE 2

COMPARE ESTIMATE OF POND WATER COMPOSITION TO ITS WATER AND STANDARD:

Compound	Trench Water	Trench Water Range	Pond Water Estimate	40 CFR 141 Standard
Arsenic	ND		0.003	0.05
Barium	ND		ND	2
Cadmium	ND		ND	0.005
Chromium	ND		0.010	0.1
Mercury	ND		ND	0.002
Nickel	ND		0.003	0.1
Selenium	0.013		0.011	0.05
Gross Alpha / Beta	**67** **131**	40- 340 100-250	**460** **860**	**15** -
Tritium	2280		2280	20,000
Nitrate as N	**2532**	1859-3205	**1750**	**10**
Fluoride	**0.93**	0.57-1.0	**13.0**	**4.0**

Table 2 Notes:

- Compounds which exceed the drinking water standard (40 CFR 141 Subpart B) are in **bold** font. These are the compounds which require treatment to meet the CDH criteria for reuse as a substitute for raw water at Rocky Flats.
- The radionuclide levels in estimated pond water are about seven times the ITS water level;
- The nitrate level in the estimated pond water is a little less than the ITS level;
- The fluoride level in the estimated pond water is about 13 times the ITS level.