

MAY 16 1991

MEMORANDUM FOR: Paul H. Lohaus, Chief
Low-Level Waste Management Branch
Division of Low-Level Waste Management
and Decommissioning, NMSS

THRU: Michael Tokar, Section Leader
Technical and Special Issues Section
Low-Level Waste Management Branch
Division of Low-Level Waste Management
and Decommissioning, NMSS

FROM: Robert E. Shewmaker, Sr. Structural Engineer
Technical and Special Issues Section
Low-Level Waste Management Branch
Division of Low-Level Waste Management
and Decommissioning, NMSS

SUBJECT: SUMMARY OF MAY 8, 1991, MEETING WITH U.S. ECOLOGY, INC.
ON SOLIDIFICATION OF LOW-LEVEL RADIOACTIVE WASTE WITH
HIGH STRENGTH ASPHALT (WM-102)

A summary of the above-referenced meeting is enclosed. The meeting summary highlights the major points addressed in the discussions held with U.S. Ecology, Inc. (USE), and JGC Corporation on the USE topical report entitled, "Stability of Low-Level Radioactive Wastes Solidified with High Strength Asphalt." The meeting was held to resolve issues relative to compliance with 10CFR Part 61 for the proposed waste streams as processed by the US Ecology bituminization system.

/s/

Robert E. Shewmaker, Sr. Structural Engineer
Technical and Special Issues Section
Low-Level Waste Management Branch
Division of Low-Level Waste Management
and Decommissioning, NMSS

Enclosure: Meeting Minutes
of 5/8/91 Mtg.

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SUBJECT ABSTRACT: SUMMARY 5/8/91 W/US ECOLOGY INC. ON SOLIDIFICATION

OFF: LLWM : LLWM
NAME: RShewmaker/sw : MTokar
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MAY 16 1991

Meeting Summary

DATE: May 8, 1991
TIME: 9:15 a.m. to 2:00 p.m.
LOCATION: ROOM 6-B-13, OWFN, Rockville, MD

PURPOSE: To discuss the issues identified in the NRC letter to U.S. Ecology, dated April 26, 1991, regarding the potential unacceptability of three proposed waste stream solidification/stabilization formulations. The end result was to be a clear definition of positions and actions to be taken on the subject topical report (Docket WM-102).

ATTENDEES:

U.S. Ecology, Inc. (USE)

Oscar Wong, General Manager
Steve Simpson, Consultant
Allan Harrington,* Counsel

JGC Corporation (JGC)

Ed Day,* General Manager
David W. Lippard, Business
Development Engineer
Akira Fujita, Engineer
Tom Dorian of Doub and
Muntzing, Counsel for JGC

U.S. Nuclear Regulatory Commission (USNRC)

John T. Greeves	Deputy Director, LLWM
Paul Lohaus	Chief, LLWM
Michael Tokar	Section Leader
Robert Shewmaker	Senior Engineer
Everett Wick*	Senior Materials Engineer
Bill Lahs*	Senior Project Engineer
Robert L. Fonner*	Counsel, OGC

* Part time attendance

BACKGROUND:

This meeting had been requested by US Ecology (USE) after receiving NRC's letter of April 26, 1991, regarding the current status of the review of USE's topical report on bituminized waste. The bituminization process equipment has already been installed, by JGC Corporation, at the Virginia Electric Power Company (VEPCO) Surry plant. Both USE and JGC were, therefore, represented at the meeting.

SUMMARY:

The NRC position as stated in a letter dated April 26, 1991, (Attachment 1) was re-emphasized. Staff indicated that while the waste forms tested by USE meet the minimum compressive strength and other acceptance criteria established in the Technical Position on Waste Form, the preponderance of data submitted by USE indicated that the waste forms lacked the long-term structural stability required by 10 CFR 61.56 (b)(1). Therefore, the staff has been unable to conclude that there was reasonable assurance that the bituminized wastes described in the USE topical report would satisfy the Part 61 requirements. Specifically, the regulations state, "a structurally stable waste form will generally maintain its physical dimensions and its form, under the expected disposal conditions such as... the presence of moisture..."

As a result of potential legal questions that might arise as to whether meeting the Technical Position is equivalent to meeting the 10CFR Part 61 requirements, NRC counsel reviewed the status of the various documents being discussed. Counsel indicated that while Technical Positions and other NRC guidance documents present methods acceptable to the NRC staff of implementing specific parts of NRC regulations, they are not substitutes for the regulations, nor can they change a codified requirement.

Staff pointed out that in discussions with current sited state regulatory authorities, they had indicated a willingness to accept the USE bituminized waste with the condition that the waste would be placed in concrete overpacks, thereby, providing the long term stability required by Part 61.

A discussion was held on the history of the development of the bitumen by U.S. Ecology and its predecessor company, Associated Technologies, Inc. (ATI).

U.S. Ecology personnel stated that they had not expected NRC concerns to focus on dimensional stability. NRC staff referred US Ecology to the statements on dimensional stability in 10 CFR 61.56(b)(1) and in RAI comment 7.08, transmitted to USE on September 18, 1990. The USE response to that comment attributed the dimensional changes to 1/4 inch deep surface effects that impact small specimens, but contended that the full scale waste forms would not be significantly affected. Staff noted that USE had not provided supporting information for their contention. Consequently, the data showing dimensional instability must be considered by the staff in determining whether 10 CFR Part 61.56(b)(1) has been met.

NRC staff indicated that it may be necessary to develop new and improved acceptance criteria for bituminized low-level waste in a manner analogous to that just completed for cement-solidified waste forms. This effort will reflect the new issues that have been identified as a result of the topical report review.

After a discussion of possible paths on which to proceed, U.S. Ecology requested a caucus and returned with a proposal to NRC (Attachment 2). The proposal requests interim approval of one waste stream (boric acid) under very limited conditions. USE also proposed to work with NRC in developing additional data and criteria for bituminized waste.

NRC staff caucused and indicated tentative acceptance, pending review by higher NRC management and the Office of the General Counsel. It was indicated that if the proposal is found fully acceptable, the NRC will issue a Technical Evaluation Report (TER) that will address the limitations and conditions of the interim approval and will reject the other ranges for treatment of the boric acid wastes under the interim approval. The TER will also address the bead and powdered resin waste streams and state that the data as proposed, do not at this time demonstrate that waste forms will satisfy the 10 CFR Part 61 structural stability requirements. NRC indicated the staff will work toward the development of a revision to the Technical Position on Waste Form that will address bitumen and its unique characteristics. This will be done on an expedited basis. A notification of the acceptability of the USE proposal and the pending interim approval that would be documented by the TER would be provided by NRC by a target date of May 17, 1991.



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

APR 26 1991

Docket No. WM-102

U.S. Ecology, Incorporated
Mr. Oscar Wong
Suite 300
212 South Tryon Street
Charlotte, N.C. 28281

Dear Mr. Wong:

In our review of your topical report (USE-61-002-P) on the use of bitumen to stabilize low-level radioactive waste, we are unable to reach the conclusion that the structural stability requirements of 10 CFR Part 61 for the waste characteristics have been met by your proposed process on the boric acid, bead resin and powdered resin waste streams. Our concern is that the waste forms produced do not appear to provide a structurally stable waste form that will generally maintain its physical dimensions and its form, under expected disposal conditions, including the presence of moisture. Our summary of the six data sets representing the three waste streams and the upper and lower boundary parameters is as follows.

Two of the six data sets show at least a 90% reduction in compressive strength after immersion testing. Four of the six show significant changes in weight during the leach testing, ranging from a weight gain of 47% to a loss of 31%. Dimensional changes also appear to be significant as a result of contact with water, either from the leaching tests or the immersion tests.

Specimen height changes for four of the six data sets demonstrate increases of 35% or more (one as large as 73%) during the leach testing. Specimen volume increases as a result of leach testing were significant for five of the six data sets and ranged from 54% to 80% of the original volume. As a result of the immersion testing two of the six data sets indicate radial growth of approximately 20%.

Based upon our understanding of the submitted information, we believe the waste forms that result from the proposed waste processing with the bitumen material using the current formulations do not meet the requirements of 10 CFR 61.56(b)(1). Consequently, we will not consider granting an interim approval for any of the waste streams, unless you can provide additional test data that can demonstrate that the waste forms can meet Part 61 structural stability requirements. If other data are available or can be made available that could provide new or additional information relative to these issues, we are ready to consider the submittal of that information.

It appears that the proposed waste loadings maybe sufficiently high that the properties imparted to the resulting waste form are being dominated by the waste and the capabilities of the bitumen to encapsulate are not becoming a predominant characteristic.

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Attachment 1

We are prepared to discuss the issues with you at your convenience; however, it is necessary for 3 weeks of lead time for meetings as a result of our need to notify the various states.

A handwritten signature in black ink, reading "Paul H. Lohaus". The signature is written in a cursive style with a large, prominent initial "P".

Paul H. Lohaus, Chief
Low-Level Waste Management Branch
Division of Low-Level Waste Management
and Decommissioning
Office of Nuclear Material Safety
and Safeguards

PROPOSAL

May 8, 1991

USNRC

Reference: Docket No. WM-102
Subject: Interim Approval

Gentlemen:

In accordance with our discussions today, JGC and US Ecology request that NRC provide, as soon as possible, interim approval for bitumenized boric acid waste form at a pH of 9.0 or above and at a solids waste loading of 40% by weight or below.

We request that is interim approval remain in effect for one year from the establishment of the criteria which are to be used for evaluation of bitumenized waste forms. These criteria are intended to form the basis on which final approval is granted. We will work with NRC to resolve expeditiously any outstanding issues. The interim approval is renewable.