R-008-208.9

1732

K-65 SILOS REMOVAL ACTION

9-27-90

DOE/EPA
DOE-1870-90
2
LETTER

Department of Energy
FMPC Site Office
P.O. Box 398705
Cincinnati, Ohio 45239-8705
(513) 738-6319

1732

SEP 27 1990

DOE-1870-90

Ms. Catherine A. McCord, Remedial Project Director
U. S. Environmental Protection Agency
Region V - 5HR-12
230 South Dearborn Street
Chicago, IL 60604

Mr. Graham E. Mitchell, DOE Coordinator
Ohio Environmental Protection Agency
40 South Main Street
Dayton, OH 45402

Dear Ms. McCord and Mr. Mitchell:

K-65 SILOS REMOVAL ACTION

Reference:
1) Letter, C.A. McCord to B.J. Davis, "EE/CA K-65 Removal #4 U.S. DOE Fernald OH6 890 008 976," dated September 4, 1990

2) Letter, G.E. Mitchell to B.J. Davis, "K-65 EE/CA," dated September 5, 1990

The referenced letters transmitted U.S. EPA and Ohio EPA conditional approval of the K-65 EE/CA document. A response to each of the conditions which were outlined in the referenced letters is enclosed.

A Work Plan which will outline the activities necessary for implementation of this removal action is being prepared. The Work Plan will be consistent with Section IX.B. of the 1990 Consent Agreement and will include a schedule for completing the removal action.

DOE also extended the public comment period on the EE/CA document by two weeks. The extended public comment period ended on September 18, 1990. Consideration and response to public comments on the EE/CA must also be completed prior to finalizing the Work Plan.

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The Work Plan, which is subject to U.S. EPA approval, will be submitted to U.S. EPA and Ohio EPA 30 days after approval of the DOE responses (enclosed) to the U.S. EPA's and Ohio EPA's EE/CA approval conditions.

If you have any questions, please contact me at (513) 738-6161 or Jack Craig, at (513) 738-6159.

Sincerely,

Andrew P. Avel
FMPC Remedial Action
Project Director

DP-84:Craig

Enclosure: As stated

cc w/encl.:

L. P. Duffy, EM-1, FORS
P. Q. Andrews, USEPA-V
D. A. Kee, USEPA-V
K. Pierard, USEPA-V
D. Ullrich, USEPA-V
E. Schuessler, PRC
D. Nixon, WMCO
T. Morris, Bechtel

RESPONSE TO U.S. EPA COMMENTS

[redacted]

1. **U.S. EPA COMMENTS:**

The initial phase of this removal action will include the placement of slurried bentonite into the K-65 Silos. The amount of bentonite to be placed in the silos will be determined by U.S. EPA after U.S. DOE submits detailed information on the radon attenuation capabilities of the bentonite. U.S. DOE shall submit this information within thirty (30) days of the date of this approval. The amount of bentonite that will be approved to be installed into the silos will be based on a number of considerations including: radon attenuation estimates and waste minimization considerations.

U.S. DOE RESPONSE:

DOE has determined that a one foot bentonite cap over the K-65 residues is the optinum thickness for Radon atteneration. However, DOE recognizes the fact that this thickness of bentonite will not provide adequate protection from the affects of a tornado. (See attached information on radon attenuation).

2. **U.S. EPA COMMENTS:**

In accordance with requirements of Section IX of the 1990 Consent Agreement, U.S. DOE shall submit a work plan for completion of the above task within thirty (30) days of this approval letter. The work plan shall include radon air monitoring systems, as required by number 4 below, capable of measuring the effectiveness of the bentonite layer. Notification and emergency procedures in the event of dome failure must also be included in the work plan.

U.S. DOE RESPONSE:

The completion of the work plan is dependent upon U.S. EPA concurrence with the responses included in this attachment. The work plan is in preparation and will be submitted 30 days from U.S. EPA approval of the DOE response to comments.

3. **U.S. EPA COMMENTS:**

U.S. DOE shall complete the installation of the bentonite layer into the K-65 Silos within one-hundred and eighty days (180) days of the date of this approval.

U.S. DOE RESPONSE:

DOE disagrees with the 180 day timeframe for completion of this removal action. The schedule for completion of this [redacted]

removal action will be included in the work plan which is subject to U.S. EPA approval.

4. **U.S. EPA COMMENTS:**

Within sixty (60) days of the date of this approval, U.S. DOE shall monitor radon emissions in accordance with the following specifications:

U.S. DOE RESPONSE:

The monitoring equipment and the schedule for installation of the equipment will be included in the work plan for this removal action which is subject to U.S. EPA review and approval.

4.A. **U.S. EPA COMMENTS:**

Install pressure transducers (sensitivity Pascal, range - up to several inches of water) in Silos 1,2, and 3 (Silo 3 may exceed the radon flux standard of 40 CFR 61, Subpart Q, and as such should be monitored).

U.S. DOE RESPONSE:

The monitoring equipment and the schedule for installation of the equipment will be included in the work plan for this removal action which is subject to U.S. EPA review and approval.

4.B. **U.S. EPA COMMENTS:**

Install temperature sensors in Silos 1,2, and 3, and in the ambient air outside the silos.

U.S. DOE RESPONSE:

The monitoring equipment and the schedule for installation of the equipment will be included in the work plan for this removal action which is subject to U.S. EPA review and approval.

4.C. **U.S. EPA COMMENTS:**

Install three or four additional continuous radon monitors at the outer fence line air monitoring stations that are in proximity to nearby residents (AMS 5,6, and 7) and at a location near the western edge of the Production Area, so as to form a triangular (or square).

U.S. DOE RESPONSE:

The monitoring equipment and the schedule for installation

of the equipment will be included in the work plan for this removal action which is subject to U.S. EPA review and approval.

4.D. **U.S. EPA COMMENTS:**

Use a continuous radon monitor enquired with an environmental radon detector having a sensitivity of approximately 0.1 picocurie per liter (pCi/l), for example, a Pylon AB-5 equipped with "Pylon kettle" to accurately measure background radon levels at AMS BK1, or AMS BK2, or both.

U.S. DOE RESPONSE:

The monitoring equipment and the schedule for installation of the equipment will be included in the work plan for this removal action which is subject to U.S. EPA review and approval.

4.E. **U.S. EPA COMMENTS:**

U.S. DOE shall use continuous radon monitors to monitor inside the head space of Silos 1,2, and 3.

U.S. DOE RESPONSE:

The monitoring equipment and the schedule for installation of the equipment will be included in the work plan for this removal action which is subject to U.S. EPA review and approval.

4.F. **U.S. EPA COMMENTS:**

Data from all of the above monitoring systems, except D, and meteorological data from the on-site met tower (wind speed, wind direction, indicators of stability class, etc.) must be fed into real time data loggers. The data loggers must be installed within sixty (60) days of the date of this letter.

U.S. DOE RESPONSE:

The monitoring equipment and the schedule for installation of the equipment will be included in the work plan for this removal action which is subject to U.S. EPA review and approval.

5. **U.S. EPA COMMENTS:**

Data collected from the radon monitoring and pressure/temperature monitoring systems must be collected in accordance with the requirements of number 4.F above for

radon, and continuously for pressure/temperature. This data must be submitted to U.S. EPA by the 20th of each month, for the previous month. This data should be submitted with the monthly reports required by the 1990 Consent Agreement.

U.S. DOE RESPONSE:

The monitoring equipment and the method of reporting the data will be included as part of the Removal Action Work Plan.

6. **U.S. EPA COMMENTS:**

U.S. DOE shall reduce radon emissions, as measured in accordance with requirements of number 4 above, with the above mentioned bentonite layer to a level of no greater than 0.015 pCi/l above background at the location of the maximally exposed individual at a non-FMPC location. This level is to be determined by monitoring, as required in number 4, above, and computational methods approved by U.S. EPA will evaluate the performance of the bentonite layer in reducing radon emissions. If U.S. EPA determines that this reduction is insufficient, additional removal response action(s) will be required.

U.S. DOE RESPONSE:

U.S. DOE is committed to reducing radon emissions from the K-65 Silos. The performance level outlined above in the EPA comment cannot be measured with known monitoring equipment. DOE and U.S. EPA will evaluate the effectiveness of this removal action in reducing radon emissions and determine if additional response actions are required.

RESPONSE TO OHIO EPA COMMENTS [redacted]

1. **OHIO EPA COMMENTS:**

DOE shall provide a range of cost estimates for the final disposal of bentonite added to the K-65 silos. These estimates should include estimates for 1,2,3 or 4 feet of bentonite added to each silo for on-site and off-site disposal options. Make sure these estimate ranges consider that this material may need to be disposed of as if it were "high level waste".

U.S. DOE RESPONSES:

Because there is along list of assumptions related to final disposition of K-65 residues and contaminated bentonite, any cost estimate at this point in time includes a high degree of uncertainty. The best estimate for on-site disposal in an Engineered Disposal Facility (DF) is $190.00 per cubic yard. This represents the construction cost for a large capacity facility when the capacity is increased by a small amount. Although the K-65 residues are not high level waste, the most recent information on costs at the Waste Isolation Pilot Plan (WIPP) facility, which is the location selected for "high level waste" disposal, is $12,000 per cubic yard for basic operation and construction of the WIPP facility. The user charges will include other indirect and overhead costs, which for this analysis are assumed to be 25% of the base cost. Off-site rail shipment is assumed, and included in the estimated cost. In both cases containment of stabilized bentonite in hexagonally shaped containers, which hold 125 cubic feet of residue and occupy eight cubic yards of burial volume, is assumed. Stabilization is estimated to increase the residue volume by 30%. The cost of the empty containers is estimated to be $1200.00 each. Based on the forgoing, the following table results:

COST ESTIMATE FOR DISPOSAL (IN MILLIONS)

Bentonite Thickness in Feet	On Site in EDF	Off Site at WIPP
1	1.1	16
2	2.3	32
3	3.4	48
4	4.5	64

2. **OHIO EPA COMMENTS:**

DOE shall add bentonite slurry to the silos only after sampling results indicate that the residues have the ability to support the weight of bentonite. DOE shall discuss how the bentonite slurry will be maintained and how moisture content will be determined. Discuss the issue of whether or not the K-65 residues will dissolve or mix with the bentonite slurry. DOE should also be able to state that no further sampling of residues will be needed.

U.S. DOE RESPONSES:

The resampling efforts will be completed prior to initiating the construction and installation of the removal action. DOE will assume, for the sake of the preparation of the work plan, that the K-65 residue material will support the bentonite. Verification will be available from the resampling analysis prior to installation of the bentonite. DOE's technical is that it is not necessary to monitor the moisture content of the bentonite since the radon emissions will be monitored as specified by the U.S. EPA's comments. DOE will assume that the K-65 residues will not mix with the bentonite slurry. Again, verification will be available from the resampling analysis prior to installation of the bentonite. DOE knows of no further sampling requirements for the K-65 Silos.

3. **OHIO EPA COMMENTS:**

DOE shall add bentonite slurry to the silos only after the borings around and under the silos are conducted and the results are analyzed to determine any possible impact on groundwater of adding bentonite and possibly additional water to the silos. The information shall be submitted to Ohio EPA.

U.S. DOE RESPONSES:

The K-65 embankment and subsoils sampling will be complete prior to initiating the construction and installation of the K-65 Silos Removal action. Any possible impacts on the groundwater of adding bentonite and possibly additional water to the silos will be known upon completion of the K-65 Silos Embankment and Subsoil Sampling.

4. **OHIO EPA COMMENTS:**

The concept of waste minimization shall be considered in selecting the amount of bentonite to be added to the K-65 silos. This is especially true considering that this is a removal action and final remediation is expected to begin within the next 3 years.

[redacted]

U.S. DOE RESPONSES:

Per the U.S. EPA comments, Bechtel will provide the optimal level of bentonite necessary to meet the Radon attenuation. U.S. EPA will determine the amount of bentonite to be added to the K-65 Silos.

5. **OHIO EPA COMMENTS:**

DOE shall state whether or not the construction of the air-tight enclosure (ATE) will be necessary for the installation of the bentonite. Will the existing radon treatment system be able to control radon during bentonite installation?

U.S. DOE RESPONSES:

Whether or not the use of an air-tight enclosure (ATE) is necessary will be determined during the detail design phase of the project.

The existing radon treatment system is not able to control the radon emissions as required by NESHAP Subpart Q. During installation of the bentonite three options exist at this time; 1) immediately after completion of the resampling, upgrade the radon treatment system, 2) do not use the radon treatment system during installation of the bentonite, and 3) use the existing radon treatment system without any modifications. Upgrades of the existing radon treatment system will have significant impacts on the bentonite installation schedule. Not using any radon treatment during installation of the bentonite may be restricted due to the uncontrolled release of radon into the environment. Using the existing radon treatment will decrease the radon emissions significantly, but will not attain NESHAP Subpart Q requirements. Please note, however, that the position clearly stated by the U.S. EPA in the ARAR negotiation is that the DOE is not required to attain NESHAP Subpart Q levels during the implementation of response actions.

6. **OHIO EPA COMMENTS:**

All work plans, monitoring plans, schedules and bentonite radon attenuation data, shall be submitted to Ohio EPA for review comment and approval.

U.S. DOE RESPONSES:

The removal action work plan which will include the monitoring plan and schedules is a required document as stated in the CERCLA Consent Agreement. The CERCLA Consent Agreement only requires that the U.S. EPA reviews and approves the removal action work plans. Removal action work plans and other pertinent information are currently transmitted to the Ohio EPA for their information. These

requirements are consistent with the statutory provisions of CERCLA (as amended).

7. **OHIO EPA COMMENTS:**

DOE needs to clarify the emergency responses the site will take in the event of dome failure. The EE/CA states that sand will be added to cover the wastes. MR. Jack Craig stated in Chicago on August 28, 1990, that the site emergency plan states that water will be added to cover the wastes. What is the actual approved procedure? What is the best emergency procedures?

U.S. DOE RESPONSES:

The existing FMPC Standard Operating Procedure (SOP) 65-c-201, K-65 Silo numbers 1 & 2 Area Emergencies, will be included in the K-65 Removal Action Work Plan as an enclosure to the task specific Health and Safety Plan.

Attachment 2

XMTL No. 004:90-054 [redacted]

Bechtel

Jackson Plaza Tower
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37830

Mail Address:
P.O. Box 350
Oak Ridge, TN 37831-0350

Telex: 3785873

Job No. 14501, FUSRAP Project
DOE Contract No. DE-AC05-81OR20722
Code: 7405/WBS: 403

U.S. Department of Energy
FMPC Site Office
P.O. Box 398705
Cincinnati, OH 45239-8705

Attention: Jack Craig, Project Manager

Subject: Bentonite Cover Thickness

Dear Mr. Craig:

Bechtel National, Inc., has optimized the required thickness for the bentonite cover to be installed over the K-65 residues. The recommended thickness for the bentonite cover is 12 inches. A summary of the calculations used to determine the bentonite thickness is enclosed.

Please note that the 12 inches of bentonite will reduce the radon emissions as required; however, it will <u>not</u> provide the required tornado protection. The potential tornado effects will result in the complete removal of the bentonite cover and two feet of the K-65 residues.

Please address any questions or comments to Tom Morris (615-482-0470) or me (FTS-626-4718).

Very truly yours,

RCRobertson

R. C. Robertson
Project Manager - FUSRAP

TEM:rtn:0281
Enclosures: (1) Summary of Bentonite Cover Calculations
(2) Bentonite Cover Calculations

SUMMARY OF BENTONITE COVER CALCULATIONS

Three NRC documents were used as the basis for the calculations:

NUREG/CR-2340 A Handbook for the Determination of Radon Attentuation through Cover Materials 12/81

NUREG/CR-3533 Radon Attentuation Handbook for Uranium Mill Tailings Cover Design 4/84

REG GUIDE 3.64 Calculation of Radon Flux Attentuation by Earthen Uranium Mill Tailings Covers 6/89

In addition, the following materials were used as references:

BENTOGROUT Technical Data from American Colloid Company 1989

ASI letter dated May 24, 1990 to Bobby Davis "Transmittal of Analytical Data." Radiological analysis of the K-65 residues.

IT Certificate of Analysis dated March 22, 1990. Geotechnical Analysis of the K-65 residues.

"Determining ^{222}Rn Diffusion Lengths in Soils and Sediments" Sogaard-Hansen and Damjaer Health Physics Vol 53(November) pp 455-459, 1987.

The computer program (RAECOM) suggested by EPA in the August 28, 1990 meeting was not used. The program would not optimize the bentonite layer with the high moisture content of the Bentonite.

Manual calculations used the following assumptions:

K-65 Residues

Average concentration of Ra^{226}:	112,000 pCi/g
Dry Bulk Density:	1.6 g/cm^3
Moisture content:	22%
Specific Gravity	2.9
Residue Thickness	731 cm (Note greater than 500 cm is considered infinite)

[redacted]

Bentonite

Average concentration of Ra^{226}	0 pCi/g
Dry Bulk Density	.88 g/cm³
Moisture content	74.627%
Specific Gravity	2.5

The objective is to provide a thickness of Bentonite grout that reduces the radon emmisions to less than 20 pCi/m²-sec.

No credit was taken for the silo dome and its diffusion coefficient. The dome reduces the radon flux by another factor of at least four. Esitmates of the Radon generation rate in the silos is about 4000 Ci/y with an estimated 650 Ci/yr released.

Using equations from the NUREGs and the above data, the calculated flux from the surface of the K-65 residues is:

$3.774 * 10^4$ pCi/m²-s

NOTE: The calculated flux based on estimated generation rates and the surface area of the silos is:

$1.5 * 10^3$ pCi/m²-s See page 24 of EE/CA

Using the equations for diffusion coefficients, the calculated diffusion coefficient for Bentonite is on the order of 10^{-4} cm²-s. Both NUREG documents and the referenced paper provide an expected diffusion coefficient for water saturated soils/clays on the order of 5 to 6 * 10^{-6} cm²-s.

Using 10^{-6} cm²-s, the required Bentonite thickness is:

6.48 inches.

Using 6 * 10^{-6} cm²-s, the required Bentonite thickness is:

5.019 inches.

CALCULATION SHEET

BECHTEL

CALC. NO. _____ REV. NO. 0

ORIGINATOR [illegible] DATE 9/24/90 CHECKED [illegible] DATE 9/24/90

PROJECT K-65 Silos JOB NO. 14501-402

SUBJECT Cap Thickness Evaluation SHEET NO. 1.5

See following Sheets.

Date September 24, 1990

K-65 Silo Removal Action

The following calculation determines the minimum thickness of Bentonite cover required to reduce the radon flux from the K-65 silos to < 20 pCi/m^2/s.

Assumptions and Constants:

R := 112000 pCi/g in the K-65 residues ASI ltr dtd 5/24/90 Subj: Transmittal of Analytical Data (Ref. 1)

$\lambda := 2.1 \cdot 10^{-6}$ radon decay constant /s

xk := 731 thickness of K-65 residue in cm. (Ref 2, page 9)

NOTE: The second letter 'k' in the variables refers to the K-65 residues and 'c' to the Bentonite cover and 'w' to water.

NOTE: m = fraction of moisture saturation
p = porosity
D = diffusion coefficient

D = 0.07 exp[-4(m-mp^2+m^5) [Equation 12 from NUREG/CR-3533]

E := .35 radon emanation coefficient (dimensionless) (from RG 3.64)

ρk := 1.6 dry bulk density g/cm^3 density of tailings from RG 3.64 page 7.

NOTE: The low dry bulk density of the residues used in this calculation is conservative.

Moisture saturation fraction for residues 'mk' is calculated as follows:

mk = [10^-2 * ρk * wk]/[nk * ρw] (RG 3.64 page 11)

where ρk = dry bulk density of residues g/cm^3
wk = long term moisture content (dry weight per cent)
nk = porosity of residue (dimensionless)
ρw = mass density of water = 1 g/cm^3

wk := 22 Moisture content ranges from 22 to 74. (Ref 3, p 31).

Gk := 2.9 Gk is the specific gravity of the K-65 residues which ranges from 2.6 to 3.4. (Ref 3, p 31).

[illegible] := 1

$$nk := 1 - \frac{\rho k}{Gk \cdot \rho w} \qquad mk := 10^{-2} \rho k \cdot \frac{wk}{nk \cdot \rho w}$$

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$mk = 0.785$ moisture saturation fraction for the residues

$$Dk := .07 \cdot \exp\left[-4 \cdot \left[mk - mk \cdot nk^{2} + mk^{5}\right]\right]$$

$Dk = 0.002$ cm^2/sec diffusion coefficient for the residues

J = Radon Flux in pCi/m^2/s

$$Jk := 10^{4} \cdot R \cdot \rho k \cdot E \cdot \sqrt{\lambda \cdot Dk} \cdot \tanh\left[xk \cdot \sqrt{\frac{\lambda}{Dk}}\right]$$

Equation 3 NUREG/CR 3533 p2-2.

$Jk = 3.774 \cdot 10^{4}$ Radon flux from residues pCi/m^2/s

$Jc := 20$ Radon flux limit. 40 CFR 192 NESHAP std. Assumed at the Benonite surface. The flux will go through a further delay in the silo dome. The diffusion coefficient for the silo domes is approximately .25.

$$\frac{Jc}{Jk} = 5.3 \cdot 10^{-4}$$

NOTE: 'a' interface constant (cm^2 s)
K equilibrium distribution coefficient radon in water and air.

$K := .26$ pCi/cm^3 in water per pCi/cm^3 in air. from NUREG/CR-3533 page 2-4.

$$ak := nk^{2} \cdot Dk \cdot (1 - (1 - K) \cdot mk)^{2}$$

$ak = 6.08 \cdot 10^{-5}$ cm^2/s

$\rho c := .88$ $Gc := 2.5$ from Bentogrout chemical analysis test data.

$$nc := 1 - \frac{\rho c}{Gc \cdot \rho w}$$

$nc = 0.648$ porosity of clay using equation 4 from REG GUIDE 3.64.

Moisture saturation fraction for Bentonite is calculated as follows:

$mc = [.01 * \rho c \bullet wc]/[nc * \rho w]$ (Equation 8 from REG GUIDE 3.64) [redacted]

where ρc = dry bulk density of Bentonite g/cm^3
wc = long term moisture content (dry weight per cent)
nc = porosity of Bentonite (dimensionless)
ρw = mass density of water = 1 g/cm^3

$$wc := \frac{240}{240 + 81.6} \cdot 100$$

from Bentogrout specifiation p2, sec 2-2. 81.6 g grout added to 240 ml of water.

$wc = 74.627$

$$mc := \frac{.01 \cdot \rho c \cdot wc}{nc \cdot \rho w} \qquad mc = 1.013$$

Moisture saturation fraction cannot be greater than 1.

NOTE: Given that NUREG/CR 3533 page 3-8 indicates that the expected value for the diffusion coefficient of radon in completely saturated soils is 6 x 10^-6 cm^2/s and reference 4 provides diffusion coefficients of radon in water saturated clays on the order of 10^-6 cm^2/s, it will be assumed that the diffusion coefficient for the bentonite cover is 10^-5 cm^2/s

CALCULATION FOR THICKNESS OF BENTONITE COVER

NOTE: 'b' is the inverse relaxation length cm^-1

$$Jc = Jk \bullet e^{(-bc \bullet xc)}$$

Solve for 'xc': xc = -ln(Jc/Jk)/bc. xc is the required thickness of Bentonite to reduce the radon flux to Jc = 20 pCi/m^2/s.

Assume $Dc := 10^{-5}$ See note above.

$$bc := \sqrt{\frac{\lambda}{Dc}} \qquad bc = 0.458$$

$$xc := \frac{-\ln\left[\frac{Jc}{Jk}\right]}{bc} \qquad xc = 16.46 \text{ cm} \qquad \frac{xc}{2.54} = 6.48 \text{ inches}$$ [redacted]

If we assume $Dc := 6 \cdot 10^{-6}$, then:

1-/24/90
F. Curry
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$$bc := \sqrt{\frac{\lambda}{Dc}} \qquad bc = 0.592$$

$$xc := \frac{-\ln\left[\frac{Jc}{Jk}\right]}{bc} \qquad xc = 12.749 \quad cm \qquad \frac{xc}{2.54} = 5.019 \quad inches$$

REFERENCE 1. Transmittal of Analytical Data ASI to DOE dtd May 24, 1990 CCN 068817.

REFERENCE 2. K-65 Silo Removal Action EE/CA dtd July 1990

REFERENCE 3. Certificate of Analysis for K-65 Residues IT to WMCO dtd March 22, 1990 CNN 071463.

REFERENCE 4. Determining Rn Diffusion Lengths in Soils and Sediments Health Physics, Vol 53 No. 5 (November), pp 455-459, 1987

Attachment 3 XMTL No. DU4:90-054 1732 1732

LWA-527-90

[redacted]

M E M O R A N D U M

DATE: September 21, 1990

TO: Jack Craig, DOE

FROM: Thomas Tucker, LWA TNT

SUBJECT: **CONDITIONS FOR APPROVAL FOR THE K-65 SILOS REMOVAL ACTION**

References: 1) Letter, W. H. Britton to Gerald W. Westerbeck "K-65 Silos Removal Action", WMCO:P:90-539, dated September 14, 1990

2) Memorandum, Thomas Tucker to Bobby Davis, "K-65 Silos EE/CA Document", LW 367-90, dated June 7, 1990

3) Memorandum, Mike Neal and Thomas Tucker to Jack Craig, "K-65 EE/CA Comment Resolution", LW 443-90, dated July 23, 1990

Review of reference 1 has been completed. Several items need clarification or revision and our specific comments are provided below.

We recommend that the "conditions" for approval, as addressed in WMCO's recommendations, be incorporated into the work plan. EPA can comment on the specifics of the work plan dealing with these issues as part of their review and approval process.

- Delete all references to Silo 3. The K-65 Silos removal action has no impact on Silo 3, and approval of a removal action taken to mitigate the threat from Silos 1 and 2 should not be conditional on any actions involving Silo 3.

- **Item 3 - WMCO identifies "significant impacts to this schedule" for any upgrade of the Radon Treatment System (RTS).** First, upgrade of the RTS is not a new issue. DOE has been pressing WMCO to evaluate and provide a plan for such an upgrade for some time. Any needed upgrades should have already been included in pre-bentonite layer installation activities.

  Second, LWA comments on the EE/CA document (Ref. 2 and 3) requested additional information on operation of the RTS, and the EE/CA document did not include any discussion of "significant impacts to schedule" for any RTS upgrade.

[redacted]

- Item 4B - It seems unreasonable to require 90 days after comment resolution to install ambient temperature sensors. This EPA requested commitment date of November 3, should be achievable.
- Item 6 - This issue is a specific ambient radon level above background. This requirement is unreasonable, for several reasons. First, it is assumed that the level chosen (.015 pCi/l) is based on an acceptable risk. The concept of acceptable risk is misleading in this case, because we are talking about levels only 2.5 percent of background. The risk from background levels is well above what is considered "acceptable risk" under CERCLA. EPA's own indoor radon "action level" is 4 pCi/l, which results in a risk well above the "acceptable risk" values.

  Second, EPA has established a regulatory limit under NESHAP for radon. The radon flux value of 20 pCi/m^2 was shown by EPA to result in "acceptable risk". If any specific limitations for the removal action are to be set, it should be this radon flux value as an ARAR.

  Finally, as WMCO's response indicates, a difference of .015 pCi/l radon is not currently measurable.

cc: Bobby Davis, FMPC
W. A. Goldsmith, LWA/ORO
LWA Central Files