

R-029-208.2

3524

GENERAL COMMENTS

07-06-92

OHIO EPAGeneral Comments

- 1) Ohio EPA's support for DOE's proposal of a water cover on Waste Pit 5 is based mainly upon remediation considerations. OEPA assumes that Pit 5 will be the first waste pit to undergo remediation and that this remediation will hopefully begin on a bench/pilot scale within the next 2 years. Based upon this assumption, it seems unjustified to spend significant monies and create additional waste through the completion of some type of interim cover/cap. If OEPA's assumption of early remediation is incorrect, DOE needs to consider a more reliable interim measure than 0.3 feet of water cover.

Response/Resolution

While a final decision on the remediation schedule has not yet been made, a bench-scale study which will use waste material from Waste Pit 5 for its tests has started.

Calculations to determine the amount of water cover were previously performed using an aerial topography from 1988. A field survey of the waste pit was conducted in March 1992. Using this survey, the water cover was calculated to be one foot.

For additional information on the amount of water cover, see Section 7.1 of the revised Removal Action Work Plan (RAWP).

- 2) What other alternatives did DOE consider for this removal action?

Response/Resolution

The DOE also evaluated the following three alternatives for this Removal Action (RA):

1. Increase the water level with pit modifications
2. Distribute material below the water line utilizing a crane
3. Place a flexible membrane over the pit

A brief description of these alternatives has been included in Section 6 of the revised RAWP.

- 3) DOE should discuss the potential groundwater impacts of the continued and possibly increased hydraulic pressure on the liner under the Pit 5 waste material.

1

Response/Resolution

This RA will not cause greater hydraulic pressure on the residues or the waste pit liner than has been present in the past. The maximum water level after the RA will not exceed the maximum water level prior to the RA.

This RA is identified in the DOE/US EPA Amended Consent Agreement as Removal 18, and is titled "Control of Exposed Material in Pit 5." The purpose of this RA is to prevent the airborne emission of exposed residues from Waste Pit 5. This RA is not intended to assess the potential for migration of contaminants through the pit liner. The potential for migration of contaminants through the waste pit liner and into the pit subsoils is an issue beyond the scope of this RA.

Specific Comments

- 1) Section 3, pg. 3-1, 1st Paragraph: The air filter analyses described in this paragraph do not correspond to those required in the Pit 5 Liner Repair WP (10/4/91, pg. 6). What basis did DOE use for deviation from the work plan?

Response/Resolution

Air filter analyses ordered were not all inclusive. Air filters were destroyed during analyses and, therefore, no further analyses could be performed. Filters were analyzed for gross Alpha and gross Beta, and the data will be presented in the final Pit 5 Liner Repair report.

- 2) Figure 3-1, Environmental Plan: Waste Pit 3 has been incorrectly identified as "Scrap Pit Number 5." Please correct.

Response/Resolution

Figure 3-1 has been removed from the RAWP. Waste Pit 3 has been correctly identified on all of the drawings contained in the revised RAWP.

- 3) Table 3-1, page 3-3:
 - a) Which date represents the three baseline air samples described in the Waste Pit 5 Liner Repair WP?
 - b) The table should include the total uranium and total thorium concentrations as described in the Waste Pit 5 Liner Repair WP.

Response/Resolution

The data from the Pit 5 liner repair was removed from Section 3 of the RAWP. The data in this section originally provided information on airborne emissions from the waste pit. Since this data was not taken under normal operating conditions but while the waste pit was drained, the data was removed to avoid confusion. The data was not originally used to justify this RA; it was only provided for information. The DOE has committed to responding to the Waste Pit 5 Exposed Material as Removal Action 18 in Section IX of the Amended Consent Agreement.

- 4) Section 6, page 1: This work plan fails to include a detailed description of any work. DOE needs to provide a detailed description of the waste movement method within this Removal Action Work Plan.

Response/Resolution

A detailed description of the work to be performed for this RA has been provided in Section 7 of the revised RAWP.

- 5) Section 6, page 1: A 0.3-foot water cover does not seem very reliable and will be difficult to maintain. DOE needs to provide more detail as to how such a uniform distribution of the material within the waste pit will be attained.

Response/Resolution

The 0.3 feet of water cover was calculated using an aerial topography from 1988. The water cover was recalculated to be one foot using survey data from March 1992. More detail on how the waste will be distributed has been provided in Section 7 of the revised RAWP.

- 6) Section 6, page 1, last sentence: The intent of this sentence is unclear. While it is true that more water would increase the depth of the water cover, the requirements of OAC 3745-67-22 must be met:

Response/Resolution

The intent of this sentence is to indicate that using a freeboard of less than two feet was considered in order to allow coverage of all the waste material in the pit. After thorough analysis, it has determined that reduction of the planned Waste Pit 5 freeboard is appropriate. This reduction in pit freeboard will permit all of the pit residues to be covered by water and will provide greater confidence that the residues will remain covered. OAC 3745-67-22 (B) indicates

that the two-foot freeboard required for surface impoundments by OAC 3745-67-22 (A) may be reduced upon certification by a qualified engineer.

Information by a qualified engineer stating that alternate design features or operating plans will, to the best of his knowledge and opinion, prevent overtopping of the dike will be added to Section 7.1 of the RAWP and have been attached. This information along with a written identification of the alternate design features or operating plans preventing overtopping shall be maintained at the FEMP.

- 7) Section 7.2, page 1: It is unclear, due to the lack of detail within the work plan, what field activities will require 12 weeks. Additionally, design should not take 16 weeks. DOE needs to include more detail and justification for such extended activity durations.

Response/Resolution

A description of the RA has been provided in Section 7 of the revised RAWP. Twelve weeks were provided for field activities to allow for down time during inclement weather. The time for design effort has been cut back to 11 weeks. This time is needed to design and procure the small pond dredge, and to properly prepare the Health and Safety Plan and other necessary documentation.

- 8) Section 7.2, page 2, first paragraph: Design details should be included within this Removal Action Work Plan.

Response/Resolution

A detailed description of the proposed RA has been provided as Section 7 of the revised RAWP.

- 9) Section 10.1, page 1, first paragraph: A date by which the four additional air monitoring stations will be installed needs to be included in this section.

Response/Resolution

The four additional air monitors stations were installed on June 12, 1992 and are currently undergoing testing procedures. These four monitors will be fully operational prior to the implementation of field activities for this RA. Section 11 (previously Section 10) has been updated to reflect this.

- 10) Section 10.1, page 1, first paragraph: DOE should consider continuing use of the high volume air monitoring samplers and locations used for the Pit 5 Liner Repair action. The use of these

4

samplers and associated analyses would allow for a continuous data base on activities around the pit and allow for evaluation of the effectiveness of the removal action.

Response/Resolution

The air monitors utilized during the Waste Pit 5 Liner Repair effort are no longer at Waste Pit 5. As indicated in the RAWP, four permanent air monitoring stations have recently been installed in the vicinity of Waste Pit 5 and will be placed into continual permanent operation before this RA begins. Please see Figure 11-2 (previously Figure 10-2) in the revised RAWP for the locations of these four air monitors. These air monitoring stations will be utilized to evaluate the RA as it proceeds and to monitor emissions from the waste pit after its completion.

US EPA Technical Review Comments

General Comment

- 1) The removal action (RA) work plan describes the installation of four air monitoring stations (AMS) that will be incorporated into the sitewide air monitoring program. Procedures for sample collection, instrument calibration, and analyses from the sitewide remedial investigation and feasibility study (RI/FS) quality assurance project plan (QAPjP) are included as attachments. However, the RA work plan does not describe the relevance of the AMS to the RA or describe how the AMS data will be used in relation to the RA. US EPA assumes that the data may be used to establish whether the RA has been effective in reducing the concentration of airborne radionuclides. If this is the intention, the RA work plan should provide further detail on the objectives of the air sampling, more detail on the number of samples to be collected, and information on how the data will be used.

Response/Resolution

The data collected from these four air monitoring stations are tracked each month to establish a trend for each air monitoring station. The manager of the Radiological Environmental Monitoring Program will investigate any deviation from this trend if they feel it is a significant deviation.

The data will be collected weekly before, during, and after this RA. The data will be compared, and will be used to demonstrate the effectiveness of this RA. The results of this sampling program will be included in the final RA report.

Specific Comments

- 1) Section 10.1, page 10-1, Table A-1: Table A-1 does not indicate the number of samples to be collected, including field blanks, trip blanks, or duplicates. The table should be revised to include this information as well as specific references to the analytical procedures included in Appendix D.

Response/Resolution

It is assumed that references to Table A-1 in this comment are in fact directed toward Table 10-1 of the RAWP. (Table 11-1 of the revised RAWP). The FEMP Air Monitor Station Sample Collection Program does not include the use or collection of duplicate samples. Each air monitoring station is capable of holding only one sample collection filter at a time. Filters are collected and analyzed weekly. The program also does not utilize trip blanks or field blanks. The Air Monitor Sample Collection Program does analyze annual composite samples and compares these analyses to annual composites analyzed by an offsite laboratory. Table 11-1 (previously Table 10-1) has been revised to specifically reference the testing procedures contained in Appendix E (previously Appendix D).

- 2) Section 10.1, page 10-1, Table A-1: Table A-1 includes laboratory analyses for 1) total uranium, 2) total suspended particulates, and 3) gross beta. The analytical procedures for total suspended particulates are not included in Appendix D. The appendix should include the analytical procedure for total suspended particulates.

Response/Resolution

It is assumed that references to Table A-1 in this comment are in fact directed toward Table 10-1 of the RAWP (Table 11-1 of the revised RAWP).

The analytical procedure for total suspended particulate has been included in Appendix E - Fernald Laboratory Analytical Methods from the Sitewide CERCLA Quality Assurance Project Plan (previously Appendix D).

- 3) Appendix C, page 4 of 9, "New Requirements": The appendix states that sample holding times will be documented in the sampling plan or sampling schedule; however, the sampling plan does not include sample holding times. Sample holding times should be included in Section 10.1.

Response/Resolution

The procedure included for the Environmental Monitoring Chain-of-Custody and Request for Analysis is used for all samples taken at the FEMP. Many samples, such as those for volatile organics, have sample holding times. There are no sample holding times for air filters, and therefore this part of the procedure is not applicable for air filters.

US EPA Radiation CommentsGeneral Comments

- 1a) **Work Plan Structure:** The work plan presented provides only a general outline of removal action methods, sequence of actions, control measures which will be taken, and quality assurance measures to be followed. In addition, the calculations used to justify the need for a removal action need to be clarified. The basis for choosing this particular option for the removal action is not justified. Based on the information contained in this work plan, it is impossible at this time to make a determination about whether the action to be taken is appropriate, whether hazards associated with the removal action are being anticipated, and whether such hazards will be adequately monitored and controlled to protect the safety of both workers on the site and the public near the site.

Response/Resolution

A detailed description of the RA methods, sequence of actions, and control measures has been provided in Section 7 of the revised RAWP. Also, the basis for choosing the option of distributing the material below the water line utilizing a small pond dredge has been included in Section 6 of the revised RAWP. Responding to the threat of the Waste Pit 5 exposed material as a RA was agreed upon by the DOE and the US EPA in the Amended Consent Agreement, and therefore no additional justification for the need of a RA is necessary.

- 1b) There are two main areas of the work plan which must be addressed in much greater detail. The first is background and justification for the removal action. This work plan should be able to stand on its own as a reference document pertaining to the removal action. Specific details, including diagrams and/or pictures of the site, should be given to show the source of water to be moved into the waste pit, the ultimate destination of water leaving the pit, mechanisms for controlling water flow, etc. Without such information it is not possible to evaluate the feasibility or effectiveness of this removal action. The chosen response method is not shown to be adequate.

Response/Resolution

The justification for the RA is the agreement between the DOE and the US EPA in the Amended Consent Agreement. Details of how water enters and leaves the waste pit has been included in Section 2.3 of the revised RAWP.

- 1c) Further elaboration is also needed in the removal action itself. More background on the site and surroundings of the waste pit would certainly help in evaluating the feasibility of the methods to be used in the remedial action. Unfortunately, these methods themselves have not been adequately described. It is not acceptable to provide only an outline of the removal action and submit design details at a later point. The design details are critical to the determination of whether this removal action is adequate and will be conducted in a safe manner that will alleviate the problem at hand. At the very minimum, any design will need to be based on specific objectives and meet various performance criteria in terms of the final condition of the waste pit, and such measures of the design success need to be articulated in the work plan.

Response/Resolution

Details of the implementation activities for this RA have been provided in Section 7 of the revised RAWP.

- 1d) In particular, the quality assurance and health and safety plans demonstrate the inability of this current document to provide reassurance to the U.S. Environmental Protection Agency (US EPA) or to the public that this removal action will be undertaken in a manner that provides adequate margins of safety and that accomplishes the goals stated by the U.S. Department of Energy (DOE). It is unacceptable simply to state that relevant plans will be developed at a future date.

Response/Resolution

During the negotiations for the Amended Consent Agreement, the DOE, the US EPA and the Ohio EPA agreed that Health and Safety Plans would only be submitted to the regulatory agencies upon written request (letter from Daugherty to Tiller dated November 18, 1991, WEMCO:EVP:91-121). The Health and Safety Plan will be completed and will be available for information prior to initiation of field activities for this removal action.

The DOE understands that Section 1X.B of the Amended Consent Agreement states that work plans required by this section will contain a Quality Assurance Plan. The DOE/WEMCO feels that a more detailed Quality Assurance plan can be further prepared during Title II, and would like to request for the approval of this RAWP with the understanding that a more detailed Quality

Assurance Plan will be completed and will be available for information prior to the initiation of field activities.

- 2) **Maintenance Plan:** In Appendix A it is stated that a maintenance plan will be developed for Waste Pit 5. Such a plan is crucial to determining the effectiveness of the action taken. Maintenance will be most effectual if plans for it are developed in conjunction with the design of the removal action so that appropriate access will be included in the design to facilitate maintenance inspections and repair of equipment or materials in and near the waste pit. Requirements for future maintenance should be included in this work plan as part of the proposed removal action (See Section 6) to ensure that these factors will be accounted for in the design of the project.

Response/Resolution

A description of the maintenance action has been provided in Section 2.3 of the revised RAWP. The maintenance procedure is being prepared by Westinghouse Environmental Management Company of Ohio.

Specific Comments

- 1) Section 2.3, page 2-2, paragraph 4: Sufficient detail needs to be provided here so that it is clear what path water will take into and out of the waste pit. Relative locations and other attributes need to be provided for the effluent tower (of which cursory mention is made), inlet and outlet pipes, the Clearwell, etc. Additional information also needs to be provided on the maximum rate at which water can leave the pond so that the possibility of the pond overflowing the dike is addressed.

The time interval between inspections of the water level should be specified as well as how the inspection will be accomplished (e.g., visual estimate, measurement along a scale positioned in the water). Also, specific details should be provided on how water level is returned to its previous level; that is, how exactly the water level (and addition of water) is modulated.

Another question to be answered is whether water will be maintained at 588.5 feet at all times. The document implies that if the water level differs at all from a level of 588.5, then the water level will be adjusted to meet this elevation. Is this interpretation correct, or will there be a given range of elevations at which the water level will be considered acceptable and not in need of change? If so, this range should be identified in the work plan.

Response/Resolution

A description of the path of the water into and out of the waste pit, and information about the inspections of the water level have been provided in Section 2.3 of the revised RAWP. Freeboard considerations have been addressed in Section 7.1 of the revised RAWP.

- 2) Section 3, page 3-1, paragraph 1: It should be stated what specific radionuclides were or will be included in analysis of air filters. One suggestion is to include all those isotopes identified in the Waste Pit 5 material during the Characterization Investigation Study (see Table 1-1). Justification should be provided for the choice of nuclides included for analysis. Identifying concentrations of specific radionuclides would be helpful in evaluating the data presented in Table 3-1 and allow for greater quantification of the hazards that exist due to the waste pit. Such quantification would add more weight to the claim that the "data appears to support the need to implement this removal action".

The filter data presented in Table 3-1 is certainly relevant to the determination of whether Waste Pit 5 should be the subject of this removal action, but some attention should be given to the conditions under which sampling was undertaken. The waste pit was not in its normal condition when these samples were collected since the pit had been drained of all water and material was being moved in order to allow access to repair the pit liner. Some explanation should be given about how the air concentrations existing during sampling may relate to concentrations that exist under normal conditions in the pit, and why these data were used as justification for the removal action.

Response/Resolution

The data from the Pit 5 liner repair was removed from Section 3 of the RAWP. The data in this section originally provided information on airborne emissions from the waste pit. Since this data was not taken under normal operating conditions but while the pit was drained, the data was removed to avoid confusion. The data was not originally used to justify this RA, it was only provided for information. The DOE has committed to responding to the Waste Pit 5 Exposed Material as Removal Action 18 in Section IX of the Amended Consent Agreement.

- 3) Section 3, page 3-1, paragraph 2: It should be stated what method was used to derive the estimate of radon emanation from the waste pit, and what assumptions were made in doing the calculation.

Response/Resolution

The theory used to calculate the radon flux is based on Fick's Law of Diffusion. The radon diffusion is dependent on the diffusion coefficient of the material. This diffusion coefficient should be determined experimentally; however, correlations have been developed to estimate the diffusion coefficient for earthen materials.

Because there is no determined experimental resolution of the diffusion coefficient for the material in Waste Pit 5, the diffusion coefficient was estimated based on the information available in NUREG/CR-3533 "Radon Altercation Handbook for Uranium Mill Tailings Cover Design" (Rogers and Nielson 1984) and Reg. Guide 3.64, "Calculation of Radon Flux by Earthen Uranium Mill Tailings Covers" (U.S. NRC 1989).

The calculation assumes the data found in the characterization investigation study, Geotechnical Evaluation of Waste Pit Material Properties and Boring Logs (Weston 1988) is accurate and pertinent for long term average purposes.

- 4a) Section 6, page 6-1, paragraph 1: More details need to be provided before a determination can be made of whether this removal action will adequately contain the hazards at the waste pit in the future.

Response/Resolution

More detail of the proposed Ra has been included in Section 7 of the revised RAWP.

- 4b) It should be specified what method will be used to inspect the water level and determine if it is at the required elevation. For example, will the inspector estimate the water level by purely visual means, will there be a scale positioned in an appropriate location within the waste pit from which the water level can be read, will there be an electronic sensor at 588.5 feet which will indicate if the water has reached the correct elevation, or will some other method be used?

Details should be provided on how water will be added to the waste pit if needed. The source of the water and its path, as well as mechanisms used for controlling the flow of water should be specified. Similar details should be provided for water leaving the pit so that its path and destination are made clear.

Response/Resolution

Information on how water will be supplied to the pit and how the water level will be inspected has been provided in Section 2.3 of the revised RAWP.

- 4c) It is stated that the depth of the water cover over the waste pit could be increased if the freeboard requirement of two feet were reduced. How would this be accomplished? It seems to require moving the location of the outfall pipe.

US EPA needs to be notified not only of the method to be used for redistribution of the material in the waste pit, but also whether the freeboard requirement will be adhered to (and if not, what measures will be taken to prevent overtopping of the dike), etc. It may not be possible for DOE to provide full design details at this point, but more detail needs to be provided especially on measures that can be specified at this point, such as how water moves into and out of the waste pit, and methods of monitoring the waste pit after the removal action is complete.

Response/Resolution

Information concerning the freeboard requirements is presented in Section 7.1 of the revised RAWP along with a more detailed description of the proposed RA.

- 5) Section 9, page 9-1, paragraph 1: This health and safety plan is inadequate. It is impossible based on the information given to assess whether health and safety of workers will be protected. Specific information needs to be provided on personnel protective equipment, personnel monitoring, monitoring of ambient conditions at the site, decontamination procedures and other measures that will be taken to reduce exposure to hazards. The statement presented here concerning the health and safety plan is entirely generic and provides no guarantee that the final plan will provide appropriate protection for workers.

It needs to be clarified whether the waste pit will be a radiologically controlled area during or after the removal action, and what measures will be taken to control access to the area.

Response/Resolution

Section IX.B of the Amended Consent Agreement states that work plans required by this section will contain a Health and Safety Plan, but during negotiations the DOE, US EPA, and Ohio EPA agreed that Health and Safety Plans would only be submitted to the regulatory agencies upon written request (letter from Daugherty to Tiller dated November 18, 1991, WEMCO:EVP:91-121). The Health and Safety Plan for this removal action will be completed and will be available for information prior to the initiation of field activities for this removal action.

- 6a) Section 10, page 10-1, paragraph 1: It should be specified how data obtained from the air-monitoring stations (AMS) will be used. Specific levels of filter radioactivity that will trigger an investigation of the waste pit should be specified. Also, earlier in this work plan (see Section 3) it was stated that there are currently three high volume air samplers operating at the perimeter

of the waste pit in conjunction with waste pit liner repair activities. The work plan should specify that these samplers are included in the monitoring plan. It seems that they could provide useful data both during removal action activities and also as part of an evaluation of the effectiveness of the removal action once it is complete.

Analysis of filters from the air samplers at the perimeter of the waste pit currently includes gross alpha and specific radionuclides as well as gross beta and total uranium. The rationale for eliminating these radionuclides from analysis after the removal action should be specified.

Response/Resolution

The quantity of radionuclides present on the sample collection filters from each air monitor is tracked each month and a trend is established for each air monitor location. If a deviation from this trend is observed, the manager of Radiological Environmental Monitoring will investigate if the deviation is significant in their judgment. Section 11 (previously Section 10) of the revised RAWP has been revised to reflect this.

The air monitors utilized during the Waste Pit 5 Liner Repair are no longer at Waste Pit 5. As indicated in the Work Plan, four permanent air monitoring stations have recently been in the vicinity of Waste Pit 5 and will be placed into continual permanent operation before this removal action begins. Please see Figure 11-2 (previously Figure 10-2) of the RAWP for the locations of these four air monitors.

The analyses performed on the filter samples collected from these four air monitors will provide the appropriate means to monitor this RA as it proceeds and after its completion.

The Waste Pit 5 Liner Repair Work Plan specified that the three air monitors utilized during that effort would be removed when the liner repairs were completed. These air monitors have been removed from Waste Pit 5. No air monitoring or analyses are currently taking place using these air monitors at Waste Pit 5.

- 6b) It should be specified what monitoring is performed on water leaving the waste pit, which potentially could be contaminated with radioactive material. The route of water after it leaves the waste pit and its eventual destination should be clarified. If measures are currently in place to prevent contaminated water from leaving the pit, then these should be discussed.

Response/Resolution

Water leaving Waste Pit 5 drains to the Clearwell through an underground pipeline. Water contained within the Clearwell is pumped to the FEMP effluent treatment system, treated and

ultimately discharged through the FEMP NPDES permitted outfall to the Great Miami River. Monitoring of this water is performed as part of the NPDES permit.

- 7) Appendix B, Attachment F: This attachment needs to be modified to include the four monitoring stations being installed around the waste pit area (see Section 10).

Response/Resolution

This procedure will be modified in the future as part of the FEMP formal modification procedure. It should be noted that the four additional monitoring stations will be included in the site Radiological Environmental Monitoring Program (REMP) Air Monitoring Program immediately after they are placed on-line regardless of whether or not they appear in Attachment F of the REMP Air Monitoring Procedure, EM-RM-001.

6120 South Gilmore Road
Fairfield Executive Center
Fairfield, OH 45014
(513) 870-0300
FAX (513) 870-0444

June 16, 1992
DC No. 01LC06169203
P-M-OU1-P30-530

Mr. Isaac Diggs
Operable Unit 1 Manager
Fernald Environmental Management Project
Westinghouse Environmental Management Company of Ohio
P. O. Box 398704
Cincinnati, Ohio 45239-8704

Subject: Project Order 30 Removal Action 18
Control of Exposed Pit 5 Materials
Waste Pit 5 Freeboard
WEMCO Subcontract 2-21487
PARSONS Environmental Remedial Action Project

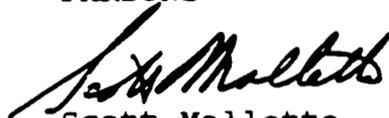
Dear Mr. Diggs:

At a PO-30 meeting held on May 29, 1992, PARSONS was directed to prepare a letter to WEMCO containing information on the freeboard of Waste Pit 5 and a recommendation for a design freeboard. Per that direction we are submitting to WEMCO the attached information.

The attached narrative addresses the existing freeboard conditions, the primary mechanisms by which overtopping could occur and a recommendation regarding the freeboard.

If you have any questions, please call me at 870-8155.

Very truly yours,
PARSONS



Scott Mallette
Project Manager, OU-1

Attachment

Freeboard
June 16, 1992
Page 2

Distribution:

c: R. Warner, DOE
L. Henke, WEMCO (w/o att.)
C. L. North, WEMCO (w/o att.)
D. C. Wright, WEMCO (w/o att.)
J. P. Hopper, WEMCO (w/o att.)
J. R. Chew, Theta (w/o att.)
J. Witzeman, WEMCO
T. Owen, WEMCO
ERA Project Files, WEMCO
Document Control No. 7

OPERABLE UNIT ONE
PO 30
WASTE PIT 5 FREEBOARD CONSIDERATIONS
JUNE 12, 1992

The basic purpose for providing freeboard on water impoundments is to prevent any overtopping of the dikes by "overflowing, wave action, or by a storm." A field survey was conducted in March 1992 and a study of existing drawings available was performed to assess freeboard conditions at pit 5. The findings of the survey and the study were:

- 1.) The pond was designed for a normal high pool elevation of 588.5 feet. The crest was set at elevation 590.0 feet. This design was completed in 1968 and the pit constructed in the same year. The historical high pool freeboard was 1.5 feet.
- 2.) The field survey determined the following:
 - The pool elevation is 588.74.
 - Crest elevation varies from el. 589.97 to el. 590.67.
 - Minimum freeboard is 1.23 feet.
- 3.) The pit would be considered an upground reservoir. No watershed area discharges through the pond. The area of the pond is 150,700 SF.

A design was performed to determine the freeboard necessary to prevent overtopping by overflowing, wave action, or by storm. The results were:

- 1.) Overflowing - All process pipelines to the pit have been abandoned. A 1.5 inch diameter hose will be used to maintain the pit's high pool level. The effluent tower can discharge 0.86 cubic feet per second or 386 gallons per minute through a 12" pipe. The discharge of the 1.5" hose is well below this rate.
- 2.) Wave Action - Wave conditions of any significance, in a pond 800' by 200' with a shallow water depth of 1 foot and no flow current, would be difficult to develop. Assuming that a wind could develop a steady state motion with a long enough wave period over a limited 800' length of fetch, the maximum height of the wave above the normal high pool would be 0.7 ft. An 80 mph wind speed was used in the computations (design wind speed per OBBC).

-2-

- 3.) Storm - The design storm used for these calculations was the 25 year, 24 hour event (design storm per DOE 6430.1A). At the site's location this equates to 4.8 inches of water. Because no additional watershed contributes to the discharge, the maximum depth needed for storm water storage is 0.4 feet. The 12" effluent pipe can discharge this storm to the Clearwell in 19.5 hours.

Based on the above conditions, the freeboard required to handle a 25 yr. storm combined with a 80 mph wind would be 1.1 foot. Corrective repair measures would be implemented at pit 5 to return the freeboard to the as designed and as built dimension of 1.5 feet (minimum). This minimum freeboard should be maintained and monitored until the pit's final remediation.