

**CONFIRMATION NOTICE NO. 18**



TO: U.S. Army Corps of Engineers  
ATTN: CEMRO-ED-EA (Mark Mercier)  
215 North 17th Street  
Omaha, NE 68102-4978

CONTRACTOR: Radian International LLC

CONTRACT NUMBER: DACW45-94-D-0003

DELIVERY ORDER NUMBER: DO #2, WAD #5

TITLE: Sewage Lagoons and Lakes Closure Project  
Holloman Air Force Base, New Mexico

DATE: 10 May 1996

SUBJECT: Stakeholders Closure Meeting, 3 April 1996

PARTICIPATING PERSONNEL: Ronald Kern, NMED/HRMB  
Stephanie Kruse, NMED/HRMB  
Gene Keeper, USEPA Region VI  
Jeff Yurk, USEPA Region VI  
Mark Wilson, U.S. Fish and Wildlife Service  
Gordon Ewing, Mesilla Valley Audubon Society  
Warren Neff, Holloman AFB  
Fred Fisher, Holloman AFB  
Sandy Frye, USACE, Omaha District  
Mark Mercier, USACE, Omaha District  
Tom Zink, USACE, Omaha District  
Judy Strawhecker, USACE, Omaha District  
Steve Weber, Foster Wheeler Environmental Corporation  
Fred Applehans, Foster Wheeler Environmental Corporation  
Tom Holcomb, Radian International  
Robert Michna, Radian International  
Kathleen Alsup, Radian International  
Jim Gibson, Radian International

This confirmation notice provides a summary of the Stakeholders Closure Meeting for the Sewage Lagoons Closure Project that occurred on 3 April 1996 in Albuquerque, New Mexico. Attachment A provides the Closure Alternative Decision Document used to facilitate the meeting's discussions.

**Participants**

The participants who attended the meeting are listed above. Attachment B provides addresses and phone numbers for each of the participants.

### Introduction

The meeting began with introductions of the participants and opening remarks by Dr. Fred Fisher (Holloman AFB). Each participant received a workbook that contained a site summary document, a copy of all of the slides to be used during the presentations, and the modules to be used during the closure alternative selection exercise. Jim Gibson explained that the purpose of the meeting was to help streamline the closure of the sewage lagoons, as well as the corrective measures study (CMS), by integrating the input of the site's major stakeholders into the closure process prior to beginning the CMS. The agenda for the meeting was presented (see Attachment C).

The participants were asked to voice all of their concerns and opinions during the meeting, and it was pointed out that any questions or concerns that could not be answered during the meeting would be documented and answered at a later date; these were recorded by Steve Weber (FWENC) during the meeting. Attachment D presents the questions to be answered at a later date (i.e., addressed in the CMS). In addition, it was stated that the meeting would focus on the sewage lagoons, and would not directly address Lake Holloman, Lake Stinky, or the ditch.

### Presentations

During the morning session, five presentations were given. The purpose of the presentations was to provide background information to the participants prior to conducting the closure alternative selection exercise. The information presented in the presentations was a summary of documents previously submitted to the New Mexico Environment Department (NMED). For further information regarding any of the following topics, refer to the original documents. The presentations included the following topics.

*Site History*—Dr. Fisher presented the site history. This presentation provided a background of the sewage lagoons' environmental setting, the wastes that have entered the sewage lagoons, the regulatory history of the sewage lagoons, and a description of the steps taken at Holloman AFB to prevent any additional contaminants from entering the sewage lagoons. Dr. Fisher also outlined the number of investigations and removal activities that have occurred at the site. Additional information can be found in the *Project Assessment Report* (Radian and Foster Wheeler, 1995).

*Long-Term Groundwater Monitoring*—Tom Holcomb (Radian) presented a background of the groundwater conditions at Holloman AFB and the role of the current long-term groundwater monitoring program. This presentation included the environmental setting of the sewage lagoons with regards to groundwater, a regulatory history of the groundwater issues associated with the sewage lagoons, and a description of the Federal Facilities Compliance Agreement's (FFCA) groundwater provisions. In addition, Mr. Holcomb presented a summary of the detection, assessment, and long-term monitoring that have occurred at the site. In particular, he explained how the long-term monitoring network will be used to support closure of the sewage lagoons.

*Investigation Results*—Robert Michna (Radian) presented a summary of the results from the surface water, sediment, sludge, and soil investigations that have occurred at the sewage lagoons. Mr. Michna presented the focus and summary of each investigation, and in particular, discussed the decreasing concentrations of organochlorine pesticides and metals in the sludge and soil.

*Risk Assessment*—Kathleen Alsop (Radian) presented a summary of the risk assessment and risk assessment addendum prepared for the sewage lagoons, and the methodology used to prepare the human health and

ecological risk assessments. Ms. Alsup stated that for the human health risk assessment, all average exposure scenarios are below the acceptable risk levels for all sewage lagoons. In addition, all reasonable maximum exposure scenarios are below or at the  $10^{-6}$  risk range. For the ecological risk assessment, she presented the ecological samples collected to support the assessment, the ecological endpoints species, and the ecological risk assessment results. During the presentation of the assessment results, Ms. Alsup stated it is unlikely that assessment endpoint species are being threatened at the sewage lagoons. This is because DDD, DDE, and DDT concentrations are decreasing in the media, and because no population decreases have been observed at the site. Jeff Yurk (USEPA Region VI) stated that he was concerned with these conclusions and wanted to make sure that long-term effects have been addressed.

*CMS Process*—Steve Weber (Foster Wheeler) presented a summary of the CMS process and how it may be streamlined for the sewage lagoons closure project. Mr. Weber pointed out during the presentation that some of the key considerations affecting the closure process are the schedule of closure, the diversion of water to Pond G and Lake Holloman, the changing physical characteristics of the sludge, and the possibility of keeping Pond G open. Ron Kern (NMED) stated that he would like to see no CERCLA terminology in the CMS and that the CMS should not be a lengthy document.

#### Closure Alternative Selection Exercise

The closure alternative selection exercise consisted of nine modules that were designed to walk the meeting's participants through the closure alternative selection process. The purpose of this activity was to provide a format in which the participants could think about the issues involved with closure and the selection of a final closure alternative. During this activity, the participants were asked to fully explore all aspects of the closure process and to voice any questions or comments that were a result of the activity. Jim Gibson (Radian) facilitated the discussions. The modules covered the following topics.

Mr. Yurk believed that just because decreases in populations weren't observed, it did not necessarily mean that they would not occur in the future. He requested that sediment criteria be compared to sludge levels in Pond G and toxicity values that contribute to eggshell thinning be researched and compared to avian tissue samples. These comparisons would address his concerns on long-term effects.

*Assessing Land Uses of the Sewage Lagoons*—Module 1 focused on the land uses associated with the sewage lagoons. In particular, current and future land use scenarios were discussed for Ponds A through F and for Pond G.

The participants agreed that the current land use for Ponds A through F and the land immediately adjacent to these sewage lagoons is industrial, and that the current land use for Pond G and its immediately adjacent land is restricted open space because the land is in the runway clear zone.

During the discussion of the future land use scenarios, several comments were made. Gene Keepper (USEPA Region VI) stated that the land use for Ponds A through F and all surrounding land should remain industrial if they are not clean closed, and that the site is a hazardous waste facility. In addition, the proximity of the new wastewater treatment plant (WWTP) makes this area industrial. The group discussed the difference between open space and restricted open space. Mr. Keepper added that he could see Ponds A through F as being classified as restricted open space after closure. Fred Fisher added that access to Ponds A through F will remain restricted.

During the discussion, Ron Kern brought up the comparison between zoning use versus exposure scenarios, and the role of postclosure care activities if clean closure is not performed. He also added that the CMS should include provisions to make sure the area is restricted, account for the role of the National Environmental Policy Act (NEPA) in the closure process, and address the difference between clean versus risk-based closure. Mr. Kern added that if a less conservative land use scenario is selected, then a process to change the designation should be in place. Warren Neff (Holloman AFB) stated that this process exists in the Base Comprehensive Plan (BCP). The group agreed that Pond G should be classified as open space in the future.

*Identifying Human Receptors*—The objective of Module 2 was to discuss the potential human health risks that may be posed by the sewage lagoons. This objective was accomplished by reviewing the results of the 1996 risk assessment addendum and discussing the human exposure scenarios associated with the sewage lagoons. Jeff Yurk stated that the evaluated scenarios looked inclusive and conservative. He added that dermal exposure is appropriate. Ron Kern agreed with Mr. Yurk's comments regarding the exposure scenarios evaluated in the risk assessment addendum.

Gene Keepper asked for additional information pertaining to hunters at the site. Gordon Ewing (Audubon) said that he has seen hunters, but he doesn't believe that many retrieve the birds they shoot.

Jeff Yurk asked about the concentration of polychlorinated biphenyls (PCBs) present at the sewage lagoons. Robert Michna explained that all of the sludge with PCB concentrations greater than 25 ppm were removed from Ponds A and B, that the maximum concentrations are now below 10 ppm, and that PCBs have not been detected in any of the other sewage lagoons. Jeff Yurk also asked about having to meet a 1-ppm concentration, given the construction of the new wetlands. Fred Fisher stated that the new wetlands will not include Ponds A or B.

Ron Kern asked whether there is going to be any additional sampling prior to closure. Warren Neff stated that no more sampling will be done because of the characterization that has been done and the declining concentrations that have been observed. On the basis of this comment, Ron Kern stated that if no more sampling is to be done, then Holloman AFB should fully describe in the CMS that closure concentrations will be based on prior sampling and process knowledge. In addition, these concentrations should be included in the closure plan. Mr. Kern also asked whether the metals concentrations used in the risk assessment were total or TCLP concentrations. Robert Michna stated that the metals concentrations are totals.

Holloman AFB presented its strategy to address groundwater through the long-term monitoring plan; the group favored the strategy. While discussing the groundwater strategy, Ron Kern stated that the connectivity of the aquifers near the sewage lagoons needs to be addressed in the CMS. He also mentioned that if clean closure is accomplished, then groundwater monitoring may not be necessary. In addition, Mr. Kern also wanted to make sure that groundwater measurements are collected prior to collecting the samples. Tom Holcomb assured Mr. Kern that this is the case.

Gordon Ewing asked about the groundwater gradient. Warren Neff stated that it is very slow and should be slower after closure. Ron Kern stated that groundwater gradient information should be presented in the CMS.

While discussing the potential risks associated with surface water, Jeff Yurk asked about human health and ecological risks associated with uncovered sludge. Warren Neff stated that dust control measures can be taken to eliminate these problems. Ron Kern asked if there is groundwater recharge to the sewage lagoons, will the sewage lagoons ever dry? Mr. Neff responded by saying that he believes the sewage lagoons create an artificial mounding of the groundwater table. The group agreed with Holloman AFB's strategy to allow Ponds

10 May 1996

A through F to drain naturally, if fugitive dust issues are addressed in the CMS. Mr. Kern would like to see groundwater contour data in the CMS.

*Identifying Ecological Receptors and Sensitive Environments*—The objective of Module 3 was to discuss the potential ecological risks that may be posed by the sewage lagoons. This objective was accomplished by reviewing the results of the 1996 risk assessment addendum for Pond G and reviewing the sensitive environments associated with the sewage lagoons. An ecological risk assessment was not performed in the addendum for Ponds A through F since these lagoons will be closed. During this conversation, Jeff Yurk mentioned that if Ponds A through F were drained and left open, these lagoons would be habitat for terrestrial life and therefore an ecological risk assessment would need to be prepared. Fred Fisher stated that Ponds A through F will not be left open.

Mark Wilson (U.S. Fish and Wildlife Service) stated that the conclusion of the ecological risk assessment states that there are no adverse affects on fish or waterfowl; however, he asked whether eggshell thinning had been adequately evaluated. He believes that there could be reproductive risks associated with the constituent concentrations in the sewage lagoons. Mr. Wilson suggested looking at modeled concentrations in the birds and evaluating for reproductive risks, and determining what is the concentration of concern for eggshell data. Fred Applehans (Foster Wheeler) said that there are plenty of data available to perform this evaluation. Mr. Applehans will look into the DDT-eggshell relationship for waterfowl.

Jeff Yurk believes that the ecological risk assessment may not address all the pathways. This is because the assessment does not account for the absence of benthos from contaminants in the sewage lagoons. Mr. Yurk said that in the CMS report Holloman AFB should compare the concentrations for the chemicals of concern with concentrations found in sediments in Ontario, Oak Ridge, or the State of Washington. Fred Applehans added that if this comparison is made, the values should be normalized to account for the high organic content of the sludge. After looking at these issues, it may be determined that there are no ecological risks associated with Pond G, and that the sludge at the bottom of the lagoon does not need to be remediated.

The group then discussed sensitive environments. Gordon Ewing stated that the snowy plover is a concern at the sewage lagoons; however, the plover is not typically associated with Pond G. Gordon added that the only birds that nest at Pond G are green herons, sparrows, and cactus wrens; no ducks nest at Pond G. Gene Keeper said that he would agree with leaving Pond G open, given all the data and the habitat that Pond G provides. Ron Kern suggested that if Holloman AFB is planning to leave Pond G open, then it should be addressed separately from Ponds A through F in the CMS. Gordon Ewing would like to make sure that after closure, enough water flows into Lake Stinky to maintain the lake as a habitat. Fred Fisher stated that a management plan (note: this is part of the Natural Resources Conservation Program) will be developed to ensure the habitat is protected.

Ron Kern stated Holloman AFB needs to make clear in the CMS the hydraulic connection between the sewage lagoons, the uppermost aquifer, and the deeper aquifers. The CMS should also make clear any beneficial uses of the area's groundwater. Fred Fisher stated that total dissolved solids (TDS) concentrations increase with increasing depth.

With regards to the wetlands that Holloman AFB is proposing to create, Jeff Yurk asked how the ditch will be affected by the new wetlands. Fred Fisher stated that the wetlands will divert water away from part of the ditch, and limited overlap between the ditch and new wetlands will occur. This issue will be addressed in the CMS.

*Identifying Closure Objectives*—The objective of Module 4 was to discuss closure objectives and closure evaluation criteria for the closure of the sewage lagoons. The objective was met by presenting and discussing Holloman AFB's proposed closure objectives and the applicable alternative evaluation criteria. After presenting Holloman AFB's proposed closure objectives, Gordon Ewing made the only comment. He was concerned about the potential misuse of the sewage lagoons, and would like to see greater management of who has access to the sewage lagoons and lakes. Steve Weber mentioned that the no action alternative could deal with the access question. The group agreed that, after some discussion, access may be best addressed as a land management issue rather than a closure issue.

After Holloman AFB's proposed closure evaluation criteria was presented, Gene Keepper asked whether leaving Pond G open met the waste management requirements of the FFCA. The group agreed that these requirements would be met. No other comments regarding the criteria were made by the group.

*Evaluation of the No Action Alternative*—While discussing the no action alternative, the group agreed that the no action alternative for Ponds A through F would probably not meet the first and third closure objectives. Gene added that he does not believe the no action alternative would meet the requirements of the FFCA. However, the no action alternative for Pond G appears to meet all three closure objectives. On the basis of this decision, the group decided that Ponds A through F should be addressed separately from Pond G in the CMS.

During the conversation regarding how to address the sewage lagoons in the CMS, Ron Kern stated that it would be best to keep the report as simple as possible from a paperwork standpoint. The CMS should cover all the necessary closure issues; however, it should be done in as straightforward a manner as possible. The CMS should cover the key issues and nothing else. Mr. Kern added that this closure may be accomplished through an innovative approach: it may be risk based. Gene Keepper added that he does not see a problem with performing a risk-based closure to meet the requirements of the FFCA.

Jeff Yurk would like to see some documentation regarding the habitat loss associated with closing Ponds A through F. He would also like to see justification for why Pond G should not be closed. Fred Fisher pointed out that the environmental assessment for the WWTP and the biological resource report provides this information.

*Evaluation of Holloman AFB's Proposed Closure Alternative*—The objective of Module 6 was to present Holloman AFB's proposed closure alternative. Ron Kern asked what the proposed cover is going to be. Warren Neff stated sufficient cover (approximately 2 to 5 ft) of clean soil would be placed over the lagoons. Mr. Kern stated that NMED may agree to look at risk-based clean closure as proposed by Holloman AFB. Stephanie Kruse (NMED) added that clean closure has historically been defined by residential cleanup standards. The group agreed that if approximately 2 to 5 ft of clean soil were to be placed over the lagoons, all exposure pathways would be eliminated, thus meeting residential risk levels.

Warren Neff added that Holloman AFB may be thinking of moving some of the sludge between ponds to reduce the amount of area containing sludge. Ron Kern stated that the entire site will probably still need to be covered. He added that if clean closure is achieved, groundwater monitoring may not be necessary. Gene Keepper added that he has difficulty understanding how leaving waste in place would not be closure-in-place; he does not see this as clean closure. The group decided that the CMS will have to fully explain how risk-based clean closure will be used to meet residential cleanup requirements.

*Evaluation of Other Proposed Closure Alternatives*—Module 7 allowed the group to develop additional alternatives to be compared with the closure objectives and evaluation criteria. The group discussed that the

listed waste issues would need to be resolved. Sandy Frye (USACE) said that the sludge should not be a listed waste. Ms. Frye said that she would look into the listed waste issue. Warren Neff stated that a listed waste allegedly entered the lagoons. However, only a few constituents of possible listed waste have been detected, and all detections have been at low concentrations. Gene Keepper added that through the mixture rule, all of the sludge is a hazardous waste.

Steve Weber asked whether it will be necessary to look at all treatment options in the CMS. Ron Kern responded that he was not sure. He would like the CMS to fulfill the applicable criteria; however, streamlining the process is preferable. He added that he does not see a problem with keeping the process focused on reasonable and realistic approaches to closure. Mr. Weber added that Holloman AFB could screen out response actions early in the process.

*Evaluation of a Final Closure Alternative*—Module 8 was not performed by the group since the group felt that all of the issues in the module had been addressed in previous modules. However, Ron Kern stated that all of the issues presented in Module 8 should be addressed in the CMS.

*Evaluation of a Closure Schedule and Milestones*—Module 9 outlined the future schedule and milestones for closure of the sewage lagoons. The group had some concerns regarding the water being shut off to the sewage lagoons; in particular, there was concern that fugitive dust may be generated once the sewage lagoons dry out. Fred Fisher stated that the initial discharge from the WWTP will go to Lake Holloman, not Pond G. Steve Weber stated that Holloman AFB can use some dust suppression techniques to prevent fugitive dust problems. This issue will be addressed in the CMS. Jeff Yurk mentioned the disease vectors that may be associated with the sewage lagoons once the influent is eliminated.

Ron Kern stated that Holloman AFB should follow the sampling and analysis checklists, and pertinent parts of closure, under 40 CFR Part 265, although a streamlined CMS can still be performed.

Stephanie Kruse stated that the initial closure plan did not have enough closure related information in the document. She added that the new closure plan that is submitted with the CMS should fully describe the closure procedure and how no additional sampling will be justified. In addition, the closure plan can reference other documents; however, the references have to be fully cited, including page numbers. Ms. Kruse also stated that the CMS should be included as an attachment to the closure plan and that it should be submitted within 45 days. Ron Kern added that review of the closure plan and the CMS should not slow down the closure process. Warren Neff stated that Holloman AFB will try to meet this 45-day date; however, the Base may ask for an extension if necessary. The group added that a CMS plan is not necessary if the CMS fully describes the closure process.

Jeff Yurk stated that it should be determined whether naturally occurring background concentrations of arsenic in the soils at Holloman AFB may trigger risk for a residential land use scenario. This issue will be addressed in the CMS.

At the end of the meeting, a list of action items was developed. These action items included the following:

1. Fred Applehans—Look at DDT concentrations and eggshell thickness studies.
2. Kathleen Alsup—Compare Pond G sludge with other sediment concentrations.
3. Kathleen Alsup—Evaluate the residential risk scenario with a soil cover.
4. Warren Neff and Fred Fisher—Send letter to NMED proposing submittal date for the CMS.

**Attachment A**  
**Closure Alternative Selection Document**

***Closure Alternative Selection Document for  
the Stakeholders Closure Meeting***

***Sewage Lagoons Closure Project  
Holloman AFB, New Mexico***

***3 April 1996***

## **CLOSURE ALTERNATIVE SELECTION DOCUMENT SEWAGE LAGOONS CLOSURE PROJECT, HOLLOMAN AFB**

This document contains modules that will aid in the selection of a closure alternative for the Holloman AFB Sewage Lagoons Closure Project. All of the modules have been based on the information provided in the site summary document and the site overview presentations. As you probably are aware, the process for selection of a closure alternative for the sewage lagoons is currently underway. Therefore, the purpose of these modules is to provide a format to voice your comments and questions pertaining to the closure of the sewage lagoons. No final decisions will be made today. Instead, any opinions voiced, or consensuses reached, will be used to guide the corrective measures study. These modules are intended to accelerate the selection process by allowing Holloman AFB to fully understand the opinions and concerns of the major stakeholders prior to selecting a final closure alternative, and are not intended to be used to select an alternative today. The Sewage Lagoons Closure Project is not a typical closure project and a large volume of information exists about the sewage lagoons. Therefore, if at any time you have questions, or are unclear about a topic, please do not hesitate to ask for clarification.

## LIST OF MODULES

Module 1:	Assessing Land Uses of the Sewage Lagoons .....	1
Module 2:	Identifying Human Receptors .....	4
Module 3:	Identifying Ecological Receptors and Sensitive Environments .....	8
Module 4:	Identifying Closure Objectives .....	10
Module 5:	Evaluation of the No Action Alternative .....	12
Module 6:	Evaluation of Holloman's Proposed Closure Alternative .....	14
Module 7:	Evaluation of Other Proposed Closure Alternatives .....	16
Module 8:	Evaluation of a Final Closure Alternative .....	18
Module 9:	Evaluation of a Closure Schedule and Milestones .....	21

## MODULE 1: ASSESSING LAND USES OF THE SEWAGE LAGOONS

**Objective:** The objective of this module is to discuss the current and future land-use designations for the sewage lagoons and the land immediately surrounding the sewage lagoons. This objective will be achieved by presenting Holloman AFB's intended land-use scenarios and the factors that led to these designations. We will then discuss these current and future land-use designations.

### Questions:

In this module, Ponds A through F have been grouped together, due to the common land uses for these sewage lagoons. Pond G is presented separately.

#### 1. Current Land Use

The Base Comprehensive Plan for Holloman AFB designates the current land use for Ponds A through F and the land immediately adjacent to the sewage lagoons as industrial. Pond G and its immediately adjacent land are classified as open space (see Figure 1-1).

*Do you have any comments/questions regarding these current land-use designations?*

#### 2. Future Land Use

After closure of the sewage lagoons has occurred, Holloman AFB foresees Ponds A through F, Pond G, and all immediately adjacent land being classified as open space (see Figure 1-2).

The factors affecting this land-use designation include:

- The sewage lagoons are within the runway clear zone;
- Pond G is within the Lake Holloman flood plain;
- The area is surrounded by wetlands;
- The TDS concentrations of the underlying groundwater; and
- The area provides poor soils for construction.

*Do you have any comments/questions regarding this future land-use designation?*

**STOP:** Has the group answered all questions in Module 1? If not, please go back and answer them now. If this module has been completed and the group's comments and/or questions have been addressed or recorded continue to Module 2.

**STOP**

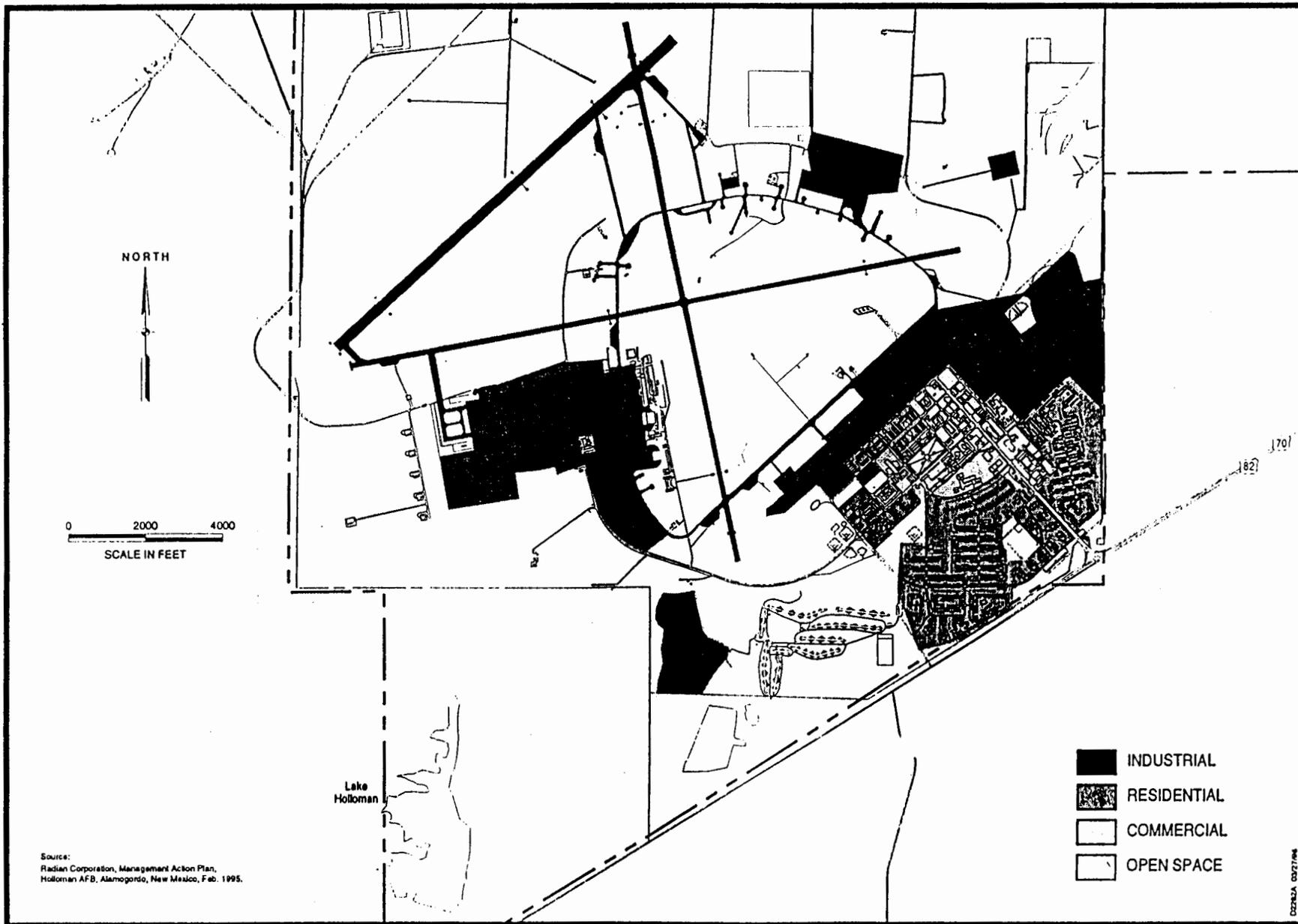
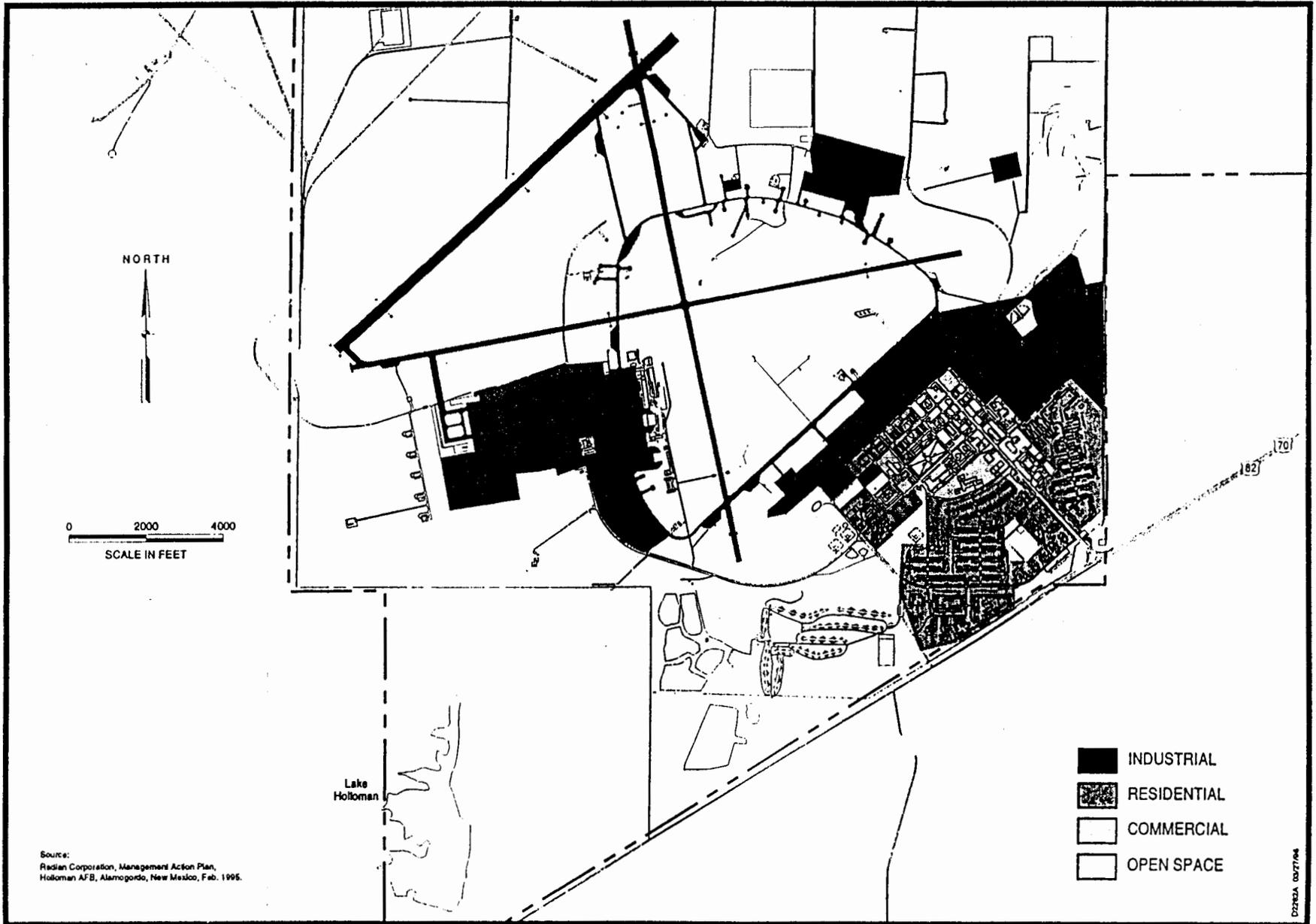


Figure 1-1. Current Land Use Map, Main Base Area, Holloman AFB



Continue 

Figure 1-2. Future Land Use Map, Main Base Area, Holloman AFB

## MODULE 2: IDENTIFYING HUMAN RECEPTORS

**Objective:** The objective of this module is to discuss the potential human health risks that may be posed by the Holloman AFB sewage lagoons. This objective will be accomplished by reviewing the results of the 1996 risk assessment addendum. This review will be based upon the earlier presentations and the information provided in the site summary document. During this module, you will be asked to voice your comments regarding the potential human health risks associated with the sewage lagoons. It should be mentioned that this module will not substitute for the official review of the *Draft Final Risk Assessment Addendum* (Radian and Foster Wheeler, 1996); however, this discussion will help expedite the corrective measures study (CMS) process by integrating your concerns at this time.

### Questions:

1. Evaluated Human Exposure Scenarios

Exposure scenarios evaluated for human health are presented in Figure 2-1.

*Do you have any comments/questions regarding the exposure scenarios that were evaluated during the risk assessment addendum?*

*Do you agree that these exposure scenarios adequately represent a range of realistic exposure scenarios associated with the sewage lagoons?*

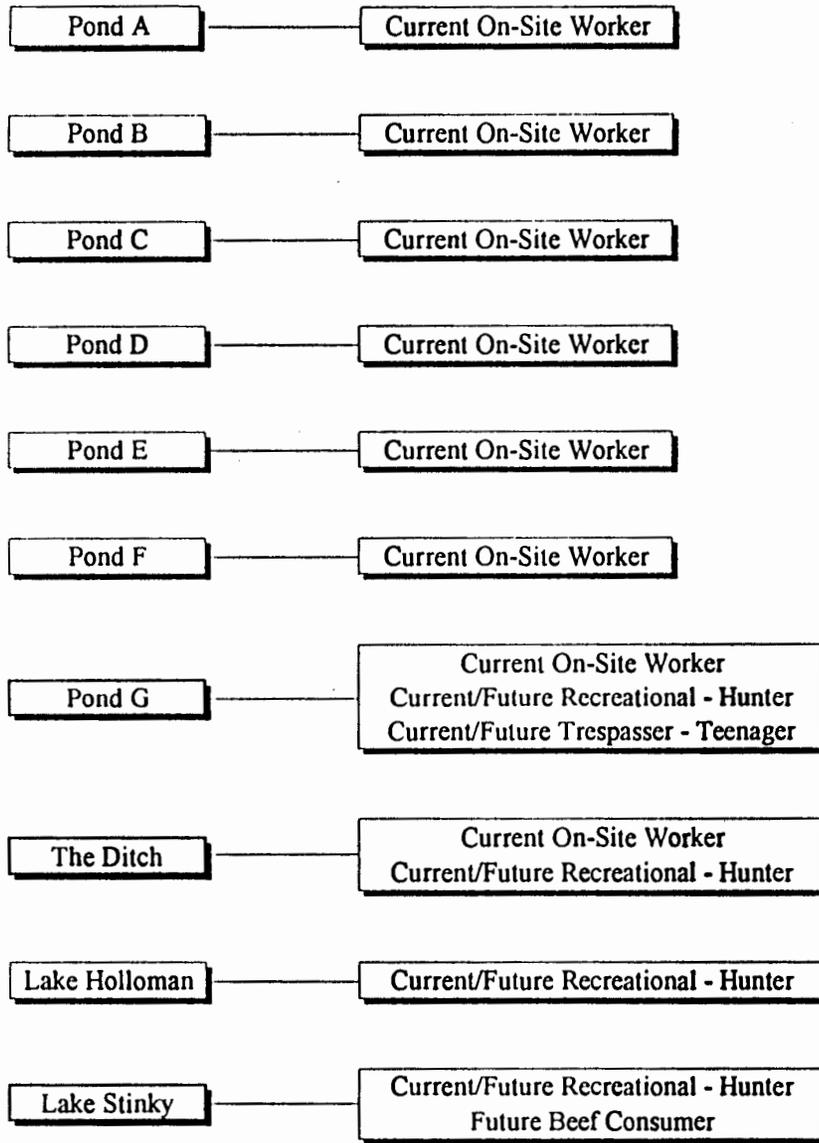
2. Risk Assessment Addendum Results and Conclusions

Table 2-1 presents the results of the human health risk assessment addendum. Holloman AFB has concluded from these results that no unacceptable risks to human health are associated with the sewage lagoons.

*Do you have any comments/questions regarding these results and conclusions?*

*Based on these results, do you agree that no unacceptable human health risks are associated with the sewage lagoons?*

Continue 



**Current On-Site Worker (chronic & subchronic)**

- Dermal Contact with Soil
- Dermal Contact with Sludge/Sediment
- Dermal Contact with Surface Water

**Current/Future Recreational - Hunter (chronic & subchronic)**

Adults

- Dermal Contact with Soil
- Dermal Contact with Sludge/Sediment
- Dermal Contact with Surface Water
- Ingestion of Surface Water
- Ingestion of Waterfowl
- Inhalation of Fugitive Dust

Children

- Ingestion of Waterfowl

**Current/Future Trespasser - Teenager (subchronic)**

- Ingestion of Surface Water
- Dermal Contact with Soil
- Dermal Contact with Sludge/Sediment
- Dermal Contact with Surface Water

**Future Beef Consumer (chronic)**

Adults & Children

- Ingestion of Beef

Figure 2-1. Exposure Scenarios for Evaluating Human Health, Holloman AFB

Site	Human Health Risk Estimates				Exposure Scenario Associated with Health Risks
	Noncancer Hazard		Cancer Risk		
	AVG	RM	AVG	RM	
Pond A	< 1	< 1	< 1E-6	2E-6*	Cancer risk estimates are based entirely on dermal contact with Aroclor-1254, in sludge, for the Current Onsite Worker Reasonable Maximum Scenario.
Pond B	< 1	< 1	< 1E-6	2E-6*	Cancer risk estimates are based entirely on dermal contact with sludge for the Reasonable Maximum Current On-site Worker Scenario. Aroclor-1254 contributes 76% to the overall risk estimate, with 4,4'-DDE, benzo[a]pyrene, and chlordane accounting for 19% of this estimate.
Pond C	< 1	< 1	< 1E-6	< 1E-6	NA
Pond D	< 1	< 1	< 1E-6	< 1E-6	NA
Pond E	< 1	< 1	< 1E-6	< 1E-6	NA
Pond F	< 1	< 1	< 1E-6	< 1E-6	NA
Pond G The Ditch Lake Holloman Lake Stinky	< 1	< 1	< 1E-6	6E-6*	Cancer risk estimates are based entirely on the ingestion of waterfowl hunted at these sites in the Adult Recreational Scenario. PCBs (36%), 4,4'-DDE (23%), oxychlordane (18%), dieldrin (15%), gamma-Chlordane (4%), and 4,4'-DDD (3%) account for this estimate.

\*The accumulative risk for this scenario is between 1E-04 and 1E-06.

AVG = Average Exposure Case

RM = Reasonable Maximum Exposure Case

Continue

Table 2-1. Summary of Human Health Risk Assessment Results, Holloman AFB

3. Groundwater

Based on complete delineation of the nature and extent of groundwater contamination associated with the sewage lagoons, Holloman AFB has prepared the *Draft Final Long-Term Monitoring Plan* (Radian, 1995). The plan provides for monitoring and reporting of groundwater associated with the sewage lagoons for the 30 years following closure. Monitoring will be performed for the constituents (metals and organochlorine pesticides) that were determined to be present in the groundwater during assessment monitoring, and present in the sludge during past investigations. Holloman AFB will use risk-based trigger criteria to determine if further groundwater investigations are necessary.

*Do you have any comments/questions regarding this strategy for addressing groundwater associated with the sewage lagoons?*

4. Surface Water

Holloman AFB intends to shut off the influent to Ponds A through F after the new wastewater treatment plant (WWTP) is operational. Water from Ponds A through F will be allowed to drain and evaporate naturally; however, if water is disposed of it will be in accordance with applicable regulations. Treated wastewater from the new WWTP will be drained to Lake Holloman or will be pumped to Pond G via a NPDES-permitted outfall. Pond G will remain open and will be regulated under the Clean Water Act. Given that water will no longer exist in Ponds A through F, Holloman AFB does not believe any surface water will require remediation.

*Do you have any comments/questions regarding this strategy to address surface water during closure?*

**STOP:** Has the group answered all questions in Module 2? If not, please go back and answer them now. If this module has been completed and the group's comments and/or questions have been addressed or recorded continue to Module 3.

**STOP**

## MODULE 3: IDENTIFYING ECOLOGICAL RECEPTORS AND SENSITIVE ENVIRONMENTS

**Objective:** The objective of this module is to discuss the potential ecological risks that result from the Holloman AFB sewage lagoons. This objective will be accomplished by reviewing the methodology and the results of the 1996 ecological risk assessment. This review will be based upon the earlier presentations and the information provided in the site summary document. During the discussion of this module, you will be asked to voice your comments regarding the ecological risk assessment. It should be mentioned that this module will not substitute for the official review of the ecological risk assessment that is presented in the *Draft Final Risk Assessment Addendum* (Radian and Foster Wheeler, 1996); however, this discussion will help expedite the CMS process by integrating your concerns at this time. **Since the closure project is limited to the sewage lagoons, this module will not address Lake Holloman, Lake Stinky, or the ditch.**

### Questions:

#### 1. Ecological Risk Assessment

Ponds A through F were not evaluated in the ecological risk assessment because they are planned to be closed and will not serve as a habitat for aquatic wildlife. An ecological risk assessment was performed for Pond G.

*Do you have any comment/questions regarding this assessment strategy?*

#### 2. Ecological Risk Assessment Results

The results for the ecological risk assessment indicate that DDD and DDE, which are breakdown products of DDT, were the only constituents found to have the potential to cause adverse effects in Pond G. DDT is no longer used at the Base. Investigation results also indicate that concentrations of DDT in the sewage lagoons decreased by an order of magnitude between 1992 and 1994, as documented in the *Site Characterization Report* (Radian and Foster Wheeler, 1995). In addition, no physical adverse effects have been observed in the fish and/or waterfowl that use Pond G. Based on these results, Holloman AFB has concluded that no unacceptable ecological risks are associated with Pond G.

*Do you have any comments/questions regarding these results?*

*Do you have any comments/questions on Holloman AFB's conclusions regarding the ecological risks associated with the sewage lagoons?*

Continue 

3. Sensitive Environments and Special Interest Species

Holloman AFB will address sensitive environments and special interest species (threatened and endangered) in the Biological Resources Report. This report will be completed after closure alternatives have been identified, then the impacts of each alternative can be assessed. To date Holloman AFB has assessed that the loss of Ponds A through F will not constitute the loss of a critical habitat. However, Pond G provides a critical habitat to some of the bird species and also supports associated wetlands. Closure of Pond G could have adverse effects to these species.

*Do you have any comments/questions regarding the sensitive environments and special interest species associated with the sewage lagoons?*

4. Constructed Wetlands

Holloman AFB intends to construct 120 acres of wetlands adjacent to the sewage lagoons. The wetlands will provide holding capacity for storm water and treated effluent from the new WWTP to prevent flooding of highway 70 and lands south of highway 70 during cool, wet years. The new wetlands will consist of 15 acres of restored jurisdictional wetlands and 105 acres of new wetlands. These wetlands are expected to enhance wildlife habitats and restore existing wetlands.

*Do you have any comments/questions regarding these new wetlands?*

**STOP:** Has the group answered all questions in Module 3? If not, please go back and answer them now. If this module has been completed and the group's comments and/or questions have been addressed or recorded, continue to Module 4.

**STOP**

## MODULE 4: IDENTIFYING CLOSURE OBJECTIVES

**Objective:** The objective of this module is to discuss closure objectives and closure alternative evaluation criteria for the closure of the sewage lagoons. This objective will be accomplished by presenting and discussing Holloman AFB's proposed closure objectives and the applicable alternative evaluation criteria. During this module, you will be asked to voice your comments regarding these topics or any other comments you may have regarding closure objectives and approach. We will be using the discussion from this module to help evaluate proposed closure alternatives in subsequent modules.

### Questions:

#### 1. Closure Objectives

Holloman AFB intends to use a risk-based approach to close Ponds A through F and Pond G. The objectives that Holloman AFB proposes for closure include the following:

- Ensure the protection of human health and the environment at the sewage lagoons after closure;
- Provide an adequate habitat for the wildlife associated with the sewage lagoons; and
- Ensure that closure is aesthetically suitable and eliminates odors and disease vectors (mosquito habitats) that may be associated with the sewage lagoons.

*Do you have any comments/questions regarding these closure objectives?*

*Would you eliminate any of these objectives?*

*Would you add any additional objectives?*

Continue 

2. Evaluation Criteria

Holloman AFB intends to use the four RCRA remedy selection standards for a CMS to evaluate proposed closure alternatives:

- Is the alternative protective of human health and the environment?
- Does the alternative control or eliminate the source of contamination?
- Does the alternative comply with applicable waste management standards?
- Does the alternative attain site-specific risk-based media cleanup objectives?

*Do you have any comments/questions regarding these evaluation criteria?*

*Would you eliminate any of these criteria?*

*Would you add any criteria?*

**STOP:** Has the group answered all questions in Module 4? If not, please go back and answer them now. If this module has been completed and the group's comments and /or questions have been addressed or recorded, continue to Module 5.

**STOP**

## MODULE 5: EVALUATION OF NO ACTION ALTERNATIVE

**Objective:** The objective of this module is to discuss the no action alternative for the sewage lagoons. This objective will be accomplished by presenting and discussing the no action alternative with regards to the discussion in Module 4 (i.e., the alternative will be compared with regards to the closure objectives and the evaluation criteria previously discussed). The no action alternative is being discussed as a baseline against which to compare other alternatives.

### Questions:

The no action alternative consists of shutting off the influent to Ponds A through F after the new WWTP is operational. Effluent from the new WWTP will be discharged to Pond G and the new wetlands via a NPDES-permitted outfall. Ponds A through F will be left to drain and evaporate naturally. No development will be allowed in the area. Groundwater will be monitored for 30 years according to the long-term monitoring (LTM) plan.

#### 1. Closure Objectives

Holloman AFB believes this alternative meets the first and second, but not the third, closure objectives listed below (discussed in Module 4).

- Ensures the protection of human health and the environment at the sewage lagoons after closure;
- Provides an adequate habitat for the wildlife associated with the sewage lagoons; and
- Ensures that closure is aesthetically suitable and eliminates odors and disease vectors (mosquito habitats) that may be associated with the sewage lagoons.

*Do you have comments/questions regarding this statement?*

Continue 

## 2. Evaluation Criteria

Holloman AFB believes this alternative meets the evaluation criteria listed below (discussed in Module 4).

- Is protective of human health and the environment;
- Controls or eliminates the source of contamination;
- Complies with applicable waste management standards; and
- Attains site-specific risk-based media cleanup objectives.

*Do you have comments/questions regarding this statement?*

*Without losing the essence of the alternative (i.e., no action), are there modifications that you would make to this alternative?*

**STOP:** Has the group answered all questions in Module 5? If not, please go back and answer them now. If this module has been completed and the group's comments and/or questions have been addressed or recorded, continue on to Module 6.

**STOP**

## MODULE 6: EVALUATION OF HOLLOMAN'S PROPOSED CLOSURE ALTERNATIVE

**Objective:** The objective of this module is to discuss Holloman AFB's proposed alternative for the sewage lagoons. This objective will be accomplished by presenting and discussing the alternative with regards to the discussion in Module 4 (i.e., the alternative will be compared with regards to the closure objectives and the evaluation criteria previously discussed).

### Questions:

Holloman AFB's proposed alternative consists of shutting off the influent to Ponds A through F after the new WWTP is operational. Effluent from the new plant will be discharged to Pond G and the new wetlands via a NPDES-permitted outfall. Ponds A through F will be drained. Sludges in the impoundments will be covered to eliminate exposure, and maintained through contouring and vegetation. Pond G will be left open to receive treated wastewater and support area wildlife. No development will be allowed in the area. Groundwater will be monitored according to the *LTM Plan*.

#### 1. Closure Objectives

Holloman believes this alternative:

- Ensures the protection of human health and the environment at the sewage lagoons after closure;
- Provides an adequate habitat for the wildlife associated with the sewage lagoons; and
- Ensures that closure is aesthetically suitable and eliminates odors and disease vectors (mosquito habitats) that may be associated with the sewage lagoons.

*Do you have any comments/questions regarding this statement?*

Continue 

2. Evaluation Criteria

Holloman believes this alternative:

- Is protective of human health and the environment;
- Controls or eliminates the source of contamination;
- Complies with applicable waste management standards; and
- Attains site-specific risk-based media cleanup objectives.

*Do you have comments/questions regarding this statement?*

3. Process Options

Holloman AFB is considering a variety of sludge management options to most cost effectively close the impoundments. The process options range from covering the sludge in place in each Pond to consolidating the sludge in a subset of Ponds. In both cases, the sludge will be covered with soil and the cover will be maintained through contouring and vegetation.

*If the CMS determines it is most favorable to leave the sludge in place in each Pond and cover with soil, do you have any comments/questions regarding this process option?*

*If the CMS determines it is most favorable to consolidate the sludge in a subset of Ponds and cover with soil, do you have any comments/questions regarding this process option?*

**STOP:** Has the group answered all questions in Module 6? If not, please go back and answer them now. If this module has been completed and the group's comments and/or questions have been addressed or recorded, continue to Module 7.

**STOP**

## MODULE 7: EVALUATION OF OTHER PROPOSED CLOSURE ALTERNATIVES

**Objective:** The objective of this module is to discuss and evaluate other proposed alternatives. This objective will be accomplished by proposing other alternatives, and then discussing these alternatives with regards to the discussion in Module 4 (i.e., the alternatives will be compared with the closure objectives and the evaluation criteria previously discussed).

### Questions:

1. Other Proposed Alternatives

*Based on the information presented today and your knowledge regarding the sewage lagoons and closure activities, are there any other closure alternatives that you would like to propose?*

Alternative # 3 \_\_\_\_\_

Alternative # 4 \_\_\_\_\_

Alternative # 5 \_\_\_\_\_

2. Closure Objectives

*Do these alternatives meet the closure objectives listed below (discussed in Module 4)?*

- Ensure the protection of human health and the environment at the sewage lagoons after closure;
- Provide an adequate habitat for the wildlife associated with the sewage lagoons; and
- Ensure that closure is aesthetically suitable and eliminates odors and disease vectors (mosquito habitats) that may be associated with the sewage lagoons.

Continue 

3. Evaluation Criteria

*Do these alternatives meet the evaluation criteria listed below (discussed in Module 4)?*

- Is the alternative protective of human health and the environment?
- Does the alternative control or eliminate the source of contamination?
- Does the alternative comply with applicable waste management standards?
- Does the alternative attain site-specific risk-based media cleanup objectives?

**STOP:** Has the group answered all questions in Module 7? If not, please go back and answer them now. If this module has been completed and the group's comments and/or questions have been addressed or recorded, continue to Module 8.

**STOP**

## MODULE 8: EVALUATION OF A FINAL CLOSURE ALTERNATIVE

**Objective:** The objective of this alternative is to select a closure alternative from the proposed alternatives. The objective will be accomplished by comparing all of the alternatives that were consistent with the closure objectives and evaluation criteria with the five remedy selection decision factors that are proposed by Holloman AFB. These decision factors will provide the basis for comparison between the alternatives.

### Questions:

1. Remedy Selection Decision Factors

The five RCRA remedy selection decision factors are:

- Long term reliability and effectiveness;
- Reduction in toxicity, mobility, or volume;
- Short-term effectiveness;
- Administrative and technical implementation; and
- Cost.

*Do you have any comment/questions regarding the RCRA remedy selection decision factors?*

*Would you eliminate any of these factors?*

*Would you add any factors?*

Regarding *effectiveness and reliability in the long term*, classify each alternative as excellent, good, fair, or poor, and provide a reason for your decision.

No action alternative: \_\_\_\_\_, because \_\_\_\_\_  
Proposed alternative: \_\_\_\_\_, because \_\_\_\_\_  
Alternative # 3: \_\_\_\_\_, because \_\_\_\_\_  
Alternative # 4: \_\_\_\_\_, because \_\_\_\_\_  
Alternative # 5: \_\_\_\_\_, because \_\_\_\_\_

Continue 

Regarding *reduction in toxicity, mobility, or volume*, classify each alternative as excellent, good, fair, or poor, and provide a reason for your decision.

No action alternative: \_\_\_\_\_, because \_\_\_\_\_  
Proposed alternative: \_\_\_\_\_, because \_\_\_\_\_  
Alternative # 3: \_\_\_\_\_, because \_\_\_\_\_  
Alternative # 4: \_\_\_\_\_, because \_\_\_\_\_  
Alternative # 5: \_\_\_\_\_, because \_\_\_\_\_

Regarding *short-term effectiveness*, classify each alternative as excellent, good, fair, or poor, and provide a reason for your decision.

No action alternative: \_\_\_\_\_, because \_\_\_\_\_  
Proposed alternative: \_\_\_\_\_, because \_\_\_\_\_  
Alternative # 3: \_\_\_\_\_, because \_\_\_\_\_  
Alternative # 4: \_\_\_\_\_, because \_\_\_\_\_  
Alternative # 5: \_\_\_\_\_, because \_\_\_\_\_

Regarding *administrative and technical implementation*, classify each alternative as excellent, good, fair, or poor, and provide a reason for your decision.

No action alternative: \_\_\_\_\_, because \_\_\_\_\_  
Proposed alternative: \_\_\_\_\_, because \_\_\_\_\_  
Alternative # 3: \_\_\_\_\_, because \_\_\_\_\_  
Alternative # 4: \_\_\_\_\_, because \_\_\_\_\_  
Alternative # 5: \_\_\_\_\_, because \_\_\_\_\_

Regarding *costs*, classify each alternative as excellent, good, fair, or poor, and provide a reason for your decision.

No action alternative: \_\_\_\_\_, because \_\_\_\_\_  
Proposed alternative: \_\_\_\_\_, because \_\_\_\_\_  
Alternative # 3: \_\_\_\_\_, because \_\_\_\_\_  
Alternative # 4: \_\_\_\_\_, because \_\_\_\_\_  
Alternative # 5: \_\_\_\_\_, because \_\_\_\_\_

2. Alternative Selection

Using the scoring values associated with each ranking category (Poor=1, Fair=2, Good=3, and Excellent=4), calculate a score for each of the alternatives

Continue 

	Long-Term Reliability	Reduction in T/M/V	Short-Term Effectiveness	Implementability	Cost	Total Score
No action						
Proposed						
Alternative #3						
Alternative #4						
Alternative #5						

*Based on your evaluation of the closure alternatives and the selection decision factors, which is the preferred alternative?*

- No action alternative
- Holloman's proposed alternative
- Alternative #3
- Alternative #4
- Alternative #5
- None of the above
- Other: \_\_\_\_\_ (Specify)

*What were the factors that led you to select this option or propose a modified alternative?*

---



---



---



---



---



---



---



---



---



---

**STOP:** Has the group answered all questions in Module 8? If not, please go back and answer them now. If this module has been completed and the group's comments and/or questions have been addressed or recorded, continue to Module 9.

**STOP**

## MODULE 9: EVALUATION OF A CLOSURE SCHEDULE AND MILESTONES

**Objective:** The objective of this module is to discuss the schedule and milestones involved with implementing the selected alternative. This objective will be accomplished by reviewing the timeline involved with the new WWTP, the regulatory requirements, and the engineering requirements involved with implementing the selected alternative. This module will serve as the basis for developing the remaining activities in the closure process.

### Questions:

1. The new WWTP

The new WWTP will be operational in summer 1996. In conjunction with the start up of the new WWTP, Ponds A through F will no longer receive influent.

*How do you foresee the new WWTP's schedule affecting the closure of the sewage lagoons?*

2. Regulatory Requirements

*What do you foresee as being the major regulatory requirements between now and final closure?*

3. Engineering Requirements

*What do you foresee as being the major engineering requirements involved with implementing the selected alternative?*

4. Schedule and milestones

*Is there a regulation-based date by which the sewage lagoons have to be closed?*

*What is the desired date by which the sewage lagoons are to be closed?*

Continue 

*What are the milestones leading up to this date?*

*Are there any foreseeable barriers to reaching this desired closure date?*

*What are the next major action items to be accomplished?*

**STOP:** Has the group answered all questions in Module 9? If not, please go back and answer them now. If you have completed this exercise and recorded the group's comments/questions, you have finished the modules. Thanks for your cooperation in helping Holloman AFB with the closure of the sewage lagoons.

**STOP**

**Attachment B**  
**Meeting Participants**

**Attachment C**  
**Stakeholders Closure Meeting Agenda**

**AGENDA for the  
STAKEHOLDERS CLOSURE MEETING**

**3 APRIL 1996**

- |               |  |
|---------------|--|
| 8:00 - 8:15   | <b>Arrive and Registration</b>   |
| 8:15 - 8:30   | <b>Introductions and Overview of Agenda</b>  |
| 8:30 - 9:45   | <b>Presentations</b><br>Environmental Setting and Site History<br>Long-Term Groundwater Monitoring<br>Investigation Results<br>Risk Assessment Results<br>Corrective Measure Study |
| 9:45 - 10:00  | <b>Break</b>   |
| 10:00 - 10:15 | <b>Module 1: Assessing Land Uses of the Sewage Lagoons</b>   |
| 10:15 - 11:00 | <b>Module 2: Identifying Human Receptors</b>   |
| 11:00 - 11:45 | <b>Module 3: Identifying Ecological Receptors and Sensitive Environments</b>   |
| 11:45 - 1:00  | <b>Lunch</b>   |
| 1:00 - 1:30   | <b>Module 4: Identifying Closure Objectives</b>  |
| 1:30 - 2:00   | <b>Module 5: Evaluation of the No Action Alternative</b>   |
| 2:00 - 2:30   | <b>Module 6: Evaluation of Holloman's Proposed Closure Alternative</b>   |
| 2:30 - 2:45   | <b>Break</b>   |
| 2:45 - 3:30   | <b>Module 7: Evaluation of Other Proposed Closure Alternatives</b>   |
| 3:30 - 4:30   | <b>Module 8: Evaluation of a Final Closure Alternative</b>   |
| 4:30 - 5:00   | <b>Module 9: Evaluation of a Closure Schedule and Milestones</b>   |

**Attachment D**  
**Issues to be Addressed During the CMS**

## Issues to be Addressed During the CMS

1. The corrective measures study (CMS) should look at the future land use scenarios of the sewage lagoons. For example, if the sewage lagoons are not clean closed, should the area be restricted to an industrial, instead of an open space, land use? In addition, can a "restricted" open space definition apply to the sewage lagoons. The CMS should address a process to reevaluate the land use designation if a <sup>less</sup> ~~more~~ conservative land use is desired in the future.
2. The CMS is the basis of closure. In the CMS, address "knowledge of process" and data trends (e.g., TCLP vs. total concentrations)
3. The CMS process needs to address ecological risk issues once the new wastewater treatment plant is operational and the water source to the sewage lagoons is eliminated.
4. The CMS needs to address erosion and dust control prior to closure.
5. The CMS should address issues with DDT and its degradation compounds. The CMS may need to incorporate additional information on eggshell thinning and sediment criteria if it is a problem.
6. The CMS should document the hydraulic connectivity between water-bearing zones associated with the sewage lagoons. In addition, the quality and use rates of groundwater in the area should be fully described.
7. The CMS should describe how the selected closure alternative meets the waste management standards presented in the FFCA.
8. The CMS should evaluate the no action alternative and closure of Pond G separately from the other sewage lagoons.
9. The CMS should determine whether naturally occurring background concentrations of arsenic may trigger risk for a residential exposure land use scenario.