Final

Five-Year Review of Interim Remedial Action at Former
Area P Lagoons

Louisiana Army Ammunition Plant
Doyline, Louisiana

Submitted to: U. S. Army

Submitted by: SNIFFEN AROUND, LLC
8704 Hollow Bluff Dr.
Haughton, LA 71037-9367

U. S. Army Contract: DACA31-99-P-0555

The Remedy is protective because the remedial action at Area P (operable unit) protects
human health and the environment. The Interim Remedial Action removed 97% of the
source material. Continued monitoring of the ground water shows an overall reduction in
contaminants. A final ROD for the ground water is under study by contractors for the U. S.
Army.

[Signature]
David Tolbert
Commander’s Representative
Louisiana Army Ammunition Plant

Date 9/14/00
MEMORANDUM

From: Caroline A. Ziegler
Remedial Project Manager (6SF-LP)

Through: Wren Stenger, Chief
LA/NM Branch (6SF)

To: Myron O. Knudson, P.E., Director
Superfund Division (6SF)

RE: Concurrence on the Five-Year Review for Louisiana Army Ammunition Plant, Doyline, Bossier and Webster Parishes, Louisiana, EPA ID# LA0213820533

This memorandum documents that EPA concurs with the U.S. Army’s findings in the Five-Year Review Report for Louisiana Army Ammunition Plant (LAAP).

Summary of Five-Year Review Findings

The remedy conducted at the site in Area P is protective of human health and the environment. This conclusion is based on interviews with persons familiar with the interim remedial action, two site inspections made on January 18, 2000 and March 23, 2000, and review of data and currently applicable regulatory requirements. Interviews were conducted with significant people such as LAAP employees, nearby residents, and regulators. These particular people were chosen because of their involvement with the project through the years and their ability to be aware of public concern due to their position. Of the nine people interviewed, there was unanimous agreement that the interim remedial action of soil excavation, incineration, disposal of the incinerator ash and capping of the disposal area was a successful solution to protecting human health and the environment. The cap and surrounding locations at Area P were inspected for signs of deterioration including erosion, subsidence, stressed vegetation, mowing and maintenance of the fence. In addition, ground water data that had been collected since the last five-year review was evaluated. As part of a natural attenuation study on explosive contaminants being conducted by the U.S. Army Corps of Engineers Waterways Experiment Station (WES), the wells in Area P have been sampled on a regular basis since 1996. This data indicates that there is a lack of movement of the contaminants and an overall decrease in their concentration levels. Federal, state and local regulations were reviewed to see that there have been no regulatory changes over the last five years that would jeopardize the protectiveness of the original remedy. None were found.
**Actions Needed**

There were no major recommendations or follow-up actions for the maintenance of the cap. There is a need to continue monitoring the ground water to verify that contaminants are not migrating. Remaining ground water issues are being addressed in a site wide ground water operable unit. Better recordkeeping practices of the site inspections and maintenance activities need to be initiated. Grass should be planted on the bare areas, and topsoil or mulch should be added as needed. Some erosion has occurred around several monitoring wells which should be filled in with topsoil. The surrounding fence should be cleared of brush and mended where needed and some additional signs should be posted.

**Concurrence**

I concur with the U.S. Army’s findings in the Five-Year Review of Interim Remedial Action at Former Area P Lagoons at the Louisiana Army Ammunition Plant dated September 2000. The Army has stated that the remedy is protective of human health and the environment, and will remain so provided the action items identified in the Five-Year Review Report are addressed as described above.

Myron O. Knudson, P.E., Director
Superfund Division (6SF)
U.S. Environmental Protection Agency
Region 6

Date
9/22/00
CONCURRENCES

FIVE-YEAR REVIEW REPORT
for
Louisiana Army Ammunition Plant
Doyline
Bossier and Webster Parishes, Louisiana
EPA ID# LA0213820533
Area P Operable Unit

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Area P Location Map

Geologic Cross Section of LAAP

Topographic Map of Area P

Geologic Cross Section of Area P

RDX Contamination 1996

RDX Contamination 2016
I. Introduction

Sniffen Around has prepared this Five-Year Review of the Interim Remedial Action (IRA) implemented at the former Area P Lagoons at the Louisiana Army Ammunition Plant (LAAP). The task was completed under U. S. Army contract No. DACA31-99-P-0555. It was conducted in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) and U. S. Environmental Protection Agency (EPA) guidance documents (EPA 1991-1999). The actual review was carried out between August of 1999 and May of 2000.

This Five-Year Review is required by statute because "if a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after initiation of the selected remedial action." It is being conducted at LAAP in accordance with CERCLA under the Federal Facilities Agreement (FFA) signed by EPA Region 6, the Louisiana Department of Environmental Quality (LDE-Q), and the U.S. Army on February 10, 1989. It was triggered by the first Five-year report SAIC 1995), which was completed in December 1995.

II. Site Chronology

A study by the U. S. Army in 1980 determined that explosives from Area P had contaminated the ground water under the site. Due to the proximity of Area P to the community of Doyline it was recommended for inclusion on the National Priorities List (NPL) in October of 1984. A Decision Memorandum recommending incineration of the soils and treatment of the water was submitted to the EPA and Louisiana Department of Environmental Quality (LDEQ) in July of 1987. An Interim Remedial Action was initiated in April 1988 as the result of a...
Demand Order by the LDEQ. A Federal Facilities Agreement (FFA) for LAAP became effective on February 10, 1989. In March of 1989 Area P was listed as an NPL site. The incineration and treatment of water were completed in 1990. After restoration, the U. S. Army Corps of Engineers accepted the site as completed on October of 1990. LAAP was divided into site wide groundwater and soil/source Operable Units (OU) in February of 1995. The first Five-Year Review Report was completed in December 1995. A ROD for no further action on soils was finalized in September 1996 for Area P and other sites at LAAP.

III. Background

Physical Setting of LAAP

LAAP is in north Louisiana, 22 miles east of Shreveport (See Figure No. 1). It is in the West Gulf Coastal Plain in an area dominated by pine forests. Most of the plant is flat with some relief caused by erosion around stream drainages. Most of this relief is on the eastern end of the plant near Bayou Dorcheat.

The nearby town of Minden has an average rainfall of 53 inches a year. Winters are cool with an average of only 2 inches of snowfall, while summers are hot with temperatures commonly in the upper 90's.

The growing and harvesting of pine trees is the main crop around the plant. About 70% of LAAP is covered with pine forest and it is periodically cut and sold by the U. S. Army.

History of LAAP

LAAP was constructed in 1941 on approximately 15,000 acres acquired from private landowners. It is a government owned (U. S. Army) and contractor operated (GOCO) facility and has been operated by four different contractors. The primary mission was to load, assemble, and pack ammunition during World War II. The plant was inactive from 1945 until the Korean conflict in 1951. A metal parts facility (Y- Line) was constructed at this time for the manufacture of 155mm projectiles. LAAP was inactive from 1957 until 1962 when the Vietnam conflict started. This activity peaked in 1968, but LAAP has remained active at a much lower level until 1994. Currently the plant has leased some of the facilities to various tenants. They include the Louisiana National Guard, a manufacturer of black powder, a rail car storage company, a company recycling military explosives, prison for Webster Parish, and a manufacturer of metal parts for mortar rounds.
Geology of LAAP

The geology of LAAP is made up of continental and marine deposits that have been filling the Gulf basin. The geologic units underlying LAAP for the first 1000 feet of depth consist of unconsolidated sediments ranging in age from Eocene to Pleistocene. The Pleistocene terrace deposits cover the entire surface of LAAP. The terrace sediments are floodplain and river deposits from the ancestral Red River. Generally they grade from clays and silts at the surface to sand and gravel at the bottom. These river deposits can vary over short distances, which may help explain the limited movement of contaminants. They are flat lying on top of the Eocene deposits, which dip to the northeast. This forms an angular unconformity between the Pleistocene and Eocene deposits (see Figure No. 2).

The youngest Eocene age unit is the Sparta formation which subcrops on the northeastern part of LAAP. It is a major source of groundwater for Minden to the northeast, but is not a well developed aquifer on LAAP. The Cane River Formation subcrops in the central portion of LAAP and is a marine shale. It has acted as a confining layer and prevented the flow of contaminants in a downward direction. On the western end of LAAP the terrace deposits are thicker and have truncated the thinning Cane River formation. The Terrace deposits lay on top of the Wilcox Formation in this area. The Wilcox is made up of nonmarine shale with some sand and lignite. It is estimated that only 20 to 30 percent of the Wilcox is sand. LAAP gets its water supply from Wilcox wells at this time. Their locations are shown on Figure No. 1.

The upper deposits are Terrace and contain all the groundwater contaminants. The Terrace deposits are divided into the Upper Terrace and Lower Terrace sands, which corresponds to shallow and deep wells in clusters. They overlay the Cane River, which has prevented downward migration of contaminants.

Description of Area P

Area P consists of 25 acres and contained 16 unlined lagoons used to dispose of wastewater from the wash down of explosive loading facilities. It is located in the central part of LAAP on the southern boundary, adjacent to the community of Doyline. Area P is one of the highest areas of LAAP (225 feet above mean sea level). It is a flat area with poorly defined drainage as would be expected from an ancient flood plain surface. Figure No. 3 shows the topography around Area P and is a segment of the 1981 U. S. Geologic Survey map.
Louisiana Army Ammunition Plant
Cross Section
Not drawn to scale
History of Area P

Area P was originally used as a burning ground when LAAP first opened in 1941. As the need to dispose of wash down water from explosive loading operations became apparent, lagoons were built in Area P. The burning of explosives in Area P ceased after 1945. More lagoons were constructed during the Korean and Vietnam conflicts. In 1975 an earthen levee was constructed around the site to contain any spills. Since the Interim Remediation Action in 1990, the majority of the site is maintained as an open field. Surrounding Area P are pine forests that are periodically harvested for timber.

Investigations of Area P

Work done in 1979 through 1980 confirmed the presence of explosives in the groundwater under Area P. This was done by installing and sampling monitor wells. Additional wells were installed along the southern boundary in 1981 to determine if off plant migration had occurred. No evidence was found of migration in these shallow wells. Early studies assumed a uniform southward movement of ground water, which is not always true. In 1986 additional wells were put in Area P to determine if the deeper aquifer (Lower Terrace) was contaminated and this was confirmed. Studies at this point in time mistakenly identified this as the Sparta Formation. In 1988 two wells were installed just outside the plant boundary to look for contamination in the Lower Terrace. They have not detected contaminants except on rare occasions and at low levels. See the section on monitoring and sampling for more information. The U. S. EPA requested a monitor well be installed just northwest of Area P in 1988 to verify that no contaminants were moving in that direction. GO168 proved to have a high level of contamination. At this time the contaminated soil in the lagoons was incinerated to remove the source of the ground water contamination. In 1990 pump tests were performed in the Upper and Lower Terrace. In 1996 the U. S. Army Corps of Engineers from Vicksburg, Mississippi initiated the Natural Attenuation Study of Area P.
Contaminants in Area P

The primary contaminants of concern in the soil and ground water at Area P are explosives. They are as follows:

- RDX: Cyclotrimethylenetetranitramine
- HMX: Cyclotetramethylene Tetranitramine
- 2,4,6-TNT: 2,4,6-Trinitrotoluene
- 1,3-DNB: 1,3-Dinitrobenzene
- 2,4-DNT: 2,4-Dinitrotoluene
- 2,6-DNT: 2,6-Dinitrotoluene
- 1,3,5-TNB: 1,3,5-Trinitrobenzene
- NB: Nitrobenzene
- Tetryl: Trinitrophenylmethylnitramine

Ammonium picrate is another explosive that was discovered and confirmed by the natural attenuation study in Area P. The standard (Method 8330) analysis for explosives does not detect this explosive. The solvents Tetrachloroethylene (PCE) and Trichloroethylene (TCE) were first noted in the 1990 work by ES&E Environmental Science and Engineering) and have been confirmed by the PMC (Program Management Company) sampling in 1998. The PMC sampling has shown the presence of dieldrin (DLDRN), which is a pesticide. All these were in monitor wells that already contained very high levels of explosives (see Review of Regulations on page 14) and do not change the plume location.

IV. Remedial Actions

Selection

The Remedial Investigation and Feasibility Study for Area P indicated that explosive wash down water from previous load and pack operations discharged into the Area P lagoons had and would continue to leach into the ground water unless remedial measures were implemented. The Interim Response Action (IRA) that was selected for Area P in order to protect the shallow ground water, consisted of excavation and treatment of lagoon sediment and soil by incineration. The action also included treatment of lagoon water and wastewater generated during the IRA activities. This action was agreed upon by the EPA, LDEQ, and the Army.
Area P Cross Section

Not Drawn to Scale
Implementation

The IRA activities began in 1987 and were completed in 1990. The soils/sediments were excavated and fed into an on-site mobile incinerator that was operated by IT Corporation. The soils and sediments that were removed contained greater than 100 milligrams per kilogram (mg/kg) of HMX and RDX. Confirmatory sampling was then conducted to ensure that the remaining soils/sediments were below the 100 mg/kg concentration levels for these constituents. After the excavated soil was incinerated, the treated soil was returned to the excavated lagoons to fill in the excavation. The filled lagoons were then covered with a cap. The cap was constructed with clay two feet thick followed by four inches of topsoil planted with grass. A four-strand barbed wire fence four feet in height was installed around the cap and the area was posted with a sign reading "Area P Decontamination Zone". The wastewater pumped from the lagoons was treated with carbon filters and reverse osmosis and discharged once it met compliance requirements per the National Pollutant Discharge Elimination System (NPDES)

Operations and Maintenance

The overall goal of the maintenance plan for Area P is maintaining the integrity of the cap over the site. The cap is designed to shed rainfall off to the sides. Water should never be standing on the cap. Some water does infiltrate the cap, it is not an absolute barrier to water. The cap also acts as a physical barrier to protect the treated and untreated soil below it from erosion.

The site maintenance plan requires mowing of the cap at lease twice a year. It requires quarterly inspections of the cap and fence. These inspections can be required more often if repairs are made or unusual weather conditions occur. The plan states that a bound maintenance log is kept at LAAP along with the maintenance plan and will record all inspections, their results, and any maintenance activities. These inspections should be recorded in the logbook and signed and dated by the person making the entry. The plan is designed for a new site and can be modified by request to the EPA and LDEQ as experience demonstrates the need for modifications.

A review of the logbook for Area P has shown that it has not been maintained since 1994. The inspections and maintenance have been carried out since then, but not recorded. The plant went from 1700 employees to 20 during this time frame and many duties were not continued. The logbook should be used to document the activities that have been ongoing.
The plan states that monitor wells shall be sampled semiannually." This statement is in the middle of a paragraph that is primarily aimed at making sure the sampling does not damage the cap. When this plan was written it was assumed that a long term monitoring plan would be in effect in a year or two. The first Five-Year Review sampled some of the wells on a onetime basis. The Natural Attenuation Study was started in 1996 and samples the wells 3 to 4 times a year. These monitor wells are in and around Area P and more than satisfies the requirement.

The only ongoing problem has been the bare areas on the cap. They were first noted in 1992 and several attempts have been made to get grass to grow on them. A more aggressive program needs to be implemented. Minor damage to the fence has resulted from small trees falling on it. These repairs have been easy to mend.

The annual maintenance expenses are estimated at $15,000.00 or less per year. Sampling and analysis of the monitor wells costs about $300,000.00 per year.

Progress in the Last Five Years

The last five-year review was completed in 1995 and concluded the cap was effective in protecting the remaining untreated soil from the environment. There was also statistical evidence of a reduction in contaminants in the ground water. The Natural Attenuation Study is the major work done on Area P since the last five-year review. The study was initiated by the U. S. Army in 1996 as a research project to demonstrate that natural attenuation could be an effective solution to reducing explosives in the ground water. There are three indications that natural attenuation of explosives is effective. The plume has been reduced or is static. There is a statistically significant decline in the concentration of explosives in the data set. There is an overall decline in the mass of explosives in the ground water. The sampling has been continued after the original two years of the research study to verify the results over a longer period of time. The Natural Attenuation study sampled the cap in three locations and verified that it retards the downward movement of water as it was designed.

Ground water at Area P is being addressed in the site wide ground water unit which is in progress.
V. Five-Year Review Process

Five-year Review Team

Ann Baines – Risk Assessor (Program Management Company)
Steve Flowers -- Environmental Engineer (Valentec)
Paul Hagerty – LAAP Forester
Danny Harrelson – U. S Corps of Engineers (natural attenuation study)
Don Koch – groundwater model (Engineering Technologies Associates)
William A. Sniffen – Hydrogeologist
Doyle Williams – U. S. Army (LAAP)

Community Notification

The following notice was placed in the Minden Press-Herald newspaper and run in the legal section on January 27, 28, and 31, 2000:

Public Notice
Five Year Review of Area P
Louisiana Army Ammunition Plant

January 2000

A review of the environmental restoration at Area P on Louisiana Army Ammunition Plant (LAAP) is required by federal law every five years to ensure the protection of human health and the environment. The original work was completed in 1990 and this is the second review of this site. This is notice that the review is in progress and the final report will be available at LAAP when it is complete. Any interested parties should contact Doyle Williams at (318) 459-5108

As of this report, there have been no responses to the newspaper notice.

Five-Year Review Tasks

(1) Document Review

The Maintenance Plan for the Former Area P Lagoons at LAAP has been reviewed to verify compliance. In addition, the Interim Remedial Action documents, Final Report on Decontamination Operations (Area P) at the
Louisiana Army Ammunition Plant, the last Five-Year review of Area P, and all operation and maintenance records for Area P have been reviewed.

(2) Review Regulations

A search has been carried out for all federal, state, and local regulatory changes that might affect the remedial action. The purpose of this search is to identify any changes that affect the validity of the assumptions that were made in establishing the original cleanup levels. These may include any Applicable or Relevant and Appropriate Requirements (ARAR's), contaminant characteristics and/or potential exposures.

(3) Data Review

All available ground water sampling that has occurred since the last five-year review has been reviewed for trends. This includes data from the Natural Attenuation Study by the Corps of Engineers and the sampling by Program Management Company (PMC) for the Follow-on Remedial Investigation of LAAP.

(4) Interviews

Interviews were completed of people from the Army, regulators, contractors, and the community. The purpose of these interviews is to identify successes and problems with the remedy implementation and develop an understanding of current site status.

(5) Site Visit

A visual inspection of the site was done to verify the integrity of the clay cap. This looked for stressed vegetation, signs of erosion, subsidence, vegetation control, and the condition of the fence around the site. A check was made for visual signs of explosives which were common before the remediation.

(6) Community Notice

A public notice was run in the Minden paper for three days.

(7) Report

This report summarizes the findings and makes recommendations. It includes significant comments made by the individuals that were interviewed.
VI. Five-Year Review Findings

Monitoring and Sampling Data

The ground water data collected since the last five-year review has been evaluated and compared to previous data for Area P. The U. S. Army Corps of Engineers Waterways Experiment Station (WES) in Vicksburg, Mississippi has been conducting research at Area P since 1993. In 1996 they started the Natural Attenuation Study to determine if explosive contaminants are breaking down naturally.

The Natural Attenuation Study groundwater sampling was monthly for the first six months and has continued quarterly ever since. They selected 30 monitor wells for the first six months of groundwater sampling. Program Management Company (PMC) sampled Area P in the fall of 1998 as a part of the Follow-on Remedial Investigation. This data has been combined with the Natural Attenuation Study and reviewed. Both sets of data were released to Sniffen Around for this Five-year Review of Area P. Most of the data is in a preliminary form and has not been released by the Corps or PMC at this time. The Corps has written and released a report in 1999 titled Natural Attenuation of Explosives In Soil and Water Systems at Department of Defense Sites: Interim Report, U. S. Army Corps of Engineers, Waterways Experiment Station (WES), Vicksburg, Mississippi. This report includes the data for the first two years of their work.

The main conclusion that can be drawn from the data is the lack of movement of the contaminants in the twenty years of data collecting. Both the first Five-Year Review (1995) and The Natural Attenuation Study (1999) found an overall decrease in contaminants. This Five-Year Review came to the same conclusion from the available data. There is a predominance of non-detection of contaminants in wells around Area P. Figure No. 5 shows the area of contamination (RDX) in 1996. In the twenty years of sampling, this has always been the area of highest concentrations of contaminants. The plume is confined to original site and shows signs of shrinking. Figure 6 shows the projected plume in 2016 according to the Natural Attenuation Study.

Review of Regulations

Federal, state, and local regulations have been reviewed for changes that could affect the site. This search was conducted using all available sources of information. It should be noted that the ground water was separated into a separate unit and is still under consideration. No changes were found for explosives in soils. The original limit of 100 ppm explosives in the soil was agreed on just for this project.
Initial distribution of RDX concentration (February 1996)

Figure No. 5
Source: WES 1999
There were no regulatory changes that would make the Interim Remedial Action not be protective of the environment. The lower limits were already exceeded and do not change the original goals of the action.

**Interviews**

Interviews have been conducted of significant people such as LAAP employees, residents, and regulators. They were chosen because of their involvement with the project over a period of years and their opportunity to be aware of public concerns. They were contacted by telephone or in person. Their significant comments are recorded as follows:

*Name: David Beaird*  
*Title or position:* Owner of David's Pharmacy in Doyline, Louisiana  

Mr. Beaird is a pharmacist and served on the advisory committee for the incineration project in the late 1980's. He is a long time resident of Doyline and has regular contact through his business with a large portion of the other residents of Doyline. He is unaware of any concerns of the residents of Doyline. He felt that too much money and time was spent on the original project. He is glad that natural attenuation is being considered for the final remediation because it is a low cost alternative.

*Name: Steve Flowers*  
*Title or Position:* Environmental Engineer for Valentec Systems, Louisiana Army Ammunition Plant  

Mr. Flowers was originally employed by Thiokol Corp., who was the operating contractor for LAAP. Valentec Systems is the current operating contractor for LAAP. He has been an engineer for LAAP since 1988 and in the environmental department since 1990. He primarily handles permitting with the USEPA and LDEQ for LAAP. He is unaware of any outstanding concerns with the Interim Remedial Action at Area P.

*Name: Dallas Garner*  
*Title or Position:* Employee of Doyline Water District, Doyline, Louisiana  

He has been a resident of Doyline since 1963 and was a former employee of LAAP. Mr. Garner operates the Doyline water system that involves maintenance and billing of customers. He assists any contractors who sample the Doyline
wells for the Army. He was an employee of LAAP from 1963 to 1994. He has not heard any complaints about the remediation at Area P.

Name: Danny Harrelson
Title or position: Project Manager for the U. S. Army Corps of Engineers, Waterways Experiment Station, Vicksburg, Mississippi.

Mr. Harrelson is project manager for the Monitoring Natural Attenuation Study of Area P and has been involved in Area P studies since 1993. Mr. Harrelson has been physically present at LAAP for the majority of the project. He says the Corps of Engineers work shows natural attenuation is working at Area P. He states that the following evidence is proof that natural attenuation of explosives is effective. The plume has been reduced or is static. There is a statistically significant decline in the concentration of explosives in the data set. There is an overall decline in the mass of explosives in the ground water.

Name: Don Koch
Title or position: Vice President of Engineering Technologies Associates (ETA)

Mr. Koch has been supervising the ground water modeling for LAAP since 1989 and is currently involved in the update of the LAAP model. He is involved in modeling efforts at many sites nationwide and compared to other sites he has studied, the contaminants are moving very slowly at Area P.

Name: James McPherson
Title or position: Commander's Representative for LAAP

The plant no longer has an on-site commander which made Mr. McPherson the highest U. S. Army personnel on site. He had been at LAAP since 1970. Even when LAAP had a commander, he was the highest civilian on site. This position made him very much aware if there were environmental problems or public complaints at LAAP. He was satisfied with the progress.

Name: Doyle Williams
Title or position: Environmental Coordinator for Louisiana Army Ammunition Plant

Mr. Williams came to LAAP in 1969 and has been involved with the environmental program for twenty years. He feels the Interim Remediation Action at Area P has been very effective because of the overall reduction in contamination as shown by the first five-year review and the natural attenuation study. Both of these are the result of ground water sampling. He does have a concern about the occasional
traces of explosives found in monitor wells around Area P that are normally below detection limits.

*Name: Duane Wilson*
*Title or position:* Louisiana Department of Environmental Quality, Baton Rouge, Louisiana

Mr. Wilson is in Inactive and Abandoned Sites. He has been involved with this site for eight years. Since the contaminants left at this site had been significantly reduced by the incineration and then protected by a cap, it reduces his overall concern. Also he was not aware of any public concerns about the site.

*Name: Caroline Ziegler*
*Title or position:* Superfund Project Manager for Louisiana, U. S. EPA, Region VI, Dallas, Texas

She is satisfied with the original Area P action (incineration of soil) but is interested in maintaining the progress. She has been involved since 1997.

**Site Inspection**

The cap at Area P was inspected for signs of deterioration on January 18, 2000. This includes erosion, subsidence, stressed vegetation, mowing, and maintenance of the fence. Photos were taken of Area P on March 23, 2000 to show the present condition of the site. The photographs are number 1 through 10 and are located in the Appendix. On the whole the cap is in good condition (Photographs 1-6, and 10). It does have an ongoing problem with bare areas with no vegetation (Photographs 7 and 8). These areas are the result of poor soil for the growth of vegetation. The bare areas have not created erosion problems. Photograph 9 shows the only erosion on the cap and it does not appear to be increasing. It will be filled with soil and grass planted. Fallen trees have damaged the fence in three locations. There is a need for cleaning vegetation from around the fence so it can be inspected and maintained.

The site inspection was the only activity carried out on the Area P site and all LAAP health and safety requirements were followed. The remaining contaminants are below the cap or in the ground water at a depth of 10 to 20 feet. Only sampling the monitor wells would bring someone into contact with the contaminants. Before the incineration of the soils, it was common to find explosives and visual indications of explosives in and around the lagoons. Since the completion of the incineration in 1990, no visual signs of explosives have been found at Area P.
Risk Assessment

While conducting the risk assessment in support of the ROD which included Area P (The Seven Soil/Source Areas ROD, ES&E 1996), the findings showed that no risk remained at this site after completion of the Interim Remedial Action (IRA). Therefore, no further remedial action was warranted. There have been no changes to the ARAR's that would change the conclusions of the Risk Assessment. The original remedial action objectives for Area P included protection of the ground water and prevention of direct contact with the soils. The IRA met these objectives by removing chemical constituents from the soils and lagoon water. There have been no changes to land use therefore the original remedial action objectives are still viable. The Army controls access to Area P and LAAP is a secure facility.

VII. Assessment

Based upon a review of existing data, the remedial action objective relating to prevention of direct contact with the soils is being met because 97% of the explosives in the soil were removed. In addition, the area is a capped and surrounded by a fence which limits access. There were, however, some parts of the fence that were damaged as noted during the site inspection. These will require repair. The bare areas should have topsoil put on them and be planted with grass.

The remedial investigation for ground water has not been completed. All issues relating to ground water will be addressed by this work.

VIII. Deficiencies

There are no major deficiencies as far as the original incineration and capping of Area P.

IX. Recommendations and Follow-up Actions

There are no major recommendations or follow-up actions for the maintenance of the cap. There is a need to continue monitoring the ground water to verify that contaminants are not migrating. Remaining ground water issues are being addressed in a site wide (all of LAAP) unit for ground water.

Better records of site inspections and maintenance activities need to be kept. Grass should be planted on the bare areas, and if topsoil or mulch is needed use it. The little bit of erosion around monitor wells GO109 and 110 should be filled.
with topsoil. The fence should be cleared of brush and mended where needed. Additional signs will be posted around Area P.

**X. Protectiveness Statement**

The Remedy is protective because the remedial action at Area P (operable unit) protects human health and the environment. The Interim Remedial Action removed 97% of the source material. Continued monitoring of the ground water shows an overall reduction in contaminants. A final ROD for the ground water is under study by contractors for the U. S. Army.

**XI. Next Review**

The next five-year review of Area P will be due October of 2005.

**XII. References**

Environmental Science & Engineering, Inc. 1996. Final Record of Decision (ROD) for Louisiana Army Ammunition Plant, Soil/Source Operable Unit (OU), S Shreveport, Louisiana


Wilson, Duane, telephone conversation, March 8, 2000, Louisiana Department of Environmental Quality, Baton Rouge, Louisiana

XIII. Appendix

Site photographs
Air photograph
Area P Site Map
Photo Number 1
Looking north at the entrance gate

Photo Number 2
Looking northeast from the entrance gate
Photo Number 3
Looking northwest at the entrance gate

Photo Number 4
Looking west from the entrance gate
Photo Number 5
Looking east from the edge of the cap showing steep slope

Photo Number 6
Looking west from the edge of the cap showing steep slope
Photo Number 7
Looking northeast showing bare area on cap

Photo Number 8
Looking north showing bare area on cap
Photo Number 9
Looking northeast from the center at the only erosion in the center of photo

Photo Number 10
Looking south from the north edge of cap at tent
Air Photograph of Area P
Monitor well locations are shown
Taken in January of 1997