THE MEMPHIS DEPOT
TENNESSEE

ADMINISTRATIVE RECORD
COVER SHEET

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DRAFT

SAMPLING AND ANALYSIS PLAN FOR FISH SAMPLING AT THE DEFENSE DISTRIBUTION DEPOT, MEMPHIS, TENNESSEE

Prepared for:

U.S. Army Corps of Engineers
Mobile, Alabama

Prepared by:

Radian International LLC
1093 Commerce Park Drive, Suite 100
Oak Ridge, Tennessee 37830
Doc. #D9806302.MW97

July 1998

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Sampling and Analysis Plan

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ACRONYMS

BRA	Baseline Risk Assessment
DDT	Dichlorodiphenyltichloroethane
EPA	U.S. Environmental Protection Agency
Radian	Radian International LLC
USACE	U.S. Army Corps of Engineers

1.0 INTRODUCTION

Radian International LLC (Radian) has been contracted by the U.S. Army Corps of Engineers (USACE) Mobile District to provide engineering services at the Defense Distribution Depot, Memphis, Tennessee (hereinafter referred to as the Depot). These services are being performed under USACE Delivery Contract No. DACA01-95-D-0015, Delivery Order 0041, funded by the U.S. Department of Defense.

The Depot is located in the south central section of Memphis, Tennessee. It is was closed in September 1997. A nine-hole golf course is located on the southeast corner of the Depot. It is anticipated that the golf course will continue to be used after the Depot is closed. The golf course includes two surface water impoundments: Lake Danielson and the golf course pond.

Lake Danielson is approximately 4 acres in size and varies in depth from 2 ft to at least 14 ft. The golf course pond is approximately one-third acre in size and approximately 3 ft deep. Both ponds receive runoff from large areas of the Depot. Historical pesticide use at the Depot apparently led to contamination of sediments in the ponds.

Lake Danielson was periodically stocked with bluegill and bass. Catfish have also been observed in the lake in the past.

2.0 PREVIOUS INVESTIGATION

Sediment, water, and fish tissue samples were collected from Lake Danielson and the golf course pond and analyzed for pesticides in 1986. Chlordane, dichlorodiphenyl-trichloroethane (DDT), dichlorodiphenyldichloroethane, and dichlorodiphenyldichloroethene were detected in sediment and fish samples [U.S. Army Environmental Hygiene Agency 1986]. Water in the ponds was found to be essentially uncontaminated. The use of DDT for pest control was discontinued in 1980. Fishing and swimming in the golf course impoundments have been banned since 1986.

In early 1997, Radian performed a baseline risk assessment (BRA) for the golf course impoundments to support remediation decisions for the ponds. The BRA was based on the 1986 contaminant data and the assumption that a male youth would routinely catch and eat fish from the ponds for several years. Very conservative assumptions were used in the quantification of human health risk resulting from this activity. The BRA concluded that direct exposure to water and sediment in the ponds would not result in unacceptable human health risks. However, the BRA further concluded that pesticide residues in fish tissue might pose an unacceptable risk to the health of humans ingesting the fish.

Data gaps regarding the method of fish tissue sample preparation during the 1986 sampling episode were a significant source of uncertainty for the risk assessment results. The small number of samples collected and the period of time elapsed since the samples were collected also contributed significantly to uncertainty in the BRA results. It was recommended that additional samples of sediment and fish tissue be collected and analyzed for pesticides and that the resulting data be used to re-evaluate human health risk.

This additional sampling was performed in late September and early October 1997. However, the only fish species observed in or captured from Lake Danielson was the Arkansas shiner (*Notropus girardi*), a non-edible bait fish. No fish were observed in or captured

from the smaller golf course pond. No address uncertainties regarding the existence of other fish species in the ponds, Radian was directed to use electroshocking to attempt to catch additional fish species. This Sampling and Analysis Plan describes the field activities that will be conducted to attempt this additional fish collection.

3.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

Mr. Lloyd Hinkle will serve as the Project Manager. In this role, Mr. Hinkle will have overall responsibility, authority, and accountability for the project. He will function as the primary interface between the USACE, Radian management, and the project team. In executing these duties, he will:

- Have responsibility for meeting all contractual requirements for the task;
- Administer and supervise all contractual requirements for the task;
- Direct the formulation of work plans in accordance with client directions;
- Have responsibility for ensuring that required staffing levels and technical expertise are provided;
- Keep the USACE Technical Manager informed on all aspects of the project, including expenditures, progress, problems, and recommended solutions; and
- Review every technical project output prior to issue.

Ms. Patrice Cole will serve as the task leader for this project. In this capacity, she will be responsible for organizing and directing the technical activities of the project and for reporting the results of these activities. In execution of these duties, Ms. Cole will:

- Ensure that planned activities are executed in accordance with this and other applicable plans;
- Advise the Project Manager of technical progress, expenditure, program needs, potential problems, and recommended solutions;
- Ensure technical quality of reports, memoranda, and other communications; and
- Maintain contact with the USACE Technical Manager in areas that require decisions on technical matters.

Ms. Cole will also serve as the site health and safety officer during all field activities.

4.0 FISH SAMPLING

The objective of the field work is to attempt to collect samples of edible fish tissue from the golf course impoundments for pesticide analysis. Any new analytical data thus obtained will be used to re-evaluate the human health risk associated with ingesting fish from the ponds. The fish sampling will also provide more definitive information on the current condition of fish populations in the ponds. This will help evaluate the degree to which the exposure assessment, which assumes that it is possible to routinely catch edible fish from the ponds, is realistic.

Radian will attempt to collect at least five specimens of each edible species of fish from each pond. The edible fish species that may reside in the ponds include sunfish (*Lepomis* sp.), smallmouth bass (*Micropteris dolomieui*), largemouth bass (*Micropteris salmoides*), and catfish (family Ameiuridae).

The smaller pond is approximately 3 ft deep with riprap sides. Lake Danielson is at least 14 ft deep in places with vertical sides and no boat ramp. Trotlines, catfish traps, and angling are the fish collection methods that were previously used to collect fish from Lake Danielson. Since these methods were successful in obtaining only Arkansas shiners, electroshocking and gill nets will be used in a final attempt to collect additional fish species.

A 17-ft aluminum boat equipped with an electro-fishing system will be launched from the side of Lake Danielson. The boat will pass over the entire surface of Lake Danielson and shock to the maximum depth (up to 8 ft) that can be affected by the electro-fishing system. The smaller golf course pond will be electroshocked in the same manner. One to two gill nets will be placed in each pond and left overnight.

Each captured fish will be identified to species, weighed, and measured by length. A field notebook will be used to record the date, time, location, and method of capture for each fish, along with any other pertinent information regarding field conditions and handling of samples. Each whole fish belonging to one of the taxa listed above will be wrapped in aluminum foil, sealed in a plastic bag with tamper-resistant custody tape, labeled, and placed into an

airtight, insulated container with dry ice. Fish samples will be numbered sequentially as they are collected, beginning with F-1. The samples will be shipped overnight to the analytical laboratory, which will be directed to filet the fish and analyze the filets, with skin, by U. S. Environmental Protection Agency (EPA) SW-846 Method 8081. Field personnel will maintain custody of all samples until shipment. Chain-of-custody records will be maintained to document that samples were not tampered with from the time they were collected until they were received by the analytical laboratory. A sample chain-of-custody form is included in Appendix A.

If more than five individuals of each taxon are collected, the five largest fish of each taxon will be sent to the laboratory for analysis. The remaining fish will be returned to the ponds.

Table 4-1

Pesticides Analyzed by EPA SW-846 Method 8081

Aldrin	4,4' -DDD	Methoxychlor
alpha-BHC	Dieldrin	Aroclor 1016
beta-BHC	Endosulfan I	Aroclor 1221
gamma-BHC (Lindane)	Endosulfan II	Aroclor 1232
delta-BHC	Endosulfan sulfate	Aroclor 1242
Chlordane	Endrin	Aroclor 1248
alpha-Chlordane	Endrine aldehyde	Aroclor 1254
gamma-Chlordane	Endrin ketone	Aroclor 1260
4,4' -DDT	Heptachlor	Toxaphene
4,4' -DDE	Heptachlor epoxide	

Appendix A

CHAIN-OF-CUSTODY RECORD

CHAIN-OF-CUSTODY RECORD

PROJECT NAME:

PROJECT NUMBER:

SAMPLERS (SIGNATURE)

PRINTED NAME

CLIENT ID (9 CHARACTERS)									#	GC/MS					GC							INORGANICS				OTHER											SAMPLING/INFO		REMARKS
1	2	3	4	5	6	7	8	9	No. of Bottles/Vials:	624-8240	625-8270	CLP-VOA	CLP-SVOA	Other:	601-8010	602-8020	608-8080	8140	CLP Pest/PCBs	Herbicides	Other:	Metals	Cyanide	CLP Metals	Other:	TIX	TOX	Oil & Grease	Pet. Hydro.	Phenols	Neutron Activation					MATRIX: Water/Soil/Sediment	DATE	TIME	

RELINQUISHED BY:	Date/Time	RELINQUISHED BY:	Date/Time	RELINQUISHED BY:	Date/Time	SHIPPING INFORMATION
COMPANY NAME:		COMPANY NAME:		COMPANY NAME:		Number of Shipping Containers:
RECEIVED BY:	Date/Time	RECEIVED BY:	Date/Time	RECEIVED BY:	Date/Time	Method of Shipment
COMPANY NAME:		COMPANY NAME:		COMPANY NAME:		
RELINQUISHED BY:	Date/Time	RELINQUISHED BY:	Date/Time	RELINQUISHED BY:	Date/Time	Special Handling Requirements-
COMPANY NAME:		COMPANY NAME:		COMPANY NAME:		

TAB

Safety and Health Plan

DRAFT

SAFETY AND HEALTH PLAN FOR FISH SAMPLING AT THE DEFENSE DISTRIBUTION DEPOT, MEMPHIS. TENNESSEE

Prepared for:

U.S. Army Corps of Engineers
Mobile, Alabama

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ACRONYMS

AOE	Arising Out of Employment
CDHS	Corporate Director of Health and Safety
CFR	Code of Federal Regulations
COE	Course of Employment
CPR	Cardiopulmonary Resuscitation
DDD	Dichlorodiphenyldichloroethane
DDE	Dichlorodiphenyldichloroethene
DDT	Dichlorodiphneyltrichloroethane
EAC	Environmental Affairs Coordinator
HAZWOPER	Hazardous Waste Operations and Emergency Response
HRA	Human Resource Administrator
HSO	Health and Safety Officer
OSHA	Occupational Safety and Health Administration
PPE	Personal Protective Equipment
QA	Quality Assurance
Radian	Radian International LLC
SSHP	Site-Specific Safety and Health Plan
TLV	Threshold Limit Value
USACE	U.S. Army Corps of Engineers

1.0 HEALTH AND SAFETY

1.1 Project Objectives

The objective of this project is to conduct fish tissue sampling at the Defense Distribution Depot, Memphis, Tennessee (hereinafter referred to as the Depot) golf course pond. The samples will be analyzed for pesticide contamination, and the results will be used to determine whether remediation of contaminated sediment and/or fish is required to protect public health.

To ensure the health and safety of project personnel during this effort, this Site-Specific Safety and Health Plan (SSHP) was prepared in accordance with Occupational Safety and Health Administration (OSHA) requirements, U.S. Environmental Protection Agency hazardous waste requirements, and the U.S. Army Corps of Engineers (USACE) Safety and Health Requirements Manual (EM 385-1-1).

1.2 Site-Specific Safety and Health Plan Objectives

This SSHP contains safety and health guidelines to be followed by Radian International LLC (Radian) during field activities performed at the Depot golf course pond. Field activities will not be performed until the SSHP is reviewed and accepted by the Contracting Officer for USACE Mobile District. This plan identifies persons responsible for administering the plan and their specific duties, training and medical monitoring, health and safety equipment, and standard operating procedures.

1.3 Radian Safety and Health Policy

Figure 1-1 is the Radian Occupational Safety and Health Policy.

April 1, 1995

Radian believes that safety and property loss prevention are equal in importance to product quality, client responsiveness, and cost control.

The fundamental responsibilities of management in this area are to prevent injury and property loss through the identification and elimination of potential hazards. The ultimate responsibility for safety rests with management. Therefore, it is necessary that:

- all employees be encouraged through training, leadership, and example to appreciate the need for safety awareness on and off the job;
- equipment and processes in our facilities be properly designed and maintained;
- all supervisors accept responsibility for the enforcement of safety procedures; and
- all employees accept their responsibility to work safely and extend this concern to their fellow employees.

Furthermore, Radian will comply with the Williams-Steiger Occupational Safety and Health Act, Resource Conservation and Recovery Act, and all federal, state, and local regulations involved in promoting safety and health in the workplace and the environment.

Donald M. Carlton
President
Radian Corporation

Figure 1-1. Radian Occupational Safety and Health Policy

2.0 REVIEW OF POTENTIAL HAZARDS

The golf course ponds are located in the southeast corner of the Depot. Gill nets and a boat-mounted electroshocking unit will be used in an attempt to obtain edible fish from the ponds.

2.1 Site Hazard Assessment/Prevention

The evaluation of hazards is based on knowledge of the site background and anticipated risks posed by specific field activities. This section outlines the chemical and physical hazards that may be encountered while conducting field activities.

2.1.1 Chemical Hazards

Dichlorodiphenyltrichloroethane (DDT), dichlorodiphenyldichloroethane (DDD), and dichlorodiphenyldichloroethene (DDE) are the contaminants of interest in the golf course pond. It is not anticipated that elevated levels of these or other chemicals will be detected while collecting samples. However, Radian personnel will wear latex gloves and chemical-resistant paper coveralls while handling fish.

2.1.2 Physical Hazards

Physical hazards encountered while sampling at the site are primarily associated with the sampling equipment and working near a water body. The smaller pond is approximately 3 ft deep, and Lake Danielson is at least 14 ft deep in places. Fish sampling will be conducted from a 17-ft aluminum boat.

Drowning could result from falling into the ponds from the sides of the ponds or from a boat. Radian personnel and subcontractors will exercise caution and will wear U.S. Coast Guard-approved personal floatation devices while working in a boat. Additionally, sampling personnel will be instructed to not stand in the boat, and they will be capable of swimming.

The voltage of the power source used for electroshocking is low enough that it is unlikely to cause injury beyond discomfort for personnel who might accidentally come into contact with the probes or pond water during electroshocking. However, insulated rubber gloves will be worn, and fiberglass handled dip nets will be used while electro-fishing.

2.1.3 Biological Hazards

On-site workers must be aware of several potential natural hazards. Poisonous plants such as poison ivy, poison oak, and sumac are unlikely to be encountered on the golf course due to standard maintenance practices. However, stinging insects might be present. Insect stings from bees, wasps, and hornets can cause mild irritation to severe allergic reactions, depending on the kind of insect, number of stings, and reaction of the victim. Stings should immediately be treated with the first aid kit maintained on-site. If the victim indicates that he or she is allergic, or shows signs of allergic reaction, transport the victim to the nearest hospital emergency room for treatment. Workers who have known allergies to insect stings shall be identified before work starts.

Poisonous snakes in West Tennessee include the water moccasin, copperhead, and eastern diamondback rattlesnake. These snakes are classed as pit vipers and inject neurotoxins by biting. Adults in good health can die from the bites of these snakes but usually suffer illness, severe pain, and tissue necrosis. If someone is bitten, keep the victim calm and immobilize the affected limb. Administer first aid and transport the victim immediately to a hospital emergency room for treatment. It is important to identify the kind of snake, if this can be done without danger, so that proper treatment can be administered.

2.1.4 Weather Conditions and Heat Stress

Weather conditions will be monitored by the task leader. Any thunderstorms and/or high winds in proximity of the site will warrant shut down of all sample collection activities.

Heat stress is the aggregate of environmental and physical work factors that constitute the total heat load imposed on the body. The environmental factors of heat stress are air temperature, radiant heat exchange, air movement, and humidity. Physical work and personal protective equipment (PPE) worn by employees will add to the total heat load imposed on the body. To minimize heat stress, rest periods will be given to employees when temperatures exceed 85°F. This is particularly important for unacclimated workers. A 10-minute rest period each hour is recommended for unacclimated workers (i.e., workers who have not been working in high temperature conditions). Light-colored clothing, sunglasses, sunscreen, and hats will be used if weather conditions call for them.

Field activities will be temporarily discontinued in the event of high winds, heavy rain, or lightening in the sampling area. Field activities will resume after the threat of inclement weather has passed.

2.2 Field Tasks to be Performed and Hazard Prevention

Upon final approval of the required work plans, the field crew will be mobilized to the site to begin collecting necessary samples. Samples will be collected as outlined in the Sampling and Analysis Plan. Table 2-1 describes specific potential hazards and preventative measures that will be followed while conducting the sampling.

When launching and retrieving the boat, caution will be exercised in ensuring sure footing to avoid falling into the water. Personal floatation devices will be worn at all times when in a boat. Caution will be exercised when in a boat (e.g., no standing or sudden movements) to avoid capsizing the boat. Outdoor work will be discontinued in the event of inclement weather.

Table 2-1

Hazard Analysis List

Potential Hazards	Recommended Controls
Trips, slips, and falls from uneven surfaces and heavy vegetation	Be alert and observe terrain while walking to minimize slips and falls. Remove trip hazards from walkways and be aware of wet surfaces
Allergic reaction to poisonous plants	Wear long-sleeved clothing and pants to minimize contact with irritant plants and protect against insect bites
Native wildlife such as snakes, ticks, insects, and rodents	Avoid wildlife when possible. In the case of an animal bite, administer first aid. Check for ticks when leaving wooded or vegetated areas. Determine whether staff members are allergic to bee stings and, if so, have medication available
Back strain from carrying instruments	Use proper lifting techniques; distribute heavy loads between two people
Accidents from driving vehicles on uneven or unsafe surfaces (overturned vehicles or flat tires)	Ensure maintenance has been performed on vehicles. A site surveillance on foot might be required to choose a clear driving path
	Wear seat belts
Heat stress from extreme weather conditions	Implement heat stress management techniques such as frequent breaks, monitoring fluid intake, and monitoring employees
Drowning	Wear approved floatation device while working in the boat. Do not stand in boat. Discontinue field activities during inclement weather
Lightening strike	Discontinue field activities during inclement weather
Electric shock	Do not touch any non-insulated objects

3.0 KEY PERSONNEL AND RESPONSIBILITIES

3.1 Program Manager

The Program Manager for this task will be Mr. Lloyd Hinkle, P.E. He is responsible for the health and safety of all members of the project team. To carry out that responsibility, the program manager will ensure that all team members follow the health and safety guidelines provided in the *Radian International LLC Health and Safety Manual* (March 1996). He will ensure that project members are familiar with appropriate plans required to execute the field efforts and that these plans are in place and understood by all participants. He will ensure that required levels of training are provided to members of the team and that this training is up-to-date.

Mr. Hinkle will also ensure that health and safety is a high priority in planning field work, that appropriately trained project staff are selected, and that adequate resources are available to develop and implement this SSHP. He will ensure that the plan is reviewed/approved by an Environmental Affairs Coordinator (EAC). It is the responsibility of the task leader to respond to an unsafe condition reported by the project staff and to work with the staff to mitigate unsafe conditions.

3.2 Task Leader

Ms. Patrice Cole is the task leader for the project and, as such, will have responsibility for day-to-day management of the project, to include health and safety oversight. She will be responsible for performing a detailed hazard analysis of the work to be performed and ensuring that site-specific health and safety training is provided to team members prior to mobilization to the site. Ms. Cole has 8 hours of Hazardous Waste Operations and Emergency Response (HAZWOPER) supervisory training, and she will conduct site-specific health and safety training before field activities begin to ensure that each member is thoroughly familiar with and has signed this SSHP and other pertinent work plans (see Section 10.0). Ms. Cole will be responsible for monitoring compliance of this SSHP during project execution and reporting up through the project manager, who has overall accountability. Ms. Cole will also coordinate

activities with Radian personnel and subcontractors at the site to ensure safe completion of the project.

The task leader is responsible for managing the execution of each specific task. The responsibilities of the task leader are to:

- Ensure that activities planned are executed in accordance with this plan;
- Ensure that technical personnel are qualified by experience or training to perform assigned work and comply with the technical and quality assurance (QA) requirements applicable to the work being performed; and
- Ensure that proper PPE is available and used.

The task leader will also act as the QA officer. The QA officer is responsible for:

- Providing QA guidelines and directions to field personnel;
- Serving as the focal point for QA activities and ensuring that activities are conducted in accordance with the work plan objectives; and
- Reviewing, as appropriate, project documentation.

3.3 Site Health and Safety Officer

Ms. Cole will act as the Health and Safety Officer (HSO). Ms. Cole will be responsible for implementing field surveillance activities necessary to ensure that worker health and safety concerns are fully addressed, including adhering to the SSHP requirements. She will provide site-specific training to employees assigned to work at the site and enforce the requirements stated in the *Radian International LLC Health and Safety Manual* and this SSHP.

As the HSO, Ms. Cole has the authority to order the immediate evacuation of personnel from any area of the site that may be determined unsafe, require personnel to obtain immediate medical attention if warranted, and provide health and safety briefings to visitors; however, any member of the project team that identifies an unsafe act or situation has the authority to stop work.

4.0 TRAINING REQUIREMENTS

Personnel working at any hazardous waste site must recognize and understand the potential safety and health risks associated with work at that site. Workers involved in site activities must be thoroughly familiar with programs contained or referenced in this SSHP. Training requirements for personnel involved in hazardous waste operations will comply with 29 Code of Federal Regulations (CFR) 1910.120 (OSHA) regulations for HAZWOPER. Refer to Appendix B for individual employee training and medical certification dates.

4.1 General Site Workers Training

Site workers who are engaged in hazardous substance removal or other activities that expose or potentially expose them to hazardous substances will receive 40 hours of hazardous waste site training and 3 days of on-the-job training as described in the OSHA 29 CFR 1910.120 (HAZWOPER) standard.

4.2 Supervisors Training

On-site supervisors, such as field sampling team leaders, will receive the same 40-hour HAZWOPER training as the general site workers they supervise. Additionally, they will receive 8 hours of specialized training as described in the HAZWOPER standard.

4.3 Refresher Training

General site workers and supervisors will receive 8 hours of refresher training annually. The refresher training will include topics similar to those presented during the 40-hour course.

During the investigation and near its conclusion, the Radian team will review current conditions at the site to determine whether additional safety procedures and/or equipment are warranted.

4.4 Documentation of Training

Training activity must be documented. Accepted documentation includes a course certificate or a letter/memorandum signed by the trainer and subject to approval by a Radian EAC. Copies of the documentation will be forwarded to Radian's Corporate Director of Health and Safety (CDHS) in Austin, Texas. Site-specific training will be documented with a sign-up sheet and topics discussed. Formal training records will be maintained by the local EAC, the training recordkeeper in Radian's Austin office, and the CDHS for all company employees. Site-specific training records will be maintained in the project files. Appendix C contains documentation of training received by field team members.

5.0 MEDICAL SURVEILLANCE AND EXPOSURE MONITORING

Prior to mobilization to the site, personnel performing surveys and/or investigations are required to participate in the medical surveillance program as required by 29 CFR 1910.120.

Medical exams will be conducted by a licensed physician who is certified in occupational medicine or who, by necessary training and experience, is considered board-eligible by the American Board of Preventive Medicine Incorporated. The physical should categorize the individuals as fit for the specific tasks to be assigned and able to wear respiratory equipment if deemed necessary. Medical monitoring documentation for the site team members is provided in Appendix B.

Radian has established a medical monitoring program for employees engaged in potentially hazardous activities as described in the *Radian International LLC Health and Safety Manual*. The medical monitoring program provides for regular physical exams for employees in certain job profiles, assessment of his or her medical status over the course of his or her employment at Radian, as well as exams or consultations in the event of an exposure or suspected exposure.

Radian will ensure that this program is based on current occupational medicine practices and that it complies with applicable government regulations by:

- Contracting physicians competent in occupational medicine;
- Monitoring of program compliance on an ongoing basis by the CDHS, the Administrator of Health Services, and the local EAC;
- Performing periodic evaluation of the program by a Radian management team; and
- Modifying/updating the program as necessary.

5.1 Applicability and Scope

Medical monitoring is conducted on those employees whose work has the potential to expose them to chemicals or agents at work sites. Employees involved in work at hazardous waste sites will comply with the medical monitoring requirements of the OSHA 1910.120 standard. Candidates for medical monitoring will be selected based on the potential for chemical exposure, environmental conditions, physical requirements, regulatory requirements, and the potential use of PPE.

The basic concepts used to develop this program are based on the following OSHA regulations:

- Access to Employee and Medical Records (29 CFR 1910.20);
- HAZWOPER (29 CFR 1910.120);
- Asbestos (29 CFR 1910.1001);
- Respiratory Protection (29 CFR 1910.134);
- Occupational Noise Exposure (29 CFR 1910.95); and
- Occupational Exposure to Hazardous Chemicals in Laboratories (29 CFR 1910.1450).

5.2 Criteria for Medical Monitoring

In general, there are two criteria that determine whether an employee should be enrolled in the medical monitoring program: potential for exposure to hazards and job profile.

5.2.1 Potential for Exposure to Chemical and Physical Hazards

OSHA-Regulated Material—Employees who work with or around the OSHA-regulated materials listed in 29 CFR 1910.1000 at or above the indicated action levels, will be entered into the medical monitoring program and will receive annual exams.

Unplanned Exposure to Hazardous Substances—Employees who are suspected of having been exposed to concentrations of hazardous substances above permissible exposure limits or threshold limit values (TLVs) will be included in the medical monitoring program. Title 29 CFR 1910.1000 and the American Conference of Governmental Industrial Hygienists TLVs pamphlet can be consulted for specific exposure limits.

5.2.2 Physical Agents

Exposure to the following physical agents or hazards requires enrollment in the medical monitoring program.

Noise Levels—Employees whose exposure to noise equals or exceeds an 8-hour time-weighted average of 85 dBA for greater than 30 days/year will be included in the medical monitoring program and will receive annual audiometric testing and training as required by OSHA 29 CFR 1910.95.

Job Profiles—Employees engaged in work at hazardous waste sites, who have the potential to be exposed to chemicals above regulatory or guidance levels, or who use respirators in their work will be enrolled in the Radian medical monitoring program.

6.0 HEALTH AND SAFETY EQUIPMENT

This section describes the PPE to be used during sample collection. OSHA defines protection levels ranging from A to D; for this project, only modified Level D is discussed as this is the site-specific level that may be used during this effort.

6.1 Site-Specific Levels of Protection

Employees will be supplied with and wear modified Level D protective equipment; however, the level of protection provided by PPE may be upgraded or downgraded based upon a change in site conditions. The task leader will determine whether a change in PPE level is warranted or additional safety procedure changes are needed. No conditions are anticipated that would require an upgrade of PPE beyond Level D.

The following constitute modified Level D protective equipment:

- Work clothes/coveralls;
- Safety glasses with side shields; and
- Latex gloves.

6.2 Site-Specific Personal Protective Equipment

Site-specific PPE for this project will be selected, used, and maintained in accordance with the requirements contained in 29 CFR 1910.132, 133, 134, 135, 136, and 138. PPE is designed to provide protection to team members when engineering and administrative controls are not feasible for controlling hazards. PPE will be used in conjunction with appropriate mitigation measures to ensure full protection against identified hazards.

6.3 Decontamination Procedures

Personnel decontamination will consist of removing disposable PPE (i.e., paper suits, paper shoe covers, and latex gloves), turning each piece of PPE inside out, and ending with removal of latex gloves. All used PPE will be placed into a plastic bag and transferred to Depot personnel for disposal.

7.0 STANDARD OPERATING PROCEDURES

7.1 Site-Specific Work Practices

While on-site, Radian team members will follow the site-specific practices established in this SSHP. These practices are described below and should be adhered to at all times for the safety of the project team members.

7.2 General Site Operating Procedures/Safety Guidelines

The following are general guidelines for safe operations in areas that are potentially contaminated.

- Wear required PPE at all times.
- Never work alone in an isolated area of the site.
- Practice contamination avoidance. Never sit, kneel, or lay equipment on potentially contaminated surfaces. Avoid obvious sources of contamination.
- No eating, drinking, or smoking is permitted in areas of sites that are suspected of being contaminated.
- In the event PPE is ripped or torn, replace it as soon as safety will allow.
- Be alert to any unusual changes in your own condition; never ignore warning signs. Notify the task leader of suspected exposures or accidents.
- A vehicle will be readily available for emergency use at all times during field efforts. Personnel working on-site shall be familiar with the most direct route to the nearest hospital.
- In the event of direct skin contact with contaminants, immediately wash the affected area with soap and water.
- Copies of the SSHP will be readily accessible at the work site.
- Hands and face should be thoroughly washed before eating or drinking.
- Any substantial modifications to this plan that could affect health and safety must be approved by the EAC or designee.

7.3 Drug Free Workplace Policy

Radian's Drug Free Workplace Policy obligates employees to perform their work free of the influence of alcohol or drugs. As part of this policy each new employee is required to submit to and pass a urine drug screen prior to beginning work. Job offers are made contingent on passing the drug test. The policy has provisions to conduct random drug testing on employees. Upon client request, Radian will provide the client a copy of the Radian Drug Free Workplace Policy.

Any employee who is impaired on the job will not be allowed to continue working. The task leader will be responsible for determining whether an employee should not be allowed on the job site.

8.0 EMERGENCY MEDICAL TREATMENT

Any person who becomes ill or injured should have first aid and or cardiopulmonary resuscitation (CPR) administered while awaiting an ambulance or paramedics. The task leader is trained in CPR and first aid. A first aid kit will be on-site. Injuries must be reported and follow the accident reporting plan in Section 9.0. Any person being transported to a hospital should take a copy of the SSHP. Additionally, if the injured's condition is serious, at least partial decontamination should be considered.

The nearest medical facility is Baptist Hospital in downtown Memphis. When leaving the Depot, take I-55 north to the Downtown Union exit, which leads directly to Baptist Hospital.

9.0 ACCIDENT REPORTING PLAN

9.1 Applicability and Scope

The accident reporting requirements apply to all incidences involving Radian personnel arising out of employment (AOE) or in the course of employment (COE) that result in personal injury, illness, or property damage or incidences that, strictly by chance, did not result in personal injury, illness, or property damage ("near misses").

9.1.1 Injuries and Illnesses

Injuries and illnesses that require reporting include those injuries and illnesses AOE/COE that result in any of the following: lost work time, restrictions in performing job duties, the need for first aid or outside medical attention, permanent physical bodily damage, or death.

Examples of "non-reportable" injuries and illnesses include small minor cuts such as paper cuts, common colds, and small bruises not resulting in work restriction or requiring first aid or medical attention. Examples of "reportable" injuries and illnesses include heat exhaustion from working outside, strained back muscles from moving objects, acid burns on fingers, chronic bronchitis from chemical exposure, and fingers crushed while conducting field activities.

9.1.2 Accidents

Accidents that require reporting include those accidents AOE/COE that result in any of the following: injury or illness damage to a Radian-operated vehicle (rented, leased, or owned), damage to a personal vehicle AOE/COE, fire/explosion, property damage of more than $100, or release of substances requiring evacuation of at least the immediate release/spill area. All lost time accidents and property damage accidents over $2000 shall be reported to the Contracting Officer Representative within 24 hours using Engineer Form 3394.

9.1.3 Near Misses

Other incidences that, strictly by chance, do not result in actual or observable injury, illness, death, or property damage are also required to be reported. The information obtained from such reporting can be extremely useful in identifying and mitigating problems before they result in actual personal or property damage. Thus, these incidences will be treated as if they did result in personal or property damage so that they can be reviewed and corrective actions implemented.

9.2 Responsibilities

All Radian employees and subcontractors have a responsibility to report accidents, injuries, illnesses, and near misses under the Radian Accident Reporting Program. Supervising personnel also have a responsibility to ensure that unsafe working practices or conditions that affected personnel under their supervision are promptly corrected.

9.2.1 Corporate Director of Health and Safety

The CDHS is responsible for ensuring that Radian's health and safety programs effectively minimize accidents and injuries, meet health and safety regulatory requirements, and provide consistency of practices and procedures among Radian offices. The CDHS has overall responsibility for implementing the accident reporting program, including review of accident reports, investigation of accidents, and recommendations of changes in practices, procedures, or the program. The CDHS is responsible for completing all regulatory compliance reports.

9.2.2 EAC

The EAC will review all accident reports and will summarize these reports to the CDHS as needed. Furthermore, the EAC will investigate the accidents if he or she deems it necessary and make recommendations for program improvement, if warranted.

9.2.3 Technical Resource Manager

The Technical Resource Manager has responsibility for ensuring that accident reports for Radian employees are complete and sent to the appropriate human resource administrator (HRA).

9.2.4 Project Manager

The Project Manager shares the responsibility with the affected employee's administrative supervisor for accident reporting. In some instances, when timeliness of reporting is not practicable for an administrative supervisor, such as an injury occurring at a field site or when an administrative supervisor is not available, the Project Manager should complete the necessary accident report forms and submit them to the appropriate HRA.

9.2.5 All Radian Employees

All Radian employees have responsibility to initiate the accident reporting sequence by communicating with their supervisors as soon as possible after an incident they observe or to which they fell victim. To effectively accomplish this, all employees must be familiar with the Radian Accident Reporting Program, including the criteria defining reportable incidents.

9.3 Reporting Procedures and Practices

This section describes the specific procedures and practices that will be followed by Radian personnel to effectively conduct accident reporting. A telephone will be available on-site for use in case of emergency.

9.3.1 Injuries and Illnesses

Serious injury or illness posing a life-threatening situation will be reported immediately to the local emergency response medical services (typically, a local fire department or paramedic service).

Injuries and illnesses will be reported by the victim to his or her administrative supervisor in person or by phone as soon as possible after any life-threatening situation has been addressed. If the victim is unable to report, the supervisor of the activity in which the victim was involved will notify the victim's administrative supervisor.

The supervisor will immediately notify the local EAC verbally of the incident and will complete an Incident Report Form (Appendix B) within 48 hours of the reported incident. This form asks for the following information:

- Date and time of incident,
- Location of incident,
- Description of incident,
- Direct cause of incident,
- Nature of injury/illness (be specific),
- Type of medical treatment provided,
- Name of treating physical or hospital and address, and
- Number of lost work days after date of injury (if already returned to work).

The local HRA will notify the local EAC within 24 hours of the incident. Within 5 days of the incident, the local HRA will complete and submit an Employer's First Report of Injury to the local Workmens' Compensation insurance carrier and send copies, along with copies of the Incident Report Form, to the local EAC and the Health Services Administrator.

Any fatality or incident where three or more employees are hospitalized must be reported to OSHA within 8 hours of any Radian employee becoming aware of the incident.

The first Radian employee becoming aware of such an incident becomes responsible for reporting the incident to the Director of Environmental Affairs or a Technical Resource Manager or company officer. The following information will be required:

- Location of incident,
- Time of incident,
- Number of fatalities or hospitalized employees,
- Contact person,
- Phone number, and
- Brief description of the incident.

When contact is made, the contacted person assumes responsibility for notifying OSHA and for convening an investigation team.

If contact cannot be made within 7 hours, then the responsible employee should contact OSHA directly either by calling the nearest OSHA office or by calling 1-800-321-6742. The report should be confined to the items listed above with no speculation (cause, blame, etc.). The responsible party should continue to try and contact the Director of Environmental Affairs or management until someone has been reached. At this point, the contacted person assumes responsibility for convening an investigation team.

The Health Services Administrator will maintain the OSHA log and summary of recordable injuries on OSHA Form 200 (a separate form will be kept for each office) and will forward copies of the updated Form 200 to the applicable office. A supplementary record will also be maintained by filing the Employer's First Report of Injury (equivalent to OSHA Form 101). The Health Services Administrator will notify the CDHS for each new entry into the reporting system.

The EAC will review each reported accident and determine whether further investigation is required and make recommendations to minimize future similar occurrences.

The CDHS is responsible for reviewing each new accident reported. At the beginning of each calendar year, the CDHS Health Services Administrator will review and sign (certify) the annual summary of OSHA Form 200 for the prior year so that local offices can post the summaries by February 1 following the reporting calendar year.

9.3.2 Accidents

Accidents not involving injury of illness, but resulting in property damage, must be reported to the local EAC on a Radian Accident/Injury Report Form within 48 hours of the accident.

In cases of fire of explosion that cannot be controlled by one person, vehicular accident resulting in injury or more than $500 worth of damage, or chemical release requiring a building evacuation, the involved party must immediately report the incident to the outside agency emergency response services in the area.

Accidents involving a Radian-operated vehicle must be reported as soon as practicable (i.e., after emergency agency reporting is completed) to the local EAC or office/facilities manager with the following information:

- Employee's name,
- Vehicle identity,
- Date and time of accident,
- Location of accident (street address),
- Name and driver's license number of other driver (if applicable),
- Other driver's insurance carrier and policy number,
- Employee's account of accident, and
- Whether police report was filed.

The local EAC or office/facilities manager will immediately notify the Corporate Insurance Clerk and relay the above information.

9.3.3 Near Misses

All near miss incidences are also required to be reported on the Radian Accident/Injury Report Form within 48 hours and submitted to the local EAC. In place of indicating the result of the incident (i.e., actual personal or property damage), the reporting person will indicate the avoided injury or damage.

9.3.4 Training

To ensure that Radian employees are cognizant of the Radian Accident Reporting Program, and are aware of their own and other's responsibilities, a series of informational and instructional training opportunities exist. The employees who will work at this site will be briefed on the Radian Accident Reporting Program during the site-specific training.

Attendance at a New Employee Orientation session, for Radian organization, resources, and procedures information, is required of all new Radian employees. This orientation ensures that new employees are aware of the existence of the *Radian International LLC Health and Safety Manual* and of its contents and who the responsible persons in their organization (office or department) are.

10.0 RECORDKEEPING REQUIREMENTS

The following records are to be maintained in the project files:

- Copy of the SSHP, original sign-off sheet (Figure 10-1), and a copy of the Certification of Hazard Assessment;
- Documentation of the PPE used during sampling (can be in field logbook);
- Copy of any accident or injury reports; and
- Copy of air monitoring results (field logbook or final reports).

By signing below, I acknowledge that I have read and understand the requirements of this Site-Specific Safety and Health Plan, that I have been briefed on the potential hazards involved with this work, and that I will abide by the provisions of this plan.

Signature	Date	Company
Signature	Date	Company
Signature	Date	Company
Signature	Date	Company
Signature	Date	Company
Signature	Date	Company

Figure 10-1. Sign-Off Sheet

11.0 APPROVAL BY CERTIFIED INDUSTRIAL HYGIENIST

This SSHP has been reviewed and approved by Robert Hayes, CIH.

Appendix A

ACCIDENT REPORT FORMS

RADIAN CORPORATION

INCIDENT REPORT

DATE: _____ LOCATION: _____

TIME: _____

Description of incident: _____

_____

_____

_____

Personnel involved: _____

_____

_____

Describe injuries (if applicable): _____

_____

_____

DESCRIBE TREATMENT:

Company first aid: _____

_____

Physician's treatment: _____

_____

Further treatment: _____

_____

RADIAN CORPORATION

326 51

CORRECTIVE ACTIONS: _____

_____

_____

ADDITIONAL COMMENTS: _____

_____

_____

REPORTED BY: _____ DATE: _____

DISTRIBUTION:
CDHS: JTC EAC: SKT GRP LDR: _____

EMPLOYEE(S): _____

These forms are intended to help identify and correct conditions or practices which result in or could result in injury to personnel and/or property damage. Please complete forms for "near-miss" as well as employee injury incidents. Employees involved in the incident, and their supervisors, should complete these forms within two days. Supervisors are responsible for ensuring timely distribution.

c:\skt\incident

Appendix B

MEDICAL SURVEILLANEC, HAZWOPER TRAINING, AND FIRST AID/CPR TRAINING DOCUMENTATION

GMG WorkCare™

TYPE OF EXAMINATION
☐ Baseline ☒ Termination / Exit
☐ Annual ☐ Special Occupational
☐ Other: _____ Specify

WORK STATUS REPORT

Employee Name: Patrice G. Cole	Position: Environmental Scientist	Date of Exam: 05/20/97
Employer Name: Radian International	Location: Oak Ridge	Social Security Number: 227-78-6554

The following recommendation is based on a review of a base history questionnaire, diagnostic tests, physical examination, and the essential functions of the position applied for or occupied by the individual named above.

STATUS:

1. ☑ The examination indicates no significant medical impairment. Can be assigned any work consistent with skills and training.

2. ☐ The examination indicates that a medical impairment currently exists that limits work assignments:

   - ☐ Cannot perform an essential job function (s): _____
   - ☐ Not to lift over _____ pounds
   - ☐ Not to work at a specific job or area: _____
   - ☐ No work with chemicals or irritants
   - ☐ No work requiring filter type respiratory protective device
   - ☐ No work in confined spaces
   - ☐ No SCBA use; No work requiring impermeable protective clothing
   - ☐ Not to work with volatile organic compounds, organic solvents, or hepatotoxins
   - ☐ Must wear hearing protection in areas with noise levels greater than 85 decibels
   - ☐ Sitting work only
   - ☐ Day work only (no shift work)
   - ☐ No overtime
   - ☐ No repeated waist bending
   - ☐ Suggested accommodations: _____
   - ☐ Not to operate commercial vehicle: _____

3. ☐ Deferred, the examination indicated that additional information is necessary. Employee given the following instructions:

_____

_____

The following recommendations comply with Federal OSHA standards:

	YES	NO	UNDECIDED
Has the employee any detected medical conditions that would increase his/her risk of material health impairment from occupational exposure?	☐	☑	☐
Does the employee have any limitations in the use of personal protective equipment, (e.g. clothing or respirators)?	☐	☑	☐

Name of Physician: Wesley P Chan, M.D. Date: 05/23/97

Signature: _____

* The employee has been informed of the results of this examination.

333 S. Anita Drive, Suite 630, Orange, CA 92868 • (714) 978-7488 • (800) 455-6155 • FAX (714) 456-2154

American Red Cross

This certifies that

Patrice Cole

has completed the requirements for

STANDARD FIRST AID

sponsored by

Appalachian Chapter

Date completed

8/5/93

American Red Cross

This certifies that

Patrice Cole

has completed the

ADULT CPR

course of instruction sponsored by

Appalachian Chapter

Date course completed

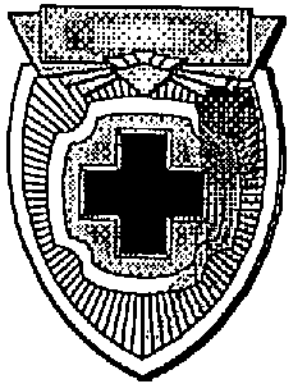
8/5/93

Certificate of Completion

This Certifies that

Patrice Cole

has met the annual 8 hour refresher training requirements for Hazardous Waste Site Operations and Emergency Response - OSHA Standard 1910.120



Radian Corporation, Technical Resources Manager

December 1996

FINAL PAGE

ADMINISTRATIVE RECORD

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