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HEALTH AND SAFETY PLAN
FOR THE
ALBANY RESEARCH CENTER SITE

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ALBANY RESEARCH CENTER SITE

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ALBANY RESEARCH CENTER SITE
EMERGENCY ASSISTANCE SERVICES

POLICE

Albany, Oregon (503) 967-4357
Oregon State Police (503) 967-2021

AMBULANCE

Albany, Oregon (503) 967-4333

FIRE

Albany, Oregon (503) 967-4333

HOSPITAL

Albany General (503) 926-2244

DOCTOR

Anita J. Jansen, MD, MPH (503) 754-1150
Office Hours 8:30 AM to 5:30 PM Ext. 175

HEALTH INFORMATIONAL SERVICES

Poison Control Center (800) 452-7165
Portland, Oregon

CHEMTREC (800) 424-9300

REAC/TS (615) 576-3098

Toxline (301) 496-1131

NOTE: All of the above telephone numbers are answered 24 hours per day unless otherwise indicated.

Site Personnel

Site Superintendent (503) 926-7012
Steve Cowan

Site Safety and Health Officer (503) 926-7012
Ken Davis

Project Office Personnel (Oak Ridge)

FUSRAP Management Switchboard (615) 576-1757

Program Manager (615) 576-1699
G. R. Hovey

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ACRONYMS

AEC	Atomic Energy Commission
ANL	Argonne National Laboratory
ARC	Albany Research Center
CPR	cardiopulmonary resuscitation
DOE	Department of Energy
ERDA	Energy Research and Developmental Agency
H&S	Health and Safety group
HSP	health and safety plan
MSDS	material safety data sheets
SSHO	site safety and health officer

1.0 INTRODUCTION

The Health and Safety Plan for the Formerly Utilized Sites Remedial Action Program (Bechtel 1989a) provides the basic direction for health and safety activities in all project operations and will be referenced throughout this document. The Health and Safety Plan for the Albany Research Center Site provides site-specific information required by site employees to implement an effective health and safety program.

1.1 SITE LOCATION AND DESCRIPTION

Albany Research Center (ARC) is located in Albany, Oregon, approximately 37 km (23 miles) south of Salem, Oregon. The facility is owned by the Department of the Interior and operated by the Bureau of Mines. The ARC property covers a rectangular area of approximately 18 ha (45 acres) (Figure 1-1), bounded on the north by Queen Avenue, on the east by Liberty Street, on the south by a tennis club, and on the west by Broadway Street. To the north is a moderate-income housing area. Private residences and the South Albany School Complex are located to the east beyond Liberty Street. The school complex consists of an elementary, middle, and high school. Beyond the tennis club to the south lies a residential area. The area to the west, beyond Broadway Street, is mostly farm and pasture land, with some residences; some of the farm and pasture land is zoned for residential development.

The ARC site comprises three main areas: ARC proper, which includes a number of buildings in the northernmost 12 ha (29 acres) of the site; the .8-ha (2-acre) Biomass Research Facility

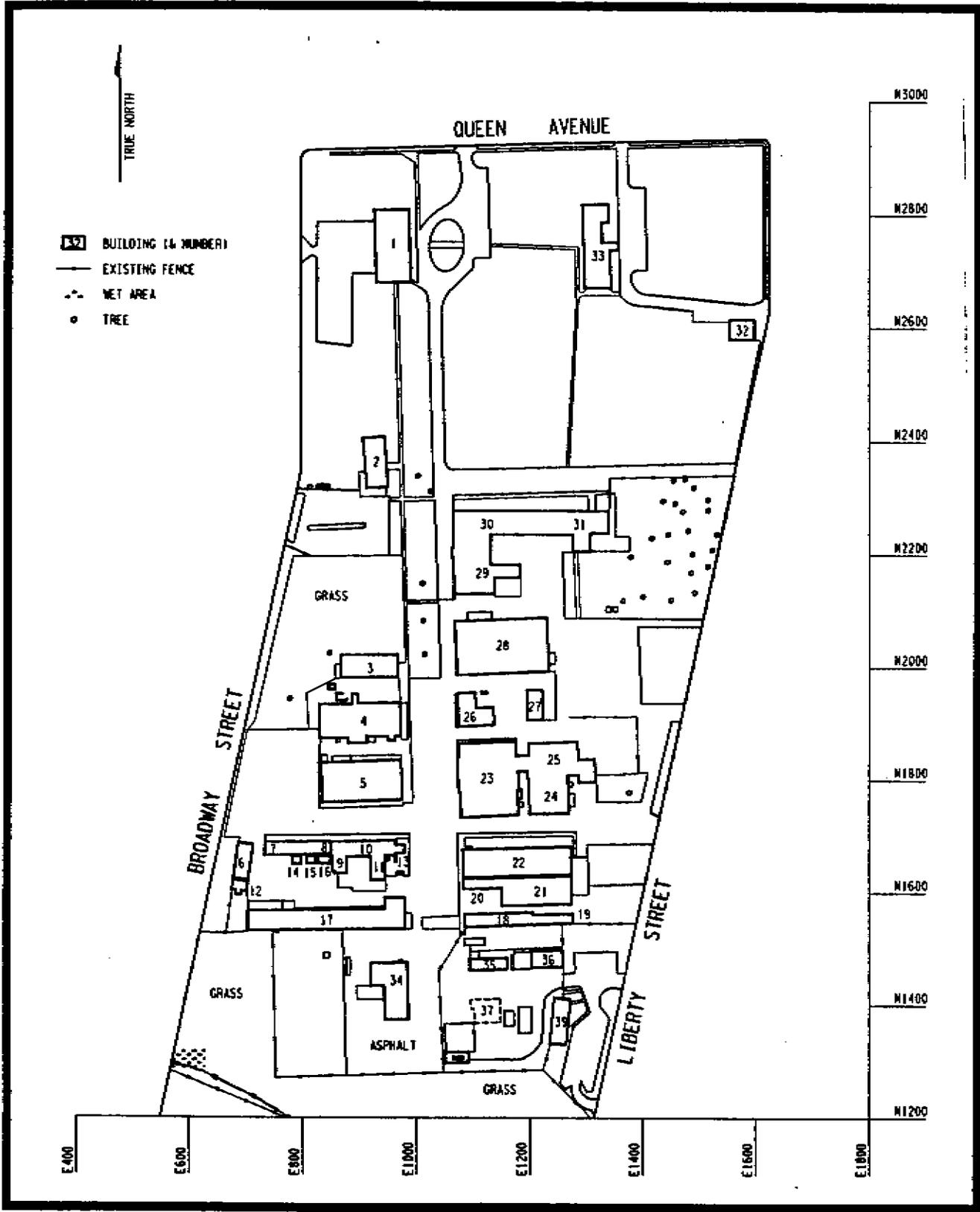


FIGURE 1-1 PLAN VIEW OF THE ALBANY RESEARCH CENTER

(inactive), which is located near the center of the site; and a 6-ha (14-acre) grass- and weed-covered area known as the "back forty," which occupies the southernmost end of the site. Portions of the back forty and the area now occupied by the Biomass Research Facility were contaminated with uranium and thorium wastes and their associated daughter products. Remedial action was performed on these areas as part of the Formerly Utilized Sites Remedial Action Program (FUSRAP) during 1987 and 1988.

1.2 SITE HISTORY

From 1954 to 1956, the Albany Metallurgical Research Center conducted metallurgical operations for the Atomic Energy Commission (AEC) involving a variety of materials, including uranium and thorium. Operations included reducing, melting, machining, welding, and alloying. Work with uranium and thorium continued with the Energy Research and Development Agency (ERDA), a predecessor to the Department of Energy (DOE). Metallurgical operations on thorium were also performed from 1960 to 1971 for the Pittsburgh Naval Reactors Office.

Under contract with AEC, process buildings and site surroundings were decontaminated at various times to AEC guidelines. Contaminated materials, equipment, or wastes were removed from the site for disposal by:

- Lawrence Livermore National Laboratory (for disposal at Richland, Washington)
- AEC Idaho Operations Office, Idaho Falls, Idaho
- Nuclear Engineering Company (now U.S. Ecology), Richland, Washington

ERDA operations at ARC were terminated in 1978. Records relating to decontamination activities conducted under AEC and ERDA were inadequate to determine if the site met the more stringent ERDA radiological guidelines in effect in 1978. As a result, Argonne National Laboratory (ANL) initiated a radiological assessment of ARC in 1978. ANL recommended that, although the levels of contamination did not pose an immediate health hazard, decontamination and cleanup of the facility was appropriate to adhere to the regulatory concept of reducing radiation exposure to levels "as low as reasonably achievable."

1.3 PROJECT ORGANIZATION

The project management structure currently in effect for FUSRAP will be implemented at ARC. Personnel assignments will be reviewed and updated monthly.

The health and safety group (H&S) of the Environmental, Health, and Safety Department on FUSRAP is responsible for the development and implementation of all health and safety criteria (Bechtel 1989a). At the beginning of the project and at the beginning of major tasks, the H&S supervisor, or designee, will assign individuals to fill site safety and health positions, including that of the site safety and health officer (SSHO). A written list of personnel assigned to the project will be maintained at the site by the H&S supervisor, or designee.

2.0 HAZARD ANALYSIS

Various operations involving radioactive materials have been conducted at ARC. From 1948 to 1956, ARC conducted work for AEC that involved the melting, machining, welding, and alloying of thorium. Additional work with uranium and thorium was also performed for ERDA. In addition to work conducted for AEC and ERDA, ARC has performed work with radioactive material for other organizations that has resulted in building contamination not related to FUSRAP.

As previously stated, a radiological assessment of ARC was initiated by ANL in 1978. Based on this assessment, ANL stated that, although the levels of contamination at ARC did not pose an immediate health hazard, further decontamination of the property was advisable (ANL 1983a, b). In early 1984, Bechtel National, Inc. (BNI), conducted a radiological survey at ARC (Bechtel 1985a) to further determine actual levels of contamination and the locations and boundaries of above-guideline contamination. This survey revealed that approximately 1,988 m³ (2,600 yd³) of contaminated material had to be removed from the site to comply with guidelines.

In June 1985, BNI issued a report documenting an evaluation of remedial alternatives for ARC (Bechtel 1985b). The disposal option of transporting contaminated material to the Hanford DOE disposal facility at Richland, Washington, was selected for implementation. A work plan for remediation of selected areas at ARC was issued by BNI in February 1987 (DOE 1987). The plan addressed building decontamination, soil excavation, backfilling and seeding of remediated areas, and transportation of contaminated soil and rubble to Hanford. Remedial action was initiated in July 1987 and completed in January 1988. Collection of post-remedial action data was completed in February 1988. The post-remedial action report

provides information on the status of ARC after completion of the 1987 remedial effort (Bechtel 1989b).

The 1987 remedial action resulted in decontamination of most areas at ARC requiring remediation under FUSRAP. Surveys conducted after the 1987 remedial effort identified additional areas of contamination exceeding guidelines. These areas were primarily buildings that had not been surveyed previously under FUSRAP. A second remedial effort has been planned by BNI to complete the decontamination of areas subject to FUSRAP requirements.

The site is contaminated with radioactive materials consisting primarily of depleted uranium and natural thorium. Depleted uranium is less radioactive than typical uranium because the isotope used for producing nuclear power has been removed during previous processing. Uranium in the soil could contaminate equipment used in cleanup at the site; therefore, attention must be given to the handling, decontamination, and disposition of contaminated cleanup equipment.

Personnel may be exposed to low-level external gamma radiation and will be required to wear a monitoring badge; protective clothing and equipment may also be required. Whole body radiation exposure is not expected to exceed approximately 20 percent of the annual exposure received from low intensity cosmic radiation and the presence of naturally occurring radioisotopes in rocks, soil, air and building materials. This exposure is 10 percent of the DOE limit for exposure to a member of the general public in any calendar year. For comparison purposes, this radiation exposure will be about the same as that received from a typical medical x-ray.

Chemicals that may be present in some work areas are included in Table 2-1. It is not anticipated that workers will be exposed to these chemicals; however, should toxic conditions be

TABLE 2-1
SUSPECTED OR KNOWN HAZARDOUS MATERIALS AT
ALBANY RESEARCH CENTER

- I. Flammable organics
- Benzene
 - Toluene
 - Xylene
 - Alkanes
 - Alkenes
- II. Halogenated hydrocarbons
- III. Heavy metals
- Mercury
 - Selenium
 - Lead
 - Cadmium
 - Nickel
 - Chromium
 - Uranium
 - Thorium
 - Radium
- IV. Corrosives
- Hydrochloric acid
 - Nitric acid
- V. Asbestos
-

encountered, a Bechtel industrial hygienist will evaluate potential exposures, and the SSHO will implement appropriate control and protective measures.

Exposures to chemicals or radioactive materials present may cause burns, blood abnormalities, central nervous system damage, kidney damage, liver damage, edema, chemical asphyxiation, cancer, and death. Pathways into the body include inhalation, skin absorption, and ingestion. Material safety data sheets (MSDS) and other sources of technical data for each identified chemical will be kept onsite. Site personnel will be trained on the use of MSDS as required by the Hazards Communication Standard (29 CFR 1910.1200). The degree of risk to personnel from each of the contaminants depends upon the amount of material encountered, the way in which it is contacted, and the duration of exposure.

Remedial action plans and subcontract specifications will identify engineering controls (including ventilation requirements) to be used to minimize exposure pathways to toxic substances whenever practicable. When engineering controls cannot reduce potential exposure to contaminants that are below permissible limits or when the potential for exposure to contamination exists, H&S will identify administrative controls and specify personal protective apparel and equipment to be used.

Hazards associated with activities are discussed in the FUSRAP health and safety plan (HSP) (Bechtel 1989a). A list of hazards at ARC is included in Table 2-2. These include hazards that are due to rough terrain, presence of trash and scrap materials on site, and presence of materials exhibiting elevated levels of radioactivity. In addition, remedial action operations have the potential to generate airborne radioactive aerosols into the breathing zone. For this reason, respiratory equipment may have to be worn during some operations. Water should also be available for dust suppression.

TABLE 2-2
HAZARDS ASSOCIATED WITH ACTIVITIES
AT THE ALBANY RESEARCH CENTER

Stress from extreme temperatures
Potential exposure to radioactive or chemical wastes
Excessive noise exposure
Physical injury due to trips, falls, sharp objects, etc.
Fire
Safety hazards associated with power equipment (e.g., flying
objects, cuts, etc.)
Electrocution
Falling objects
Confined space
Burns due to contact with furnaces used to melt metals

3.0 MEDICAL SURVEILLANCE

The medical surveillance program described in the FUSRAP HSP (Bechtel 1989a) will be in place for personnel working at the site. These health assessments will include the following:

- Complete medical and occupational history
- Physical examination
- Laboratory studies, including a complete blood count
- Blood lead analysis
- Urinalysis
- Chemistry panel
- Pulmonary function testing
- Audiometry and visual screening
- Chest X-ray or electrocardiogram (when determined to be necessary by the physician)
- Special urine or blood tests

Upon termination of employment, personnel who have worked continuously at FUSRAP sites for more than 6 months will undergo an examination equivalent to the baseline health assessment. All personnel who terminate employment within a 6-month period will undergo an examination based upon their exposure to chemicals and radioactive materials at FUSRAP sites. Specific tests to be conducted will be determined by the physician and the H&S supervisor.

4.0 BIOASSAY PROGRAM

Routine bioassay samples will be collected from all employees before starting work in restricted areas, at quarterly intervals, and upon termination of work. Urinary analyses will include those for thorium-230 and radium-226. Special samples will be collected from individuals suspected of sustaining an intake of radioactive contaminants. These samples will be taken at the direction of the Health and Safety Supervisor, or designee.

In addition to the standard medical physical described in the FUSRAP HSP (Bechtel, 1989a), the presence of specific contaminants on site requires that additional bioassay samples be taken. Urine samples will be collected and analyzed during the health assessment for mercury. The results will be used in establishing a baseline health assessment for each employee.

5.0 MONITORING PROGRAM

5.1 MONITORING RATIONALE

Personnel and the work area will be monitored using the following instrumentation: direct-reading instrumentation for volatile organic chemicals, combustible gas/oxygen meter, and direct-reading radiation monitor. Table 2-1 lists the suspected and known hazardous materials that will be monitored. Monitoring will be supplemented with long-term personal air samples, as necessary.

Continuous monitoring using an organic vapor direct-reading instrument will be conducted at borehole openings and in personnel breathing zones. The level of personal protection required determined by will be the results of direct-reading instruments.

5.2 PERIMETER MONITORING

Results from direct-reading instruments will be used to determine the need for perimeter monitoring. The following rationale for monitoring will be followed:

- If 5 ppm is detected at the perimeter of exclusion zone, then monitoring at the perimeter of the site should begin.
- If the combustible gas/oxygen meter reaches 10 percent of the lower explosive limit at the perimeter of the exclusion zone, then perimeter monitoring should be initiated
- If two direct readings of zero ppm are obtained, and the combustible gas/oxygen meter reads zero percent, then monitoring at the perimeter of the site can be discontinued.

6.0 PERSONAL PROTECTIVE APPAREL AND EQUIPMENT

Personal protective apparel and equipment requirements for protection against airborne contamination, skin absorption, skin contact, or impact hazards are described in the FUSRAP HSP (Bechtel 1989a).

Personal protective apparel and equipment to be used during most activities will consist of white Tyvek coveralls or equivalent, rubber boots or shoe covers, and gloves. All reusable personal protective equipment will be thoroughly decontaminated before being removed from the site.

Other safety equipment to be worn by employees during operations on-site may include, but is not limited to:

- Work boots
- Eye protection, such as goggles when determined necessary by the SSHO
- Safety helmets (hard hats) to be worn by all workers at all times in work areas
- Hearing protection, such as ear plugs, to safeguard against noise levels exceeding permissible limits
- Negative-pressure respirators

7.0 TRAINING REQUIREMENTS

7.1 GENERAL

Training requirements will follow the criteria established in Occupational Safety and Health Administration standards 29 CFR 1910.120, "Hazardous Waste Operations and Emergency Response," and 29 CFR 1910.1200, "Hazard Communications." The training program is described in the FUSRAP HSP (Bechtel 1989a).

7.2 SITE-SPECIFIC TRAINING

Site-specific training for all personnel will be conducted prior to the start up of work. Subjects to be discussed will include types and levels of contamination, specific health and safety concerns, use of portable fire extinguishers, emergency response plan, site safety and security procedures, the hazardous waste minimization program, and FUSRAP protocol. The SSHO and site superintendent will select a training location that provides a minimum of distractions.

Site visitors must also receive a briefing on site safety. Visitors will not be allowed into restricted areas unless they have been trained, respirator fit-tested (if required by the condition of the area), and medically approved. Visitors not meeting these requirements may observe site conditions from an area determined to be safe by the SSHO.

8.0 EMERGENCY RESPONSE AND NOTIFICATION

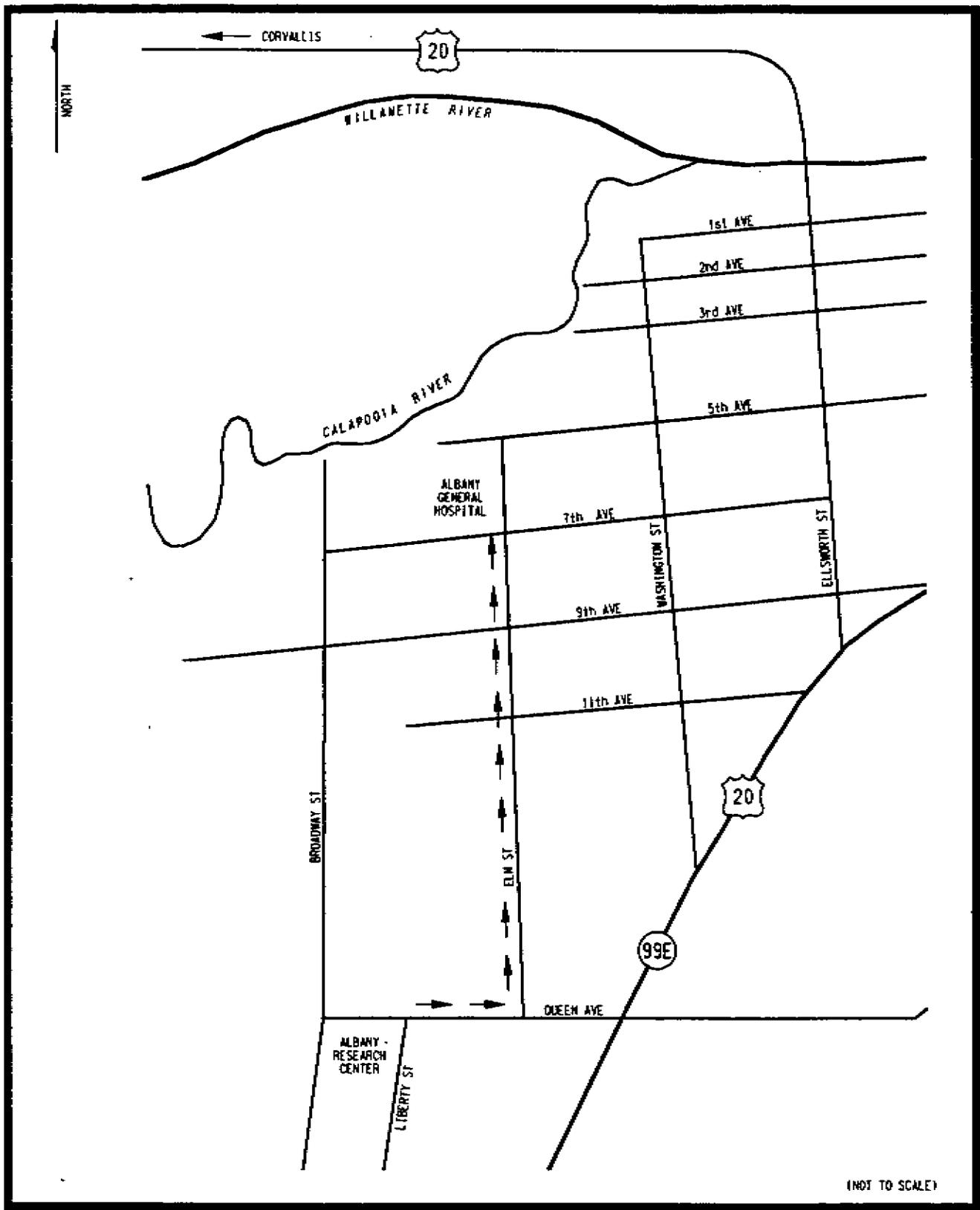
8.1 GENERAL

Emergency response and notification procedures for ARC will comply with emergency response plan of ARC and notification guidelines established for FUSRAP.

The SSHO will ensure that all personnel are familiar with procedures for communicating with local and project emergency services so that someone other than the SSHO or a designated representative can properly handle an emergency.

When responding to emergencies at the site, personnel will contact the appropriate services according to the type of emergency condition (e.g., fire department, doctor, police). Emergency telephone numbers are listed on page iii of this HSP. The location of and routes to the preferred local hospital are shown in Figure 8-1. Site personnel will transport severely injured persons to the hospital only when professional service is not available.

A detailed investigation of emergency conditions and causes will be conducted jointly by the senior on-site BNI representative and the SSHO. The senior BNI representative or the SSHO will notify the project office in Oak Ridge, Tennessee, as soon as the emergency condition is under control. Project management will be notified about the incident in accordance with established FUSRAP emergency response procedures.



**FIGURE 8-1 ROUTE TO ALBANY GENERAL HOSPITAL
FROM ALBANY RESEARCH CENTER**

8.2 OCCUPATIONAL INJURIES

In compliance with 29 CFR 1926.50, a person with a valid certificate in first aid training from the American Red Cross, or equivalent training that can be verified by documentary evidence, will be available at the site to render first aid. First-aid kits will be located on site in the BNI office.

Personnel with injuries that require a physician's attention will be transported by the ambulance service specified on pages ii and iii of this HSP.

If the injured worker has been working in a radioactively contaminated or restricted area, a radiological survey will be conducted by qualified personnel before the ambulance arrives. If needed, decontamination activities will be conducted prior to the arrival of emergency medical personnel. However, medical care for the injured worker takes precedence over decontamination. Emergency workers and hospital personnel will be notified of the type and extent of contamination, if present.

Personnel rescuing an accident victim requiring cardiopulmonary resuscitation (CPR) or first-aid may proceed under the following conditions:

- At least one person in the rescue party must possess a valid CPR/first-aid certification card.
- Existing environmental conditions must not threaten the lives of the rescue workers. Rescue workers must have proper protective equipment and follow proper decontamination procedures to prevent injury to themselves.

- If personal protective equipment is not available when investigating hazardous or toxic conditions in confined spaces, air monitoring equipment must be available and used during rescue operations.

8.3 FIRE EMERGENCY

In the event of a small fire, trained personnel should attempt to extinguish the fire with portable fire extinguishers. If a fire cannot be extinguished with portable extinguishers, personnel will immediately evacuate the area. The local fire department will be notified immediately.

The senior on-site BNI representative, or designee, will interact with the fire department as it arrives on the scene. The BNI representative, or designee, will provide all pertinent information including potential hazards, missing personnel and their last known work location, and fire location and description.

8.4 EVACUATION PLAN

Since ARC is an occupied facility, the occupant's emergency evacuation plan will be followed. Evacuation may be required in the case of fire, natural disaster, or other emergency. If so, the evacuation will continue until normal working conditions have been restored and permission to return to work granted by authorized personnel. During any evacuation in progress, all personnel should remain calm and follow prescribed procedures for an orderly exit. The decision to evacuate the immediate work area only will normally be made by the senior on-site BNI representative or the SSHO. The evacuation alarm may be given verbally.

On receiving the evacuation notice, all equipment in use will immediately be shut down if time allows. All personnel will then proceed to a common, predetermined location, unless conditions require an alternative. Personnel who are unable to reach this location must report their locations to the site superintendent or SSHO as soon as possible. The SSHO will be responsible for the evacuation and will account for all personnel as soon as possible.

Evacuation of on-site buildings may be required because of fire or other emergency. Specific escape routes from the buildings will be established prior to the start of clean-up work inside buildings. Personnel will be briefed on these routes prior to entering the buildings.

8.5 SITE SECURITY

Site security during on-site operations will be conducted in accordance with procedures agreed to by DOE, BNI, and the site owner/operator.

8.6 EMERGENCY ASSISTANCE SERVICES

Refer to pages ii and iii of this HSP for the list of emergency assistance services.

REFERENCES

Argonne National Laboratory, 1983a. Radiological Survey of the Albany Metallurgical Research Center, United States Bureau of Mines Biomass Facility and the "Back Forty" Area, Albany, Oregon, DOE/EV-0005/39, ANL-OHS/HP-83-101, Argonne, Ill. (April).

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