DOE/EA-0980

Environmental Assessment

300 Area Process Sewer Piping Upgrade and 300 Area Treated Effluent Disposal Facility Discharge to the City of Richland Sewage System, Hanford Site, Richland, Washington

U.S. Department of Energy
Richland, Washington

May 1995

DISCLAIMER

DOE/EA-0980

ENVIRONMENTAL ASSESSMENT

FOR

300 AREA PROCESS SEWER PIPING UPGRADE

AND

300 AREA TREATED EFFLUENT DISPOSAL FACILITY

DISCHARGE TO THE CITY OF RICHLAND SEWAGE SYSTEM

U.S. DEPARTMENT OF ENERGY

RICHLAND, WASHINGTON

MAY 1995

This page intentionally left blank.

Summary

The U.S. Department of Energy (DOE) is proposing to upgrade the existing 300 Area Process Sewer System, which serves the 300 Area and receives the process industrial wastewater, by constructing and operating a new process sewer collection system that would discharge to the 300 Area Treated Effluent Disposal Facility (TEDF). The DOE is also considering the construction of a tie-line from the TEDF to the 300 Area Sanitary Sewer for discharging the process wastewater to the City of Richland Sewage System.

The DOE needs to take action to reduce or where appropriate eliminate untreated liquid effluents discharged to the soil from activities in the 300 Area of the Hanford Site. The proposed action is needed because the integrity of the old piping in the existing 300 Area Process Sewer System is questionable and effluents might be entering the soil column from leaking pipes. In addition, the DOE has identified a need to reduce anticipated operating costs at the new TEDF.

The 300 Area Process Sewer Piping Upgrade (Project L-070) is estimated to cost approximately $9.9 million. The proposed work would involve the construction and operation of a new process sewer collection system. The new system, when completed in December 1996, would discharge the effluents to a collection sump and lift station for the TEDF. The TEDF was built one-half mile north of the 300 Area and commenced operation in December 1994. The TEDF was addressed in an environmental assessment (EA) *Hanford Environmental Compliance Project*, DOE/EA-0383. The TEDF is designed to treat and discharge the process effluent to the Columbia River. The process waste liquid effluent is

currently well below the DOE requirements for radiological secondary containment and is not considered a *Resource Conservation and Recovery Act of 1976* hazardous waste or a *State of Washington Hazardous Waste Management Act* dangerous waste. A National Pollutant Discharge Elimination System (NPDES) permit has been obtained from the U.S. Environmental Protection Agency for discharge to the Columbia River.

The proposed action would upgrade the existing 300 Area Process Sewer System by the construction and operation of a new combined gravity, vacuum, and pressurized process sewer collection system consisting of vacuum collection sumps, pressure pump stations, and approximately 8,900 meters (29,200 feet) of buried polyvinyl chloride or similar pipe. Two buildings would also be built to house a main collection station and a satellite collection station.

The DOE also is considering sending the process wastewater directly to the City of Richland sewage system for treatment and discharge. This option would represent a potential cost savings to the treatment of the process wastewater solely by the TEDF. The City of Richland would treat the wastewater in its sewage treatment plant and discharge it to the Columbia River under its NPDES permit. The TEDF could then be maintained to treat the process wastewater, to either meet the City of Richland acceptance criteria or to discharge directly to the Columbia River as necessary. A discharge line would be constructed connecting the TEDF to the new 300 Area sanitary sewer line which is being built to connect to the City of Richland sewage collection system just south of the 300 Area and is scheduled to be placed in operation by June 1995. This new 300 Area sanitary sewer line to the City of Richland sewage collection system has been categorically excluded from further *National Environmental Policy Act of 1969* (NEPA) review.

The existing 300 Area Process Sewer System is primarily a gravity system (supplemented by a lift station) that formerly discharged facility process wastewater to the soil column at the 300 Area process trenches. The discharge to the soil column was terminated in December 1994, when the new TEDF was placed in operation to meet a *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement) milestone to reduce, and where appropriate eliminate, the discharge of untreated liquid effluents to the soil column. The existing process sewer system would be used until December 1996, when the new process sewer system would be completed. The existing process sewer piping system would be removed from service and eventually remediated as part of the 300 Area *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* program Operable Units 300-FF-1 and 300-FF-2.

This EA evaluates alternatives to the proposed action. Alternatives to the proposed combined gravity flow, pressurized and vacuum collection system are: (1) a No-Action Alternative and (2) relining or slip lining the existing pipes. Under the No-Action Alternative, the 300 Area Process Sewer would not be upgraded, the probability of effluents entering the soil column from leaking pipes and carrying contaminants from past discharges would increase with time, and the Tri-Party Agreement milestone M-17-06K would not be met. Failure of the existing system could shut down the facilities in the 300 Area. Slip lining or lining the pipes might be more cost effective than installing new pipe and would require less extensive excavation. The feasibility and extent of slip lining would be determined during final project design.

A No-Action Alternative to constructing the discharge line connecting the TEDF to the new 300 Area sanitary sewer line also was considered. If the discharge line connecting the TEDF to the new 300 Area sanitary sewer line were not built, there would be no option to discharge to the City of Richland sewage system to realize potential cost savings from reduced operation of the TEDF, and no alternate discharge line would be available in case of problems with the TEDF.

No environmental impacts of concern were identified for the proposed action. There would not be any substantial releases of gaseous or particulate radioactive emissions to the atmosphere, and no unpermitted discharges of contaminated liquids to the environment. Solid waste generated by project activities would be disposed in existing Hanford Site waste management units in compliance with all applicable regulations.

Biological surveys and a cultural resources review have been conducted. The Cultural resource review concluded that there are no known cultural or historic properties that would be affected by the projects other than the culturally sensitive area within 400 meters (1300 feet) of the Columbia River which potentially could be affected. Any work within this zone would require monitoring by a Hanford Cultural Resources Laboratory (HCRL) archeologist. If cultural remains were encountered, work in the vicinity of the find would stop until an HCRL archeologist assessed the find and arranged for mitigation of impacts.

The biological (ecological) surveys concluded that no plant or animal species of concern would be affected by the projects either within the 300 Area or between the TEDF and the 300 Area where the discharge line to the sanitary sewer would be constructed.

Construction impacts would be minimal. There would be potential radiation exposure to workers during the tie-in to existing drain lines and limited removal of portions of the old lines. Workers trained in radiation protection would be used for work in areas where radioactive contamination is present and would have the proper protective clothing and equipment and if necessary wear respiratory protection. In addition, health physics technicians would be present to monitor for radiation. The estimated exposure to workers during construction is 2.0 person-roentgen equivalent man (person-rem), effective dose equivalent (EDE), resulting in a calculated 8.0×10^{-4} latent cancer deaths. Therefore, no cancer deaths would be anticipated.

Removal of some of the old process sewer piping during construction would generate an estimated 30 cubic meters (1,060 cubic feet) of solid waste. This waste would be characterized and stored or disposed of in existing Hanford Site storage and disposal facilities.

Operation of the new system would result in the venting of small amounts of vapor from the water collection tank in the main collection station. The estimated dose to the maximally exposed offsite individual from these emissions would be 6.1×10^{-7} rem per year EDE, resulting in a calculated 3×10^{-10} latent cancer deaths. Therefore, no serious health effects would be anticipated from the routine emissions.

The postulated upper bounding accident for the 300 Area Process Sewer System is the accidental spilling within a laboratory of plutonium-239 or strontium-90 into a process sewer drain. This spill would be followed by a pipe break in a pressurized line, which results in a spray release of the contaminated effluent to the atmosphere. Because of the unusual chain of circumstances required, the probability of this accident is calculated to be 2.7×10^{-7}, which is incredible. The calculated dose to the maximally exposed onsite individual from the postulated accident is 4.8 rem EDE, which is calculated to result in 1.8×10^{-3} latent cancer deaths. The calculated dose to the maximally exposed offsite individual is 0.52 rem EDE, which is calculated to result in 2.6×10^{-4} latent cancer deaths. Because the quantity of effluent expected from the postulated accident is small, no serious groundwater contamination would be expected.

Cumulative impacts considered for the proposed sewer line upgrade would be the emplacement of an estimated 225 cubic meters (7,800 cubic feet) of pipe in the ground that would eventually be remediated as part of the 300 Area Operable Unit work. Cumulative impacts considered for the proposed tie-line to the 300 Area Sanitary Sewer and the City of

Richland Sewage System would be the addition of about 1,750,000 liters (470,000 gallons) per day of effluent to the City Sewage Treatment Plant. This is approximately 4.25 percent of the plant's design capacity. Construction of the tie-line would add an estimated 24 cubic meters (850 cubic feet) of new pipe to the ground to eventually be remediated.

Table of Contents

Appendices

List of Figures

Glossary

Acronyms and Initialisms

CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
DOE	U.S. Department of Energy
EA	Environmental Assessment
Ecology	State of Washington Department of Ecology
EDE	effective dose equivalent
EPA	U.S. Environmental Protection Agency
ICRP	International Commission on Radiological Protection
LCF	latent cancer fatality
NEPA	*National Environmental Policy Act of 1969*
NPDES	National Pollutant Discharge Elimination System
rem	roentgen equivalent man
RI/FS	Remedial Investigation/Feasibility Study
RPS	retention process sewer
TEDF	Treated Effluent Disposal Facility
Tri-Party Agreement	*Hanford Federal Facility Agreement and Consent Order*
WAC	*Washington Administrative Code*

Scientific Notation Conversion Chart

Multiplier	Equivalent
10^{-1}	0.1
10^{-2}	.01
10^{-3}	.001
10^{-4}	.0001
10^{-5}	.00001
10^{-6}	.000001
10^{-7}	.0000001
10^{-8}	.00000001
10^{-9}	.000000001
10^{-10}	.0000000001
10^{-11}	.00000000001
10^{-12}	.000000000001

Metric Conversion

If you know	Multiply by	To get
	Length	
centimeters	0.394	inches
meters	3.2808	feet
kilometers	0.62	miles
	Area	
square kilometers	0.39	square miles
	Temperature	
Celsius	multiply by 9/5ths, then add 32	Fahrenheit
	Volume	
liters	0.26	Gallons
cubic meters	35.31	cubic feet

Source: CRC Handbook of Chemistry and Physics, Robert C. Weast, Ph.D., 70th Ed., 1989-1990, CRC Press, Inc., Boca Raton, Florida.

1.0 Purpose and Need for Agency Action

The U.S. Department of Energy (DOE) needs to take action to reduce or where appropriate eliminate untreated liquid effluents discharged to the soil in the 300 Area of the Hanford Site which is located immediately north of the City of Richland. The action is needed because the integrity of the old piping in the existing 300 Area Process Sewer System is questionable and effluents might be entering the soil from leaking pipes. Figure 1 is a Hanford Site map showing the location of the 300 Area.

In addition, the DOE has identified a need to reduce anticipated operating costs at the new 300 Area Treated Effluent Disposal Facility (TEDF) which became operational during December 1994. The TEDF has been designed and built to treat the effluent from the existing process sewer. The TEDF includes an outfall line which discharges the treated effluent to the Columbia River.

1.1 Background

The 300 Area contains facilities for the fabrication of nuclear fuel elements that were used in Hanford's reactors, laboratories where the chemical separations processes to recover plutonium and uranium from irradiated fuel were developed and where other research and development activities are now carried out, offices, and numerous other support facilities for the Hanford Site. The 300 Area facilities are expected to continue to operate for many years.

The existing 300 Area Process Sewer System is primarily a gravity system (supplemented by one lift station[1]) that formerly discharged facility process wastewater to the soil column at the 300 Area Process Trench and now discharges to the TEDF. The existing system consists of approximately 10,516 meters (34,500 linear feet) of piping, ranging in size from 10.16 centimeters (4 inches) to 91.44 centimeters (36 inches) diameter. The system connects to 62 of the existing buildings. Most of the piping is vitreous clay pipe, some of which has been in service for 47 years. Known past discharges through the piping include quantities of radioactive materials, including 1 kilogram (2.2 pounds) or more of uranium, acids, solvents, organic chemicals, and other materials used in the operations conducted in the 300 Area buildings (WHC 1992c). Appendix A presents the types and quantities of the constituents which have been discharged to the system and which are now received by the TEDF.

In the past, liquids and particulates in solution disposed to the process sewer included all of the metallic and chemical components from the fuel fabrication process and all of the separations process chemicals and solutions used in laboratory development of the Bismuth

[1] A Lift Station is a buried, central collection point which is used to accumulate liquid effluent at a low point in the system and transfer it, by pumping, to a treatment facility or a higher point in the system.

Phosphate, Reduction-Oxidation, Metal Recovery, Plutonium-Uranium Extraction, and other processes. Many of the process drains, pipes, pipe trenches, and sewer manholes may be expected to contain some degree of process waste contamination.

The TEDF, which is designed to treat and discharge the process effluent to the Columbia River, is located 0.8 kilometers (0.5 miles) north of the 300 Area. The existing process sewer has been tied into the TEDF and direct discharge of the process sewer effluents to the 300 Area Process Trench and the soil column has been stopped; however, there remains the potential for contaminants to be carried into the new plant or into the soil from residual contamination in the existing pipes.

The integrity of the piping and the degree of accumulation of past discharges presently remaining in the pipe are largely unknown at this time. Use of a remote television camera to examine sections of pipe has revealed cracks that may have leaked effluents to the soil during transfer of effluent streams to the 300 Area trench. This makes the integrity of all the old pipes suspect.

The 300 Area Process Sewer System discharges the effluents to the collection sump and lift station for the TEDF. The TEDF was addressed in an environmental assessment (EA) *Hanford Environmental Compliance Project*, DOE/EA-0383 (DOE 1992). The process waste liquid effluent is currently well below the DOE requirements for radiological secondary containment, and is not considered a *Resource Conservation and Recovery Act of 1976* (RCRA) hazardous waste or a *State of Washington Hazardous Waste Management Act* dangerous waste. A U.S. Environmental Protection Agency National Pollutant Discharge Elimination System (NPDES) permit is in place for discharge to the Columbia River.

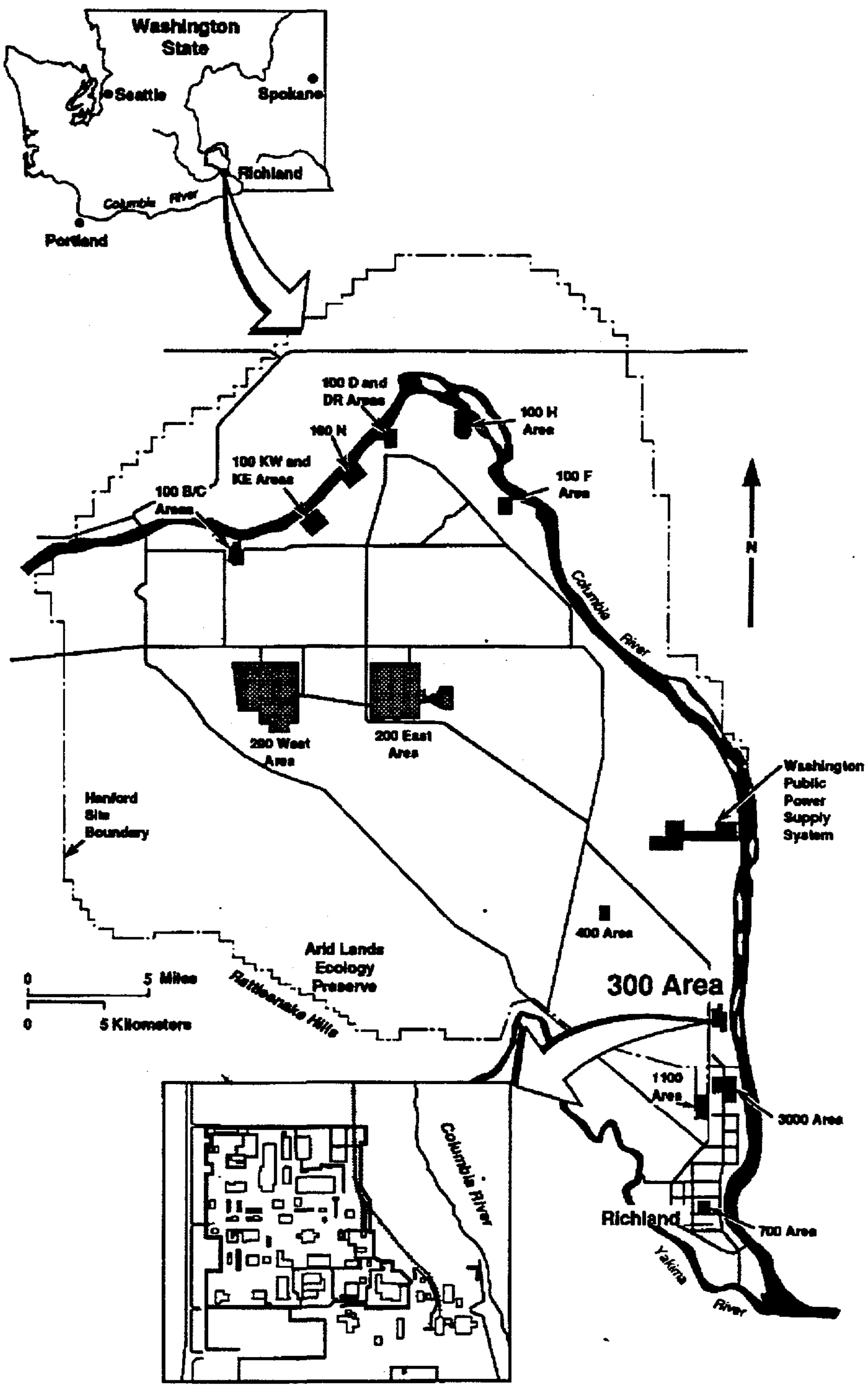

FIGURE 1. HANFORD SITE MAP

2.0 Description of the Proposed Action

2.1 Process Sewer System Upgrade

The proposed action would upgrade the 300 Area Process Sewer System by the construction and operation of a new combined gravity, vacuum, and pressurized process sewer collection system consisting of approximately 36 vacuum collection sumps, approximately five pressure pump stations, and approximately 8,900 meters (29,200 feet) of buried polyvinyl chloride or similar pipe (WHC 1994a). Two buildings would also be built to house a main collection station and a satellite collection station. The project location is shown in Figure 2. The 300 Area Process Sewer Piping Upgrade (Project L-070), for the construction of the new process sewer, is estimated to cost approximately $9.9 million.

Two milestones for the Tri-Party Agreement would be met by the proposed action. They are to: (1) submit design documentation for the 300 Area Process Sewer piping replacement to the U.S. Environmental Protection Agency (EPA) and the State of Washington Department of Ecology (Ecology) by April 30, 1995 (M-17-06J) and (2) replace the 300 Area Process Sewer piping by June 30, 1997 (M-17-06K).

The new collection system would be connected to approximately 36 of the existing buildings. The system would be designed for a total of about 1,230 liters per minute (325 gallons per minute) flow, including extra capacity for connection of additional buildings, as necessary, and for future growth. The new system would start as close to each building as practical. At this point, a vacuum collection sump or a pressure pump station would be built. The new vacuum collection sumps and pressure pump stations would be connected to the existing drain pipes from the buildings and would be gravity fed from the buildings. In some instances, it may be necessary to modify the existing pump systems within selected buildings. The lines from the vacuum collection sumps and pressure pump stations would feed to the satellite collection station, the main collection station, or a pressure system and would be installed at a depth of approximately 1.2 meters (4 feet).

The building at the main collection station would be about 9 x 9 meters (30 x 30 feet) in size and contain duplex vacuum pumps, a vacuum reservoir tank, a water collection tank, water discharge pumps, and monitoring instruments and controls. The satellite collection station would be about 8 meters (25 feet) by 5 meters (15 feet) in size and contain the same equipment as the main collection station with the exception of the vacuum pumps and vacuum reservoir tank because vacuum is provided by the main collection station. Electrical power, operating controls, level switches, monitoring and alarm systems, and lighting at the collection stations would be part of the new system. Normally, the vacuum pumps would maintain a vacuum range of 41 to 51 centimeters (16 to 20 inches) of mercury within the entire collection system. The water collection tank from the main collection station would discharge through pressure pumps to the collection sump and lift station for the 300 Area TEDF (Waste Collection Sump No. 1) on the north end of the 300 Area. This sump and lift station has been constructed to accept the discharge from the existing process sewer as part of the TEDF (DOE 1992).

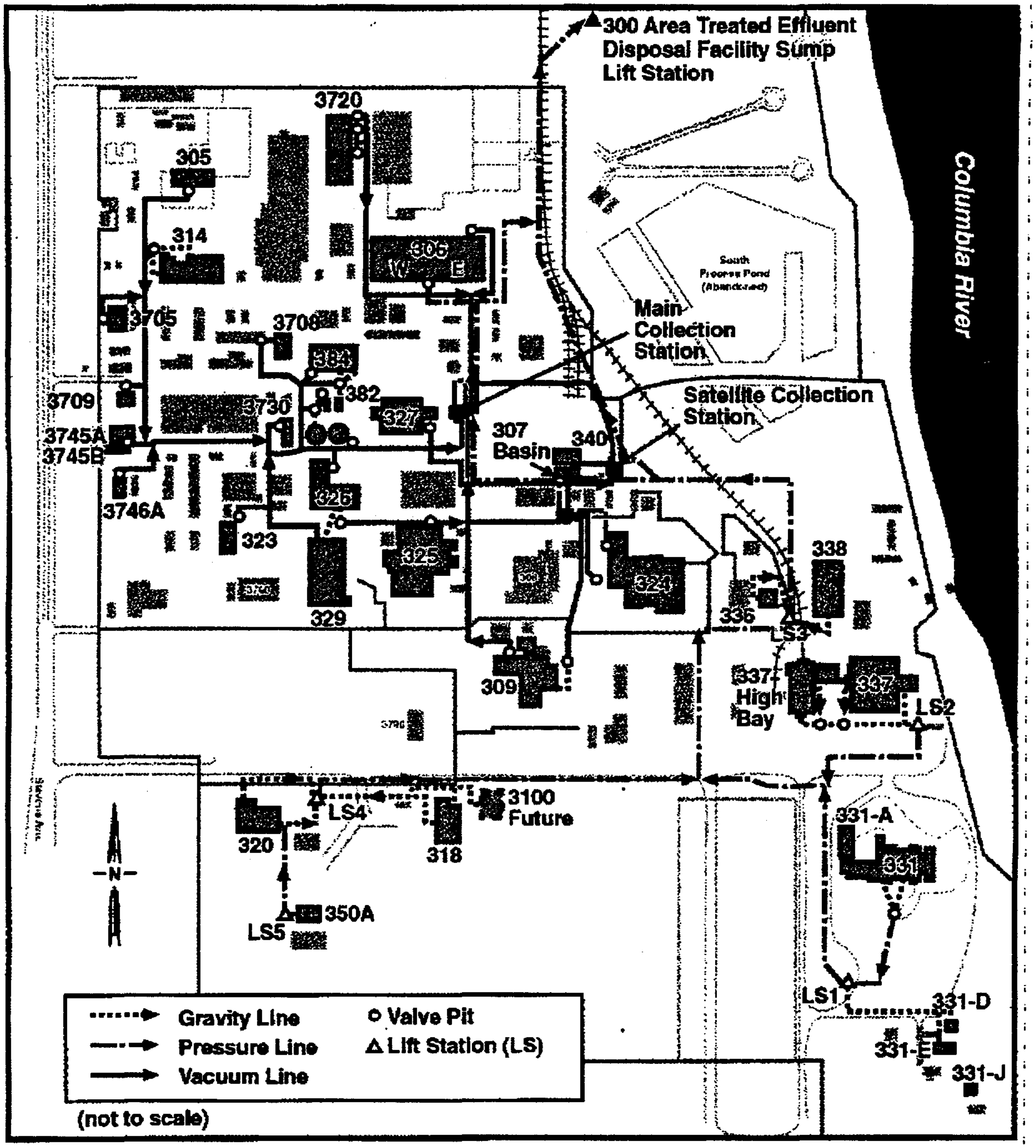

Figure 2. Location for the 300 Area Process Sewer Upgrade

The vacuum collection sumps would be used at buildings with low flow quantities and low lift requirements to reach the main and satellite collection stations. Pressure pump stations would be installed at several buildings at locations where higher flows are expected and higher lift is required to feed into the collection system. A vacuum system would be used wherever possible because of the lower initial capital costs, fewer maintenance and operating requirements, lower complexity, and due to the fact that it is an environmentally safer system because pipe breaks would not result in pressurized leakage of liquids into the soil.

Much of the excavation for the vacuum collection sumps and pressure pump stations, as well as trenching for the new pipe, would involve digging through asphalt or concrete paving in roads, walkways, and parking lots. All trenching would be backfilled and asphalt and concrete paving would be restored.

Most of the present process sewer system would be removed from service and left in place following completion of the new system. The only sections of the existing pipe to be removed by this project would be small sections of the lines adjacent to the buildings where the vacuum collection sumps and pressure pump stations would be built or at other locations where the pipes might interfere with trenching. Piping removed from service would be drained and capped where it is cut and left in place. Removal of the out-of-service pipe would not be part of this proposed action. The out-of-service pipe and any surrounding contaminated soil from leaks in the system would be included in the Remedial Investigation/Feasibility Study (RI/FS) work plans for the 300 Area as part of the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) program and eventually be remediated as part of the program for operable units 300-FF-1 and 300-FF-2. This would be more cost effective and less disruptive to 300 Area operations than tearing up the 300 Area to remove all the old pipes during project construction.

There is a possibility that certain sections of the existing sewer lines would be incorporated in the new system rather than being replaced if found to be in good condition and uncontaminated. Portions would be slip lined if found to be contaminated but otherwise in good condition. The amount of slip lining to be done would depend on the condition of the pipes found from detailed examination of the system and the technical feasibility and cost considerations to be determined during project design.

Dangerous waste, including contaminated pipe and soil removed at the tie-ins to the building drains and constructing collection sumps, would be handled in accordance with applicable contractor procedures and standards, as low as reasonably achievable (ALARA) principles, all applicable federal and state regulations, and DOE orders and guidelines. All waste would be characterized and stored or disposed in existing Hanford Site waste management units, or approved permitted offsite facilities, if required. Any mixed waste would be characterized and stored or disposed of in a RCRA permitted storage and/or disposal facility at the Hanford Central Waste Complex in the 200 West Area of the Hanford Site. Construction scrap materials and debris would be generated by the proposed project, and non-dangerous waste would be disposed of in Hanford Site landfills.

2.2 Discharge to the 300 Area Sanitary Sewer

The proposed action would also include construction of a buried discharge line from the TEDF to Lift Station No. 1 of the new 300 Area Sanitary Sewer Line (Project V-784), currently under construction and scheduled for completion by June 1995, which will connect to the City of Richland sewage system just south of the 300 Area. The discharge line from the TEDF to Lift Station No. 1 would be approximately 975 meters (3,200 feet) long. The line would provide an option for the 300 Area process effluent to be sent to the City of Richland Sewage Treatment Plant rather than directly to the Columbia River from the TEDF. The TEDF would then require operation only when the 300 Area Process Effluent did not meet City of Richland acceptance criteria. The new 300 Area Sanitary Sewer Line to the City of Richland sewage collection system has been categorically excluded from further *National Environmental Policy Act of 1969* (NEPA) review.

The discharge line from the TEDF would be built as a separate construction project independent from the process sewer upgrade. The tie-line would follow the same route and be adjacent to the process sewer line from the collection sump and lift station that goes out to the TEDF, and would tie into the new sanitary sewer at Lift Station No. 1, a short distance south of the TEDF collection sump. Figure 3 shows the location of the TEDF and Lift Station No. 1 of the sanitary sewer.

When the system is in place, the 300 Area Process Sewer would discharge to the TEDF collection sump and lift station, where the effluent would be pumped to the equalization tank at the TEDF and monitored for radiation, pH, and other parameters. Record samples would also be taken. If the effluent meets City of Richland acceptance criteria, it would be pumped through the tie-line into the sanitary sewer at Lift Station No. 1, where it would combine with the sanitary effluent and be pumped to the City of Richland Sewer System. If the process sewer effluent does not meet acceptance criteria at the equalization tank, it would be diverted into diversion tanks at the TEDF and then processed in the TEDF to meet acceptance criteria, or transferred to tank waste storage elsewhere on the Hanford Site. After processing to acceptance level in the TEDF, the effluent would either be sent to the City of Richland Sewage System or to the Columbia River outfall, which has been constructed as part of the TEDF. This would provide two options for discharge of the 300 Area process effluent with possible long-term cost savings from reduced operation of the TEDF. Figure 4 is a schematic showing the process options for the effluent at the TEDF.

An aquatic lands sewer outfall lease is in place with the State of Washington Department of Natural Resources (DNR) for the lands at the Columbia River used for the outfall from the TEDF. The lease presently requires that the TEDF effluent be monitored for radiation. Sampling is carried out at the TEDF to insure that the effluent meets the radiation standards of WAC 246-221-290.

The maximum design discharge rate for the tie-line from the 300 Area Process Sewer to the sanitary sewer system would be 1,230 liters per minute (325 gallons per minute); the maximum from the sanitary sewer would be 1,855 liters per minute (490 gallons per minute), for a combined maximum of 3,085 liters per minute (815 gallons per minute) to the City of Richland Sewage Treatment Plant.

The construction of the discharge line from the TEDF to the 300 Area Sanitary Sewer would be contingent upon an agreement with the City of Richland to accept the process sewer effluent.

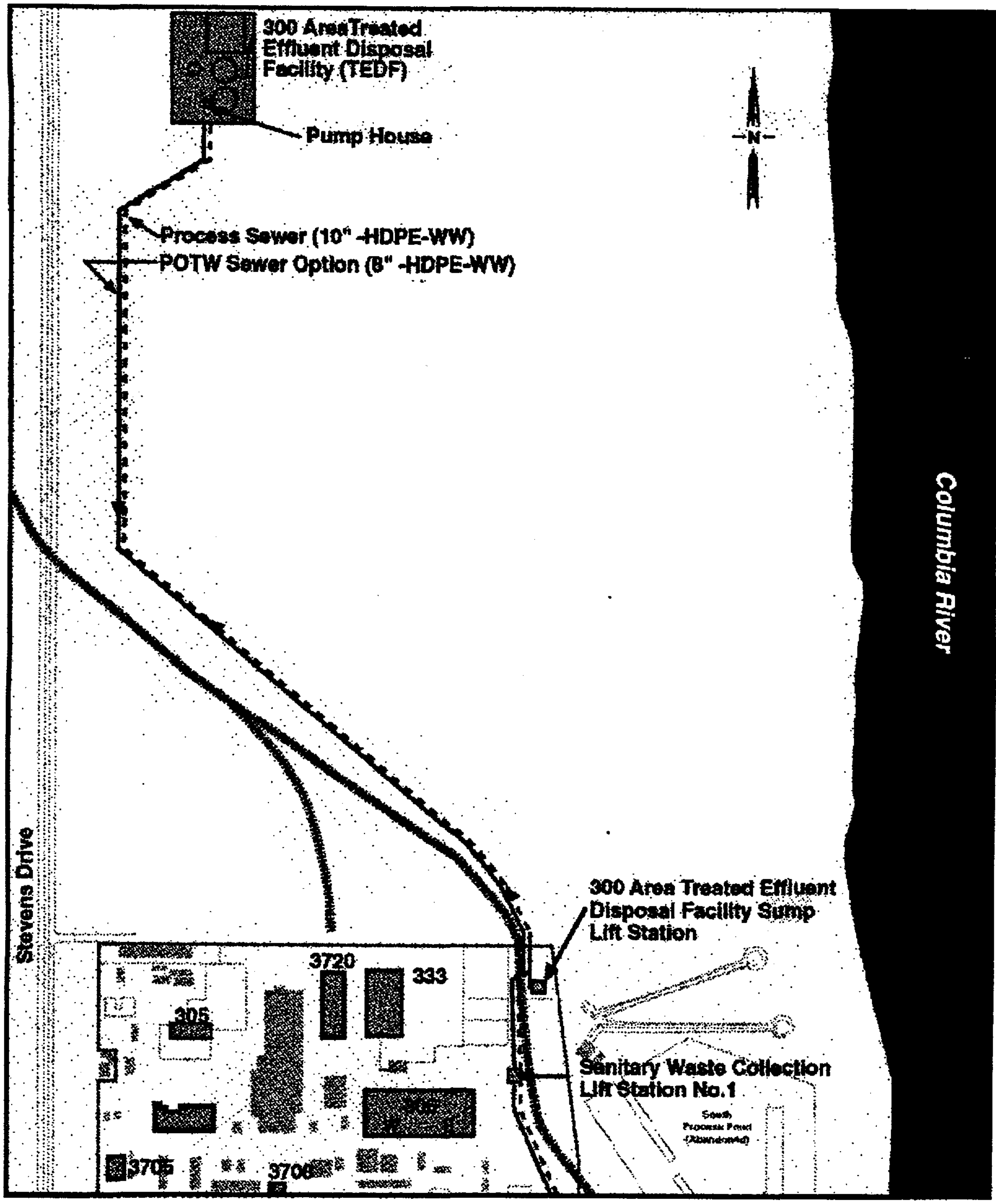

Figure 3. Location of the 300 Area Treated Effluent Disposal Facility and the Proposed Connection to the City of Richland Sewage System

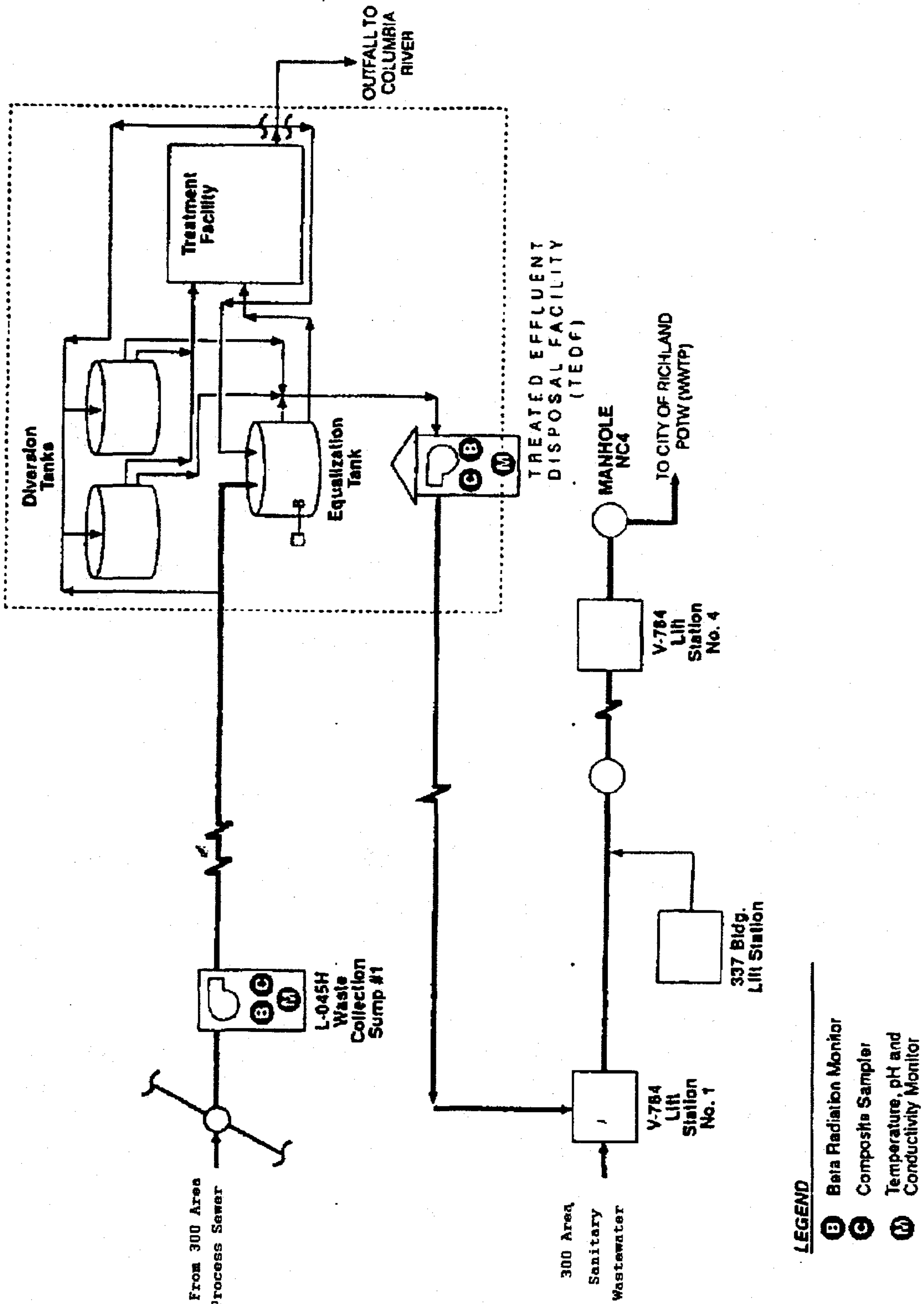

FIGURE 4. TEDF PLANT SCHEMATIC

3.0 Alternatives to the Proposed Action

Engineering studies have considered reasonable alternatives for the proposed process sewer upgrade and discharge line to the sanitary sewer. The preferred alternative is described in Section 2.0. Other alternatives are discussed below.

3.1 Process Sewer System Upgrade

3.1.1 No-Action Alternative

The 300 Area Process Sewer would not be upgraded. The integrity of the old piping in the existing system is questionable and the probability of effluents entering the soil from leaking pipes and carrying contaminants from past discharges would increase with time. The Tri-Party Agreement objective to eliminate the discharge of untreated liquid effluents to the soil would not be completely met, including a Tri-Party Agreement milestone requiring replacement of the old piping. Removal of the old system and residual contamination as part of the 300 Area CERCLA actions could not be accomplished as long as the system is in use. Failure of the existing system could shut down the facilities in the 300 Area.

3.1.2 Reline or Slip Line the Existing Pipes

The 300 Area Process Sewer would be upgraded by relining the existing pipe with a thin epoxy resin-impregnated liner, or slip lining by installing high-density polyethylene pipes within the existing pipes. This proposed alternative would require a combination of both methods and would also require limited replacement of portions of the existing sewer pipes that could not be slip lined. This alternative would require isolating individual sections of line and excavating to gain access points. The lines would be power scrubbed or cleaned on the inside to prevent blockage by debris or coatings, and to provide room for insertion of the liner or high-density polyethylene. Lateral connections with special saddle fittings would be made where mains and laterals join. Wastewater and debris from cleaning the lines would be captured, sampled, and disposed as hazardous waste, radioactive waste, or mixed waste as appropriate. This alternative might be more costly than the preferred alternative, would still require extensive excavation, and would preclude the removal of the old pipes and surrounding contaminated soil as part of a CERCLA action until the process sewer is no longer in use.

Certain sections of the existing process sewer could be incorporated into the new system if examination shows them to be in good condition and uncontaminated. Portions of the system could be slip lined if found to be contaminated but otherwise in good condition. The amount of slip lining to be done would depend on the condition of the pipes found from detailed examination of the system and the technical feasibility and cost considerations to be determined during project design.

3.2 Discharge to the 300 Area Sanitary Sewer

3.2.1 No-Action Alternative

The discharge line from the TEDF to the 300 Area Sanitary Sewer would not be constructed and the 300 Area process effluent could not be sent to the City of Richland Sewage System and Treatment Plant. All process effluent from the process sewer and the TEDF would be discharged to the Columbia River outfall, which has been constructed as part of the 300 Area TEDF (Project L-045H). There would be no option to discharge to the City of Richland system to realize cost savings from reduced operation of the TEDF, and no alternate discharge line would be available.

4.0 Affected Environment

The 300 Area of the Hanford Site is about 1.6 kilometers (1 mile) north of the City of Richland, Washington, and is adjacent to the Columbia River. The TEDF is located about 0.8 kilometers (0.5 miles) north of the 300 Area. Figure 1 is a Hanford Site Map. The 300 Area contains facilities for the fabrication of nuclear fuel elements that were used in Hanford's reactors, laboratories where the chemical separations processes to recover plutonium and uranium from irradiated fuel were developed and where other research and development activities are carried out, offices, and numerous other support facilities for the Hanford Site.

The 300 Area continues to provide administrative functions, laboratory operations, and other services necessary for the Hanford Site to support research and development needs of the DOE.

The Hanford Site has a mild, dry climate with 15 to 18 centimeters (6 to 7 inches) of annual precipitation and occasional high winds up to 129 kilometers (80 miles) per hour. There has been no reported occurrence of a tornado on the Hanford Site. The Hanford Site has low to moderate seismicity. The prevailing winds in the 300 Area are from the northwest and southwest directions.

The soils and shallow underlying materials within the 300 Area primarily consist of unconsolidated silty sands and gravels with excellent drainage characteristics. Most of the 300 Area is developed with buildings, roads, and pavement underlain by compacted sand and gravel-fill material. Because the area is adjacent to the Columbia River, the water table is shallow, generally between 9 and 18 meters (30 to 60 feet) below the surface. The groundwater flow is toward the river.

The open land in the vicinity of the 300 Area contains the typical Hanford Site shrub-steppe community of sagebrush and rabbitbrush, with an understory consisting primarily of cheatgrass and Sandberg's bluegrass. The typical insects, small birds, mammals, and reptiles that inhabit the rest of the Hanford Site are found here.

The structures in the 300 Area are not located in the 100-year floodplain or in wetlands. A Biological Review (PNL #94-WHC-237) is provided in Appendix B and Cultural Resources Reviews (HCRC #92-300-007 and HCRC #94-300-080) are provided in Appendix C for both the Process Sewer Upgrades and the tie-line from the TEDF to the 300 Area Sanitary Sewer. The biological review concluded that no plant or animal species of concern would be affected by the projects. A culturally sensitive area in the 300 Area runs within 400 meters (1,300 feet) of the Columbia River and has been identified as containing several known archeological sites. The Cultural Resource Reviews concluded that there are no known cultural or historic properties that would be affected by the project other than that culturally sensitive area.

No species of plant or animal registered as rare, threatened, endangered, or candidate are known to depend on the habitats within the 300 Area.

Additional information about the Hanford Site can be found in the *Hanford Site National Environmental Policy Act (NEPA) Characterization* report (PNL 1994).

5.0 Environmental Impacts

5.1 Construction

The impacts from constructing the process sewer upgrade and the line connecting the TEDF to the 300 Area Sanitary Sewer would be essentially the same. There would be a potential for airborne emissions of radioactive or hazardous materials resulting from construction of the project. This potential for release would occur during the excavation and tie-in work to the existing drain lines at the 36 or more buildings to be connected to the new system and by excavation for the collection sumps and drain pipes. These activities also would create some potential exposure to workers during the limited removal and handling of the old pipes, residual liquids, and contaminated soil at these sites.

All excavation and pipe removal activities would be controlled by procedures and administrative controls that prevent the escape of hazardous airborne emissions. Procedures that might be employed to control airborne emissions would be: (1) the use of radiation monitoring and greenhouses with high-efficiency particulate air filters, as necessary, during excavation, (2) removal of old piping and contaminated soil which is uncovered by the proposed action at the connection points, and (3) stopping or limiting work during adverse wind and weather conditions.

All excavation and removal of pipe, residual liquid, and contaminated soil would be controlled by approved radiological and industrial safety procedures and administrative controls that prevent or minimize worker exposure and soil erosion. Radiation monitoring of work areas, use of shielding or remote handling, if found necessary, and limitations on individual exposure time would be used to limit worker exposure. Exposure of onsite personnel to radiation doses must be limited by safety procedures to ALARA.

Workers trained in radiation protection would be used for work in areas where radioactive contamination is present and would have the proper protective clothing and equipment and if necessary wear respiratory protection. In addition, health physics technicians would be present to monitor for radiation. Only direct radiation would be received and Hanford Site ALARA principles would be implemented to minimize direct radiation exposure. Radiation workers wear dosimeters to measure radiation dose; these badges are monitored monthly. The average Hanford Site radiation worker with a monthly dosimeter exchange frequency received a dose of 0.065 roentgen equivalent man (rem), effective dose equivalent (EDE), during calendar year 1993 (WHC 1994d). Because the radiation to be encountered during the construction is very difficult to predict, some conservative assumptions are used to estimate the dose to workers. Assuming that a crew of 20 radiation workers would be involved in the construction, and conservatively assuming that each worker receives an annual dose equivalent to the average dose for 1993 over an 18 month construction period, the total dose to the construction workers is calculated to be 2.0 person-rem. Applying a dose-to-risk conversion factor developed by the International Commission on Radiological Protection (ICRP) of 4.0×10^{-4} latent cancer fatalities (LCF) per person-rem EDE for a worker population (ICRP 1991), the worker exposure during construction would result in a calculated 8.0×10^{-4} cancer deaths. Therefore, no latent cancer deaths would be expected.

Particulate releases to the atmosphere would be limited to nonhazardous dust that would be generated for short periods as a result of project construction activities. Release of dust containing radionuclides or hazardous materials to the atmosphere would be controlled as described above. There would be no liquid releases to the environment other than raw water used to control dust during construction.

There would be exhaust gases discharged to the atmosphere from vehicles and equipment used during construction, operation, and maintenance activities. There also would be relatively minor amounts of heat generated by construction equipment and by operating and maintenance equipment.

Ambient noise levels would be temporarily increased in the immediate vicinity as a result of project construction activities and subsequent operation and maintenance activities. Workers would wear appropriate hearing protection as necessary.

Location of the new vacuum collection sumps and pressure pump stations and routing of the new piping would be coordinated with presently ongoing RI/FS planning work to avoid areas of known contamination within the 300 Area operable units that are being scheduled for remediation.

It is estimated that removal of existing pipe from the process sewer system where the building tie-ins are made and at other locations would generate approximately 30 cubic meters (1,060 cubic feet) of solid waste. It is also estimated that the new pipe installed for the Process Sewer would represent a potential volume of approximately 225 cubic meters (8,000 cubic feet) that would eventually be remediated when 300 Area operations are completed. An additional volume estimated at approximately 24 cubic meters (850 cubic feet) of pipe would be in the ground if the tie-line from the TEDF to the sanitary sewer is built. Construction materials, such as concrete and steel, and the consumption of petroleum products would represent a long-term commitment of nonrenewable resources.

The locations to be excavated for the pipe trenches and collection sumps are in previously disturbed parts of the entirely fenced 300 Area and would be expected to have very little impact on plant or animal life. Much of the excavation for collection sumps and trenching for the new pipe would involve excavation through and eventual reconstruction of asphalt or concrete paving in roads, walkways, and parking lots. All trenching would be backfilled. Site preparation and excavation for construction would require a Hanford Site contractor excavation permit. The construction of the process sewer would cause some disruption to transportation and facility operations in the 300 Area. Work would be planned and scheduled so as to minimize transportation disruption and facility shutdowns.

A Biological Review (PNL #94-WHC- 237) is provided in Appendix B and Cultural Resources Reviews (HCRC #92-300-007 and HCRC #94-300-080) are provided in Appendix C for both the process sewer upgrades and the tie-line from the TEDF to the 300 Area Sanitary Sewer. The biological review concluded that no plant or animal species of concern would be affected by the projects.

The cultural resource reviews concluded that there are no known cultural or historic properties that would be affected by the project other than the culturally sensitive area within 400 m (1,300 ft) of the Columbia River. Because of this sensitivity, an HCRL archeologist must be present to monitor these excavation activities for archeological materials. The monitoring would be conducted on an intermittent basis, with emphasis on excavations that may extend deeper than fill material. If cultural materials (bones, artifacts) were encountered, work in the vicinity of the find would stop until an Hanford Cultural Resources Laboratory (HCRL) archeologist assessed the find and arranged for mitigation of impacts. Representatives of the local Native American Tribes would also be consulted.

The socioeconomic impact of the proposed project construction on current employment and the local economy would be minimal. Construction of the system would require a temporary increase in construction workers. A crew of about 20 construction workers is anticipated for a duration of approximately 18 months.

5.2 Operations

Under normal operation of the system, there would be minimal environmental impacts from either the new process sewer or the discharge line to the 300 Area Sanitary Sewer other than minor amounts of heat, noise, and exhaust fumes from operating and maintenance equipment and small quantities of maintenance waste. The 300 Area liquid process waste would be collected and transferred through the new buried process sewer lines to the collection sump and lift station. The waste would then be transferred to the 300 Area TEDF and from the TEDF to the 300 Area Sanitary Sewer. There would be no liquid effluents discharged to the soil column. This would eliminate a subsurface discharge thus reducing the likelihood of remobilizing subsurface contaminants.

The only routine air emissions would be vented from the water collection tank at a central vacuum collection station, where the process effluent would be accumulated for transfer to the TEDF. No dose calculations were made for these minor emissions; however, the emissions would be comparable to those from the wastewater treatment system in the TEDF, which were estimated in *Washington Administrative Code* (WAC) 246-247, "Radiation Protection - Air Emissions," and the "Washington Administrative Code 246-247, Notice of Construction for 300 Area Treated Effluent Disposal Facility" (Jackson 1992). The Notice of Construction for the TEDF was submitted to the State of Washington Department of Health to meet requirements of WAC 246-247-070 for insignificant sources of radionuclide air emissions. An insignificant source is defined as one that could result in a committed EDE of less than 1×10^{-3} rem per year to the maximally exposed offsite individual without emission controls. The calculated dose to the maximally exposed offsite individual from the TEDF emissions is approximately 6.1×10^{-7} rem per year. The emissions from the tank in the vacuum collection station would probably be at a lower rate than from the TEDF.

Applying a dose-to-risk conversion factor developed by the ICRP of 5.0×10^{-4} LCF per person-rem EDE for a population of all ages (ICRP 1991), the emissions would result in a calculated 3×10^{-10} offsite cancer deaths per year. Therefore, no latent cancer deaths are expected. Operation and maintenance of the complex might generate additional solid waste which would be handled as described in Section 5.1. No change in the number of employees required to operate and maintain the process sewer system would be anticipated.

5.2.1 Accident Risk

A hazard classification document was prepared to examine the operation of the proposed 300 Area process sewer upgrade to determine the hazard class for the project (WHC 1992a). It was determined that there would be a potential for airborne emissions from a postulated accidental breach of a process sewer pipe if there were a pressurized spray release to the environment. Hazardous materials in the facilities that would discharge to the upgraded system were identified and include hazardous chemicals and radionuclides. It was concluded that radionuclides are the controlling factor in establishing the hazard classification.

The upgraded process sewer system is classified as low hazard based on a requirement for the 300 Area facilities that would discharge to the system to maintain radionuclide inventories at or below levels set by administrative controls and DOE orders. The potential for a release of liquid radioactive materials from each facility draining to the system was evaluated based on a review of existing inventories and two limiting isotopes identified. They are plutonium-239 in the 325 Laboratory Building and strontium-90 in the 324 Laboratory Building. The maximum allowable inventories within these buildings are 20 and 1,200 curies for plutonium-239 and strontium-90, respectively. An upper bound accident was postulated and analyzed in the Hazard Classification Report to determine the limiting conditions based on these maximum allowable inventories (WHC 1992a).

The postulated upper bounding accident scenario is the accidental dumping of 0.322 kilograms (0.71 pounds) of plutonium-239 from the 325 Laboratory Building or 0.009 kilograms (0.02 pounds) of strontium-90 from the 324 Laboratory Building into a sink drain or floor drain. These quantities represent maximum possible spills estimated from the maximum allowable inventories in the buildings. The drains from these buildings feed by gravity to a retention process sewer (RPS), which is used for facilities such as laboratories that contain radioactive materials. The liquids from the RPS are accumulated in the 307 Basins, and intermittently pumped into the process sewer. In the postulated upper bounding accident, a pipe break is assumed to occur in the process sewer line downstream from the 307 Basins following the spill and during the pressurized liquid transfer. The pipe break would result from an excavation activity or a seismic event. The buried line would have to be uncovered at the break to enable a pressurized spray release, resulting in an airborne release to the environment. This is a very conservative worst-case accident scenario with a very low probability of occurrence. This postulated accident could also take place under the No-Action Alternative.

The likelihood of a release to the environment because of a pipe breach in the RPS or the process sewer occurring at the same time as or shortly after a spill in one of the buildings was calculated (WHC 1992b). The probability of the failure occurring at that time is calculated to be about 2.7 x 10^{-7}. A probability of 1.0 x 10^{-6}, or one in one million, is considered a credible occurrence and this postulated accident is not credible.

The liquid effluent from the 324 and 325 Laboratory Buildings passes by radiation detectors. Radiation detectors at the laboratory buildings and the 307 Basins are to be upgraded in 1996 and the detectors would be calibrated to measure gamma and alpha radiation. If the gamma radiation level at the labs is below 5,000 picocuries per liter, the effluent would be discharged to the 307 Basins. If the concentration is greater than 5,000 picocuries per liter, the effluent would be diverted to a radioactive liquid waste system and eventually be transferred for waste tank storage. A second diverter in the RPS system is located at the 307 Basins. Only effluent with a gamma concentration under 5,000 picocuries per liter would be transferred from the 307 Basins into the process sewer (WHC 1994b). For the postulated spray release accident following an accidental spill in a laboratory to occur, the pipe breach would have to take place in a pressurized portion of the RPS or the radionuclides would have to get through the 307 Basins detectors to a pressurized segment of the process sewer. The RPS is classified as less than category 3 or "normal public hazard" (WHC 1994c).

The Hanford Site standard dosimetry GENII computer code (PNL 1988) was used to determine the radiological doses from the postulated upper bounding accident. Radiological dose consequences were calculated for the maximally exposed onsite and offsite individuals. Calculated dose consequences to the maximally exposed individual using the GENII computer code are very conservative dose estimates.

The maximally exposed onsite individual is defined as a person who is not aware or trained for the particular hazardous accident condition that may exist and is located at least a distance of 100 meters (328 feet) from the source. The atmospheric dispersion factors for all sixteen wind sectors was calculated at a distance of 100 meters from the building facilities in the 300 Area and for the onsite facilities. The calculated maximum X/Q for all 16 directions at a receptor location of 100 meters was determined for an onsite individual. The exposure pathways for the onsite individual include both inhalation and submersion. The worst case location is in the direction east of the source. For the accident scenario, the controlling pathway is inhalation; the controlling organ is the bone surface; and the controlling radionuclide is Pu-239 for an onsite location.

The maximally exposed offsite individual for the postulated accident is a person who is located a distance of 1,140 meters (3,740 feet) east of the 300 Area. This location would be on the east side of the Columbia River. For an offsite location, the controlling pathway is ingestion and the controlling radionuclide is Sr-90. All alpha emitters were modeled as Pu-239, which is very conservative. An eight hour aerosolization release accident was assumed for the pipe break in the process sewer line. The total discharge from the spray leak would be 152.6 gallons in which 2.4 gallons becomes aerosolized and contains respirable particles (WHC 1992a).

The calculated dose to the maximally exposed onsite individual from the postulated accident is 4.8 rem EDE. The calculated dose to the maximally exposed offsite individual from the postulated accident is 0.52 rem EDE. The individual would have to be a resident at the offsite location because the controlling pathway is ingestion and the controlling radionuclide is strontium-90.

Following the postulated upper bounding accident, it would be possible that maintenance workers could receive a radiation dose from residual contamination in the new process sewer system. Because the postulated accident is in the incredible range (2.7×10^{-7}) and the residual contamination would be expected to be at a very low level because the pipes would be flushed following an accident, no estimate of this dose was made.

5.2.2 Health Effects

Estimates may be made for the health effects from radiation exposure in the form of LCF using the dose calculations from the GENII computer code model for the postulated accident (PNL 1988) and applying the dose-to-risk conversion factors developed by the ICRP. The ICRP has determined that the nominal dose-to-risk conversion factors for low-dose, low dose rate irradiation are approximately 4.0×10^{-4} LCF per person-rem EDE for a worker population; and for a population of all ages, approximately 5.0×10^{-4} LCF per person-rem EDE (ICRP 1991). The health effects are calculated by multiplying the calculated radiological dose by the ICRP conversion factor.

The health effects estimated from the dose calculations and the ICRP conversion factors are 1.9×10^{-3} LCF for the maximally exposed onsite individual and 2.6×10^{-4} LCF for the maximally exposed offsite individual. The calculated health effect of 1.9×10^{-3} LCF means that the probability of the maximally exposed onsite individual becoming an LCF as a result of the postulated upper bound accident is about 1 in 526. The calculated health effect of 2.6×10^{-4} LCF for the maximally exposed offsite individual means that the probability of the maximally exposed offsite individual becoming an LCF as a result of the postulated upper bound accident is about 1 in 3,850.

Because the postulated upper bound accident and dose estimates from the GENII computer code represent very conservative bounding cases with low probability of occurrence, the estimated health effects must also be considered as very conservative (PNL 1988). As previously stated, the probability of the upper bound accident occurring is calculated to be in the incredible range.

The postulated upper bound accident and the calculated radiological doses would apply only for the upgraded 300 Area Process Sewer if a pipe break occurred in a segment of the system where the lines would be pressurized by pumps. Where the vacuum collection system is used in the system, a break in a line would not result in a pressurized spray release because the pressure inside the line would be lower than the outside pressure.

5.2.3 Hazardous Chemicals

Hazardous chemicals and radionuclides were identified in the facilities that would discharge to the upgraded sewer system. Because it was concluded that radionuclides would be the controlling factor in establishing the hazard classification for the system, no analysis of the effects of hazardous chemicals was made in the Hazard Classification Report (WHC 1992a). It was calculated that the postulated accident would release only 9.08 liters (2.4 gallons) of liquid as an aerosolized spray. Because of the small quantity of liquid in the spray release, it is assumed that there would be no consequences of concern from hazardous chemicals. Because the quantity of effluent expected from an accidental breach of the line is small, no serious contamination of the groundwater in the 300 Area would be expected from an accident. The process waste liquid effluent is currently well below the DOE requirements for radiological secondary containment, and is not considered a RCRA hazardous waste or a *State of Washington Hazardous Waste Management Act* dangerous waste.

5.2.4 Discharge to the 300 Area Sanitary Sewer

A Preliminary Safety Analysis Document (WHC 1992c) was prepared to assess the operation of the 300 Area TEDF to determine potential hazards associated with the facility and its operation. When the TEDF is operating, the treated wastewater from the TEDF is required to meet or exceed water quality standards for discharge to the Columbia River. The TEDF discharge is covered by a NPDES permit from EPA and certified by Ecology, and will meet water quality standards for the state of Washington. The effluent is currently being monitored for radiation at the TEDF under the terms of the DNR Aquatic Lands Lease.

The quality of the chemical-process wastewater would be monitored continuously as it arrives at the TEDF. If the wastewater meets the City of Richland's acceptance criteria, it would be discharged continuously to the Sanitary Sewer. If the wastewater quality does not meet the City of Richland's acceptance criteria, it would be diverted into holding tanks and treated in the TEDF and discharged to the City of Richland, blended in over time with untreated wastewater for discharge to the City system, or disposed of at another location. Discharge to the City would also be stopped if a major spill or other accident occurs that would result in wastewater that could not be adequately treated to meet the City of Richland's acceptance criteria.

The upper bound accident for the process sewer discussed in Sections 5.2.1 and 5.2.2 of the Preliminary Safety Analysis Document would not result in a discharge of contaminated effluent to the sanitary sewer and the City of Richland that would exceed the City of Richland's acceptance criteria. The process sewer effluent would be collected, monitored, and record sampled at the equalization tank at the TEDF. The presence of unacceptable pollutants resulting from an upset or accident would cause the effluent to be diverted into holding tanks and the effluents would either be processed to reduce the contaminants to acceptable levels before discharge to the City of Richland, or the liquids would be removed to tank waste storage elsewhere on the Hanford Site. The holding tanks in the TEDF will have the capacity to hold a volume equal to approximately five days of the process sewer average flow. Figure 4 is a schematic showing the arrangement of the monitoring and diversion system for the TEDF.

Waste acceptance criteria for the TEDF are in place for the 300 Area facilities, which will discharge to the process sewer. Engineered and administrative controls will be in place to limit discharges of unacceptable wastes to the process sewer.

5.2.5 Impacts From Alternatives

5.2.5.1 Process Sewer System Upgrade

The impacts of the No-Action Alternative which would mean not constructing the new process sewer and continuing to operate the existing system would be the continued risk that risk that contaminants would enter the soil column and the groundwater. This risk would probably increase with time. Tri-Party Agreement objectives to eliminate liquid effluents to the soil column would not be completely met and Tri-Party Agreement milestones to replace the old piping would not be met. There would be less piping that would eventually be remediated as part of the 300 Area CERCLA operable units. This remediation could not be accomplished until the process sewer is no longer in use.

The impacts of relining or slip lining the existing pipes would be similar to the impacts for the proposed sewer line replacement except that there would be less ground disturbance and less waste to dispose of. Contaminated pipe and soil would be removed at access point excavations and the remaining piping including the interior lining and any contaminated soil would eventually be remediated as part of the 300 Area CERCLA operable units. This remediation could not be accomplished until the process sewer is no longer in use.

5.2.5.2 Discharge to the 300 Area Sanitary Sewer

The impacts of the No-Action Alternative would be less than building the tie-line to the City of Richland sewer system. If the tie-line is not built there would be no ground disturbance and the line would not have to be eventually remediated as part of the 300 Area Operable Unit work.

5.2.6 Cumulative Impacts

The cumulative impacts from the proposed action to upgrade the 300 Area Process Sewer would be the increased quantity of approximately 225 cubic meters (10,600 cubic feet) of pipe in the ground to eventually be remediated as part of the 300 Area operable Unit work. This could potentially increase the quantity of waste to be added to existing Hanford storage and disposal sites as discussed in Section 5.1.

The cumulative impacts from the proposed action to construct a tie-line to the 300 Area Sanitary Sewer for discharge of the 300 Area process effluent to the City of Richland would be to add approximately 1,780,000 liters per day (470,000 gallons per day) to the liquid effluent processed at the City of Richland Sewage Treatment Plant. This would represent about 4.25 percent of the plant capacity of 42 million liters (11 million gallons) per day. Current utilization of the Richland Plant is well below capacity. Construction of the line would also add an estimated volume of pipe in the ground of approximately 24 cubic meters (850 cubic feet) to eventually be remediated as part of the 300 Area operable Unit work.

5.2.7 Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires that federal agencies identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of their programs and activities on minority and low-income populations. The DOE is in the process of developing official guidance on the implementation of the Executive Order.

With respect to Executive Order 12898 regarding environmental justice, distributions of minority and low income population groups have been identified for the Hanford Site (DOE 1994). Because the entire proposed action would occur on the Hanford Site, the offsite environmental impacts from the proposed action analyzed in this EA are expected to be minimal. No adverse health effects are expected to occur in any offsite community. No socioeconomic impacts are expected. Therefore, no disproportionate impacts on any subgroups of the public including minority and low-income populations are expected.

6.0 Permits and Regulatory Requirements

Under WAC 173-240-110(1), "Submission of Plans and Reports for Construction of Wastewater Facilities," the 300 Area Process Sewer would normally require submittal and approval of engineering reports and plans and specifications by Ecology before construction. A waiver was requested by the DOE and granted by Ecology under WAC 173-240-110(5) to allow for submittal of conceptual plans and appropriate information from the engineering report.

In addition, a Notice of Construction (NOC) for the 300 Area Process Sewer was submitted to the State of Washington Department of Health and the EPA notifying them of estimated air emissions from the proposed new system. Approvals of the NOC have been received from both agencies.

The City of Richland would require the DOE to submit a Waste Discharge Permit Application for Industrial Discharge to the City of Richland Sewage Treatment Plant if the proposed tie-line were built. The issuance of this permit is required as part of the federally mandated Pretreatment Program (40 CFR 403) as a part of the city's NPDES permit. This application would require approval and issuance of the waste discharge permit from the city before beginning discharge to the city sewer system. The process sewer and sanitary sewer effluents would be monitored and sampled before entering the system and would conform to the limitations and requirements contained in the waste discharge permit.

The City of Richland's Pretreatment Program is regulated by the EPA and the city ordinance (Richland Municipal Code, Chapter 17.30) that establishes the minimum requirements for issuing and complying with the waste discharge permit. The City of Richland's pretreatment requirements are specified in NPDES Permit No. WA-002041-9, dated March 15, 1985. The wastewater quality would have to meet the acceptance criteria of the City of Richland's Pretreatment Program and Ordinance No. 35-84.

Two milestones for the Tri-Party Agreement are to: (1) submit design documentation for the 300 Area Process Sewer Piping Replacement to EPA and Ecology by April 30, 1995 (M-17-06J), and (2) replace the 300 Area Process Sewer piping by June 30, 1997 (M-17-06K). The design documentation was submitted to EPA and Ecology on April 7, 1995.

7.0 Agencies Consulted

Preliminary meetings have been held between the DOE and the City of Richland regarding the feasibility of discharging the 300 Area Process Sewer effluent to the City sewage system.

Prior to the DOE approval of this EA, it was sent to the City of Richland, States of Oregon and Washington, the Yakama Indian Nation, the Confederated Tribes of the Umatilla Indian Reservation, the Nez Perce Tribe, and the Wanapum for review.

Comments were received from the States of Washington and Oregon. The comments and the DOE responses to these comments are provided in Appendix D.

8.0 References

10 CFR 1021, "National Environmental Policy Act Implementing Procedures," *Code of Federal Regulations*, as amended.

40 CFR 403, " General Pretreatment Regulations for Existing and New Sources of Pollution," *Code of Federal Regulations, as amended.*

40 CFR 1500-1508, 1992, "Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act," *Code of Federal Regulations,* as amended.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 USC 9601 et seq.

DOE, 1992, *Environmental Assessment, Hanford Environmental Compliance Project*, DOE/EA-0383, U.S. Department of Energy, Washington, D.C.

DOE, 1994, Letter to Addressees: *"Draft Demographic Maps Identifying Minority Populations and Low-income Populations for Purpose of Environmental Justice (OPE-EIS-94.708)"* from Tom Wichmann, EIS Project Manager, Idaho Operations Office, Idaho Falls, Idaho. (Copy available for inspection in the DOE Public Reading Room, Room 130, Washington State University-Tri-Cities, 100 Sprout Road, Richland, Washington.)

Ecology, EPA, and DOE, 1994, *Hanford Federal Facility Agreement and Consent Order*, as amended, 89-10 Rev. 3, Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington.

ICRP, 1991, *Annals of the ICRP*, Publication 60, International Commission on Radiological Protection, Elmsford, New York.

National Environmental Policy Act of 1969, 42 USC 4321 et seq.

PNL, 1988, *GENII - The Hanford Environmental Radiation Dosimetry Software System*, 3 vols., PNL-6584, Pacific Northwest Laboratory, Richland, Washington.

PNL, 1994, *Hanford Site National Environmental Policy Act (NEPA) Characterization*, PNL-6415, Rev. 6, Pacific Northwest Laboratory, Richland, Washington.

Resource Conservation and Recovery Act of 1976, 42 USC 6901 et seq.

WAC 173-240, "Submission of Plans and Reports for Construction of Wastewater Facilities," *Washington Administrative Code*, as amended.

WAC 246-221-290, "Appendix A - Concentrations in Air and Water Above Natural Background."

WAC 246-247, "Radiation Protection - Air Emissions," *Washington Administrative Code*, as amended.

WHC, 1992a, *Hazard Classification for the 300 Area Process Sewer, Project L-070*, WHC-SD-L070-HC-001, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

WHC, 1992b, *300 Area Facility Evaluations for Potential Upset to Process Sewer*, WHC-SD-GN-ER-30016, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

WHC, 1992c, *300 Area Treated Effluent Disposal Facility Preliminary Safety Analysis Document*, WHC-SD-L045H-SAD-001, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

WHC, 1994a, *Advance Conceptual Design Report, 300 Area Process Sewer Piping Upgrade, Project L-070*, WHC-SD-L070-ACDR-001, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

WHC, 1994b, *Functional Design Criteria for the 300 Area Diverter Stations Upgrade Project 94C-EWW-353*, WHC-SD-W353-FDC-001, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

WHC, 1994c, *Addendum to Safety Assessment for the 340 Waste Handling Facility*, WHC-SD-WM-TM-001, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

WHC, 1994d, *Westinghouse Hanford Company Health and Safety Performance Report, Fourth Quarter Calendar Year 1993*, WHC-SP-0564-32, Westinghouse Hanford Company, Richland, Washington.

Appendices

APPENDIX A

300 AREA PROCESS SEWER CONSTITUENTS

WHC-SD-L045H-ER-002, Rev. 0

Table 2-1
300 Area TEDF
Design Source Term

Constituent	Current PMEOP	Historical PMEOP	Design Source Term PMEOP
ORGANIC COMPOUNDS (ug/l)			
Acetone	ND	70	70
Bisthanolethanedithiol	ND	1 C	1 C
Bis(ethylhexyl)phthalate	8.8	80	80
2-Butoxyethanol	ND	1 C	1 C
2-(2-butoxy ethoxy)ethanol	ND	100	100
Bromodichloromethane	1.5	NA	1.5
Bromomethane	14	NA	14
Chlorodifluoromethane	ND	20 C	20 C
Chloroform	14	40	40
1,1-Dichloroethane	ND	40	40
Dichlorodifluoromethane	ND	3 C	3 C
Ethyl alcohol	ND	3 C	3 C
Methyl ethyl ketone	ND	5 C	5 C
Methylene chloride	5.1	4 C	5.1
m-Xylene	ND	1 C	1 C
o-,p-Xylene	ND	1 C	1 C
2-Propanol	ND	4 C	4 C
Tetrachloroethylene	ND	10	10
Toluene	6.4	2 C	6.4
1,1,1-Trichloroethane	ND	10	10
Trichloroethene	ND	0.4 C	0.4 C
Trichloromonofluoromethane	ND	1 C	1 C

WHC-SD-L045H-ER-002, Rev. 0

Table 2-1 (Continued)
300 Area TEDF
Design Source Term

Constituent	Current PMEOP	Historical PMEOP	Design Source Term PMEOP
INORGANIC COMPOUNDS (ug/l)			
Aluminum	418	350	418
Ammonia (total)	541	400	541
Arsenic (III)	ND	10 T	10 T
Arsenic (Penta)	1.5	10 T	10 T
Barium	36	60	60
Beryllium	ND	30	30
Boron	ND	25	25
Bromide	ND	4 C	4 C
Cadmium	0.3	10	10
Calcium	20223	30000	30000
Chloride	9208	60000	60000
Chromium (III)	ND	10 T	10 T
Chromium (VI)	ND	10 T	10 T
Copper	35	80	80
Cyanide	29	50	50
Fluoride	100	200	200
Iron	542	600	600
Lead	37	60	60
Lithium	ND	30	30
Magnesium	4007	5000	5000
Manganese	8.7	60	60
Mercury	1	3	3
Nickel	ND	60	60
Nitrate	745	6000	6000
Nitrite	ND	400	400
Phosphate	23	1000	1000
Phosphorous-Total	53	NA	53
Potassium	973	1000	1000
Selenium	ND	6	6
Silicon	2594	3000	3000
Silver	1.7	20	20
Sodium	6051	40000	40000
Strontium	91	100	100
Sulfate	13186	30000	30000
Sulfide	ND	100	100
Tin	ND	100 C	100 C
Titanium	21	7	21
Uranium	ND	10	10
Vanadium	3	8	8
Zinc	211	150	211

Table 2-1 (Continued)
300 Area TEDF
Design Source Term

Constituent	Current PMEOP	Historical PMEOP	Design Source Term PMEOP
RADIONUCLIDES (pCi/L)			
Alpha Activity	4.3	9	9
Beta Activity	5.5	40	40
Am-241	0.6	0.4	0.6
Cs-137	46	ND	46
Co-60	ND	1	1
H-3 (tritium)	401	400	401
Pm-147	9	ND	9
Pu-238	0.05	ND	0.05
Pu-239/240	0.05	0.2	0.2
Pu-241	40	ND	40
Radium Total	0.08	0.2	0.2
Ru-106	ND	4	4
Sr-90	ND	1	1
Sr-Total	2.8	ND	2.8
Uranium Total	6.4	8	8
MISCELLANEOUS PARAMETERS (ug/l)			
Alkalinity	53597	60000	60000
Bicarbonate	65274	NR	65274
BOD-5 day	6534	NA	6534
COD	50245	NA	50245
Carbon-Total	47646	14000	47646
Coliform (# per 100 ml)	17	230	230
Conductivity-field (uS)	0	250	250
Hardness	65194	NR	65193
pH-field	ND	9	9
POX-Br	14	6	14
POX-Cl	62	6	62
Suspended Solids	3000	9000	9000
Total Dissolved Solids	94234	120000	120000
Total Organic Carbon	29906	6000	29905
TOX-Br	21	NA	21
TOX-Cl	153	NA	153

PMEOP = Post-Minimization, End-of-Pipe
ND = Not Detected
NA = Not Analyzed
C = Calculated value based on measured upstream concentration
T = Total metal concentration
NR = Not Reported

APPENDIX B

BIOLOGICAL REVIEW

Battelle
Pacific Northwest Laboratories
Battelle Boulevard
P.O. Box 999
Richland, Washington 99352
Telephone (509) 376-5345

November 23, 1994

Howard Wellsfry
Westinghouse Hanford Company
P. O. Box 1970, MSIN L4-93
Richland, WA 99352

Dear Mr. Wellsfry:

BIOLOGICAL REVIEW OF THE L-070/CONDUIT FOR COMMUNICATIONS MONITORING CIRCUITS AND REPLACEMENT OF THE PROCESS SEWER PIPELINE IN THE 300 AREA PROJECT, 300 and 600 Area, #95-WHC-237 (Update)

Project Description:

- Update of the L-070 project, replacement of the sewer lines in the 300 Area, to include a future tie line from Treated Effluent Disposal Facility (TEDF) to the Sanitary Sewer Lift Station in the 300 Area.
- Previous biological surveys of the L-070 project and the L-045 project include: PNL Survey 93-WHC-002, PNL Survey 93-WHC-028 and PNL Survey 94-WHC-237.

Survey Objectives:

- to identify plant and animal species protected under the *Endangered Species Act* (ESA), candidates for such protection, and species listed as threatened, endangered, candidate, sensitive, or monitor by the state of Washington, and species protected under the Migratory Bird Treaty Act,
- to evaluate the potential impacts of disturbance on priority habitats and protected plant and animal species identified in the survey.

Survey Methods:

- pedestrian and ocular reconnaissance of the proposed site was conducted by R. Zufelt and G. Fortner on November 18, 1994.
- the Braun-Blanquet cover-abundance scale (Bonham 1989) was used to determine percent cover of dominant vegetation.

Survey Results and Conclusions:

- no plant and animal species protected under the ESA, candidates for such protection, or species listed by the Washington state government were observed in the vicinity of the proposed site,
- *Section A* (*moving south from TEDF* - See map) vegetative habitat consists primarily of cheatgrass (*Bromus tectorum*) 5-10% cover, Russian thistle (*Salsola kali*) 1-5% cover, Sandberg's bluegrass (*Poa sandbergii*) 1-5% cover, and snow buckwheat (*Erigonum niveum*) 1-5% cover in the vicinity,
- *Section B* (*parallels the east side of Stevens Road* - See map) vegetative habitat consists primarily of Russian thistle 5-10% cover, crested wheatgrass (*Agropyron cristatum*) 5-10% cover, and bluebunch wheatgrass (*Pseudoroegneria spicatum*) 5-10% cover in the vicinity,

- Section C (which follows the existing gravel road to the Sanitary Sewer Lift Station - See map) vegetative habitat consists primarily of Russian thistle 5-10% cover in the vicinity,
- no migratory bird nests were observed in the vicinity of the proposed site,
- no adverse impacts to species of concern are expected to occur from the proposed action.

Sincerely,

CA Brandt

CA Brandt, Ph.D.
Project Manager
Ecological Compliance Assessment

CAB:glf

APPENDIX C

CULTURAL RESOURCES REVIEW

Battelle
Pacific Northwest Laboratories
Battelle Boulevard
P.O. Box 999
Richland, Washington 99352
Telephone (509) 372-1791

November 18, 1994

No Known Historic Properties

Mr. Howard Wellsfry
Westinghouse Hanford Company
Construction Projects
P. O. Box 1970/L4-93
Richland, WA 99352

Dear Mr. Wellsfry:

CULTURAL RESOURCES REVIEW OF THE POTW SEWER OPTION PROJECT.
HCRC #92-300-007.

In response to your request received November 18, 1994, staff of the Hanford Cultural Resources Laboratory (HCRL) conducted a cultural resources review of the subject project, located in the 300 Area of the Hanford Site. According to the information that you supplied, the project entails installing a tie line from TEDF (Project L-045) to the Sanitary Sewer Lift Station (Project V-784). The tie line will parallel the existing TEDF to the 300 Area TEDF Process Sewer Lift Station then proceed to the V-784 Sanitary Sewer lift station.

Our literature and records review shows that the project area was surveyed by HCRL archaeologists in 1993. No archaeological materials were found during the survey. In addition, the project area has been disturbed by the installation of the process sewer line that will parallel the new line. Additional survey and monitoring by an archaeologist are not necessary.

It is the finding of the HCRL staff that there are no known cultural resources or historic properties within the proposed project area. The workers, however, must be directed to watch for cultural materials (e.g., bones, artifacts) during all work activities. If any are encountered, work in the vicinity of the discovery must stop until an HCRL archaeologist has been notified, assessed the significance of the find, and, if necessary, arranged for mitigation of the impacts to the find. The HCRL must be notified if any changes to project location or scope are anticipated.

A copy of this letter has been sent to James Bauer, DOE, Richland Operations Office, as official documentation. If you have any questions, please call me at 372-1791. Please use the HCRC# above for any future correspondence concerning this project.

Very truly yours,

M. E. Crist
Technical Specialist
Cultural Resources Project

Concurrence:
P. R. Nickens, Project Manager
Cultural Resources Project

cc: J. D. Bauer, RL (4)
File/LB

Battelle
Pacific Northwest Laboratories
Battelle Boulevard
P.O. Box 999
Richland, Washington 99352
Telephone (509)372-1791

October 25, 1994

Monitoring Required

Mr. H. E. Wellsfry
Westinghouse Hanford Company
Tank Waste Remediation Systems
P. O. Box 1970/G6-47
Richland, WA 99352

Dear Mr. Wellsfry:

CULTURAL RESOURCES REVIEW OF THE 300 AREA PROCESS SEWER PIPING UPGRADE, PROJECT L-070 - REVISION. HCRC #94-300-080.

In response to your request received August 10, 1994, staff of the Hanford Cultural Resources Laboratory (HCRL) conducted a cultural resources review of the subject project, located in the 300 Area of the Hanford Site. According to the information that you supplied, the project entails upgrading the 300 Area process sewer system utilizing a combined vacuum-gravity and pressure system. The project involves installing conduit, approximately 52 valve stations, four pump stations, buried pipe, and a main and a satellite collection station.

Our literature and records review shows that all of the project areas have been highly disturbed by previous building, utility, and other construction. The review also shows that the excavations to be conducted around the 331 and 337 Buildings will be within 400 meters of the Columbia River and will therefore be in culturally sensitive areas. Because of this sensitivity, an HCRL archaeologist must be present to monitor these excavation activities for archaeological materials. The monitoring will be conducted on an intermittent basis, with emphasis on excavations that may extend deeper than fill material.

No further work is required by the HCRL for the remaining excavation locations. The workers, however, must be directed to watch for cultural materials (e.g., bones, artifacts) during all work activities. If any are encountered, work in the vicinity of the discovery must stop until an HCRL archaeologist has been notified, assessed the significance of the find, and, if necessary, arranged for mitigation of the impacts to the find.

The HCRL must be notified of the schedules for construction near the 331 Building and 337 Building work sites as soon as they are finalized. All HCRL staff members who work on the project will be required to read and sign the project's Job Safety Analysis before entering the construction area. The HCRL must be notified if any changes to project location or scope are anticipated. This is a Class III case, defined as a project which involves new construction in a disturbed, low-sensitivity area, and a Class IV case, a project which involves new construction in a disturbed, high-sensitivity area.

Mr. Howard Wellsfry
October 25, 1994
Page 2

Battelle

A copy of this letter has been sent to James Bauer, DOE, Richland Operations Office, as official documentation. If you have any questions, please call me at 372-1791. Please use the HCRC# above for any future correspondence concerning this project.

Very truly yours,

M. E. Crist
Technical Specialist
Cultural Resources Project

Concurrence:
P. R. Nickens, Project Manager
Cultural Resources Project

cc: O. Bradt
J. D. Bauer, RL (4)
File/LB

Appendix D

EA Comments and Responses

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

P.O. Box 47600 • Olympia, Washington 98504-7600 • (206) 407-6000 • TDD Only (Hearing Impaired) (206) 407-6006

March 21, 1995

Mr. Paul F. X. Dunigan
U.S. Dept. of Energy
PO Box 550
Richland WA 99352

Dear Mr. Dunigan:

Thank you for the opportunity to comment on the environmental assessment (EA) for the 300 Area Process Sewer Piping Upgrade and the 300 Area Treated Effluent Disposal Facility Discharge to the City of Richland and the Hanford Site, Benton County. We reviewed the EA and have the following concerns.

1. Section 2.2, second paragraph -- The discharge line from the TEDF would be built as a separate construction project independent from the process sewer upgrade. We suggest using the same trench as a cost savings measure.

2. Section 3.1.2, Reline or Slip Line the Existing Pipes -- We believe that slip lining the existing pipes should cost less.

3. Section 3.2.1, No Action Alternative -- We need more explanation as to where and how much cost savings are being considered.

4. A review of the site water system water rights should be made, and the results reported as a possible permitting constraint in the Environmental Assessment.

If you have any questions on comments 1-3, please call Mr. Ron Effland with the Nuclear Waste Program at (360) 407-7134. For questions on Comment 4, please call Mr. Tim Reierson with the Water Resources Program at (509) 575-2384.

Sincerely,

M. Vernice Santee
Environmental Review Section

MVS:95-1235
cc: Ron Effland, Nuclear Waste
Tim Reierson, CRO
Debbie Smith, CRO

DON'T SAY IT --- *Write It!*

DATE: March 24, 1995

TO: Bob Archer

FROM: SHANNON HERRES G3-18

Telephone: 373-0908

cc:

SUBJECT: State of Oregon Comments on EA-0980

Comments were received from Dirk Dunning, State of Oregon, Department of Energy, on March 21, 1995 via telephone conversation with Annabelle L. Rodriquez, U. S. Department of Energy, Richland Operations Office.

Comments were as follows:

Overall he said a good analysis was done in the EA.

- How is the transition going to be made? Make sure secondary containment is used during the transition.
- What type of stainless steel is going to be used? Will #316L type steel be used for corrosion resistance?
- Are any chelants (citric acid or EDTA) going to be part of the process sewer? The chelants tend to corrode steel at a high rate.

General Comment: In reading the Hanford EAs, he noticed there is a tendency to "skimp" on the quality of materials used i.e., lower grade materials are used because of budget/project constraints, however, we may end up paying a higher price in the end, especially if the lower grade materials do not hold up for the life of the project.

Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

Ms. M. Vernice Santee
Environmental Review Section
State of Washington
Department of Ecology
P. O. Box 47600
Olympia, Washington 98504-7600

Dear Ms. Santee:

RESPONSE TO COMMENTS OF ENVIRONMENTAL ASSESSMENT (EA) DOE-EA-0980: 300 AREA PROCESS SEWER PIPING UPGRADE AND 300 AREA TREATED EFFLUENT DISPOSAL FACILITY DISCHARGE TO THE CITY OF RICHLAND

The U.S. Department of Energy (DOE), Richland Operations Office (RL) wishes to thank you for your comments of March 21, 1995, on the subject draft EA. Responses to the comments are detailed below, and changes to the EA are noted.

1) Section 2.2, second paragraph -- The discharge line from the TEDF would be built as a separate construction project independent from the process sewer upgrade. We suggest using the same trench as a cost saving measure.

    The 10 inch HDPE Process Sewer from the TEDF Lift Station No 1 to TEDF has already been completed and the TEDF is in operation, so it would not be feasible to construct the proposed City of Richland Sewer Connection in the same trench as a cost saving. No agreement to connect the TEDF to the City of Richland Sanitary Sewer has been made, and the connection is contingent on a future agreement. No change to the EA is needed.

2) Section 3.1.2, Reline or slip line the existing pipes -- We believe that slip lining the existing pipes should cost less.

    It is agreed that there may be cost savings from slip lining. The EA is being revised to reflect this. Section 3.1.2 is being modified to state: "It might be possible that certain sections of the existing process sewer would be incorporated into the new system if found to be in good condition and uncontaminated. Portions would be slip lined if found to be contaminated, but otherwise in good condition. The amount of slip lining to be done would depend on technical feasibility and cost considerations to be determined by the project design."

3) Section 3.2.1, No Action Alternative -- We need more explanation as to where and how much cost savings are being considered.

Ms. M. Vernice Santee -2-

Since the tie-in to the City of Richland is a possible future project contingent upon an agreement with the City of Richland and future DOE funding, the possible cost savings have not been determined at this time. No change to the EA is needed.

4) A review of the site water system water rights should be made, and the results reported as a possible permitting constraint in the EA.

The 300 Area Process Sewer receives discharges from the existing 300 Area facilities and now delivers the effluents to the new TEDF which discharges to the Columbia River under an approved NPDES permit. There would be no new permitting issues in connection with the process sewer upgrade. Should the tie-in to the City of Richland be made by a future project, the City would discharge effluent under it's NPDES permit. The adequacy of existing water rights is not an appropriate subject for this EA. No change to the EA is needed.

If you have any further questions or comments, please contact me at (509) 376-6667 or Mr. D. J. Ortiz, Site Infrastructure Division, at (509) 376-0950.

Sincerely,

Paul F. X. Dunigan, Jr.
Paul F. X. Dunigan, Jr.
NEPA Compliance Officer

SID:DJO

cc: B. J. Ritchie, Ecology

Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

Mr. Dirk Dunning
Oregon Department of Energy
625 Marion Street Northeast
Salem, Oregon 97310

Dear Mr. Dunning:

RESPONSE TO COMMENTS OF ENVIRONMENTAL ASSESSMENT (EA) DOE-EA-0980: 300 AREA PROCESS SEWER PIPING UPGRADE AND 300 AREA TREATED EFFLUENT DISPOSAL FACILITY DISCHARGE TO THE CITY OF RICHLAND

The U.S. Department of Energy (DOE), Richland Operations Office (RL) wishes to thank you for your telephone comments of March 21, 1995, on the subject draft EA. Responses to address your comments are detailed below. No changes to the EA are being made as a result of the comments.

1) How is the transition going to be made? Make sure secondary containment is used during the transition.

   The connections to the existing systems would be made during off shift or weekends when the upstream flows would be stopped. The process effluent is well below DOE reqoirements for radiological secondary containment, and is not an RCRA hazardous waste or a State of Washington Hazardous Waste Management Act dangerous waste. However, any residual liquids collected from the drain pipes would be handled, characterized, and disposed in accordance with existing Hanford Site waste handling and disposal procedures.

2) What type of stainless steel is going to be used? Will No. 316 type steel be used for corrosion resistance?

   No stainless steel has been specified. The materials would consist of SDR 21 PVC, fiberglass, ductile iron, and ABS which are the normal materials selected for underground sewer systems.

3) Are any chelants (citric acid or BDTA) going to be part of the process sewer effluents? The chelants tend to corrode steel at a high rate.

   The effluent is not highly corrosive and stainless steel would not be used. Table 2-1 in Appendix A lists the design source term of the waste stream by elements and compounds.

4) General Comment: In reading the Hanford EAs, the reviewer noticed there is a tendency to "skimp" on the quality of materials used, i.e. lower grade materials are used because of budget/project constraints. However, DOE may end up paying a higher price in the end, especially if the lower grade materials do not hold up for the life of the project.

Mr. Dirk Dunning -2-

It is agreed that inferior materials could result in early system failure resulting in higher maintenance costs; however, the EA deals with conceptual design of the system and does not specify final material selection. The materials are carefully selected and specified during design by professional engineers to insure that they are suitable for the application. All engineering work is approved by licensed Engineers and meets rigid DOE and contractor standards.

If you have any further questions or comments, please contact me at (509) 376-6667 or Mr. D. J. Ortiz, Site Infrastructure Division, at (509) 376-0950.

Sincerely,

Paul F. X. Dunigan, Jr.

Paul F. X. Dunigan, Jr.
NEPA Compliance Officer

SID:DJO

FINDING OF NO SIGNIFICANT IMPACT

FOR

300 AREA PROCESS SEWER PIPING UPGRADE
AND
300 AREA TREATED EFFLUENT DISPOSAL FACILITY DISCHARGE TO THE CITY OF RICHLAND SEWAGE SYSTEM

HANFORD SITE, RICHLAND, WASHINGTON

U.S. DEPARTMENT OF ENERGY

MAY 1995

AGENCY: U.S. Department of Energy

ACTION: Finding of No Significant Impact

SUMMARY: The U.S. Department of Energy (DOE) has prepared an Environmental Assessment (EA), DOE/EA-0980, to assess environmental impacts associated with upgrading the 300 Area Process Sewer System and constructing a discharge line from the 300 Area Treated Effluent Disposal Facility (TEDF) to the 300 Area sanitary sewer for discharge to the City of Richland Sewage System at the Hanford Site, Richland, Washington. Alternatives considered in the review process were: the No Action alternative; re-lining or slip lining the existing pipes; and the proposed action.

Based on the analysis in the EA, and considering preapproval comments from the State of Washington and the State of Oregon, DOE has determined that the proposed action is not a major federal action significantly affecting the quality of the human environment within the meaning of the *National Environmental Policy Act* (NEPA) *of 1969*. Therefore, the preparation of an Environmental Impact Statement (EIS) is not required.

ADDRESSES AND FURTHER INFORMATION:

Single copies of the EA and further information about the proposed action are available from:

Mr. W. A. Rutherford, Director
Site Infrastructure Division
U.S. Department of Energy
Richland Operations Office
Richland, Washington 99352
(509) 376-7597

For further information regarding the DOE NEPA process, contact:

Ms. Carol M. Borgstrom, Director
Office of NEPA Oversight
U.S. Department of Energy
1000 Independence Avenue, S.W.
Washington, D.C. 20685
(202) 586-4600 or (800)-472-2756

PURPOSE AND NEED: DOE needs to take action to reduce or where appropriate eliminate untreated liquid effluents discharged to the soil in the 300 Area of the Hanford Site, located immediately north of the City of Richland. The action is needed because the integrity of the old piping in the existing 300 Area Process Sewer System is questionable and effluents might be entering the soil from leaking pipes. In addition, the DOE has identified a potential to reduce anticipated operating costs at the new 300 Area Treated Effluent Disposal Facility (TEDF) which became operational during December 1994.

BACKGROUND: The existing 300 Area Process Sewer System serves the 300 Area buildings and receives the process industrial wastewater. The effluent is now discharged to the 300 Area TEDF which treats the wastewater and discharges to the nearby Columbia River. The TEDF was built in order to meet a *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement) milestone to reduce liquid effluents to the soil. The process waste liquid effluent is well below DOE requirements for radiological secondary containment, and is not considered a *Resource Conservation and Recovery Act of 1976* hazardous waste or a State of Washington *Hazardous Waste Management Act* dangerous waste.

The existing process sewer system consists of approximately 10,516 meters (34,500 linear feet) of piping, ranging in size from 10.16 centimeters (4 inches) diameter to 91.44 centimeters (36 inches) diameter. The system connects to 62 existing buildings. Most of the piping is vitreous clay pipe, some of which has been in service for 47 years. Known past discharges through the piping include quantities of radioactive materials, acids, solvents, organic chemicals, and other materials used in the operations conducted in the 300 Area buildings. The integrity of the old vitreous clay, steel, and concrete piping in the existing system is questionable and effluents might be entering the soil from leaking pipes.

PROPOSED ACTION: DOE proposes upgrading the existing 300 Area Process Sewer System through the construction and operation of a new collection system. The new system, when completed in December 1996, will discharge to the collection sump/lift station for the TEDF. DOE also proposes connecting the TEDF to the new 300 Area sanitary sewer line which is being built to connect to the City of Richland sewage system just south of the 300 Area. This will allow discharge of both the 300 Area sanitary sewer and the process sewer to the City of Richland Sewer System.

The proposed action will construct and operate a combined gravity, vacuum, and pressurized collection system consisting of approximately 52 vacuum collection sumps with vacuum valve pits, several pressurized system pumping stations, and approximately 8,900 meters (29,200 feet) of buried polyvinyl chloride (PVC) or similar pipe. Two buildings containing a central vacuum collection station and a satellite collection station will also be built. Most of the existing process sewer pipes will be removed from service following completion of the new system. The new collection system will be connected to about 36 of the existing buildings that still require process sewer drains. The system will be designed for about 1,230 liters (325 gallons) per minute flow, including extra capacity of about 25 percent for connection of additional buildings as necessary and for future growth.

The new collection system will start as close to each building as practical. At this point, a vacuum collection sump or a pressure pump station will be excavated and built. The new vacuum collection sumps and pressure pump stations will be connected to the existing drain pipes from the buildings and will be gravity fed from the buildings. The vacuum collection system will be utilized at buildings with low flow quantities and low head requirements to reach the central collection station. Pump lift stations will be installed at several locations where higher flows are expected and higher pressure head is required to feed into the collection system. The new collection system will consist of small diameter pipe 5.08 to 20.32 centimeters (2 to 6 inches) installed at a depth of approximately 1.22 meters (4 feet). The lines will feed through a satellite collection station to the central vacuum collection station. The central station will contain duplex vacuum pumps, a vacuum reservoir tank, a water collection tank, water discharge pumps, and monitoring instruments and controls. The new process sewer will terminate at the TEDF collection sump/lift station on the north end of the 300 Area.

Much of the excavation for collection stations and trenching for the new pipe will involve digging through and eventual reconstruction of asphalt or concrete paving in roads, walkways, and parking lots. All trenching will be backfilled. The only sections of the existing pipe to be removed by this project will be small sections of the lines adjacent to the buildings where lift stations will be built or at other locations where the pipes might interfere with trenching. Pipe removed from service will be capped and left in place. The out-of-service pipe and any surrounding contaminated soil from leaks in the system will be included in the Remedial Investigation/Feasibility Study (RI/FS) work plans for the 300 Area as part of the *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA) *of 1980* program and eventually disposed of as part of the remediation program.

There is a possibility that certain sections of the existing sewer lines will be incorporated in the new system rather than being replaced if found to be in good condition and uncontaminated. Portions will be slip lined if found to be contaminated but otherwise in good condition. The amount of slip lining to be done will depend on the condition of the pipes found from detailed examination of the system and the technical feasibility and cost considerations to be determined during project design.

The proposed action will also provide for the construction of a buried discharge line from the TEDF to Lift Station Number One of the new 300 Area Sanitary Sewer Line in the event a decision is made to connect the TEDF to the City of Richland sewage system. The discharge line from the TEDF to Lift Station Number One will be approximately 975.3 meters (3,200 feet) long and will allow the 300 Area process effluent to be sent to the City of Richland Sewage Treatment Plant along with the sanitary sewage. The discharge line construction will be a separate project and is independent from the process sewer upgrade. The discharge line will be constructed parallel to the process sewer line from the TEDF collection sump to the TEDF and will tie into the sanitary sewer approximately 30.48 meters (100 feet) south of the collection sump. The tie line is contingent on an agreement with the City of Richland.

When the system is in place, the 300 Area process sewer discharge to the TEDF collection sump will be pumped to an equalization tank at the TEDF and be sampled. If the effluent meets City of Richland acceptance criteria, it will be pumped through the tie-line into the sanitary sewer, where it will combine with the sanitary effluent and be pumped to the City of Richland Sewage System. If the process sewer effluent does not meet acceptance criteria at the equalization tank, the effluent will be diverted into tanks at the TEDF and then be processed in the TEDF or removed for storage in waste tanks in the 200 Areas of the Hanford Site. After processing to acceptance level in the TEDF, the effluent will either be pumped to the tie line for transfer to the City of Richland system or directly to the Columbia River. This will provide two options for discharge of the 300 Area process effluent.

The maximum design discharge rate for the tie-line from the 300 Area process sewer to the sanitary sewer system will be 1,230 liters (325 gallons) per minute and the maximum from the sanitary sewer will be 1,855 liters (490 gallons) per minute for a combined maximum of 3,085 liters (815 gallons) per minute to the City of Richland sewage system.

ALTERNATIVES CONSIDERED:

No-Action Alternative: The 300 Area process sewer would not be upgraded and the old piping in the existing system of questionable integrity would continue in use. The potential for leaks to the soil column would continue and failure of the existing system could shut down the facilities in the 300 Area. Removal of the old system and any residual contamination as part of the 300 Area CERCLA actions cannot be accomplished as long as the existing system is in use. Under the no-action alternative, the discharge line from the TEDF to the 300 Area sanitary sewer would not be constructed and there would be no option to discharge to the City of Richland Sewage System to realize potential cost savings from reduced operation of the TEDF and no alternate discharge line would be available in case of problems with the TEDF.

Re-Line or Slip-Line the Existing Pipes: The 300 Area process sewer would be upgraded by re-lining the existing pipe with a thin epoxy resin-impregnated liner or slip-lining by installing high density polyethylene (HDPE) pipes within the existing pipes. This proposed alternative would require a combination of both and also require replacement of portions of the existing sewer pipes. This alternative would require isolating individual sections of line and excavating to gain access points to provide room for insertion of the liner or HDPE. Lateral connections with special saddle fittings would be made where mains and laterals join. This alternative may be more costly than the preferred alternative and also would preclude the removal of the old pipes and surrounding contamination as part of a CERCLA action as long as the pipes were in use.

ENVIRONMENTAL IMPACTS:

Construction Impacts: There will be a potential for airborne emissions of radioactive or hazardous materials during the excavation and tie-in work to the existing drain lines near the buildings to be connected to the new system and by excavation for the lift stations and drain pipes. These activities also will create some potential exposure to workers during the limited removal and handling of the old pipes and contaminated soil at these sites. All excavation and removal of pipe, residual liquid, and contaminated soil will be controlled by approved radiological and industrial safety procedures and administrative controls that prevent the escape of hazardous airborne emissions and minimize worker exposure. Exposure of onsite personnel to direct radiation doses is limited by safety procedures to As Low As Reasonably Achievable (ALARA). Work in areas where radioactive contamination is present will be accomplished by workers trained in radiation protection using protective clothing and equipment. In addition, health physics technicians would be present to monitor for radiation. The estimated exposure to workers during construction is 2.0 person-roentgen equivalent man (rem) resulting in a calculated 8.0×10^{-4} latent cancer deaths. Therefore, no cancer deaths are expected.

Particulate releases to the atmosphere will be limited to nonhazardous dust that will be generated for short periods as a result of project construction activities. Release of dust containing radionuclides or hazardous materials to the atmosphere will be prevented as described above. There will be exhaust gases and minor amounts of heat discharged to the atmosphere from vehicles and equipment used during construction, operation, and maintenance activities. Ambient noise levels will be temporarily increased.

Construction scrap materials will be generated by the proposed project, and operation and maintenance of the system also might generate additional solid waste. Construction will generate an estimated 30 cubic meters (1,060 cubic feet) of solid waste. Solid waste will be characterized and disposed of in accordance with applicable contractor procedures and standards, all applicable federal and state regulations, and DOE orders and guidance. All waste will be disposed of in existing Hanford Site disposal units or approved, permitted offsite treatment, storage, and/or disposal facilities if required. Mixed waste will be stored or disposed of in a *Resource Conservation and Recovery Act of 1976* permitted storage and/or disposal facility. Construction materials, such as concrete and steel, and the consumption of petroleum products will represent a long-term commitment of nonrenewable resources.

Excavation will be in previously disturbed parts of the 300 Area entirely within the 300 Area fence. Much of the excavation will be through asphalt or concrete paving in roads, walkways, and parking lots. All trenching will be backfilled and the paving restored. No impacts to archaeological, historical, or native American religious sites will occur and no floodplains, wetlands, or critical habitat areas will be affected as a result of this action.

Operational Impacts: Operation of the new system will result in the venting of small amounts of vapor from the water collection tank in the Central Vacuum Collection Station. The estimated radiation dose to the maximally exposed offsite individual from these emissions is 6.1×10^{-7} rem/year resulting in a calculated 3×10^{-10} cancer deaths per year. Therefore, no cancer fatalities are anticipated from the routine emissions. Under normal operation of the system, there will be no other environmental impacts except for minor amounts of heat, noise, and exhaust fumes from operating and maintenance equipment and small quantities of maintenance waste. There will be no liquid effluents to the soil column.

Potential Accidents: A hazard classification document for the operation of the proposed process sewer system identified a potential for airborne emissions from a postulated accidental breach of a process sewer pipe resulting in a pressurized spray release to the

environment. The hazard classification requires all facilities that will discharge to the system maintain radionuclide inventories at or below levels set by administrative controls.
A postulated upper bounding accident scenario is the accidental dumping of 0.322 kilograms (0.71 pounds) of plutonium-239 from the 325 Laboratory Building or 0.009 kilograms (0.02 pounds) of strontium-90 from the 324 Laboratory Building into a gravity drain that connects to a retention process sewer (RPS) line. These quantities represent maximum possible spills estimated from the maximum allowable inventories.

The liquids from the RPS are accumulated in the 307 Basins and intermittently pumped into the process sewer. A pipe break is postulated to occur in the process sewer line following the spill and during a pressurized liquid transfer from the 307 Basins. The pipe break is postulated from excavation or a seismic event which uncovers and damages the buried line resulting in a pressurized spray release to the atmosphere. The probability of the accident occurring during a major spill is calculated to be about 2.7×10^{-7}. A probability of 1.0×10^{-6} is considered a credible occurrence, therefore this postulated accident is in the incredible range. The calculated dose to the maximally exposed onsite individual from the postulated upper bound accident is 4.8 rem effective dose equivalent (EDE), resulting in an estimated 1.9×10^{-3} latent cancer fatalities (LCF). The calculated dose to the maximally exposed offsite individual from the postulated accident is 0.52 rem EDE, resulting in an estimated 2.6×10^{-4} LCF.

The calculated 1.9×10^{-3} LCF means that the probability of the maximally exposed onsite individual becoming a LCF as a result of the postulated accident is about 1 in 526. The calculated 2.6×10^{-4} LCF for the maximally exposed offsite individual means that the probability of the maximally exposed offsite individual becoming a LCF as a result of the postulated accident is about 1 in 3,850.

The postulated upper bound accident for the process sewer would not result in a discharge of contaminated effluent to the sanitary sewer or City of Richland sewage system that would exceed the City of Richland's acceptance criteria. The process sewer effluent will be collected and monitored at the equalization tank for the TEDF, and the presence of unacceptable pollutants resulting from an upset or accident would cause the effluent to be diverted into holding tanks in the TEDF and either be processed in the TEDF to meet acceptance criteria or removed to waste tanks in the 200 Areas of the Hanford Site. The holding tanks in the TEDF will have the capacity to hold a volume equal to approximately five days of process sewer average flow. The effluent also will be monitored and record sampled prior to discharge to the City of Richland.

<u>Socioeconomic Impacts:</u> The socioeconomic impacts of the proposed action would be minimal. Construction of the system would require about 20 construction workers for about 18 months. Very few workers would be required for the operation and maintenance of the system.

<u>Environmental Justice:</u> Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires that federal agencies identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of their programs and activities on minority and low-income

populations. DOE is in the process of developing official guidance on the implementation of the Executive Order.

Distributions of minority and low income population groups have been identified for the Hanford Site. Because the entire proposed action would occur on the Hanford Site, the offsite environmental impacts from the proposed action analyzed in this EA are expected to be minimal. No adverse health effects are expected to occur in any offsite community. No socioeconomic impacts are expected. Therefore, no disproportionate impacts on any subgroups of the public including minority and low-income populations are expected.

Cumulative Impacts: The proposed action to upgrade the 300 Area Process Sewer would add approximately 225 cubic meters (10,600 cubic feet) of pipe in the ground to eventually be remediated as part of the 300 Area operable Unit work. This could potentially increase the quantity of waste to be added to existing Hanford storage and disposal sites.

The proposed action to construct a tie-line to the 300 Area Sanitary Sewer for discharge of the 300 process effluent to the City of Richland would be to add approximately 1,780,000 liters per day (470,000 gallons per day) to the liquid effluent processed at the City of Richland Sewage Treatment Plant. This would represent about 4.25 percent of the plant capacity of 42 million liters (11 million gallons) per day. Construction of the line would also add an estimated volume of pipe in the ground of approximately 24 cubic meters (850 cubic feet) to eventually be remediated as part of the 300 Area operable Unit work.

DETERMINATION: Based on the analysis in the EA, and after considering the preapproval review comments of the State of Washington and the State of Oregon, I conclude that the proposed construction and operation of a new process sewer collection system for the 300 Area and the construction and operation of a discharge line to the City of Richland sewage system do not constitute a major federal action significantly affecting the quality of the human environment within the meaning of NEPA. Therefore, an EIS for the proposed action is not required.

Issued at Richland, Washington, this 25th day of May 1995.

John D. Wagoner
Manager
Richland Operations Office