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ENVIRONMENTAL ASSESSMENT FOR IMPLEMENTATION OF A SITEWIDE TREATABILITY STUDY AT ROCKY FLATS PLANT

U. S. DEPARTMENT OF ENERGY

ROCKY FLATS PLANT
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CONTENTS

1.0 INTRODUCTION

This Environmental Assessment (EA) is prepared pursuant to the National Environmental Policy Act of 1969 as implemented by regulations promulgated by the President's Council on Environmental Quality (40 CFR 1500-1508), DOE Guidelines (52 FR 47662 as modified), and DOE Order 5440.1D. It is written to provide sufficient evidence for determining whether the effects of the Proposed Action require preparation of an environmental impact statement, or a finding of no significant impact (FONSI).

The Environmental Assessment analyzes the impacts of a Sitewide Treatability Study (TS) to be undertaken at the Department of Energy's Rocky Flats Plant (RFP) north of Golden, CO. The study (the Proposed Action), would evaluate 10 technologies for remediation, or cleaning up, sites at which hazardous and/or radioactive material has been released to the natural environment at RFP. Such sites include soil, sediments, ground water and/or surface water. Remedial actions would be undertaken pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) or the Resource Conservation and Recovery Act (RCRA).

The Proposed Action consists of the laboratory testing of approximately 10 remediation technologies for use on water and soil. Approximately 300 gallons of water and approximately 1,650 gallons of soil (thirty 55-gallon drums) would be collected from contaminated sites at RFP for testing in laboratories at RFP, commercial laboratories or laboratories at other DOE facilities. All tests would be small-scale jar/beaker or bench-scale tests. All unused samples and test spoils (used samples, test materials) would be returned to RFP for appropriate treatment and/or disposal. The rationale for selection of individual technologies and general methods for carrying out the TS are described in the *Final Sitewide Treatability Study Plan*, dated August 26, 1991.

DOE is currently preparing an environmental impact statement (the Site Wide Environmental Impact Statement or SWEIS) on the ongoing operation of RFP, which would include the remediation program that would be supported by the Proposed Action. This treatability study is being analyzed separately in accordance with regulations of the President's Council on Environmental Quality allowing agencies to evaluate proposed projects by stage of technological development (40 CFR 1502.4(c)(3)). The Treatability Study would be an interim action during the preparation of the SWEIS because (1) there would be limited adverse environmental impacts from conducting the study, and (2) the study would not limit the choice of reasonable alternatives for the overall remediation (40 CFR 1506.1(a)). The study would provide information to DOE to facilitate the choice of remediation technologies to be used.

2.0 NEED FOR THE PROPOSED ACTION

RFP began operations in 1953. During the intervening years, the plant has fabricated components containing plutonium, uranium, beryllium and stainless steel, and has pursued the related activities of chemical recovery and purification of process-produced transuranic

radionuclides. Radioactive, hazardous and mixed wastes (wastes that consist of both hazardous and radioactive substances) are generated at RFP. In the course of operations, various contaminants have been released to the environment at locations on the site. DOE is presently engaged in a program to clean up each location pursuant to an Interagency Agreement with the U. S. Environmental Protection Agency and the Colorado Department of Health. This study is planned as an integral part of that cleanup program. The purpose of the Sitewide Treatability Study is to identify treatment technologies that can be applicable to cleaning up more than one operable unit (OU) at RFP. (OUs are administrative groupings of adjacent individual hazardous substance sites - i.e., places where hazardous and/or radioactive materials have been released to the environment.) The study is being undertaken on a sitewide basis to realize the efficiencies of doing a single study for RFP rather than separate studies for each of the OUs at the Plant.

Sixteen OUs have been designated at RFP. Each is to be studied to characterize the nature and extent of contamination present, determine the present risk to the environment and to human health, and, where those risks are unacceptably high, identify technologies for remediation the OUs to a level at which the risks are acceptable. The proposed study would help DOE identify the most effective, efficient and appropriate technologies for use at the OUs, given the specific characteristics of the soil, hydrogeology, flora and fauna at the OU. Without such a study, treatability tests would have to be repeated at each OU, adding significant time and expense to the program without any offsetting benefits.

3.0 DESCRIPTION OF PROPOSED ACTION

The Proposed Action is a multi-year program consisting of the laboratory testing of 10 remediation technologies. "Laboratory testing" means that tests would be conducted inside laboratories using quantities of sample material and agents that would fit in conventional laboratory beakers and jars. Studies on this small scale are often referred to as laboratory-scale or bench-scale studies, in distinction to pilot-scale or full scale studies involving much larger samples, larger equipment and testing in the field. Pilot and full-scale studies are not part of this EA.

Water samples would be collected from existing wells and surface water sampling locations (streams, ponds, and seeps) in OUs 1 (881 Hillside Area), 2 (903 Pad Area), 3 (Off site Areas), 4 (Solar Evaporation Ponds), 5 (Woman Creek), 6 (Walnut Creek), and/or 7 (Present Landfill), and the South Interceptor Ditch. Sample gathering would involve removal of the desired quantity of water in a hand held container or using a small pump. Total volume of water samples planned to be collected during the study is approximately 300 gallons. Samples would be taken at various times during the study. Appropriate RFP standard operating procedures for obtaining ground water or surface water samples would be followed.

It may be necessary to drill a small number of new wells if groundwater samples of adequate size and quality cannot be obtained from existing wells, but this is not expected to be necessary. If new wells are required, they would be drilled using a truck mounted drill rig

which can be driven to the drill location. Drill cuttings would be collected in 55 gallon drums for later analysis of contaminants and appropriate disposal.

Soil/sediment samples would be gathered from OU 1 or OU 2 or both. Soil/sediment samples would typically be gathered by hand-held shovel from the top 10-to-20 centimeters of the ground. A backhoe may be used if an adequate quantity of samples cannot be obtained by shovel. Total volume of soil/sediment samples planned to be collected during the study is approximately 1,650 gallons or thirty 55-gallon drums. RFP standard operation procedures for obtaining soil/sediment samples would be used, regardless of the sample gathering method used. Soil sample pits would be contoured to blend with the surrounding terrain.

All testing would take place within laboratories certified by the state within which they are located to work with the hazardous and radioactive substances involved and which have the necessary local, state and federal permits for their operations. Laboratories may be at RFP (the 881 Building analytical laboratory), commercial laboratories, at other DOE facilities such as the Nevada Test Site or Los Alamos National Laboratory, or, particularly in the case of the two proprietary technologies, at a vendor's laboratory. In all cases, compliance by the laboratory with all applicable regulations would be investigated prior to initiation of work by that laboratory. By virtue of working with qualified laboratories, no non-permitted release of hazardous or radioactive materials from laboratories to the environment is expected to occur during the course of the study.

Transportation and storage of samples from the collection point to laboratories would be in accordance with Department of Transportation, DOE and RFP regulations and standard operating procedures for such activities. Movement may be by private or common carrier according to the regulations applicable to the particular contaminant and the needs of the study.

All unused samples and test spoils would be returned to RFP for appropriate disposal in accordance with RFP standard operating procedures. No unused samples or test spoils would remain at a laboratory or be otherwise disposed of other than return to RFP.

It is anticipated that preparation of a few new RFP standard operating procedures would be necessitated by this study. Such procedures would be developed in accordance with established RFP policies to ensure that they are reviewed and ultimately approved by all appropriate authorities.

Because of the indoor, highly controlled nature of the planned studies, no impacts to the natural environment are anticipated beyond the removal of small amounts of contaminated soil and water.

The technologies and testing characteristics are:

1. **Adsorption tests.** In **adsorption**, molecules or particles physically adhere to the surface of a solid material without chemical reaction. Adsorption is potentially applicable to the removal of metals and radionuclides from water. Testing would

involve a total of up to 55 gallons of water. The adsorption tests would involve exposing contaminated water, typically in a column, to one of several inert adsorbents including ferrite, granular activated carbon, clay and other soils, activated alumina, bone char, zeolites and proprietary specialty adsorbents. The adsorbents in the columns would ultimately become fully loaded with contaminants, after which they are removed and replaced with fresh adsorbent. The used adsorbent becomes a solid waste to be disposed of in accordance with applicable regulations.

2. **Ion Exchange** is similar to sorption involving a column packed with ion exchange material such as a synthetic acidic or basic resin in bead form, through which the contaminated water is run. Ion exchange would be investigated for use in removing metals and radionuclides from water. The tests would focus on identifying the best exchange material and, secondarily, testing means of regenerating the resin after use. A key difference between ion exchange and other sorption techniques is that ion exchange generates two forms of waste. First, the resin must be flushed periodically to remove the concentrated contaminants and the flushing liquid becomes liquid waste. Second, the resin ultimately wears out and must be disposed of.

   Small, bench-scale columns of ion exchange materials would be used. The discharge from each column would be analyzed for metals and radionuclides and compared to the makeup of the feed water to test the effectiveness of various ion exchange materials. The objectives of the tests would be to test whether individual contaminants are amenable to treatment using ion exchange columns, to screen appropriate ion exchange materials in order to select the most suitable resins, and to establish bench-scale design information such as various resins' capacity and breakthrough behavior.

3. **Magnetic Separation** involves use of one of a variety of magnetic separators to remove magnetic materials from either wet or dry waste streams. The proposed test would examine the applicability of magnetic separation to removal of radionuclides from soils. Approximately 55 gallons (a 55-gallon drum) of soil would be collected. The test process would separate radioactive contamination from soils by attracting the charged, radioactive contaminants from the host soils. The contaminants would then be removed from the magnets. The tests would look at various separators, the effects of soil composition on the effectiveness of the process, and the effects of the process on soil volume as contaminants are removed.

4. **Reduction/Oxidation** (redox) processes involve a change of the oxidation state of the reactants; one is increased while that of the other is decreased. A sample of up to approximately 55 gallons of water would be obtained and different oxidizing and reducing agents would be tested on the contaminants in the sample. The primary objective of the testing is to evaluate the relative effectiveness of four redox technologies in removing metals and radionuclides from water. The four technologies are:

a. oxidation/precipitation
b. stannous chloride reduction
c. sulphur dioxide/metabisulphite reduction
d. ferrous sulphate reduction

The oxidation/precipitation tests would use jar tests in which aeration would be used to oxidize and precipitate the contaminants. Various doses of agent would be added in multiple jar tests to determine the most effective type and dose of coagulant and operating pH. A sample of three-to-five liters would be required for each jar test.

The three reduction technologies (b, c, and d) would be performed by varying the doses of reducing agent in concentrations from 20% to 300% in excess of the stoichiometric need of the target contaminants. Effluent samples from each test would be split in two to be analyzed for metals and radionuclides separately. The effluent sample to be tested for metals would be precipitated following reduction. The one to be tested for plutonium would be subject to flocculation and settling after reduction.

5. **Physical Separation** is a technology used in removing contaminants from soils. Soil contaminants are often found in association with particular sizes of soil particles. Separation of soil by particle size can, therefore, be an effective means of reducing the volume of soil that requires additional treatment. Separation by screening (using a screen or sieve), and classification (separating particles based on their settling rate in a fluid) would be evaluated. Separation is primarily used for inorganic, metal and radionuclide contaminates, but may also be effective on organic contaminants.

The first phase of testing would use a laboratory attrition scrubber to totally separate soils by particle size. The key step would be analyses of the distribution of the contaminants among the various sizes of particles and an evaluation of which contaminants are associated with various particle sizes. Tests would be conducted on separation technologies, primarily screening and classification, to evaluate their effectiveness in separating contaminated particles from non-contaminated particles to reduce the amount of material that must subsequently be treated by soil washing or solidification/stabilization.

The second phase of testing would confirm the results of the first phase, produce material for the soil washing and solidification/stabilization tests and develop data for later pilot-scale testing. A total of approximately 55 gallons of contaminated soil would be used in the physical separation tests.

6. **Soil Washing** is a technique for removing contaminants from soil by washing with a solution. Washing agents can include water, acids, surfactants, solvents or chelating agents. (Chelating refers to the tendency of certain agents to bind to certain elements [contaminants, in this case] in a medium [soil]). The agent, together with the contaminant, can then be removed from the medium. Sorbed contaminants are transferred to the liquid phase by dissolving, by forming an emulsion, or by a chemical reaction with the solution. When extraction is complete, soil particles are physically separated from the solution. The solution containing the contaminants requires further treatment for recycling or disposal. By selecting the appropriate washing solution, soil washing can be used to remove inorganic compounds, metals, organic compounds or radionuclides.

   The objective of the soil washing tests would be to evaluate several possible washing solutions for their effectiveness on the particular contaminants and soils at RFP, and to establish the best operating conditions for the effective agents. The effects of temperature, washing agent concentration, solid-liquid ratio in washing, and contact time would be investigated. Treatment of loaded wash solution and recycle/disposal issues would also be addressed. Less than 55 gallons of contaminated soil would be used.

7. **Solidification** involves the addition of an agent to soil to create a monolithic block of material with high structural integrity. The agent does not interact chemically with the contaminants but they are mechanically bonded. **Stabilization** uses the addition to soil of reagents which limit the solubility or mobility of the contaminants. The two processes are often used together and can be applied to soils in place or soils that have been removed and subjected to some initial treatment. These processes are particularly suited to soils containing metals and/or radionuclides, but leaching of organic constituents from the solidified/stabilized block would be tested to determine whether further treatment is required. Tests would focus on the applicability of solidification/stabilization to contaminated soil that has been separated from the bulk of soil by physical means.

   The processes are very site-specific and so the objective of the tests would be to identify agents and additives that are effective under the particular conditions that exist at RFP. Agents to be tested include those that are based on portland cement, epoxy polymer, polyester polymer and pozzolan. Mixtures of soils and agents would be tested for leaching; formulations that pass the leaching test would then be subject to testing for strength and durability. Tests would focus on immobilization of heavy metals and radionuclides, but leaching of organic constituents would also be tested for to determine whether further treatment would be required. The solidification/stabilization tests are estimated to require not more than 220 gallons (the equivalent of four, 55-gallon drums) of soil.

8. **Tru-Clear**^{tm} is a proprietary product under development by Analytical Development Corporation for use in removing trace levels of alpha-emitting transuranic (TRU) elements, such as plutonium, americium and uranium, from water. The technology is

based on ferrite ion chemistry with TRU removal accomplished by mixing proprietary chemical additives in specific formulations for the conditions encountered. The additives cause removal of TRU elements from water through precipitation. As with all the technologies using solutions, the process results in a contaminated solution that must be disposed of.

Small bench-scale tests would be conducted to determine the effectiveness of Tru-Clear^{tm}, to establish the correct dosage and operating pH and to determine the removal efficiencies that can be obtained by the addition of Tru-Clear^{tm} with either solids settling or filtration. Multiple jar tests would be employed using different dosages of Tru-Clear^{tm} and different pH levels. Less than 55 gallons of water would be required for these tests.

9. **Tru-Clean^{tm}**, like Tru-Clear^{tm}, is a proprietary process for removing TRU elements. Instead of working on contaminated water, however, Tru-Clean^{tm} is designed for use on contaminated soil. Contaminated soil is sent through a series of mixers and separators where the soil is mixed with a liquid additive, agitated and allowed to separate into cleaner soil and contaminants. It is then sent to another container where the process is repeated with the same or a different additive until desired levels of decontamination are achieved.

   Using small, bench-scale testing, the effectiveness of the Tru-Clean^{tm} method on RFP soils would be identified. An initial round of tests would develop optimum operating parameters for the Tru-Clean^{tm} system given the conditions present at RFP. The effects of size and soil type would be investigated. Data would also be gathered on the volume-reduction factor based on the volume of soil processed versus the volume of decontaminated soil. A second round of tests would be conducted to determine removal efficiencies and the most effective operating conditions for the process. A total of not more than 275 gallons of soil would be used in testing the Tru-Clean^{tm} process.

10. **Ultrafiltration/Microfiltration** use special membrane material through which liquids with contaminants in particulate form are forced. The membrane prevents passage of the contaminants. As contaminants accumulate on one side of the membrane, they are collected in a concentrated, liquid form for subsequent disposal. Ultrafiltration/microfiltration are applicable to undissolved contaminants, including plutonium, in water. In addition, dissolved metals and radionuclides can be removed by these processes if they are first precipitated in a pre-treatment step.

    The objectives of the ultrafiltration/microfiltration tests are to establish that certain contaminants found at RFP are amenable to treatment using filtration, to screen appropriate chelating agents to identify the most appropriate, and to determine the optimum chelating agent doses and solution pH for maximum contaminant removal. Given the range of contaminants to be treated, it is likely that a broad range of high-molecular-weight chelating agents would be tested.

The test program would use small, bench-scale tests to chelate the metals and radionuclides and filter the chelated contaminants from the water using various membranes. Initial testing would involve multiple jar tests using all potentially applicable chelating agents at the estimated best dose and at a number of different pH levels. These samples would then be filtered and the filtered water analyzed for metals and radionuclides. The four chelating agents which produce the best removal rates would be subject to a second round of testing to determine the most effective dosage of chelating agent and operating pH. A total of not more than 55 gallons of water would be used in these tests.

4.0 DESCRIPTION OF ALTERNATIVES

4.1 Incremental Treatability Tests Alternative

The Incremental Treatability Studies Alternative consists of individual treatability tests at each OU. This program would involve the same tests as in the Proposed Action, repeated at each OU as appropriate. A series of individual treatability studies would be initiated over a period of time as work on each individual OU necessitated. The types and degrees of environmental impacts would be the same under either alternative, but, with incremental treatability testing, the studies would be implemented over a longer period of time and many studies would be duplicated at multiple OUs.

4.2 Change of Sample Locations Alternative

Potential for impacts to wetlands and floodplains would be eliminated if sampling locations were all located outside of the wetlands and floodplains. Because surface water and sediment samples must come from surface water bodies such as streams and ponds, it would not be possible to obtain suitable samples from other sources. Similarly, soil samples would be collected from areas suspected to contain contamination so that treatment technologies can be tested to remove the contaminants. It would not be possible to obtain comparable samples from soils located outside the contaminated areas which lie within floodplains. Changing the sampling locations to avoid wetlands and floodplains is not considered a reasonable alternative, because it would not fulfill the same purpose as the proposed action.

4.3 The No Action Alternative

The No Action Alternative, i.e., doing no treatability tests, is not considered a reasonable alternative because:

a. Statutes (CERCLA and RCRA) require the cleanup of contaminated sites and the Interagency Agreement between DOE, the Environmental Protection Agency and the Colorado Department of Health require DOE to remediate the 16 OUs at RFP.

b. Remediation of a site cannot reasonably be pursued without identifying and testing the technologies to be used to effect the cleanup.

5.0 DESCRIPTION OF AFFECTED ENVIRONMENT

Rocky Flats Plant is located in rural Jefferson County, Colorado. The Plant's vacant buffer zone provides a distance of more than one mile between the Plant site itself and any public road or private property. RFP is six miles from the nearest school and ten miles from the nearest hospital. Surrounding land uses are primarily agricultural with scattered industrial operations and only a few, widely distributed, single family residences. The entire metropolitan Denver area, with a population in excess of two million, is within 50 miles of RFP.

The Plant is situated on a broad alluvial fan at the base of the Rocky Mountains at an elevation of about 6,000 feet. Underlying the Plant is Rocky Flats alluvium, a gravelly soil over a largely-claystone bedrock. Seismic activity in the area is low and the potential for landslides and subsidence are not considered significant.

Surface drainage from Rocky Flats is to the east. The Plant site is drained by two ephemeral streams (Woman and Walnut Creeks), while three other streams drain portions of the buffer zone. Ground water systems at RFP consist of a shallow, unconfined system in the Rocky Flats alluvium and a confined system in deeper sandstone units of underlying rock. Ground water flow is generally to the east in both systems.

Vegetation at RFP consists of species representative of the short-grass and mid-grass prairie with riparian vegetation occurring along water courses. Outside the developed area of the Plant in the buffer zone, animal life includes species associated with western prairies, the most common of which include mule deer, coyote, red fox, striped skunk, pocket gopher and white tailed weasel. Roughly 38 species of birds have been identified on the site along with seven species of reptiles. Aquatic life present at the site includes insect species, crustaceans and small minnow populations.

No threatened or endangered species are known to live on or regularly use the Plant-site (*Threatened and Endangered Species Evaluation - Rocky Flats Plant Site*, EG&G, April, 1991). The Plant site includes habitat potentially suitable for four sensitive plant species and two endangered animal species (black-footed ferret and peregrine falcon), but field reconnaissance did not locate any individuals of any of these species.

A plant-wide cultural resource inventory was completed in July 1991. That study identifies no cultural resources at RFP.

The RFP includes areas of wetlands and floodplains. Wetlands have been identified in *Wetlands Assessment - Rocky Flats Site*, EG&G, April 1990. Most wetland areas identified are very small and are scattered across the 6,550 acre site.

6.0 ENVIRONMENTAL IMPACTS AND ISSUES

6.1 AIR

There are three potential, air related impacts associated with the Proposed Action:

a. Release of volatile organic compounds (VOCs) as a result of ground water or soil sampling.
b. Fugitive dust and motor vehicle exhaust related to sample gathering or transportation of samples.
c. Permitted releases of off-gasses during testing in laboratories.

Release of very small amounts of VOCs during sampling is likely as soil/sediment and ground water samples are brought to the surface. However, most of the soil samples are being sought from the top 20 centimeters of the soil profile, so much of the VOCs that might have existed in that relatively shallow soil have probably off-gassed already. In addition, because of the small cumulative size of the soil/sediment samples (approximately 1,650 gallons, or thirty 55-gallon drums) gathered at different times on different days, it is highly unlikely that released VOCs, even in total, can have an identifiable, even localized, effect on the natural environment or human health. Implementation of standard operating procedures (SOPs) for soil/sediment sampling would provide full protection to workers in this study.

Similarly, ground water sampling, with even smaller total sample sizes (approximately 300 gallons or fewer than six 55-gallon drums), gathered over a period of days or months, is unlikely to contain sufficient quantities of VOCs to present any hazard. Both soil/sediment and ground water sampling are subject to SOPs to protect human health and the natural environment and would be conducted in accordance with those procedures in order to provide full protection to workers.

Fugitive dust from vehicles travelling on unpaved roads and from the soil sampling process itself would be controlled as specified in the Job Safety Analysis administered by the RFP Health and Safety Group. The soil sampling SOPs would be followed to control dust emissions.

Any releases in laboratories during testing would be within permitted levels. Laboratories selected to do this work would have proper procedures in place to protect worker health and the environment.

6.2 WATER

Acquisition of samples and conduct of the study is anticipated to have no effect on water quality. Samples would be collected from existing sampling locations to the greatest extent possible to minimize any additional impacts from the sampling program. It may be necessary to drill new wells if existing sampling locations are not able to provide the type of samples necessary, but they are not expected to be needed. The quantities of water to be taken (approximately 300 gallons from different locations at different times) are very small and their withdrawal would not have a measurable effect on water resources.

6.3 FLOODPLAINS AND WETLANDS

Water, sediment and soil samples will be gathered from locations where target contaminants exist in concentrations appropriate for the tests. Exact locations for obtaining the project samples have not been identified, but it is probable that some of the groundwater and all of surface water and stream sediment samples will be taken from within the floodplains and wetlands along Woman or Walnut Creeks and their tributaries, and along the South Interceptor Ditch. Some soil samples may be taken from within floodplains, but will not be taken not from within wetlands.

Water samples totalling approximately 300 gallons will be gathered from locations including streams, ponds, seeps and wells. Many of the water sampling locations will be within floodplains and wetlands. No impacts to floodplains or wetlands are anticipated from walking or driving to a sample location and collecting water samples.

It may be necessary to drill a few new wells within the floodplains to obtain groundwater samples. The expected effect from drilling activity is trampled vegetation in the immediate vicinity of the well. Most of the vegetation will be affected temporarily, but some vegetation may be killed. Drilling is not expected to affect the floodplains.

Sediment samples of about 5 kilograms (one and one half gallons) will be collected from stream or pond bottoms. No adverse effects are projected from sample collection.

Due to the small size of individual soil samples to be taken, no adverse effects are expected to occur to floodplains from soil sampling. No change to the present or future shape or level of the floodplains is anticipated.

6.4 TERRESTRIAL IMPACTS

6.4.1 General

Neither sampling nor testing is anticipated to have any impacts to flora, fauna or habitats. Sampling would involve small numbers of people and support equipment (motor vehicles, shovels) operating in the field at RFP. Their impacts, however, would be minimized by utilizing SOPs and maximizing the use of existing sampling locations so that untrodden terrain is avoided. Some vegetation will be damaged at well drilling locations if new water wells are required.

6.4.2 Threatened or Endangered Species

Because of its brief duration, relatively confined location near areas where similar activities regularly occur, and its nature, sampling for the study is expected to have no adverse impact on any threatened, endangered or sensitive species of plant or animal or their habitats.

6.5 WASTE MANAGEMENT

Sampling for, and execution of, the tests would generate material that would be classified as hazardous, radioactive or mixed waste. After testing, some of this material would be unused samples and some would be test spoils. All unused samples and test spoils would be returned to RFP for proper treatment/disposal. The quantity of such material is likely to be somewhat greater than the volume of samples originally taken, because both the entire sample volume (whether still contaminated or decontaminated by the testing procedures) and the solutions and solids used in the tests would be sent back to the Plant. Thus, the makeup of the spoils may not be the same as the makeup of the samples. Regardless of the degree of success of the tests, all returning material would be considered to be hazardous and/or radioactive, as appropriate.

Laboratory equipment that becomes contaminated during the study would be decontaminated and retained at the laboratory.

Procedures, trained personnel and equipment are in place at RFP to properly treat, or store pending disposal, the types of spoils that would be produced by this study in the quantities mentioned. Treatment, storage and/or disposal would be accomplished in accordance with SOPs presently in place.

6.6 TRANSPORTATION

Many samples would be sent to laboratories outside RFP. Transportation of hazardous, radioactive and/or mixed materials is regulated by the U. S. Department of Transportation. In addition, DOE and RFP have regulations and procedures for transportation of hazardous and/or mixed materials. Shipments of such material as part of this study would be done in accordance with the regulations.

6.7 DIRECT, INDIRECT, CUMULATIVE AND LONG-TERM EFFECTS

The gathering of samples of contaminated water and soil, their testing in laboratories and the proper disposal of unused sample material and test spoils are not anticipated to have any significant direct, cumulative or long-term effects on the natural or human environment.

6.8 RISK OF ACCIDENTS

There are two basic elements in the Proposed Action: sample acquisition and testing. Each of these activities is routinely carried out at RFP and is covered by SOPs and other regulations. It may be necessary to develop a small number of additional SOPs to deal with specific activities. Because of their routine nature, none of the study activities, nor the activities taken cumulatively, is expected to have any higher risk of accident than similar routine Plant activities.

6.9 IMPACTS OF INCREMENTAL TREATABILITY STUDY ALTERNATIVE

The Incremental Treatability Study Alternative would result in impacts very similar to those of the Proposed Action, though they would occur over a longer period of time. The total impact under this alternative would be somewhat greater than under the Proposed Action because of the duplication of sampling and testing involved in the incremental studies approach.

6.10 IMPACTS OF THE NO ACTION ALTERNATIVE

The No Action Alternative would result in no impacts to the environment. However, the No Action Alternative would not support remediation of the site, and would result in less effective or less efficient remediation.

7.0 CONCLUSION

Implementation of the proposed treatability study would have no significant effects on air or water quality. Sampling would likely take place in floodplains and wetlands but would not adversely affect those areas. Flora and fauna, including threatened and endangered species, and habitat areas would be unaffected by the study. Small amounts of hazardous and/or radioactive wastes would result, but their volumes could be dealt with routinely. Transportation of the samples would be accomplished in full compliance with Department of Transportation, DOE and RFP regulations and guidelines for such materials. The Proposed Action would have less environmental impact that the Incremental Treatability Studies Alternative and, in the long-term, less environmental impact than the No Action Alternative.

Because the activities of the Proposed Action are among or similar to those routinely carried out at RFP, the risk of accidents from the study, though not quantified, is believed to be within the acceptable accident risk parameters of routine Plant operations.

8.0 AGENCIES CONSULTED

Colorado Department of Health.

9.0 REFERENCES

- Final Sitewide Treatability Study Plan, EG&G, dated June 3, 1991;
- Threatened and Endangered Species Evaluation, Rocky Flats Plant Site, EG&G, April 1991; and
- Wetlands Assessment, Rocky Flats Site, EG&G, April 1990.