Environmental Assessment
Repair of Sewers at the NASA Lewis Research Center
Cleveland, Cuyahoga County, Ohio

Lead Agency: National Aeronautics and Space Administration (NASA) Lewis Research Center (LeRC)

Proposed Action: NASA LeRC proposes to upgrade a section of sanitary sewer at its Brookpark Road facility and modify existing sanitary sewage pumping capabilities.

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Abstract: NASA LeRC is required by the Clean Water Act to meet the stormwater limitations specified in its discharge permits. The sewer systems at LeRC in some places are over 50 years old and in disrepair. This could prevent LeRC from consistently meeting its discharge permit requirements. The condition of the sewer system also results in unnecessary charges for sewage treatment due to inflows. LeRC proposes to repair its sewers to reduce the potential for contaminants to enter the stormwater sewer system and to reduce the flow of stormwater into the sanitary sewer system. Modifications to LeRC sewage pumping stations may also be required. Alternatives considered in addition to the proposed action include the no-action alternative. The no-action alternative is not preferred because it has the potential to jeopardize the ability of LeRC to comply with Clean Water Act regulations.

EXECUTIVE SUMMARY

The National Aeronautics and Space Administration (NASA) Lewis Research Center (LeRC), located in Cleveland, Ohio, proposes to repair portions of its existing sewers to correct deficiencies and to increase the system's reliability and flexibility. This Environmental Assessment (EA) has been prepared to characterize and analyze environmental impacts that may result from the proposed sewer system rehabilitation and modification project.

Wastewater discharges originating from LeRC must comply with Clean Water Act requirements and limitations specified in discharge permits. The existing sanitary sewer and lift station located along Walcott Road were constructed during the 1940s and have deteriorated over the years. This deterioration has resulted in a high rate of infiltration and inflow (I & I) between sanitary and stormwater sewers, particularly during storm events. The excessive I & I increases the cost of sewer system operation and maintenance and increases the potential for exceeding Clean Water Act related permit limitations. The Industrial Waste Sewer (IWS) System at LeRC collects a variety of discharges from inside buildings and outside inlets and catch basins. All IWS flow is directed into a retention basin. During the past four or five years, all IWS discharges have been pumped to the sanitary sewer. This practice results in unnecessary wastewater treatment costs and the cost of pumping the excess water.

Planning, design, and construction associated with the proposed action will take place in five phases starting approximately in 1999 and ending five years later. The proposed project involves replacing the existing 12-inch diameter sanitary sewer main along Walcott Road; improving the main sanitary lift station to improve flow; adding intermediate lift stations, if necessary; eliminating the IWS system in this area by connecting effluent lines to the proper storm or sanitary sewer; and performing other modifications of the existing storm and IWS sewers, where necessary.

This EA is prepared pursuant to the National Environmental Policy Act (NEPA) and its implementing regulations which require that NASA consider and analyze the environmental impacts of its actions. The proposed action and alternative considered are:

1. Rehabilitate and modify the sewer system
2. No action taken to correct existing sewer system deficiencies.

No other reasonable alternatives to the proposed action were identified.

The possible environmental impacts of the proposed action and the no-action alternative have been analyzed and are characterized in this EA. Possible impacts associated with the proposed action include those to water resources, biota, historic or cultural resources, and from the generation of waste. The potential for these environmental impacts is negligible to minor, and temporary in nature. Implementation of the no-action alternative may result in adverse impacts should recurrent failures of the existing sanitary system result in undesirable loadings to waterbodies.

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1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

The National Aeronautics and Space Administration (NASA) Lewis Research Center (LeRC), located in Cleveland, Ohio, researches and develops advanced technology for national needs (Figure 1). The Center's work is directed toward new propulsion, power, and communications technologies with applications in aeronautics and space exploration. Special emphasis is placed on defining future facility needs and on a comprehensive maintenance program that reduces unscheduled down time and increases facility reliability.

The proposed action, and subject of this Environmental Assessment (EA), is the repair and modification of portions of the existing sewer system at the LeRC facility. Wastewater discharges originating from LeRC stormwater and sanitary sewer systems are regulated by the Clean Water Act (CWA) and must meet specified standards and permit limitations. Sewer system repairs and modifications are needed to reduce the potential for sanitary sewage to enter the stormwater sewer system and/or for stormwater to enter the sanitary sewer system.

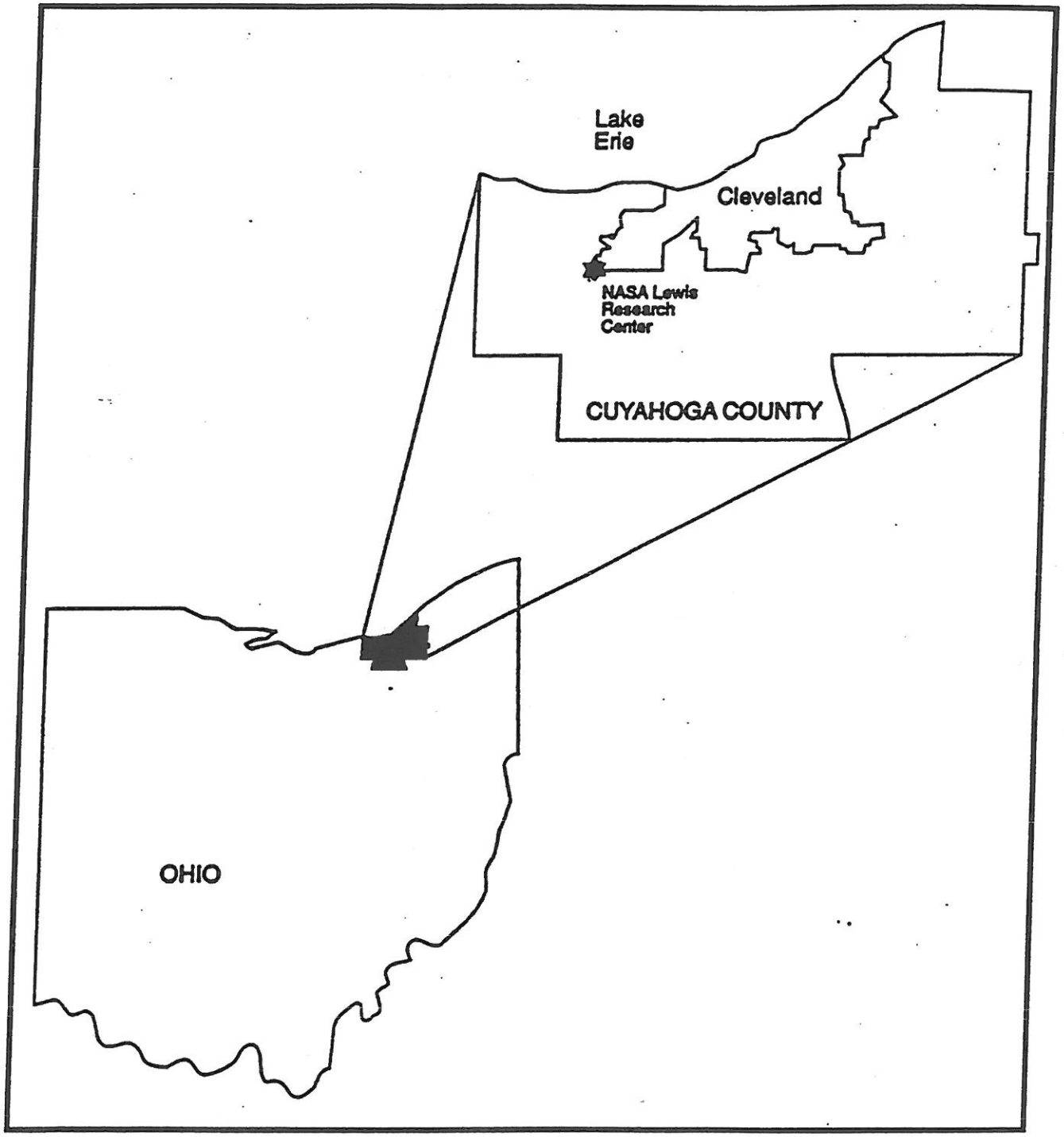
The existing sanitary sewer main at LeRC was installed in the 1940s and is now in disrepair. This sewer system has occasionally collapsed resulting in operational problems and creating the potential to discharge sanitary sewage directly into waterways or soil. The grade of the existing sanitary sewer main is nearly flat resulting in poor wastewater flow. In addition to deterioration within the existing system, some cross-connections exist between the stormwater and sanitary sewer lines. These cross-connections create the potential for discharge of sanitary sewage into the stormwater system and directly into the environment. The condition of the existing sewer system also results in unnecessary sewage treatment charges because of stormwater entering the sanitary sewer system.

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

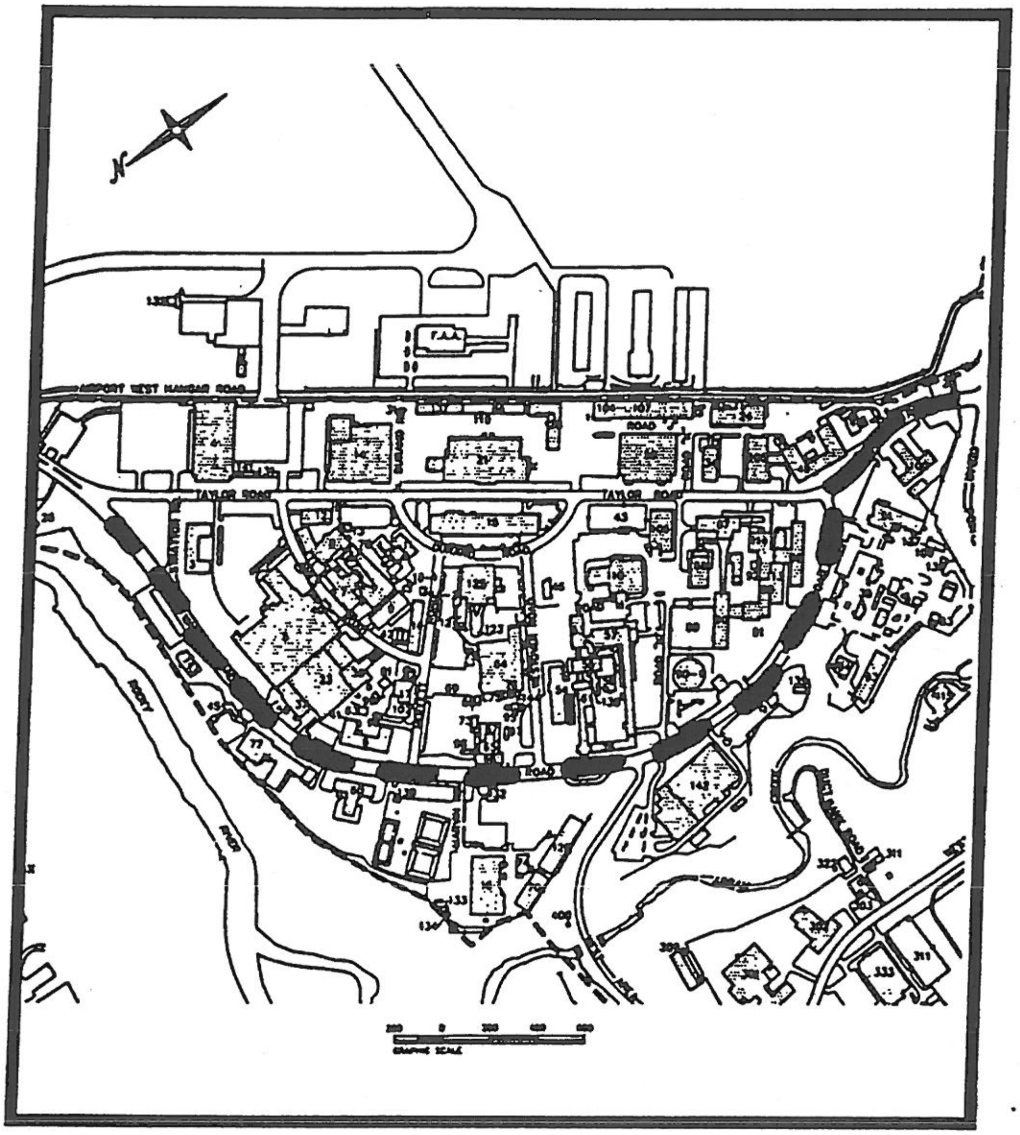
The proposed action is the rehabilitation and modification of portions of the existing LeRC sewer system. The proposed project will take place in five phases starting approximately in 1999 and scheduled to take five years to complete.

There are three distinct wastewater collection systems at NASA LeRC: the sanitary sewer system, the stormwater sewer system, and the industrial waste sewer system (IWS). The sanitary sewer system receives wastewater from lavatories, food processing areas, and other LeRC activities. The sanitary sewer collection main consists of approximately 6,000 feet of vitrified clay pipe and runs along Walcott Road between Building 26, Sewage Pump Station Number 1, and Cedar Point Road (Figure 2). Sanitary wastewater ultimately flows to the Southerly Wastewater Treatment Plant operated by the Northeast Ohio Regional Sewer District (NEORSD) where it undergoes tertiary treatment before discharge into the Cuyahoga River. Wastewater originating from NASA LeRC is sampled by the NEORSD to verify compliance with required parameters.

Stormwater is collected through a separate sewer system and is discharged at points along Abram Creek and the Rocky River. Stormwater discharges are regulated under provisions of the CWA



MAP 1
NASA LEWIS RESEARCH CENTER
VICINITY MAP



MAP 2
LOCATION OF PROPOSED WORK
ALONG WALCOTT ROAD
(HEAVY DASHED LINE INDICATES PROBABLE AREA OF WORK)

and are monitored by LeRC for compliance with National Pollutant Discharge Elimination System (NPDES) permit requirements. Monitoring reports generated by LeRC are submitted to the State of Ohio.

The IWS collects both wastewater and stormwater from areas where there is the potential for the presence of oil or other industrial wastes. This includes discharges from inside buildings and outside inlets and catch basins. The IWS functions principally as a spill control system to ensure that regulated wastes such as oils are not improperly discharged. Separators within the IWS system remove oils, grease, and solids and the wastewater collected is directed to retention basins with a capacity of 2.8 million gallons. The retention basins are discharged to the sanitary sewer system. Prior to 1994, wastewater from the retention basins was discharged either to the sanitary or stormwater system.

Under normal conditions, the sanitary and stormwater collection systems are separate. However, broken or disintegrating sewer lines create the potential for infiltration and inflow between them, resulting in excessive and unnecessary loadings to the sanitary sewer or the flow of untreated sewage into waterways in violation of regulations.

The proposed action and alternatives are:

1. Rehabilitate and modify the existing sewer system
2. No action taken to correct existing sewer system deficiencies.

2.1 Proposed Action: Rehabilitate and Modify the Sewer System

The proposed rehabilitation and modification of the NASA LeRC sewer system will entail replacing the existing sanitary sewer main along Walcott Road. In addition, the proposed action entails improving the main sanitary lift station; adding intermediate lift stations, if necessary; eliminating the IWS system in this area by connecting effluent lines to either the storm or sanitary sewer, as appropriate; and modifying the existing storm and IWS sewers, where necessary. The determination about whether to rehabilitate or replace the sewage pump station will be made as further evaluation and design criteria are developed.

2.2 No Action

An alternative to the proposed action is the no-action alternative. The no-action alternative involves repairing and modifying the existing sewer system in response to discrete failures of the system on an as-needed, emergency basis.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL IMPACT OF ALTERNATIVES

This section describes components of the environment that might be impacted by the proposed action or the alternative considered. The proposed action and the alternative considered are analyzed for their potential to impact the following environmental media or factors:

- Land Resources
- Air Resources
- Water Resources
- Noise
- Biotic Resources
- Floodplains and Wetlands
- Solid Waste
- Hazardous Substances and Hazardous Waste Management
- Historical, Archeological, and Cultural Resources
- Socioeconomic Factors.

The organization of this section follows that of the Environmental Resources Document for NASA LeRC (SAIC 1997) and examines the environmental components identified in the Facility Project Implementation Handbook (NHB 8820.2) and NASA Procedures for Implementing NEPA (14 CFR 1216.3).

3.1 Land Resources

The proposed sewer system modifications will take place within the Central Area of NASA LeRC. The Central Area is densely developed, comprising 71.9 x 10^4 square meters (177.7 acres) of NASA's approximately 147.7 x 10^4 square meters (365 total site acres). Approximately 30% of the Central Area is open or underdeveloped, and as such there are no important farmland, prime forest, or prime rangeland resources present (SAIC 1997).

Rehabilitate and Modify the Sewer System

The proposed action is expected to have a temporary minor impact on land resources. Minor negative impacts to land resources resulting from excavation activities and installation of sewer system components is anticipated to be temporary and of short duration.

No Action

Implementing the no-action alternative would not likely result in an immediate impact on land resources. As with impacts expected from the proposed action, incremental repairs to the existing system are anticipated to be minor and transient in nature.

3.2 Air Resources

The U.S. Environmental Protection Agency (USEPA) is delegated primary responsibility for administering the Clean Air Act. In Ohio, this authority has been delegated by the USEPA to the Ohio EPA, which has contracted with the Cleveland Bureau of Air Pollution Control to administer the program in Cleveland and Cuyahoga County (which includes the LeRC facility). Portions of Cuyahoga County are a non-attainment area for PM10 (particulate matter <10 microns). The County is in attainment for carbon monoxide, ozone, and nitrogen oxides (SAIC 1997). Regional air quality is significantly influenced by vehicle traffic.

An air emission inventory has been performed at LeRC, and LeRC submitted a Clean Air Act Title V permit application to the Ohio EPA in September 1996. Based on its potential emissions, LeRC is classified as a major source under the provisions of Title V. The permit application identified 33 "non-insignificant" (most important potential) air emission sources. These include 6 boilers (primarily natural gas fueled), 7 natural gas heaters, and 20 research test cells.

Rehabilitate and Modify the Sewer System

The proposed action is expected to have a negligible impact on air resources. Air emissions anticipated are limited to dust from soil excavation activities and vehicular emissions generated by construction vehicles. Dusts generated during construction activities and the installation of sewer system components are expected to be minor in amount and transient in nature. If dust is generated, it will be controlled through water spray or other Best Management Practices. The potential for dust generation during excavation activities such as are anticipated during sewer system rehabilitation was studied in 1995 as part of the LeRC Phase I Remedial Investigation/Feasibility Study (RI/FS). This study concluded that the potential for generating and transporting particulates (e.g., dust) from soil excavation activities is minor (R&R International, Inc. 1995).

No Action

Impacts to air resources from implementing the no-action alternative would be negligible, of limited duration, and restricted to impacts resulting from incremental sewer system repairs and maintenance. In the event that emergency repairs to the existing sewer system would be required, the impacts to air resources resulting from dust generation and construction vehicle emissions would likely be less than those of the proposed action because such activities would involve more discrete areas of impact and be of lesser scale. However, the impacts to air resources for a given section of sewer line may be greater due to the inability to plan and implement protective measures.

3.3 Water Resources

Wastewater discharges originating from LeRC are regulated under the authority of the Clean Water Act (CWA) which sets both health-based and technology-based standards. Point source discharges to U.S. waters require permitting under the NPDES program. NASA LeRC stormwater discharges are regulated by Ohio EPA under NPDES permit Number OH 3IO00001*DD. The permit covers 13 discharge points and as currently issued expires January 31, 1999. NASA LeRC submits monthly discharge monitoring reports. Sanitary discharges to the NEORSD are regulated by local ordinance based upon requirements of the CWA. Treated NEORSD wastewater is discharged to the Cuyahoga River and must comply with CWA regulations.

Rehabilitate and Modify the Sewer System

The proposed sewer system rehabilitation and modification have the potential to result in minor positive impacts to water resources. Reducing the possibility of sanitary sewage infiltration into stormwater collection systems will decrease the potential for sanitary sewer or IWS wastewaters to commingle with stormwater discharged to points along the Rocky River or Abram Creek. Improvement in the water quality parameters of LeRC stormwater discharges may be anticipated from the rehabilitation of the existing sewer system.

The reduced potential for infiltration between wastewater collection systems resulting from sewer system modifications and repairs may increase stormwater discharges from LeRC to points along Abram Creek and the Rocky River by an indeterminate amount.

Impacts associated with the possible elimination of discharges to the IWS retention basins are expected to be negligible. Water held in the retention basins does not support significant biological communities and is currently routed to the sanitary sewer system where it is required to meet wastewater quality standards based on Federal, State, and local regulations.

No Action

Implementing the no-action alternative may result in minor negative impacts to water resources because repairs and modifications will be made only following failures of the existing system. Failures resulting from the disrepair of the existing sewer system may potentially result in unacceptable flows to both the local watershed through stormwater discharges or to the sanitary sewer system.

3.4 Noise

The USEPA has established guidelines for "environmental" noise, but there are no enforceable standards. Noise control for stationary sources is primarily driven by Occupational Safety and Health Administration (OSHA) workplace standards. Noise ordinances of communities adjacent to the LeRC facility restrict noise levels in residences and commercial facilities. Overall responsibility for noise management at LeRC resides with the Noise Management Team of the EMO, which maintains programs in hearing conservation, community noise control, and acoustical and noise control engineering.

Rehabilitate and Modify the Sewer System

Implementation of the proposed action will likely result in noise from the machinery and vehicular traffic engaged in excavation and construction activities. It is anticipated that these short-term and occasional contributions to existing noise levels will be insignificant relative to other noises produced on a daily basis at the LeRC facility and the adjoining Cleveland Hopkins International Airport and other sources.

No Action

There will be no immediate additional noise impacts associated with the no-action alternative. Excavation and construction required on an emergency basis will not likely significantly impact existing noise levels at LeRC.

3.5 Biotic Resources

Biotic resources are the living (biological) components of the environment. These resources include plants and animals, some of which may be endangered or protected species.

Rehabilitate and Modify the Sewer System

The impact to biotic resources from this alternative will be minor. Minor positive impacts in aquatic biodiversity in the streams receiving LeRC stormwater may be experienced if stormwater discharges improve in quality, and the potential for inappropriate discharges is reduced.

No Action

Impacts to biotic resources from implementing the no-action alternative are expected to be minor. Minor negative impacts may result should failures in the existing sewer system result in the infiltration of significant quantities of sanitary sewage into the stormwater collection system and into stormwater receiving waters.

3.6 Floodplains and Wetlands

Section 404 of the CWA restricts the development, dredging, or filling of wetlands within designated areas. The proposed modifications to the LeRC sewer system will not impact designated wetlands. Areas at LeRC within the 100-year floodplain include small strips of land adjacent to Abram Creek and Rocky River. There are no LeRC facilities located within this floodplain (SAIC 1997).

Rehabilitate and Modify the Sewer System

The rehabilitation and modifications proposed for the LeRC sewer system are unlikely to impact wetlands or floodplains.

No Action

Implementing the no-action alternative is unlikely to impact wetlands or floodplains.

3.7 Solid Waste

The generation, management, and disposal of solid wastes are regulated at the Federal level by the Resource Conservation and Recovery Act (RCRA), Subtitle D. In Ohio, licenses to dispose of solid waste are issued by the Ohio EPA and monitored by local county health departments. Currently, NASA LeRC utilizes a contractor to transport solid wastes to the Cuyahoga Regional Sanitary Landfill in Solon, Ohio for

final disposal. The LeRC Soil Excavation and Removal Policy (LeRC 1996) outlines procedures for handling, sampling, and determining the most environmentally sound and appropriate means of disposal of soil and excavation wastes.

Rehabilitate and Modify the Sewer System

Implementing the proposed action may result in minor impacts due to waste soils generated by excavation. Adherence to the LeRC Soil Excavation and Removal Policy will minimize the potential for adverse environmental impacts by requiring proper identification and disposal of waste soils.

Solid wastes generated from rehabilitation and modifications to the sewer system will include scrap clay pipe and related structures. It is anticipated that the amount of this waste material generated will be insignificant given the quantity of such materials generated from similar construction and excavation activities. All solid wastes generated will be recycled to the maximum extent practicable or disposed of according to solid waste disposal regulations.

No Action

No solid wastes will be immediately generated by implementing the no action alternative. The generation of solid wastes, including waste soils, is anticipated in the future as repairs to the existing sewer system become necessary. Impacts from the generation and disposal of these wastes to geologic resources and their contributions to total wastes will be minimal.

3.8 Hazardous Substances and Hazardous Waste Management

A solid waste is considered a hazardous waste if it exhibits a hazardous characteristic or if it is a listed waste under 40 CFR Part 260, Chapter I, Subpart D. Applicable Federal and State hazardous waste regulations are described in the Environmental Resources Document (SAIC 1997). Hazardous wastes generated at LeRC are held for a maximum of 90 days, and are temporarily stored at the Central Chemical Storage Facility for final disposition. Specific regulations exist for the disposal of pesticides, radioactive wastes, asbestos, and polychlorinated biphenyls (PCBs).

Rehabilitate and Modify the Sewer System

The generation of hazardous wastes such as contaminated soil is possible, though unlikely, during rehabilitation and modification of the existing sewer system. Should contaminated soils be encountered, environmental impacts resulting from the generation of these wastes will be minimal because procedures are in place to properly identify and handle hazardous wastes or hazardous soils.

No Action

Minor impacts associated with the generation of hazardous wastes are possible during the implementation of the no-action alternative if emergency repairs to the existing sewer system are required. In the event of emergency repairs, the same hazardous waste handling and disposal procedures would be required as for the proposed action.

3.9 Historical, Archeological, and Cultural Resources

Federal agencies are required to consider the effects of their actions on historical, archeological, and cultural resources to ensure these are preserved for future generations. There are two facilities at LeRC that have been designated as National Historic Landmarks: the Rocket Engine Test Facility and the Zero Gravity Facility (SAIC 1997). A possible archaeological site has been identified in the vicinity of Building 501.

Rehabilitate and Modify the Sewer System

The proposed action will not impact any known historic buildings at the facility. A recent cultural survey of LeRC concluded that a potential exists for culturally sensitive areas at several locations (Gray and Pape, Inc. 1996). The proposed excavation work could possibly disturb artifacts. While it is not certain that artifacts exist, a representative of the EMO will inspect soil excavated from potentially culturally sensitive areas prior to removal. If evidence of cultural artifacts is discovered, excavation will cease until a qualified professional can perform a detailed survey of the area of impact. In every circumstance, efforts will be made to return all excavated soil to the general area from which it was excavated.

No Action

The no-action alternative would have no immediate impact on historical, archeological, or cultural parameters. In the event that modifications and repairs to the existing sewer system are required, LeRC criteria for the protection of historical and cultural resources will be implemented.

3.10 Socioeconomics

Included in this category are impacts on factors such as local economics, workforce, and sociological features in the local area including population and employment levels. Environmental justice issues have been evaluated at LeRC and no significant offsite impacts have been determined to exist or are anticipated in the foreseeable future. No significant minority or low-income populations have been identified within the radius of LeRC potential influence (Jones Technologies, Inc. 1996).

Rehabilitate and Modify the Sewer System

Impacts to employment levels and local economies resulting from the rehabilitation and modification of the sewer system are anticipated to be negligible. The addition of workers to

perform construction and rehabilitation activities would be temporary and small in comparison to the total LeRC workforce. Existing NASA engineering and technician employees or contractors will be used to maintain the equipment once installed.

No Action

Implementing the no-action alternative would have no immediate impact on socioeconomic factors within LeRC or the adjacent community. Incremental repairs to the system will be unlikely to significantly impact existing socioeconomic factors.

3.11 Cumulative Impacts

NEPA regulations define cumulative impacts as those effects resulting from the combined impacts of past, present, and future actions. Combined impacts include all direct and indirect impacts, both positive and negative, resulting from the action when added to other relevant past, present, and future actions. It is unlikely that adverse cumulative environmental impacts would result from the rehabilitation and modification of the existing sewer system. Potential impacts from implementing the proposed action are anticipated to be minor and temporary in nature. Implementation of the no-action alternative may result in negative minor impacts should sanitary sewer system degradation continue and recurrent failures result in multiple inappropriate loadings to stormwater discharge points. The cumulative environmental impacts of individual sewer repair efforts, over time, would likely result in the same general impacts as the proposed action.

4.0 AGENCIES AND INDIVIDUALS CONSULTED

No agencies or individuals outside of NASA LeRC were consulted in the preparation of this EA.

5.0 LIST OF PREPARERS

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