



# MARS SAMPLE RETURN – POTENTIALLY IMPACTED RESOURCES

# NASAfacts

During the scoping process for the Mars Sample Return (MSR) Campaign Programmatic Environmental Impact Statement (EIS), some resource areas were identified as a greater concern than others (i.e., health and safety, cultural resources, and hazardous materials and wastes). As a result, individual factsheets for those three resources are available (please see MSR – Health and Safety Factsheet, MSR – Cultural Resources Factsheet, and MSR – Hazardous Materials and Wastes Factsheet for additional details regarding the potential impact associated with those resources). This Factsheet focuses on the remaining resource areas analyzed in the draft MSR Programmatic EIS. Additional details regarding the description of the proposed action and no action alternative are available in the Proposed Action and No Action Alternative Factsheet.

## Soils and Geology

### Proposed Action

#### *Programmatic Analysis*



Operation of an SRF would not be anticipated to impact soils or geology; the main impact driver for this resource is the site development associated with establishment of an SRF. The amount of soil disturbance and associated extent of adverse impacts would be dependent on the location, type and size of the facility, as well as the need for any additional infrastructure (such as access roads, above and below ground utilities, parking, perimeter fencing, etc.)

#### **Site-Specific Analysis** (Utah Test and Training Range [UTTR] / Dugway Proving Ground [DPG])

There would be ground disturbance associated with on-site mission preparation (to include testing and rehearsals and landing site preparation), EES landing, and recovery operations; however, disturbance would be localized and would not result in loss of soil productivity or significant erosion given the flat land area and lack of substantive precipitation. Given the context of the landing site, and low intensity of the action, these activities are expected to have minimal impacts on soils and geology at the UTTR. During landing site preparation and EES recovery operations, standard practices for preventing soil erosion would be employed (e.g., minimizing the size of the disturbed area associated with landing site preparation activities).

#### **No Action Alternative**

The No Action Alternative would not result in any additional impacts to soils or geology within or adjacent to the proposed landing site outside of those associated with ongoing and potential future military operations and other activities occurring at the site. Potential impacts associated with development of an SRF would not be realized.

## Biological Resources

### Proposed Action

#### *Programmatic Analysis*

Operation of an SRF would not be anticipated to impact biological resources; the main impact driver for this resource is the development of an SRF. Construction activities that may impact biological resources include vehicle and equipment operation, land clearing, earth moving, stormwater runoff, and potential introduction of invasive species.

#### **Site-Specific Analysis (UTTR / DPG)**

On-site mission preparation, EES landing, recovery, and transportation operations are expected to have minimal direct or indirect impacts on the biotic environment at the UTTR given the context of the landing area (e.g., desert playa with sparse vegetation and lack of suitable wildlife habitat) and the intensity of the action (minor, temporary disturbance). Based on information received from Federal and state resource management agencies, there are no Endangered Species Act-protected species or designated critical habitat located on the UTTR.

#### **No Action Alternative**

The No Action Alternative would not result in any additional impacts to biological resources within or adjacent to the proposed landing site outside of those associated with ongoing and potential future military operations and other activities occurring at the site. Potential impacts associated with development of an SRF would not be realized.

## Air Quality/Climate

### Proposed Action

#### *Programmatic Analysis*



Both construction and operation of an SRF may have the potential to affect air quality associated with emissions from point sources and mobile sources. Construction requiring ground improvements would result in mobile air emissions from equipment use, as well as particulate matter from fugitive dust emissions; facility operations could involve air emissions of criteria pollutants depending on the types of operations conducted and whether there are direct air exhaust systems or roof stacks for facility operation activities.

#### **Site-Specific Analysis (UTTR / DPG)**

On-site mission preparation, EES landing, recovery, and transportation operations are expected to have minimal direct impacts on Tooele County air quality and climate given the context of the landing area (i.e., a remote site on an active military range with more extensive air emissions) and the intensity of the action (temporary emissions from mobile sources and fugitive dust).

#### **No Action Alternative**

The No Action Alternative would not result in any additional impacts to air quality or climate within or adjacent to the proposed landing site outside of those associated with ongoing and potential future military operations and other activities occurring at the site. Potential impacts associated with development of an SRF would not be realized.

## Water Resources

### Proposed Action

#### *Programmatic Analysis*

Both construction and operation of an SRF may have the potential to affect water resources, each in a different manner. Depending on the type and size of the facility, operation of the SRF may involve industrial stormwater discharges to the environment, while development of the SRF may have a direct or indirect impact on water resources from sediment runoff during construction and may require a general stormwater construction permit. Effects of the construction of the SRF on wetlands would be assessed once a site-specific location is identified.

#### **Site-Specific Analysis (UTTR / DPG)**

Given the context of the action area (no surface or surface adjacent water resources), on-site mission preparation (to include testing and rehearsals and landing site preparation), EES landing, recovery, and transportation operations are expected to have no direct or indirect impacts to water resources at the UTTR or DPG.

#### **No Action Alternative**

The No Action Alternative would not result in any additional impacts to water resources within or adjacent to the proposed landing site outside of those associated with ongoing and potential future military operations and other activities occurring at the site. Potential impacts associated with development of an SRF would not be realized.

## **Land Use**

### **Proposed Action**

#### ***Programmatic Analysis***

Temporary impacts on land use from construction operations can affect ongoing uses in nearby areas, both on and off the SRF site. These include elevated traffic, including heavier-than-usual truck traffic; dust from ground disturbance and site preparation; and noise from construction equipment. While these effects can cause inconvenience and some annoyance for local users, upon completion of construction, these effects would cease. Were NASA to propose siting the SRF in an area of incompatible land use, adverse impacts to existing uses may occur. The significance of the environmental impact of SRF siting on land use would be affected by the location and type of SRF NASA determines is best suited to carry out the purpose and need for the proposed action.

#### **Site-Specific Analysis (UTTR / DPG)**

On-site mission preparation, EES landing, recovery, and EES transportation operations are expected to have no impacts to the UTTR or DPG land use given the context of the activities (within an active military installation and roads for intended use) and the intensity of the action (transient, short-term events).

#### **No Action Alternative**

The No Action Alternative would not result in any additional impacts to land use within or adjacent to the proposed landing site outside of those associated with ongoing and potential future military operations and other activities occurring at the site. Potential impacts associated with development of an SRF would not be realized.

## **Socioeconomics**

### **Proposed Action**

#### ***Programmatic Analysis***

SRF development activities would likely result in some beneficial direct, indirect, and induced economic impacts in terms of employment and income, the scope of benefit tied to the size and type of facility. Construction-related impacts would last for the duration of the activities. Long-term socioeconomic impacts would be directly tied to the number of new jobs created and the projected population increase associated with those jobs. Employment numbers would be dependent on the type and size of the facility. Direct impacts to housing, education, and public services (e.g., emergency services) would also be dependent on local population increases. Depending on the scope of any increases in local population, this could adversely affect these aspects if availability and capacity cannot adequately accommodate the increase.

#### **Site-Specific Analysis (UTTR / DPG)**

Mission preparation activities, EES landing site preparation and landing recovery operations, and sample transportation would be expected to have no adverse impacts to socioeconomics because activities would be within the existing range and there are no anticipated effects outside this area. There may be minimal beneficial impacts associated with NASA scientists and other recovery team members utilizing services (e.g., hotels, restaurants, etc.) within the local community during their time at the UTTR or DPG.

#### **No Action Alternative**

The No Action Alternative would not result in any additional socioeconomic impacts at the UTTR or surrounding area outside of those associated with ongoing and potential future military operations and other activities occurring at the site. Potential impacts associated with development of an SRF would not be realized.

## Infrastructure

### Proposed Action

#### *Programmatic Analysis*

The main impact driver for utilities is operation of an SRF; development would not be expected to result in any adverse utility impacts. The size and intended operational parameters of the facility would dictate the amount of electricity and/or natural gas and potable water required, as well as wastewater generation. The size, location, and number of employees for a facility would also determine the extent of potential impacts to local transportation networks. The scope of the impact would also depend on the existing level of service for surrounding transportation networks.

#### **Site-Specific Analysis (UTTR / DPG)**

On-site mission preparation, EES landing and recovery would not require the construction of new, or modification of existing, UTTR or DPG infrastructure. Hookups to existing utility infrastructure for temporary use (e.g., electricity for trailers, communications) may be required, a small number of wheeled vehicles may use UTTR and DPG roads, and recovery team members may use local roadways transiting to/from the UTTR. This would not be expected to adversely impact infrastructure or utility use on UTTR, DPG, or local roadways.

#### **No Action Alternative**

The No Action Alternative would not result in any additional impacts to the UTTR or surrounding area infrastructure outside of those associated with ongoing and potential future military operations and other activities occurring at the site. Potential impacts associated with development of an SRF would not be realized.

## Environmental Justice/ Protection of Children

### Proposed Action

#### *Programmatic Analysis*

Impacts to environmental justice communities from development and operation of an SRF would be based on the extent to which minority and low-income populations reside within the affected environment. Potential environmental justice impacts are directly tied to the location of the facility and would require site-specific analysis.

#### **Site-Specific Analysis (UTTR / DPG)**

There are no environmental justice concerns associated with on-site mission preparation or EES landing and recovery operations as these activities would all occur within the UTTR South Range and DPG boundary. There are no anticipated effects outside this area; therefore, there would be no environmental justice concerns associated with activities at the UTTR or DPG.

#### **No Action Alternative**

The No Action Alternative would not result in any additional environmental justice impacts at the UTTR or surrounding area outside of those associated with ongoing and potential future military operations and other activities occurring at the site. Potential impacts associated with development of an SRF would not be realized.

## Noise

### Proposed Action

#### *Programmatic Analysis*

Development of an SRF would generate localized noise associated with heavy equipment and generator operation; such noise would be temporary (lasting only the duration of the construction project) and would be expected to be limited to normal working hours. Construction activities would not be expected to result in significant community noise impacts provided the location is not within or adjacent to a residential area. Operationally, non-significant levels of external noise may be generated by such equipment as cooling towers, laboratory ventilation fans, and emergency generators.

#### **Site-Specific Analysis (UTTR / DPG)**

Upon entering the Earth's upper atmosphere, the EES would create a sonic boom above the UTTR. The UTTR airspace is currently used for supersonic aircraft operations, and this one-time event would be indistinguishable from regular UTTR operations. This sonic boom, while somewhat audible at this altitude, would not be expected to result in overpressures at ground level that would result in hearing or structural damage. Based on the type of noise, context of occurrence (roadways or airfields), and single event transient intensity this type of noise would not be expected to result in adverse impacts.

#### **No Action Alternative**

The No Action Alternative would not result in any additional noise impacts at the UTTR or surrounding area outside of those associated with ongoing and potential future military operations and other activities occurring at the site. Potential impacts associated with development of an SRF would not be realized.