

Geology

Minor impacts on the geologic resources, notably loss of prime farmland soils, are expected from the construction and operation of the No Action Alternative 2 and the Proposed Action. However, the impacts are expected to be minor, because the site has been previously graded and disturbed. The Proposed Action would have a slightly greater impact on geologic resources due to the additional support facilities required for operation. Disturbances associated with construction would be mitigated with runoff, erosion, and dust controls. Geologic hazards are not expected to have any effects on either No Action Alternative 2 or the Proposed Action.

Air Resources

Air emissions would be similar in quantity under No Action Alternative 2 and the Proposed Action. Increases would occur in annual air emissions of nitrogen oxides (NO_x), carbon monoxide (CO), sulfur oxides (SO_x), particulate matter, and reactive organic gases. Under the Proposed Action, the greatest quantity of emissions would be from NO_x (approximately 1,100 tons per year [TPY]), CO (approximately 800 TPY), and SO_x (approximately 500 TPY). The Proposed Action would also result in increases in hazardous air pollutant emissions of approximately 9 TPY for all hazardous pollutants combined. More than half of this figure is attributable to the increase in nickel emissions; however, the overall increase would present little risk to human health and the environment (see Occupational and Public Health and Safety section, below). Pollutant emissions would be well within applicable standards; however, annual average emissions for NO_x and particulate matter would approach the Prevention of Significant Deterioration (PSD) Rule for Significant Impact Level Limits. The levels of particulate matter would also approach the 24-hour PSD limits.

Emission control requirements (equipment design requirements and operational procedures requirements) for the proposed project have been established by the Kentucky Division for Air Quality and the EPA as part of the PSD permit approval process. Emission controls included as part of the PSD permit include enclosed storage of raw materials; fabric filters on limestone storage silos; covered conveyors for raw material transfer; drift eliminators on the cooling tower; and steam injection or other combustion controls on the gas turbines. During construction activities,

fugitive dust will be minimized using standard dust control measures such as watering. Railcars will be covered to minimize fugitive dust from coal and RDF pellet transport to the site.

Water Resources

No Action Alternative 2 would require 3.8 million liters per day (MLD) (1 million gallons per day [MGD]) of surface water from the Kentucky River for facility operations and would generate less than 1.5 MLD (0.4 MGD) of wastewater. The Proposed Action would require 15.1 MLD (4 MGD) of surface water from the Kentucky River for facility operations and would generate 1.5 MLD (0.4 MGD) of wastewater. Treated wastewater would be discharged into the Kentucky River. The remaining 13.6 MLD (3.6 MGD) would be used during the operation of the gasifier, turbine condensers, and fuel gas saturation process, as well as for other miscellaneous uses. It is expected that no significant impacts would occur to water levels as the amount of the intake required for the Proposed Action represents approximately 0.1 percent of the average calculated daily flow and 4 percent of the low flow conditions of the Kentucky River near the site. Coal and RDF pellets would be unloaded, stored, and conveyed in enclosed structures with concrete floors and would not impact water resources. No use of or discharge to groundwater resources is expected to occur during construction and operation of either facility.

Potential water resources and water quality impacts for facility discharges will be minimized by pretreatment in a new wastewater treatment facility. Federal and state-issued permits regulating water usage and wastewater discharge would specify site-specific criteria to minimize potential impacts. The facility will be designed to minimize water usage, and any discharges would comply with federal and state wastewater and stormwater discharge permits.

During low flow conditions, potential conflicts could exist between competing users of the river. To help minimize such conflicts, KPE will cease water withdrawals if drought conditions warrant or if requested by the state.

Under the proposed action, minor activity to extend the water intake structure would be required alongside the river channel, however, no impacts to the floodplain would result. No wetlands have been identified in the project area and no impacts to wetlands would result.

Ecological Resources

The construction of the facilities for No Action Alternative 2 would result in the loss of approximately 4.8 hectares (12 acres) while the Proposed Action would result in a loss of 7.6 hectares (19 acres) of old-field vegetation and its respective habitat. No federal- or state-listed protected, sensitive, rare, or unique species have been identified at the project site location and suitable habitat for the federally-endangered running buffalo clover is not present. Therefore, there would be no impacts to any federal- or state-listed protected or endangered species from either No Action Alternative 2 or the Proposed Action. The thermal plume from wastewater discharge into the Kentucky River would likely not have an impact on aquatic organisms.

Post construction mitigation landscaping will consist of a control program for non-native invasive plant species such as non-native thistles, fescue, and mustard. The site will be revegetated with a blend of native grasses and forbs. Due to the height of the emissions stacks, the Federal Aviation Administration requires stack lighting. To minimize bird strike mortality, the U.S. Fish and Wildlife Service (USFWS) has developed a set of voluntary recommendations for tower siting, construction, operation, and decommissioning. The gasifier stacks lighting system will be designed in consideration of the USFWS recommendations.

Noise

The construction and operation of both No Action Alternative 2 and the Proposed Action would result in minor noise increases over existing background noise levels beyond the borders of the J.K. Smith Site. Vehicle and rail traffic associated with both alternatives would cause minor noise increases of less than 2 decibels over background noise levels in the nearby community of Trapp.

Mitigation measures necessary to minimize noise impacts will be implemented for the proposed action. Buildings housing the gas turbine units will be designed to ensure a substantial reduction in noise transmitted to the outside. A reduction of gas turbine noise to 95 dBA or less, adjacent to the outside of the building, is a basic design requirement. In addition, the building housing the gasifiers will be designed to ensure a significant reduction in noise transmitted to the outside. A reduction of gasifier noise to 65 dBA or less, adjacent to the outside of the building, is a basic design requirement.