TO: All Interested Parties

FROM: JS Jessica Schultz, Deputy Director, National Weather Service (NWS) Radar Operations Center

SUBJECT: Lowering the Minimum Scan Angle of the KGJX Weather Surveillance Radar - Model 1988 Doppler (WSR-88D) serving New Orleans / Baton Rouge, LA, area

DATE: July 13, 2020

In accordance with provisions of the National Environmental Policy Act of 1969, the National Weather Service (NWS) prepared a Draft Environmental Assessment (EA) analyzing the potential environmental effects of relocating and lowering the minimum scan angle of the KLIX WSR-88D serving the New Orleans / Baton Rouge, LA, area. The Draft Environmental Assessment is available for public review and comment. The Draft EA may be obtained at:

https://www.roc.noaa.gov/WSR88D/SafetyandEnv/EAReports.aspx

The KLIX WSR-88D is an existing radar facility located at Slidell Airport in St. Tammany Parish, LA, about 30 miles northeast of downtown New Orleans, LA and about 78 miles east of downtown Baton Rouge, LA. The KLIX WSR-88D was commissioned in February 1995 and is one of 159 WSR-88Ds in the nationwide network. NWS proposes to relocate the KLIX WSR-88D to Hammond North Shore Regional Airport (HDC) in Hammond, Tangipahoa Parish, LA. The proposed relocation site is about 40 miles west-northwest of the existing location, 40 miles northwest of downtown New Orleans, and 50 miles east-northeast of downtown Baton Rouge.

The WSR-88D antenna transmits a narrow focused main beam with a width of 1 degree. In normal operation, the radar antenna rotates horizontally to cover all directions (i.e. azimuths). The radar antenna also varies the scan angle at which it points with respect to the horizon. Currently, the WSR-88D operates at a minimum of scan angle of +0.5 degrees (deg) above the horizon. When relocating the KLIX WSR-88D, NWS proposes to reduce the minimum scan angle from the current minimum of +0.5 deg to +0.3 deg (i.e. 0.2 deg lower than existing) to provide enhanced coverage of the lower portions of the atmosphere.

NWS will accept written comments on the Draft EA until August 21, 2020. Please submit comments via either email or regular mail to:

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Comments sent by regular mail must be postmarked by August 21, 2020. After the end of the Draft EA review period, NWS will prepare a Final EA containing responses to all comments. NWS will not make any decision on implementing the proposed action until completion of the environmental review. Thank you for your interest in this important project.

SENSOR ENVIRONMENTAL LLC
www.sensorenvirollc.com

Draft Environmental Assessment Report • July 2020

ENVIRONMENTAL ASSESSMENT (EA)

RELOCATION OF THE WEATHER SURVEILLANCE RADAR - MODEL 1988, DOPPLER (WSR-88D) SERVING NEW ORLEANS / BATON ROUGE, LOUISIANA, AREA

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EXECUTIVE SUMMARY

The National Weather Service (NWS) owns and operates the existing Weather Surveillance Radar, Model 1988 Doppler (WSR-88D) serving the New Orleans/Baton Rouge, LA area. The International Civil Aviation Organization designator for the radar is KLIX and the radar is located adjacent to the Weather Forecast Office (WFO) and Lower Mississippi River Forecast Center (RFC) at Slidell Airport in Slidell, St. Tammany Parish, LA. The radar site is about 30 miles northeast of downtown New Orleans, LA and about 78 miles east of downtown Baton Rouge, LA. The KLIX WSR-88D was commissioned in February 1995 and has been in continuous operation since 1995. It is one of 159 WSR-88Ds in the nationwide network.

NWS plans to relocate the KLIX WSR-88D from its current site to a new location at Hammond North Shore Regional Airport (HDC) in Hammond, Tangipahoa Parish, LA (about 40 miles west-northwest of the WSR-88D's existing location). The proposed relocation site is about 40 miles northwest of downtown New Orleans, and 50 miles east-northeast of downtown Baton Rouge. HDC is owned and operated by the City of Hammond. After relocation, the height of the WSR-88D tower structure would be about 143 ft above ground level (same as existing tower height). In addition to the radar tower, an electronics equipment shelter, transitional power maintenance shelter, an 80-kiloWatt (kW) power generator, an aboveground fuel tank would be installed at the new site. The radar tower and associated shelters and equipment would be enclosed in a roughly 102 ft x 68 ft area surrounded by chain-link fence. The WSR-88D is an automated unstaffed facility. Technicians from the New Orleans / Baton Rouge WFO would periodically access the site for maintenance and repair purposes.

The WSR-88D rotating antenna emits a narrow main beam with a width of 1 deg in the horizontal and vertical directions (i.e., beam edge is ½ deg from the center of the beam). The antenna rotates continuously around a vertical axis to cover the surrounding area. The main beam scan angle is the number of degrees above or below horizontal at the center of the main beam. NWS proposes to reduce the minimum center of beam scan angle of the KLIX WSR-88D to +0.3 deg, which is 0.2 deg lower than the current minimum scan angle. Operating this radar at a lower scan angle would increase the area of radar coverage, providing additional data on atmospheric conditions to NWS forecasters and other data users. The area covered at 2,000 ft above site level (ASL) would increase by 58.2%. Relocating the radar and lowering its scan angle would reduce the height of radar coverage over Baton Rouge from 3,100 ft to 400 ft above ground level (AGL); coverage height over New Orleans would decrease from 600 to 200 ft AGL. Radar coverage improvements would be very beneficial to NWS forecasters and others parties (e.g. public safety agencies and emergency responders) using the radar information.

The power density of radiofrequency (RF) radiation emitted by the WSR-88D would conform to American National Standards Institute, Federal Communications Commission, and Occupational Safety and Health Administration safety standards for public and occupational exposure at all locations in the vicinity of the relocated radar. Because the KLIX WSR-88D operates in a

frequency band dedicated to government radiolocation services and the main beam would not impinge on the ground surface or structures in the radar vicinity, the proposed action would not cause radio interference with television, radio, cellular telephone, personal communications devices (PCDs), electro-explosive devices, fuel handling, or active implantable medical devices.

The proposed WSR-88D relocation site at HDC airport is zoned for airport use. Nearby uses are aviation, industrial, and recreational. The nearest residences are located 750 feet southeast of the site. The relocated WSR-88D would be compatible with existing and planned uses in the site vicinity. The WSR-88D tower would also comply with Federal Aviation Administration Part 77 height restrictions for structures at airports.

Construction of the proposed radar would require clearing of approximately one acre of mowed grassland. This would expose soil to wind and water erosion, and could lead to soil entrainment and deposition in nearby drainages. The project would be classified as a small construction site (i.e. 1 to 5 acres in size). NWS would prepare and implement a stormwater pollution prevention plan in conformance with Louisiana Department of Environmental Quality requirements to prevent erosion and washing of pollutants in local drainages.

Construction of the radar would take approximately 6 to 12 months. During this period, local roads, primarily Industrial Park Road, would be used to access the site. Construction equipment, workers' vehicles, and supply trucks would travel to and from the site on a daily basis. The expected number of vehicle trips would not exceed 50 per day and would not result in significant congestion on public roads serving the sites.

Construction of the WSR-88D will generate emissions of criteria air pollutants, including NO_x (an ozone precursor), carbon monoxide, and particulate matter. Emissions of lead and sulfur dioxide would be negligible. Earthmoving activities, dirt/debris pushing operations, grading, storage pile creation, truck dumping, and wind entrainment of dust from temporary dirt piles and exposed soil would also generate fugitive dust. Air emissions would be temporary and minor. The HDC site is not located in an area designated by Environmental Protection Agency in non-attainment or maintenance of National Ambient Air Quality Standards area and the proposed action would not be a federal highway or mass transit project, therefore, a federal conformity determination would not be required.

The HDC Site is mapped in Zone X – an area of minimal flood hazard, and is not within the 100-year floodplain. The closest wetland to the site is a freshwater pond (classified as palustrine, unconsolidated bottom permanently flooded, PUBH) about 500 feet south of the site. The drainage ditch east of Industrial Park Road is classified as riverine habitat (riverine intermittent streambed seasonally flooded, R4SBC). That ditch is about 100 ft from the site and would not be disturbed during WSR-88D construction. No impacts to floodplains, wetlands or riverine habitat would result.

NWS consulted with USFWS which provided a list of threatened and endangered species that could potentially occur in the site vicinity, including gopher tortoises, red-cockaded

woodpeckers, and West Indian manatees. The HDC site does not contain critical habitat for any of these species. Based on USFWs evaluation guidelines, no effects would result to red-cockaded woodpeckers or gopher tortoises and no adverse effects would result to manatees. The WSR-88D tower would conform to the maximum extent possible with USFWs voluntary guidelines to minimize migratory bird collisions.

Section 106 of the National Historic Preservation Act (NHPA) of 1966 (as amended) requires federal agencies to consider the effects of their actions on historic places within the area of potential effects (APE). The APE for the proposed action is defined as the area within 1,740 ft of the site. The Louisiana Office of Cultural Development Department interactive map of historic resource was searched. No places listed on the National Register of Historic Places (NRHP), historic districts listed on the NRHP, or NRHP-eligible historic districts are present within the APE. The proposed action would not impact historic or cultural resources.

During the construction period for the WSR-88D radar, noise would be generated by use of vehicles and equipment and other construction activities. Based on the type of equipment likely to be used during construction of the WSR-88D, the peak level of noise at 50 ft from the source of noise would be about 91 A-weighted decibels (acoustic) (dBA). Construction activities would occur primarily during normal working hours and noise would dissipate with distance from the source. The proposed site is at an airport. The nearest residences are about 750 ft to the southeast and construction noise levels would dissipate to 79 dBA or less. Construction noise would occur intermittently and sporadically during the construction period and would not significantly affect nearby uses.

Soil at the KLIX WSR-88D site Guyton silty loam, 0 to 1% slope, which can support prime farmland. However, the KLIX WSR-88D is located at an active airport and the site and vicinity are committed to non-agricultural uses. The proposed action would not convert farmland to non-farm use. No impacts to farmland would result.

The WSR-88D tower would consist of a spherical white fiberglass radome mounted on a free-standing (i.e., lacking guy wires) steel-lattice tower. Two one-story shelters and a standby generator would be located at the base of the tower. A red or white aviation warning light would be installed at the top of the radome. Exterior lights would be installed at ground level at the facility for security purposes. WSR-88D tower and radome would be a new visual element. Although the WSR-88D would be taller than other nearby structures to avoid blockage of the WSR-88D main beam, the radar tower would be a typical structure in this airport setting and would not significantly alter the visual character of the area.

NWS considered alternatives to the proposed action, including relocating the KLIX WSR-88D to Lacombe, St. Tammany Parish, LA, which is the future site of the St. Tammany Parish Emergency Operations Center and the NWS WFO/RFC. The Lacombe site is a cleared field and no significant environmental impacts would be expected to result at that site. NWS also considered lowering the minimum scan angle of the KLIX WSR-88D to angles between 0.0 and

+0.4 deg other than the proposed +0.3 deg. However, negligible additional benefit would result from lowering the minimum scan angle below +0.3 deg. Because the proposed action would result in the greatest improvement in overall radar coverage of the New Orleans / Baton Rouge area and significantly lower the altitude of radar coverage over the Baton Rouge area while avoiding significant environmental effects, NWS believes it is superior to the alterative actions.

NWS will distribute the Draft EA to interested members of the public and government agencies for review and comment. Comments on the Draft EA will be accepted by NWS during a minimum 30-day comment period which will end August 21, 2020. The NWS will provide official responses to all pertinent comments received during the Draft EA comment period in a Final EA report. The NWS will make a decision whether to relocate the KLIX WSR-88D and reduce its minimum scan angle after the Final EA report is completed.

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ABBREVIATIONS

AGL	above ground level
AAMI	Association for Advancement of Medical Instrumentation
ANSI	American National Standards Institute
ASL	above site level
deg	degree(s)
DoA	Department of Agriculture
EA	Environmental Assessment
E.O.	Executive Order
EED	electro-explosive device
EMI	electromagnetic interference
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FCC	Federal Communications Commission
FEMA	Federal Emergency Management Agency
FONSI	Finding of No Significant Impact

ft	foot, feet
HDC	Hammond North Shore Regional Airport
HERO	Hazards of Electromagnetic Radiation to Ordnance
IEEE	Institute of Electrical and Electronics Engineers
JSPO	Joint System Program Office
KLIX	WSR-88D serving the New Orleans/Baton Rouge, Louisiana, area
LA	Louisiana
m	meter(s)
MBTA	Migratory Bird Treaty Act (of 1918)
MHz	megahertz
mi	mile(s)
MPE	maximum permissible exposure
MSL	mean sea level
mW/cm^2	milliwatts per square centimeter
NAO	NOAA Administrative Order
NEPA	National Environmental Policy Act
NEXRAD	Next Generation Weather Radar (also known as WSR-88D)
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
NTIA	National Telecommunications and Information Agency
NWS	National Weather Service
PEIS	Programmatic Environmental Impact Statement
RF	radiofrequency
SEA	Supplemental Environmental Assessment
SHPO	State Historic Preservation Office
sq mi	square mile(s)
std	standard
U.S.	United States
USAF	U.S. Air Force
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WSR-88D	Weather Surveillance Radar – 1988, Doppler

1 BACKGROUND AND SCOPE OF REPORT

1.1 BACKGROUND

The National Weather Service (NWS) operates a nationwide network of weather radars that provide critical real-time information on atmospheric conditions to weather forecasters. Additional similar weather radars located in Alaska, Hawaii and Puerto Rico are operated by the Department of Transportation Federal Aviation Administration (FAA). The Department of Defense Air Weather Service also operates weather radars located at military installations in the U.S. and abroad. The weather radars operated by these three agencies are part of 159 WSR-88Ds in the nationwide network.

The network radars operated by NWS are named Weather Surveillance Radar-Model 1988 Doppler (WSR-88D) after the year they were first put into service and their capabilities to use Doppler shift measurements to determine wind velocities. They are also known as Next Generation Weather Radars (NEXRADs) or Weather Service Radars.

The National Weather Service (NWS) owns and operates the WSR-88D serving the New Orleans / Baton Rouge, LA, area. The radar identifier is KLIX and the radar is located at Slidell Airport in Slidell, St. Tammany Parish, LA. The KLIX WSR-88D is co-located with the NWS Weather Forecast Office and is part of the nationwide WSR-88D network. The NWS proposes to relocate the KLIX to Hammond North Shore Regional Airport (HDC) in Hammond, Tangipahoa Parish, LA and to operate the relocated KLIX WSR-88D at a minimum scan angle of +0.3 deg, which is lower than the current minimum scan angle of +0.5 deg above the horizon. The proposed relocation site is about 40 miles west-northwest of the radar's existing location.

The National Oceanic and Atmospheric Administration (NOAA), the parent agency of NWS, requires analysis of the potential environmental consequences of proposed actions to comply with the National Environmental Policy Act (NEPA). Procedures to be followed are set forth in NOAA Administrative Order (NAO) 216-6A (NOAA, 2016). Because NWS's proposed action of relocating the KLIX WSR-88D and reducing its minimum scan angle at a minimum scan below +0.5 deg have the potential to cause environmental effects, there is a need to analyze potential environmental consequences, determine their significance, and develop measures to mitigate adverse impacts if necessary.

1.2 SCOPE OF REPORT

This Draft Environmental Assessment (EA) analyzes the potential effects on persons and activities in the vicinity that could result from implementing the proposed action (i.e. relocating the KLIX WSR-88D to HDC and lowering the KLIX WSR-88D minimum scan angle to +0.3 deg). Potential environmental effects of relocating the KLIX WSR-88D to an alternative site at Lacombe, St. Tammany Parish LA, operating the KLIX WSR-88D at an alternate minimum scan

angle between +0.5 and 0.0 deg, and taking no-action (i.e. continued operation of the KLIX WSR-88D at the current site and minimum scan angle of +0.5 deg) are also considered for comparison purposes.

The scope of this EA is limited to analyzing potential effects from relocating and lowering the minimum scan angle of the KLIX WSR-88D. Because the types of environmental effects that may result and their significance depends on local conditions, including uses and topography of the local area, the analysis and conclusions in this EA are specific to the KLIX WSR-88D, and are not applicable to other WSR-88Ds or the WSR-88D network as a whole.

2 PURPOSE AND NEED

The NWS is the nation's premiere meteorological forecasting organization. The agency's official mission is as follows:

> "The National Weather Service (NWS) provides weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters and ocean areas, for the protection of life and property and the enhancement of the national economy. NWS data and products form a national information database and infrastructure which can be used by other governmental agencies, the private sector, the public, and the global community [NWS, 2009]".

The nationwide network of 159 WSR-88Ds plays a crucial role in meeting the NWS mission. Data from the WSR-88Ds is used by the NWS to improve the accuracy of forecasts, watches, and warnings. As an example, the WSR-88D generates precipitation estimates allowing prediction of river flooding in hydrological basins of the area. The NWS then disseminates advance flood warnings to local and state public safety, emergency managers, and the public, allowing them to take appropriate actions to minimize hazards to life and property. Because the meteorological phenomena of greatest interest occur with a few thousand feet (ft) of the ground surface, radar coverage of lower portions of the atmosphere is of great value to forecasters.

The KLIX WSR-88D is located adjacent to the NWS New Orleans/Baton Rouge Weather Forecast Office (WFO) and Lower Mississippi River Forecast Center (RFC), which are the primary recipient of the radar data. Engineers and technicians based at the WFO maintain the radar. NWS plans to relocate the WFO/RFC to a newly constructed site adjacent to the main campus of North Shore Technical Community College (NSTCC) in Lacombe, St. Tammany Parish, LA. At that location, the relocated WFO/RFC will share a newly constructed building with the St. Tammany Parish Emergency Operations Center (EOC). The Lacombe site is about 5 miles west-northwest of the current location of the WFO/RFC and WSR-88D. After the WFO/RFC is being moved from Slidell, NWS, the KLIX WSR-88D will be remote from its principal user. Therefore, NWS evaluated whether to retain the WSR-88D at its existing location at Slidell Airport or relocate the WSR-88D. Two relocations sites were considered: the Lacombe site (i.e. adjacent to the relocated WFO/RFC), or Hammond North Shore Regional Airport (HDC) in Hammond, Tangipahoa Parish, LA (about 40 miles west-northwest of the WSR-88D's existing location). Based on an analysis of property size and ownership, radar coverage, infrastructure, economic, and environmental factors, NWS determined that the Hammond Site would be the most beneficial location for the KLIX WSR-88D.

The elevation above the ground at which the WSR-88D can collect atmospheric data rises with distance from the radar due to earth curvature and the upward tilt of the radar beam, which is currently +0.5 deg or greater. In addition to relocating the KLIX WSR-88D, NWS proposes to lower the minimum scan angle at which the KLIX WSR-88D operates to +0.3 deg to expand the

geographic area with radar coverage. Improved radar coverage would be a substantial benefit to forecasters and other users of WSR-88D data. It would be advantageous to make this change in operation concurrent with relocation of the WSR-88D because the radar operating software would have to be modified to perform optimally at the new location and to allow lower scan angle operation. Doing both at the same time would be more efficient and less costly than modifying the software twice.

The National Oceanic and Atmospheric Administration (NOAA) is the parent agency of the NWS. NOAA requirements for complying with the National Environmental Policy Act (NEPA) are contained in NOAA Administrative Order (NAO) 216-6A, *Compliance with the National Environmental Policy Act, Executive Orders 12114, Environmental Effects Abroad of Major Federal Actions; 11988 and 13690, Floodplain Management; and 11990 Protection of Wetlands* (NOAA, 2016)], and the Companion Manual for NOAA Administrative Order 216-6A; Policies and Procedures for Compliance with the National Environmental Policy Act and Related Authorities (NOAA, 2017). NWS is subject to those requirements. Appendix E of the NOAA Companion Manual specifies the proper level of NEPA review for actions proposed by NOAA components and lists types of actions that are categorically excluded from the need to prepare a NEPA analysis document (e.g., an EA or environmental impact statement [EIS]). Two categorical exclusions could potentially apply to the relocation of the KLIX WSR:88D:

- F3: New construction, expansion or improvement of facilities where certain conditions are met, or
- F5: Installation, operation, maintenance, improvements, repair upgrade, removal, and/or replacement of instruments or instrument systems where certain conditions are met.

However, changes to WSR-88D radar coverage patterns are categorically excluded only if the change would not result in direct scanning of previously non-scanned terrain by the WSR-88D main beam. (NOAA, 2017). Lowering the minimum scan angle of the KLIX WSR-88D would result in scanning of previously non-scanned areas and does not qualify for categorical exclusion treatment. Therefore, preparation of a NEPA document is required. Because relocation of the KLIX WSR-88D and lowering its minimum scan angle are closely related actions which NWS would implement concurrently, NWS is addressing both in this EA.

3 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

3.1 PROPOSED ACTION

3.1.1 Relocation of KLIX WSR-88D

The NWS (Department of Commerce), Air Force (Department of Defense), and FAA (Department of Transportation) jointly operate a nationwide network of Doppler meteorological radars, known as NEXRAD or WSR-88D. The WSR-88D collects data on weather conditions and provides critical inputs to forecasters. The network is composed of 159 radars, most of which were installed in the late 1980s and 1990s. Each radar includes a roughly 28-ft diameter dish antenna mounted on a steel lattice tower of varying height (depending on local conditions), and shelters housing electronic equipment, a standby power generator and fuel tank, and a transitional power maintenance system. The dish antenna rotates 360 deg and is covered by a fiberglass radome to protect it from the elements.

Figure 1 is a photograph of the KLIXWSR-88D, which was commissioned in February 1995 and has been in continuous operations since being commissioned. Table 1 provides information on the KLIX WSR-88D, which serves the New Orleans / Baton Rouge, LA, area. The radar is operated and maintained by the NWS and the New Orleans / Baton Rouge, LA, WFO is the primary recipient of data from the KLIX WSR-88D and serves southeastern Louisiana and southern Mississippi. The KLIX WSR-88D is located at Slidell Airport about 30 miles northeast of downtown New Orleans, LA and about 78 miles east of downtown Baton Rouge, LA (see Figure 2). The radar antenna, radome, and steel-lattice tower are standard.

NWS proposes to relocate the KLIX WSR-88D from its current site to a new site at HDC, a general aviation airport located in Hammond, Tangipahoa Parish LA. HDC also hosts Louisiana Air National Guard operations. HDC is owned and operated by the City of Hammond. The proposed relocation site is about 40 miles northwest of downtown New Orleans, and 50 miles east-northeast of downtown Baton Rouge. The height of the relocated would be 30 m (same as existing tower height). The antenna pedestal, radome, and lightning rod would rise 45 feet above the steel-lattice tower, resulting in a total structure height of about 143 ft above ground level. In addition to the radar tower, an electronics equipment shelter, transitional power maintenance shelter, an 80-kiloWatt (kW) power generator, an aboveground fuel tank would be installed at the new site. The generator would provide electric power if primary power supply is interrupted. The radar tower and associated shelters and equipment would be enclosed in a roughly 102 ft x 68 ft area surrounded by chain-link fence (See Figure 3). Underground electric and telecommunications line would be installed to serve the site and a driveway would extend from a nearby public road to the site. The driveway and area within the fenced area would be surfaced with crushed rock. The WSR-88D is an automated unstaffed facility. Technicians from the New Orleans / Baton Rouge WFO would periodically access the site for maintenance and repair purposes. The proposed WSR-88D site is located at the eastern boundary of the airport and is

accessible via Industrial Park Road, a two-lane paved public road (see Figure 4). The site is currently a vacant field vegetated with mowed grass (see Figure 5).

Figure 1: Photograph of Existing KLIX WSR-88D

Table 1: Information on KLIX WSR-88D

Elevation, ground surface at tower base (mean sea level, MSL)	24 ft
Elevation, center of antenna (MSL)	138 ft
Tower Height (m)	30 m (98 ft)
Latitude (WGS84)	30°20’12” N
Longitude (WGS84)	89°49’32” W
Operating Frequency	2,993 megaHertz (MHz)
Spot Blanking or Sector Blanking used	No

Figure 2: Map of Existing Site and Proposed Relocation Site for KLIX WSR-88D

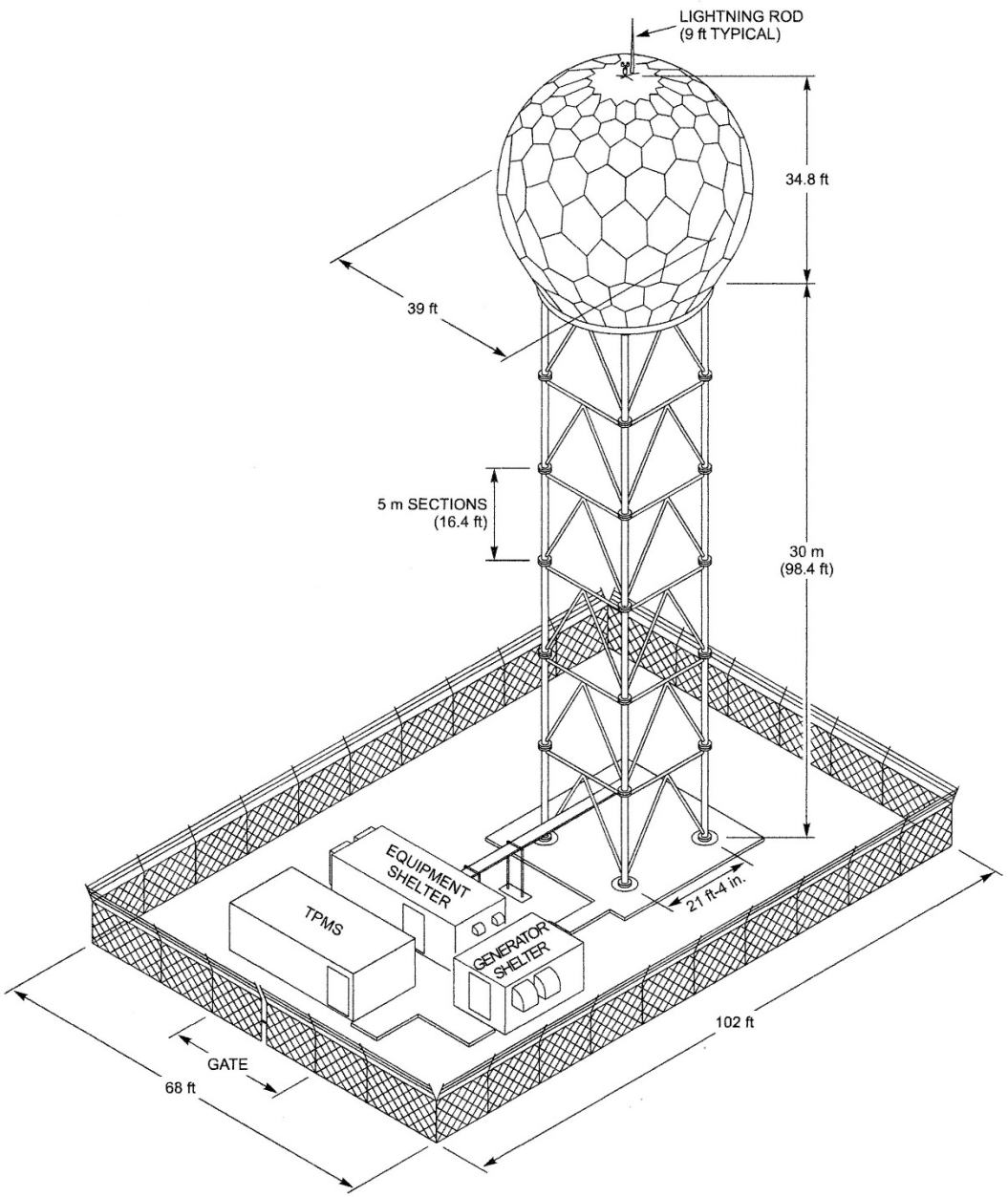

Figure 3: WSR-88D Site Layout

Figure 4: Proposed Relocation Site for KLIX WSR-88D at HDC

Figure 5: Photograph of Proposed KLIX WSR-88D Relocation Site

The relocated KLIX WSR-88D would have the same range as it currently does. The area covered at 2,000 feet, 5,000 ft, and 10,000 ft above site level (ASL) be about 10,800 square miles (sq. mi.), 28,000 sq. mi., and 56,600 sq. mi., respectively. The coverage area would be shifted westward. Figure 6 shows the westward shift in coverage area compared to existing radar coverage from Slidell. Radar coverage of the Baton Rouge area would be improved by lowering the minimum height above ground of radar coverage (i.e. coverage floor) as shown in Table 2. The minimum height of radar coverage over Baton Rouge would decrease by 2,500 ft while minimum coverage height over New Orleans would increase slightly by about 500 ft. The reduction in coverage height over the Baton Rouge area would aid NWS meteorologists by improving their ability to accurately detect and measure low atmosphere weather features and phenomena (e.g. tropical storms and tornadoes).

Table 2: Radar Coverage Floor at Minimum Scan Angle of +0.5 deg

Site	Coverage Floor Over Baton Rouge (ft AGL)	Coverage Floor Over New Orleans (ft AGL)
Slidell (Existing)	3,100	600
HDC (Hammond)	1,000	1,100

Figure 6: Existing and Proposed Coverage at Minimum Scan Angle of +0.5 deg

NWS will perform an electromagnetic compatibility and electromagnetic interference (EMC/EMI) study to determine if the existing operating frequency of 2,993 MHz should be retained if the KLIX WSR-88D if relocated. Depending on the results of the EMC/EMI study, a new operating frequency within the WSR-88D band of 2,700 to 3,000 MHz may be selected. Assigning a new operating frequency to the relocated WSR-88D would not change the findings of the above RF exposure analysis.

As part of the proposed action, NWS would dismantle and remove the existing WSR-88D from Slidell Airport. Electronic equipment and re-usable parts of the tower and radome would be relocated to the new site at HDC. The WSR-88D steel-lattice tower and radome would be salvaged as much as possible for re-use at the new site, but it is likely that pieces of the tower and radome would be worn beyond re-use or damaged during the dismantling process. Worn or damaged structural elements would be replaced. The existing tower and radome are over 20 years old and may be unsalvageable. In that case the tower and radome would be completely replaced. The electronics and TPMS shelters at the base of the tower would likely be removed for disposal. New shelters would be placed at the relocation sites. After removal of the WSR-88D tower, radome and shelters, the site would be cleared, including removal of concrete foundations and the property returned to the City of Slidell for re-use.

3.1.2 Proposed Change in Minimum Scan Angle

The WSR-88D is designed to detect and track weather phenomena within a roughly 230 mi distance of the radar. Like all active radars, the WSR-88D transmits a radio signal, which reflects off targets and returns to the radar. The radar measures the strength of the return signal, its direction of return, and the time between transmission and return, which allows determination of the target characteristics. The WSR-88D rotating antenna emits a narrow main beam with a width of 1 deg in the horizontal and vertical directions (i.e., beam edge is ½ deg from the center of the beam), as shown in Figure 7. The antenna rotates continuously around a vertical axis to cover the surrounding area. The main beam scan angle is the number of degrees above or below horizontal at the center of the main beam. The upward tilt of the antenna (and therefore the scan angle of the main beam) can be changed, allowing the radar to scan the sky at angles up to+ 60.0 deg and down to -1.0 deg; however, in current operation, the maximum scan angle used by the KLIX WSR-88D is +19.5 deg and the minimum scan angle is +0.5 deg.

The power density of the WSR-88D signal is greatest at the center of the beam and decreases towards the edge of the beam. At the edge of the main beam, the power density is one half of the center of beam power density. In current operation, the minimum scan angle of the main beam is +0.5 deg (i.e., 0.5 deg above horizontal at the center of the main beam) and the lower edge of the main beam (i.e. lower half-power point) is at 0.0 deg or horizontal.

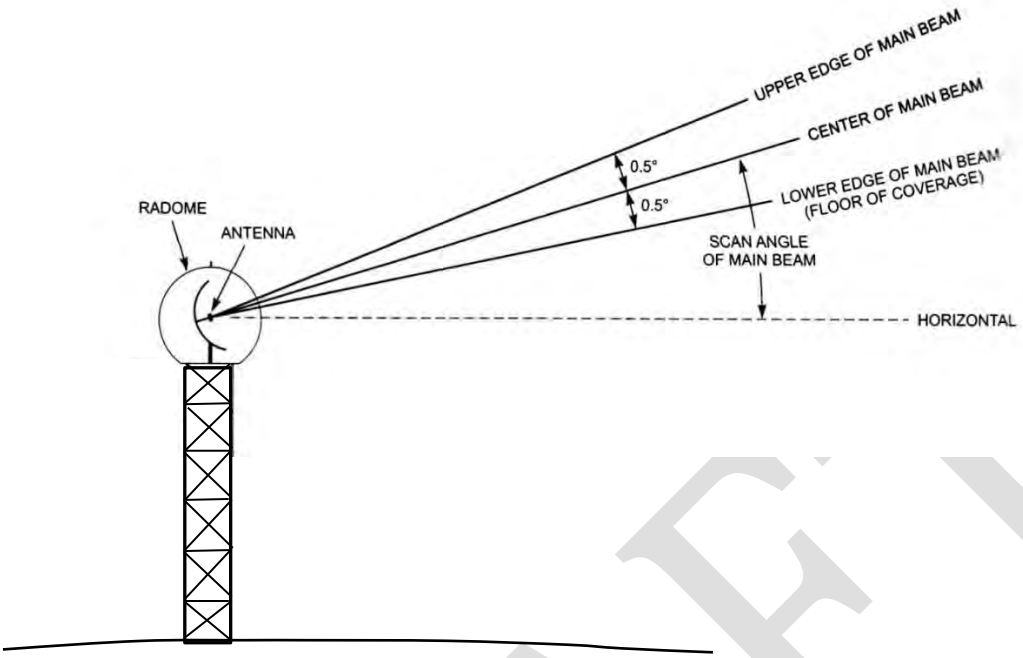

Figure 7: Schematic of WSR-88D Main Beam

(Not to scale, width of main beam exaggerated)

The WSR-88D scan angle can be adjusted in 0.1 deg increments. Lowering the minimum scan angle of the relocated KLIX WSR-88D to +0.4 deg would increase radar coverage in all directions. Lowering the minimum scan angle to +0.3 deg would result in additional increases in coverage area as shown in Table 3. Lowering the minimum scan angle below +0.3 degree would result in less than 1% increase in coverage area at 2,000 ft ASL and less than 2% increase at 5,000 or 10,000 ft ASL (see Attachment A for estimated coverage area for all angles between +0.5 deg and 0.0 deg). Therefore, NWS proposes to reduce the minimum center of beam scan angle of the KLIX WSR-88D to +0.3 deg, which is 0.2 deg lower than the current minimum scan angle.

Table 3: Radar Coverage Area at HDC Site - Minimum Scan Angle of +0.3 deg

Minimum Center of Beam Scan Angle (deg)	Area Covered (sq. mi.)		
	2,000 ft ASL (sq mi)	5,000 ft ASL (sq mi)	10,000 ft ASL (sq mi)
+0.5	10,801	27,974	56,611
+0.3	17,083 (+58.2%)	37,560 (34.3+%)	70,089 (23.8+%)

Lowering the minimum scan angle of the relocated KLIX WSR-88D to +0.3 deg would reduce the minimum height of radar coverage over Baton Rouge and New Orleans (see Table 4). The floor of radar coverage over Baton Rouge would decrease by about 600 ft to 400 ft AGL. The floor of radar coverage over New Orleans would decrease by about 900 ft to 200 ft AGL. Coverage height over both cities would improve compared to the existing operation of the Slidell WSR-88D. The reduction in coverage height over these urban areas area would aid NWS meteorologists by improving their ability to accurately detect and measure low atmosphere weather features and phenomena (e.g. tropical storms and tornadoes).

Table 4: Radar Coverage Floor at Minimum Scan Angle of +0.3 deg

Site / Minimum Scan Angle	Coverage Floor Over Baton Rouge (ft AGL)	Coverage Floor Over New Orleans (ft AGL)
Slidell / +0.5 deg	3,100	600
HDC / +0.5 deg	1,000	1,100
HDC / +0.3 deg	400	200

The WSR-88D transmitter and antenna are physically equipped to operate at minimum scan angles down to 0.0 deg. The only change required to lower the minimum scan angle to +0.3 deg would be modifications to the software that controls radar operations and processes data collected by the radar. The transmit power of the radar would also be unchanged. The increase in WSR-88D coverage areas would benefit weather forecasters and users of weather information, such as emergency response mangers, transportation officials., and aviators.

Lowering the WSR-88D minimum scan angle to +0.3 deg would not result in the main beam impinging on the ground within two miles. A minimum scan angle of +0.2 deg would result in the main beam impinging on elevated terrain about 1.75 miles north and 1.9 miles southeast of the radar site. Further lowering below +0.2 deg would result in the main beam impinging on terrain to the southwest, west and northwest of the radar (see Attachment A).

Figure 8 shows in map view the increase in radar coverage at 2,000 ft ASL if the minimum scan angle is reduced below +0.5 deg. Figures 9 and 10 show the change in radar coverage at 5,000 ft and 10,000 ft ASL, respectively, for minimum scan angles below +0.5 deg. Similar to the 2,000 ft ASL coverage, coverage increases down to +0.3 deg but increase in coverage area below +0.3 deg is negligible.

Figure 8: Radar Coverage at 2,000 ft ASL with Lower Scan Angle

Figure 9: Radar Coverage at 5,000 ft ASL with Lower Scan Angle

Figure 10: Radar Coverage at 10,000 ft ASL with Lower Scan Angle

4 ENVIRONMENTAL SETTING, CONSEQUENCES, AND MITIGATION

4.1 EXPOSURE OF PERSONS TO RADIOFREQUENCY RADIATION

Safety Standards

The electromagnetic environment at a specific location and time is composed of the all the electromagnetic fields from various sources (natural and manmade) that arrive there. The electromagnetic spectrum in an area is a continuously usable resource whose dimensions are amplitude, time, frequency, and space. In areas large enough to permit adequate spatial separation of users, the electromagnetic spectrum can simultaneously accommodate many users if they are sufficiently separated in frequency. The electromagnetic environment at any point can change nearly instantaneously and will vary spatially, even at locations in close proximity; therefore, it is convenient to measure and characterize electromagnetic phenomena using averages over time and space.

Manmade contributions to the electromagnetic environment are both intentional and unintentional. Radio and television broadcasts, cellular telephone transmissions, and radar signals are examples of intentional contributions. Electromagnetic noise generated by power lines, fluorescent lights, and motors of all sorts are examples of unintentional human contributions. The KLIX WSR-88D transmits a radio signal at a frequency of 2,993 MHz, which is within the radiofrequency (RF) or microwave portion of the electromagnetic spectrum. Although microwaves can add heat to objects, they do not contain enough energy to remove electrons from biological tissue, and are a form of non-ionizing radiation. In this regard, microwaves are fundamentally different from ionizing radiations (e.g., X-rays, ultraviolet rays) which occur at higher frequency portions of the electromagnetic spectrum. Ionizing radiation occurs only at frequencies greater than 10^9 MHz. RF or microwave fields are non-ionizing radiation. Due to the fundamental differences between ionizing and non-ionizing radiation, safety standards and guidelines vary greatly for the two types of electromagnetic radiation. In this section only standards for non-ionizing radiation are addressed because the KLIX WSR-88D RF emissions are non-ionizing.

The Institute of Electrical and Electronics Engineers (IEEE) developed safety guidelines for human exposure to RFR, and those standards have been adopted by the American National Standards Institute (ANSI) [ANSI/IEEE, 2006]. The ANSI/IEEE safety standard is designed to protect all persons (including infants, elderly persons, and pregnant women) from adverse health effects from exposure to radiofrequency (RF), even if exposure should last over an entire lifetime. These guidelines set safety levels for maximum permissible exposure (MPE) to RF signals, which include a 10- to 50-fold safety margin and are intended to protect all members of the population.

MPEs are specified in power density of the radio signal in milliwatts per square centimeter (mW/cm^2) and vary with operating frequency. Separate MPEs have been established for exposure of the general public and workers and for time-averaged exposure and peak exposure.

Occupational safety standards are higher than those for the general public because workers are trained in RF safety practices and have greater ability to use that knowledge to protect themselves from potentially harmful RF exposure. The KLIX WSR-88D operating frequency is and 2,993 MHz. The IEEE/ANSI safety standards for that frequency is 1.0 mW/cm^2 for the general public (averaged over 30 minutes) and 9.98 mW/cm^2 for workers (averaged over 6 minutes).

The Occupational Health and Safety Administration (OSHA) regulates occupational exposure to RF emissions. The OSH safety standard is similar to the ANSI/IEEE occupational safety standard: 10.0 mW/cm^2 (averaged over 6 minutes) (OSHA, 2015). Federal Communications Commission (FCC) standard for exposure of the general public to RF is the same as the ANSI/IEEE standard: 1.0 mW/cm^2 (averaged over 30 minutes). The FCC RF exposure standard for occupational exposure is somewhat lower that the ANSI/IEEE standard: 5.0 mW/cm^2 (averaged over 6 minutes).

The NEXRAD Joint System Program Office (JSPO) prepared environmental reports evaluating potential electromagnetic effects of the WSR-88D during planning and implementation of the WSR-88D network. In 1984, the JSPO issued the first environmental document which considered electromagnetic effects (among other effects). That report is titled: *Next Generation Weather Radar Programmatic Environmental Impact Statement (PEIS), Report R400-PE201* [NWS, 1984]. In 1993, JSPO issued a supplemental report updating the analysis contained in the 1984 PEIS to account for changes since 1984 in electromagnetic standards and guidelines and developments in radar design and operational modes. The supplemental report is titled *Final Supplemental Environmental Assessment (SEA) of the Effects of Electromagnetic Radiation from the WSR-88D Radar* [NEXRAD JSPO, 1993]. The 1993 SEA analyzed the potential electromagnetic effects of operating the WSR-88D at a minimum scan angle of +0.5 degree (deg) above horizontal, measured at the center of the WSR-88D main beam. The minimum scan angle of +0.5 deg represented the lowest scan angle used operation of the WSR-88Ds at that time.

The KLIX WSR-88D is currently mounted on a 30 m tall steel-lattice tower and the same height tower. Ground elevation is ft 24 ft MSL. The center of the antenna is at 138 ft MSL and the lower edge of the antenna is at 122 ft MSL, which is 98 ft above ground level (AGL). When operating at the current minimum scan angle of +0.5 deg, the lower edge of the beam is at 0.0 deg (i.e. horizontal). Table 5 compares the time-averaged power density of the KLIX WSR-88D operating at a minimum scan angle of +0.5 deg to RF safety standards at various distances from the radar. During normal operation with a rotating antenna, RF power densities would conform to ANSI/IEEE, OSHA, and FCC safety standards for public and occupational exposure at all locations.

Table 5: RF Power Density (minimum scan angle of +0.5 deg) Compared to ANSI/IEEE Safety Standards

Distance from Radar	Time-Averaged Power Density (mW/cm^2)*	ANSI/IEEE General Public RF Safety Standard		ANSI/IEEE Occupational RF Safety Standard	
		Safety Standard (mW/cm^2)	Factor Below Std	Safety Standard (mW/cm^2)	Factor Below Std
20 ft**	0.598	1.0	1.67	9.98	16.7
900 ft	0.0072	1.0	139	9.98	1,390
1 mile	0.00021	1.0	4,760	9.98	47,500
3 miles	0.000023	1.0	43,500	9.98	435,000

*within WSR-88D main beam, minimum scan angle of +0.5 deg
**surface of WSR-88D radome

Compared to the existing minimum scan angle of +0.5 deg, lowering the minimum scan angle to +0.3 deg would result in a slight increase in RF exposure levels at air space in the vicinity of the radar. Attachment B contains calculations of the existing time-averaged RF exposure levels in the vicinity of the KLIX WSR-88D, and the RF exposure that would result if NWS lowers the WSR-88D minimum scan angle to +0.3 deg. Table 6 summarizes the results from Attachment A. During normal operation of the WSR-88D with a rotating antenna, RF exposure levels at all locations would comply with safety standards for exposure of both workers (i.e. occupational exposure) and the general public.

Table 6: RF Power Density (minimum scan angle of +0.3 deg) Compared to ANSI/IEEE Safety Standards

Distance from Radar	Time-Averaged Power Density (mW/cm^2)	ANSI/IEEE General Public RF Safety Standard		ANSI/IEEE Occupational RF Safety Standard	
		Safety Standard (mW/cm^2)	Factor Below Std	Safety Standard (mW/cm^2)	Factor Below Std
20 ft*	0.603	1.0	1.66	9.98	16.6
900 ft	0.0100	1.0	100	9.98	998
1 mile	0.00029	1.0	3,450	9.98	34,400
5 miles	0.000032	1.0	31,300	9.98	312,00

*within WSR-88D main beam, minimum scan angle of +0.3deg
*surface of WSR-88D radome

During infrequent stationary antenna operation, RF exposure levels within the WSR-88D main beam could exceed ANSI/IEEE and FCC safety levels for exposure of the general within 1,740 ft of the WSR-88D antenna. FCC occupational safety levels could be exceeded within 780 ft and ANSI//IEEE occupational safety levels within 563 ft. The KLIX WSR-88D operating at +0.3 deg would not impinge on the ground surface or any structures within those distance and risks to human health would not result.

RF Electro-stimulation

The ANSI/IEEE safety guidelines also cover possible induction of currents within the bodies of persons and the potential for electro-stimulation of persons who make contact with conductive objects in the RFR field. The result is potentially harmful sensation of shock and/or burn. These effects only occur for RF fields at frequencies below 110 MHz (ANSI/IEEE, 2006). The KLIX WSR-88D would continue to operate in the 2,700 to 3,000 MHz band, outside the frequency range where induced currents or electro-simulation occur, and would not cause these effects.

Cumulative RF Exposure

As shown in Tables 5 and 6, the power density of RF transmissions decreases exponentially with distance from the antenna. At all locations in the vicinity, RF emitted by the WSR-88D during normal operation would be at substantially below the safety standard for RF exposure of the general public. It is improbable that radio emissions from an external source would add to the WSR-88D RF emissions during normal operation to cause cumulative RF exposure levels exceeding safety standards.

Mitigation for Exposure of Persons to Radiofrequency Radiation: None required.

4.2 RF EXPOSURE OF EQUIPMENT AND ACTIVITIES

There are no buildings within two miles of the HDC site that are tall enough to be within the WSR-88D main beam operating at a minimum scan angle of +0.5 deg or +0.3 deg. The Airport Traffic Control Tower (ATCT) at HDC is located about 4,500 ft west-northwest of the proposed WSR-88D site. The ATCT has a maximum height of 112.5 ft MSL and ground elevation is 40 ft MSL, therefore, the top of structure is at 72.5 ft AGL (Thompson, 2019). The lower half-power point of main beam of the WSR-88D (mounted a 30-m tower) operating at +0.3 deg minimum scan angle would be 84 ft AGL at the ATCT. The WSR-88D main beam would pass over the ATCT cab, and would not impinge on the ATCT.

A search of the FCC Antenna Structure Registration web site identified 4 antenna structures within 7,200 ft of the Hammond Site. Table 7 provides information on those structures. The structures include two cellular telephone towers and one communications tower in the vicinity of the airport and communications masts at HDC. The off-airport towers range from 6,000 to 7,200 ft from the proposed WSR-88D site and are tall enough to be within the WSR-88D main beam.

The on-airport communications masts are shorter and would not be within the WSR-88D main beam.

Table 7: Tall Structures in Vicinity of HDC Site

Description	FCC Registration #	Distance, Direction from Site	Structure Height (ft AGL)	Within WSR-88D Main Beam?	RF Hazard?
Cellular Telephone on N. Coburn Road	1252362	6,000 ft NE	130 ft	Yes	No*
Comm Masts at Airport	1231638	3,700 ft NW	33 ft	No	No**
Monopole comm tower	1231638	6,300 ft SW	157 ft	Yes	No*
Cellular Telephone on Highway 190	1211591	7,200 ft WSW	155 ft	Yes	No*
*Farther from HDC site than all safe setback distances ** Below lower edge of WSR-88D main beam					

4.2.1 Television, Radio, Cellular Telephone, and Personal Communications Devices (PCDs)

High-power radar, such as the WSR-88D, can interfere with operation of radio, television, cellular telephone, and PCDs in close vicinity to the radar antenna. However, these devices operate at different frequencies from the WSR-88D, reducing the potential for radio interference. NTIA regulations reserve the 2,700 to 3,000 MHz band for government radiolocation users (e.g., meteorological and aircraft surveillance radars) [NTIA, 2009]. The WSR-88D operates outside the frequencies used by television and radio broadcasts, cellular telephones, and personal communication devices. NWS has not received any reports of the KLIX WSR-88D interfering with operation of other radio uses (Schultz, 2019). Lowering the minimum scan angle to +0.3 deg would not result in the main beam impinging on the ground surface within 2 miles of the radar and the potential for radio interference would be low.

4.2.2 Electro-explosive Devices (EEDs)

Electro-explosive devices are used to detonate explosives, separate missiles from aircraft, and propel ejection seats from aircraft. Under extreme circumstances, electromagnetic radiation can cause unintended firing of EEDs. Calculations based on a U.S. Air Force (USAF) standard indicate that using electric blasting caps at distances beyond approximately 900 ft from the WSR-88D is a safe practice, even in the main beam of the radar, where the power density of the WSR-88D radio signal is greatest [USAF, 1982]. The U.S. Navy Hazards of Electromagnetic

Radiation to Ordnance (HERO) regulations classify ordnance as safe, susceptible, or unsafe and unreliable, based on compliance with MIL-STD 664 (series). HERO safe ordnance is considered safe in all RFR environments. HERO susceptible ordnance may be detonated by RF energy under certain circumstances. HERO unsafe or unreliable ordnance has not been evaluated for compliance with MILSTD 664 or is being assembled, dissembled, or subject to unauthorized conditions, which can increase its sensitivity to RF emissions. Safe separation distances vary for susceptible and unsafe or unreliable ordnance [Naval Sea Systems Command, 2008]. For HERO susceptible ordnance, the safe separation distance (D) in ft is calculated as follows:

$$D = (781)\ (f)^{-1}(\text{average power x antenna gain})^{½}$$

Where f is operating frequency in MHz and average power = maximum transmitted power × duty cycle. Inserting these values gives:

$$D = (781)\ (2{,}993)^{-1}\ (475{,}000\ \text{W} \times 0.0021 \times 35{,}500)^{½}\ \text{ft}$$

$$D = 1{,}552\ \text{ft}$$

For HERO unsafe or unreliable ordnance, the safe separation distance (D) in ft is calculated as follows:

$$D = (2{,}873)\ (f)^{-1}(\text{average power x antenna gain})^{½}$$

$$D = (2{,}873)\ (2{,}993)^{-1}\ (475{,}000\ \text{W} \times 0.0021 \times 35{,}500)^{½}\ \text{ft}$$

$$D = 5{,}712\ \text{ft}$$

HERO concerns are only applicable in locations illuminated by the main beam of the radar. When operating at a minimum scan angle of +0.3 deg, the KLIX WSR-88D main beam would not illuminate the ground or any structures within 5,712 ft of the HDC site. The WSR-88D would not be a hazard to EEDs use in the vicinity.

4.2.4 Fuel Handling

Electromagnetic fields can induce currents in conductive materials and those currents can generate sparks when contacts between conductive materials are made or broken. Sparks can ignite liquid fuels, such as gasoline. This phenomenon is rare, but can result in hazards to human health and property. This potential hazard arises during the transfer of fuel from container to another (e.g., fueling an automobile, boat, or airplane). The U.S. Navy developed a Technical Manual identifying the circumstances where this hazard may occur and providing direction on how to prevent it. The Technical Manual identifies a safe standoff distance based on radar operating characteristics [Naval Sea Systems Command, 2003]. Using formula contained in the Technical Manual, the distance from the WSR-88D at which RFR hazards to fuel may occur is 537 ft. This hazard only exists in areas directly illuminated by the main beam. The WSR-88D main beam operating at a minimum center of antenna scan angle of +0.3 deg would not illuminate the ground or any structure within 537 ft of the radar. The existing fuel tank for the

standby generator at the base of the WSR-88D tower would not be illuminated by the WSR-88D main beam and hazards to fuel handling activities would not result.

4.2.5 Active Implantable Medical Devices

ANSI and the Association for Advancement of Medical Instrumentation (AAMI) developed the PC69:2007 standard to prevent external electromagnetic sources from causing electromagnetic interference with active implantable medical devices, including cardiac pacemakers and implantable cardiac defibrillators [ANSI/AAMI, 2007]. This standard specifies that cardiac pacemakers and ICDs must be tested by exposing them to a specified magnetic field and that the device must operate without malfunction or harm to the device. The specified field strength varies with frequency. For the WSR-88D operating frequency of 2,993 MHz, the field strength is 3 A/m. This is converted to power density (S) in units of W/m^2 by assuming free air impedance of 377 ohms:

$$S = 377\ |3|^2\ \ W/m^2$$

$$S = 3{,}393\ W/m^2$$

To convert to mW/cm^2, we multiply the numerator by 1,000 mW/W and the divisor by 10,000 $cm^2/\ m^2$ which gives a value of 339.3 mW/cm^2. The peak pulse power of the WSR-88D is given by the following formula (see Attachment A):

$$U_1 = 1.44\ X\ 10^9/R^2\ mW/cm^2$$

Inserting R = 2,060 ft gives a value of 339.3 mW/cm^2, which is equal to the threshold established by PC69:2007 standard. At distances of 2,060 ft or greater, the main beam of the WSR-88D would not adversely affect implantable medical devices. There would also be no hazards to implantable medical devices at locations outside the main beam. Operating at the minimum potential center of beam scan angle of +0.3 deg, the main beam of the KLIX WSR-88D would not illuminate the ground or structures within 2,060 ft of the radar and no hazards would results to persons with implanted devices.

Theoretically, persons in aircraft flying within 2,060 ft of the radar could be exposed to RF levels above the device susceptibility threshold set by ANSI/AAMI, but the likelihood of significant harm is extremely low. For persons in aircraft, the airframe would attenuate the RF level and the duration of exposure would be far less than the averaging time (6 to 30 minutes) specified in the RF safety standards, reducing the amount of RF exposure. Additionally, device susceptibility threshold in the PC69:2007 standard is based on coupling of the RFR directly into the device leads (which is the test protocol); the WSR-88D signal would be incident upon the surface of the body and would decrease considerably in strength at the location of the device leads within the body. Third, even in the unlikely event that the WSR-88D RFR couples into the device at levels above the susceptibility threshold, the device would revert to safe mode of operation that would prevent significant harm to the wearer or damage to the device [ANSI/AAMI, 2007].

FCC regulations at 47 CFR Part 95.1221 require that MedRadio medical implant devices and medical body-worn transmitters be able to withstand exposure to RF at the MPEs specified in FCC regulations at 47 CFR 1.1310 (FCC, 2017). As described in Section 4.1 above, RF exposure levels in the vicinity of the KLIX WSR-88D would comply with the FCC safety standards. Exposure of persons wearing implantable medical devices to the KLIX WSR-88D radio emissions would not result in adverse effects.

4.2.6 Astronomical Observatories

The WSR-88D can cause harmful electromagnetic interference (EMI) with charge-couple devices (CCDs) which electronically record data collected by astronomical telescopes (NEXRAD JSPO 1993). The potential for harmful EMI would arise if the WSR-88D's main beam would directly impinge on an astronomical observatory during low angle scanning. The only astronomical observatory within 150 miles of the HDC site is the Highland Road Park Observatory operated by Louisiana State University, about 41 miles west of the HDC site. The lower edge of WSR-888D main beam operating at a minimum scan angle of +0.3 deg would have an elevation of 220 ft above mean sea level (msl) at the observatory. Ground elevation at the observatory is about 20 ft msl. Therefore, the lower edge of the main beam would be about 200 ft over the observatory and would not impinge on the observatory telescopes or equipment and EMI with observatory operations would not result.

Summary of RF Exposure Effects

Table 8 summarizes impacts to potentially RF-sensitive equipment and activities. The potential for the proposed action to cause radio interference with other radio users would be very low.

Table 8: RF Effects of KLIX WSR-88D on Equipment and Activities

Equipment / Activity	Applicable Standard	Setback Distance	Would Main Beam Impinge on Ground or Structures Within Setback Distance?	Potential for Significant Effects
Television, Radio, and Cellular Telephone, and Personal Communications Devices (PCDs)	NTIA Frequency Allocations	n/a	n/a	Very Low
EEDs	U.S. Navy HERO	5,712 ft	No	Very Low

Equipment / Activity	Applicable Standard	Setback Distance	Would Main Beam Impinge on Ground or Structures Within Setback Distance?	Potential for Significant Effects
Fuel Handling	U.S. Navy Hazards to Personnel, Fuel, and Other Flammable Material	537	No	Very Low
Active Implantable Medical Devices	AAMI PC69:2007, FCC 47 CFR Part 95.1221	2,060	No	Very Low
Astronomical Observatories	Exposure to WSR-88D Main Beam	n/a	n/a	None

Mitigation: None required.

4.3 LAND USE AND COASTAL ZONE MANAGEMENT

Setting and Consequences: Louisiana is a coastal state and The Office of Coastal Resources within the Department of Natural Resources manages the state's coastal resources management program. The proposed relocation site for the KLIX WSR-88D is not within the coastal management zone (State of Louisiana Department of Natural Resources, 2020). The proposed action would not affect the coastal zone.

The proposed WSR-88D relocation site is at HDC airport in the S-2 Airport zoning district (City of Hammond, 2020). Nearby uses are aviation, industrial, and recreational (Oak Knoll Country Club across Industrial Park Road from the site). The nearest residences are located 750 feet southeast of the site. The City of Hammond is in the process of updating the Airport Master Plan and the relocated WSR-88D would be compatible with existing and planned uses in the site vicinity (Lobue, 2019).

The nearest runway to the proposed WSR-88D site is Runway 13/31, located 1,600 ft southwest of the site. Runway 13/31 is currently a non-precision instrumented runway, but could potentially become a precision instrumented runway in the future. Assuming a 1,000 ft primary surface for a precision instrumented runway (worst-case analysis), the height of the 7:1 transitional surface at the Hammond Site is 157 ft AGL, which is above the maximum height of the relocated WSR-88D, 143 ft AGL. The relocated WSR-88D would comply with FAA height restrictions for objects at airports. NWS would file Form 7460-1, *Notice of Proposed Construction or Alteration*, with the Federal Aviation Administration (FAA) to comply with

Code of Federal Regulations (CFR) at Title 14, Part 77.9. Based on a review of the filing, FAA would determine the need for aviation warning lights on the tower in compliance with CFR Title 14, Part 139.311. NWS would install aviation warning lights in compliance with FAA Aviation Circular 150/5345/43J, *Specification for Obstruction Lighting Equipment* (FAA 2019). Typically, WSR-88Ds are equipped with a steady burning red light mounted at the apex of the radome., but a different aviation warning light meeting FAA requirements may be installed.

Dismantling the existing WSR-88D tower at Slidell Airport and constructing the new tower at HDC would require use of cranes that could potentially be a temporary obstruction to air traffic. To prevent hazards to air traffic, NWS would prepare and submit 7460-1 forms for temporary use of cranes at the two airports to FAA. NWS would mark and light the cranes as required by the FAA to increase their visibility to aviators.

The responsibilities of federal agencies in complying with local zoning ordinances are set forth in *Title 40 U.S. Code (USC), Public Buildings, Property, and Works*, Chapter 33, Section 3312, Compliance with Nationally Recognized Codes. That law requires federal agencies to consider local zoning and development requirements, provide local officials with plans to review for up to 30 days, and permit normal inspections by building officials during the construction period. The NWS would comply with these requirements.

Mitigation Install aviation warning lighting on the WSR-88D as required by FAA regulations at CFR Title 14, Part 139.311.

Mark and light cranes used to dismantle the existing WSR-88D tower and construct the new WSR-88D tower as required by the FAA.

4.4 GEOLOGY, SOILS, AND SEISMIC HAZARDS

Setting and Consequences: The geologic substrate at the HDC is Prairie formation, which consists of flat-lying sedimentary layers of Pleistocene age (2 million to 10,000 years old) (American Association of Petroleum Geologists, 1975). Soil at the HDC Site is Guyton silty loam, 0 to 1% slope, rarely flooded. Guyton soil is poorly drained and the depth to water table is less than 18 inches (Soil Survey Staff, Natural Resources Conservation Service, U.S. Department of Agriculture, 2019). The site is currently a mowed grass field. There are no signs of soil erosion at the site.

Construction of the proposed radar would require clearing of approximately one acre of land, including the radar site (0.16 acre) and construction staging area (up to 0.85 acre). The length of the access drive would depend on detailed site layout, but would be less than 100 ft in length within the staging area. Underground utility connections would also be within the construction staging area. This would expose soil to wind and water erosion, and could lead to soil entrainment and deposition in nearby drainages. The project would be classified as a small construction site (i.e. 1 to 5 acres in size).

To prevent erosion, NWS would develop a Storm Water Pollution Prevention Plan (SWPPP) in conformance with Environmental Protection Agency (EPA) National Pollutant Discharge Elimination Systems (NPDES) regulations (40 CFR Section 122.26 – Storm Water Discharges). EPA has delegated authority for administration of NPDES to Louisiana Department of Environmental Quality (LDEQ). Small Construction Stormwater Permit (LAR200000) covers discharge of stormwater from construction sites of 1 to 5 acres in size. LAR200000 does not require submittal of a permit application or notice of intent to LDEQ, but does requires preparation of a storm water pollution prevention plan (SWPPP). The SWPPP would describe best management practices (BMPs) to control stormwater runoff and prevent soil erosion and washing of material into drainages. The SWPPP would also include BMPs for safe handling and containment of materials and potential contaminants on site during construction.

After construction is complete, exposed soil would be covered with structures, concrete, or crushed rock, which would prevent soil erosion. The access road would be surfaced with crushed rock. The area outside the fenced facility would be allowed to revegetate with mowed grass, thereby stabilizing the soil. In the long term, soil erosion would be insignificant.

Removal of the WSR-88D from its existing site at Slidell would disturb less than one acre and reduce the amount of impervious surfaces at the site. This would promote infiltration of storm water and decrease the rate of storm runoff. To stabilize the site and prevent long-term erosion, the site should be hydroseeded to re-establish vegetative cover.

The risk of an earthquake is low. U.S. Geological Survey (USGS) estimates the potential for an earthquake strong enough to cause minor damage or greater at the HDC site at less than 1% per year (USGS, 2019).

Mitigation: NWS would prepare a SWPPP in conformance with LAR200000.

The existing Slidell site would be hydroseeded after removal of the WSR-D facilities.

4.5 DRAINAGE AND WATER QUALITY

Setting and Consequences: The HDC WSR-88D site drains into an existing drain inlet located in the field a short distance north of the site. That inlet discharges to a drainage canal on the east side of Industrial Park Road, which flows southward to Selser Canal and eventually Selsers Creek, which is a tributary of Lake Maurepas (USGS, 2018a, 2018d). The area within perimeter fence and the driveway would be almost completely covered by structures, concrete pads, or gravel, creating approximately 0.2 acre of new impervious surfaces. This small amount of impervious surfaces would have insignificant impact on runoff volumes and rates.

BMPs described in the SWPPP would be implemented to reduce the potential for soil erosion and retain soil and potential water pollutants on site. After construction, the new WSR-88D site would be stabilized and bare areas would be allowed to revegetate, preventing adverse effects on water quality of the drainage along Industrial Park Road, Selser Channel, Selsers Creek, or Lake Maurepas.

A SWPPP would also be prepared for dismantling and removal of the existing WSR-88D at the Slidell Site. The site would be cleared of wastes and returned to its pre-existing condition. Hydroseeding would promote re-establishment of vegetative cover.

The radar would be equipped with a standby generator and an above-ground storage tank (AST) for diesel fuel. The AST would have a capacity of less than 1,000 gallons and would have secondary containment and an overflow alarm to prevent release of fuel to the environment. The WSR-88D would be automated and unstaffed. The facility would not require water service and would not generate sewage. No adverse effects to water quality would result.

Mitigation: As noted in above, NWS would prepare and implement SWPPPs conforming to LAR200000 for the HDC and Slidell sites. Prior to and during construction and demolition activities, BMPs described in the SWPPP would be implemented to reduce the potential for soil erosion and retain soil and potential water pollutants on site. The plans would address grading and drainage patterns, installation and maintenance of control measures (for example, silt fences, hay bales, fiber rolls), proper storage of stockpiles of soil and materials, periodic inspections, and documentation of results.

4.6 TRANSPORTATION

Setting and Consequences: Construction of the radar would take approximately 6 to 12 months. During this period, local roads, primarily Industrial Park Road, would be used to access the site. Construction equipment, workers' vehicles, and supply trucks would travel to and from the site on a daily basis. The expected number of vehicle trips would not exceed 50 per day and would not result in significant congestion on public roads serving the sites. Closure of the road shoulder or traffic lanes on Industrial Park Road may be necessary during WSR-88D construction and installation of utility lines to serve the radar. Although Industrial Park Road has low traffic volumes, temporary traffic controls should be employed prevent hazards to motorists and construction workers, and to maintain traffic flow. NWS would consult with City of Hammond Streets Department about proper temporary traffic controls as needed.

The existing WSR-88D site at Slidell is accessible via Airport Road, a two-lane paved public road with low traffic volumes. The duration of dismantling and removal activities at the existing Slidell Site would be less than the duration of the construction activities at the HDC site. A small number of trips by worker vehicles and trucks would be generated and would not significantly affect traffic flow. Although Airport Road has low traffic volumes, temporary traffic controls should be employed prevent hazards to motorists and construction workers, and to maintain traffic flow. NWS would consult with City of Slidell Public Works Department about proper temporary traffic controls as needed.

During operation, the WSR-88D would be automated and unstaffed. Maintenance personnel and trucks delivering diesel fuel would infrequently access the facility. The average number of trips generated would be one or two per week. The radar facility would have adequate parking areas

surfaced with crushed rock inside the perimeter fence to accommodate maintenance vehicles and delivery trucks.

Mitigation: NWS would consult with City of Hammond Streets Department to identify and implement traffic controls necessary for safety of crews and motorists during WSR-88D construction and installation of utility lines to serve the proposed radar.

Similarly, NWS would consult with the City of Slidell Street Public Works Department to identify and implement traffic controls necessary for safety of crews and motorists during dismantling and removal of the WSR-88D from its existing site.

4.7 AIR QUALITY

Setting and Consequences: As required by the Clean Air Act (amended in 1990), the EPA issued National Ambient Air Quality Standards (NAAQS) for six criteria pollutants to protect public health, including the health of sensitive populations (that is, asthmatics, children, and the elderly). Those regulations are found at 40 CFR Part 50. The six criteria pollutants are carbon monoxide (CO), lead, nitrogen dioxide, ozone (O_3), particulate matter (PM), and sulfur dioxide. Ozone is a photochemical oxidant and the primary component of smog. Ozone is formed through a series of chemical reactions between O_3 precursors (reactive organic gases and nitrogen oxide [NO_x]) driven by sunlight. Motor vehicles are a major source of emission of O_3 precursors. PM is the result of vehicle emissions (diesel vehicles) and fugitive dust. Fugitive dust can be emitted when dirt/dust is kicked up from trucks or vehicles moving over unpaved surfaces. Major sources of PM include fugitive dust emissions from ground-disturbing activities such as construction. Both Tangipahoa and St. Tammany Parishes are in attainment of all NAAQS and neither parish is designated as a maintenance area (formerly non-attainment) for any NAAQS (EPA, 2020).

EPA regulations at 40 CFR Part 93, *Determining Conformity of Federal Actions to State or Federal Implementation Plans,* require preparation of a conformity determination for federal projects proposed in air quality non-attainment and maintenance areas, and for federal highway and mass transit projects [EPA, 2001]. Because neither the HDC site nor the existing Slidell site is located in a non-attainment or maintenance area and the proposed action would not be a federal highway or mass transit project, a conformity determination would not be required for relocation of the KLIX WSR-88D.

Construction of the WSR-88D will generate emissions of criteria pollutants. During construction activities, cars, trucks, and equipment would generate exhausts containing criteria pollutants, including NO_x (an ozone precursor), carbon monoxide, particulate matter with diameter less than 2.5 microns and 10 microns ($PM_{2.5}$, and PM_{10}, respectively). Emissions of lead and sulfur dioxide would be negligible. Earthmoving activities, dirt/debris pushing operations, grading, storage pile creation, truck dumping, and wind entrainment of dust from temporary dirt piles and exposed soil would also generate fugitive dust. Construction-period emissions s of PM_{10}, $PM_{2.5}$, CO, and NO_x from all sources (vehicle and equipment operations and fugitive dust) prepared for

construction of a WSR-88D in Washington State are shown in Table 9. The proposed WSR-88D would be almost identical to the WSR-88D constructed in Washington and construction period emissions would also be very similar. The emissions in the table are based on 170 weekdays (approximately 8 months) of daily travel for construction crew and that construction workers and delivery trucks and assumes wind erosion would occur over an eight-month period including non-work days equal to approximately 240 days (SRI International, 2010). Those assumptions are applicable to the proposed radar. For comparison purposes, air emissions generated during construction of WSR-88D can be compared with conformity determination thresholds established by the EPA for federal activities in non-attainment areas (40 CFR Part 93.153). The amount of air emissions generated during WSR-88D construction would be a small fraction of the EPA thresholds for projects in NAAQS non-attainment areas. Construction-period air emissions would not be significant. To further reduce these non-significant emissions, NWS would apply BMPs listed in the mitigation measure below.

Table 9: Emissions of Criteria Pollutants during Construction

Pollutant	Construction Emissions (tons/project) *	EPA Conformity Determination Thresholds in Non-attainment Areas (tons/yr.)**
$PM_{2.5}$	1.33	70 - 100
PM_{10}	5.82	70 - 100
CO	1.90	100
NO_x	0.12	10 - 100

*Tons/project is equivalent to tons/year since the construction period will be less than one year.

**Tangipahoa and St. Tammany Parishes are in attainment of NAAQS; table is presented for comparison purposes only.

Dismantling and removal of the existing WSR-88D at Slidell would take less time than construction of the relocated WSR-88D at HDC. The amount of air pollutants generated would be a fraction of the amounts shown in Table 8. Because the Slidell and HDC sites are separated by about 40 miles, the air emissions at each would not combine to generate unhealthy levels of pollutants.

During operations, the WSR-88D would not emit criteria pollutants, except emissions from operation of the standby generator and vehicles used by maintenance technicians or security personnel to visit the site. The proposed radar would be equipped with a standby generator with a capacity of approximately 100 kW. The new generator would be fueled by either natural gas or diesel. The standby generator would operate only during emergencies and for maintenance purposes. The NWS would follow the manufacturer's standard for maintenance. Given the relatively small size of the generator and its limited hours of operation, emissions of air pollutants would be minimal. During typical operations, one or two vehicle trips per week are

expected. The amount of emissions from vehicles during operation of the radar would be minor. No significant effects on air quality would result.

Mitigation: The NWS would implement the following measures during the construction period to minimize emissions of dust and other air pollutants:

- Stabilize unpaved roads at the construction site using water, chemical dust suppressants, and/or other stabilization techniques
- Pre-soak and/or periodically sprinkle water on areas to be cleared of vegetated and/or graded areas
- Periodically sweep streets surrounding the construction site, to minimize dust emissions
- Limit vehicle speeds on unpaved roads and areas to 15 miles per hour
- Promptly revegetate areas of exposed soil as soon as construction activities are completed
- Limit idling time of construction equipment to 10 minutes when not in use

4.8 FLOOD HAZARDS

Setting and Consequences: Executive Order (E.O.) 11988, *Floodplain Management*, requires the Federal Government to avoid adverse impacts to the 100-year or base floodplain (that is, the area subject to a 1 percent annual chance of flooding), unless there is no practicable alternative [President, 1977a]. The HDC Site is mapped in Zone X – an area of minimal flood hazard, and is not within the 100-year floodplain. Industrial Park Road between the site and State Highway 1064 is mapped in Zone A - a special flood hazard area, and is within the 100-year floodplain. However, the site is also accessible by interior roads at the airport which are not within the 100-year floodplain (LSU Agcenter, 2020). The proposed action would not be subject to flood hazards and would not increase flood hazards to nearby properties.

Mitigation: None required.

4.9 WETLANDS

Setting and Consequences: E.O. 11990, *Protection of Wetlands*, requires the Federal Government avoid funding or implementing projects which would adversely impact wetlands unless there is no practicable alternative [President, 1977b]. Based on National Wetland Inventory maps prepared by the U.S. Fish and Wildlife Service (USFWS), the WSR-88D site does not contain federal jurisdictional wetlands. The closest wetland to the site is a freshwater pond (classified as palustrine, unconsolidated bottom permanently flooded, PUBH) about 500 feet south of the site at Oak Knoll Golf Course (USFWS, 2020d). Construction of the WSR-88D would not impact that wetland pond. The drainage ditch east of Industrial Park Road is classified as riverine habitat (riverine intermittent streambed seasonally flooded, R4SBC). That ditch is about 100 ft from the site and would not be disturbed during WSR-88D construction. No impacts to wetlands or riverine habitat would result.

Mitigation: None required.

4.10 BIOLOGICAL RESOURCES / PROTECTED SPECIES

Setting and Consequences: The proposed site for relocation of the KLIX WSR-88D is a mowed grass field at HDC airport. There are no trees, shrub, or water bodies present at the site.

The USFWS administers the Endangered Species Act (ESA) and Migratory Bird Treaty Act. The KLIX WSR-88D is located within the area served by the USFWS Louisiana Ecological Services Field Office in Lafayette, LA. NWS consulted with USFWS which provided a list of threatened and endangered species that could potentially occur in the HDC site vicinity (see Table 10). The HDC site does not contain critical habitat for any of these listed species.

Table 10: Threatened and Endangered Species that may Occur in the Site Vicinity

Common Name	Scientific Name	Description	Federal Status
West Indian Manatee	*(Trichechus manatus)*	Mammal	Threatened
Red-cockaded woodpecker	(*Picoides borealis)*	Bird	Endangered
Gopher Tortoise	(*Gopherus Polyphemus)*	Reptile	Threatened

West Indian Manatees are marine mammals that inhabit water bodies, including Lake Pontchartrain and Lake Maurepas. The occasionally may enter coastal rivers and waterways. The HDC site does not contain open water and site development would not physically disturb water bodies or have adverse effects on water quality or drainages (USFWS, 2020c). The proposed action is not likely to adversely affect manatees.

The red-cockaded woodpecker is small non-migratory bird about 7 inches in length with a wingspan of about 15 inches. It inhabits open mature pine forest, especially long-leaf pine forest, in the mid-Atlantic and southeastern states (USFWS, 2020b). The HDC site has been previously cleared of vegetation and consists of a mowed grass field that does not contain suitable habitat for red-cockaded woodpecker. The proposed action would not affect red-cockaded woodpeckers.

Gopher tortoises inhabit open areas with well-drained sandy soils appropriate for burrow establishment in open longleaf pine-scrub oak communities that are periodically thinned or burned. They are known to inhabit disturbed areas along pipeline, powerline, and road right of ways (ROWs) and old fields and pastures. Gopher tortoises occur in Tangipahoa Parish (USFWS 2020a). Suitable soil types include Latoni, Bassfield, Cahaba, Ruston, Smithdale, Abita, Malbis, Angie and Prentiss (Rieck, 2014). The Hammond Site is located within a cleared field and does not contain open woodland; however, pine-oak woodland is present near the site. Soil at the Hammond Site is Guyton silty loam, 0 to 1% slope, rarely flooded. Guyton soil is poorly drained (Soil Survey Staff, 2019). Due to its poor drainage and fine texture, it is not listed among the soil types suitable for gopher tortoises. The proposed action would not affect gopher tortoises.

NWS completed a project review in conformance with USFWS evaluation protocol. That review determined that the proposed action would not adversely affect red-cockaded woodpeckers or

gopher tortoises or their habitat and is unlikely to adversely affect manatees or their habitat. Impacts to endangered and threatened species would not be significant (see USFWS Letter in Attachment C).

The Migratory Bird Treaty Act (MBTA) of 1918 prohibits the taking of migratory birds listed for protection. The MBTA protects species that are native and belong to families, groups, or species covered by conventions implemented by the MBTA. The MBTA does not contain habitat protection policies. A number of migratory bird species protected under the MBTA may occur in the vicinity of the HDC site (See Attachment C). Communications towers can adversely affect migratory birds due to collisions; construction, maintenance, and operation activities, and loss of fat reserves in adult birds circling towers. The USFWS developed recommended best practices for design and location of communications towers to reduce collision hazards to birds, including migratory birds (USFWS, 2018). The USFWS recommendations and their application to the proposed action are given in Table 11. The proposed action would conform to the USFWS recommendations with regard to tower placement, construction, tower design, lighting system, security lighting, removal of bird nests, tower access, and tower removal. The vegetation management recommendations are not applicable as the relocated WSR-88D would not include substantial landscaping.

Table 11: USFWS Voluntary Guidelines for Minimizing Bird Collisions Applied to Relocated KLIX WSR-88D

Summary of USFWS Guidelines for Bird Collision Hazard	Application to Relocated WSR-88D
Co-location: Collocate the proposed communication equipment on an existing communication tower or related existing structure (e.g. billboard mount, water tower, electric transmission tower, or building).	The relocated WSR-88D cannot be collocated on an existing communication tower due to electromagnetic compatibility concerns. The radar cannot be located on another kind of tower or building because the Doppler radar has a large rotating antenna that produces large dynamic loads, which most structures cannot tolerate.
Placement: Place new towers within existing "antenna farms" when possible. Select already degrade sites. Towers should not be sited in or near wetlands or other known bird concentration areas (e.g. federal or state wildlife refuges, rookeries, Important Bird areas). Towers and associated facilities should be designed, sited and constructed to avoid or minimize habitat loss.	The WSR-88D tower would be relocated to an existing airport which has a number of existing towers in the vicinity. The proposed site is surrounded by existing development and is not within a refuge, wetlands or near known bird concentration areas. The proposed site avoids ridgelines, coastlines, and wetlands. The radar tower would be up to 143 ft AGL and would not be guyed, complying with this recommendation. It is NWS policy to put FAA aviation warning lights on all network radars. The proposed radar would be equipped.

Summary of USFWS Guidelines for Bird Collision Hazard	Application to Relocated WSR-88D
Construction: Schedule all vegetation removal and maintenance activities (e.g. general landscaping) outside of the peak bird breeding season.	The WSR-88D site contains only mowed grass and lacks trees or shrubs. No substantial vegetation removal would occur during WSR-88D construction. The constructed WSS-88D site would not contain landscaping.
Tower Design, Tower Height and Guy Wires: It is recommended that new towers be less than 199 ft AGL and be free-standing unguyed towers.	The relocated tower would be 142 feet AGL, conforming to the recommended tower height of less than 199 feet AG, and would be a standing unguyed tower as recommended.
Tower Design, Lighting System: Lights are a primary source of bird aggregation and should be minimized. If allowed by the FAA, an aircraft detection lighting system (ADLS) which illuminates only when an aircraft is detected in the vicinity. The minimum amount of obstruction avoidance lighting allowed by FAA should be installed. If allowed by FAA only flashing white or red flashing lights should be used. Avoid using non-flashing warning lights at night.	Due to its on-airport location it is unlikely that FAA would approve an ADLS for the relocated WSR-88D. NWS would install the minimum amount of tower lighting required by FAA. If allowed by FAA the WSR-88D tower would be equipped with white or red flashing aviation warning lights.
Security Lighting: Lighting for ground facilities, equipment and infrastructure should be motion or heat sensitive, down shielded, and of minimum intensity to reduce bird attraction.	NWS would install shielded, motion-detection lighting to illuminate the facilities at the base of the WSR-88D tower.
Vegetation Management: Schedule all vegetation removal and maintenance activities outside the peak breeding season.	Not applicable as the WSR-88D facility would not include landscaping.
Bird Nesting on Towers: If birds are nesting on towers that require maintenance, contact the state natural resources agency and the USFWS for permits, recommendations, and requirements. Minimize excess wires and securely attached wires to the tower structure to avoid bird entanglement. Consider installing bird exclusion devices on towers where birds frequently nest.	NWS would follow these recommendations and contact USFWS before removing active bird nests on the WSR-88D tower.
Tower Access: Representatives from USFWS or researchers should be allowed access to the site to evaluate bird use, conduct dead bird searches, and conduct other research as necessary.	NWS would allow USFWS staff and researchers to access the relocated WSR-88D site as practical.
Tower Removal: Towers no longer in use should be removed within 12 months of cessation of use, preferably sooner.	NWS would remove the existing WSR-88D tower at Slidell Airport promptly after decommissioning.

The proposed action would not result in significant impacts to protected species, critical habitat, or migratory birds.

Mitigation: NWS would install the minimum amount of tower lighting required by FAA. If allowed by FAA the WSR-88D tower would be equipped with white or red flashing aviation warning lights.

NWS would install shielded, motion-detection lighting to illuminate the equipment shelters at the base of the WSR-88D tower.

If migratory birds nest on the WSR-88D tower, NWS would contact the and the USFWS for permits, recommendations, and requirements. NWS would minimize excessive wires excess wires and securely attached wires to the tower structure to avoid bird entanglement.

NWS would allow USFWS staff or researchers to access the radar site to evaluate bird use, conduct dead bird searches, and conduct other research as necessary.

4.11 CULTURAL AND HISTORIC RESOURCES

Setting and Consequences: Section 106 of the National Historic Preservation Act of 1966 (as amended) requires that federal agencies consider the effects of their actions on historic places and, if effects may result, provide the State Historic Preservation Officer (SHPO) with an opportunity to comment on their actions. Section 106 regulations are set forth in 36 CFR Part 800, *Protection of Historic Properties* (Advisory Council on Historic Preservation, 2010).

The proposed action would disturb about 1 acre to construct the WSR-88D facility and extend drive and utilities to the site. The site is a mowed gras field that was previously disturbed during airport development and the potential for archaeological or paleontological resources to be present is very low.

Section 106 of the National Historic Preservation Act (NHPA) of 1966 (as amended) requires federal agencies to consider the effects of their actions on historic places and to seek comments from the State Historic Preservation Officer (SHPO). Additional NOAA compliance procedures for considering impacts to places of cultural, historical, and scientific importance are laid out in NAO 216-6. Section 106 requirements are set forth in 36 CFR Part 800, *Protection of Historic and Cultural Properties*. Under Section 106 Regulations 36 CFR Section 800.16 4(a) & (b), the NWS is required to consult with SHPO, identify the area of potential effects (APE), and determine whether historic properties listed or eligible for listing on the National Register of Historic Places (NRHP) are within the APE. The APE is defined by 36 CFR Section 800.16(d) as “the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist.

The proposed action could result in visual and RF effects on the surrounding area. Visual effects are based on the height and bulk of the tower and the amount of external lighting given the visual

setting. The visuals setting of the HDC site is an active airport with an ATCT and several communication towers. The WSR-88D would be taller than other nearby towers to avoid blockage of the WSR-88D main beam and the white radome at the top of the tower would increase its visibility. The tower would also be equipped with an aviation warning light at the top of the structure and shielded ground level lighting, adding to its visibility. The local area has minimal topographic relief and is developed with airport, industrial uses, recreational, and residential use. Recreational and residential area to the east and southeast of the site are densely forested. Structures and forest, combined with the lack of topographic relief, limit long-range views from most area. Given the setting, visual impacts could occur within 10x the tower height of about 1,400 ft. Beyond 1,400 ft from the WSR-88D tower, structures and/or forest would mostly obstruct views of the WSR-88D. In the limited areas where long-range views (i.e. from distance greater than 1,400 ft) may occur, the tower would appear as a minor visual element conforming to the airport setting, an insignificant impact. Thus, the area of potential visual impacts to historic or cultural resources is within 1,400 of the proposed WSR-88D site. The area of potential RF effects is defined as area within 1,740 ft of the WSR-88D where RF safety levels could be exceeded during very infrequent stationary antenna operation (see section 4.1). Because the area of potential RF effects is larger than the area of potential visual effects, the overall APE is the same as the area of potential RF effects -- within 1,740 ft of the proposed WSR-88D site.

The Louisiana Office of Cultural Development Department interactive map of historic resource was searched for individual properties listed on the National Register of Historic Places (NRHP), historic districts listed on the NRHP, and NRHP-eligible historic districts. The closest historic place to the Hammond Site is Hammond High School, located 3 miles to the west in the City of Hammond and outside the APE (Louisiana Office of Cultural Development, Division of Historic Preservation, 2019. At that distance the WSR-88D would rise only about 0.5 deg above the horizon and views of the WSR-88D would be blocked by intervening structures and trees. The WSR-88D would not be visible from historic Hammond High School or the Hammond Historic District. No historic places listed or eligible for NRHP are located within the APE and none would be affected by the proposed action.

Under Section 106 Regulations 36 CFR Section 800.2 (a)(1), *Protection of Historic Properties*, if the proposed action doesn't have the potential to affect historic properties, NWS "has no further obligations under section 106" and consultation with Louisiana SHPO regarding possible impacts on historic properties is not required [Advisory Council on Historic Preservation, 2010].

Mitigation: None required.

4.12 NOISE

Setting and Consequences: During the construction period for the WSR-88D, noise would be generated by use of vehicles and equipment and other construction activities. Based on the type of equipment likely to be used during construction of the WSR-88D, the peak level of noise at 50 ft from the source of noise would be about 91 A-weighted decibels (acoustic) (dBA) (Bolt, Beranek

and Newman, 1971). Construction activities would occur primarily during normal working hours and would dissipate with distance from the source.

The proposed site is at an airport. The nearest residences are about 750 ft to the southeast. Noise dissipates by about 3 decibels with each doubling of distance. At a distance of 750 ft, construction noise levels would dissipate to 79 dBA or less. Construction noise would occur intermittently and sporadically during the construction period and would be a temporary insignificant impact.

Dismantling and removal of the existing WSR-88D from the Slidell Site would result in similar noise levels as construction of the WSR-88D at HDC, but the duration would be shorter, about 1 to 2 months. The nearest residence is 250 ft southwest of the existing site. At that distance the loudest noise levels would be about 85 dBA. No explosives would be used during demolition. Demolition noise would be intermittent during the construction period and the loudest nose events would only occur during a small portion of the construction period. Due to its short duration and intermittent nature, demolition noise would not be a significant impact

During operation of the relocated WSR-88D, noise would be generated by the infrequent visits of maintenance and repair vehicles, operation of the moving assemblies of the radar, and occasional use of the back-up power generator (approximately once per month). Those noises would not significantly affect the nearest residence, located approximately 750 ft to the southeast. No significant noise impacts would result.

Mitigation: Demolition activities at the existing WSR-88D site and construction at the HDC site would occur during normal working hours to the maximum extent possible.

4.13 ENVIRONMENTAL JUSTICE AND SOCIOECONOMIC IMPACTS

Setting and Consequences: E.O. 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires federal agencies to identify and address, as appropriate, disproportionately high and adverse environmental or human health effects on minority populations and low-income populations (President, 1994).

Industrial Park Road is the boundary between the City of Hammond and unincorporated Tangipahoa parish. Because the proposed WSr-88D site is at the city boundary and distant from the developed urban areas of Hammond, demographic data for Tangipahoa Parish is representative of the site vicinity. Table 12 presents demographic data for Tangipahoa Parish and Louisiana as a whole. Tangipahoa Parish had a population of 134,758 as of July 21, 2019, which represents a 11.3% increase over the 2010 population. The county's population is growing faster than Louisiana as whole. The parish has a somewhat higher percentage of white population and somewhat lower percentage of minorities than the state. The percentage of owner-occupied residences is greater in the parish than in the state by about 3%. Per capita income in Tangipahoa parish is about 10% less than for the state as a whole; however, the percentage of population in poverty is slightly less than in the state. Except for faster population growth than in the state, parish demographics are not substantially different from those of the whole state.

Table 12: Demographics of Tangipahoa Parish

Attribute	Tangipahoa Parish	Louisiana
Population (2019)	134,758	4,648,794
Change since 2010	11.3%	2.5%
White	66.8%	62.8%
Black	30.4%	32.8%
Hispanic or Latino	4.4%	5.3%
Asian	0.7%	1.8%
American Indian / Alaskan Native	0.4%	0.8%
Native Hawaiian / Pacific Islander	0.1%	0.1%
% of Housing Owner Occupied	68.3%	65.4
Per capita income	$24,004	$27,027
% population in poverty	17.9%	18.6%

The Hammond Site is at HDC airport and is zoned for airport use. Nearby uses are aviation, industrial, and recreational (Oak Knoll Country Club across Industrial Park Road from the site). The relocated WSR-88D would be compatible with existing and planned uses at and near the site (Lobue, 2019).

Construction and operation of the WSR-88D would not generate noxious emissions or pollutant streams. Temporary noise, traffic, and air emission impacts would occur during the construction period. After construction is complete, the primary environmental effect would be the visual presence of the radar tower. Disproportionately high and adverse environmental or human health effects would not result to minority or low-income populations in the vicinity.

The expected cost of relocating the WSR-88D is about $2 million. However, much of that expenditure would be for purchase of equipment and engineering design studies, which would occur outside Tangipahoa Parish. The local construction expenditures would provide a modest boost to the local economy. Assuming 50% of relocation expenditures occur in Tangipahoa Parish ad a multiplier of three for local construction expenditures, the economic benefit to the economy of Tangipahoa County would be $3 million, which would represent 0.1% of the annual parish GDP of about $3.2 billion. While this economic impact would be beneficial, it would not be significant when compared with the overall economy of the parish. Indirectly, the WSR-88D would provide improved weather forecasts and data that would benefit many local industries.

Mitigation: None required.

4.13 FARMLANDS

Setting and Consequences: The Farmland Protection Policy Act sets forth federal policies to prevent the unnecessary conversion of agricultural land to non-agricultural use. NRCS regulations at 7 CFR Part 658, *Farmland Protection Policy Act*, are designed to implement those policies. Completion of Form AD-1006 and submission to the U.S. Department of Agriculture (DoA) is required if a federal agency proposes to convert land designated as prime farmland, farmland of statewide importance, or unique farmland to non-agricultural use. Soil at the KLIX WSR-88D site Guyton silty loam, 0 to 1% slope, which can support prime farmland. However, the KLIX WSR-88D is located at an active airport and the site and vicinity are committed to non-agricultural uses. The proposed action would not convert farmland to non-farm use. No impacts to farmland would result.

Mitigation: None required.

4.14 ENERGY CONSUMPTION

Setting and Consequences: The WSR-88D would have 200-amp 208Y/120 primary electric service. Average monthly electric consumption by a similar radar (Airport Surveillance Radar, Model 11 serving Stockton Municipal Airport) is 18,800 kW-hours per month. It is expected that the WSR-88D would consume similar amounts of electricity. The radar would be equipped with a transitional power maintenance unit and a standby diesel generator to provide service if primary power is lost. The generator would be equipped with an AST with capacity to store approximately 1,000 gallons of fuel. The standby generator would operate only during periodic testing and maintenance (approximately once per month) and during failure of primary power. It is expected that the generator would operate less than 200 hours per year. Diesel fuel consumption by a 100-kW generator operating at full load would be approximately 6.8 gallons per hour [Pramac, n.d.]. Thus, fuel use by the standby generator would be no more than 1,360 gallons per year. Energy consumption would not be significant.

Mitigation: None required.

4.15 VISUAL QUALITY/ LIGHT EMISSIONS

Setting and Consequences:

The visual setting of the HDC site is an active airport with an ATCT and several communication towers. Nearby uses to the north, west, and south of the site are commercial aviation-related business and facilities supporting airport operations. To the east of the site across Industrial Park Road is a golf course. The nearest residences are south of the golf course, about 750 feet southeast of the WSR-88D site.

The WSR-88D tower would consist of a spherical white fiberglass radome mounted on a free-standing (that is, lacking guy wires) steel-lattice tower (see Figure 1). Two one-story shelters containing electronic equipment and a standby diesel generator would be located at the base of the tower. The tower and shelters would be contained within a 102 ft × 68 ft area surrounded by

a 7 ft tall chain-link fence (see Figure 3). A red or white aviation warning light would be installed at the top of the radome. Exterior lights would be installed at ground level at the facility for security purposes. WSR-88D tower and radome would be a prominent new visual element. The WSR-88D would be taller than other nearby towers to avoid blockage of the WSR-88D main beam and the white radome at the top of the tower would increase its visibility. The radar tower would be a typical structure in this airport setting and would not significantly alter the visual character of the area.

The local area has minimal topographic relief and is developed with airport, industrial uses, recreational, and residential use. Recreational and residential area to the east and southeast of the site are forested. Structures and forest, combined with the lack of topographic relief, limit long-range views from most area. Structures and/or forest would mostly obstruct views of the new WSR-88D from most nearby areas, The WSR-88D would be most visible when viewed across the infield and runways at HDC. In those views, it would not be a discordant element in this airport setting and would not adversely affect the visual quality of the area. There may be limited areas outside the airport, such as along Industrial Park Road or State Highway 3158 (U.S. Highway 190) at the southern boundary of the airport, where the WSR-88D would be visible in long-range views. In those views, the tower would appear as a minor visual element conforming to the airport setting.

Trees along Industrial Park Road and at the gold course provide a visual screen between the site and residences. Exterior lighting at the WSR-88D would not affect residences or other light-sensitive uses. No scenic highways or byways are located in proximity to the site and the proposed action would not affect a scenic viewshed. Visual impacts would not be significant.

Mitigation: None required.

4.16 SOLID AND HAZARDOUS WASTE

Setting and Consequences: The proposed WSR-88D site is not listed on any environmental databases. A facility engaged in manufacture of aircraft engine and engine parts, located 500 south of the site is a Resource Recovery and Conservation Act (RCRA) small quantity generator of hazardous/non-hazardous waste. No violations have been reported for that facility. Additionally, a Confirmed and Potential Sites Inventory (CPI) listing is located at the Air National Guard Combat Communications Squadron facility located about 4,700 ft west of the Hammond Site. CPI sites are areas of potential or confirmed contamination identified by the State of Louisiana. Neither of the facilities in those two listings is likely to have contaminated the proposed WSR-88D site.

Construction of the proposed radar, upgrade of the access drive, and installation of underground utility lines would generate solid wastes typical of a construction site, including building scraps, lumber, metal parts, cables, waste paper, empty containers and packaging, and vegetative materials. These wastes would be removed from the construction site for recycling or disposal at a licensed facility.

During operation, the radar would generate small quantities of solid waste, which would be periodically removed from the site for disposal. The radar would be equipped with a standby generator to provide electric power in case of loss of primary electric service. The generator would include a roughly 1,000-gallon tank for diesel fuel. The tank would be located above ground in a masonry building with secondary containment to prevent release of fuel to the environment. The fuel storage tank would also be equipped with an overflow alarm. No significant impacts would result.

Mitigation: None required.

4.17 WILD AND SCENIC RIVERS

Setting and Consequences: The Wild and Scenic Rivers Act of 1968 protects free-flowing rivers of the U.S. These rivers are protected under the Act by prohibiting water resource projects from adversely impacting values of the river: protecting outstanding scenic, geologic, fish and wildlife, historic, cultural, or recreational values; maintaining water quality; and implementing river management plans for these specific rivers.

No designated wild and scenic river occur at or near HDC. The closest designated wild a scenic river is Black Creek Wild and Scenic River in Southern Mississippi, about 86 miles northeast of the proposed WSR-88D site at HDC and about 60 miles north-northeast of the existing Slidell site (National Park Service, 2020). The proposed action would not affect Black Creek or any other wild and scenic river.

Mitigation: None required.

5 ALTERNATIVES TO THE PROPOSED ACTION

5.1 RELOCATING THE KLIX WSR-88D TO LACOMBE, LA

NWS conducted site surveys for both the preferred site at HDC and an alternative site at Lacombe, St. Tammany Parish, Louisiana (see Attachment D). The site surveys report evaluated the benefits and potential impacts of relocating the KLIX WSR-88D to each of the alternative sites, as well as retaining the WSR-88D at the existing Slidell, LA site. The Lacombe site is about 5 miles west of the existing WSR-88D location at Slidell. Figure 11 is a photograph of Lacombe alternative site, which is currently a cleared field. The Lacombe site is accessible via existing paved roads. Highway 434 provides access from the site to Interstate 12.

Figure 11: Photograph of Lacombe Alternative Site

The Lacombe site is the future home of the St. Tammany Parish EOC and adjacent to the main campus of North Shore Technical Community College. The new EOC is under construction and NWS plans to construct a new WFO/RFC building adjacent to the EOC. When the newly constructed WFO building is available for occupancy, NWS plans to shift WFO/RFC operations

from Slidell Airport to the new WFO/RFC facility. Sufficient land is available to relocate the KLIX WSR-88D to the Lacombe site. The Lacombe site is owned by St. Tammany Parish.

The Lacombe site is about 5 miles from the existing WSR-88D location and radar coverage from this site would be very similar to existing WSR-88D coverage. Radar coverage over Baton Rouge would slightly improve, but the substantial improvements in Baton Rouge coverage resulting from the proposed action would not be realized. It would be feasible to lower the minimum scan angle of the KLIX WSR-88D if relocated to the Lacombe site. This would improve coverage at low altitudes, as would be true for the proposed action.

The only tall structure within the RF safety setback distances of the Lacombe Site is a water tower located 1/2-mile northeast of the site. That tower is sufficiently distant that it would not substantially block the WSR-88D beam and would be outside all safety setback distances, except for unsafe and unreliable EEDs. It is improbable that that those types of EEDs would be in use at the upper portion of the water tower and no RF hazards would result from relocating the KLIX WSR-88D to the Lacombe Site and operating at a minimum scan angle of +0.3 deg.

Relocation of the KLIX WSR-88D to the Lacombe site would result in similar construction impacts as the proposed action. About one acre of previously cleared ground would be disturbed to install the relocated WSR-88D. No trees or shrubs would be removed. The Lacombe site does not contain suitable habitat for threatened or endangered species and no impacts to those species would result. The Lacombe site itself is not listed on any environmental databases for disposal of hazardous waste. The Lacombe Site and is mapped in Zone X – an area of minimal flood hazard, and is not within the 100-year floodplain. Based on a review of National Wetland Inventory maps prepared by the U.S. Fish and Wildlife Service (USFWS), the Lacombe site does not contain federal jurisdictional wetlands (USFWS, 2020d). The nearest wetland is a freshwater forested/shrub wetland about 700 ft to the east.

The Lacombe site is not listed on the National Register of Historic Places and is not located within an historic district. The closest historic place is the Lacombe School, located 4.5 miles to the south in the City of Lacombe. No adverse effects to historic resources would result.

Similar to the proposed action relocation of the KLIX WSR-88D to the alternative a Lacombe would not result in significant adverse effects. The Lacombe site would be adjacent to the new WFO once constructed. This would reduce the amount of travel required by NWS staff based at the WFO to maintain the WSR-88D. In contrast, NWS staff would have to travel about 40 miles to maintain the KLIX WSR-88D if relocated to the Hammond site. However, the WSR-88D is automated and the number of trips is typically 1 to 2 per week. The amount of traffic generated and the fuel consumed would be negligible. Similar to the proposed action, relocation of the KLIX WSR-88D to Lacombe site and lowering its minimum scan angle would not result in significant environmental effects.

5.2 NO ACTION

The no action alternative consists of continued operation of the KLIX WSR-88D at its existing location at Slidell Airport with the current minimum scan angle of +0.5 deg. The improvements in radar coverage summarized in Section 3 would not be achieved and the project objectives would not be met.

The proposed action would result in increased RF exposure compared to existing WSR-88D operations as described in section 4.1; the no-action alternative would not change RF exposure levels from existing. Under both the proposed action and the no action alternative, RF exposure during normal WSR-88D operations would conform to safety standards established by ANSI/IEEE, OSHA, and FCC. The no-action alternative would avoid the minor amount of soil disturbance and vegetation clearing and the visual impacts at the HDC site that would result from the proposed action. Temporary construction-period generation of traffic, air pollutants and noise would also be avoided.

If the KLIX WSR-88D is retained at the existing Slidell site, technicians from the WFO would continue to maintain the site. After the WFO is moved to Lacombe, the technicians would travel about five miles from the WFO to the WSR-88D. Those trips would typically occur about one to twice per week and would consume negligible amounts of fuel and generate minimal air pollutants.

Like the proposed action, the no-action alternative would not result in significant environmental effects.

6 FINDINGS

The proposed action consists of two parts:

- Relocating the KLIX WSR-88D from its existing location at Slidell Airport in Slidell, LA to HDC Airport in Hammond, LA, and
- Lowering the minimum scan angle of the KLIX WSR-88D from the current minimum of +0.5 deg to +0.3 deg.

Implementing the proposed action would not result in significant changes in the quality of the human environment would also not add to the environmental effects of past, present, and reasonably foreseeable future actions to cause cumulatively significant effects.

The proposed action would improve the quality of meteorological radar data available to NWS forecasters and others users of the data. This may indirectly benefit the residents and businesses of the New Orleans / Baton Rouge LA, WFO service area (i.e. southeastern Louisiana, and southern Mississippi) by improving the accuracy of forecast and severe weather alerts, which could result in environmental benefits if weather dependent economic activities (e.g., agriculture, construction, outdoor recreation, transportation, water management) become more efficient or safer as a result of improved weather services. The resulting environmental benefits are difficult to quantify, but are unlikely to be significant.

Implementation of the proposed action would not have the potential to cause significant changes in the environmental. A Finding of No Significant Impact is warranted for the proposed action.

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This Draft EA was prepared by Sensor Environmental LLC under contract to Centuria Corporation. Centuria Corporation provides support to the NWS Radar Operations Center (ROC) in Norman, OK. Mr. James Manitakos, CEO, served as Sensor's Project Manager. Alion Science and Technology Corporation prepared radar coverage maps and calculated coverage areas under subcontract to Sensor. Mr. Andre Tarpinian, Radio Frequency Engineer, served as Alion's Project Manager. Ms. Jessica Schultz, ROC Deputy Director, and Mr. Edward Ciardi, Program Manager, EVP Weather Systems, from the ROC assisted in preparation of this EA. Mr. Ben Schott, Meteorologist-in-Charge, and staff from the New Orleans / Baton Rouge, LA, WFO and Mr. Bobby Harp, Regional Maintenance Specialist, NWS Southern Region also assisted in preparation of this EA.

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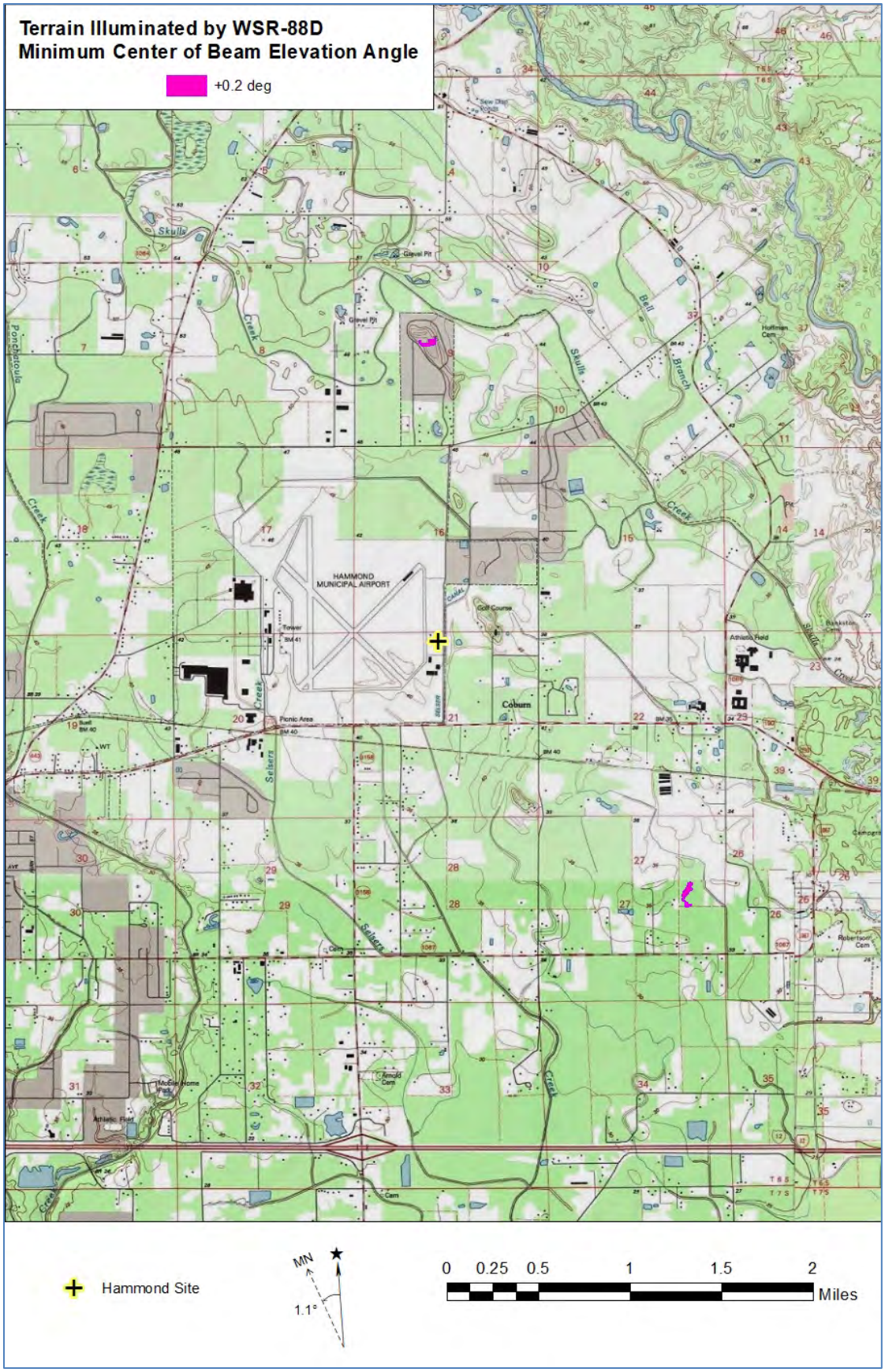
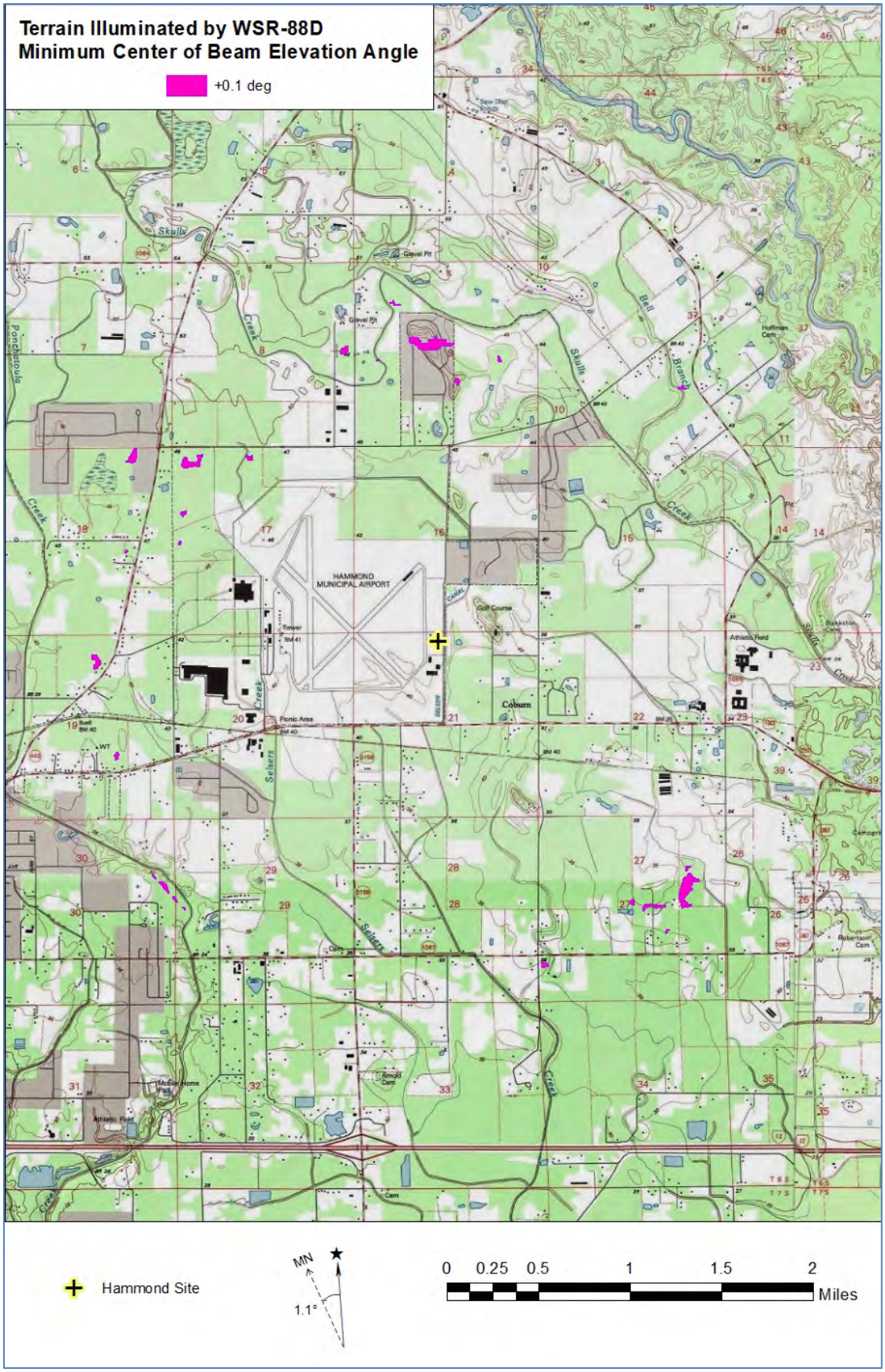
ATTACHMENT A

Lower Scan Angle Coverage Areas and Main Beam Ground Impingement Maps

Coverage Areas at Minimum Scan Angles of +0.5 deg to 0.0 deg			
Site Name	**Minimum Center of Beam Scan Angle (deg)**	**Lower Half-Power Point (deg)**	**Area (sq. mi.)**
Coverage at 2,000 ft Above Site Level (ASL)			
Hammond	+0.5	0.0	10,801.04
Hammond	+0.4	-0.1	14,261.16
Hammond	+0.3	-0.2	17,083.23
Hammond	+0.2	-0.3	17,178.62
Hammond	+0.1	-0.4	17,178.62
Hammond	0.0	-0.5	17,178.62
Coverage at 5,000 ft ASL			
Hammond	+0.5	0.0	27,974.99
Hammond	+0.4	-0.1	33,413.36
Hammond	+0.3	-0.2	37,560.15
Hammond	+0.2	-0.3	37,953.52
Hammond	+0.1	-0.4	37,953.52
Hammond	0.0	-0.5	37,953.52
Coverage at 10,000 ft ASL			
Hammond	+0.5	0.0	56,613.51
Hammond	+0.4	-0.1	64,337.99
Hammond	+0.3	-0.2	70,089.21
Hammond	+0.2	-0.3	71,091.30
Hammond	+0.1	-0.4	71,091.30
Hammond	0.0	-0.5	71,091.30


Terrain Illuminated by WSR-88D
Minimum Center of Beam Elevation Angle
+0.2 deg
HAMMOND MUNICIPAL AIRPORT
Coburn
Hammond Site
MN
1.1°
0 0.25 0.5 1 1.5 2
Miles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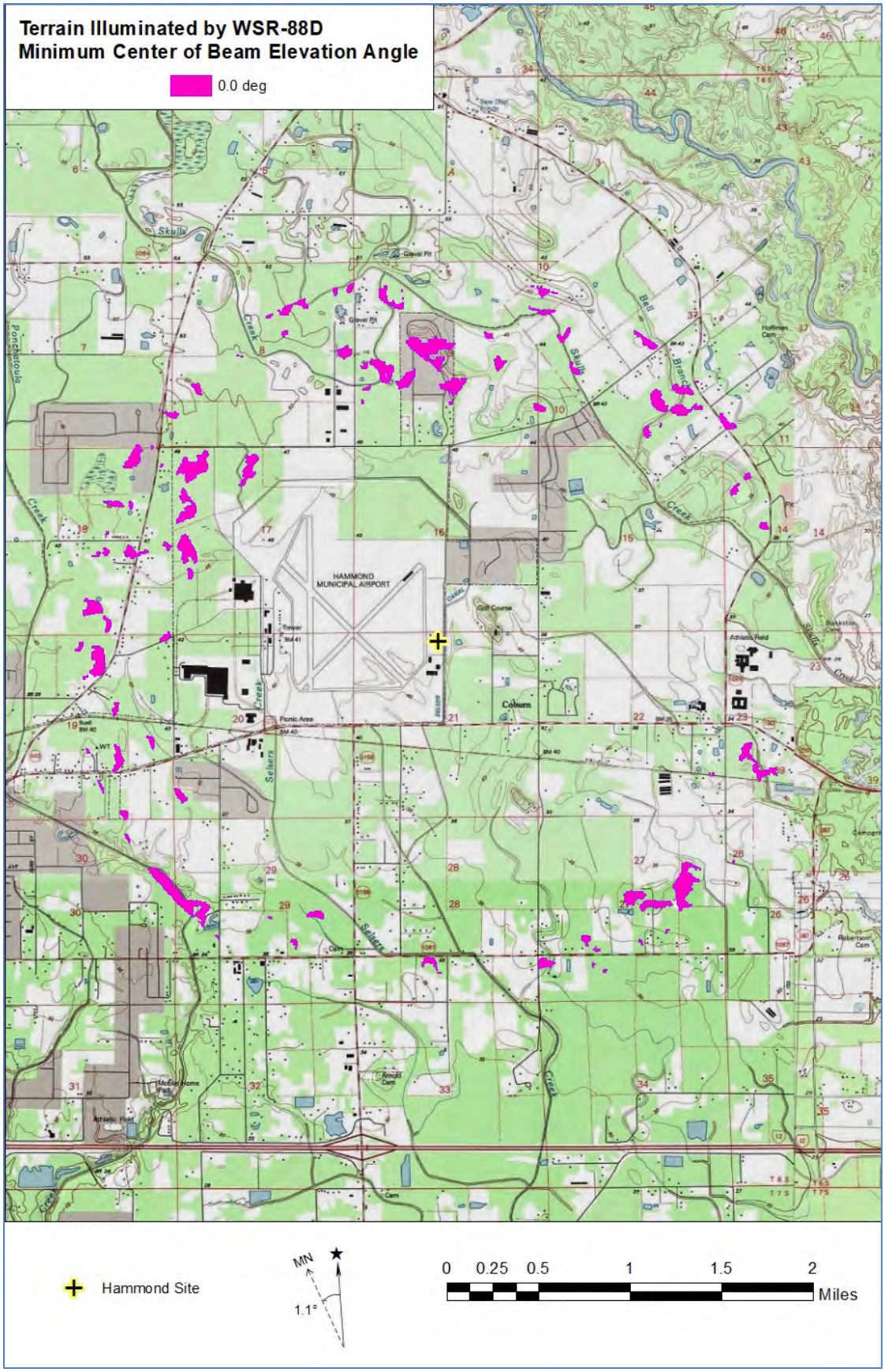
Miles


Terrain Illuminated by WSR-88D
Minimum Center of Beam Elevation Angle
0.0 deg
HAMMOND MUNICIPAL AIRPORT
Coburn
Hammond Site
MN
1.1°
0 0.25 0.5 1 1.5 2
Miles

ATTACHMENT B

Calculation of WSR-88D Radiofrequency Radiation Power Density

1. OBJECTIVE

This attachment quantifies the power densities of the radiofrequency radiation (RFR) emitted by the Weather Surveillance Radar, Model 1988 Doppler (WSR-88D) during operations that include minimum scan angles of +0.5 and +0.3 degrees (deg). The calculated power densities will be used to analyze the potential for effects to result from exposure of humans, equipment, and activities to the WSR-88D radio signal, and the significance of any identified potential effects.

2. METHODOLOGY

This memorandum builds upon the analysis included in the 1993 *Supplemental Environmental Assessment (SEA) of the Effects of Electromagnetic Radiation from the WSR-88D Radar* [NEXRAD Joint System program Office, 1993]. The 1993 analysis analyzed the potential electromagnetic effects of the WSR-88D signal when the radar operates at a minimum center of beam scan angle of +0.5 deg. This memorandum builds on that analysis by considering operation at a lower minimum scan angle of +0.3 deg. The parameters of the WSR-88D are shown in Table A1 and are not changed from the 1993 analysis:

TABLE A1: Operating Characteristics of KLIX WSR-88D serving the New Orleans/Baton Rouge, Area

Parameter	**Value**
Operating Frequency	2,993 megahertz (MHz)
Wavelength at WSR-88D center frequency (2,850 MHz)	0.345 ft, 10.5 cm
Maximum pulse power	475 kiloWatts (kW)
Maximum duty cycle	0.21%
Antenna diameter	28 ft, 853 cm
Antenna gain	35,500:1, 45.5 dB
Beam width to half-power points	1.0 deg
First sidelobe relative power density, maximum	0.00325, -25 dB
Other sidelobe maximum power density, relative to main beam	0.0004, -34 dB

The NWS proposes to modify the minimum center of beam scan angle used during operation of the KLIX WSR-88D below the +0.5 angle currently used. This would not require changes to the antenna, other hardware which composes the WSR-88D, or the radiated pulse power of the WSR-88D. However, incorporating scans at angles below +0.5 deg could affect the amount of RFR exposure experienced by persons, equipment, and activities at or near ground level in the vicinity of the radar. This memorandum quantifies that change.

3. MODIFIED VOLUME SCAN PATTERN 31

The WSR-88D uses a number of complex volume scan patterns to maximize the quality and usefulness of the meteorological data it collects. The 1993 report analyzed volume scan pattern 31, which results in the highest levels of ground-level RFR exposure. Volume Scan Pattern (VCP) 31 consists of eight 360 deg rotations of the antenna at various scan angles. NWS proposes to add two additional antenna rotations at a scan angle less than +0.5 to this scan pattern to increase the range at which the radar can detect and track meteorological phenomena, especially at low elevations within the atmosphere. This memorandum assumes that the two added scans would be at +0.3 deg (i.e. lower half power point of -0.2 deg, which is considered to be the lowest practical scan angle for the KLIX WSR-88D. Adding two +0.3 degree scans would result in the greatest possible increase in ground level RFR exposure. The modified VCP 31 would be as follows:

- Two complete rotations at +0.3 deg
- Two complete rotations at +0.5 deg
- Two complete rotations at +1.5 deg
- Two complete rotations at +2.5 deg
- One complete rotation at +3.5 deg
- One complete rotation at +4.5 deg

The complete pattern would include 10 rotations of the antenna at a speed of 0.8 revolutions per minute (rpm), the pattern would take about 12 minutes and 22 seconds to complete [Turner, 2011].

4. CALCULATION OF RF POWER DENSITIES

Appendix A of the 1993 SEA includes detailed calculations of the RFR power density and exposure levels resulting from volume scan pattern 31. The proposed scan change would not affect the distance of the transition from the near field to the far field, calculated at 640 to 800 ft in section A.3 of the 1993 Appendix A.

4.1 Far Field

The values of U_1, U_2, and U_3 would be unchanged from the values derived in 1993 Appendix A. The maximum pulse power density within the main beam (U_1) is given by the formula:

$$U_1 = 1.44 \times 10^9/R^2 \text{ milliWatts per square centimeter } (mW/cm^2)$$

where R is the distance from the antenna in ft. The maximum pulse power density at locations greater than 6 deg off the main beam axis (i.e. outside the area illuminated by the main beam and first five sidelobes is U_2 (unchanged from 1993 Appendix A), given below:

$U_2 = 5.76 \times 10^5/R^2$ mW/cm^2

The RF human exposure standards are based on time-averaged RF exposure for six minutes (occupational exposure) or 30 minutes (general public exposure) [American National Standards Institute/Institute of Electrical and Electronic Engineers, 2005]. We use six minutes as the averaging time as a worst-case analysis. The time-averaged power density for the main beam rotating continuously at +0.5 deg, considering the contributions from both the main beam and the first five sidelobes is given by U_3 (unchanged from 1993 Appendix A), below:

$U_3 = 1.35 \times 10^4/R^2$ mW/cm^2

At this point the analysis must consider the proposed modifications to VCP 31. The modified VCP 31 would have two additional +0.3 deg scans. Within the six minute averaging time, these two added scans would replace the RFR contribution from one +1.5 deg and one +2.5 deg scan. As described in the 1993 appendix, U_4 sums the RFR contributions at center of antenna level from each of the scans performed during the six minute period. The coefficients for the +0.3 deg scans are 2.4/6 reflecting the proportion of the 6 minutes and 1.0 because the center of beam will essentially be at antenna level (i.e. +0.3 deg which equates to 4.2 ft, or one-seventh of the beam width at the far field transition distance of 800 ft). The corresponding coefficients for the two + 0.5 deg scans within the six minutes are 2.4/6 and 0.5, and for the one +1.5 deg scan within the six minutes are 1.2/6 and 0.012. The modified U_4 calculation is given below

$U_4 = [(2.4/6)\ (1.0) + (2.4/6)\ (0.5) + (1.2/6)\ (0.012)]\ U_3$
$U_4 = (0.6024)U_3$

Inserting the U_3 value of $1.35 \times 10^4/R^2$ milliwatts/cm^2 (mw/ cm^2), yields:

$U_4 = 8.132 \times 10^3/R^2$ mW/cm^2

U_4 is the 6-minute time-averaged power density at locations in the far field directly illuminated by the main beam and at the same elevation as the WSR-88D antenna, considering the RFR contributed from the main beam and the first five sidelobes. According to the WSR-88D specification, sidelobes of higher order than the first five will contain less than 5% of the eradiated energy. The 1993 SEA calculated the average power density of these higher order sidelobes at $4/R^2$ mW/cm^2. We add this to U_4 to obtain U_5, the total time-averaged power density at an elevation even with the center of antenna elevation and distances greater than 800 ft from the antenna:

$U_5 = 8.132 \times 10^3/R^2 + 4/R^2 = 8.136 \times 10^3/R^2$ mW/cm^2

4.2 Near Field

Appendix A of the 1993 SEA calculates the height Y of the mathematical cylinder illuminated by all scans during the six-minute period using the formula Y = 28 ÷ R Tan 2 deg + 0.035R. Since the modified scan pattern of interest includes scans of +0.3, +0.5, and +1.5 degs, the angular range is 1.2 deg, and we recalculate Y as follows:

$$Y = 28 + R \times \text{Tan}(1.2 \text{ deg}) = 28 + 0.021R$$

The circumference of the illumination cylinder is $2\pi RY$ and the total area A is:

$$A = 2\pi RY = 176R + 0.13R^2$$

The average power radiated is less than or equal to 1 kW, and the average power over the cylindrical surface cannot exceed this value divided by the area. At the mid-height of the cylinder, the local power density will exceed the average value by a factor of 2 (unchanged from the 1993 analysis). We introduce this factor, multiply by 10^6 to convert from kW to mW, and divide by 929 to convert from sq ft to square centimeters (sq cm):

$$U_6 = 2 * 10^6 / (929)\,(176R + 0.13R^2) = 16{,}560 / (R^2 + 1{,}354R)\ \text{mW/cm}^2$$

$U_{6\,is}$ the time-averaged RFR exposure within the area illuminated by the WSR-88D main beam up to distances of 640 ft where the beam begins to spread.

4.3 Combined Result and RF Exposure Levels near KLIX WSR-88D

Table A-2 shows the time-averaged RFR power densities that would result at locations directly illuminated by the main beam of the KLIX WSR-88D when operating in modified VCP 31. The near field is within 640 ft of the radar and the U_6 formula is used to calculate these near field values. At greater distances, the far field formula for U_5 is used. For comparison purposes, corresponding values for the original VCP 31 are also shown. As can be seen from Table A2, use of modified scan pattern 31 would lower the elevation at which the lower half-power point (i.e. bottom edge) of the main beam occurs and would also slightly increase the time-averaged power densities in both the near and far fields.

Table A2: Comparison of Time-Average RFR Power Densities at Various Distances within the KLIX WSR-88D Main Beam				
Distance (ft)	**Distance (mi)**	**Elevation Change of Lower Half-Power Point (ft)**	**Original VCP 31 Time-Avg Power Density (mW/cm2)**	**Modified VCP 31 Time-Avg Power Density (mW/cm^2)**
20*	0.004	No change	0.598	0.603
900	0.17	- 3	0.0072	0.0100
5,280	1	-18	0.00021	0.00029
15,840	3	-55	0.000023	0.000032
*surface of WSR-88D radome				

NWS may infrequently operate the KLIX WSR-88D with a stationary antenna, resulting in the main beam being continuously pointed at the same location for a period of time. The RF exposure level within the main beam can be calculated using equation U_1 multiplied by the radar duty cycle

$$U_7 = (1.44 \times 10^9/R^2)\ 0.0021 = 3.024 \times 10^6/R^2 \qquad (mW/cm^2)$$

5. EXPOSURE OF PERSONS TO RADIOFREQUENCY RADIATION

The KLIX WSR-88D transmits a radio signal at a frequency of 2,993 MHz, which is within the radiofrequency (RF) or microwave portion of the electromagnetic spectrum. Although microwaves can add heat to objects, they do not contain enough energy to remove electrons from biological tissue, and are a form of non-ionizing radiation. In this regard, microwaves are fundamentally different from ionizing radiations (e.g., X-rays, ultraviolet rays) which occur at higher frequency portions of the electromagnetic spectrum. Ionizing radiation occurs only at frequencies greater than 10^9 MHz. RF or microwave fields are non-ionizing radiation. Due to the fundamental differences between ionizing and non-ionizing radiation, safety standards and guidelines vary greatly for the two types of electromagnetic radiation. In this section only standards for non-ionizing radiation are addressed because KLIX WSR-88D RF emissions are non-ionizing.

The Institute of Electrical and Electronics Engineers (IEEE) developed safety guidelines for human exposure to RFR, and those standards have been adopted by the American National Standards Institute (ANSI) [ANSI/IEEE, 2006]. The ANSI/IEEE safety standard is designed to protect all persons (including infants, elderly persons, and pregnant women) from adverse health effects from exposure to radiofrequency (RF), even if exposure should last

over an entire lifetime. These guidelines set safety levels for maximum permissible exposure (MPE) to RF signals, which include a 10- to 50-fold safety margin and are intended to protect all members of the population. MPEs are specified in power density of the radio signal in milliwatts per square centimeter (mW/cm^2) and vary with operating frequency. Separate MPEs have been established for exposure of the general public and workers and for time-averaged exposure and peak exposure. Occupational safety standards are higher than those for the general public because workers are trained in RF safety practices and have greater ability to use that knowledge to protect themselves from potentially harmful RF exposure. The KLIX WSR-88D operating frequency is and 2,993 MHz. The IEEE/ANSI safety standards for those frequencies are 1.0 mW/cm^2 for the general public (averaged over 30 minutes) and 9.98 mW/cm^2 for workers (averaged over 6 minutes).

The Occupational Health and Safety Administration (OSHA) regulates occupational exposure to RF emissions. The OSHA safety standard is similar to the ANSI/IEEE occupational safety standard: 10.0 mW/cm^2 (averaged over 6 minutes) (OSHA, 2015).

Federal Communications Commission (FCC) RF exposure standards for RF exposure of the general public are the same as the ANSI/IEEE: 1.0 mW/cm^2 averaged over 30 minutes). The FCC RF exposure standard for occupational exposure is somewhat lower that the ANSI/IEEE safety level: 5.0 mW/cm^2 (averaged over 6 minutes).

The KLIX WSR-88D is mounted on a 30 m tall steel-lattice tower. Ground elevation is 24 ft MSL. The center of the antenna is at 114 ft MSL and the lower edge of the antenna is 100 ft above ground level (AGL). When operating at the current minimum scan angle of +0.5 deg, the lower edge of the beam is at 0.0 deg (i.e. horizontal) and the radar's main beam does not impinge on the ground surface or any structures in proximity to the radar. Operating at the proposed minimum scan angle of +0.3 deg would not change that situation; the main beam would still not impinge on the ground surface or structures within 3 miles of the WSR-88D.

Compared to the existing minimum scan angle of +0.5 deg, lowering the minimum scan angle to +0.3 deg would result in a slight increase in RF exposure levels at air space in the vicinity of the radar. Table A3 compares RF power densities to safety standards for human exposure. During normal operation of the WSR-88D with a rotating antenna, RF exposure levels at all locations would comply with safety standards for exposure of both workers (i.e. occupational exposure) and the general public.

Table A3: RF Power Density within KLIX WSR-88D Main Beam Compared to ANSI/IEEE Safety Standards					
Distance from Radar	**Time-Averaged Power Density (mW/cm^2)**	**ANSI/IEEE General Public RF Safety Standard**		**ANSI/IEEE Occupational RF Safety Standard**	
		Safety Standard (mW/cm^2)	**Factor Below Std**	**Safety Standard (mW/cm^2)**	**Factor Below Std**
20 ft*	0.603	1.0	1.65	9.98	16.5
900 ft	0.0100	1.0	100	9.98	998
1 mile	0.00029	1.0	3,450	9.98	34,400
3 miles	0.000032	1.0	31,300	9.98	433,000
*surface of WSR-88D radome					

During infrequent stationary antenna operation, time-averaged RF exposure levels within the WSR-88D main beam would be higher than during normal operation. When operating in stationary antenna mode, the KLIX WSR-88D would exceed the ANSI/IEEE safety levels within the following distances:

ANSI/IEEE and FCC General Public Safety Level (1.0 mW/cm^2): 1,740 ft
FCC Occupational Safety Level (5.0 mW/cm^2): 780 ft
ANSI/IEEE Occupational Safety Level (9.37 mW/cm^2): 568 ft

The KLIX WSR-88D operating at +0.3 deg would not impinge on the ground surface or any structures within those distance and risks to human health would not result.

ATTACHMENT C

USFWS Threatened and Endangered Species Letter

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Louisiana Ecological Services Field Office
200 Dulles Drive
Lafayette, LA 70506
Phone: (337) 291-3100 Fax: (337) 291-3139

IPaC Record Locator: 509-22144305 June 12, 2020

Subject: Consistency letter for the project named 'KLIX WSR-88D Relocation to Hammond North Shore Regional Airport' for specified threatened and endangered species that may occur in your proposed project location pursuant to the Louisiana Endangered Species Act project review and guidance for other federal trust resources determination key (Louisiana DKey).

Dear James Manitakos:

The U.S. Fish and Wildlife Service (Service) received on June 12, 2020 your effects determination(s) for the 'KLIX WSR-88D Relocation to Hammond North Shore Regional Airport' (the Action) using the Louisiana DKey within the Information for Planning and Consultation (IPaC) system. The system was developed in accordance with the Endangered Species Act of 1973 (ESA) (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.).

Based on the answers provided, the proposed Action is consistent with a determination of “no effect” or “may affect, but not likely to adversely affect (NLAA)” for the following species as outlined in the Service’s Louisiana Endangered Species Act project review and guidance for other federal trust resources key.

Threatened West Indian Manatee (*Trichechus manatus*)	NLAA
Endangered Red-cockaded woodpecker (*Picoides borealis*)	No Effect
Endangered Gopher Tortoise(*Gopherus polyphemus*)	No Effect

The "may affect - not likely to adversely affect" determination(s) becomes effective when the lead Federal action agency or designated non-federal representative uses it to ask the Service to rely on the Louisiana Endangered Species Act project review and guidance for other federal trust resources key to satisfy the agency's consultation requirements for this project.

Please provide this consistency letter to the lead Federal action agency or its designated non-federal representative with a request for its review, and as the agency deems appropriate, to submit for concurrence verification through the IPaC system. The lead Federal action agency or designated non-federal representative should log into IPaC using their agency email account and click "Search by record locator". They will need to enter the record locator **509-22144305**

If the action agency is unable to generate a concurrence verification letter through IPaC, please sign below verifying your species determination(s) listed above and submit your project to the Louisiana Field Office for concurrence.

_____ _____

_____ _____

Project Representative Date

Based on the information provided in this report, as well as any pertinent correspondence and documentation saved to the project file at our office (if applicable), the Service agrees with your determination(s) for the species listed above for the proposed Federal Action:

_____ _____

Louisiana Ecological Services Office Date
U.S. Fish and Wildlife Service

Consultation on the proposed action is concluded when you receive signature from this office.

The Service recommends that your agency contact the Service for additional consultation if: 1) the scope or location of the proposed project is changed significantly, 2) new information reveals that the action may affect listed species or designated critical habitat; 3) the action is modified in a manner that causes effects to listed species or designated critical habitat; or 4) a new species is listed or critical habitat designated. Additional consultation as a result of any of the above conditions or for changes not covered in this consultation should occur before changes are made and or finalized.

Please Note: If the Federal Action may impact bald or golden eagles, additional coordination with the Service under the Bald and Golden Eagle Protection Act (BGEPA) (54 Stat. 250, as amended, 16 U.S.C. 668a-d) may be required. Please contact Ulgonda Kirkpatrick (phone: 321/972-9089, e-mail: ulgonda_kirkpatrick@fws.gov) with any questions regarding potential impacts to bald or golden eagles.

Action Description
You provided to IPaC the following name and description for the subject Action.

1. Name

KLIX WSR-88D Relocation to Hammond North Shore Regional Airport

2. Description

The following description was provided for the project 'KLIX WSR-88D Relocation to Hammond North Shore Regional Airport':

> The project consists of relocating the National Weather Service (NWS) WSR-88D weather radar serving the New Orleans / Baton Rouge area (KLIX) from its existing location at Slidell, LA to a new site at Hammond North Shore Regional Airport in Hammond, LA. The WSR-88D is an automated S-band radar with a 28-ft diameter rotating antenna mounted on a steel-lattice tower. The total structure height is 143 feet above ground level. The KLIX WSR-88D will be maintained by staff from the NWS Weather Forecast Office in Lacombe, LA. Relocation of the KLIX WSR-88D is expected to occur in 2021/2022.

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/30.519727484452993N90.40751616542184W

Qualification Interview

1. Is this a Federal project?

   Yes

2. Have you determined that the project will have "no effect" on federally listed species? (If unsure select "No")

   No

3. Are you with the U.S. Army Corps of Engineers Regulatory Division?

   No

4. Are you with the U.S. Army Corps of Engineers Planning Division?

   No

5. [Hidden Semantic] Does the project intersect the west indian manatee AOI?

   Automatically answered
   Yes

6. (Semantic) Is the project located within the manatee consultation zone, excluding the Mississippi River?

   Automatically answered
   No

7. [Hidden Semantic] Does the project intersect the red-cockaded woodpecker AOI?

   Automatically answered
   Yes

8. Will the project involve removal of suitable RCW foraging habitat (pine or pine/hardwood stands in which 50 percent or more of the dominant trees are pines and the dominant pine trees are 30 years of age or older)?

   No

9. Will the project occur within suitable RCW nesting habitat (pine or pine/hardwood stands that contain pines 60 years of age or older)?

   No

10. [Hidden Semantic] Does the project intersect the gopher tortoise AOI?

    Automatically answered
    Yes

11. [Semantic] Will the project occur on Latonia, Bassfield, Cahaba, Ruston, Smithdale, Abita, Malbis, Angie, or Prentiss soils?

    Automatically answered
    No

12. (Semantic) Does the project intersect the Louisiana black bear Range?

    Automatically answered
    No

ATTACHMENT D

Site Survey Report

SENSOR ENVIRONMENTAL LLC
www.sensorenvirollc.com

Final Site Survey Report • July 2020

RELOCATION OF NATIONAL WEATHER SERVICE WEATHER SURVEILLANCE RADAR, MODEL 1988 DOPPLER (WSR-88D) SERVING THE NEW ORLEANS/BATON ROUGE, LOUISIANA AREA

Prepared by:

James Manitakos, Project Leader
Sensor Environmental LLC

Andre Tarpinian, Senior Radio Frequency Engineer
Alion Science and Technology

Prepared for:

WSR-88D Radar Operations Center
Norman, Oklahoma

EXECUTIVE SUMMARY

The KLIX WSR-88D serves the NWS New Orleans/Baton Rouge, LA, Area and is currently located adjacent to the Weather Forecast Office (WFO) and Lower Mississippi River Forecast Center (RFC) at Slidell Airport in Slidell, LA. NWS plans to relocate the WFO/RFC to a new site in Lacombe, LA, about 5 miles west of the existing site and is considering whether to retain the WSR-88D at its existing location at Slidell Airport or relocate the WSR-88D. Two relocation sites are under consideration: the Lacombe site (i.e. adjacent to the future WFO/RFC site), and the Hammond Site at Hammond North Shore Regional Airport in Hammond, LA (about 40 miles west-northwest of the WSR-88D's existing location). This site survey report evaluates and compares each of these three alternative WSR-88D sites with regard to property size, radar coverage, infrastructure, economic, and environmental factors.

All three sites are located on government-owned property available to the NWS and are of sufficient size to accommodate the KLIX WSR-88D. All three sites are served by roads and utility lines which are needed for WSR-88D operation. None of the sites is contaminated by substantial amount of hazardous or regulated wastes. The existing site meets all criteria, except EV5 - Not in Floodplain, which is only partially met because access to the site unavoidably traverses the 100-year floodplain although the existing site itself is outside the 100-year floodplain. The Lacombe and Hammond sites are outside the 100-year floodplain, are accessible without crossing the 100-year floodplain, and meet all other evaluation criteria

The most notable difference between the alternative sites is in radar coverage. All three sites would provide radar coverage at 5,000 ft and 10,000 ft above site level comparable to existing coverage. Radar coverage at 5,000 feet above site level and above would overlap coverage provided by adjoining WSR-88Ds serving Fort Polk, LA; Jackson, MS; Lake Charles, LA; and Mobile, AL. Compared to the existing site, the Lacombe site would modestly lower the altitude of the coverage flood over Baton Rouge and would not change the coverage floor over New Orleans (see Table ES1). The Hammond site would have a more substantial impact. Compared to existing coverage, the Hammond site would considerably lower the altitude of the coverage floor over Baton Rouge would moderately increase the altitude of the coverage floor over New Orleans.

Table ES1: Height above Ground of Radar Coverage Floor

Site	Coverage Floor Over Baton Rouge (ft AGL)	Coverage Floor Over New Orleans (ft AGL)
Existing (Slidell)	3,100	600
Lacombe	2,800	600
Hammond	1,000	1,100

The minimum scan angle of the KLIX WSR-88D could be reduces from +0.5 deg (the existing minimum) to +0.3 deg at any of the three alternative sites. Lowering the minim scan angle would improve low-level radar coverage of the area.

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FIGURES

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ABBREVIATIONS

AGL	above ground level
ASL	above site level
ATCT	airport traffic control tower
Comm	Communications
CPI	Confirmed and Potential Sites Inventory
Deg	degree
DTED	Digital Terrain Evaluation Data
DOT	Department of Transportation
EA	Environmental Assessment
EMC/EMI	electromagnetic compatibility/electromagnetic interference
EOC	Emergency Operations Center
F	Fahrenheit
FAA	Federal Aviation Administration
ft	foot, feet
HDC	Hammond North Shore Regional Airport
ITAS	Integrated Target Acquisition System
m	meter(s)
KDGX	WSR-88D serving the Jackson, Mississippi, area
KLCH	WSR-88D serving the Lake Charles, Louisiana, area
KLIX	WSR-88D serving the New Orleans/Baton Rouge, Louisiana, area
KMOB	WSR-88D serving the Mobile, Alabama, area
KPOE	WSR-88D serving the Fort Polk, Louisiana, area
LA	Louisiana
MSL	mean sea level
NCRS	Natural Resources Conservation Service
NOAA	National Oceanographic and Atmospheric Administration
NSTCC	North Shore Technical Community College
NWS	National Weather Service
PEIS	Programmatic Environmental Impact statement
RCRA	Resource Conservation and Recovery Act
RFC	River Forecast Center
sq mi	square miles
SEA	Supplemental Environmental Assessment
TAS	Target Acquisition System
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WFO	Weather Forecast Office
WSR-88D	Weather Surveillance Radars, Model 1988 Doppler

1 PURPOSE AND NEED

The National Weather Service (NWS) operates a nationwide network of weather radars that provide critical real-time information on atmospheric conditions to weather forecasters. Additional similar weather radars located in Alaska, Hawaii and Puerto Rico are operated by the Department of Transportation (DOT) Federal Aviation Administration (FAA). The Department of Defense Air Weather Service also operates weather radars located at United States (U.S.) military installations in the U.S. and abroad. The weather radars operated by these three agencies are part of 159 weather radars in the nationwide network.

The network radars operated by NWS are named Weather Surveillance Radar-Model 1988 Doppler (WSR-88D) after the year they were first put into service and their capabilities to use Doppler shift measurements to determine wind velocities. They are also known as Next Generation Weather Radars (NEXRADs) or Weather Service Radars. Like all active radars, the WSR-88D transmits a radio signal, which reflects off targets and returns to the radar. The radar measures the strength of the return signal, its direction of return, and the time between transmission and return, which allows determination of the targets characteristics.

The National Weather Service (NWS) owns and operates the WSR-88D serving the New Orleans/Baton Rouge, LA, area. The radar identifier is KLIX and the radar is located at Slidell Airport, Slidell, St. Tammany Parish. The radar site is about 30 miles northeast of downtown New Orleans, LA and about 78 miles east of downtown Baton Rouge, LA. The KLIX WSR-88D was commissioned in February 1995 and has been in operation at its current location since be commissioned. The KLIX WSR-88D is part of the nationwide WSR-88D network.

The KLIX WSR-88D is located adjacent to the NWS New Orleans/Baton Rouge Weather Forecast Office (WFO) and Lower Mississippi River Forecast Center (RFC). The NWS plans to relocate the WFO/RFC to a location adjacent to the main campus of North Shore Technical Community College (NSTCC) in Lacombe, St. Tammany Parish, LA. At that location, the relocated WFO/RFC will be colocated with the newly constructed St. Tammany Parish Emergency Operations Center (EOC). The Lacombe site is about 5 miles west-northwest of the current location of the WFO/RFC and WSR-88D. NWS is considering whether to retain the WSR-88D at its existing location at Slidell Airport or relocate the WSR-88D. Two relocations sites are under consideration: the Lacombe site (i.e. adjacent to the relocated WFO/RFC), or Hammond North Shore Regional Airport (HDC) in Hammond, Tangipahoa Parish, LA (about 40 miles west-northwest of the WSR-88D's existing location). The existing WSR-88D site and the two alternative relocation sites under consideration are shown in Figure 1. This site survey report evaluates and compares each of these three alternative sites with regard to property size, radar coverage, infrastructure, economic, and environmental factors.

Figure 1: Location Map, Existing and Alternative Sites for KLIX WSR-88D

2 DESCRIPTION OF ALTERNATIVE SITES FOR KLIX WSR-88D

The existing KLIX WSR-88D and the Lacombe relocation site are both in St. Tammany Parish. The Hammond relocation site is located in Tangipahoa Parish. The two parishes are on the north shore of Lake Pontchartrain and New Orleans is on the southeastern shore of the lake. Baton Rouge, the capital of Louisiana, is located about 65 miles west-northwest of New Orleans. Elevations within St. Tammany and Tangipahoa parishes range from sea level at Lake Pontchartrain to 365 ft MSL in the northern portion of Tangipahoa Parish. Most of the two parishes are drained by rivers flowing southward to Lakes Maurepas and Pontchartrain, which are hydrologically connected to the Gulf of Mexico. The easternmost portion of St. Tammany Parish drains into the Pearl River (the boundary between Louisiana and Mississippi), which also flows to the Gulf of Mexico.

The existing WSR-88D site is at Slidell Airport, a general aviation airport owner by the City of Slidell. Figure 2 shows photographs of the KLIX WSR-88D. Ground elevation at the existing WSR-88D site is 24 ft above mean sea level (MSL), while the two relocation sites are 18 to 19 ft higher in elevation. Table 1 presents information on the three alternative WSR-88D sites and the distance and direction from each site to New Orleans and Baton Rouge. Appendix 1 contains a trip report describing the three sites, including 360-degree panoramic photographs taken from elevated structures in proximity to each of the three sites.

Table 1: Existing and Relocation Sites for KLIX WSR-88D

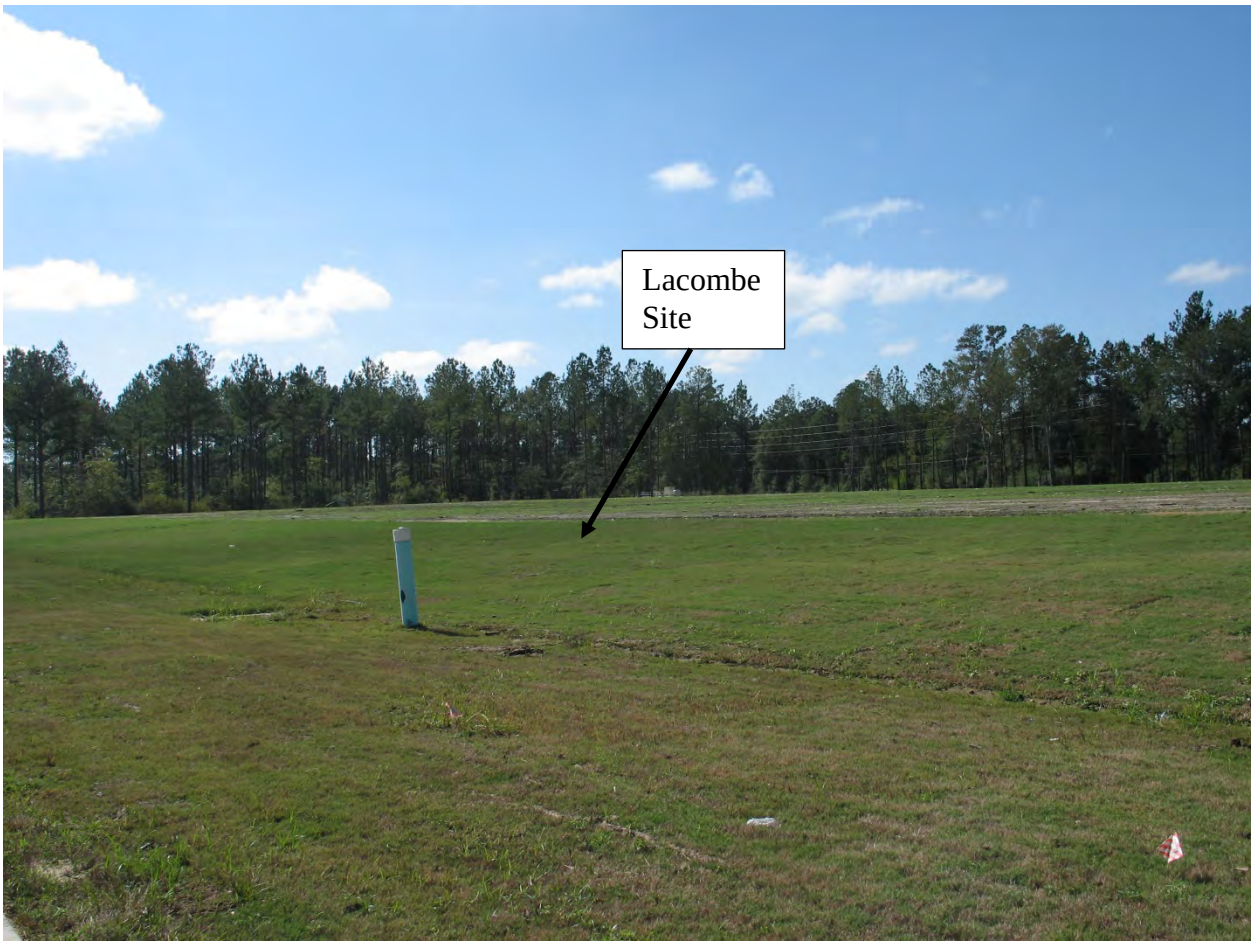
Site	Parish	Latitude / Longitude	Ground Elev (ft MSL)	Distance, Direction from New Orleans (mi)	Distance Direction from Baton Rouge (mi)
Existing	St. Tammany	30°20’12” N 89°49’32” W	24	30 NE	78 E
Lacombe	St. Tammany	30°22’42” N 89°53’58” W	42	31 NNE	74 E
Hammond	Tangipahoa	30°31’08” N 90°24’27” W	43	44 NW	43 E

The Lacombe site is at the future site of the St. Tammany Parish EOC and adjacent to NSTCC main campus. The new EOC is under construction and NWS plans to construct a new WFO/RFC building adjacent to the EOC. When the newly constructed WFO building is available for occupancy, NWS plans to shift WFO/RFC operations from Slidell Airport to the new WFO/RFC facility at Lacombe. Sufficient land is available to relocate the KLIX WSR-88D to the Lacombe site, where it would be colocated with the WFO/RFC. The Lacombe site is owned by St. Tammany Parish. Figure 3 shows photographs of Lacombe site

(a) Entrance sign at WFO/RFC

(b) Ground-level view looking south at existing WSR-88D

Figure 2: Photographs of Existing KLIX WSR-88D



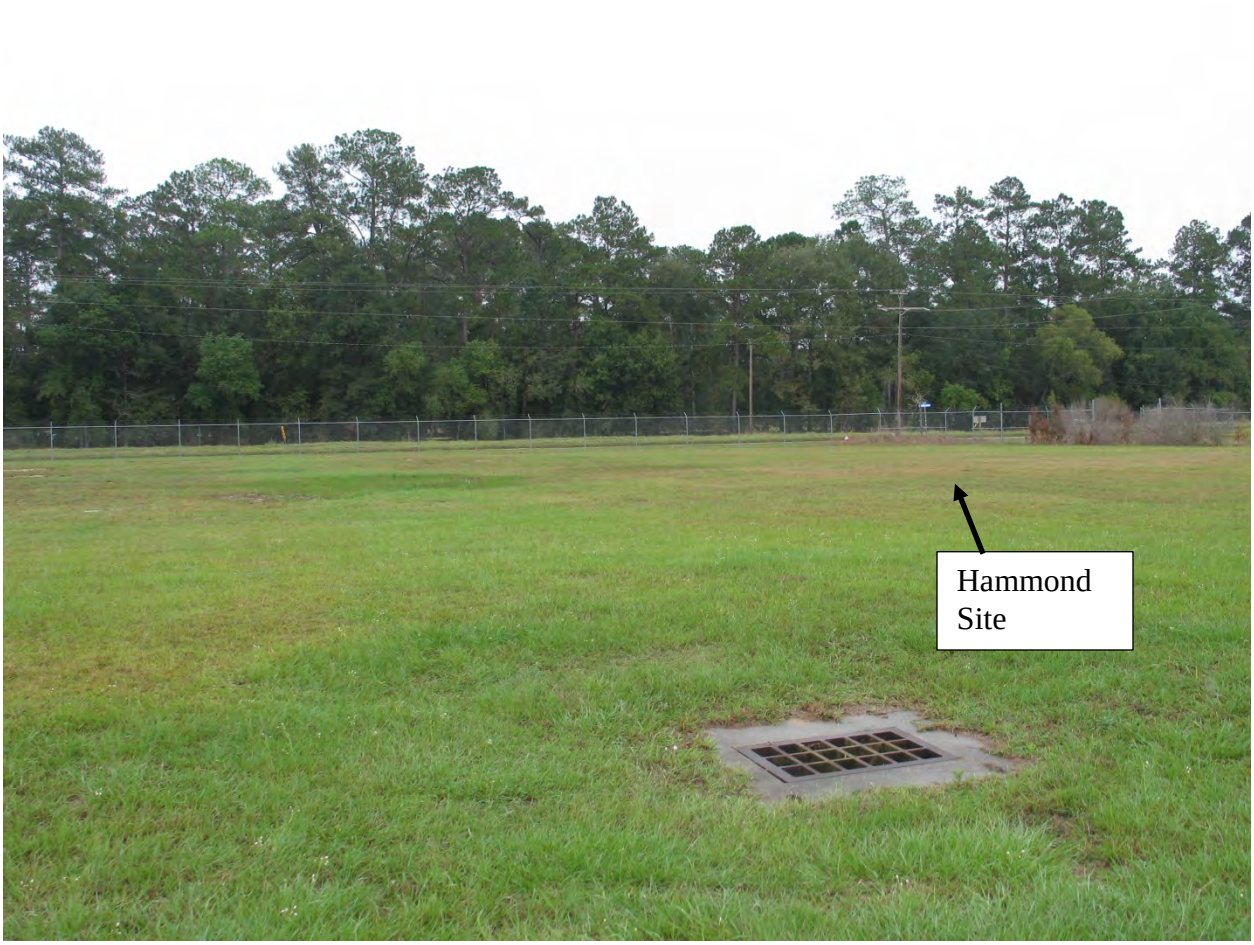
(a) Ground-level view looking southwest at Lacombe site

Figure 3: Photographs of Lacombe Alternative Site for Relocation of KLIX WSR-88D

(b) Elevated view of Lacombe site

Figure 3: Photographs of Lacombe Alternative Site for Relocation of KLIX WSR-88D

The Hammond site is at HDC, a general aviation airport located in Hammond, Tangipahoa Parish LA. HDC also hosts Louisiana Air National Guard operations. HDC is owned and operated by the City of Hammond. Sufficient land is available to relocate the KLIX WSR-88D to the Hammond site. Figure 4 shows photographs of the Hammond site.



(a) Ground-level view looking southeast at Hammond site

Figure 4: Photographs of Hammond Alternative Site for Relocation of KLIX WSR-88D

(b) Elevated view of Hammond site

Figure 4: Photographs of Hammond Alternative Site for Relocation of KLIX WSR-88D

3 SITE EVALUATION CRITERIA

Each of the three alternative sites for the KLIX WSR-88D was carefully evaluated against the following property size, radar coverage, infrastructure, economic, and environmental criteria:

Property Size

(S1) Site size is roughly 210 ft × 210 ft

Radar Coverage

(R1) Combined with adjoining radars, coverage meets or exceeds existing network coverage
(R2) High-value military assets receive radar coverage
(R3) Terrain blockage of radar beam is minimized
(R4) Radar beam is not blocked by trees

Infrastructure

(I1) Site is served by suitable electric power (i.e. three-phase 200-A 208Y/120V)
(I2) Site is served by commercial T-1 communication lines
(I3) Site is accessible by good condition all-weather roads
(I4) Construction access is not restricted by bridges or culverts with low weight capacity

Economic

(EC1) Sites on suitable government property are preferred over private land
(EC2) Site is available from a willing owner for purchase or 20+-year lease
(EC3) The likelihood of substantial environmental contamination of the site by regulated materials or hazardous wastes is low

Environmental

(EV1) Radar would be compatible with nearby land uses and local zoning
(EV2) Radar structure would comply with Part 77 FAA height restrictions
(EV3) Site is at least 3,000 ft from an airport surveillance radar or airport traffic control tower (ATCT)
(EV4) Site is not eroded or geologically unstable
(EV5) Site is not within a 100-year floodplain
(EV6) Site does not contain federal-jurisdictional wetlands
(EV7) Construction of the radar will not cause significant conversion of farmland
(EV8) No taking of threatened or endangered species or destruction of critical habitat
(EV9) No significant effects on historic or traditional cultural properties
(EV10) No significant effects on scenic view shed, such as a scenic highway, or wilderness area
(EV11) Not within one-quarter mile of a wild and scenic river.

The detailed results of this evaluation are presented in Section 4.

4 RADAR COVERAGE

A. Radar Coverage at Existing and Alternative Relocation Sites

The WSR-88D is designed to detect and track weather phenomena within a roughly 230 mi distance of the radar. It accomplishes this task by emitting a narrow main beam from a rotating dish antenna. The antenna rotates continuously around a vertical axis to cover the surrounding area. The main beam scan angle is the number of degrees above or below horizontal at the center of the main beam. The upward tilt of the antenna (and therefore the scan angle of the main beam) can be changed, allowing the radar to scan the sky at angles up to+ 60.0 deg and down to -1.0 deg; however, in current operation, the maximum scan angle is +19.5 deg and the minimum scan angle is +0.5 deg.

The WSR-88D main beam has a total width of 1 deg in the horizontal and vertical directions (i.e., beam edge is ½ deg from the center of the beam). The power density of the WSR-88D is greatest at the center of the beam and decreases towards the edge of the beam. At the edge of the main beam, the power density is one half of the center of beam power density. The current minimum scan angle of the main beam is +0.5 deg (i.e., 0.5 deg above horizontal at the center of the main beam) and the lower edge of the main beam (i.e. lower half-power point) is at 0.0 deg or horizontal. The Project team used Alion's Integrated Target Acquisition System (ITAS) terrain-based computer model with GIS-based interface to project the terrain-dependent radar coverage for the KLIX WSR-88D at the existing site and the alternative relocation sites. The radar coverages are based on Digital Terrain Elevation Data (DTED) Level 2 topographic data and 4/3 earth radius to account for atmospheric refraction of the WSR-88D main beam. The lower half-power point of the unobstructed WSR-88D main beam is considered the minimum elevation of WSR-88D coverage. In addition to the KLIX WSR-88D radar coverage, the maps show radar coverage for the following adjoining WSR-88D network radars: Lake Charles, LA (KLCH); Fort Polk, LA (KPOE); Jackson, Mississippi (KDGX); and Mobile, Alabama (KMOB).

Figures 5 through 7 show estimated radar coverage at 2,000 ft; 5,000 ft; and 10,000 ft above site level (ASL). The coverage areas are , based on a 30-m WSR-88D tower, and the existing minimum scan angle of +0.5 degree (deg), which results in a lower half-power point of 0.0 deg. As shown in the figures, there is no terrain blockage of the existing KLIX WSR-88D, and no terrain blockage would occur at the Hammond or Lacombe sites. Table 2 shows the area in sq mi of coverage at 2,000 ft, 4,000 ft, and 10,000 ft ASL for each of the six potential sites. There would be negligible difference among the three sites in coverage areas at 2,000 ft, 5,000 ft, and 10,000 ft ASL.

Table 2. Projected Radar Coverage for Existing and Relocation Sites		
Altitude Above Site Level (ft)	**Site**	**Coverage Area (sq mi)**
2,000	Slidell (existing)	10,813
	Lacombe	10,810
	Hammond	10,801
5,000	Slidell (existing)	28,006
	Lacombe	27,999
	Hammond	27,974
10,000	Slidell (existing)	56,676
	Lacombe	56,662
	Hammond	56,611

The sites would vary in the coverage with respect to network coverage. The Lacombe site would shift coverage slightly westward compared to the existing site, while the Hammond site would shift coverage significantly westward. Compared to existing coverage (and coverage from the Lacombe site), Hammond site coverage would overlap less with the KMOB WSR-88D at all elevations. The Hammond site would result in 5,000 ft ASL coverage overlapping the KPOE and KLCH radar coverages, while the existing site and Lacombe site coverages would not overlap KPOE and KLCH coverage at 5,000 ft ASL. Coverage from all of the three KLIX WSR-88D sites at 10,000 ft ASL would overlap coverages provided by all four adjoining WSR-88D network radars.

Table 3 shows the minimum height above ground level (i.e. radar floor) over downtown New Orleans and downtown Baton Rouge for KLIX WSR-88D at the existing site and the two relocation sites. The Lacombe site would result in a slight lowering of the radar floor over Baton Rouge and no change in the height of radar floor over New Orleans. The Hammond site would have a more substantial impact; radar floor height over Baton Rouge would decrease from 3,100 ft to 1,000 ft and the radar floor height over New Orleans would increase from 600 ft to 1,100 ft.

Table 3: Height above Ground of Radar Coverage Floor		
Site	**Coverage Floor Over Baton Rouge (ft AGL)**	**Coverage Floor Over New Orleans (ft AGL)**
Existing (Slidell)	3,100	600
Lacombe	2,800	600
Hammond	1,000	1,100

Figure 5: Estimated Radar Coverage at 2,000 ft above Site Level

Figure 6: Estimated Radar Coverage at 5,000 ft above Site Level

Figure 7: Estimated Radar Coverage at 10,000 ft above Site Level

B. Proposed Lower Minimum Scan Angle

NWS is considering reducing the minimum center of beam scan angle of the KLIX WSR-88D below the current minimum of +0.5 deg. Lowering the minimum scan angle would increase coverage areas at 2,000, 5,000, and 10,000 ft ASL for all three sites. However, due to the relatively flat topography of the area and dense forest in the vicinity of the existing WSR-88D site and potential relocation sites, lowering the minimum scan angle below +0.3 deg (i.e. 0.2 deg lower than current minimum) would not result in substantial additional increase in coverage area.

Lowering the minimum scan angle to +0.3 deg would not result in the WSR-88D main beam impinging on the ground surface within radiofrequency (RF) safety setback distances at any of the sites (see Appendix 2 for calculation of RF safety setback distances). However, there is potential for nearby structures and towers to be directly illuminated by the WSR-88D beam. Appendix 2 contains calculations the power density emitted by the KLIX WSR-88D if it were to operate at a minimum center-of-beam scan angle of +0.3 deg, which is 0.2 deg lower than the minimum scan angle in current use. The power density of WSR-88D RF emissions is compared to safety levels established for exposure of the general public, occupational exposure, electro-explosive devices (EEDS), fuel handling, and implantable medical devices to determine safe setback distances. The safe setback distances would apply to areas directly illuminated by the WSR-88D main beam and the largest setback is 5,712 ft for unsafe or unreliable EEDs. Therefore tall structures in the vicinity of the WSR-88D sites were identified by field inspection of the three sites, review of aerial photographs and FAA Sectional Chart for the New Orleans Area (FAA, 2019), careful inspection of the panoramic photographs contained in Appendix 1, and radius searches for antenna structures registered with the FCC (FCC, 2019).

Existing Site: There are no tall structures within the RF safety setback distances that could be affected by the existing WSR-88D main beam operating at a minimum scan angle of +0.3 deg.

Lacombe Site: The only tall structure within the RF safety setback distances of the Lacombe Site is a water tower located 0.5 mile northeast of the site. That tower is sufficiently distant that it would not substantially block the WSR-88D beam and would be outside all safety setback distances, except for unsafe and unreliable EEDs. It is improbable that that those types of EEDs would be in use at the upper portion of the water tower and no RF hazards would result from relocating the KLIX WSR-88D to the Lacombe Site and operating at a minimum scan angle of +0.3 deg.

Hammond Site: The ATCT at HDC is located about 4,500 ft west-northwest of the Hammond site. The ATCT has a maximum height of 112.5 ft MSL and ground elevation is 40 ft MSL, therefore, the top of structure is at 72.5 ft AGL (Thompson, 2019). The lower half-power point of main beam of the WSR-88D (mounted a 30-m tower) operating at +0.3 deg minimum scan angle would be 84 ft AGL at the ATCT. The WSR-88D main beam would pass over the ATCT cab, which would not be within the main beam.

The search of the FCC web site for antenna structures identified 4 antenna structures within 7,200 ft of the Hammond Site. Two of the structures (comm towers 1 and 2) are visible in Panoramic Photograph 3C in Appendix 1. Table 4 provides information on those structures.

TABLE 4: Tall Structures in Vicinity of Hammond Site

Description	FCC Registration #	Distance, Direction from Site	Structure Height (ft AGL)	Within WSR-88D Main Beam?	RF Hazard?
Cellular Telephone on N. Coburn Road	1252362	6,000 ft NE	130 ft	Yes	No*
Comm Masts at Airport	1231638	3,700 ft NW	33 ft	No	No**
Monopole (comm tower 1)	1231638	6,300 ft SW	157 ft	Yes	No*
Cellular Telephone on Highway 190 (comm tower 2)	1211591	7,200 ft WSW	155 ft	Yes	No*

*Farther from Hammond site than all safe setback distances
** Below lower edge of WSR-88D main beam

NWS plans to perform additional detailed analysis to determine the increase in radar coverage that could be achieved by lowering the minimum scan angle after selecting a relocation site.

NWS will perform an electromagnetic compatibility and electromagnetic interference (EMC/EMI) study to determine if the existing operating frequency of 2,993 MHz should be retained if the KLIX WSR-88D if relocated. Depending on the results of the EMC/EMI study, a new operating frequency within the WSR-88D band of 2,700 to 3,000 MHz may be selected. Assigning a new operating frequency to the relocated WSR-88D would not change the findings of the above RF exposure analysis for any of the sites under consideration.

Summary: Lowering the minimum scan angle of the relocated WSR-88D below the current minimum scan angle of +0.5 deg would not result in RF hazards at any of the three sites.

5 EVALUATION OF WSR-88D SITES

This section compares each of the three sites under consideration against the site evaluation criteria contained in Section 3.

S1: Site Size

All of the sites are of sufficient size to accommodate the proposed NWS Network Weather Radar facility. The Lacombe Site may shift somewhat when the design plans for the St. Tammany Parish EOC and relocated WFO/RFC are finalized. The Hammond Site is bounded by public roads and existing buildings to the west, south and east and a large underground storm drain to the north. Hammond site size is 130 ft x 250 ft, which is rectangular while the criterion conservatively calls for a 210 ft x 210 ft square site. However, the Hammond Site is considered adequate for installation of the relocated WSR-88D. All three sites meet criterion S1.

R1 through R4: Radar Coverage

All three sites meet the radar overage criteria, but vary in coverage altitudes over New Orleans and Baton Rouge. See section 4 for details.

The existing WSR-88D is mounted on a 30-m tower Trees in the vicinity rise to a height of 80 to 90 ft in the vicinity (see Photographs 1A through 1D in Appendix 1) and the WSR-88D main beam clears nearby trees. Trees heights in the vicinity of the Lacombe and Hammond sites are similar in height and a 30-m tower is recommended at either the Lacombe or Hammond sites.

I1: Electric Power

The existing site has electric service. Aboveground three-phase electric power lines are present along State Highway 434 in proximity to the Lacombe site and electric service will be extended to the new WFO/RFC facility. The WSR-88D at the Lacombe Site could receive electric service either through connection to the WFO/RFC or through an individual service connection. Aboveground three-phase power lines are present along Industrial Park Road adjacent to the Hammond Site. All three sites meet criterion I1.

I2: Telecommunications

The existing site has telecommunications service. Overhead telephone lines are present along State Highway 434 near the Lacombe Site. Overhead telephone lines are present along industrial Park Road adjacent to the Hammond Site. All three sites meet criterion I2

I3: Road Access

Road access to all three sites is good. The existing site is accessed by Airport Road, a two-lane paved public road. The Lacombe Site is accessible via State Highway 434, Tamanend Way, and Centerpoint Boulevard, all of which are two-lane paved public roads. The Hammond Site is accessible via Industrial Park Road, a two-lane paved public road. All three sites meet criterion S1.

I4: Bridges and Culverts with limited Weight Capacity

There are no bridges or culverts with limited weight capacity which would limit access to any of the sites. All three sites meet criterion I4.

EC1 and EC2: Government Property, Owner Willing to Sell or Lease Property

The existing, Lacombe, and Hammond sites are all publically owned. The existing site is owned by the City of Slidell and leased to NWS. The Lacombe Site is owned by St Tammany Parish and is available for NWS use (Accardo, 2019). The Hammond Site is owned by the City of Hammond and is available for NWS use (Lobue, 2019). All sites meet criteria EC1 and EC2.

EC3: Potential Contamination

NWS has operated the KLIX WSR-88D and WFO at the existing site for over 20 years and significant contamination is not expected. A search was conducted of environmental databases for potential contamination at the Lacombe and Hammond sites. The search distances conformed to American Society of Testing and Materials 1527 standard (see Appendix 3).

The Lacombe site itself is not listed on any environmental databases. The only listing within the applicable search distances for the Lacombe site is an approved hurricane debris dump site located about 3/8 mile northwest of the site across Highway 434. That site is unlikely to have contaminated the Lacombe site.

The Hammond site itself is not listed on any environmental databases. A facility engaged in manufacture of aircraft engine and engine parts, located 500 south of the site is a Resource Recovery and Conservation Act (RCRA) small quantity generator of hazardous/non-hazardous waste. No violations have been reported for that facility. Additionally, a Confirmed and Potential Sites Inventory (CPI) listing is located at the Air National Guard Combat Communications Squadron facility located about 4,700 ft west of the Hammond Site. CPI sites are areas of potential or confirmed contamination identified by the State of Louisiana. Neither of the facilities in those two listings is likely to have contaminated the Hammond site.

All three sites meet criterion EC3.

EV1: Land Use Compatibility

The KLIX WSR-88D has been located at its existing location at Slidell Airport for 24 years. It is compatible with existing and planned uses in the vicinity.

The Lacombe Site is zoned for Planned Unit development that hosts government, commercial and residential uses, including the main campus of NSTCC. Construction of the St. Tammany EOC and WFO/RFC is planned at this location in the near future. The relocated WSR-88D would be compatible with existing and planned uses at the Lacombe Site (Accardo, 2019).

The Hammond Site is at HDC airport and is zoned for industrial use. Nearby uses are aviation, industrial, and recreational (Oak Knoll Country Club across Industrial Park Road from the site). The City of Hammond is updating the Airport Master Plan and the relocated WSR-88D would be compatible with existing and planned uses at the Lacombe Site (Lobue, 2019).

All three sites meet criterion EV1.

EV2: FAA Height Restrictions

The existing WSR-88D is compatible with FAA Part 77 requirements (Federal Code of Regulations, Title 14, Part 77, *Safe, Efficient Use and Preservation of the Navigable Airspace*). The WSR-88D is located 1,400 ft west of the extended centerline of Runway 18/36 at Slidell Airport. Assuming a 500 ft primary surface for a non-precision instrumented runway, the height of the 7:1 transitional surface at the WSR-88D site is 164 ft AGL, which is above the height of the WSR-88D, 135 ft AGL. The existing WSR-88D complies with FAA Part 77 height restrictions.

The Lacombe Site is greater than 20,000 ft from the nearest airport, Slidell Airport, and the WSR-88D tower would be less than 200 ft AGL. Therefore, filing of 7460-1 with the FAA would not be required and the relocated WSR-88D would comply with Part 77 requirements.

The Hammond Site is located at HDC Airport. The nearest runway is Runway 13/31, located 1,600 ft southwest of the site. Runway 13/31 is currently a non-precision instrumented runway, but could potentially become a precision instrumented runway in the future. Assuming a 1,000 ft primary surface for a precision instrumented runway, the height of the 7:1 transitional surface at the Hammond Site is 157 ft AGL, which is above the height of the relocated WSR-88D on a 30-m tower, 135 ft AGL. The relocated WSR-88D at the Hammond Site would comply with FAA height restrictions for objects at airports. Filing of Form 7460-1 with the FAA would be required for this site.

All three sites meet criterion EV2.

EV3: Setback from Airport Surveillance Radar and ATCT

There is no ATCT or airport surveillance radar at Slidell Airport. The Lacombe site is not located at or near an airport. The Hammond Site is at HDC Airport, which has an ATCT but no airport surveillance radar. The Hammond Site is 4,500 ft from the ATCT which exceeds the 3,000 ft setback distance. All three sites meet criterion EV3.

EV4: Erosion and Geologic Stability

The three sites are located on level cleared land with no signs of accelerated erosion or geologic instability. All three sites meet criterion EV4.

EV5: 100-year Floodplain

The existing WSR-88D site is not within a special flood hazard area, but Airport Road, which provides vehicle access to the WSR-88D is within the 100-year floodplain and is mapped in zone AE – a special flood hazard area (LSU Agcenter, 2019). Airport Road provides the only available road access to the existing site. Thus the existing site partially meets criterion EV5.

The Lacombe Site and is mapped in Zone X – an area of minimal flood hazard, and is not within the 100-year floodplain. Highway 434 between the site and Interstate 12 is not within the 100-year floodplain (LSU Agcenter, 2019).

The Hammond Site is mapped in Zone X – an area of minimal flood hazard, and is not within the 100-year floodplain. Industrial Park Road between the site and State Highway 1064 is mapped in Zone A - a special flood hazard area, and is within the 100-year floodplain. However, the site is also accessible by interior roads at the airport which are not within the 100-year floodplain. Since alternative means of vehicular aces are present that avoid the 100-year floodplain, the Hammond Site meets criterion EV5 (LSU Agcenter, 2019).

The existing site partially meets criterion EV5, while the Lacombe and Hammond sites fully meet criterion EV5.

EV6: Wetlands

Based on a review of National Wetland Inventory maps prepared by the U.S. Fish and Wildlife Service (USFWS), none of the sites contain federal jurisdictional wetlands (USFWS, 2019a). The nearest wetlands to the existing site are a freshwater pond 600 ft southwest and freshwater forested/shrub wetlands 600 ft west. The nearest wetland to the Lacombe Site is a freshwater forested/shrub wetland 700 ft east. The nearest wetland to the Hammond Site is a freshwater pond 500 ft southeast at Oak Knoll Country Club. All three sites meet criterion EV6.

EV7: Farmlands

None of the three sites is located on farmland. All three sites are committed to airport or government uses. No conversion of farmland to non-agricultural use would result from retention of the WSR-88D at its existing site or relocation to the Lacombe or Hammond sites. All three sites meet criterion EV7.

EV8: Threatened and Endangered Species

The U.S. Fish and Wildlife Service (USFWS) was informally consulted and provided data on threatened and endangered species that may occur in the vicinity of the WSR-88D relocation sites (see Appendix 4 for protected species lists for each of the three sites prepared by USFWS). Table 5 lists protected species potentially occurring in St. Tammany and Tangipahoa parishes. Critical habitat has been designated for the West Indian manatee but not for the red-cockaded woodpecker or the gopher tortoise. None of the three sites is located in critical habitat.

Table 5: Protected Species that May Occur in the Vicinity of the Existing and Relocation Sites

Common Name (Scientific Name)	Site(s)	Description	Federal Status
West Indian Manatee *(Trichechus manatus)*	Existing, Lacombe, Hammond	Mammal	Threatened
Red-cockaded woodpecker (*Picoides borealis)*	Existing, Lacombe, Hammond	Bird	Endangered
Gopher Tortoise (*Gopherus Polyphemus)*	Existing, Lacombe, Hammond	Reptile	Threatened

The West Indian Manatee is a marine mammal that inhabits water bodies and would not occur at any of the three sites. The red-cockaded woodpecker is small non-migratory bird about 7 inches in length with a wingspan of about 15 inches. It inhabits open mature pine forest, especially long-leaf pine forest, in the mid-Atlantic and southeastern states (USFWS, 2019b). The Lacombe and Hammond sites have been previously cleared of vegetation and consist of mowed grass fields and do not contain suitable habitat for red-cockaded woodpecker.

Gopher tortoises inhabit open areas with well-drained sandy soils appropriate for burrow establishment in open longleaf pine-scrub oak communities that are periodically thinned or burned. They are known to inhabit disturbed areas along pipeline, powerline, and road right of ways (ROWs) and old fields and pastures. Gopher tortoises occur in St. Tammany and Tangipahoa parishes. Suitable soil types include Latoni, Bassfield, Cahaba, Ruston, Smithdale, Abita, Malbis, Angie and Prentiss (Rieck, 2014).

The Lacombe Site is located within a cleared field and does not contain open woodland; however pine woodland is present near the site. Soil at the Lacombe Site is Stough fine sandy loam 0 to 1% slope and it is somewhat poorly drained (Soil Survey Staff, 2019). Due to its poor drainage, it is not listed among the soils types suitable for gopher tortoises. USFWS was consulted during planning of the Tamanend Development/ St. Tammany Advanced Campus in 2014. As recommended by USFWS, surveys were conducted for gopher tortoises at the State Highway 434 ROW and woodland adjacent to the St. Tammany Parish Coroner's Office, and no gopher tortoises or active, inactive, or abandoned burrows were found (Rieck, 2014). Gopher tortoises are not expected to occur at the Lacombe site.

The Hammond Site is located within a cleared field and does not contain open woodland; however pine-oak woodland is present near the site. Soil at the Hammond Site is Guyton silty loam, 0 to 1% slope, rarely flooded. Guyton soil poorly drained (Soil Survey Staff, 2019). Due to its poor drainage and fine texture, it is not listed among the soils types suitable for gopher tortoises.

None of the three sites contains habitat suitable for West Indian manatees, red-cockaded woodpeckers, or gopher tortoises. All three sites meet criterion EV8.

EV9: Historic Resources

A search of the National Register of Historic Places was performed. None of the three sites is listed as a historic place or is located within an historic district. The closest historic place to the existing WSR-88D site is the Camp Salmen House, located 3 miles to the south in the City of Slidell. The closest historic place to the Lacombe Site is the Lacombe School, located 4.5 miles to the south in the City of Lacombe. The closest historic place to the Hammond Site is Hammond High School, located 3 miles to the west in the City of Hammond. (Louisiana Office of Cultural Development, Division of Historic Preservation, 2019. All three sites meet criterion EV9.

EV10: Scenic Viewsheds

No scenic highways or byways are located in proximity to any of the three sites (Louisiana Byways, 2019). All three sites meet criterion EV10.

EV11: Wild and Scenic Rivers

No designated wild and scenic rivers are located within ¼ mile of any of the three sites. The nearest wild and scenic river is Black Creek Wild and Scenic River in Southern Mississippi (National Park service, 2019). All three sites meet criterion EV11.

Table 6 summarizes the results of the evaluations of all three sites. The existing site meets all criteria, except EV5 - Not in Floodplain, which is partially met because access to the site unavoidably traverses the 100-year floodplain although the site itself is outside the 100-year floodplain. The Lacombe and Hammond sites meet all of the evaluation criteria

The most notable difference between the sites is in radar coverage. Compared to existing coverage, the Lacombe site would modestly lower the altitude of the coverage flood over Baton Rouge by 300 ft and would not change the coverage floor over New Orleans. The Hammond site would lower the altitude of the coverage floor over Baton Rouge by about 2,100 ft and would increase the altitude of the coverage floor over New Orleans by about 500 ft.

Table 6: Summary of Alternative Site Evaluations			
Siting Criteria	**Existing site**	**Lacombe**	**Hammond**
Site Size			
S1: 210 ft x 210 ft	●	●	●
Radar coverage			
R1: Meets or exceeds existing network coverage	●	●	●
R2: High value Military Assets	●	●	●
R3: Terrain blockage minimized	●	●	●
R4: Tree/structure blockage is minimized	●	●	●
Infrastructure			
I1: Electric power	●	●	●
I2: Telecommunications	●	●	●
I3: Roads	●	●	●
I4: No weight-restricted brides	●	●	●
Economic			
E1: Government property	●	●	●
E2: Willing landowner	●	●	●
E3: Low potential contamination	●	●	●
Environmental			
EV1: Compatible land use	●	●	●
EV2: Complies FAA Part 77	●	●	●
EV3: ≥ 3,000 ft from ATCT	●	●	●
EV4: Geologically stable	●	●	●
EV5: Not in floodplain	●	●	●
EV6: No wetlands	●	●	●
EV7: Farmland impacts	●	●	●
EV8: Threatened and endangered species	●	●	●
EV9: Historic / cultural resources	●	●	●
EV10: Scenic highway/wilderness impacts	●	●	●
EV11: ≥ one-quarter mi from wild/scenic rivers	●	●	●

Key: ● Meets Criteria ● Partially Meets Criteria ✕ Doesn't Meet Criteria

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7 REPORT AUTHORS

This site survey report was prepared by Sensor Environmental LLC under contract to Centuria Corporation. Centuria Corporation provides support to the NWS Radar Operations Center (ROC) in Norman, OK.

Mr. James Manitakos, CEO, served as Sensor's Project Manager. Alion Science and Technology Corporation prepared radar coverage maps and calculated coverage areas under subcontract to Sensor. Mr. Andre Tarpinian, Senior Radio Frequency Engineer, served as Alion's Project Manager. Ms. Jessica Schultz, NWS Radar Focal Point, Mr. Edward Ciardi, Program Manager, EVP Weather Systems, and Ms. Cheryl Stephenson from the ROC assisted preparation of this EA. Mr. Bobby Harp from NWS Southern Region and Mr. Benjamin Schott, Meteorologist-in-Charge, and staff from the New Orleans/Baton Rouge, LA, WFO, also assisted preparation of this report.

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APPENDIX 1

Trip Report with Panoramic Photographs, October 2019

TRIP REPORT

Traveler: James Manitakos, Sensor Environmental LLC

Destination: Slidell, LA, area

Dates: Oct. 27 - 30, 2019

Purpose: Field Inspection of existing site and alternative sites for relocation of the KLIX Weather Surveillance Radar, Model 1988 Doppler (WSR-88D) serving the New Orleans/Baton Rouge, LA, area

October 27, 2019: Mr. Manitakos flew from San Francisco, CA, to New Orleans, LA.

October 28, 2019: Weather was 75° F, sunny. In the morning, Mr. Manitakos met with staff from National Weather Service (NWS) Southern region headquarters and New Orleans/ Baton Rouge Weather Forecast Office (WFO). Figure 1 shows the location of the existing KLIX WSR-88D site and two alternative relocation sites identified by NWS. Mr. Manitakos obtained 360-degree panoramic photographs from the 25-meter level of the KLIX WSR-88D tower (see Figure 2).

In the afternoon, NWS staff and Mr. Manitakos met with Dexter Accardo, St. Tammany Parish Emergency Operations Director at the campus of North Shore Technical Community College (NSTCC) in Lacombe, LA. The New Orleans/ Baton Rouge WFO will be relocating adjacent to the NSTCC campus to be co-located with the St. Tammany Parish Emergency Operations Center (EOC). The EOC and WFO will be housed in newly constructed buildings at the campus and a location has been reserved for the WSR-88D adjacent to the WFO building, if NWS decides to move the WSR-88D to this site. Figure 3 is a drawing of the future EOC/WFO. Figure 4 is a photograph of the Lacombe WSR-88D relocation site. Mr. Manitakos obtained 360-degree panoramic photographs from the roof of a NSTCC building about 350 ft northeast of the potential WSR-88D relocation site.

October 29, 2019: Weather was 70° F, mostly cloudy with light showers. NWS staff and Mr. Manitakos met with David Lobue, Director of Hammond North Shore Regional Airport (HDC) in Hammond, Tangipahoa Parish, LA and representatives from Michael Baker and Associates who are updating the HDC Master Plan. The team identified a suitable relocation site for the KLIX WSR-88D at the airport and conducted a field inspection of the site. Figure 5 shows the location of the potential Hammond WSR-88D relocation site. Figure 6 is photograph of the site.

October 30, 2019: Weather was 75° F, overcast with showers. Mr. Manitakos met with Mr. Lobue at HDC, who obtained access to the airport traffic control tower (ATCT). Mr. Manitakos obtained 360-degree panoramic photographs from the cab level of the ATCT about 4,500 ft west of the Hammond WSR-88D relocation site. In the evening, Mr. Manitakos flew back to San Francisco, CA.

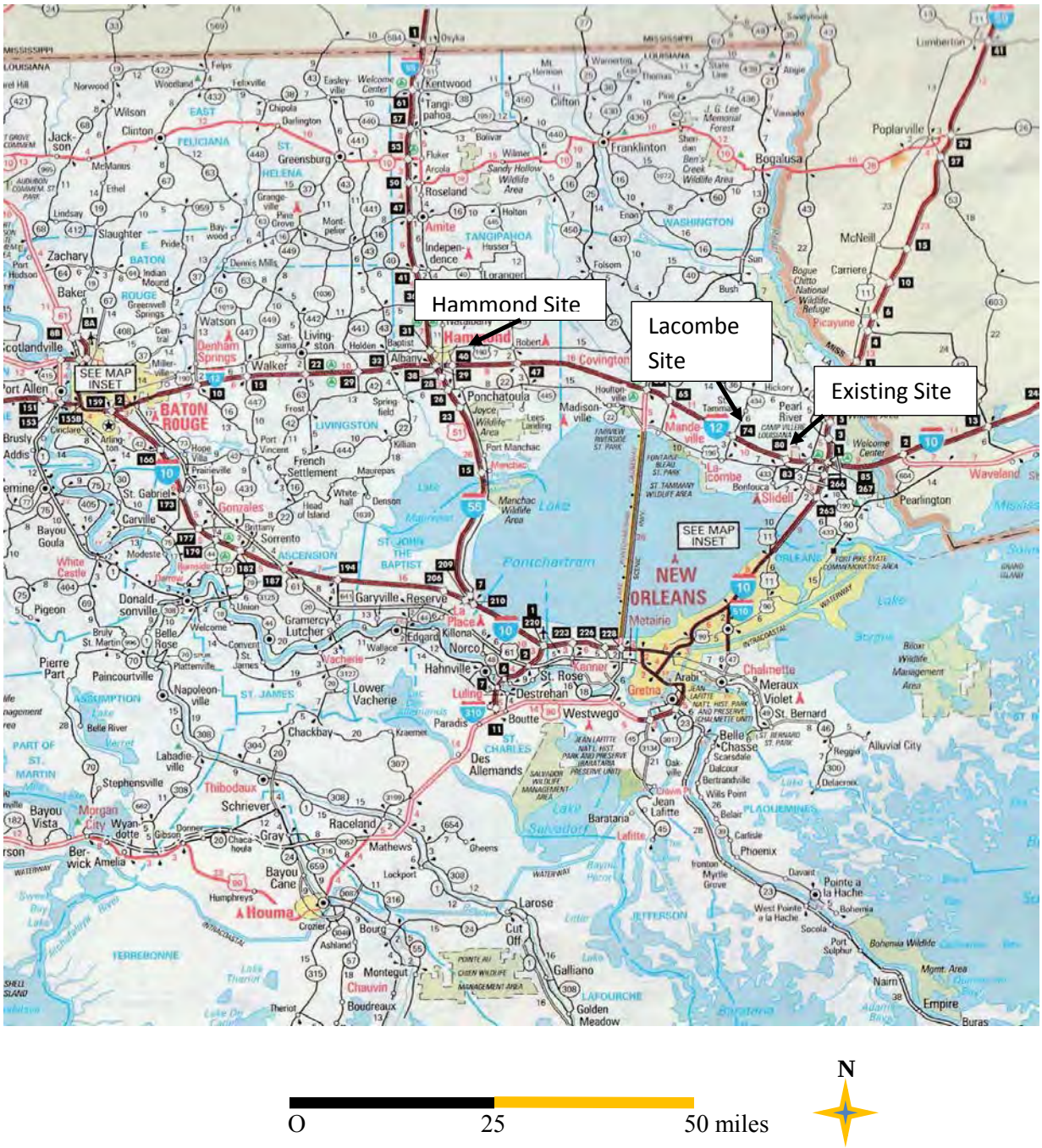


Figure 1: Locations of Existing and Alternative Sites for Relocation of KLIX WSR-88D

Figure 2: Existing KLIX WSR-88D Site, Slidell, LA

Figure 3: Drawing of Future St. Tammany Parish EOC/NWS WFO at Lacombe, LA

Figure 4: Photograph of Alternative KLIX WSR-88D Relocation Site at NSTCC Campus, Lacombe, LA

Figure 5: Location of Alternative KLIX WSR-88D Relocation Site at HDC Airport, Hammond, LA

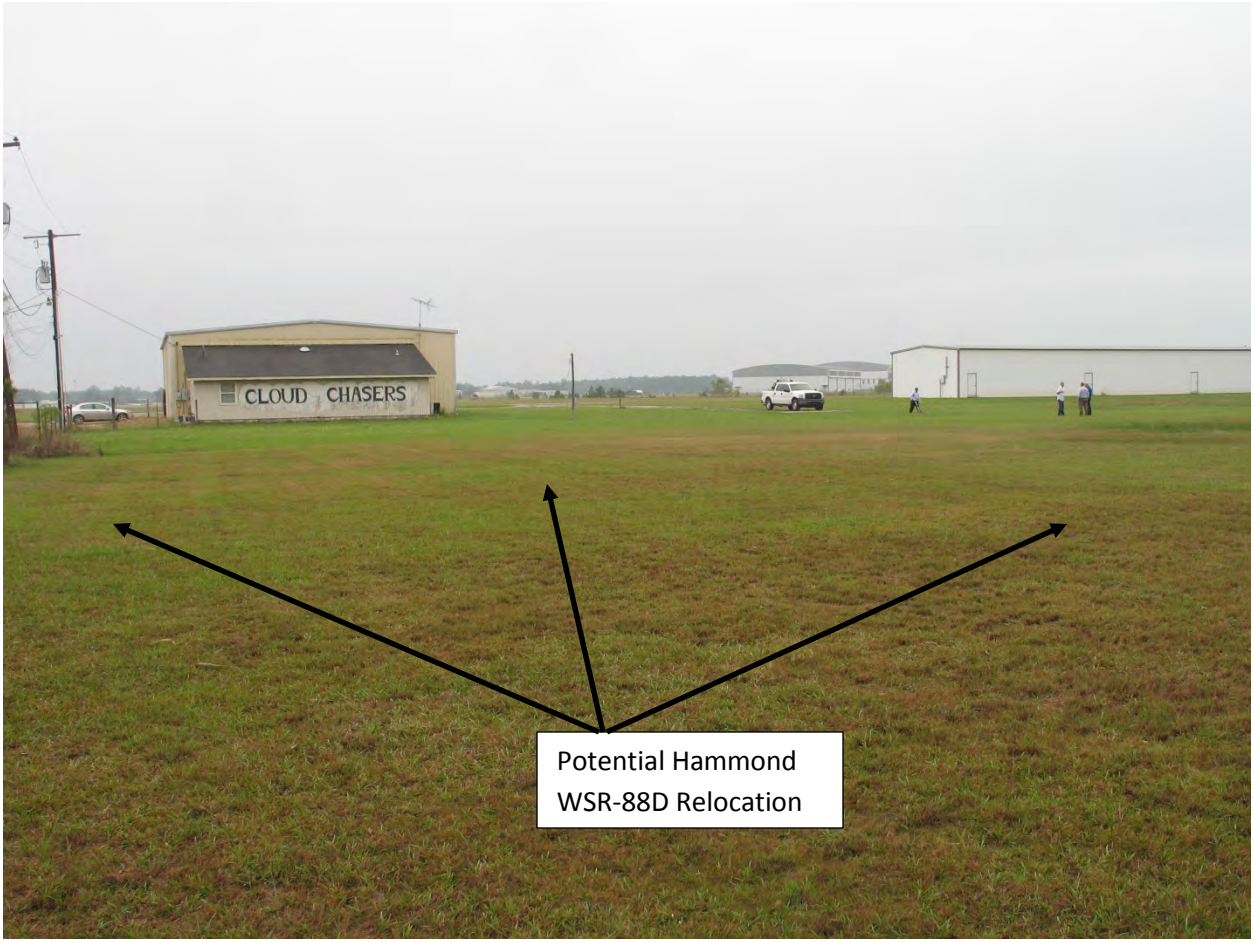
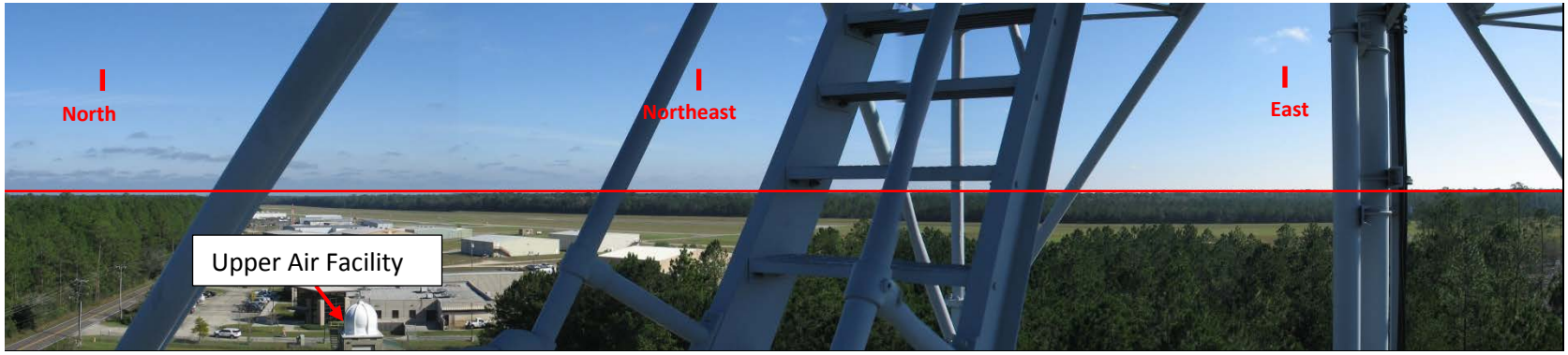


Figure 6: Photograph of Alternative KLIX WSR-88D Relocation Site at HDC Airport, Hammond, LA

ATTACHMENT A

PANORAMIC PHOTOGRAPHS AT EXISTING KLIX WSR-88D AND POTENTIAL RELOCATION SITES

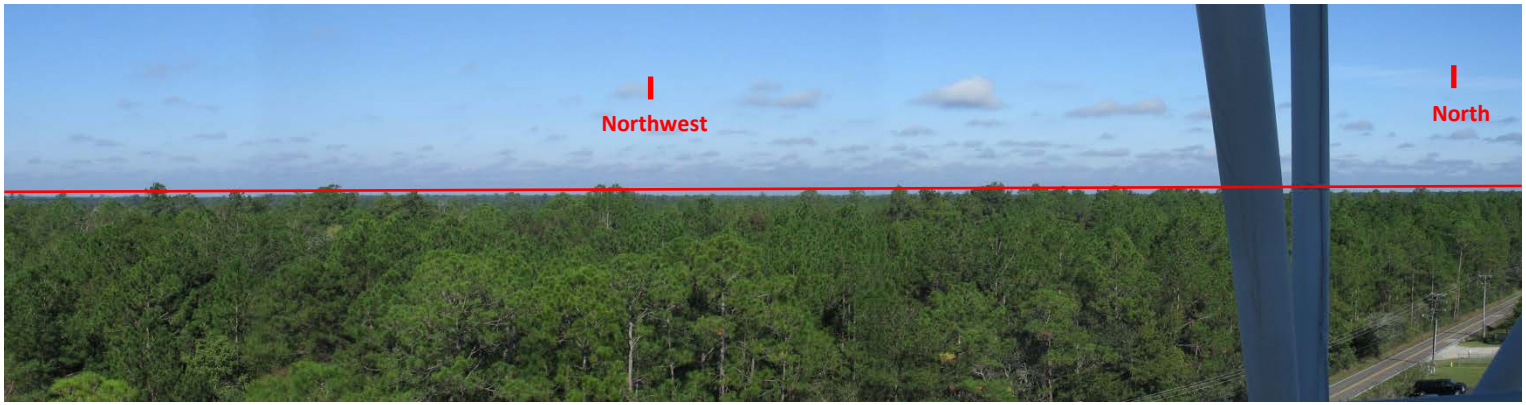
Existing WSR-88D Site, Slidell, LA	
Photography Date	October 28, 2019
Camera Location	25-m level of existing KLIX WSR-88D tower
Camera Height	85 ft aboveground level (AGL)
Camera Elevation	105 ft above mean sea level (MSL)
Coordinates	30°20’12.1’ N, 89°43’31.9” W
Notes	Pano taken at height of 89 ft, about 24 ft below the WSR-88D center of antenna



Photograph 1A: Panoramic photograph, Existing KLIX WSR-88D Site [— 0 deg]

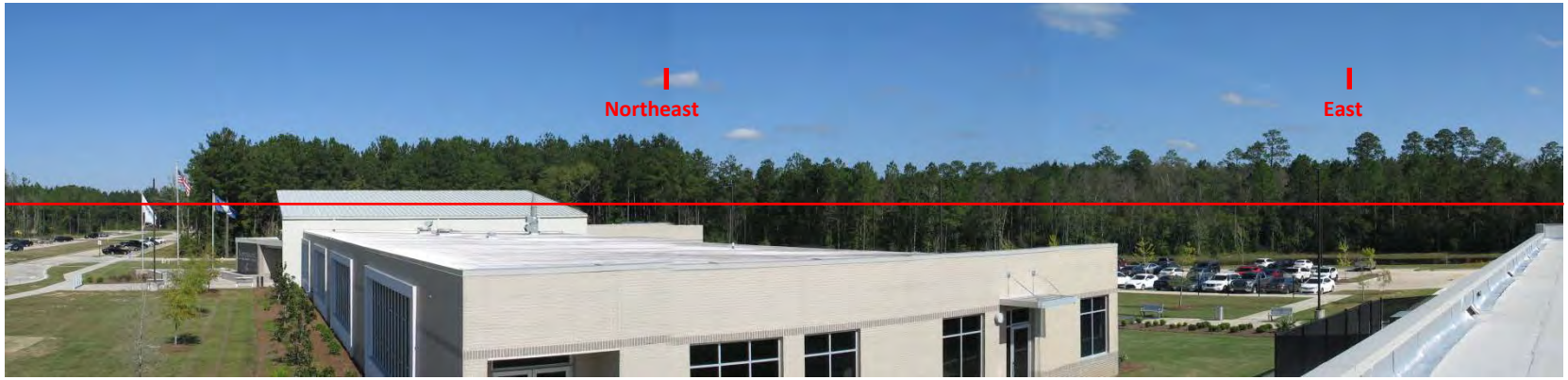
Photograph 1B: Panoramic photograph, Existing KLIX WSR-88D Site [— 0 deg]

Photograph 1C: Panoramic photograph, Existing KLIX WSR-88D Site [— 0 deg]

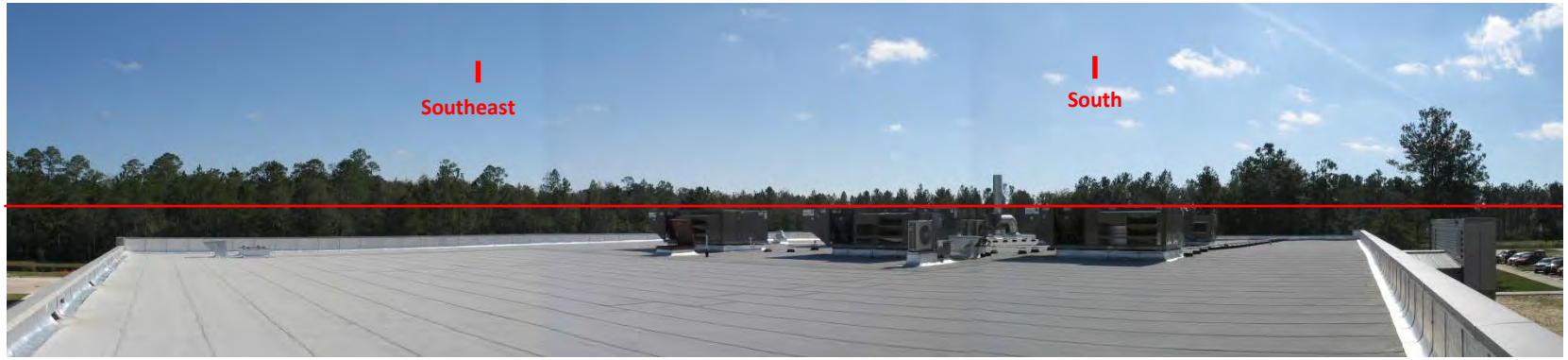


Photograph 1D: Panoramic photograph, Existing KLIX WSR-88D Site [— 0 deg]

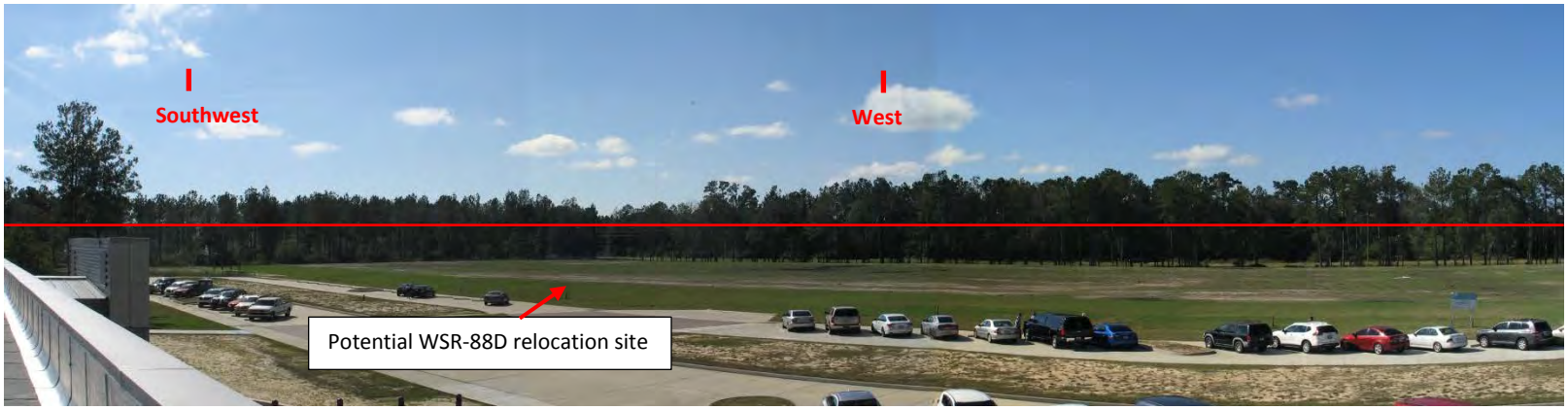
Lacombe Site (Colocated with St. Tammany EOC), Lacombe, LA	
Photography Date	October 28, 2019
Camera Location	Northeast corner of roof of southern NSTCC Building
Camera Height	20 ft aboveground level (AGL)
Camera Elevation	51 ft above mean sea level (MSL)
Coordinates	30°22’42.2’ N, 89°53’59.4” W
Notes	Pano taken from highest nearby structure, camera elevation is about 93 feet lower that the WSR-88D center of antenna would be if located at this site.



Photograph 2A: Panoramic photograph, Lacombe Site [— 0 deg]



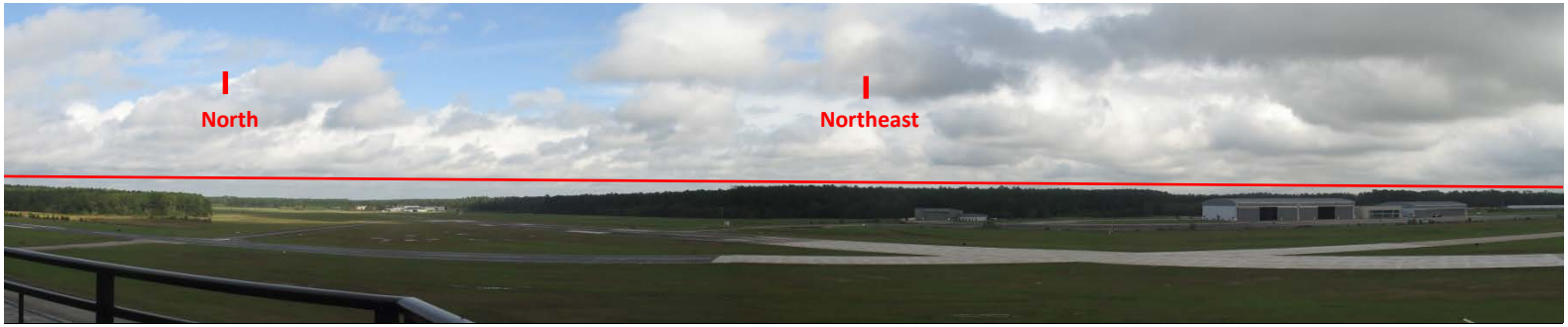
Photograph 2B: Panoramic photograph, Lacombe Site [— 0 deg]



Photograph 2C: Panoramic photograph, Lacombe Site [— 0 deg]

Photograph 2D: Panoramic photograph, Lacombe Site [— 0 deg]

Hammond Site (Hammond North Shore Regional Airport), Hammond, LA	
Photography Date	October 29, 2019
Camera Location	Airport Traffic Control Tower (ATCT)
Camera Height	65 ft aboveground level (AGL)
Camera Elevation	105 ft above mean sea level (MSL)
Coordinates	30°31’18.9 N, 90°25’517.8” W
Notes	Two communications (comm) towers located south-southwest of the ATCT rise above the horizon. They are located 1.20 and 1.37 miles, respectively from the potential WSR-88D relocation site.



Photograph 3A: Panoramic photograph, Hammond Site [— 0 deg]

Photograph 3B: Panoramic photograph, Hammond Site [— 0 deg]

Photograph 3C: Panoramic photograph, Hammond Site [— 0 deg]

Photograph 3D: Panoramic photograph, Hammond Site [— 0 deg]

APPENDIX 2

Calculation of WSR-88D Radiofrequency Radiation Power Density

1. OBJECTIVE

This appendix quantifies the power densities of the radiofrequency radiation (RFR) emitted by the Weather Surveillance Radar, Model 1988 Doppler (WSR-88D) during operations that include minimum scan angles of +0.5 and +0.3 degrees (deg). The calculated power densities will be used to analyze the potential for effects to result from exposure of humans, equipment, and activities to the WSR-88D radio signal, and the significance of any identified potential effects.

2. METHODOLOGY

This memorandum builds upon the analysis included in the 1993 *Supplemental Environmental Assessment (SEA) of the Effects of Electromagnetic Radiation from the WSR-88D Radar* [NEXRAD Joint System program Office, 1993]. The 1993 analysis analyzed the potential electromagnetic effects of the WSR-88D signal when the radar operates at a minimum center of beam scan angle of +0.5 deg. This memorandum builds on that analysis by considering operation at a lower minimum scan angle of +0.3 deg. The parameters of the WSR-88D are shown in Table A1 and are not changed from the 1993 analysis:

TABLE A1: Operating Characteristics of KLIX WSR-88D serving the New Orleans/Baton Rouge, Area

Parameter	**Value**
Operating Frequency	2,993 megahertz (MHz)
Wavelength at WSR-88D center frequency (2,850 MHz)	0.345 ft, 10.5 cm
Maximum pulse power	475 kiloWatts (kW)
Maximum duty cycle	0.21%
Antenna diameter	28 ft, 853 cm
Antenna gain	35,500:1, 45.5 dB
Beam width to half-power points	1.0 deg
First sidelobe relative power density, maximum	0.00325, -25 dB
Other sidelobe maximum power density, relative to main beam	0.0004, -34 dB

The NWS proposes to modify the minimum center of beam scan angle used during operation of the KLIX WSR-88D below the +0.5 angle currently used. This would not require changes to the antenna, other hardware which composes the WSR-88D, or the radiated pulse power of the WSR-88D. However, incorporating scans at angles below +0.5 deg could affect the amount of RFR exposure experienced by persons, equipment, and activities at or near ground level in the vicinity of the radar. This memorandum quantifies that change.

3. MODIFIED VOLUME SCAN PATTERN 31

The WSR-88D uses a number of complex volume scan patterns to maximize the quality and usefulness of the meteorological data it collects. The 1993 report analyzed volume scan pattern 31, which results in the highest levels of ground-level RFR exposure. Volume Scan Pattern (VCP) 31 consists of eight 360 deg rotations of the antenna at various scan angles. NWS proposes to add two additional antenna rotations at a scan angle less than +0.5 to this scan pattern to increase the range at which the radar can detect and track meteorological phenomena, especially at low elevations within the atmosphere. This memorandum assumes that the two added scans would be at +0.3 deg (i.e. lower half power point of -0.2 deg, which is considered to be the lowest practical scan angle for the KLIX WSR-88D.. Adding two +0.3 degree scans would result in the greatest possible increase in ground level RFR exposure. The modified VCP 31 would be as follows:

- Two complete rotations at +0.3 deg
- Two complete rotations at +0.5 deg
- Two complete rotations at +1.5 deg
- Two complete rotations at +2.5 deg
- One complete rotation at +3.5 deg
- One complete rotation at +4.5 deg

The complete pattern would include 10 rotations of the antenna at a speed of 0.8 revolutions per minute (rpm), the pattern would take about 12 minutes and 22 seconds to complete [Turner, 2011].

4. CALCULATION OF RF POWER DENSITIES

Appendix A of the 1993 SEA includes detailed calculations of the RFR power density and exposure levels resulting from volume scan pattern 31. The proposed scan change would not affect the distance of the transition from the near field to the far field, calculated at 640 to 800 ft in section A.3 of the 1993 Appendix A.

4.1 Far Field

The values of U_1, U_2, and U_3 would be unchanged from the values derived in 1993 Appendix A. The maximum pulse power density within the main beam (U_1) is given by the formula:

$$U_1 = 1.44 \times 10^9/R^2 \text{ milliWatts per square centimeter (mW/cm}^2\text{)}$$

where R is the distance from the antenna in ft. The maximum pulse power density at locations greater than 6 deg off the main beam axis (i.e. outside the area illuminated by the main beam and first five sidelobes is U_2 (unchanged from 1993 Appendix A), given below:

$$U_2 = 5.76 \times 10^5/R^2 \text{ mW/cm}^2$$

The RF human exposure standards are based on time-averaged RF exposure for six minutes (occupational exposure) or 30 minutes (general public exposure) [American National Standards Institute/Institute of Electrical and Electronic Engineers, 2005]. We use six minutes as the averaging time as a worst-case analysis. The time-averaged power density for the main beam rotating continuously at +0.5 deg, considering the contributions from both the main beam and the first five sidelobes is given by U_3 (unchanged from 1993 Appendix A), below:

$$U_3 = 1.35 \times 10^4/R^2 \ \ mW/cm^2$$

At this point the analysis must consider the proposed modifications to VCP 31. The modified VCP 31 would have two additional +0.3 deg scans. Within our six minute averaging time, these two added scans would replace the RFR contribution from one +1.5 deg and one +2.5 deg scan. As described in the 1993 appendix, U_4 sums the RFR contributions at center of antenna level from each of the scans performed during the six minute period of interest. The coefficients for the +0.3 deg scans are 2.4/6 reflecting the proportion of the 6 minutes and 1.0 because the center of beam will essentially be at antenna level (i.e. +0.3 deg which equates to 4.2 ft, or one-seventh of the beam width at the far field transition distance of 800 ft). The corresponding coefficients for the two + 0.5 deg scans within the six minutes are 2.4/6 and 0.5, and for the one +1.5 deg scan within the six minutes are 1.2/6 and 0.012. The modified U_4 calculation is given below

$$U_4 = [(2.4/6)\ (1.0) + (2.4/6)\ (0.5) + (1.2/6)\ (0.012)]\ U_3$$
$$U_4 = (0.6024)U_3$$

Inserting the U_3 value of $1.35 \times 10^4/R^2$ milliwatts/cm^2 (mw/ cm^2), yields:

$$U_4 = 8.132 \times 10^3/R^2 \quad mW/cm^2$$

U_4 is the 6-minute time-averaged power density at locations in the far field directly illuminated by the main beam and at the same elevation as the WSR-88D antenna, considering the RFR contributed from the main beam and the first five sidelobes. According to the WSR-88D specification, sidelobes of higher order than the first five will contain less than 5% of the eradiated energy. The 1993 SEA calculated the average power density of these higher order sidelobes at $4/R^2$ mW/cm^2. We add this to U_4 to obtain U_5, the total time-averaged power density at an elevation even with the center of antenna elevation and distances greater than 800 ft from the antenna:

$$U_5 = 8.132 \times 10^3/R^2 \ + 4/R^2 \ = 8.136 \times 10^3/R^2 \quad mW/cm^2$$

4.2 Near Field

Appendix A of the 1993 SEA calculates the height Y of the mathematical cylinder illuminated by all scans during the six-minute period using the formula Y = 28 ÷ R Tan 2 deg + 0.035R.

Since the modified scan pattern of interest includes scans of +0.3, +0.5, and +1.5 degs, the angular range is 1.2 deg, and we recalculate Y as follows:

$$Y = 28 + R \times \text{Tan}(1.2 \text{ deg}) = 28 + 0.021R$$

The circumference of the illumination cylinder is $2\pi RY$ and the total area A is:

$$A = 2\pi RY = 176R + 0.13R^2$$

The average power radiated is less than or equal to 1 kW, and the average power over the cylindrical surface cannot exceed this value divided by the area. At the mid-height of the cylinder, the local power density will exceed the average value by a factor of 2 (unchanged from the 1993 analysis). We introduce this factor, multiply by 10^6 to convert from kW to mW, and divide by 929 to convert from sq ft to square centimeters (sq cm):

$$U_6 = 2 * 10^6 / (929)(176R + 0.13R^2) = 16{,}560 / (R^2 + 1{,}354R) \text{ mW/cm}^2$$

U_6 is the time-averaged RFR exposure within the area illuminated by the WSR-88D main beam up to distances of 640 ft where the beam begins to spread.

4.3 Combined Result and RF Exposure Levels near KLIX WSR-88D

Table A-2 shows the time-averaged RFR power densities that would result at locations directly illuminated by the main beam of the KLIX WSR-88D when operating in modified VCP 31. The near field is within 640 ft of the radar and the U_6 formula is used to calculate these near field values. At greater distances, the far field formula for U_5 is used. For comparison purposes, corresponding values for the original VCP 31 are also shown. As can be seen from Table A2, use of modified scan pattern 31 would lower the elevation at which the lower half-power point (i.e. bottom edge) of the main beam occurs and would also slightly increase the time-averaged power densities in both the near and far fields.

Table A2: Comparison of Time-Average RFR Power Densities at Various Distances within the KLIX WSR-88D Main Beam

Distance (ft)	Distance (mi)	Elevation Change of Lower Half-Power Point (ft)	Original VCP 31 Time-Avg Power Density (mW/cm2)	Modified VCP 31 Time-Avg Power Density (mW/cm^2)
20*	0.004	No change	0.598	0.603
900	0.17	- 3	0.0072	0.0100
5,280	1	-18	0.00021	0.00029
15,840	3	-55	0.000023	0.000032

*surface of WSR-88D radome

NWS may infrequently operate the KLIX WSR-88D with a stationary antenna, resulting in the main beam being continuously pointed at the same location for a period of time. The RF exposure level within the main beam can be calculated using equation U_1 multiplied by the radar duty cycle

$$U_7 = (1.44 \times 10^9/R^2)\ 0.0021 = 3.024 \times 10^6/R^2 \qquad (mW/cm^2)$$

5. EXPOSURE OF PERSONS TO RADIOFREQUENCY RADIATION

The KLIX WSR-88D transmits a radio signal at a frequency of 2,993 MHz, which is within the radiofrequency (RF) or microwave portion of the electromagnetic spectrum. Although microwaves can add heat to objects, they do not contain enough energy to remove electrons from biological tissue, and are a form of non-ionizing radiation. In this regard, microwaves are fundamentally different from ionizing radiations (e.g., X-rays, ultraviolet rays) which occur at higher frequency portions of the electromagnetic spectrum. Ionizing radiation occurs only at frequencies greater than 10^9 MHz. RF or microwave fields are non-ionizing radiation. Due to the fundamental differences between ionizing and non-ionizing radiation, safety standards and guidelines vary greatly for the two types of electromagnetic radiation. In this section only standards for non-ionizing radiation are addressed because KLIX WSR-88D RF emissions are non-ionizing.

The Institute of Electrical and Electronics Engineers (IEEE) developed safety guidelines for human exposure to RFR, and those standards have been adopted by the American National Standards Institute (ANSI) [ANSI/IEEE, 2006]. The ANSI/IEEE safety standard is designed to protect all persons (including infants, elderly persons, and pregnant women) from adverse health effects from exposure to radiofrequency (RF), even if exposure should last over an entire lifetime. These guidelines set safety levels for maximum permissible exposure (MPE) to RF signals, which include a 10- to 50-fold safety margin and are intended to protect all members of the population. MPEs are specified in power density of the radio signal in milliwatts per square centimeter (mW/cm^2) and vary with operating frequency. Separate MPEs have been established for exposure of the general public and workers and for time-averaged exposure and peak exposure. Occupational safety standards are higher than those for the general public because workers are trained in RF safety practices and have greater ability to use that knowledge to protect themselves from potentially harmful RF exposure. The KLIX WSR-88D operating frequency is and 2,993 MHz. The IEEE/ANSI safety standards for those frequencies are 1.0 mW/cm^2 for the general public (averaged over 30 minutes) and 9.98 mW/cm^2 for workers (averaged over 6 minutes).

The Occupational Health and Safety Administration (OSHA) regulates occupational exposure to RF emissions. The OSHA safety standard is similar to the ANSI/IEEE occupational safety standard: 10.0 mW/cm^2 (averaged over 6 minutes) (OSHA, 2015).

Federal Communications Commission (FCC) RF exposure standards for RF exposure of the general public are the same as the ANSI/IEEE: 1.0 mW/cm^2 averaged over 30 minutes). The FCC RF exposure standard for occupational exposure is somewhat lower that the ANSI/IEEE safety level: 5.0 mW/cm^2 (averaged over 6 minutes).

The KLIX WSR-88D is mounted on a 30 m tall steel-lattice tower. Ground elevation is 24 ft MSL. The center of the antenna is at 114 ft MSL and the lower edge of the antenna is 100 ft above ground level (AGL). When operating at the current minimum scan angle of +0.5 deg, the lower edge of the beam is at 0.0 deg (i.e. horizontal) and the radar's main beam does not impinge on the ground surface or any structures in proximity to the radar. Operating at the proposed minimum scan angle of +0.3 deg would not change that situation; the main beam would still not impinge on the ground surface or structures within 3 miles of the WSR-88D.

Compared to the existing minimum scan angle of +0.5 deg, lowering the minimum scan angle to +0.3 deg would result in a slight increase in RF exposure levels at air space in the vicinity of the radar. Table A3 compares RF power densities to safety standards for human exposure. During normal operation of the WSR-88D with a rotating antenna, RF exposure levels at all locations would comply with safety standards for exposure of both workers (i.e. occupational exposure) and the general public.

Table A3: RF Power Density within KLIX WSR-88D Main Beam Compared to ANSI/IEEE Safety Standards

Distance from Radar	Time-Averaged Power Density (mW/cm^2)	ANSI/IEEE General Public RF Safety Standard		ANSI/IEEE Occupational RF Safety Standard	
		Safety Standard (mW/cm^2)	Factor Below Std	Safety Standard (mW/cm^2)	Factor Below Std
20 ft*	0.603	1.0	1.65	9.98	16.5
900 ft	0.0100	1.0	100	9.98	998
1 mile	0.00029	1.0	3,450	9.98	34,400
3 miles	0.000023	1.0	43,400	9.98	433,000

*surface of WSR-88D radome

During infrequent stationary antenna operation, time-averaged RF exposure levels within the WSR-88D main beam would be higher than during normal operation. When operating in stationary antenna mode, the KLIX WSR-88D would exceed the ANSI/IEEE safety levels within the following distances:

ANSI/IEEE and FCC General Public Safety Level (1.0 mW/cm^2): 1,740 ft
FCC Occupational Safety Level (5.0 mW/cm^2): 780 ft
ANSI/IEEE Occupational Safety Level (9.37 mW/cm^2): 568 ft

The KLIX WSR-88D operating at +0.3 deg would not impinge on the ground surface or any structures within those distance and risks to human health would not result.

RF Electro-stimulation

The ANSI/IEEE safety guidelines also address possible induction of currents within the bodies of persons and the potential for electro-stimulation of persons who make contact with conductive objects in the RFR field. The result is potentially harmful sensation of shock and/or burn. These effects only occur for RF fields at frequencies below 110 MHz (ANSI/IEEE, 2006). The KLIX WSR-88D would continue to operate at 2,993 MHz, outside the frequency range where induced currents or electro-simulation occur, and would not cause these effects.

Cumulative RF Exposure

As shown in Table 3, the power density of RF transmissions decreases exponentially with distance from the antenna. At all locations in the vicinity, RF emitted by the WSR-88D during normal operation would be at substantially below the safety standard for RF exposure of the general public. It is improbable that radio emissions from an external source would add to the WSR-88D RF emissions during normal operation to cause cumulative RF exposure levels exceeding safety standards.

6. RF EXPOSURE OF EQUIPMENT AND ACTIVITIES

Television, Radio, Cellular Telephone, and Personal Communications Devices (PCDs)

High-power radar, such as the WSR-88D, can interfere with operation of radio, television, cellular telephone, and PCDs in close vicinity to the radar antenna. However, these devices operate at different frequencies from the WSR-88D, reducing the potential for radio interference. NTIA regulations reserve the 2,700 to 3,000 MHz band for government radiolocation users (e.g., meteorological and aircraft surveillance radars) [NTIA, 2009]. The WSR-88D operates outside the frequencies used by television and radio broadcasts, cellular telephones, and personal communication devices. NWS has not received any recent reports of the KLIX WSR-88D interfering with operation of other radio uses (Schultz, 2019). Lowering the minimum scan angle to +0.3 deg would not result in the main beam impinging on the ground surface within 3 miles of the radar and the potential for radio interference would be low.

Electro-explosive Devices (EEDs)

Electro-explosive devices are used to detonate explosives, separate missiles from aircraft, and propel ejection seats from aircraft. Under extreme circumstances, electromagnetic radiation can cause unintended firing of EEDs. Calculations based on a U.S. Air Force (USAF) standard indicate that using electric blasting caps at distances beyond approximately 900 ft from the WSR-88D is a safe practice, even in the main beam of the radar, where the power density of the WSR-88D radio signal is greatest [USAF, 1982]. The U.S. Navy Hazards of Electromagnetic Radiation to Ordnance (HERO) regulations classify ordnance as safe, susceptible, or unsafe and unreliable, based on compliance with MIL-STD 664 (series). HERO safe ordnance is considered safe in all RFR environments. HERO susceptible ordnance may be detonated by RF energy under certain circumstances. HERO unsafe or unreliable ordnance has not been evaluated for compliance with MILSTD 664 or is being assembled, dissembled, or subject to unauthorized conditions, which can increase its sensitivity to RF emissions. Safe separation distances vary for susceptible and unsafe or unreliable ordnance [Naval Sea Systems Command, 2008]. For HERO susceptible ordnance, the safe separation distance (D) in ft is calculated as follows:

$$D = (781)\ (f)^{-1}(\text{average power x antenna gain})^{½}$$

Where f is operating frequency in MHz and average power = maximum transmitted power × duty cycle. Inserting these values gives:

$$D = (781)\ (2{,}993)^{-1}\ (475{,}000\ \text{W} \times 0.0021 \times 35{,}500)^{½}\ \text{ft}$$

$$D = 1{,}552\ \text{ft}$$

For HERO unsafe or unreliable ordnance, the safe separation distance (D) in ft is calculated as follows:

$$D = (2{,}873)\ (f)^{-1}(\text{average power x antenna gain})^{½}$$

$$D = (2{,}873)\ (2{,}993)^{-1}\ (475{,}000\ \text{W} \times 0.0021 \times 35{,}500)^{½}\ \text{ft}$$

$$D = 5{,}712\ \text{ft}$$

HERO concerns are only applicable in locations illuminated by the main beam of the radar. When operating at a minimum scan angle of +0.3 deg, the KLIX WSR-88D main beam would not illuminate the ground within either 1,552 or 5,712 ft of the radar. The WSR-88D would not be a hazard to EEDs use in the vicinity. No mitigation is necessary.

Fuel Handling

Electromagnetic fields can induce currents in conductive materials and those currents can generate sparks when contacts between conductive materials are made or broken. Sparks can ignite liquid fuels, such as gasoline. This phenomenon is rare, but can result in hazards to human health and property. This potential hazard arises during the transfer of fuel from container to another (e.g., fueling an automobile, boat, or airplane). The U.S. Navy developed a Technical

Manual identifying the circumstances where this hazard may occur and providing direction on how to prevent it. The Technical Manual identifies a safe standoff distance based on radar operating characteristics [Naval Sea Systems Command, 2003]. Using formula contained in the Technical Manual, the distance from the WSR-88D at which RFR hazards to fuel may occur is 537 ft. This hazard only exists in areas directly illuminated by the main beam. The WSR-88D main beam operating at a minimum center of antenna scan angle of +0.3 deg would not illuminate the ground or any structures within 537 ft of the radar. The existing fuel tank for the standby generator at the base of the WSR-88D tower would not be illuminated by the WSR-88D main beam and hazards to fuel handling activities would not result. No mitigation is required.

Active Implantable Medical Devices

ANSI and the Association for Advancement of Medical Instrumentation (AAMI) developed the PC69:2007 standard to prevent external electromagnetic sources from causing electromagnetic interference with active implantable medical devices, including cardiac pacemakers and implantable cardiac defibrillators [ANSI/AAMI, 2007]. This standard specifies that cardiac pacemakers and ICDs must be tested by exposing them to a specified magnetic field and that the device must operate without malfunction or harm to the device. The specified field strength varies with frequency. For the WSR-88D operating frequency of 2,993 MHz, the field strength is 3 A/m. This is converted to power density (S) in units of W/m^2 by assuming free air impedance of 377 ohms:

$$S = 377\ |3|^2 \quad W/m^2$$

$$S = 3{,}393\ W/m^2$$

To convert to mW/cm^2, we multiply the numerator by 1,000 mW/W and the divisor by 10,000 $cm^2/\ m^2$ which gives a value of 339.3 mW/cm^2. The peak pulse power of the WSR-88D is given by the following formula (see Appendix A):

$$U_1 = 1.44\ X\ 10^9/R^2\ mW/cm^2$$

Inserting R = 2,060 ft gives a value of 339.3 mW/cm^2, which equals the threshold established by PC69:2007 standard. At distances of 2,060 ft or greater, the main beam of the WSR-88D would not adversely affect implantable medical devices. There would also be no hazards to implantable medical devices at locations outside the main beam. Operating at the minimum potential center of beam scan angle of +0.3 deg, the main beam of the KLIX WSR-88D would not illuminate the ground or structures within 2,060 ft of the radar and no hazards would results to persons with implanted devices.

Theoretically, persons in aircraft flying within 2,060 ft of the radar could be exposed to RF levels above the device susceptibility threshold set by ANSI/AAMI, but the likelihood of significant harm is extremely low. For persons in aircraft, the airframe would attenuate the RF level and the duration of exposure would be far less than the averaging time (6 to 30 minutes) specified in the RF safety standards, reducing the amount of RF exposure. Additionally, device susceptibility

threshold in the PC69:2007 standard is based on coupling of the RFR directly into the device leads (which is the test protocol); the WSR-88D signal would be incident upon the surface of the body and would decrease considerably in strength at the location of the device leads within the body. Third, even in the unlikely event that the WSR-88D RFR couples into the device at levels above the susceptibility threshold, the device would revert to safe mode of operation that would prevent significant harm to the wearer or damage to the device [ANSI/AAMI, 2007].

FCC regulations at 47 CFR Part 95.1221 require that MedRadio medical implant devices and medical body-worn transmitters be able to withstand exposure to RF at the MPEs specified in FCC regulations at 47 CFR 1.1310 (FCC, 2017). As described in Section 4.1 above, RF exposure levels in the vicinity of the KLIX WSR-88D would comply with the FCC safety standards. Exposure of persons wearing implantable medical devices to the KLIX WSR-88D radio emissions would not result in adverse effects.

7. SUMMARY OF RF EXPOSURE EFFECTS

Table A4 summarizes impacts to potentially RF-sensitive equipment and activities. The potential for the proposed action to cause radio interference with other radio users would be very low.

Table A4: RF Effects of KLIX WSR-88D on Equipment and Activities

Equipment / Activity	Applicable Standard	Setback Distance	Would Main Beam Impinge on Ground Within Setback Distance?	Potential for Significant Effects
Television, Radio, and Cellular Telephone, and Personal Communications Devices (PCDs)	NTIA Frequency Allocations	n/a	n/a	Very Low
EEDs	U.S. Navy HERO	5,712 ft	No	Very Low
Fuel Handling	U.S. Navy Hazards to Personnel, Fuel, and Other Flammable Material	537	No	Very Low
Active Implantable Medical Devices	AAMI PC69:2007, FCC 47 CFR Part 95.1221	2,060	No	Very Low

8. REFERENCES

American National Standards Institute / Institute of Electrical and Electronic Engineers (ANSI/IEEE). *IEEE Standard for Safety Levels with respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz*. IEEE Std C95.1-2005 (April 19, 2006).

ANSI/AAMI. *American National Standard, Active Implantable Medical Devices – Electromagnetic compatibility – EMC test protocols for cardiac pacemakers and implantable cardioverter defibrillators*, ANSI/AAMI PC69:2007 (2007).

Ciardi, Edward, Program Manager, EVP Weather Systems, Centuria Corporation. Personal communication to James Manitakos, Sensor Environmental LLC, (September 19. 2019).

FCC. Title 47 Code of Federal Regulations Part 1.1310 *Radiofrequency Radiation Exposure Limits* and Part 95.1221 *Medical Device Radiocommunication Service, RF Exposure*, https://www.law.cornell.edu/cfr/text/47/1.1310 (accessed May 6, 2017).

Naval Sea Systems Command. *Technical Manual, Electromagnetic Radiation Hazards (U), (Hazards to Personnel, Fuel, and Other Flammable Material) (U),* NAVSEA OP 3565/NAVAIR 16-1-529, Volume 1, Sixth Revision (February 1, 2003).

Naval Sea Systems Command. *Technical Manual, Electromagnetic Radiation Hazards (U), (Hazards to* Ordnance*) (U)*, NAVSEA OP 3565/NAVAIR 16-1-529, Volume 2, Seventeenth Revision, (September 11, 2008).

Next Generation Weather Radar Joint System Program Office (JSPO), *Final Supplemental Environmental Assessment (SEA) of the Effects of Electromagnetic Radiation from the WSR-88D Radar* (April 1993).

NTIA. *Manual of Regulations and Procedures for Federal Radio Frequency Management* (revised September 2009).

NWS. *Next Generation Weather Radar Programmatic Environmental Impact Statement (PEIS), Report R400-PE201* (1984).

APPENDIX 3

Environmental Database Radius Search Reports

Radius Report

GeoLens by GeoSearch

Target Property:

Lacombe KLIX WSR-88D Site
65556 Centerpoint Blvd
Lacombe, St. Tammany Parish, Louisiana 70445

Prepared For:

Sensor Environmental LLC

Order #: 136481
Job #: 326129
Project #: 201903
Date: 12/03/2019

Table of Contents

Disclaimer

This report was designed by GeoSearch to meet or exceed the records search requirements of the All Appropriate Inquiries Rule (40 CFR Â§312.26) and the current version of the ASTM International E1527, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process or, if applicable, the custom requirements requested by the entity that ordered this report. The records and databases of records used to compile this report were collected from various federal,state and local governmental entities. It is the goal of GeoSearch to meet or exceed the 40 CFRÂ§312.26 and E1527 requirements for updating records by using the best available technology. GeoSearch contacts the appropriate governmental entities on a recurring basis. Depending on the frequency with which a record source or database of records is updated by the governmental entity, the data used to prepare this report may be updated monthly, quarterly, semi-annually, or annually.

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Target Property Summary

Target Property Information

Lacombe KLIX WSR-88D Site
65556 Centerpoint Blvd
Lacombe, Louisiana 70445

Coordinates
Area centroid (-89.901375, 30.3781095)
31 feet above sea level

USGS Quadrangle
Saint Tammany, LA

Geographic Coverage Information

County/Parish: St. Tammany (LA)
ZipCode(s):
Lacombe LA: 70445
Slidell LA: 70460

Database Summary

FEDERAL LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
EMERGENCY RESPONSE NOTIFICATION SYSTEM	ERNSLA	0	0	TP/AP
FEDERAL ENGINEERING INSTITUTIONAL CONTROL SITES	EC	0	0	TP/AP
LAND USE CONTROL INFORMATION SYSTEM	LUCIS	0	0	TP/AP
RCRA SITES WITH CONTROLS	RCRASC	0	0	TP/AP
RESOURCE CONSERVATION & RECOVERY ACT - GENERATOR	RCRAGR06	0	0	0.1250
RESOURCE CONSERVATION & RECOVERY ACT - NON-GENERATOR	RCRANGR06	0	0	0.1250
BROWNFIELDS MANAGEMENT SYSTEM	BF	0	0	0.5000
DELISTED NATIONAL PRIORITIES LIST	DNPL	0	0	0.5000
NO LONGER REGULATED RCRA NON-CORRACTS TSD FACILITIES	NLRRCRAT	0	0	0.5000
RESOURCE CONSERVATION & RECOVERY ACT - NON-CORRACTS TREATMENT, STORAGE & DISPOSAL FACILITIES	RCRAT	0	0	0.5000
SUPERFUND ENTERPRISE MANAGEMENT SYSTEM	SEMS	0	0	0.5000
SUPERFUND ENTERPRISE MANAGEMENT SYSTEM ARCHIVED SITE INVENTORY	SEMSARCH	0	0	0.5000
NATIONAL PRIORITIES LIST	NPL	0	0	1.0000
NO LONGER REGULATED RCRA CORRECTIVE ACTION FACILITIES	NLRRCRAC	0	0	1.0000
PROPOSED NATIONAL PRIORITIES LIST	PNPL	0	0	1.0000
RESOURCE CONSERVATION & RECOVERY ACT - CORRECTIVE ACTION FACILITIES	RCRAC	0	0	1.0000
RESOURCE CONSERVATION & RECOVERY ACT - SUBJECT TO CORRECTIVE ACTION FACILITIES	RCRASUBC	0	0	1.0000

SUB-TOTAL		0	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
AEROMETRIC INFORMATION RETRIEVAL SYSTEM / AIR FACILITY SUBSYSTEM	AIRSAFS	0	0	TP/AP
BIENNIAL REPORTING SYSTEM	BRS	0	0	TP/AP
CERCLIS LIENS	SFLIENS	0	0	TP/AP
CLANDESTINE DRUG LABORATORY LOCATIONS	CDL	0	0	TP/AP
EPA DOCKET DATA	DOCKETS	0	0	TP/AP
ENFORCEMENT AND COMPLIANCE HISTORY INFORMATION	ECHOR06	0	0	TP/AP
FACILITY REGISTRY SYSTEM	FRSLA	0	0	TP/AP

Database Summary

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
HAZARDOUS MATERIALS INCIDENT REPORTING SYSTEM	HMIRSR06	0	0	TP/AP
INTEGRATED COMPLIANCE INFORMATION SYSTEM (FORMERLY DOCKETS)	ICIS	0	0	TP/AP
INTEGRATED COMPLIANCE INFORMATION SYSTEM NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM	ICISNPDES	0	0	TP/AP
MATERIAL LICENSING TRACKING SYSTEM	MLTS	0	0	TP/AP
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM	NPDESR06	0	0	TP/AP
PCB ACTIVITY DATABASE SYSTEM	PADS	0	0	TP/AP
PERMIT COMPLIANCE SYSTEM	PCSR06	0	0	TP/AP
SEMS LIEN ON PROPERTY	SEMSLIENS	0	0	TP/AP
SECTION SEVEN TRACKING SYSTEM	SSTS	0	0	TP/AP
TOXIC SUBSTANCE CONTROL ACT INVENTORY	TSCA	0	0	TP/AP
TOXICS RELEASE INVENTORY	TRI	0	0	TP/AP
ALTERNATIVE FUELING STATIONS	ALTFUELS	0	0	0.2500
FEMA OWNED STORAGE TANKS	FEMAUST	0	0	0.2500
HISTORICAL GAS STATIONS	HISTPST	0	0	0.2500
INTEGRATED COMPLIANCE INFORMATION SYSTEM DRYCLEANERS	ICISCLEANERS	0	0	0.2500
MINE SAFETY AND HEALTH ADMINISTRATION MASTER INDEX FILE	MSHA	0	0	0.2500
MINERAL RESOURCE DATA SYSTEM	MRDS	0	0	0.2500
OPEN DUMP INVENTORY	ODI	0	0	0.5000
SURFACE MINING CONTROL AND RECLAMATION ACT SITES	SMCRA	0	0	0.5000
URANIUM MILL TAILINGS RADIATION CONTROL ACT SITES	USUMTRCA	0	0	0.5000
DEPARTMENT OF DEFENSE SITES	DOD	0	0	1.0000
FORMER MILITARY NIKE MISSILE SITES	NMS	0	0	1.0000
FORMERLY USED DEFENSE SITES	FUDS	0	0	1.0000
FORMERLY UTILIZED SITES REMEDIAL ACTION PROGRAM	FUSRAP	0	0	1.0000
RECORD OF DECISION SYSTEM	RODS	0	0	1.0000

SUB-TOTAL		0	0	

Database Summary

STATE (LA) LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
SITES WITH CONTROLS	IC	0	0	TP/AP
NO LONGER REPORTED UNDERGROUND STORAGE TANKS	NLRUST	0	0	0.2500
UNDERGROUND STORAGE TANKS	UST	0	0	0.2500
APPROVED HURRICANE DEBRIS DUMP SITES	ADS	1	0	0.5000
HISTORICAL LEAKING UNDERGROUND STORAGE TANKS	HLUST	0	0	0.5000
LEAKING UNDERGROUND STORAGE TANKS	LUST	0	0	0.5000
SOLID WASTE LANDFILLS	SWLF	0	0	0.5000
VOLUNTARY REMEDIATION PROGRAM SITES	VRP	0	0	0.5000
CONFIRMED AND POTENTIAL SITES INVENTORY	CPI	0	0	1.0000
SUB-TOTAL		1	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
ASBESTOS DEMOLITION AND RENOVATION NOTIFICATION PROJECTS	ASBESTOS	0	0	TP/AP
CLANDESTINE DRUG LABORATORY LOCATIONS	CDL	0	0	TP/AP
LISTING OF LOUISIANA DEQ LIENS	LIENS	0	0	TP/AP
SPILLS LISTING	SPILLS	0	0	TP/AP
WASTE TIRE GENERATOR LIST	WASTETIRE	0	0	TP/AP
DRYCLEANING FACILITIES	DCR	0	0	0.2500
RECYCLING FACILITIES	RCY	0	0	0.5000
WASTE PITS	WP	0	0	0.5000
SUB-TOTAL		0	0	

TRIBAL LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
UNDERGROUND STORAGE TANKS ON TRIBAL LANDS	USTR06	0	0	0.2500
LEAKING UNDERGROUND STORAGE TANKS ON TRIBAL LANDS	LUSTR06	0	0	0.5000
OPEN DUMP INVENTORY ON TRIBAL LANDS	ODINDIAN	0	0	0.5000
SUB-TOTAL		0	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
INDIAN RESERVATIONS	INDIANRES	0	0	1.0000
SUB-TOTAL		0	0	
TOTAL		1	0	

Database Radius Summary

FEDERAL LISTING

*Standard environmental records are displayed in **bold**.*

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
AIRSAFS	0.0200	0	NS	NS	NS	NS	NS	0
BRS	0.0200	0	NS	NS	NS	NS	NS	0
CDL	0.0200	0	NS	NS	NS	NS	NS	0
DOCKETS	0.0200	0	NS	NS	NS	NS	NS	0
EC	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
ECHOR06	0.0200	0	NS	NS	NS	NS	NS	0
ERNSLA	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
FRSLA	0.0200	0	NS	NS	NS	NS	NS	0
HMIRSR06	0.0200	0	NS	NS	NS	NS	NS	0
ICIS	0.0200	0	NS	NS	NS	NS	NS	0
ICISNPDES	0.0200	0	NS	NS	NS	NS	NS	0
LUCIS	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
MLTS	0.0200	0	NS	NS	NS	NS	NS	0
NPDESR06	0.0200	0	NS	NS	NS	NS	NS	0
PADS	0.0200	0	NS	NS	NS	NS	NS	0
PCSR06	0.0200	0	NS	NS	NS	NS	NS	0
RCRASC	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
SEMSLIENS	0.0200	0	NS	NS	NS	NS	NS	0
SFLIENS	0.0200	0	NS	NS	NS	NS	NS	0
SSTS	0.0200	0	NS	NS	NS	NS	NS	0
TRI	0.0200	0	NS	NS	NS	NS	NS	0
TSCA	0.0200	0	NS	NS	NS	NS	NS	0
RCRAGR06	**0.1250**	**0**	**0**	**NS**	**NS**	**NS**	**NS**	**0**
RCRANGR06	**0.1250**	**0**	**0**	**NS**	**NS**	**NS**	**NS**	**0**
ALTFUELS	0.2500	0	0	0	NS	NS	NS	0
FEMAUST	0.2500	0	0	0	NS	NS	NS	0
HISTPST	0.2500	0	0	0	NS	NS	NS	0
ICISCLEANERS	0.2500	0	0	0	NS	NS	NS	0
MRDS	0.2500	0	0	0	NS	NS	NS	0
MSHA	0.2500	0	0	0	NS	NS	NS	0
BF	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
DNPL	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
NLRRCRAT	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
ODI	0.5000	0	0	0	0	NS	NS	0
RCRAT	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**

Database Radius Summary

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
SEMS	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
SEMSARCH	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
SMCRA	0.5000	0	0	0	0	NS	NS	0
USUMTRCA	0.5000	0	0	0	0	NS	NS	0
DOD	1.0000	0	0	0	0	0	NS	0
FUDS	1.0000	0	0	0	0	0	NS	0
FUSRAP	1.0000	0	0	0	0	0	NS	0
NLRRCRAC	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
NMS	1.0000	0	0	0	0	0	NS	0
NPL	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
PNPL	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
RCRAC	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
RCRASUBC	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
RODS	1.0000	0	0	0	0	0	NS	0
SUB-TOTAL		0	0	0	0	0	0	0

Database Radius Summary

STATE (LA) LISTING

*Standard environmental records are displayed in **bold**.*

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
ASBESTOS	0.0200	0	NS	NS	NS	NS	NS	0
CDL	0.0200	0	NS	NS	NS	NS	NS	0
IC	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
LIENS	0.0200	0	NS	NS	NS	NS	NS	0
SPILLS	0.0200	0	NS	NS	NS	NS	NS	0
WASTETIRE	0.0200	0	NS	NS	NS	NS	NS	0
DCR	0.2500	0	0	0	NS	NS	NS	0
NLRUST	**0.2500**	**0**	**0**	**0**	**NS**	**NS**	**NS**	**0**
UST	**0.2500**	**0**	**0**	**0**	**NS**	**NS**	**NS**	**0**
ADS	**0.5000**	**0**	**0**	**1**	**0**	**NS**	**NS**	**1**
HLUST	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
LUST	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
RCY	0.5000	0	0	0	0	NS	NS	0
SWLF	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
VRP	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
WP	0.5000	0	0	0	0	NS	NS	0
CPI	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**

SUB-TOTAL		0	0	1	0	0	0	1

Database Radius Summary

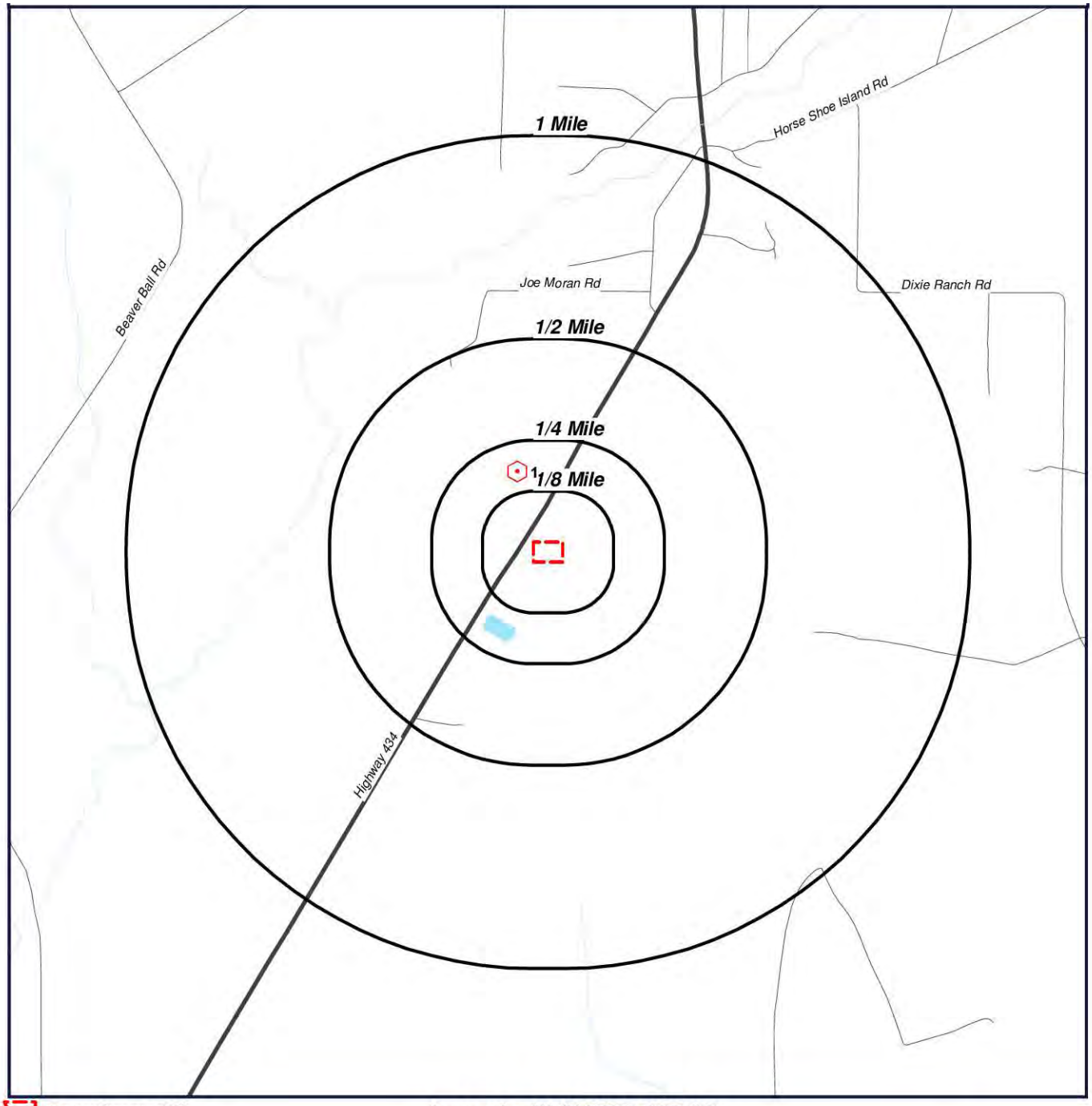
TRIBAL LISTING

*Standard environmental records are displayed in **bold**.*

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
USTR06	**0.2500**	**0**	**0**	**0**	**NS**	**NS**	**NS**	**0**
LUSTR06	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
ODINDIAN	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
INDIANRES	1.0000	0	0	0	0	0	NS	0
SUB-TOTAL		0	0	0	0	0	0	0
TOTAL		0	0	1	0	0	0	1

NOTES:
NS = NOT SEARCHED
TP/AP = TARGET PROPERTY/ADJACENT PROPERTY

Radius Map 1



Target Property (TP)
ADS

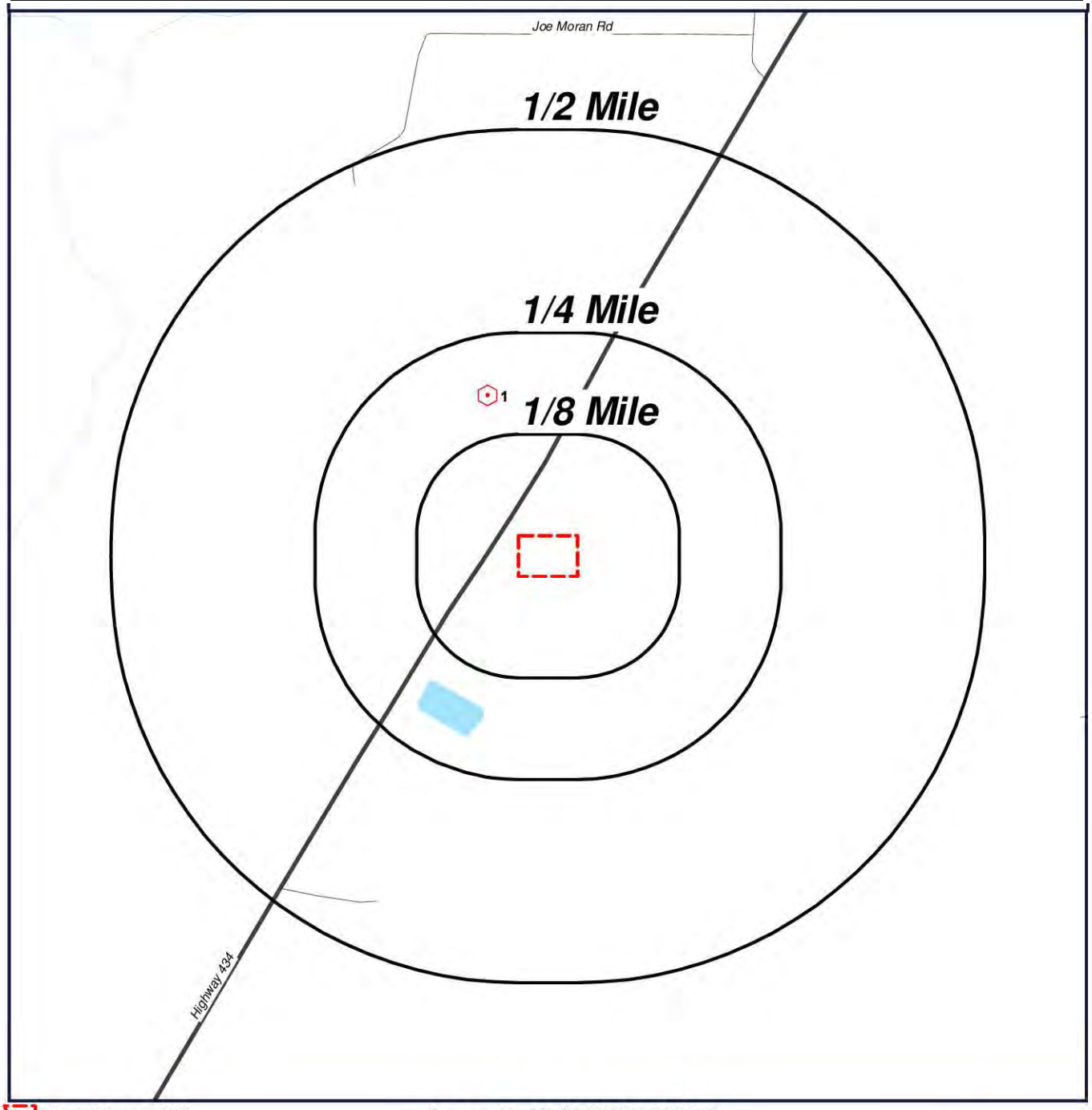
Lacombe KLIX WSR-88D Site
65556 Centerpoint Blvd
Lacombe, Louisiana
70445

N
W E
S

0' 1000' 2000' 3000'
SCALE: 1" = 2000'

[Click here to access Satellite view]

Radius Map 2



Target Property (TP)
ADS

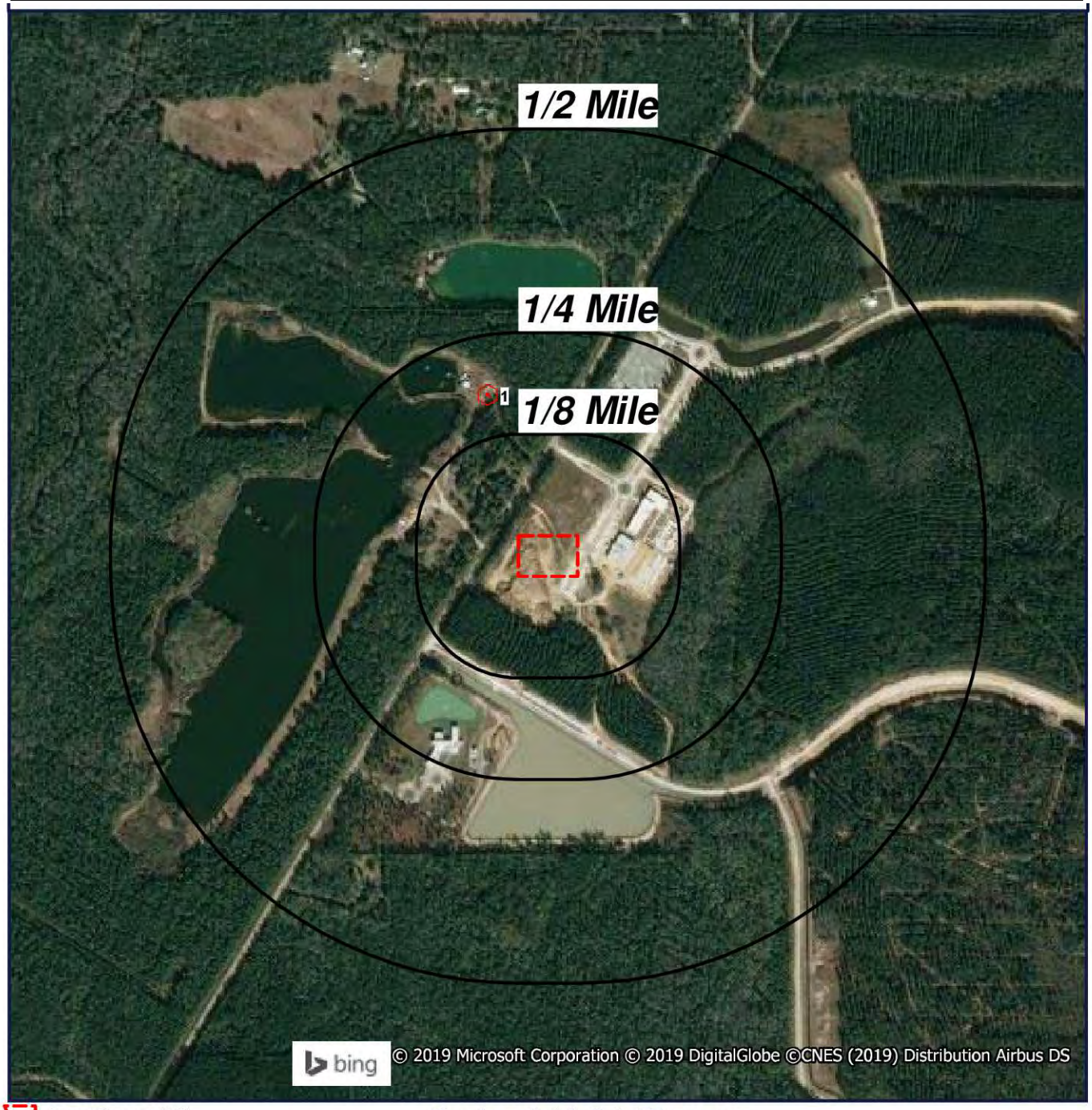
Lacombe KLIX WSR-88D Site
65556 Centerpoint Blvd
Lacombe, Louisiana
70445

N
W E
S

0' 500' 1000' 1500'
SCALE: 1" = 1000'

[Click here to access Satellite view]

Ortho Map



Target Property (TP)
ADS

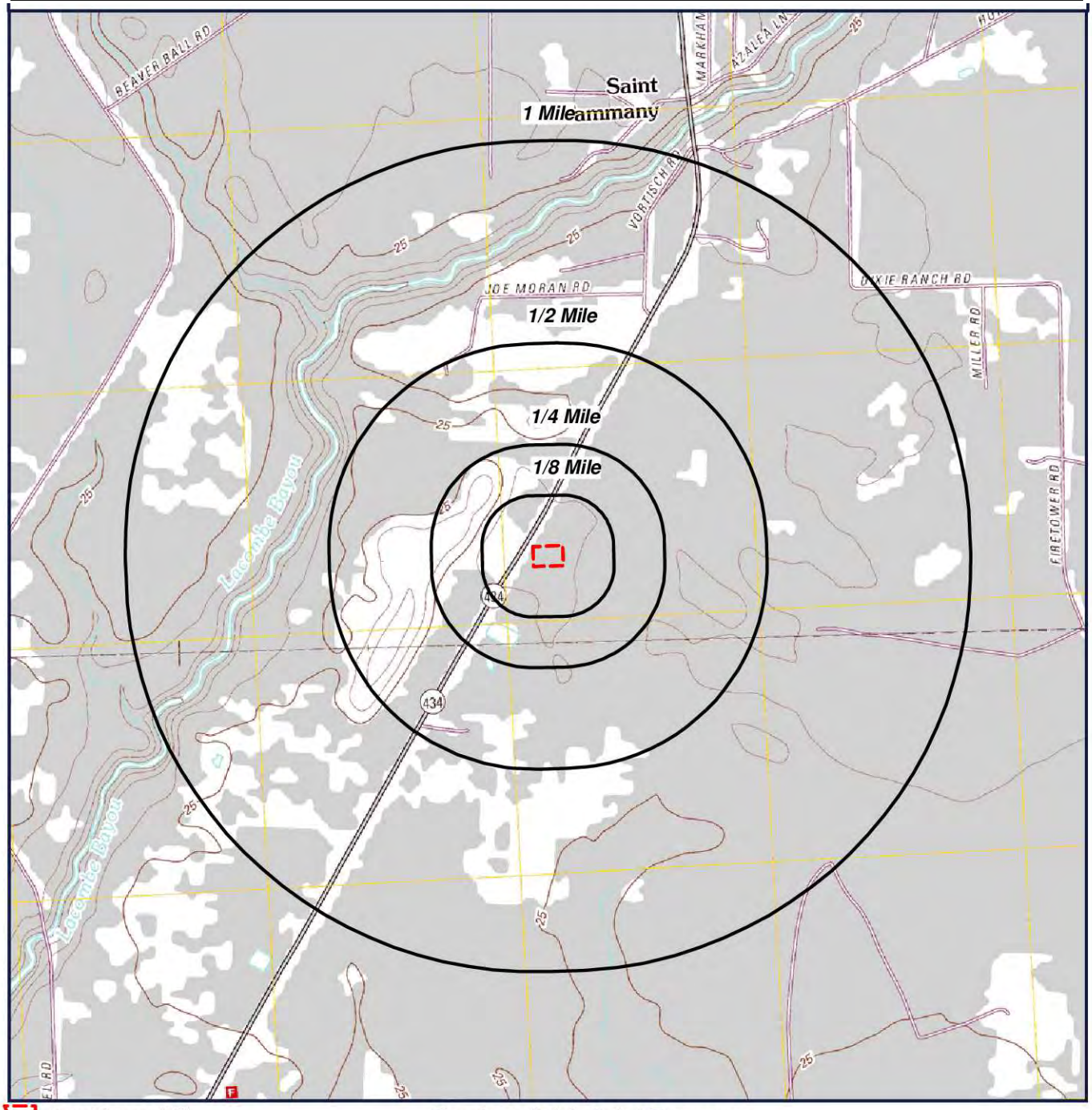
Quadrangle(s): Saint Tammany
Lacombe KLIX WSR-88D Site
65556 Centerpoint Blvd
Lacombe, Louisiana
70445

N
W E
S

0' 500' 1000' 1500'
SCALE: 1" = 1000'

[Click here to access Satellite view]

Topographic Map



Target Property (TP)

Quadrangle(s): Saint Tammany
Source: USGS, 03/09/2012
Lacombe KLIX WSR-88D Site
65556 Centerpoint Blvd
Lacombe, Louisiana
70445

N
W E
S

0' 1000' 2000' 3000'
SCALE: 1" = 2000'

Click here to access Satellite view

Located Sites Summary

*NOTE: Standard environmental records are displayed in **bold**.*

Map ID#	Database Name	Site ID#	Relative Elevation	Distance From Site	Site Name	Address	PAGE #
1	*ADS*	*166165*	*Equal (31 ft.)*	*0.176 mi. NNW (929 ft.)*	*ST TAMMANY PARISH - HWY 434 DEBRIS SITE*	*65501 HWY 434, LACOMBE, LA*	*16*

Elevation Summary

Elevations are collected from the USGS 3D Elevation Program 1/3 arc-second (approximately 10 meters) layer hosted at the NGTOC. .

Target Property Elevation: 31 ft.

*NOTE: Standard environmental records are displayed in **bold**.*

EQUAL/HIGHER ELEVATION

Map ID#	Database Name	Elevation	Site Name	Address	Page #
1	ADS	31 ft.	ST TAMMANY PARISH - HWY 434 DEBRIS SITE	65501 HWY 434, LACOMBE, LA	16

LOWER ELEVATION

No Records Found

MAP ID# 1

Distance from Property: 0.176 mi. (929 ft.) NNW
Elevation: 31 ft. (Equal to TP)

SITE INFORMATION

ID#: **166165**

NAME: **ST TAMMANY PARISH - HWY 434 DEBRIS SITE**

ADDRESS: **65501 HWY 434**
LACOMBE, LA

PARISH: **ST. TAMMANY**

SITE DETAILS

CATEGORY: **NOT REPORTED**

PERMIT NUMBER: **NOT REPORTED**

REQUESTED ACTIVITY: **C & D STAGING, VEGETATIVE BURNING OPEN, VEGETATIVE CHIPPING/GRINDING, VEGETATIVE STAGING, WHITE GOODS STAGING, WOODWASTE STAGING**

SITE OPERATOR: **NOT REPORTED**

SITE OWNER: **NOT REPORTED**

SITE OWNER ADDRESS: **NOT REPORTED**

SITE OWNER PHONE: **NOT REPORTED**

CONTACT NAME: **JOEY LOBRANO**

CONTACT PHONE: **(985) 898-2557**

APPROVED STAGING: **NOT REPORTED**

APPROVED CHIPPING GRINDING: **NOT REPORTED**

APPROVED BURN AREA: **NOT REPORTED**

Back to Report Summary

Unlocated Sites Summary

This list contains sites that could not be mapped due to limited or incomplete address information.

No Records Found

AIRSAFS Aerometric Information Retrieval System / Air Facility Subsystem

VERSION DATE: 10/20/14

The United States Environmental Protection Agency (EPA) modified the Aerometric Information Retrieval System (AIRS) to a database that exclusively tracks the compliance of stationary sources of air pollution with EPA regulations: the Air Facility Subsystem (AFS). Since this change in 2001, the management of the AIRS/AFS database was assigned to EPA's Office of Enforcement and Compliance Assurance.

BRS Biennial Reporting System

VERSION DATE: 12/31/15

The United States Environmental Protection Agency (EPA), in cooperation with the States, biennially collects information regarding the generation, management, and final disposition of hazardous wastes regulated under the Resource Conservation and Recovery Act of 1976 (RCRA), as amended. The Biennial Report captures detailed data on the generation of hazardous waste from large quantity generators and data on waste management practices from treatment, storage and disposal facilities. Currently, the EPA states that data collected between 1991 and 1997 was originally a part of the defunct Biennial Reporting System and is now incorporated into the RCRAInfo data system.

CDL Clandestine Drug Laboratory Locations

VERSION DATE: 05/06/19

The U.S. Department of Justice ("the Department") provides this information as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments. The Department does not establish, implement, enforce, or certify compliance with clean-up or remediation standards for contaminated sites; the public should contact a state or local health department or environmental protection agency for that information.

DOCKETS EPA Docket Data

VERSION DATE: 12/22/05

The United States Environmental Protection Agency Docket data lists Civil Case Defendants, filing dates as far back as 1971, laws broken including section, violations that occurred, pollutants involved, penalties assessed and superfund awards by facility and location. Please refer to ICIS database as source of current data.

EC Federal Engineering Institutional Control Sites

VERSION DATE: 06/11/19

This database includes site locations where Engineering and/or Institutional Controls have been identified as part

of a selected remedy for the site as defined by United States Environmental Protection Agency official remedy decision documents. The data displays remedy component information for Superfund decision documents issued in fiscal years 1982-2017, and it includes final and deleted NPL sites as well as sites with a Superfund Alternative Approach (SAA) agreement in place. A site listing does not indicate that the institutional and engineering controls are currently in place nor will be in place once the remedy is complete; it only indicates that the decision to include either of them in the remedy is documented as of the completed date of the document. Institutional controls are actions, such as legal controls, that help minimize the potential for human exposure to contamination by ensuring appropriate land or resource use. Engineering controls include caps, barriers, or other device engineering to prevent access, exposure, or continued migration of contamination.

ECHOR06 Enforcement and Compliance History Information

VERSION DATE: 10/27/19

The U.S. Environmental Protection Agency's Enforcement and Compliance History Online (ECHO) database, provides compliance and enforcement information for facilities nationwide. This database includes facilities regulated as Clean Air Act stationary sources, Clean Water Act direct dischargers, Resource Conservation and Recovery Act hazardous waste handlers, Safe Drinking Water Act public water systems along with other data, such as Toxics Release Inventory releases.

ERNSLA Emergency Response Notification System

VERSION DATE: 10/06/19

This National Response Center database contains data on reported releases of oil, chemical, radiological, biological, and/or etiological discharges into the environment anywhere in the United States and its territories. The data comes from spill reports made to the U.S. Environmental Protection Agency, U.S. Coast Guard, the National Response Center and/or the U.S. Department of Transportation.

FRSLA Facility Registry System

VERSION DATE: 10/09/19

The United States Environmental Protection Agency's Office of Environmental Information (OEI) developed the Facility Registry System (FRS) as the centrally managed database that identifies facilities, sites or places subject to environmental regulations or of environmental interest. The Facility Registry System replaced the Facility Index System or FINDS database.

HMIRSR06 Hazardous Materials Incident Reporting System

VERSION DATE: 11/20/19

The HMIRS database contains unintentional hazardous materials release information reported to the U.S. Department of Transportation located in EPA Region 6. This region includes the following states: Arkansas, Louisiana, New Mexico, Oklahoma, and Texas.

ICIS Integrated Compliance Information System (formerly DOCKETS)

VERSION DATE: 09/21/19

ICIS is a case activity tracking and management system for civil, judicial, and administrative federal Environmental Protection Agency enforcement cases. ICIS contains information on federal administrative and federal judicial cases under the following environmental statutes: the Clean Air Act, the Clean Water Act, the Resource Conservation and Recovery Act, the Emergency Planning and Community Right-to-Know Act - Section 313, the Toxic Substances Control Act, the Federal Insecticide, Fungicide, and Rodenticide Act, the Comprehensive Environmental Response, Compensation, and Liability Act, the Safe Drinking Water Act, and the Marine Protection, Research, and Sanctuaries Act.

ICISNPDES Integrated Compliance Information System National Pollutant Discharge Elimination System

VERSION DATE: 07/09/17

Authorized by the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. This database is provided by the U.S. Environmental Protection Agency.

LUCIS Land Use Control Information System

VERSION DATE: 09/01/06

The LUCIS database is maintained by the U.S. Department of the Navy and contains information for former Base Realignment and Closure (BRAC) properties across the United States.

MLTS Material Licensing Tracking System

VERSION DATE: 06/29/17

MLTS is a list of approximately 8,100 sites which have or use radioactive materials subject to the United States Nuclear Regulatory Commission (NRC) licensing requirements. Disclaimer: Due to agency regulations and policies, this database contains applicant/licensee location information which may or may not be related to the physical location per MLTS site.

NPDESR06 National Pollutant Discharge Elimination System

VERSION DATE: 04/01/07

Authorized by the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. The NPDES database was collected from the U.S. Environmental Protection Agency (EPA) from December 2002 through April 2007. Refer to the PCS and/or ICIS-NPDES database as source of current data. This database includes permitted facilities located in EPA Region 6. This region includes the following states: Arkansas, Louisiana, New Mexico, Oklahoma, and Texas.

PADS PCB Activity Database System

VERSION DATE: 09/14/18

PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of Polychlorinated Biphenyls (PCB) who are required to notify the U.S. Environmental Protection Agency of such activities.

PCSR06 Permit Compliance System

VERSION DATE: 08/01/12

The Permit Compliance System is used in tracking enforcement status and permit compliance of facilities controlled by the National Pollutant Discharge Elimination System (NPDES) under the Clean Water Act and is maintained by the United States Environmental Protection Agency's Office of Compliance. PCS is designed to support the NPDES program at the state, regional, and national levels. This database includes permitted facilities located in EPA Region 6. This region includes the following states: Arkansas, Louisiana, New Mexico, Oklahoma, and Texas. PCS has been modernized, and no longer exists. National Pollutant Discharge Elimination System (ICIS-NPDES) data can now be found in Integrated Compliance Information System (ICIS).

RCRASC RCRA Sites with Controls

VERSION DATE: 09/12/19

The Resource Conservation and Recovery Act (RCRA) gives the U.S. Environmental Protection Agency (EPA) the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to RCRA enabled EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances. This listing refers to facilities with institutional controls in place.

SEMSLIENS SEMS Lien on Property

VERSION DATE: 08/13/18

The U.S. Environmental Protection Agency's (EPA) Office of Solid Waste and Emergency Response, Office of Superfund Remediation and Technology Innovation (OSRTI), has implemented The Superfund Enterprise Management System (SEMS), formerly known as CERCLIS (Comprehensive Environmental Response, Compensation and Liability Information System) to track and report on clean-up and enforcement activities taking place at Superfund sites. SEMS represents a joint development and ongoing collaboration between Superfund's Remedial, Removal, Federal Facilities, Enforcement and Emergency Response programs. This is a listing of SEMS sites with a lien on the property.

SFLIENS CERCLIS Liens

VERSION DATE: 06/08/12

A Federal CERCLA ("Superfund") lien can exist by operation of law at any site or property at which United States

Environmental Protection Agency has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties. This database contains those CERCLIS sites where the Lien on Property action is complete. Please refer to the SEMSLIENS database as source of current data.

SSTS Section Seven Tracking System

VERSION DATE: 02/01/17

The United States Environmental Protection Agency tracks information on pesticide establishments through the Section Seven Tracking System (SSTS). SSTS records the registration of new establishments and records pesticide production at each establishment. The Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) requires that production of pesticides or devices be conducted in a registered pesticide-producing or device-producing establishment. ("Production" includes formulation, packaging, repackaging, and relabeling.)

TRI Toxics Release Inventory

VERSION DATE: 12/31/17

The Toxics Release Inventory, provided by the United States Environmental Protection Agency, includes data on toxic chemical releases and waste management activities from certain industries as well as federal and tribal facilities. This inventory contains information about the types and amounts of toxic chemicals that are released each year to the air, water, and land as well as information on the quantities of toxic chemicals sent to other facilities for further waste management.

TSCA Toxic Substance Control Act Inventory

VERSION DATE: 12/31/12

The Toxic Substances Control Act (TSCA) was enacted in 1976 to ensure that chemicals manufactured, imported, processed, or distributed in commerce, or used or disposed of in the United States do not pose any unreasonable risks to human health or the environment. TSCA section 8(b) provides the United States Environmental Protection Agency authority to "compile, keep current, and publish a list of each chemical substance that is manufactured or processed in the United States." This TSCA Chemical Substance Inventory contains non-confidential information on the production amount of toxic chemicals from each manufacturer and importer site.

RCRAGR06 Resource Conservation & Recovery Act - Generator

VERSION DATE: 08/19/19

The Resource Conservation and Recovery Act (RCRA) gives the U.S. Environmental Protection Agency (EPA) the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to RCRA enabled EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances. This listing refers to facilities currently generating hazardous waste. EPA region 6 includes the following states: Arkansas,

Louisiana, New Mexico, Oklahoma, and Texas.

RCRANGR06 Resource Conservation & Recovery Act - Non-Generator

VERSION DATE: 08/19/19

The Resource Conservation and Recovery Act (RCRA) gives the U.S. Environmental Protection Agency (EPA) the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to RCRA enabled EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances. This listing refers to facilities classified as non-generators. Non-Generators do not presently generate hazardous waste. EPA Region 6 includes the following states: Arkansas, Louisiana, New Mexico, Oklahoma, and Texas.

ALTFUELS Alternative Fueling Stations

VERSION DATE: 09/24/19

Nationwide list of alternative fueling stations made available by the U.S. Department of Energy's Office of Energy Efficiency & Renewable Energy. Includes Bio-diesel stations, Ethanol (E85) stations, Liquefied Petroleum Gas (Propane) stations, Ethanol (E85) stations, Natural Gas stations, Hydrogen stations, and Electric Vehicle Supply Equipment (EVSE).

FEMAUST FEMA Owned Storage Tanks

VERSION DATE: 12/01/16

This is a listing of FEMA owned underground and aboveground storage tank sites. For security reasons, address information is not released to the public according to the U.S. Department of Homeland Security.

HISTPST Historical Gas Stations

VERSION DATE: NR

This historic directory of service stations is provided by the Cities Service Company. The directory includes Cities Service filling stations that were located throughout the United States in 1930.

ICISCLEANERS Integrated Compliance Information System Drycleaners

VERSION DATE: 09/21/19

This is a listing of drycleaner facilities from the Integrated Compliance Information System (ICIS). The U.S. Environmental Protection Agency (EPA) tracks facilities that possess NAIC and SIC codes that classify businesses as drycleaner establishments. The following Primary SIC Codes are included in this data: 7211, 7212, 7213, 7215, 7216, 7217, 7218, and/or 7219; the following Primary NAICS Codes are included in this data: 812320, 812331, and/or 812332.

MRDS Mineral Resource Data System

VERSION DATE: 03/15/16

MRDS (Mineral Resource Data System) is a collection of reports describing metallic and nonmetallic mineral resources throughout the world. Included are deposit name, location, commodity, deposit description, geologic characteristics, production, reserves, resources, and references. This database contains the records previously provided in the Mineral Resource Data System (MRDS) of USGS and the Mineral Availability System/Mineral Industry Locator System (MAS/MILS) originated in the U.S. Bureau of Mines, which is now part of USGS.

MSHA Mine Safety and Health Administration Master Index File

VERSION DATE: 09/20/19

The Mine dataset lists all Coal and Metal/Non-Metal mines under MSHA's jurisdiction since 1/1/1970. It includes such information as the current status of each mine (Active, Abandoned, NonProducing, etc.), the current owner and operating company, commodity codes and physical attributes of the mine. Mine ID is the unique key for this data. This information is provided by the United States Department of Labor - Mine Safety and Health Administration (MSHA).

BF Brownfields Management System

VERSION DATE: 07/10/19

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. The United States Environmental Protection Agency maintains this database to track activities in the various brown field grant programs including grantee assessment, site cleanup and site redevelopment. This database included tribal brownfield sites.

DNPL Delisted National Priorities List

VERSION DATE: 10/18/19

This database includes sites from the United States Environmental Protection Agency's Final National Priorities List (NPL) where remedies have proven to be satisfactory or sites where the original analyses were inaccurate, and the site is no longer appropriate for inclusion on the NPL, and final publication in the Federal Register has occurred.

NLRRCRAT No Longer Regulated RCRA Non-CORRACTS TSD Facilities

VERSION DATE: 08/19/19

This database includes RCRA Non-Corrective Action TSD facilities that are no longer regulated by the United States Environmental Protection Agency or do not meet other RCRA reporting requirements. This listing includes facilities that formerly treated, stored or disposed of hazardous waste.

ODI Open Dump Inventory

VERSION DATE: 06/01/85

The open dump inventory was published by the United States Environmental Protection Agency. An “open dump” is defined as a facility or site where solid waste is disposed of which is not a sanitary landfill which meets the criteria promulgated under section 4004 of the Solid Waste Disposal Act (42 U.S.C. 6944) and which is not a facility for disposal of hazardous waste. This inventory has not been updated since June 1985.

RCRAT Resource Conservation & Recovery Act - Non-CORRACTS Treatment, Storage & Disposal Facilities

VERSION DATE: 08/19/19

The Resource Conservation and Recovery Act (RCRA) gives the U.S. Environmental Protection Agency (EPA) the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to RCRA enabled EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances. This listing refers to facilities recognized as hazardous waste treatment, storage, and disposal sites (TSD).

SEMS Superfund Enterprise Management System

VERSION DATE: 10/21/19

The U.S. Environmental Protection Agency's (EPA) Office of Solid Waste and Emergency Response, Office of Superfund Remediation and Technology Innovation (OSRTI), has implemented The Superfund Enterprise Management System (SEMS), formerly known as CERCLIS (Comprehensive Environmental Response, Compensation and Liability Information System) to track and report on clean-up and enforcement activities taking place at Superfund sites. SEMS represents a joint development and ongoing collaboration between Superfund's Remedial, Removal, Federal Facilities, Enforcement and Emergency Response programs.

SEMSARCH Superfund Enterprise Management System Archived Site Inventory

VERSION DATE: 10/22/19

The U.S. Environmental Protection Agency’s (EPA) Superfund Enterprise Management System Archived Site Inventory (List 8R Archived) replaced the CERCLIS NFRAP reporting system in 2015. This listing reflects sites at which the EPA has determined that assessment has been completed and no further remedial action is planned under the Superfund program.

SMCRA Surface Mining Control and Reclamation Act Sites

VERSION DATE: 11/26/19

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by the Office of Surface Mining Reclamation and Enforcement (OSMRE) to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type,

and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

USUMTRCA Uranium Mill Tailings Radiation Control Act Sites

VERSION DATE: 03/04/17

The Legacy Management Office of the Department of Energy (DOE) manages radioactive and chemical waste, environmental contamination, and hazardous material at over 100 sites across the U.S. The L.M. Office manages this database of sites registered under the Uranium Mill Tailings Control Act (UMTRCA).

DOD Department of Defense Sites

VERSION DATE: 12/01/14

This information originates from the National Atlas of the United States Federal Lands data, which includes lands owned or administered by the Federal government. Army DOD, Army Corps of Engineers DOD, Air Force DOD, Navy DOD and Marine DOD areas of 640 acres or more are included.

FUDS Formerly Used Defense Sites

VERSION DATE: 06/01/15

The Formerly Used Defense Sites (FUDS) inventory includes properties previously owned by or leased to the United States and under Secretary of Defense Jurisdiction, as well as Munitions Response Areas (MRAs). The remediation of these properties is the responsibility of the Department of Defense. This data is provided by the U.S. Army Corps of Engineers (USACE), the boundaries/polygon data are based on preliminary findings and not all properties currently have polygon data available. DISCLAIMER: This data represents the results of data collection/processing for a specific USACE activity and is in no way to be considered comprehensive or to be used in any legal or official capacity as presented on this site. While the USACE has made a reasonable effort to insure the accuracy of the maps and associated data, it should be explicitly noted that USACE makes no warranty, representation or guaranty, either expressed or implied, as to the content, sequence, accuracy, timeliness or completeness of any of the data provided herein. For additional information on Formerly Used Defense Sites please contact the USACE Public Affairs Office at (202) 528-4285.

FUSRAP Formerly Utilized Sites Remedial Action Program

VERSION DATE: 03/04/17

The U.S. Department of Energy (DOE) established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from the Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations. The DOE Office of Legacy Management (LM) established long-term surveillance and maintenance (LTS&M) requirements for remediated FUSRAP sites. DOE evaluates the final site conditions of a remediated site on the basis of risk for different future uses. DOE then confirms that LTS&M requirements will maintain protectiveness.

NLRRCRAC No Longer Regulated RCRA Corrective Action Facilities

VERSION DATE: 08/19/19

This database includes RCRA Corrective Action facilities that are no longer regulated by the United States Environmental Protection Agency or do not meet other RCRA reporting requirements.

NMS Former Military Nike Missile Sites

VERSION DATE: 12/01/84

This information was taken from report DRXTH-AS-IA-83A016 (Historical Overview of the Nike Missile System, 12/1984) which was performed by Environmental Science and Engineering, Inc. for the U.S. Army Toxic and Hazardous Materials Agency Assessment Division. The Nike system was deployed between 1954 and the mid-1970's. Among the substances used or stored on Nike sites were liquid missile fuel (JP-4); starter fluids (UDKH, aniline, and furfuryl alcohol); oxidizer (IRFNA); hydrocarbons (motor oil, hydraulic fluid, diesel fuel, gasoline, heating oil); solvents (carbon tetrachloride, trichloroethylene, trichloroethane, stoddard solvent); and battery electrolyte. The quantities of material a disposed of and procedures for disposal are not documented in published reports. Virtually all information concerning the potential for contamination at Nike sites is confined to personnel who were assigned to Nike sites. During deactivation most hardware was shipped to depot-level supply points. There were reportedly instances where excess materials were disposed of on or near the site itself at closure. There was reportedly no routine site decontamination.

NPL National Priorities List

VERSION DATE: 10/18/19

This database includes United States Environmental Protection Agency (EPA) National Priorities List sites that fall under the EPA's Superfund program, established to fund the cleanup of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial action.

PNPL Proposed National Priorities List

VERSION DATE: 10/18/19

This database contains sites proposed to be included on the National Priorities List (NPL) in the Federal Register. The United States Environmental Protection Agency investigates these sites to determine if they may present long-term threats to public health or the environment.

RCRAC Resource Conservation & Recovery Act - Corrective Action Facilities

VERSION DATE: 08/19/19

The Resource Conservation and Recovery Act (RCRA) gives the U.S. Environmental Protection Agency (EPA) the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to RCRA enabled EPA to address environmental problems

that could result from underground tanks storing petroleum and other hazardous substances. This listing refers to facilities with corrective action activity.

RCRASUBC Resource Conservation & Recovery Act - Subject to Corrective Action Facilities

VERSION DATE: 08/19/19

The Resource Conservation and Recovery Act (RCRA) gives the U.S. Environmental Protection Agency (EPA) the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to RCRA enabled EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances. This listing refers to facilities subject to corrective actions.

RODS Record of Decision System

VERSION DATE: 10/18/19

These decision documents maintained by the United States Environmental Protection Agency describe the chosen remedy for NPL (Superfund) site remediation. They also include site history, site description, site characteristics, community participation, enforcement activities, past and present activities, contaminated media, the contaminants present, and scope and role of response action.

Environmental Records Definitions - STATE (LA)

ASBESTOS Asbestos Demolition and Renovation Notification Projects

VERSION DATE: 08/13/19

This listing of Asbestos Demolition and Renovation Projects is provided by the Louisiana Department of Environmental Quality (DEQ). In accordance with the DEQ Air Quality Regulations, LAC 33:III.5151.F.1.f, any contractor performing removal of asbestos containing material that involves Regulated Asbestos Containing Material (see definition in LAC 33:III.5151.B) must become licensed by the Louisiana State Licensing Board for Contractors.

CDL Clandestine Drug Laboratory Locations

VERSION DATE: 01/30/18

This list of Clandestine Methamphetamine Labs is provided by the Louisiana Department of Environmental Quality. These residential real properties have been reported as potentially contaminated.

IC Sites With Controls

VERSION DATE: 09/05/19

This site listing is maintained by the Louisiana Department of Environmental Quality's Remediation Division. Institutional controls (IC) are administrative and/or legal measures in place to safeguard the public and the environment from potential contamination. In certain circumstances, local zoning or ordinances can serve as an IC. This listing may also include locations where Engineering Controls are in effect, such as a cap, barrier, or other engineering device to prevent access, exposure, or continued migration of contamination.

LIENS Listing of Louisiana DEQ Liens

VERSION DATE: 03/13/18

A listing of liens filed against properties by the Remediation Services Division of the Louisiana Department of Environmental Quality.

SPILLS Spills Listing

VERSION DATE: 10/10/19

The Louisiana Department of Environmental Quality provides this database. Information includes releases of hazardous or potential hazardous chemical/materials into the environment.

WASTETIRE Waste Tire Generator List

VERSION DATE: 08/06/19

This listing of registered waste tire generators is maintained by the Louisiana Department of Environmental Quality.

DCR Drycleaning Facilities

VERSION DATE: 11/05/19

This listing of drycleaning facilities was provided by the Louisiana Department of Environmental Quality.

NLRUST No Longer Reported Underground Storage Tanks

VERSION DATE: 02/01/04

This Underground Storage Tank listing originates from the no longer active PEL filing sytem of the Louisiana Department of Environmental Quality.

UST Underground Storage Tanks

VERSION DATE: 10/25/19

The Underground Storage Tank database includes a listing of registered underground storage tanks maintained by the Louisiana Department of Environmental Quality.

ADS Approved Hurricane Debris Dump Sites

VERSION DATE: 10/28/19

This Louisiana Department of Environmental Quality listing of hurricane debris sites contains the temporary and the permitted landfills in the state that can currently accept hurricane debris (C&D, chipping, grinding, burning, staging, woodwaste). These landfills include Type I (Non-hazardous Industrial), Type II (Municipal) and Type III (Construction and Demolition Debris and Wood Waste).

HLUST Historical Leaking Underground Storage Tanks

VERSION DATE: 03/26/99

The Historical Leaking Underground Storage Tank database provides descriptive leaking facility reports from the Louisiana Department of Environmental Quality's Underground Storage Tanks Case History System. This database has not been updated since 1999. Please refer to LUST database as source of current data.

LUST Leaking Underground Storage Tanks

VERSION DATE: 10/25/19

This database contains facilities with reported leaking underground storage tanks and is maintained by the by the Louisiana Department of Environmental Quality.

RCY Recycling Facilities

VERSION DATE: 03/06/19

This listing of recycling facilities is maintained by the Louisiana Department of Environmental Quality.

SWLF Solid Waste Landfills

VERSION DATE: 09/26/19

This Louisiana Department of Environmental Quality solid waste facility listing includes type I, II, and III landfills. A type I facility is used for the disposal of industrial solid waste. A type II facility is used for the disposal of residential or commercial solid waste. A type III facility is defined in LAC 33:VII.115 as a facility used for disposing or processing of construction/demolition debris or wood waste, composting organic waste to produce a usable material, or separating recyclable wastes. Residential, commercial, or industrial solid waste must not be disposed in a type III facility.

VRP Voluntary Remediation Program Sites

VERSION DATE: 09/05/19

The Louisiana Department of Environmental Quality's Voluntary Remediation Program (VRP) provides a mechanism by which property owners (or potential owners) or others can clean up contaminated properties and receive a release of liability for further cleanup of historical contamination at a site. This release of liability flows to future owners of the property as well.

WP Waste Pits

VERSION DATE: 01/01/99

This listing is from a 1999 Louisiana Oil Spill Coordinator's Office (LOSCO) study, which identified statewide abandoned non-hazardous waste pits and facilities that have the potential to initiate an oil spill.

CPI Confirmed and Potential Sites Inventory

VERSION DATE: 09/16/19

The Inactive and Abandoned Sites Division of the Louisiana Department of Environmental Quality maintains the confirmed and potential sites inventory. This listing contains state-equivalent CERCLIS hazardous wastes sites.

Environmental Records Definitions - TRIBAL

USTR06 Underground Storage Tanks On Tribal Lands

VERSION DATE: 05/01/19

This database, provided by the United States Environmental Protection Agency (EPA), contains underground storage tanks on Tribal lands located in EPA Region 6. This region includes the following states: Arkansas, Louisiana, New Mexico, Oklahoma, and Texas.

LUSTR06 Leaking Underground Storage Tanks On Tribal Lands

VERSION DATE: 05/01/19

This database, provided by the United States Environmental Protection Agency (EPA), contains leaking underground storage tanks on Tribal lands located in EPA Region 6. This region includes the following states: Arkansas, Louisiana, New Mexico, Oklahoma, and Texas.

ODINDIAN Open Dump Inventory on Tribal Lands

VERSION DATE: 11/08/06

This Indian Health Service database contains information about facilities and sites on tribal lands where solid waste is disposed of, which are not sanitary landfills or hazardous waste disposal facilities, and which meet the criteria promulgated under section 4004 of the Solid Waste Disposal Act (42 U.S.C. 6944).

INDIANRES Indian Reservations

VERSION DATE: 01/01/00

The Department of Interior and Bureau of Indian Affairs maintains this database that includes American Indian Reservations, off-reservation trust lands, public domain allotments, Alaska Native Regional Corporations and Recognized State Reservations.

Radius Report

GeoLens by GeoSearch

Target Property:

Hammond KLIX WSR-88D Site
600 N. Airport Road
Hammond, Tangipahoa Parish, Louisiana 70401

Prepared For:

Sensor Environmental LLC

Order #: 136479
Job #: 326123
Project #: 201903
Date: 12/04/2019

Table of Contents

Disclaimer

This report was designed by GeoSearch to meet or exceed the records search requirements of the All Appropriate Inquiries Rule (40 CFR Â§312.26) and the current version of the ASTM International E1527, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process or, if applicable, the custom requirements requested by the entity that ordered this report. The records and databases of records used to compile this report were collected from various federal,state and local governmental entities. It is the goal of GeoSearch to meet or exceed the 40 CFRÂ§312.26 and E1527 requirements for updating records by using the best available technology. GeoSearch contacts the appropriate governmental entities on a recurring basis. Depending on the frequency with which a record source or database of records is updated by the governmental entity, the data used to prepare this report may be updated monthly, quarterly, semi-annually, or annually.

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Target Property Summary

Target Property Information

Hammond KLIX WSR-88D Site
600 N. Airport Road
Hammond, Louisiana 70401

Coordinates
Area centroid (-90.407554, 30.5193374)
39 feet above sea level

USGS Quadrangle
Hammond, LA

Geographic Coverage Information

County/Parish: Tangipahoa (LA)
ZipCode(s):
Hammond LA: 70401, 70403

Database Summary

FEDERAL LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
EMERGENCY RESPONSE NOTIFICATION SYSTEM	ERNSLA	0	0	TP/AP
FEDERAL ENGINEERING INSTITUTIONAL CONTROL SITES	EC	0	0	TP/AP
LAND USE CONTROL INFORMATION SYSTEM	LUCIS	0	0	TP/AP
RCRA SITES WITH CONTROLS	RCRASC	0	0	TP/AP
RESOURCE CONSERVATION & RECOVERY ACT - GENERATOR	RCRAGR06	1	0	0.1250
RESOURCE CONSERVATION & RECOVERY ACT - NON-GENERATOR	RCRANGR06	0	0	0.1250
BROWNFIELDS MANAGEMENT SYSTEM	BF	0	0	0.5000
DELISTED NATIONAL PRIORITIES LIST	DNPL	0	0	0.5000
NO LONGER REGULATED RCRA NON-CORRACTS TSD FACILITIES	NLRRCRAT	0	0	0.5000
RESOURCE CONSERVATION & RECOVERY ACT - NON-CORRACTS TREATMENT, STORAGE & DISPOSAL FACILITIES	RCRAT	0	0	0.5000
SUPERFUND ENTERPRISE MANAGEMENT SYSTEM	SEMS	0	0	0.5000
SUPERFUND ENTERPRISE MANAGEMENT SYSTEM ARCHIVED SITE INVENTORY	SEMSARCH	0	0	0.5000
NATIONAL PRIORITIES LIST	NPL	0	0	1.0000
NO LONGER REGULATED RCRA CORRECTIVE ACTION FACILITIES	NLRRCRAC	0	0	1.0000
PROPOSED NATIONAL PRIORITIES LIST	PNPL	0	0	1.0000
RESOURCE CONSERVATION & RECOVERY ACT - CORRECTIVE ACTION FACILITIES	RCRAC	0	0	1.0000
RESOURCE CONSERVATION & RECOVERY ACT - SUBJECT TO CORRECTIVE ACTION FACILITIES	RCRASUBC	0	0	1.0000

SUB-TOTAL		1	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
AEROMETRIC INFORMATION RETRIEVAL SYSTEM / AIR FACILITY SUBSYSTEM	AIRSAFS	0	0	TP/AP
BIENNIAL REPORTING SYSTEM	BRS	0	0	TP/AP
CERCLIS LIENS	SFLIENS	0	0	TP/AP
CLANDESTINE DRUG LABORATORY LOCATIONS	CDL	0	0	TP/AP
EPA DOCKET DATA	DOCKETS	0	0	TP/AP
ENFORCEMENT AND COMPLIANCE HISTORY INFORMATION	ECHOR06	0	0	TP/AP
FACILITY REGISTRY SYSTEM	FRSLA	0	0	TP/AP

Database Summary

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
HAZARDOUS MATERIALS INCIDENT REPORTING SYSTEM	HMIRSR06	0	0	TP/AP
INTEGRATED COMPLIANCE INFORMATION SYSTEM (FORMERLY DOCKETS)	ICIS	0	0	TP/AP
INTEGRATED COMPLIANCE INFORMATION SYSTEM NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM	ICISNPDES	0	0	TP/AP
MATERIAL LICENSING TRACKING SYSTEM	MLTS	0	0	TP/AP
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM	NPDESR06	0	0	TP/AP
PCB ACTIVITY DATABASE SYSTEM	PADS	0	0	TP/AP
PERMIT COMPLIANCE SYSTEM	PCSR06	0	0	TP/AP
SEMS LIEN ON PROPERTY	SEMSLIENS	0	0	TP/AP
SECTION SEVEN TRACKING SYSTEM	SSTS	0	0	TP/AP
TOXIC SUBSTANCE CONTROL ACT INVENTORY	TSCA	0	0	TP/AP
TOXICS RELEASE INVENTORY	TRI	0	0	TP/AP
ALTERNATIVE FUELING STATIONS	ALTFUELS	0	0	0.2500
FEMA OWNED STORAGE TANKS	FEMAUST	0	0	0.2500
HISTORICAL GAS STATIONS	HISTPST	0	0	0.2500
INTEGRATED COMPLIANCE INFORMATION SYSTEM DRYCLEANERS	ICISCLEANERS	0	0	0.2500
MINE SAFETY AND HEALTH ADMINISTRATION MASTER INDEX FILE	MSHA	0	0	0.2500
MINERAL RESOURCE DATA SYSTEM	MRDS	0	0	0.2500
OPEN DUMP INVENTORY	ODI	0	0	0.5000
SURFACE MINING CONTROL AND RECLAMATION ACT SITES	SMCRA	0	0	0.5000
URANIUM MILL TAILINGS RADIATION CONTROL ACT SITES	USUMTRCA	0	0	0.5000
DEPARTMENT OF DEFENSE SITES	DOD	0	0	1.0000
FORMER MILITARY NIKE MISSILE SITES	NMS	0	0	1.0000
FORMERLY USED DEFENSE SITES	FUDS	0	0	1.0000
FORMERLY UTILIZED SITES REMEDIAL ACTION PROGRAM	FUSRAP	0	0	1.0000
RECORD OF DECISION SYSTEM	RODS	0	0	1.0000

SUB-TOTAL		0	0	

Database Summary

STATE (LA) LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
SITES WITH CONTROLS	IC	0	0	TP/AP
NO LONGER REPORTED UNDERGROUND STORAGE TANKS	NLRUST	0	0	0.2500
UNDERGROUND STORAGE TANKS	UST	0	0	0.2500
APPROVED HURRICANE DEBRIS DUMP SITES	ADS	0	0	0.5000
HISTORICAL LEAKING UNDERGROUND STORAGE TANKS	HLUST	0	0	0.5000
LEAKING UNDERGROUND STORAGE TANKS	LUST	0	0	0.5000
SOLID WASTE LANDFILLS	SWLF	0	0	0.5000
VOLUNTARY REMEDIATION PROGRAM SITES	VRP	0	0	0.5000
CONFIRMED AND POTENTIAL SITES INVENTORY	CPI	1	0	1.0000
SUB-TOTAL		1	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
ASBESTOS DEMOLITION AND RENOVATION NOTIFICATION PROJECTS	ASBESTOS	0	0	TP/AP
CLANDESTINE DRUG LABORATORY LOCATIONS	CDL	0	0	TP/AP
LISTING OF LOUISIANA DEQ LIENS	LIENS	0	0	TP/AP
SPILLS LISTING	SPILLS	0	0	TP/AP
WASTE TIRE GENERATOR LIST	WASTETIRE	0	0	TP/AP
DRYCLEANING FACILITIES	DCR	0	0	0.2500
RECYCLING FACILITIES	RCY	0	0	0.5000
WASTE PITS	WP	0	0	0.5000
SUB-TOTAL		0	0	

TRIBAL LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
UNDERGROUND STORAGE TANKS ON TRIBAL LANDS	USTR06	0	0	0.2500
LEAKING UNDERGROUND STORAGE TANKS ON TRIBAL LANDS	LUSTR06	0	0	0.5000
OPEN DUMP INVENTORY ON TRIBAL LANDS	ODINDIAN	0	0	0.5000
SUB-TOTAL		0	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
INDIAN RESERVATIONS	INDIANRES	0	0	1.0000
SUB-TOTAL		0	0	
TOTAL		2	0	

Database Radius Summary

FEDERAL LISTING

*Standard environmental records are displayed in **bold**.*

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
AIRSAFS	0.0200	0	NS	NS	NS	NS	NS	0
BRS	0.0200	0	NS	NS	NS	NS	NS	0
CDL	0.0200	0	NS	NS	NS	NS	NS	0
DOCKETS	0.0200	0	NS	NS	NS	NS	NS	0
EC	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
ECHOR06	0.0200	0	NS	NS	NS	NS	NS	0
ERNSLA	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
FRSLA	0.0200	0	NS	NS	NS	NS	NS	0
HMIRSR06	0.0200	0	NS	NS	NS	NS	NS	0
ICIS	0.0200	0	NS	NS	NS	NS	NS	0
ICISNPDES	0.0200	0	NS	NS	NS	NS	NS	0
LUCIS	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
MLTS	0.0200	0	NS	NS	NS	NS	NS	0
NPDESR06	0.0200	0	NS	NS	NS	NS	NS	0
PADS	0.0200	0	NS	NS	NS	NS	NS	0
PCSR06	0.0200	0	NS	NS	NS	NS	NS	0
RCRASC	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
SEMSLIENS	0.0200	0	NS	NS	NS	NS	NS	0
SFLIENS	0.0200	0	NS	NS	NS	NS	NS	0
SSTS	0.0200	0	NS	NS	NS	NS	NS	0
TRI	0.0200	0	NS	NS	NS	NS	NS	0
TSCA	0.0200	0	NS	NS	NS	NS	NS	0
RCRAGR06	**0.1250**	**0**	**1**	**NS**	**NS**	**NS**	**NS**	**1**
RCRANGR06	**0.1250**	**0**	**0**	**NS**	**NS**	**NS**	**NS**	**0**
ALTFUELS	0.2500	0	0	0	NS	NS	NS	0
FEMAUST	0.2500	0	0	0	NS	NS	NS	0
HISTPST	0.2500	0	0	0	NS	NS	NS	0
ICISCLEANERS	0.2500	0	0	0	NS	NS	NS	0
MRDS	0.2500	0	0	0	NS	NS	NS	0
MSHA	0.2500	0	0	0	NS	NS	NS	0
BF	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
DNPL	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
NLRRCRAT	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
ODI	0.5000	0	0	0	0	NS	NS	0
RCRAT	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**

Database Radius Summary

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
SEMS	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
SEMSARCH	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
SMCRA	0.5000	0	0	0	0	NS	NS	0
USUMTRCA	0.5000	0	0	0	0	NS	NS	0
DOD	1.0000	0	0	0	0	0	NS	0
FUDS	1.0000	0	0	0	0	0	NS	0
FUSRAP	1.0000	0	0	0	0	0	NS	0
NLRRCRAC	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
NMS	1.0000	0	0	0	0	0	NS	0
NPL	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
PNPL	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
RCRAC	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
RCRASUBC	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
RODS	1.0000	0	0	0	0	0	NS	0
SUB-TOTAL		0	1	0	0	0	0	1

Database Radius Summary

STATE (LA) LISTING

*Standard environmental records are displayed in **bold**.*

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
ASBESTOS	0.0200	0	NS	NS	NS	NS	NS	0
CDL	0.0200	0	NS	NS	NS	NS	NS	0
IC	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
LIENS	0.0200	0	NS	NS	NS	NS	NS	0
SPILLS	0.0200	0	NS	NS	NS	NS	NS	0
WASTETIRE	0.0200	0	NS	NS	NS	NS	NS	0
DCR	0.2500	0	0	0	NS	NS	NS	0
NLRUST	**0.2500**	**0**	**0**	**0**	**NS**	**NS**	**NS**	**0**
UST	**0.2500**	**0**	**0**	**0**	**NS**	**NS**	**NS**	**0**
ADS	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
HLUST	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
LUST	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
RCY	0.5000	0	0	0	0	NS	NS	0
SWLF	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
VRP	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
WP	0.5000	0	0	0	0	NS	NS	0
CPI	**1.0000**	**0**	**0**	**0**	**0**	**1**	**NS**	**1**

SUB-TOTAL		0	0	0	0	1	0	1

Database Radius Summary

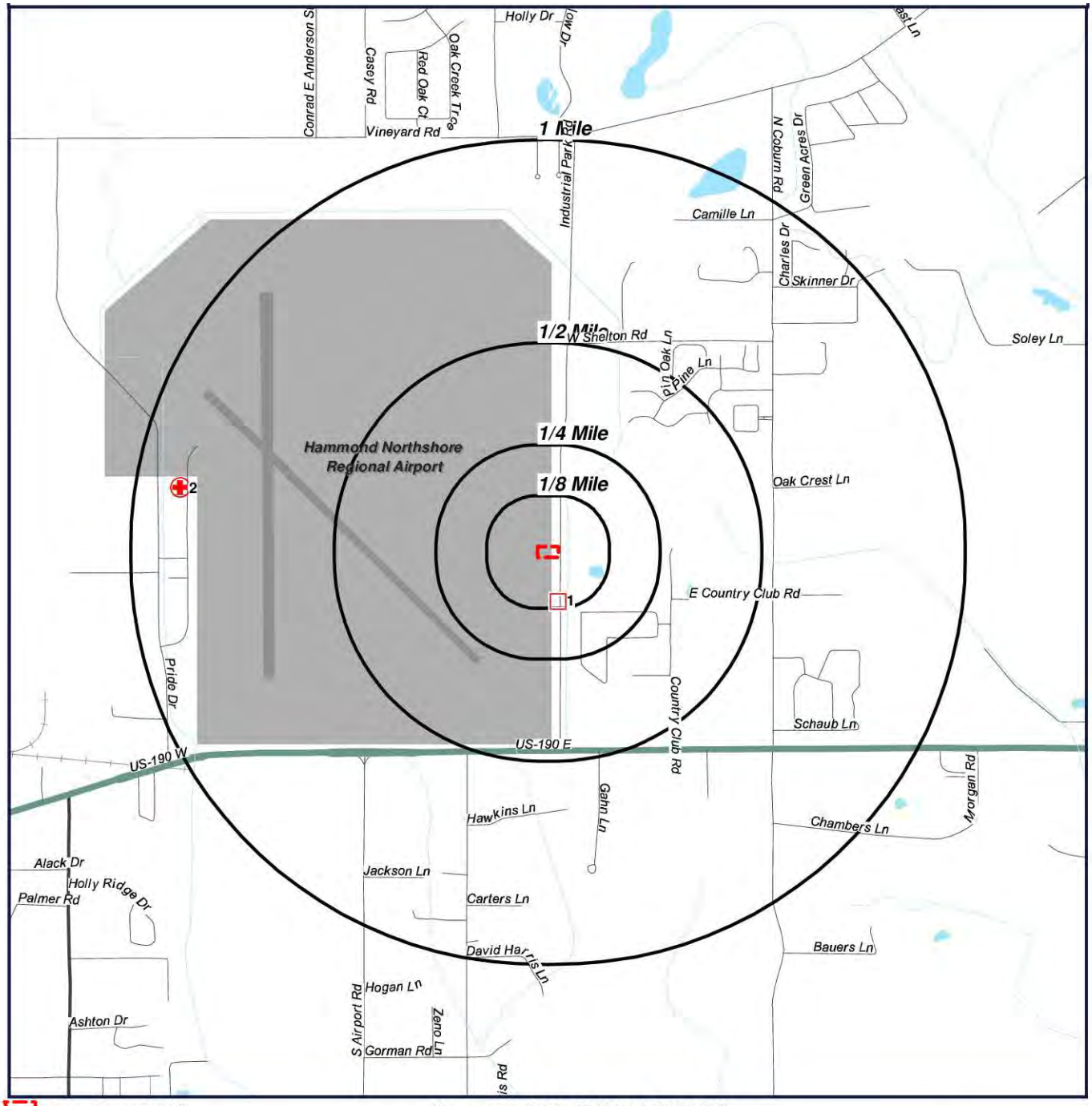
TRIBAL LISTING

*Standard environmental records are displayed in **bold**.*

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
USTR06	**0.2500**	**0**	**0**	**0**	**NS**	**NS**	**NS**	**0**
LUSTR06	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
ODINDIAN	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
INDIANRES	1.0000	0	0	0	0	0	NS	0
SUB-TOTAL		0	0	0	0	0	0	0
TOTAL		0	1	0	0	1	0	2

NOTES:
NS = NOT SEARCHED
TP/AP = TARGET PROPERTY/ADJACENT PROPERTY

Radius Map 1



Target Property (TP)
RCRAGR06
CPI

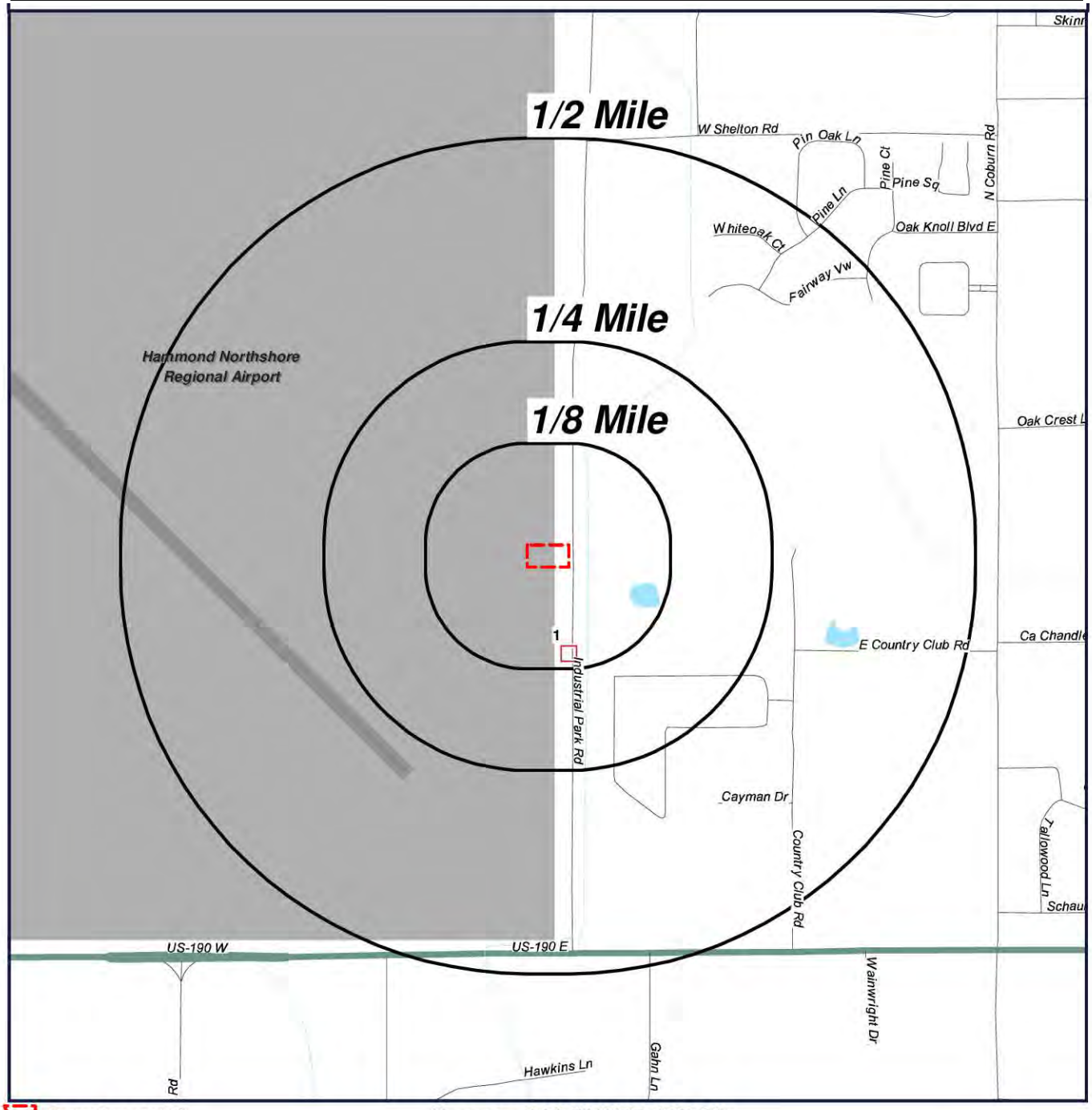
Hammond KLIX WSR-88D Site
600 N. Airport Road
Hammond, Louisiana
70401

N
W E
S

0' 1000' 2000' 3000'
SCALE: 1" = 2000'

[Click here to access Satellite view]

Radius Map 2



Target Property (TP)
RCRAGR06
CPI

Hammond KLIX WSR-88D Site
600 N. Airport Road
Hammond, Louisiana
70401

N
W E
S

0' 500' 1000' 1500'
SCALE: 1" = 1000'

[Click here to access Satellite view]

Ortho Map

Target Property (TP)
RCRAGR06
CPI

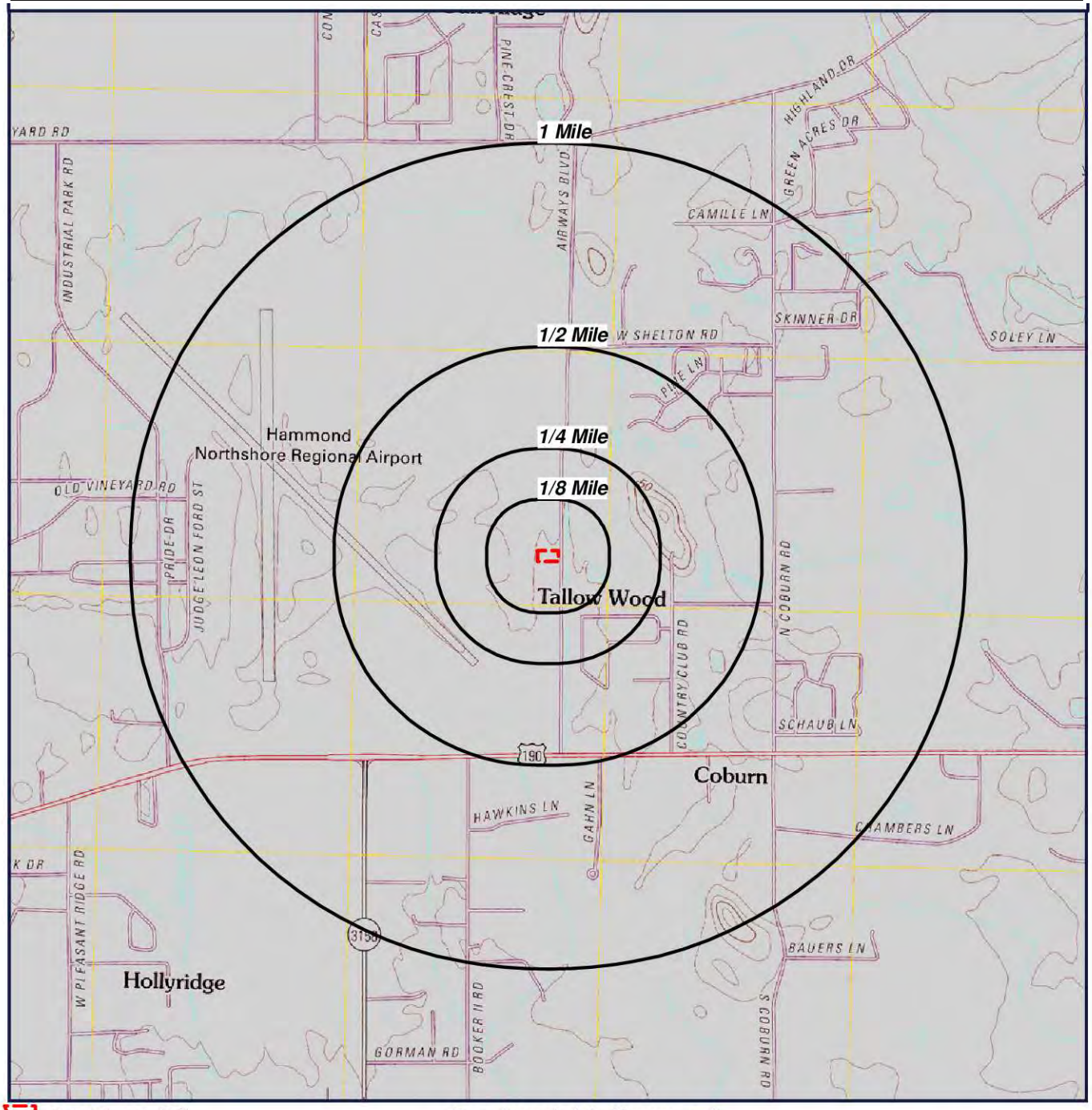
Quadrangle(s): Hammond
Hammond KLIX WSR-88D Site
600 N. Airport Road
Hammond, Louisiana
70401

N
W E
S

0' 500' 1000' 1500'
SCALE: 1" = 1000'

[Click here to access Satellite view]

Topographic Map



Target Property (TP)

Quadrangle(s): Hammond
Source: USGS, 03/15/2012
Hammond KLIX WSR-88D Site
600 N. Airport Road
Hammond, Louisiana
70401

N
W E
S

0' 1000' 2000' 3000'
SCALE: 1" = 2000'

[Click here to access Satellite view]

Located Sites Summary

*NOTE: Standard environmental records are displayed in **bold**.*

Map ID#	Database Name	Site ID#	Relative Elevation	Distance From Site	Site Name	Address	PAGE #
1	RCRAGR06	LAR000005959	Higher (40 ft.)	0.105 mi. S (554 ft.)	CLOUD CHASERS INC	553 N INDUSTRIAL PARK RD, HAMMOND, LA 70401	16
2	CPI	13332CPI	Higher (43 ft.)	0.889 mi. W (4694 ft.)	US 236 COMBAT COMMUNICATIONS SQUADRON LA AIR NATIONAL GUARD	901 JUDGE LEON FORD DR, HAMMOND, LA 70401	17

Elevation Summary

Elevations are collected from the USGS 3D Elevation Program 1/3 arc-second (approximately 10 meters) layer hosted at the NGTOC. .

Target Property Elevation: 39 ft.

*NOTE: Standard environmental records are displayed in **bold**.*

EQUAL/HIGHER ELEVATION

Map ID#	Database Name	Elevation	Site Name	Address	Page #
1	RCRAGR06	40 ft.	CLOUD CHASERS INC	553 N INDUSTRIAL PARK RD, HAMMOND, LA 70401	16
2	CPI	43 ft.	US 236 COMBAT COMMUNICATIONS SQUADRON LA AIR NATIONAL GUARD	901 JUDGE LEON FORD DR, HAMMOND, LA 70401	17

LOWER ELEVATION

No Records Found

Resource Conservation & Recovery Act - Generator (RCRAGR06)

MAP ID# 1

Distance from Property: 0.105 mi. (554 ft.) S
Elevation: 40 ft. (Higher than TP)

FACILITY INFORMATION

EPA ID#: **LAR000005959**
NAME: **CLOUD CHASERS INC**
ADDRESS: **553 N INDUSTRIAL PARK RD**
HAMMOND, LA 70401
CONTACT NAME: **TOM SIEGRIST**
CONTACT ADDRESS: **553 N INDUSTRIAL PARK RD**
HAMMOND LA 70401
CONTACT PHONE: **985-542-1163**
NON-NOTIFIER: **NOT A NON-NOTIFIER**
DATE RECEIVED BY AGENCY: **04/10/2001**
CERTIFICATION **- NO CERTIFICATION REPORTED -**
INDUSTRY CLASSIFICATION (NAICS)
336412 - AIRCRAFT ENGINE AND ENGINE PARTS MANUFACTURING

OWNER TYPE: **PRIVATE**
OWNER NAME: **TOM SIEGRIST**
OPERATOR TYPE: **NOT REPORTED**
OPERATOR NAME: **NOT REPORTED**

CURRENT ACTIVITY INFORMATION

GENERATOR STATUS: **CONDITIONALLY EXEMPT SMALL QUANTITY GENERATOR** LAST UPDATED DATE: **04/10/2001**
SUBJECT TO CORRECTIVE ACTION UNIVERSE: **NO**
TDSFs POTENTIALLY SUBJECT TO CORRECTIVE ACTION UNDER 3004 (u)/(v) UNIVERSE: **NO**
TDSFs ONLY SUBJECT TO CORRECTIVE ACTION UNDER DISCRETIONARY AUTHORITIES UNIVERSE: **NO**
NON TSDFs WHERE RCRA CORRECTIVE ACTION HAS BEEN IMPOSED UNIVERSE: **NO**
CORRECTIVE ACTION WORKLOAD UNIVERSE: **NO**

IMPORTER: **NO**
MIXED WASTE GENERATOR: **NO**
RECYCLER: **NO**
TRANSPORTER: **NO**
ONSITE BURNER EXEMPTION: **NO**
FURNACE EXEMPTION: **NO**
USED OIL REFINER: **NO**
USED OIL TRANSFER FACILITY: **NO**

UNDERGROUND INJECTION: **NO**
UNIVERSAL WASTE DESTINATION FACILITY: **NO**
TRANSFER FACILITY: **NO**
USED OIL FUEL BURNER: **NO**
USED OIL PROCESSOR: **NO**
USED OIL FUEL MARKETER TO BURNER: **NO**
SPECIFICATION USED OIL MARKETER: **NO**
USED OIL TRANSPORTER: **NO**

COMPLIANCE, MONITORING AND ENFORCEMENT INFORMATION

EVALUATIONS **- NO EVALUATIONS REPORTED -**
VIOLATIONS **- NO VIOLATIONS REPORTED -**
ENFORCEMENTS **- NO ENFORCEMENTS REPORTED -**

HAZARDOUS WASTE

D001 **IGNITABLE WASTE**

UNIVERSAL WASTE **- NO UNIVERSAL WASTE REPORTED -**
CORRECTIVE ACTION AREA **- NO CORRECTIVE ACTION AREA INFORMATION REPORTED -**
CORRECTIVE ACTION EVENT
NO CORRECTIVE ACTION EVENT(S) REPORTED

Back to Report Summary

MAP ID# 2

Distance from Property: 0.889 mi. (4,694 ft.) W
Elevation: 43 ft. (Higher than TP)

FACILITY INFORMATION

GEOSEARCH ID: **13332CPI**
FACILITY ID: **13332**
NAME: **US 236 COMBAT COMMUNICATIONS SQUADRON LA AIR NATIONAL GUARD**
ADDRESS: **901 JUDGE LEON FORD DR**
HAMMOND, LA 70401
PARISH: **TANGIPAHOA**

SITE DETAILS

STATUS: **CONFIRMED**
ACTIVITY DESCRIPTION: **REM20110001**
TEAM LEADER: **ROBERT HARRIS**
TITLE DESCRIPTION: **REMEDIATION OVERSIGHT**
REGION DESCRIPTION: **CAPITAL**

Back to Report Summary

Unlocated Sites Summary

This list contains sites that could not be mapped due to limited or incomplete address information.

No Records Found

APPENDIX 4

Protected Species List

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly aected by activities in the project area. However, determining the likelihood and extent of eects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS oce(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Project information

NAME

KLIX WSR-88D Existing Site

LOCATION

St. Tammany County, Louisiana

DESCRIPTION

NWS Weather Radar

Local office

Louisiana Ecological Services Field Office

(337) 291-3100
(337) 291-3139

646 Cajundome Boulevard, Suite 400
Lafayette, LA 70506-4290

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of inuence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water ow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Log in to IPaC.
2. Go to your My Projects list.
3. Click PROJECT HOME for this project.
4. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS

West Indian Manatee Trichechus manatus There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/4469	Threatened Marine mammal

Birds

NAME	STATUS
Red-cockaded Woodpecker Picoides borealis No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/7614	Endangered

Reptiles

NAME	STATUS
Gopher Tortoise Gopherus polyphemus No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6994	Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/

conservation-measures.php

- Nationwide conservation measures for birds
  http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
American Kestrel Falco sparverius paulus This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds Apr 1 to Aug 31
Bachman's Sparrow Aimophila aestivalis This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/6177	Breeds May 1 to Sep 30

Bald Eagle Haliaeetus leucocephalus — Breeds Sep 1 to Jul 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1626

Henslow's Sparrow Ammodramus henslowii — Breeds May 1 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3941

Kentucky Warbler Oporornis formosus — Breeds Apr 20 to Aug 20

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

King Rail Rallus elegans — Breeds May 1 to Sep 5

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/8936

Prairie Warbler Dendroica discolor — Breeds May 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Prothonotary Warbler Protonotaria citrea — Breeds Apr 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Red-headed Woodpecker Melanerpes erythrocephalus — Breeds May 10 to Sep 10

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Swallow-tailed Kite Elanoides forficatus — Breeds Mar 10 to Jun 30

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/8938

Willet Tringa semipalmata — Breeds Apr 20 to Aug 5

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wood Thrush Hylocichla mustelina — Breeds May 10 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

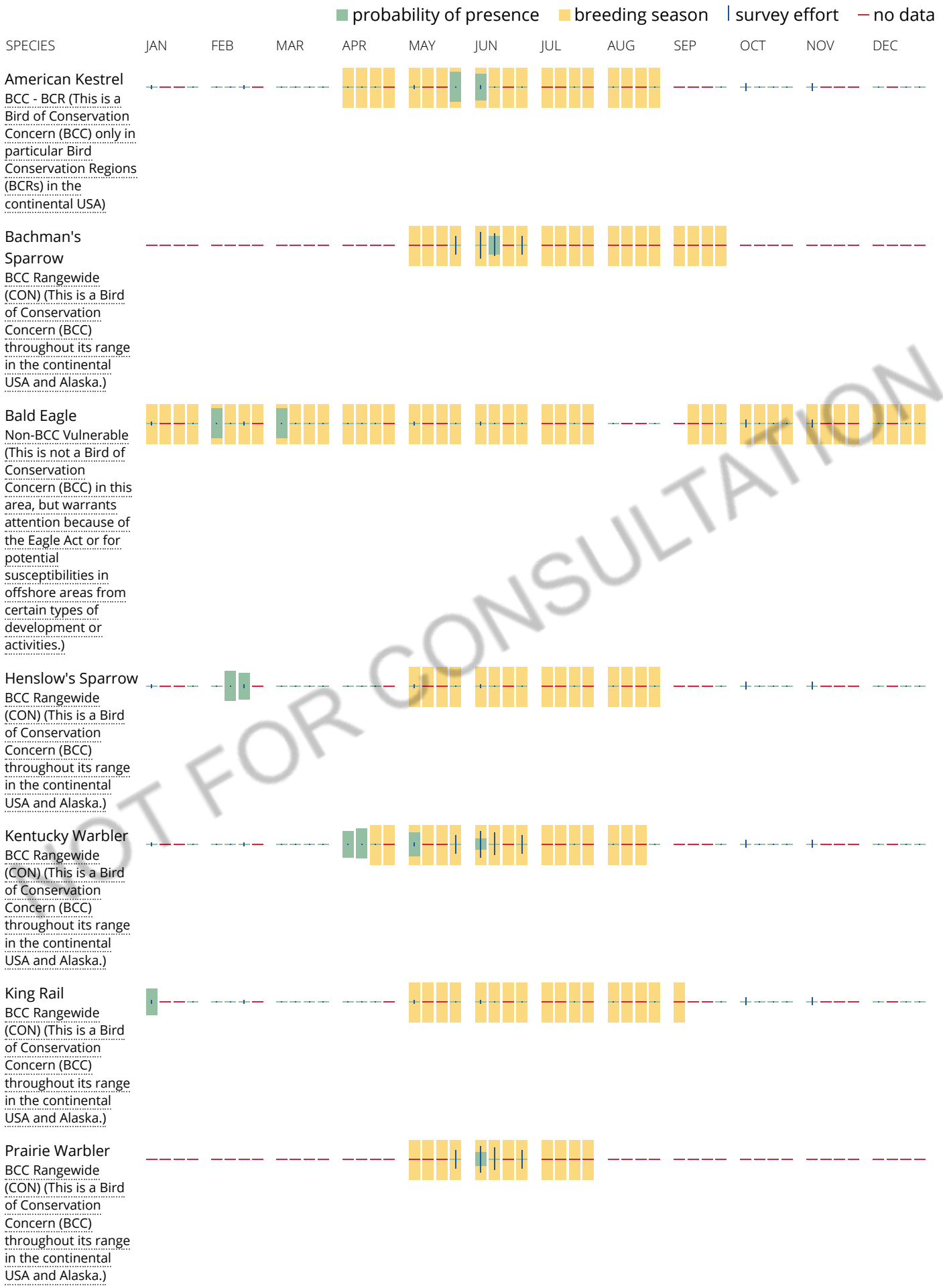
Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project

intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, eorts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also oers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey eort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey eort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey eort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Marine mammals

Marine mammals are protected under the Marine Mammal Protection Act. Some are also protected under the Endangered Species Act[1] and the Convention on International Trade in Endangered Species of Wild Fauna and Flora[2].

The responsibilities for the protection, conservation, and management of marine mammals are shared by the U.S. Fish and Wildlife Service [responsible for otters, walruses, polar bears, manatees, and dugongs] and NOAA Fisheries[3] [responsible for seals, sea lions, whales, dolphins, and porpoises]. Marine mammals under the responsibility of NOAA Fisheries are **not** shown on this list; for additional information on those species please visit the Marine Mammals page of the NOAA Fisheries website.

The Marine Mammal Protection Act prohibits the take (to harass, hunt, capture, kill, or attempt to harass, hunt, capture or kill) of marine mammals and further coordination may be necessary for project evaluation. Please contact the U.S. Fish and Wildlife Service Field Office shown.

1. The Endangered Species Act (ESA) of 1973.
2. The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is a treaty to ensure that international trade in plants and animals does not threaten their survival in the wild.
3. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following marine mammals under the responsibility of the U.S. Fish and Wildlife Service are potentially affected by activities in this location:

NAME

West Indian Manatee *Trichechus manatus*
https://ecos.fws.gov/ecp/species/4469

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

THERE ARE NO KNOWN WETLANDS AT THIS LOCATION.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly aected by activities in the project area. However, determining the likelihood and extent of eects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS oce(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Project information

NAME

KLIX WSR-88D NSTCC Site

LOCATION

St. Tammany County, Louisiana

DESCRIPTION

NWS Weather Radar

Local office

Louisiana Ecological Services Field Office

(337) 291-3100
(337) 291-3139

646 Cajundome Boulevard, Suite 400
Lafayette, LA 70506-4290

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of inuence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water ow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Log in to IPaC.
2. Go to your My Projects list.
3. Click PROJECT HOME for this project.
4. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS

West Indian Manatee Trichechus manatus There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/4469	Threatened Marine mammal

Birds

NAME	STATUS
Red-cockaded Woodpecker Picoides borealis No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/7614	Endangered

Reptiles

NAME	STATUS
Gopher Tortoise Gopherus polyphemus No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6994	Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/

conservation-measures.php

- Nationwide conservation measures for birds
  http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ “Proper Interpretation and Use of Your Migratory Bird Report” before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

■ probability of presence ■ breeding season | survey effort – no data

SPECIES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

Bald Eagle
Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

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guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

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Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also oers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ “What does IPaC use to generate the migratory birds potentially occurring in my specified location”. Please be aware this report provides the “probability of presence” of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey eort (indicated by the black vertical bar) and for the existence of the “no data” indicator (a red horizontal bar). A high survey eort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey eort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or

minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ “Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds” at the bottom of your migratory bird trust resources page.

Marine mammals

Marine mammals are protected under the Marine Mammal Protection Act. Some are also protected under the Endangered Species Act[1] and the Convention on International Trade in Endangered Species of Wild Fauna and Flora[2].

The responsibilities for the protection, conservation, and management of marine mammals are shared by the U.S. Fish and Wildlife Service [responsible for otters, walruses, polar bears, manatees, and dugongs] and NOAA Fisheries[3] [responsible for seals, sea lions, whales, dolphins, and porpoises]. Marine mammals under the responsibility of NOAA Fisheries are **not** shown on this list; for additional information on those species please visit the Marine Mammals page of the NOAA Fisheries website.

The Marine Mammal Protection Act prohibits the take (to harass, hunt, capture, kill, or attempt to harass, hunt, capture or kill) of marine mammals and further coordination may be necessary for project evaluation. Please contact the U.S. Fish and Wildlife Service Field Office shown.

1. The Endangered Species Act (ESA) of 1973.
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3. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following marine mammals under the responsibility of the U.S. Fish and Wildlife Service are potentially affected by activities in this location:

NAME

West Indian Manatee *Trichechus manatus*
https://ecos.fws.gov/ecp/species/4469

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

THERE ARE NO KNOWN WETLANDS AT THIS LOCATION.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly aected by activities in the project area. However, determining the likelihood and extent of eects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS oce(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Project information

NAME

KLIX WSR-88D HDC Site 20191008

LOCATION

Tangipahoa County, Louisiana

DESCRIPTION

NWS weather Radar

Local office

Louisiana Ecological Services Field Office

(337) 291-3100
(337) 291-3139

646 Cajundome Boulevard, Suite 400
Lafayette, LA 70506-4290

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of inuence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water ow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Log in to IPaC.
2. Go to your My Projects list.
3. Click PROJECT HOME for this project.
4. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS

West Indian Manatee Trichechus manatus There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/4469	Threatened Marine mammal

Birds

NAME	STATUS
Red-cockaded Woodpecker Picoides borealis No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/7614	Endangered

Reptiles

NAME	STATUS
Gopher Tortoise Gopherus polyphemus No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6994	Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/

conservation-measures.php

- Nationwide conservation measures for birds
  http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31
Prothonotary Warbler Protonotaria citrea This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 1 to Jul 31
Red-headed Woodpecker Melanerpes erythrocephalus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10

Rusty Blackbird Euphagus carolinus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Wood Thrush Hylocichla mustelina This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

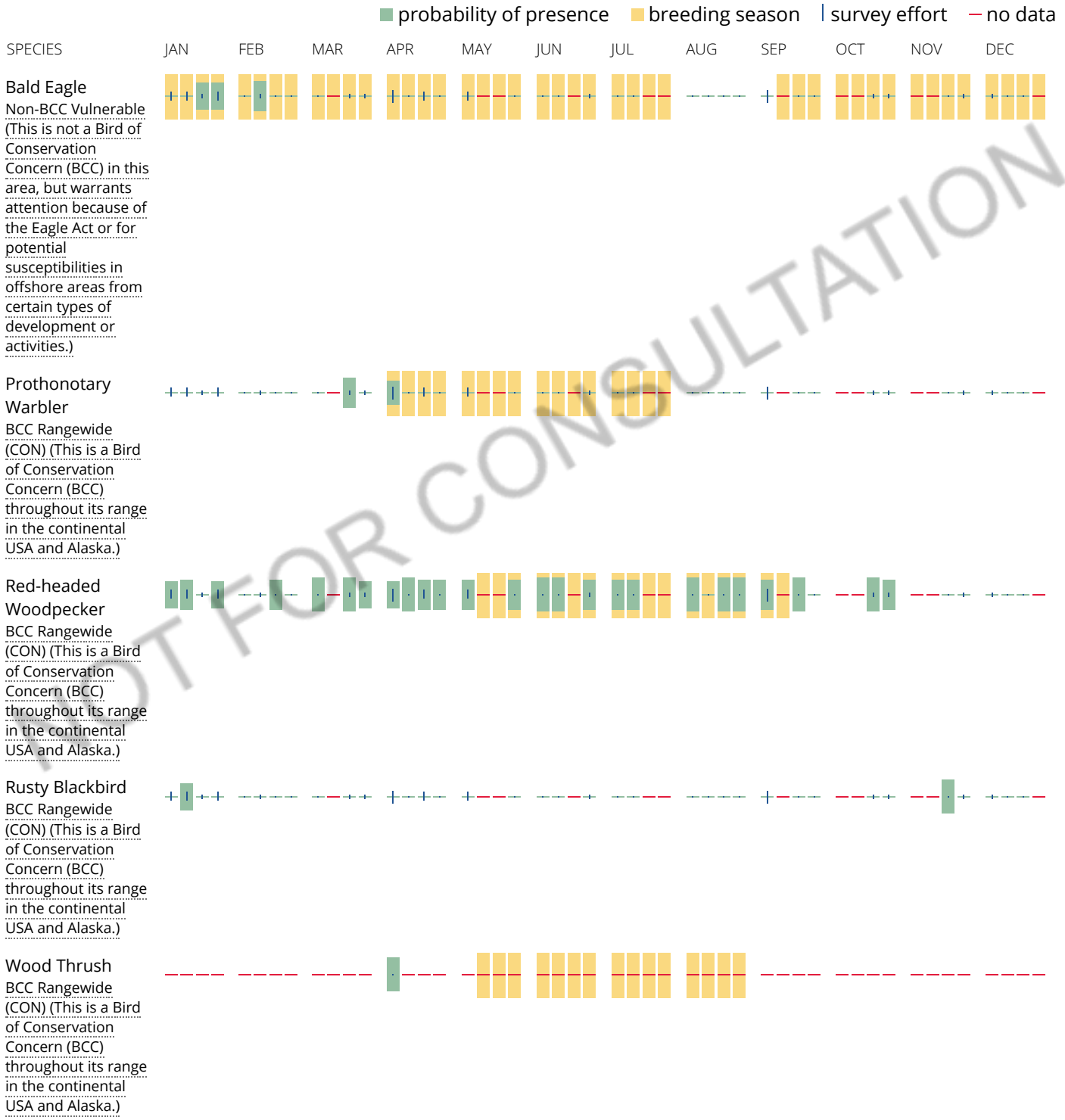
Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, eorts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

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THERE ARE NO REFUGE LANDS AT THIS LOCATION.

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Data precautions

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