Biological Opinion for the Indiana Bat (*Myotis sodalis*) and Northern Long-Eared Bat (*Myotis septentrionalis*) and Incidental Take Statement for the Indiana bat for the NEXUS Gas Transmission Project.

December 14, 2016

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INTRODUCTION

This document transmits the U.S. Fish and Wildlife Service's (Service) Biological Opinion based on our review of the Federal Energy Regulatory Commission's (FERC's) proposed issuance of a Certificate of Public Convenience and Necessity to NEXUS Gas Transmission, LLC (NEXUS) for the NEXUS Gas Transmission Project (NGT Project), and the effects on the Indiana bat (*Myotis sodalis*; IBAT) and northern long-eared bat (*Myotis septentrionalis*; NLEB) in accordance with section 7(a)(2) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). The FERC docket number for the NGT Project is CP16-22-000. FERC's request for formal consultation was received on October 20, 2016.

This BO is based on information provided in the Biological Assessment (BA). A complete administrative record of this consultation is on file at the Service's Columbus Ohio Field Office (COFO).

4(d) for the Northern Long-Eared Bat

On January 14, 2016, the Service published a species-specific rule pursuant to section 4(d) of the ESA for NLEB (81 FR 1900). Section 4(d) of the ESA states that:

> *Whenever any species is listed as a threatened species ... the Secretary shall issue such regulations as he deems necessary and advisable to provide for the conservation of such species* (16 U.S.C. 1533(d)).

The Service's 4(d) rule for NLEB exempts the take of NLEB from the section 9 prohibitions of the ESA, as follows:

(1) Incidental take, for areas of the country in the White-Nose Syndrome zone, that results from tree removal activities is exempted as long as the activity:
   a. Occurs more than 0.25 mile (0.4 km) from a known, occupied hibernacula; and
   b. Avoids cutting or destroying known, occupied roost trees during the pup season (June 1–July 31)

(2) All incidental take in areas of the country not within the White-Nose Syndrome zone is exempted

(3) Throughout the range of the NLEB, purposeful take is exempted if it results from:
   c. Removal of NLEBs from human structures;
   d. Defense of human life (e.g., public health monitoring for rabies); and
   e. Removal of hazardous trees for the protection of human life and property

Thus, any take of NLEB occurring in conjunction with these activities that complies with the conservation measures, as necessary, is exempted from section 9 prohibitions by the 4(d) rule, and does not require incidental take authorization. We distinguish these activities from other actions in the accompanying BO.

However, the 4(d) rules do not afford exemption from the ESA's section 7 procedural requirements. Therefore, consultation is required when actions (even those within the scope of the 4(d) rule) are funded, authorized or carried out by a federal agency. This is because the purpose of section 7 consultation is broader than the mere evaluation of take and issuance of an Incidental Take Statement; such consultations fulfill the requirements of section 7(a)(2) of the ESA, which directs that all federal actions insure that their actions are not likely to jeopardize the continued existence of any listed species, or result in the destruction or adverse modification of designated critical habitat.

CONSULTATION HISTORY

FERC determined that the NGT Project is likely to adversely affect the IBAT and NLEB, and submitted a request for initiation of formal consultation to the Service on October 20, 2016. In an October 21, 2016 response letter, the Service concurred with FERC's determination, and agreed that the initiation package was complete in accordance with 50 CFR §402.14, and that the timeframe for formal consultation had begun effective October 20, 2016.

Date	**Event**
September 2014	Initial project coordination letters sent to COFO and the Service's East Lansing FO (ELFO) requesting technical assistance for the NGT Project
October 7, 2014	COFO and TRC Solutions (TRC) meet at COFO to discuss the NGT Project
October 9, 2014	COFO sends letter to TRC providing technical assistance
November 2014	ELFO and TRC Solutions meet at ELFO to discuss the NGT Project
December 3, 2014	ELFO sends letter to TRC providing technical assistance
February 2, 2015	COFO receives Initial Pre-filing Drafts of Resource Reports sent by NEXUS
March 2, 2015	Service receives proposal for mussel habitat assessment and survey proposals for plants and butterflies
April 8, 2015	FERC publishes Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS)
May 6, 2015	TRC submits bat survey plan to the Service
May 21, 2015	NEXUS initiates the exchange emails and phone calls regarding the NGT Project with the Service's Region 3 Regional Office (R3RO) and
May 22, 2015	Service submits comment to FERC on NOI to prepare an EIS

June 2015	NEXUS meets with R3RO to provide updates on the NGT Project
June 17, 2015	COFO receives Draft Environmental Report from NEXUS
June 26, 2015	COFO, NEXUS, and TRC meeting at COFO to discuss federally listed species and migratory birds
July 30, 2016	COFO receives request from Environmental Solutions and Innovations to conduct a mussel survey in Swan Creek, Fulton County, Ohio
July 31, 2015	COFO authorizes mussel survey in Swan Creek
October 18, 2015	COFO receives Swan Creek mussel survey report from TRC
October 26, 2015	Service receives written update on the status of the NGT Project
October 29, 2015	Service meets with TRC and Spectra Energy, LLC in Bloomington, MN to review progress of the NGT Project
November 24, 2015	NEXUS sends Service their FERC Application for the NGT Project that was filed with FERC on November 20, 2015
December 7, 2015	FERC publishes NEXUS NGT Project Notice of Application
January 2016	NEXUS meets with R3RO to provide updates on the NGT Project
January 6, 2016	Service submits letter to FERC providing comments on the NGT Project Application
February 18, 2016	Meeting at COFO with NEXUS and TRC to discuss status of the NGT Project surveys
March 2016	Meeting at ELFO with NEXUS and TRC to discuss status of the NGT Project surveys
May 2016	NEXUS meets with R3RO to provide updates on the NGT Project
May 24, 2016	COFO received Administrative Draft EIS
June 6, 2016	Service submits comment on Adm. Draft EIS to FERC
July 20, 2016	COFO receives Draft EIS from FERC
August 19, 2016	TRC submits final threatened and endangered species reports for the NGT Project to COFO
August 22, 2016	U.S. Dept. of Interior submits comments on the Draft EIS to FERC

September 14, 2016	Service meets with NEXUS to discuss status of the NGT Project
October 4, 2016	COFO and FERC conference call to discuss section 7 consultation for the NGT Project
October 20, 2016	COFO received FERC's request for initiation of formal consultation for the IBAT and NLEB and informal consultation for the rayed bean
October 21, 2016	COFO sends letter to FERC acknowledging initiation for formal consultation for the IBAT and NLEB and concluding informal consultation for the rayed bean
December 6, 2016	COFO sends draft BO to FERC for review
December 13, 2016	FERC submits comments on draft BO to COFO
December 14, 2016	COFO issues final BO to FERC concluding formal consultation

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The federal action evaluated in this biological opinion (BO) is FERC's issuance of a Certificate of Public Convenience and Necessity (Certificate) to NEXUS to construct, own, and operate the NGT Project. The NGT Project includes the construction of the Greenfield Mainline Route (Mainline) which is approximately 255.7 miles of new 36-inch-diameter natural gas transmission pipeline running from Columbiana County, Ohio and connecting to DTE Gas Company (DTE Gas) in Ypsilanti Township, Washtenaw County, Michigan. Approximately 209 miles of the new pipeline will be in Ohio and 47 miles of new pipeline in Michigan. Additionally, approximately 0.9 mile of new 36-inch-diameter interconnecting pipeline connecting to Tennessee Gas Pipeline Company will be constructed and operated near Hanover Township, Columbiana County, Ohio.

The NGT Project also includes the installation of 4 new gas turbine compressor stations, 6 new metering and regulating (M&R) stations, 4 new pig launchers and receiver facilities, and 13 new tee-taps. Figure 1 provides an overview map of the NGT Project.

Compressor Stations

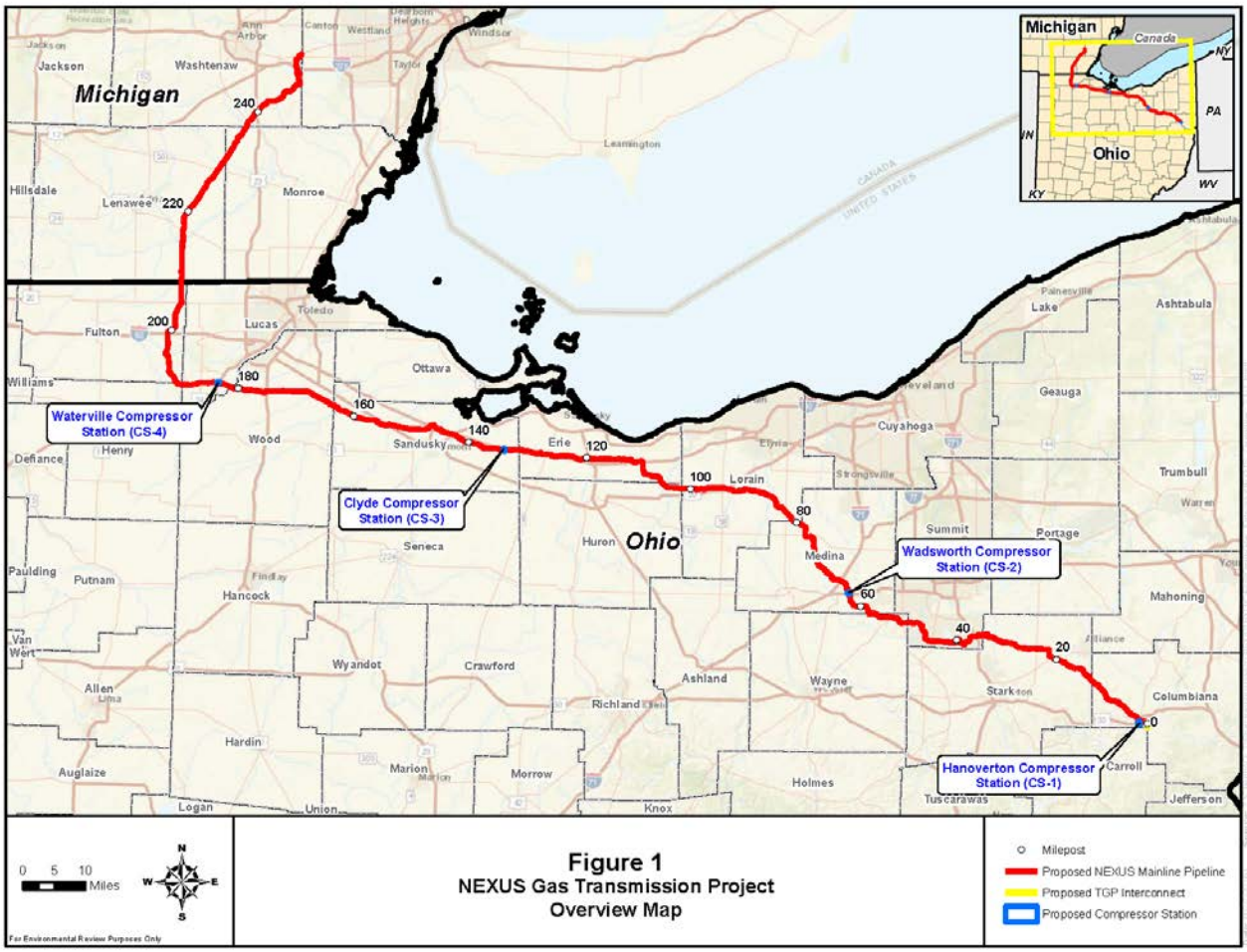
The proposed Hanoverton Compressor Station is located in Hanover Township, Columbiana County, Ohio and would be comprised of two gas turbine-driven compressor packages totaling 52,000 horsepower (hp). The facility would be located on 27.7 acres within a 119.6-acre parcel of agriculture and open lands.

The proposed Wadsworth Compressor Station is located in Guilford Township, Medina County, Ohio and would be comprised of a single gas turbine-driven compressor package totaling 26,000 hp. The facility would be located on 22.0 acres within a 76.5-acre parcel of agricultural, open, and residential land.

The proposed Clyde Compressor Station is located in Townsend Township, Sandusky County, Ohio and would be comprised of a single gas turbine-driven compressor package totaling 26,000 hp. The facility would be located on 37.2 acres within a 50.4-acre parcel of agricultural, open, industrial/commercial land.

The proposed Waterville Compressor Station is located at in Waterville Township, Lucas County, Ohio and would be comprised of a single gas turbine-driven compressor package totaling 26,000 hp. The facility would be located on 33.0 acres within a 48.8-acre parcel of agricultural, open, and industrial/commercial land.

Figure 1. NEXUS Project Overview



Meter and Regulating Stations

NEXUS would construct six new M&R stations. M&R stations measure the volume of gas added to or removed from a pipeline system. Most M&R stations consist of a small, fenced, graveled area with small building(s) that enclose the measurement equipment.

Texas Gas Pipeline Company, LLC (TGP) M&R Receipt Station (MR01) is proposed at the beginning of the TGP Interconnecting Pipeline and would tie-in with TGP's mainline in Columbiana County, Ohio. The facility would be located on 3.6 acres within a 35.1-acre parcel of agricultural, open, and industrial/commercial land.

Texas Eastern M&R Receipt Station (MR03) is proposed at the end of the TGP interconnecting pipeline in Columbiana County, Ohio. The MR03 facilities would be located on 5.2 acres of land within a 117.2-acre parcel of agricultural, forested, and industrial/commercial land.

The Kensington M&R Receipt Station (MR02) is proposed at the beginning of the NGT Project

Mainline and would be immediately adjacent to MR03 in Columbiana County, Ohio. The MR02 facilities would be co-located on the same 5.2 acres of land within the same 117.2-acre parcel as MR03.

The Dominion East Ohio M&R Delivery Station is proposed at the delivery point with Dominion East Ohio Gas in Erie County, Ohio. The facility would be located on 1.8 acres of land within a 20.2-acre parcel of agricultural land.

The Columbia Gas Ohio Delivery Station is proposed at the delivery point with Columbia Gas Ohio in Sandusky County, Ohio. The facility would be located on 1.0 acre of land within a 76.9-acre parcel of agricultural land.

The Willow Run M&R Delivery Station (MR04) is proposed at the terminus of the NGT Project Mainline and would tie-in with DTE Gas facilities in Washtenaw County, Michigan. The facility would be located on 0.7 acre of land within a 3.7-acre parcel of open and industrial/commercial land.

Mainline Valves

The NGT Project would include construction and operation of 16 remote-controlled mainline valves (MLVs). MLVs consist of a system of aboveground and underground piping and valves that control the flow of gas within the pipeline. MLVs are monitored at a gas control center and can be closed remotely with an electronic command to stop the flow of gas if necessary. MLVs would be installed within other aboveground facilities or in areas already disturbed by pipeline construction and would be primarily located within the permanent operational right-of-way (ROW).

Pig Launchers and Receivers

The NGT Project would include construction and operation of four pig launchers and four pig receivers. Launchers and receivers are facilities where internal pipeline cleaning and inspection tools, referred to as "pigs," can be inserted or retrieved from the pipeline. Pig launchers and receivers consist of aboveground piping within the pipeline ROW or other aboveground facility boundaries. Pig launchers and receivers would be installed at the Wadsworth and Waterville compressor stations. Launcher facilities also would be installed at MR01 and at MR02, and receiver facilities would be installed at MR03 and MR04.

Communications Towers

The NGT Project would include construction and operation of five communications towers. Communications towers support licensed very high frequency mobile radio transmission equipment for voice communications. One tower would be installed at each of the compressor stations, and one tower would be installed at MLV 15. All of the towers would be 190 feet tall, except the tower at the Wadsworth Compressor Station, which would be 140 feet tall.

Tee-Taps

The NGT Project would include construction of 13 tee-taps along the proposed pipeline. Tee-taps

typically are underground fittings installed on a pipeline to facilitate potential future connections, which may or may not include aboveground components at that location at a later date. Installing tee-taps during initial construction eliminates the need to make connections to an operational pipeline while natural gas is flowing (also known as a hot tap) at a later time.

Construction

The NGT Project would require a 100-foot wide construction ROW with additional temporary workspace (ATWS) where required for site-specific construction techniques. Within wetlands, the construction ROW is reduced to 75 feet wide. In areas where full construction right-of-way topsoil stripping would be conducted and at steep side-slopes, NEXUS proposes to increase its construction ROW width to 125 to 145 feet. Many conditions must be taken into consideration when determining the amount of construction workspace needed to build the pipeline including agricultural land, drain tiles, proximity to existing residences, roads, railroads, transmission line structures and wires, existing pipeline crossings, topography, soils, bedrock and presence of trees, wetlands, and waterbodies. As a result, in many locations ATWS will be needed outside the 100-foot construction corridor to manage these conditions.

The proposed NGT Project would impact a total of approximately 398.3 acres of forested land (upland forest and forested wetland) during construction and would permanently convert approximately 184.4 acres of forested land (upland forest and forested wetland) to either a scrub-shrub or herbaceous vegetative type during operation of the pipeline.

Existing public and private road crossings along the NGT Project pipeline route would be used, to the extent practicable, as the primary means of accessing the NGT Project ROW. NEXUS would also use existing public and private roads to the extent practicable to access the aboveground facilities. NEXUS would require permanent access roads for the life of the pipeline to access permanent facilities such as compressor stations, MLV, M&R stations, and cathodic protection sites. Generally, temporary and permanent access roads would be up to 25-feet wide to accommodate vegetation clearing setbacks, pull offs, and road shoulder/stormwater management features.

The majority of the existing access roads proposed for use would require minor improvements (tree trimming, addition of gravel, back blading, etc.) to allow for passage of construction vehicles. Existing access roads are generally built on fill materials and have previously been developed for other uses. It is the intention of NEXUS to avoid high quality natural areas including wetland impacts and forest impacts associated with the creation of, or upgrades to, temporary and permanent access roads.

NEXUS has identified eight contractor ware yards for use during construction of the NGT Project. The contractor ware yards would be used for equipment, pipe, and material storage, as well as temporary field offices and pipe preparation/field assembly areas. All of the proposed contractor ware yards consist of previously disturbed areas and are mainly comprised of

agricultural land or previous industrial land uses. Upon completion of the NGT Project, these pipe/contractor ware yards and staging/storage areas would be restored or allowed to regenerate to preconstruction conditions. NEXUS would avoid and minimize impacts to natural areas, including wetland, waterbodies, and forested areas to the extent practicable when using these sites.

Vegetative clearing would be required for construction of proposed pipeline facilities that traverse forested habitats. The limits of clearing would be identified and flagged in the field prior to clearing operations. Initial clearing operations would include the removal of vegetation within the pipeline permanent easement and the temporary construction workspace either by mechanical or hand cutting. In wetlands, trees and brush would either be cut with rubber-tired and/or tracked equipment, or hand-cut. Unless grading is required for safety reasons, wetland woody vegetation would be cut off at ground level leaving existing root systems intact outside of the area excavated for the trench. The aboveground vegetation would be removed from the wetlands for chipping or disposal. In uplands, tree stumps and rootstock would be left in the temporary workspace wherever possible to encourage natural revegetation. Brush and tree limbs will be chipped and hauled off site for disposal.

The anticipated noise level ranges for equipment associated with this project are approximately 60 to 106 decibels with the highest levels occurring during tree clearing due to chainsaw noise. Chainsaws range from 85 to 106 decibels. Excavators and dozers range from 85 to 93 decibels. Vehicle idle noise ranges from 60 to 63 decibels.

The majority of the proposed construction activities would occur during daylight hours. Night construction activities would be limited to occasional time-sensitive pipeline activities, such as road crossings and horizontal directional drillings (HDDs).

The pipeline trench will be excavated using heavy equipment. Rock and/or substrate blasting is also expected to be necessary along the pipeline route in order to complete the excavation of the pipeline trench. All blasting will be performed in accordance with the NGT Project Blasting Plan.

Once the pipeline is installed and cleaned, it will be pressure tested to confirm its integrity for the intended service and operating pressures. The pipeline is hydrostatically tested with water. The water is normally obtained from water sources crossed by the pipeline, including available municipal supply lines. It is pumped from the water source into the pipeline. The water propels a (pipeline cleaning) pig through the pipeline in a manner that displaces the air from the line and completely fills the pipeline with water. Test pressure is obtained by adding water to the test section with a high-pressure pump. At the completion of the hydrostatic test, the pressure is removed from the section and the water is released from the test section, via approved methods, by propelling the pig with air, which forces the water from the pipeline. All water would be discharged in accordance with state and federal requirements. Additional drying pig runs are made, if necessary, to remove any residual water from the pipeline.

Project Area Restoration

Following construction, the entire pipeline ROW would be revegetated, and the minimum ROW width necessary (maximum of 50 feet) for operation would be maintained by NEXUS. The temporary workspace areas used during construction would be seeded and allowed to revegetate with no further maintenance or disturbance associated with the pipeline. In accordance with FERC's Upland Erosion Control, Revegetation, and Maintenance Plan, all disturbed areas would be monitored to determine the post-construction revegetative success for two growing seasons following construction or until revegetation is successful. In addition, FERC staff has recommended that NEXUS file with the Secretary a 5-year post-construction monitoring program to evaluate crop productivity in areas impacted by the construction of the Project.

Operations and Maintenance

Operation and maintenance of newly constructed pipeline and aboveground facilities would be conducted in the same manner used on existing FERC regulated pipeline systems. Standard operations and maintenance procedures include erosion controls, periodic pipeline and ROW patrols, vegetation maintenance, and operations and maintenance at aboveground facilities.

Evidence of post-construction soil erosion or sedimentation on the pipeline ROW or at aboveground facilities would be reported to the local operations supervisor. These reports may originate from NEXUS personnel performing routine patrols or from landowners. Prompt corrective measures would be performed as needed in accordance with NEXUS operations and maintenance procedures.

During periodic pipeline and ROW patrols, permanent erosion control devices installed during construction would be inspected to confirm that they are functioning properly. In addition, attention would be given to:

- Erosion and wash-outs along the ROW;
- Settling, undermining, or degradation of repaired ditch line in streets or parking lots;
- Performance of water control devices such as diversions;
- Condition of banks at stream and river crossings;
- Third-party activity along the pipeline ROW; and
- Any other conditions that could threaten the integrity of the pipeline.

The applicable local operations supervisors would be notified of any conditions that need attention. Significant conditions would be reported to the pipeline owners. Corrective measures would be performed in accordance with applicable regulations and standards.

Vegetation management practices to be utilized include mowing, tree clearing, herbicide

application, and tree side clearing. Regular ROW vegetation maintenance would be performed to facilitate sufficient ground visibility for proper inspection of the ROW by aerial and ground patrols and to ensure the integrity of the pipeline coating is not affected by roots of large trees. An environmental permits database would be maintained to track required environmental permit conditions or notifications that are required for ROW maintenance activities. In wetlands, maintenance of woody vegetation over the full width of the permanent easement is prohibited pursuant to FERC's Wetland and Waterbody Construction and Mitigation Procedures (Procedures). An area 10 feet wide centered over the pipeline would be maintained in an early successional stage of vegetation in accordance with the FERC Procedures. In forested wetlands, tree clearing would be limited to selectively clearing trees within 15 feet of the pipeline with roots that could compromise the integrity of the pipeline coating. Trees and shrubs that become reestablished beyond 15 feet (on both sides of the pipeline) would not be cut unless they present a safety hazard. Typically mowing and vegetation maintenance is performed once every 3 years, however this varies due to local conditions and ROW needs.

The pipeline would be routinely cleaned and inspected for integrity. Integrity assessments are prioritized based on the risk assessment, and are conducted to find pipeline defects before they become a threat. The integrity assessment method for each pipeline segment is selected based on the types of potential integrity threats applicable to that segment. The integrity assessment methods could include:

- In-line inspection – an assessment method that uses an internal inspection tool (commonly referred to as a smart pig) that is capable of identifying and classifying pipe defects, including metal loss, dents, gouges, and other types of defects. The smart pig is inserted into the pipeline and is typically pushed by the flow of natural gas in the pipeline. Cleaning pigs are operated similarly only they function to clean the interior of the pipeline.

- Direct assessment – an assessment method that uses a systematic approach to identifying potential defects through data review, indirect assessments, and targeted hands-on inspections.

- Pressure testing – an assessment method where the pipeline is filled with an inert substance (typically water) and is tested to a pressure that is well above the normal operating pressure to validate the strength of the pipe and identify any smaller defects long before they could become a threat.

These data would be used by NEXUS to monitor the integrity of the pipeline.

The following operations and maintenance activities would be performed at new aboveground facilities:

- Planned blowdowns are the venting of natural gas from pipeline and related facilities usually in preparation for pipeline maintenance activities. NEXUS would notify local

officials and landowners 48 hours in advance of planned gas releases and then again within 1 hour of the event.

- Unplanned blowdowns occur at a compressor stations when an automated station operating system detects an abnormal condition and engages the designed safety features of the facility. Unplanned blowdowns are rare. In either case, the process includes evacuating the pressurized gas within the piping being isolated, normally in less than 3 minutes.

- Painting of aboveground facilities is performed on a periodic basis, as needed, based on site specific conditions and the effect of the elements on the paint condition. Painting of aboveground facilities is typically performed about every 15 years.

- Valve maintenance is typically performed at least once a year, which consists of lubrication and ensuring the valves are operating property.

Operation and maintainence of the project facilities include the periodic regrading and revegetation of the ROW; in stream stabilizations, and; grading, graveling, and culvert repair for access roads.

Conservation Measures

Conservation measures are those actions taken to benefit or promote the recovery of the species. These actions taken by the federal agency or the applicant that serve to minimize or compensate for project effects on the species under review and are included as an integral portion of the proposed action.

Bat conservation measures were included in the BA. The Service recognizes that, individually and/or cumulatively, these bat conservation measures contribute to the avoidance and minimization of adverse effects to IBATs and NLEBs but that these measures do not necessarily eliminate all adverse effects that may result from the proposed action. These conservation measures are included below and by reference. NEXUS has agreed to implement the following conservation measures as part of this project in order to avoid and/or minimize the effects of the proposed action on the IBAT and NLEB.

1. Routing efforts avoided sensitive species and habitats to the maximum extent practicable. Approximately 44 percent of the proposed pipeline route is collocated with existing overhead electric transmission line, pipeline, or railroad utility corridors; with an additional 48 percent of the route (that is not co-located with existing utilities), crossing agricultural land uses. A resulting 92 percent of the proposed pipeline route was sited to avoid conversion of existing land uses to reduce impacts on sensitive species and habitat including protected bat species.

2. NEXUS modified construction workspace and routing after target bat species were captured

during mist-net surveys to prevent unnecessary forested impacts.

3. All tree clearing would be conducted between October 1 and March 31 to the extent that landowner access and schedule allows. Clearing would be prioritized to clear maternity roost and non-maternity roost IBAT and NLEB habitat first, if the schedule does not allow all clearing within the October 1 and March 31 clearing window. Clearing outside of this window would follow the restrictions outlined in 4, 5 and 6.

4. As a contingency for areas not cleared between October 1 and March 31, NEXUS would prioritize the quality of habitat for additional clearing restrictions. No additional clearing restrictions would apply to areas with no presence of IBATs, all foraging habitat and areas outside of known NLEB sensitive areas (within 150 feet of known maternity roosts and/or within 0.25 mile of known occupied hibernacula).

5. As a contingency for areas not cleared between October 1 and March 31, NEXUS would prioritize the quality of habitat for additional clearing restrictions. Tree removal activities would be performed between August 15 and May 15 for forested areas that have been determined to be suitable roost habitat within the known occupied IBAT areas.

6. As a contingency for areas not cleared between October 1 and March 31, NEXUS would prioritize the quality of habitat for additional clearing restrictions. Tree removal activities would be performed between August 1 and May 31 for forested areas that have been determined to be within known NLEB sensitive areas (within 150 feet of known maternity roosts and/or within 0.25 mile of known occupied hibernacula).

7. NEXUS would use a typical ROW width of 100 feet. The ROW would be reduced to 75 feet in wetlands, including forested wetlands. In areas where full construction right-of-way topsoil stripping would be conducted and at steep side-slopes, NEXUS proposes to increase its construction right-of-way width to 125 to 145 feet. The permanently maintained ROW would be 50 feet in width. The additional temporary workspace, aboveground facilities, access roads, ware yards and staging areas were designed to avoid tree clearing to reduce impacts to the federally listed bats.

8. NEXUS would conduct all NGT Project activities in accordance with the NEXUS construction plans. The plans were developed to ensure that all pertinent construction-related environmental policies, procedures, and mitigation measures are implemented during construction. The plans are intended to meet or exceed applicable federal, state, and local environmental protection specifications and practices.

9. NEXUS would employ Environmental Inspectors and Craft Inspectors during construction to observe construction activities to ensure the compliance with environmental permit requirements and implementation of the NEXUS construction plans to prevent unnecessary impacts to the federally listed bats. NEXUS also filed information with the Commission on June 12, 2015 indicating it would like to implement a third-party compliance monitoring program on the NGT

Project. All inspectors would be provided specific environmental training according to the task and presence of threatened and endangered species and sensitive habitat.

10. Post-construction mitigation efforts are focused on revegetation of the construction and permanent ROW. Temporary workspace would be allowed to return to its preconstruction condition. The maximum 50-foot-wide permanently maintained ROW would be periodically cleared of woody vegetation, as required for operation and maintenance activities.

11. NEXUS and the Service have executed a Memorandum of Understanding (MOU) agreement to mitigate for lost suitable roosting habitat. NEXUS is committed to mitigation to reduce overall impacts federally listed bats by providing compensatory mitigation reflecting the acreages of lost habitat.

Action Area

In 50 CFR §402.02 "action area" is defined as, "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action." The action area is not limited to the footprint of the action and should consider the effects to the environment resulting from the action. Within a set action area, all activities that can cause measurable or detectable changes in land, air, and water or to other measurable factors that may elicit a response in the species or critical habitat are considered. The action area is not defined by the range of the species that would be impacted; rather it is defined by the impacts to the environment that would elicit a response in the species (USFWS and NMFS 1998). Therefore, the action area includes the NGT Project footprint and the geographic extent of the area that could be affected by the construction, operation, and maintenance of the pipeline and project facilities either directly, indirectly, or through interrelated or interdependent actions.

The proposed NGT Project will include clearing and grading of the temporary and permanent ROWs; construction of new roads and upgrades to existing roads to create temporary and permanent access roads; and clearing and/or grading for construction of the aboveground facilities including M&R stations, MLVs, pig launchers and receivers, communications towers, and tee-taps.

Of all the NGT Project construction, operation, and maintenance activities, tree clearing, blasting, and heavy equipment operation during construction are expected to have the most far reaching changes to the natural environment due to noise. The ambient noise level will vary throughout the project area from around 40 decibels in rural areas to around 85 in suburban areas. The increase in noise disturbance during clearing and construction could encompass an area up to approximately 1.5 miles (7,920 ft) from the actual work limits. This distance was estimated based upon: (1) the lowest typical ambient noise level in the construction area in rural areas of 40 dBA, (2) the reduction in noise level with distance, and (3) the highest sustained noise level produced during project construction is estimated to be 110 decibels (chainsaw noise) with sporadic levels up to 120 dBA during blasting (The Engineering ToolBox 2015;

NoiseNet.org 2015).

As described above, issuance of a Certificate to NEXUS will result in the construction, operation, and maintenance of the NGT Project. Therefore, the action area for this consultation includes all of the project workspace plus buffer distance of 1.5 miles surrounding the workspace (Figure 2). The 1.5-mile buffer distance is used to incorporate all potential effects of the project to IBATs and NLEBs. The action area encompasses approximately 501,576 acres (~784 sq. miles).

Figure 2. Action Area

STATUS OF THE SPECIES

Indiana Bat

Refer to the IBAT (*Myotis sodalis*) Draft Recovery Plan: First Revision (USFWS 2007) for the best available information on IBAT life history and biology, threats, distribution and overall status. The following is a summary from that plan.

Life History and Biology

The IBAT is a temperate, insectivorous, migratory bat that hibernates colonially in caves and mines in the winter. In spring, reproductive females migrate and form maternity colonies where they bear and raise their young in wooded areas. Males and non-reproductive females typically do not roost in colonies and may stay close to their hibernaculum or migrate to summer habitat. Summer roosts are typically behind exfoliating bark of large, often dead, trees. Both males and females return to hibernacula in late summer or early fall to mate and enter hibernation.

Summer habitat and ecology

Suitable summer habitat for IBATs consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags ≥5 inches dbh [12.7 centimeter] that have exfoliating bark, cracks, crevices, and/or hollows) as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet (305 meters) of other forested/wooded habitat.

In summer, female IBATs form maternity colonies where they bear and raise their pups. Members of the same maternity colony exhibit strong site fidelity to summer roosting and foraging areas and will return to the same summer range annually. Maternity colony size averages between 50 to 80 adult females (Whitaker and Brack 2002).

Maternity colony habitats include riparian, bottomland, and floodplain forests, wooded wetlands, and upland forest communities. Maternity roost sites are most often under the exfoliating bark of dead trees, although live trees, especially shagbark hickory, are also used if they have flaking bark under which the bats can roost. Maternity colonies typically use 10 to 20 trees each year, but only one to three of these are primary roosts used by the majority of bats for some or all of the summer (Callahan 1993, Callahan *et al.* 1997). Roost trees can vary considerably in size, but primary roosts are usually large diameter snags (dead trees). Although male IBATs may roost in trees less than12.7 cm (5 in) dbh, suitable roosting habitat is defined as forest patches with trees

of 12.7 cm (5 in) dbh or larger (USFWS 2016a). Although roost trees are often in mature, mostly closed-canopy forests, maternity roost trees, especially in Ohio, are typically in open areas exposed to solar radiation (i.e., sunlight on the roost area for at least part of the day). These trees may be in canopy gaps in the forest, in a fence line, or along a wooded edge. Roost trees, although ephemeral in nature, may be occupied by a colony for a number of years until they are no longer suitable.

IBATs eat a variety of flying insects found along rivers or lakes and in uplands. IBATs typically forage within 2.5 miles from roost trees. When the locations of roost trees are unknown, the home range for a maternity colony is considered to be all suitable habitat within 5 miles from capture points (USFWS 2011a).

Female IBATs give birth to one young each year (Mumford and Calvert 1960, Humphrey *et al.* 1977, Thomson 1982). Most births occur in mid to late June and lactation continues into July for 3 to 5 weeks (Kurta and Rice 2002). Young bats can fly at about four weeks of age after which maternity colonies begin disbanding. A few bats from maternity colonies may commence fall migration in August, although at many sites some bats remain in their maternity colony area through September and even into October (Humphrey *et al.* 1977, Kurta *et al.* 1993). Members of a maternity colony do not necessarily hibernate in the same hibernacula (Kurta and Murray 2002).

Migration

IBATs can migrate hundreds of kilometers from their hibernacula (USFWS 2007). In the Midwest Recovery Unit (RU), the maximum documented migratory distance is 574.5 km (357 mi) (Winhold and Kurta 2006). Migration is an energetically demanding behavior for the IBAT, particularly in the spring when their fat reserves and food supplies are low and females are pregnant.

Winter habitat and ecology

IBATs tend to hibernate in the same cave or mine at which they swarm (LaVal *et al.* 1976), although swarming has been observed at hibernacula other than those in which the bats hibernated (Cope and Humphrey 1977; MacGregor 2005, pers. comm.) and at caves that do not serve as hibernacula for the species (Brack 2006, pers. comm.). It is generally accepted that IBATs, especially females, are philopatric; that is, they return annually to the same hibernacula (LaVal and LaVal 1980). However, exceptions have been noted (Hall 1962, Myers 1964). Some IBATs apparently also move from traditional hibernacula to occupy manmade hibernacula, primarily mines, as these become available.

Most IBATs enter hibernation by the end of November (mid-October in northern areas) (Kurta *et al.* 1997), although populations of hibernating bats may increase throughout fall and into early January at some hibernacula (Clawson *et al.* 1980). IBATs usually hibernate in large,

dense clusters ranging from 300 bats per square foot (LaVal and LaVal 1980) to 484 bats per square foot (Clawson *et al.* 1980, Hicks and Novak 2002), although cluster densities as high as 500 bats per square foot have been recorded (Stihler 2005). While the IBAT characteristically forms large clusters, small clusters and single bats also occur (Hall 1962, Hicks and Novak 2002).

IBATs often winter in the same hibernaculum with other species of bats and are occasionally observed clustered with or adjacent to other species, including gray bats (*Myotis grisescens*), Virginia big-eared bats (*Corynorhinus townsendii virginianus*), little brown bats (*Myotis lucifugus*), and NLEB (Myers 1964, LaVal and LaVal 1980).

Spring staging and fall swarming habitat and ecology

Upon arrival at hibernacula, IBATs mate and build up fat reserves by foraging, usually in close proximity to the cave. This period of activity prior to hibernation is called swarming, which is a critical part of the life cycle when IBATs converge at hibernacula, mate, and forage until sufficient fat reserves have been deposited to sustain them through the winter (Hall 1962). Swarming behavior typically involves large numbers of bats flying in and out of cave entrances throughout the night, while most of the bats continue to roost in trees during the day.

IBATs arrive at their hibernacula in preparation for mating and hibernation as early as late July; usually adult males or non-reproductive females make up most of the early arrivals (Brack 1983). The number of IBATs active at hibernacula increases through August and peaks in September and early October (Cope and Humphrey 1977, Hawkins and Brack 2004, Hawkins *et al.* 2005). Swarming continues for several weeks and mating may occur on cave ceilings or near the cave entrance during the latter part of the period. After fall migration, females typically do not remain active outside the hibernaculum as long as males. Males may continue swarming through October in what is believed to be an attempt to breed with late arriving females.

Limited mating activity occurs throughout the winter and in spring before the bats leave hibernation (Hall 1962). Young female bats can mate in their first autumn and have offspring the following year (although how many actually do so is variable), whereas males may not mature until the second year.

Shortly after emerging from hibernation in the spring, females become pregnant via delayed fertilization from the sperm that has been stored in their reproductive tracts through the winter. Most reproductive females leave immediately for summer habitat although some may linger for a few days near the hibernaculum. Members of a maternity colony do not necessarily hibernate in the same hibernacula (Kurta and Murray 2002). Males and non-reproductive females may stay near hibernacula or travel to summer habitat.

Threats

The IBAT was one of 78 species first listed as being in danger of extinction under the

Endangered Species Preservation Act of 1966 because of large decreases in population size and an apparent lack of winter habitat (USFWS 1983, USFWS 1999). The 1967 federal document that listed the IBAT as "threatened with extinction" (32 FR 4001, March 11, 1967) did not address the five factor threats analysis later required by section 4 of the 1973 ESA. The subsequent recovery plans do address threats to the species in greater detail. Threats to the species discussed in the 2007 Recovery Plan (USFWS 2007) include the following: destruction/degradation of hibernation habitat (caves and mines); loss and degradation of summer habitat, migration habitat, and swarming habitat (especially forested habitats); disturbance of hibernating bats; predation; competition; inadequacy of existing regulations, particularly regulations that protect summer roosting habitat; natural catastrophes in hibernacula, such as flooding; and, environmental contaminants.

Since 2006, white-nose syndrome (WNS) has emerged as a new threat that may have serious implications for IBAT recovery. WNS primarily affects hibernating bats. Affected bats usually exhibit a white fungus on their muzzles, ears, and wings (Blehert *et al.* 2009). The fungus associated with WNS has been identified as *Pseudogymnoascus destructans* (formerly *Geomyces destructans),* a previously undescribed species (Minnis and Lindner 2013). The fungus thrives in the cold and humid conditions of bat hibernacula (USFWS 2011b). The skin infection caused by *P. destructans* is thought to act as a chronic disturbance during hibernation (USGS 2010). The fungus invades living tissue, causing cup-like epidermal erosions and ulcers (Meteyer *et al.* 2009, Puechmaille *et al.* 2010). These erosions and ulcers may in turn disrupt the many important physiological functions that wing membranes provide, such as water balance (Cryan *et al.* 2010). Infected bats exhibit premature arousals, aberrant behavior, and premature loss of critical fat reserves which is thought to lead to starvation prior to spring emergence (Frick *et al.* 2010). It has been determined that *P. destructans* is the primary cause of death (Lorch *et al.* 2011).

It is believed that WNS is primarily transmitted through bat-to-bat contact. In addition, people may unknowingly contribute to the spread of WNS by visiting affected caves and subsequently transporting fungal spores to unaffected caves via clothing and gear (USFWS 2011b). Within North America, WNS has been diagnosed on the IBAT, NLEB, gray bat, little brown bat, eastern small-footed bat (*Myotis leibii*), tri-colored bat (*Perimyotis subflavus*), and big brown bat (*Eptesicus fuscus*).

First documented in a New York Cave in 2006, WNS has since spread to 29 states and five Canadian provinces, including over 50 known IBAT hibernacula. Affected hibernacula typically exhibit significant mortality (USFWS 2013). WNS has resulted in significant population declines in the Northeast and Appalachian RUs. Between 2007 and 2011, the Northeast RU lost 70 % of its IBAT population (USFWS 2013). WNS is spreading rapidly throughout the rest of the IBAT's range. WNS continues to be found at an increasing number of sites throughout the Midwest RU.

In March 2011, the first case of WNS was confirmed in Ohio, in an abandoned mine in Lawrence County. Currently, 16 counties in Ohio have been confirmed as WNS positive

(ODNR 2016a). Declines in IBAT populations are apparent. WNS was first documented in Michigan in 2014 and to date it has been confirmed in 11 counties (White-Nose Syndrome.org 2016, MLive 2016). As the disease spreads, further declines in populations are expected. The Service, with the help of States, researchers, and others, is continuing to research this evolving threat. Methods are being evaluated to stop the spread of WNS and to minimize mortality where it currently exists.

Another emerging risk to bat species is the recent increase in the number of wind turbines being constructed and operated. To date, eight IBAT fatalities have been documented at wind energy facilities (USFWS 2014a; Seymour 2016, pers. comm.). While it is assumed that other IBAT mortalities have occurred at wind facilities, these fatalities represent the only documented take at wind facilities to date.

Critical Habitat

Critical habitat was designated for the species on September 24, 1976 (41 FR 41914). Eleven caves and two mines in six states were listed as critical habitat. None of these critical habitat units occur within Ohio or Michigan.

Conservation Needs of the Species

To recover the IBAT, it is important to ensure genetic representation, redundancy (populations distributed across the landscape) and resiliency (sufficiently large populations). To do this, the following must be addressed:

1. Maintaining the current winter and summer range of the IBAT. The key steps of conserving and managing IBATs across the species range include establishing IBAT RUs, and maintaining self-sustaining IBAT populations in each RU.

2. Conserving and managing winter colonies and hibernacula. The key steps in conserving and managing winter colonies and hibernacula include: maintaining both large and small hibernating populations; maintaining or providing appropriate physical structure, airflow, and microclimate of the hibernacula; maintaining forest habitat surrounding hibernacula; avoiding disturbance of hibernating bats which can lead to excessive arousal and premature depletion of fat reserves; and minimizing disturbance of bats during the swarming period that can lead to disruptions in mating and foraging activity.

3. Conserving and managing maternity colonies. The key steps in conserving and managing maternity colonies include: locating maternity colonies in each RU via spring emergence radio tracking or summer surveys; ensuring a sufficient number of self-sustaining maternity colonies persist in order to support the regional population (i.e., RU population) by managing and controlling threats acting singly and cumulatively upon the fitness of maternity colonies; and, maintaining the ecological processes that ensure the continued availability of roosting, foraging, and commuting habitat needed to support maternity colonies.

4. Conserving migrating IBATs. The key steps in conserving and managing migrating IBATs include: understanding IBAT migration, including migratory routes, behaviors and differences between fall and spring migration; maintaining safe and suitable migration pathways across the species range; conserving and managing important stopover habitat, if such habitat is deemed necessary; identifying limiting factors and managing threats during migration, including minimizing/managing fatalities due to wind energy.

5. Managing the effects of WNS. There is currently no effective treatment for WNS. The key steps of managing the impacts of WNS may include: avoiding/minimizing the transmission of *P. destructans;* implementing measures to control *P. destructans* should effective, non-harmful measures become available; and restoring and protecting populations affected by WNS, with emphasis on populations that are seemingly more resilient to the disease.

Northern Long-Eared Bat

Refer to the final rule (80 FR 17974) for the best available information on NLEB life history and biology, threats, distribution and overall status. The following is a summary from that rule.

Life History and Biology

The NLEB is a temperate, insectivorous, migratory bat that hibernates in mines and caves in the winter and spends summers in wooded areas. The key stages in its annual cycle are: hibernation, spring staging and migration, pregnancy, lactation, volancy/weaning, fall migration and swarming. NLEB generally hibernate between mid-fall through mid-spring each year. The spring migration period likely runs from mid-March to mid-May each year, as females depart shortly after emerging from hibernation and are pregnant when they reach their summer area. Young are born between mid-June and early July, with nursing continuing until weaning, which is shortly after young become volant in mid- to late-July. Fall migration likely occurs between mid-August and mid-October.

Summer habitat and ecology

Suitable summer habitat for NLEB consists of a wide variety of forested/wooded habitats where they roost, forage, and travel, and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts, as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure.

Many species of bats, including the NLEB, consistently avoid foraging in or crossing large open areas, choosing instead to use tree-lined pathways or small openings (Patriquin and Barclay 2003, Yates and Muzika 2006). Further, wing morphology of the species suggests that they are

adapted to moving in cluttered habitats. Thus, isolated patches of forest may not be suitable for foraging or roosting unless the patches are connected by a wooded corridor.

Upon emergence from the hibernacula in the spring, females seek suitable habitat for maternity colonies. NLEB actively form colonies in the summer (Foster and Kurta 1999) and exhibit fission-fusion behavior (Garroway and Broders 2007), where members frequently coalesce to form a group (fusion), but composition of the group is in flux, with individuals frequently departing to be solitary or to form smaller groups (fission) before returning to the main unit (Barclay and Kurta 2007). As part of this behavior, NLEBs switch tree roosts often (Sasse and Pekins 1996), typically every 2 to 3 days (Foster and Kurta 1999; Owen *et al.* 2002; Carter and Feldhamer 2005; Timpone *et al.* 2010). NLEB maternity colonies range widely in size, although 30-60 may be most common (USFWS 2014b). NLEB show some degree of interannual fidelity to single roost trees and/or maternity areas. Male NLEB are routinely found with females in maternity colonies. NLEB use networks of roost trees often centered around one or more central-node roost trees (Johnson *et al.* 2012). NLEB roost networks also include multiple alternate roost trees and male and non-reproductive female NLEB may also roost in cooler places, like caves and mines (Barbour and Davis 1969, Amelon and Burhans 2006).

NLEB roost in cavities, underneath bark, crevices, or hollows of both live and dead trees and/or snags (typically ≥3 inches dbh). NLEB are known to use a wide variety of roost types, using tree species based on presence of cavities or crevices or presence of peeling bark. NLEB have also been occasionally found roosting in structures like barns and sheds (particularly when suitable tree roosts are unavailable).

Young NLEB are typically born in late-May or early June, with females giving birth to a single offspring. Lactation then lasts 3 to 5 weeks, with pups becoming volant (able to fly) between early July and early August.

Migration

Males and non-reproductive females may summer near hibernacula, or migrate to summer habitat some distance from their hibernaculum. NLEB is not considered to be a long distance migrant (typically 40-50 miles). Migration is an energetically demanding behavior for the NLEB, particularly in the spring when their fat reserves and food supplies are low and females are pregnant.

Winter habitat and ecology

Suitable winter habitat (hibernacula) includes underground caves and cave-like structures (e.g. abandoned or active mines, railroad tunnels). There may be other landscape features being used by NLEB during the winter that have yet to be documented. Generally, NLEB hibernate from October to April depending on local climate (November-December to March in southern areas and as late as mid-May in some northern areas).

Hibernacula for NLEB typically have significant cracks and crevices for roosting; relatively constant, cool temperatures (0-9 degrees Celsius) and with high humidity and minimal air currents. Specific areas where they hibernate have very high humidity, so much so that droplets of water are often seen on their fur. Within hibernacula, surveyors find them in small crevices or cracks, often with only the nose and ears visible.

NLEB tend to roost singly or in small groups (USFWS 2014b), with hibernating population sizes ranging from a just few individuals to around 1,000. NLEB display more winter activity than other cave species, with individuals often moving between hibernacula throughout the winter (Griffin 1940, Whitaker and Rissler 1992, Caceres and Barclay 2000). NLEB have shown a high degree of philopatry to the hibernacula used, returning to the same hibernacula annually.

Spring staging and fall swarming habitat and ecology

Upon arrival at hibernacula in mid-August to mid-November, NLEB "swarm," a behavior in which large numbers of bats fly in and out of cave entrances from dusk to dawn, while relatively few roost in caves during the day. Swarming continues for several weeks and mating occurs during the latter part of the period. After mating, females enter directly into hibernation but not necessarily at the same hibernaculum as they had been mating at. A majority of bats of both sexes hibernate by the end of November (by mid-October in northern areas).

After hibernation ends in late March or early April (as late as May in some northern areas), most NLEB migrate to summer roosts. Females emerge from hibernation prior to males. Reproductively active females store sperm from autumn copulations through winter. Ovulation takes place after the bats emerge from hibernation in spring. The period after hibernation and just before spring migration is typically referred to as "staging," a time when bats forage and a limited amount of mating occurs. This period can be as short as a day for an individual, but not all bats emerge on the same day.

In general, NLEB use roosts in the spring and fall similar to those selected during the summer. Suitable spring staging/fall swarming habitat consists of the variety of forested/wooded habitats where they roost, forage, and travel, which is most typically within 5 miles of a hibernaculum. This includes forested patches as well as linear features such as fencerows, riparian forests and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Isolated trees are considered suitable habitat when they exhibit the characteristics of a suitable roost tree and are less than 1,000 feet from the next nearest suitable roost tree, woodlot, or wooded fencerow.

Threats

No other threat is as severe and immediate for the NLEB as the disease WNS. It is unlikely that NLEB populations would be declining so dramatically without the impact of WNS. Since the disease was first observed in New York in 2007 (later biologists found evidence from 2006 photographs), WNS has spread rapidly in bat populations from the Northeast to the Midwest and the Southeast. Population numbers of NLEB have declined by 99 percent in the Northeast, which along with Canada, has been considered the core of the species' range. Although there is uncertainty about how quickly WNS will spread through the remaining portions of these species' ranges, it is expected to spread throughout their entire ranges. In general, the Service believes that WNS has significantly reduced the redundancy and resiliency of the NLEB.

Although significant NLEB population declines have only been documented due to the spread of WNS, other sources of mortality could further diminish the species' ability to persist as it experiences ongoing dramatic declines. Specifically, declines due to WNS have significantly reduced the number and size of NLEB populations in some areas of its range. This has reduced these populations to the extent that they may be increasingly vulnerable to other stressors that they may have previously had the ability to withstand. These impacts could potentially be seen on two levels. First, individual NLEB sickened or struggling with infection by WNS may be less able to survive other stressors. Second, NLEB populations impacted by WNS, with smaller numbers and reduced fitness among individuals, may be less able to recover making them more prone to extirpation. The status and potential for these impacts will vary across the range of the species.

Bats affected but not killed by WNS during hibernation may be weakened by the effects of the disease and may have extremely reduced fat reserves and damaged wing membranes. These effects may reduce their capability to fly or to survive long-distance migrations to summer roosting or maternity areas.

In areas where WNS is present, there are additional energetic demands for NLEBs. For example, WNS-affected bats have less fat reserves than non-WNS-affected bats when they emerge from hibernation (Reeder *et al.* 2012; Warnecke *et al.* 2012) and have wing damage (Meteyer *et al.* 2009; Reichard and Kunz 2009) that makes migration and foraging more challenging. Females that survive the migration to their summer habitat must partition energy resources between foraging, keeping warm, successful pregnancy and pup-rearing, and healing and may experience reduced reproductive success. In addition, with wing damage, there may be an increased chance of WNS-affected bats being killed or harmed as a result of the proposed action. Again, this is particularly likely if timber harvest or burns are conducted early in the spring (April – May) when bats have just returned, have damaged wings, and are exposed to colder temperatures when torpor is used more frequently.

Over the long-term, sustainable forestry benefits NLEB by maintaining suitable habitat across a mosaic of forest treatments. However, forest practices can have a variety of impacts on the NLEB depending on the quality, amount, and location of the lost habitat, and the time of year of

clearing. Depending on their characteristics and location, forested areas can function as summer maternity habitat, staging and swarming habitat, migration or foraging habitat, or sometimes, combinations of more than one habitat type. Impacts from tree removal to individuals or colonies would be expected to range from indirect impact (e.g., minor amounts of forest removal in areas outside NLEB summer home ranges or away from hibernacula) to minor (e.g., largely forested areas, areas with robust NLEB populations) to significant (e.g., removal of a large percentage of summer home range, highly fragmented landscapes, areas with WNS impacts).

Lastly, there is growing concern that bats, including the NLEB (and other bat species) may be threatened by the recent surge in construction and operation of wind turbines across the species' range. Mortality of NLEB has been documented at multiple operating wind turbines/farms. The Service is now working with wind farm operators to avoid and minimize incidental take of bats and assess the magnitude of the threat.

Rangewide Status

The NLEB ranges across much of the eastern and north central United States, and all Canadian provinces west to the southern Yukon Territory and eastern British Columbia (Nagorsen and Brigham 1993; Caceres and Pybus 1997; Environment Yukon 2011). In the United States, the species' range reaches from Maine west to Montana, south to eastern Kansas, eastern Oklahoma, Arkansas, and east through the Gulf States to the Atlantic Coast (Whitaker and Hamilton 1998; Caceres and Barclay 2000; Amelon and Burhans 2006). The species' range includes the following 37 States (plus the District of Columbia): Alabama, Arkansas, Connecticut, Delaware, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Vermont, Virginia, West Virginia, Wisconsin, and Wyoming. Historically, the species has been most frequently observed in the northeastern United States and in Canadian Provinces, Quebec and Ontario, with sightings increasing during swarming and hibernation (Caceres and Barclay 2000). However, throughout the majority of the species' range it is patchily distributed, and historically was less common in the southern and western portions of the range than in the northern portion of the range (Amelon and Burhans 2006).

Although they are typically found in low numbers in inconspicuous roosts, most records of NLEB are from winter hibernacula surveys (Caceres and Pybus 1997). More than 780 hibernacula have been identified throughout the species' range in the United States, although many hibernacula contain only a few (1 to 3) individuals (Whitaker and Hamilton 1998). Known hibernacula (sites with one or more winter records of NLEBs) include: Alabama (2), Arkansas (41), Connecticut (8), Delaware (2), Georgia (3), Illinois (21), Indiana (25), Kentucky (119), Maine (3), Maryland (8), Massachusetts (7), Michigan (103), Minnesota (11), Missouri (more than 269), Nebraska (2), New Hampshire (11), New Jersey (7), New York (90), North Carolina (22), Oklahoma (9), Ohio (7), Pennsylvania (112), South Carolina (2), South Dakota (21),

Tennessee (58), Vermont (16), Virginia (8), West Virginia (104), and Wisconsin (67). NLEB are documented in hibernacula in 29 of the 37 States in the species' range. Other States within the species' range have no known hibernacula (due to no suitable hibernacula present, lack of survey effort, or existence of unknown retreats).

The current range and distribution of NLEB must be described and understood within the context of the impacts of WNS. Prior to the onset of WNS, the best available information on NLEB came primarily from surveys (primarily focused on IBAT or other bat species) and some targeted research projects. In these efforts, NLEB was very frequently encountered and was considered the most common myotid bat in many areas. Overall, the species was considered to be widespread and abundant throughout its historic range (Caceres and Barclay 2000).

WNS has been particularly devastating for NLEB in the northeast, where the species was believed to be the most abundant. There are data supporting substantial declines in NLEB populations in portions of the Midwest due to WNS. In addition, WNS has been documented at more than 100 NLEB hibernacula in the southeast, with apparent population declines at most sites. In March 2016, WNS was found in Washington State, making this the first case of WNS in any of the western states to date. NLEBs are considered rarer in the western extremes of its range. We expect further declines as the disease continues to spread across the species' range.

Critical Habitat

Critical habitat has not been proposed for the NLEB.

Conservation Needs of the Species

The species' conservation needs define what is needed in terms of reproduction, numbers, and distribution to ensure the species is no longer in danger of extinction. The conservation needs should be defined in the species' recovery outline or plan. Since there is no recovery plan or recovery outline available at this time, we will outline the conservation needs based on our current understanding of the species.

We find that the primary conservation need of the NLEB is to reduce the threat of WNS. This includes minimizing mortality in WNS-affected areas, and slowing the rate of spread into currently unaffected areas. In addition, NLEB that continue to exist within WNS-affected areas need to be able to continue to survive and reproduce in order to stabilize and/or increase the populations. This can be done by reducing the other threats to the species, as listed above. Therefore, efforts to protect hibernacula from disturbances need to continue. This should include restricting human access to hibernacula particularly during the hibernation period, constructing and maintaining appropriately designed gates, and restoring microhabitat conditions in hibernacula that have been altered. Efforts should also be made to protect and restore (in some cases) adequate fall swarming habitat around hibernacula. Known maternity habitat should be maintained, and the removal of known roost trees, particularly when pregnant females and/or

young are present should be reduced. Research to identify important hibernacula and summer areas and to delineate the migratory relationship between summering and wintering populations should also be pursued.

ENVIRONMENTAL BASELINE

The Environmental Baseline analyzes the effects of past and ongoing human and natural factors leading to the current status of the species, their habitat, and the ecosystem within the action area. In order to assess the potential for the IBAT and NLEB to occur within the action area, the Service must formulate reasonable assumptions. These assumptions must be made in order to analyze the potential effects of the action. It is important to note that the Service has been mandated by Congress to provide the benefit-of-the-doubt to federally listed species (H.R.Conf. Report No. 697, 96th Cong., 2d Session, 1979). That is to say, the Service must err on the conservative side (the side of the species) when making reasoned assumptions.

Status of the Indiana Bat in the Action Area

Summer Habitat

The entire State of Ohio and the southern portion of Michigan's lower peninsula are considered to be within the range of the IBAT. Therefore, the Service assumes that IBATs may be present anywhere within Ohio and southern Michigan during the summer where suitable habitat exists. There are four IBAT records (all in Ohio) with buffers that intersect with the proposed NGT Project action area from surveys previously performed for unrelated activities: two are results from acoustic surveys in Erie and Summit Counties, one is a male bat capture in Medina County, and one is a post-lactating female capture in Summit County. No roost tree data was obtained for any of these four records.

COFO places a five-mile buffer around all IBAT record locations to delineate the potential roosting and foraging range for individual IBATs. This five-mile buffer is based on the typical maximum distance an IBAT will travel between roost trees and foraging areas. The typical maximum distance an IBAT will travel between roosts and foraging areas is two and a half miles (2.5 miles). Neither of the two captured IBATs for any of the IBAT within the action area. Without data on roost tree locations, COFO assumes that the roost trees for these IBATs could be within two and a half miles from the capture location and that the bats would forage up to two and a half miles in any direction of that roost location. Therefore, a buffer radius of five miles, which is double the typical maximum foraging distance, is placed around the capture/detection points to incorporate both the roosting and foraging area for individual bats. Due to the close proximity of the two Summit County records, those buffers overlap significantly.

A summer survey for IBATs was completed in 2015 in Ohio and Michigan within portions of the NGT Project area outside of the buffer areas where previous IBAT and NLEB records existed. The survey followed the Service's 2015 Range-Wide Indiana Bat Summer Survey Guidelines.

The survey served as a presence/absence survey for the IBAT for the portion of project area surveyed. No IBATS were captured during the 2015 survey.

In 2016, a summer bat survey was conducted in all project areas with suitable bat habitat that were not surveyed in 2015, including the areas with previous IBAT records and areas with previous NLEB captures. While the 2016 survey of the known IBAT areas did not serve as a presence/absence survey for the IBAT due to previous presence records, it does provide valuable information on the usage of these areas by IBATs. No IBATs were captured during the 2016 survey. Therefore, IBAT presence within the action area is limited to the locations where IBATs were previously documented during prior survey efforts for unrelated activities (Figure 3). As previously noted, the five-mile buffers around the acoustic detection and post-lactating female capture buffer in Summit County have significant overlap and appear as one area on Figure 3. Outside of these record buffers, IBATs are assumed to be absent based on the results of the 2015 and 2016 summer surveys.

It can be surmised from the 2016 survey results that the density of IBATs within the workspace area is low since no IBATs were captured. Typical IBAT maternity colonies have approximately 60 to 80 adult females plus their young following parturition. If any primary maternity roost trees were in close proximity to the workspace, the 2016 summer survey would likely have detected one or more reproductively active females and/or juvenile IBATs. Therefore, a low density of IBATs also indicates that IBAT primary maternity roosts are likely absent from the workspace area.

The total proposed tree clearing to construct the NGT Project is approximately 398.3 acres. Of the 398.3 acres, 79.4 acres occur within the four IBAT record buffers. IBATs present during summer in these 79.4 acres of habitat may include reproductively active females, non-reproductively active males and females, and juveniles. It is difficult to quantify the actual number of IBATs that may be present in the action area because IBATs are not uniformly dispersed on the landscape during the summer. The 2016 summer survey data indicates that occupied primary maternity roosts may be absent from the 79.4 acres to be cleared. However, based on previous data, IBATs, including members of maternity colonies, do occur in the action area. Based on the 2016 survey data, the actual number of IBATs that occupy the action area in the summer is estimated to be relatively low since no IBATs were captured.

Figure 3. Indiana Bat Records within the Action Area.

Fall, Winter, and Spring Habitat
The NGT Project is not occurring near any known IBAT fall swarming habitat or winter hibernacula. Investigations within the project workspace also did not identify any portals to underground caves or mines. Nonetheless, due to the history of underground coal mining in eastern Ohio, it is possible that unknown portals to abandoned underground coal mines exist in the action area (outside the workspace) in Wayne, Summit, Stark, and/or Columbiana Counties that may serve as fall swarming and/or winter hibernacula for IBATs (ODNR 2016b). Therefore, the action area (outside the project workspace) may contain suitable fall swarming and/or hibernation habitat for IBATs.

Status of the Northern Long-Eared Bat in the Action Area

Summer Habitat
The entire States of Ohio and Michigan are considered to be within the range of the NLEB. Therefore, the Service assumes that NLEBs may be present anywhere within Ohio and Michigan during the summer where suitable habitat exists. Prior to NEXUS performing bat surveys along the proposed project route, there were five areas where the NGT Project intersected with the buffers of known NLEB records in Sandusky, Erie, Wayne, Summit, Stark, and Columbiana Counties, Ohio. All of the five areas have capture records of reproductively active females and/or juveniles which indicate that maternity colonies of NLEB are present in each of these areas. No roost tree data was obtained in any of these five records area during previous surveys.

COFO places a three-mile buffer around all NLEB capture locations to delineate the potential roosting and foraging range for individual NLEBs. This three-mile buffer is based on the typical maximum distance a NLEB will travel between roost trees and foraging areas. The typical maximum distance a NLEB will travel between roosts and foraging areas is one and a half miles (1.5 miles). COFO assumes that all of the roost trees for these NLEBs could be within one and a half miles from the capture location and that the bats would forage up to one and a half miles in any direction of that roost location. Therefore, a buffer radius of three miles, which is double the typical maximum foraging distance, is placed around the capture points to incorporate both the roosting and foraging area for individual bats. When the location of a NLEB maternity roost is known, a one and one-half mile radius is used to indicate the likely home range for that NLEB maternity colony. Maternity roost trees for NLEB are defined as trees where at least one reproductively active female or juvenile NLEB have been documented roosting.

A summer survey for NLEBs was completed in 2015 in Ohio and Michigan within the portion of the NGT Project area where no previous NLEB and/or IBAT records existed. The survey followed the Service's 2015 Range-Wide Indiana Bat Summer Survey Guidelines, which the Service also accepts as suitable for the NLEB. The survey served as a presence/absence survey for the NLEB for the portion or the project area surveyed. Four NLEBs were captured at three survey sites in 2015. The captures includes two juveniles captured at the same site in Wayne County, Ohio and two reproductively active females each captured at separate sites in Lorain and Sandusky Counties, Ohio. All four bats were fit with radio transmitters and released at their point of capture. Three of the bats were tracked to roost trees while one shed its transmitter and

was never successfully tracked. Two NLEB maternity roost trees were located during radio tracking efforts. All the NLEB records within the vicinity of the NGT Project occur in Ohio. The 2015 summer survey confirmed probable absence of the NLEB with the portion of the project area in Michigan.

In 2016, NEXUS performed a summer bat survey in Ohio within the areas with previous NLEB and/or IBAT records. The 2016 survey of the areas where previous NLEB records existed did not serve as a presence/absence survey for the NLEB. However, it does provide valuable information on the usage of these areas by NLEBs. Four NLEBs were captured during the 2016 survey including one non-reproductive female, one pregnant female, and two lactating females. These captures occurred at three sites in Stark County, Ohio. All of these females were fit with radio transmitters and released at their point of capture. Three of the bats were tracked to a total of seven maternity roost trees. All NLEB records within the action area, from previous surveys and the 2015/2016 NEXUS surveys, are shown in Figure 4.

The total proposed tree clearing to construct the NGT Project is approximately 398.3 acres. Of the 398.3 acres, 75.0 acres occur within the NLEB buffers. NLEBs present during summer in these 75.0 acres of habitat may include reproductively active females, non-reproductively active males and females, and juveniles. It is difficult to quantify the actual number of NLEBs that may be present in the action area because NLEBs are not uniformly dispersed on the landscape during the summer.

The 2015 and 2016 summer surveys did document a total of nine NLEB maternity roost trees in the action area. A juvenile male and a juvenile female were captured in Wayne County in 2015 and tracked to the same roost tree in Medina County, approximately 3,300 feet north of the project construction workspace. A post-lactating female, was captured in Lorain County in 2015 and tracked to a roost tree approximately 2,400 feet south of the project construction workspace. The fourth bat captured in 2015, a lactating female was captured in Sandusky County, but was not successfully tracked to a roost. The four NLEBs captured in 2016 were all captured in Stark County. All roosts were located through telemetry, or if access didn't allow, estimated using triangulation. Two of the Stark County bats, a pregnant female and a lactating female, were found utilizing the same forested area with the closest roost located approximately 200 feet from the construction workspace. The third Stark County bat, a non-reproductive female, was triangulated to a roost approximately 450 feet from the construction area. The fourth Stark County bat, a lactating female, used several roosts, one within the construction workspace and two others within 50 feet of the workspace. The maternity roost tree that is within the construction workspace is a dead American elm (*Ulmus americana*). Emergence counts on June 23 and 24, 2016 counted 5 and 0 bats emerging at dusk from the tree.

Figure 4. Northern Long-Eared Bat Records within the Action Area.

Fall, Winter, and Spring Habitat
The NGT Project is not occurring near any known NLEB fall swarming habitat or winter hibernacula. Investigations within the project workspace also did not identify any portals to underground caves or mines. Nonetheless, due to the history of underground coal mining in eastern Ohio, it is possible that unknown portals to abandoned underground coal mines exist in the action area (outside the workspace) in Wayne, Summit, Stark, and/or Columbiana Counties that may serve as fall swarming and/or winter hibernacula for NLEBs (ODNR 2016b). Therefore, the action area (outside the project workspace) may contain suitable fall swarming and/or hibernation habitat for NLEBs.

Conservation Needs in the Action Area

The conservation needs of the IBAT and NLEB in the action area are similar to their needs rangewide. The action area provides habitat for maternity colonies and non-reproductive bats during the summer. Therefore, within the action area the conservation needs include providing suitable summer habitat conditions for IBAT and NLEB roosting, foraging, and traveling.

Habitat Conditions in the Action Area

The types of vegetation along the proposed NGT Project are generally common plant communities found in Ohio and Michigan. Many of the vegetative communities traversed by the proposed NGT Project have been considerably altered by forest conversion and fragmentation and the historic draining of saturated areas primarily for agricultural purposes. The proposed NGT Project would impact a total of approximately 398.3 acres of forested land (upland forest and forested wetland) during construction and would permanently convert approximately 184.4 acres of forested land (upland forest and forested wetland) to either a scrub-shrub or herbaceous vegetative type during operation of the pipeline (Table 1).

The proposed NGT Project has been designed to minimize impacts to existing natural vegetation. Approximately 44 percent of the proposed pipeline route is co-located with existing overhead electric transmission line, pipeline, or railroad utility corridors; with an additional 48 percent of the route (that is not co-located with existing utilities), crossing agricultural land uses, resulting in 92 percent of the proposed pipeline route being sited to avoid conversion of existing land uses. The natural vegetation communities that do occur within the NGT Project area are generally characterized as small fragmented forests (less than 20 acres in size), abandoned agricultural land in various degrees of succession ranging from open fields to shrub lands; and emergent, scrub-shrub, and forested wetlands.

Table 1. Forested Habitat Impacts

Age Class	Temporary Impact[2] (acres)	O&M Impact[3] (acres)	Total Impacts[4] (acres)
Ohio			
Old Growth	0	0	0
Mature	42.6	41.3	83.9
Middle	90.3	83.4	173.7
Young	13.2	11.6	24.8
Scrub	39.4	31	70.4
Ohio Subtotal	*185.5*	*167.3*	*352.8*
Michigan			
Old Growth	0	0	0
Mature	2.9	2.5	5.4
Middle	6.6	4.2	10.8
Young	4.4	3.8	8.2
Scrub	14.5	6.6	21.1
Michigan Subtotal	*28.4*	*17.1*	*45.5*
Totals	***213.9***	***184.4***	***398.3***

[1]Bat habitat areas include the following habitat types: Forested, Riparian, Forested/Riparian, Treeline, Hedge/Ditch and Scrub-shrub. Both upland and wetland areas are represented in this table.
[2]Temporary impact reflects all areas that will be allowed to revegetate post-construction.
[3]O&M acres is the operation and maintenance area of the Project that may maintained as part of the permanent easement of the Project.
[4]Total acres is the area of the Project that will be cleared for construction and operation. This includes both temporary and O&M impacts.

EFFECTS OF THE ACTION

This BO evaluates the anticipated effects of the NGT Project on the IBAT and NLEB. This project will require removal of 398.3 acres of potential IBAT and NLEB habitat. Of this 398.3 acres, approximately 79.4 acres are known to be occupied by IBATs in the summer and 75.0 acres are known to be occupied by NLEBs in the summer. Potential effects to the IBAT and NLEB include direct and indirect effects. Direct effects occur when bats are present while the activities are being conducted; indirect effects occur later in time. Effects will vary based on the type of the proposed activity.

Our analysis of effects for the IBAT and NLEB entails: (1) evaluating individual IBAT and NLEB exposure to action-related stressors and response to that exposure; (2) integrating those individual effects (exposure risk and subsequent response) to discern the consequences to the populations to which those individuals belong; and (3) determining the consequences of any population-level effects to the species rangewide. If, at any point, we demonstrate that the effects are unlikely, we conclude that the agency has insured that their action is not likely to

jeopardize the continued existence of the species and our analysis is completed.

Direct and Indirect Effects

Effects to IBATs and NLEBs During Fall and Winter

There are no known fall swarming and/or hibernacula within the project action area. NEXUS has surveyed the project workspace for has determined that there are no cave or coal mine portals within the project's temporary and permanent clearing limits. However, it is possible that there may be unknown mine portals within the action area due to previous underground coal mining activities, particularly in Wayne, Summit, Stark, and Columbiana Counties in eastern Ohio (ODNR 2016b). It is also possible that IBATs and NLEBs are present in the action area in the fall engaging in swarming and/or spring staging activity around these portals.

Project activities which could affect swarming/staging and hibernating bats include noise and ground vibrations during project construction from operating heavy equipment and blasting. Rock and/or substrate blasting in the ROW will be utilized to facilitate pipeline installation.

In Ohio, IBATs and NLEBs may engage in fall swarming in August until November and enter hibernation as early as mid-September and remain in hibernation until late March or early April (Caceres and Barclay 2000, USFWS 2007). Ground vibrations from heavy equipment operation and blasting that occurs during the swarming and hibernation period could affect bats if these activities are conducted in close proximity to any unknown underground abandoned mines. Vibrations from equipment and blasting could harass bats present in the action area during fall swarming. Substrate born vibrations from equipment and blasting could affect hibernating bats in a couple ways: (1) blasting near the mine could cause the mine to collapse which would kill or trap hibernating bats, and (2) vibrations generated from equipment and blasting could cause bats to awaken during hibernation thus decreasing their fitness by causing them to deplete their limited fat reserves prematurely.

Equipment and blasting activities would be restricted to the daytime. Therefore, vibrations and noise is not likely to occur when bats area actively engaging in swarming and/or staging activity. Several studies have been undertaken to assess the effect of noise on hibernating IBATs. Data from these studies indicate that when hibernating, IBATs are not particularly sensitive to air and substrate-born vibrations (ESI 2004). Therefore, it is possible that noise vibrations that do not threaten the structural integrity of mines may not pose a detectable response from hibernating IBATs. It is assumed that NLEB sensitivity to noise vibrations would be similar to that of IBATs.

There are no portals located within the project ROW. Thus, it is unlikely that there is an unknown underground mine directly below or directly adjacent to the project ROW. It is probable that noise vibrations from construction activities would either not reach unknown mines outside the ROW, or if they did, the levels would not cause bats day roosting in and around

mines and hibernating bats to awaken. Therefore, no adverse effects to swarming and hibernating IBATs and NLEBs are anticipated and any effects to bats in the fall, winter, and spring are expected to be insignificant or discountable.

Effects to IBATs and NLEBs during Summer

The NGT Project will require clearing of approximately 398.3 acres of potential bat habitat. An area of approximately 184.4 acres will be permanently maintained for the permanent ROW easement and associated project facilities. Approximately 213.9 of the 398.3 acres will be allowed to revegetate post-construction. The proposed tree removal includes 79.4 acres of confirmed IBAT summer habitat and 75.0 acres of NLEB summer habitat.

Indiana Bats – Roost Trees
Loss of roost trees can have substantial implications for reproductive females. As explained previously in Status of Species section, female and young IBATs depend on specific roost trees for their reproductive success and survival. If their primary maternity roost tree (MRT) or several secondary roost trees are removed, the exposed individuals will need to search for new roosting sites. This can lead to increased energy expenditure, torpor, and possibly loss of young if the expenditure is sufficiently severe and prolonged. Individual males can also be impacted by loss of an undetected roost tree if cut while occupying the tree.

Based on the results of the 2016 summer bat survey for the project, we do not anticipate adverse impacts to IBATs due to loss of occupied IBAT primary MRTs. While presence of IBATs has been confirmed in the project area, no IBATs were captured in 2016 indicating a low density of IBATs within the vicinity of the workspace. A low density of IBATs also indicates that IBAT primary maternity roosts are likely absent from the workspace area.

Direct impacts to roosting IBATs will occur only if secondary roost trees are removed while occupied by individuals. Removal of trees between April 1 and September 30 has the potential to directly impact individual bats. NEXUS intends to clear all trees within the NRG Project area between October 1 and March 31 to the maximum extent possible. Should clearing outside the October 1 to March 31 timeframe be necessary within the 79.4 acres of occupied IBAT habitat, NEXUS will still avoid all tree clearing from May 15 to August 15 to avoid impacts to IBATs during the core maternity period. However, it is possible that trees would be removed between April 1 to May 15 and August 15 to September 30 when IBATs are present.

Removal of potential roost trees (PRTs) when IBATs are present could result in crushing or injury of individuals. Death or injury of non-volent juveniles would be avoided because clearing will not occur during the core maternity period (May 15-August 15). Tree removal when bats are present should often result in sufficient disturbance through noise and tree vibrations to arouse IBATs causing them to leave a roost tree while it is being cut. IBATs that do not leave the tree could be killed or injured as the tree is dropped. Due to the less specific requirement for PRT (non-maternity roost trees) it is expected that there are sufficient numbers of these trees on the landscape and it should be feasible for an IBAT to locate alternate roost sites.

Northern Long-Eared Bats – Roost Trees
Direct impacts to roosting NLEBs will occur only if occupied roost trees are removed while bats are present. Removal of trees between April 1 and September 30 has the potential to directly impact individual bats. NEXUS intends to clear all trees within the NRG Project area between October 1 and March 31 to the maximum extent possible. Should clearing outside the October 1 to March 31 timeframe be necessary within the 75.0 acres of occupied NLEB habitat, NEXUS will still avoid all tree clearing from June 1 to July 31, and May 15 to August 15 where NLEB records overlap IBAT records, to avoid impacts to NLEBs when juveniles may not yet be able to fly. However, it is possible that trees would be removed between April 1 to May 31 and August 1 to September 30 when NLEBs are present or April 1 to May 15 and August 15 to September 30 where NLEB records overlap with IBAT records.

Removal of PRTs when NLEBs are present could result in crushing or injury of individuals. The 2016 summer bat survey confirmed one NLEB maternity roost tree within the construction workspace and two additional maternity roost trees within 50 feet of the construction workspace. Death or injury of non-volent juveniles would be avoided because clearing will not occur during the non-volent period (June 1-July 31). Tree removal when bats are present should often result in sufficient disturbance through noise and tree vibrations to arouse NLEBs causing them to leave a roost tree while it is being cut. NLEBs that do not leave the tree could be killed or injured as the tree is dropped. Habitat for NLEBs does not appear to be a limiting factor for the species. Therefore, it is expected that there are sufficient numbers of PRT trees on the landscape and it should be feasible for NLEBs to locate alternate roost sites. This is further supported by the fact that NLEBs frequently switch roost trees using multiple roost trees during the summer season.

IBAT and NLEB – Foraging
The forested habitat within the project workspace and within the action area provides suitable foraging habitat for IBATs and NLEBs. Both species forage within and around the canopy of upland forests and occasionally forage over forest clearings, water, and along roads. The preferred foraging habitat for IBATs is more typically associated with riparian areas while NLEB foraging typically occurs on forested hillsides and ridges rather than along riparian areas (Brack and Whitaker 2001, LaVal *et al*. 1977).

The loss of foraging habitat when bats are present could directly affect the IBAT and NLEB by disrupting bat foraging patterns within the action area. During tree clearing, some individual bats may avoid crossing the project footprint. Bats in this scenario would be subject to take in the form of harassment as they are displaced from their home range. Due to the availability of suitable foraging opportunities in the surrounding landscape, it is likely that these bats will have little difficulty in establishing new home ranges. Bats that remain loyal to certain foraging areas may continue to cross through newly cleared areas in the project footprint and would likely have an increased risk of mortality from predation although this risk is not detectable or measurable. Due to the linear nature of the project, individual bat foraging areas are not likely to be significantly altered and indirect adverse effects to individual bats are not anticipated.

Mitigation for Summer Habitat Loss

To help offset habitat losses from the NGT Project, NEXUS has collaborated with the Service on the development of a MOU. By creating a MOU with the Service, NEXUS has committed to compensatory mitigation for lost bat habitat. Mitigation for occupied bat habitat focuses on assigning ratios to the impact area to determine mitigation acreages based on habitat quality. NEXUS has ongoing communications with the Service to determine the mitigation required for IBAT and NLEB habitat potentially impacted by the NGT Project.

Tree inventory surveys and extensive desktop analyses were conducted for the forested areas within the NGT Project corridor to determine forest composition and structure. This information is being used by the Service to quantify forested impacts and to determine mitigation ratios for mature forest, intermediate forest, young forest, and scrub-shrub open land. The methodology used for these assessments is referred to as a Habitat Equivalency Analysis, which is a metric based on the total number of years that habitat is lost or degraded due to temporary or permanent conversions (NOAA 2015). Mitigation totals are estimated by utilizing growth factors of dominant tree species to determine the recovery time of impacted habitat to the pre-construction conditions.

Effects from Noise and Disturbance

Noise and vibration and general human disturbance are stressors that may disrupt normal feeding, sheltering, and breeding activities of the IBAT and NLEB. Bats may be exposed to noise, vibrations, and disturbance from tree clearing, equipment operation, and blasting in and near their roosting and foraging areas.

There is limited literature available regarding impacts from noise (outside of road/traffic) on bats. Gardner *et al.* (1991) had evidence that an IBAT, continued to roost and forage in an area with active timber harvest. Callahan (1993) noted that the likely cause of the bats in his study area abandoning a primary roost tree was disturbance from a bulldozer clearing brush adjacent to the tree. Therefore, novel noises would be expected to result in some changes to bat behaviors.

Increased noise created by construction equipment within the project area could disturb bats day roosting in nearby forests during spring, summer, and fall. This potential disturbance would be localized and short-term for the project. The novelty of these noises and their relative volume levels will likely dictate the range of responses from individuals or colonies of bats. At low noise levels (or farther distances), bats initially may be startled and have increased respiration/heart rates, but they would likely habituate to the low background noise levels. At closer range and louder noise levels (particularly if accompanied by physical vibrations from heavy machinery and crashing of falling trees), many bats would probably be startled to the point of fleeing from their day-time roosts and in a few cases may experience increased predation risk.

Because the noise levels in construction areas will continue for more than a single day, the bats roosting within or close to these areas are likely to shift their focal roosting areas farther away or may temporarily abandon these roosting areas completely. Gardner *et al.* (1991) suggested that noise and exhaust emissions from machinery could possibly disturb colonies of roosting bats, but such disturbances would have to be severe to cause roost abandonment.

Proposed activities may also disrupt swarming behavior in the action area due to increased noise levels during construction. However, impacts should be minimal or negligible, as the majority of the construction activities are scheduled to occur during daylight hours when bats would not be swarming.

Effects from Lighting

The majority of the proposed construction activities would occur during daylight hours. Night construction activities would be limited to occasional time-sensitive pipeline installation, such as road crossings and HDDs. Artificial lighting during operation and maintenance activities would be limited to the compressor stations.

Bat behavior may be affected by lights when emerging and traveling between roosting and foraging areas (USFWS 2016b, Downs *et al.* 2003). Foraging in lighted areas may increase risk of predation (leading to death) or it may deter bats from flying in those areas. Bats that significantly alter their foraging patterns may increase their energy expenditures resulting in reduced reproductive rates. This depends on the context (e.g., duration, location, extent, type) of the lighting.

While there is limited information regarding potential neutral, positive, or negative impacts to NLEB from increased light levels, slow-flying bats such as *Rhinolophus, Myotis, and Plecotus* species have echolocation and wing-morphology adapted for cluttered environments (Norberg and Rayner 1987), and emerge from roosts relatively late when light levels are low, probably to avoid predation by diurnal birds of prey (Jones and Rydell 1994). Therefore, we would generally expect that NLEB would avoid lit areas. In Indiana, IBATs avoided foraging in urban areas and Sparks *et al.* (2005) suggested that it may have been in part due to high light levels.

Lighting during construction activities would be minimal due to the majority of work being performed during the daylight hours. Therefore, the effect of lighting on IBATs and NLEBs during construction is expected to be insignificant and discountable. During operation and maintenance, bat usage of the action area will generally have already shifted in response to habitat alterations. Therefore, lighting effects on IBATs and NLEBs during operation and maintenance activities are also anticipated to be insignificant and discountable.

Effects from Stream and Wetland Impacts

Earthwork and general construction activities may result in short-term adverse impacts to the water quality in the action area. Sediment, herbicides, and other contaminants could affect water quality through erosion, vegetation management, and accidental spills during any phase of the project from construction to operation. These impacts will primarily be localized (i.e., limited to the construction limit footprint), but may extend for some distance downstream, depending on intensity of disturbance and field conditions at the time of construction.

Insects associated with these aquatic habitats make up a portion of the diet of the IBAT and NLEB. A change in water quality can affect the species base of these prey species. Decreases in water quality through contamination and the temporary disturbance of wetlands and stream habitats while bats are present may reduce the availability of aquatic insects and may temporarily reduce the availability or quality of suitable drinking sources.

NEXUS will follow federal wetland permitting, stormwater management, and water quality standards. Implementation of the standard best management practices (e.g., minimization of wetland fill, implementation of erosion control measures) and narrowing of the project corridor from 100 feet to 75 feet through wetlands and streams is expected to provide for continued clean water and aquatic foraging habitat for bats.

Even if there are minor water quality changes that cause a temporary, localized reduction in prey base and drinking resources for the bats, we presume that the surrounding landscape will continue to provide an abundant prey base of both terrestrial and aquatic insects during project construction, operation, and maintenance. Therefore, any potential direct and indirect effects to the bats from a reduction in water quality are anticipated to be insignificant.

Effects from Spills

Accidents during project construction and/or operation could result in the leakage of hazardous substances into the environment which could affect water quality resulting in reduced densities of aquatic insects that bats consume. If an accident occurred and hazardous substances leaked into the environment, a rapid response from state and/or federal agencies would limit the size of the spill area. However, if hazardous substances did reach surface waters (streams and wetlands), a short-term reduction in both aquatic and terrestrial insects could occur, thus reducing the spring, summer, or fall prey base for foraging IBATs and NLEBs. If this occurred, it would be localized, thus allowing foraging bats to move nearby and continue foraging. Therefore, direct and indirect effects to bats of a possible accident involving leakage of hazardous chemical are likely to be insignificant and discountable.

Cumulative Effects

Cumulative effects include the effects of future state, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future

federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA. This section analyzes the added impact from cumulative effects.

The Service is unaware of any tribal, state, local, or private actions presently occurring or that are reasonably certain to occur in the future, which would destroy, modify or curtail the IBAT and NLEB summer habitat within the action area. Therefore we do not anticipate significant cumulative effects from the proposed action, combined with other reasonably foreseeable non-federal actions.

Summary of Effects

Impacts to Individuals

Potential effects of the action include direct effects to IBAT and NLEB present within the action area when activities are being conducted, and indirect effects as a result of changes in habitat suitability. Direct effects to individual bats include mortality, injury, harm, or harassment as a result of removal roost trees and foraging habitat when bats are present. Disturbance from the tree clearing and construction activities may also harass bats and cause them to alter their roosting and foraging activities.

Indirect effects from the action may result from habitat modification and primarily involve changes to roosting and foraging suitability. Given the linear nature of the project and the existing fragmentation of habitat in the action area, this project will not substantially alter the overall character of the landscape nor the availability or suitability of IBAT and NLEB roosting or foraging habitat. Therefore, indirect effects are likely to be insignificant and discountable.

Impacts to Populations

As we have concluded that individual bats are likely to experience mortality, injury, harm, or harassment, we need to assess the aggregated consequences of the anticipated reductions in fitness (i.e., reproductive success and survival), of the exposed individuals on the populations (maternity colonies) to which these individuals belong. We recognize the potential for a small amount of injury or lethal take of individuals, but we believe the IBAT and NLEB colonies affected should be able to sustain the worst-case losses discussed above.

Impacts to the Species

Reductions in the maternity colonies' population fitness are unlikely to occur. Thus, no component of the proposed action is expected to reduce the reproduction, numbers, or distribution of the IBAT and NLEB rangewide. While we recognize that the status of these species are uncertain due to WNS, given the environmental baseline, and the intensity, frequency, and duration of the project impacts, we find that the proposed project is unlikely to

have population-level impacts, and thus, is also unlikely to decrease the overall reproduction, numbers, or distribution of the IBAT and NLEB. Therefore, we do not anticipate a reduction in the likelihood of both survival and recovery of these species as a whole.

CONCLUSION

After reviewing the current status of this species, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is our biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the IBAT and NLEB. No critical habitat has been designated for the NLEB and no critical habitat for the IBAT occurs in the action area; therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering (50 CFR § 17.3). Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering (50 CFR § 17.3). Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

On January 14, 2016, the Service published an species-specific rule pursuant to section 4(d) of the ESA for NLEB (81 FR 1900). The Service's 4(d) rule for NLEB exempts the take of NLEB from the section 9 prohibitions of the ESA, when such take occurs as follows (see the final rule for more information):

The Service's 4(d) rule for NLEB exempts the take of NLEB from the section 9 prohibitions of the ESA, as follows:

(2) Incidental take, for areas of the country in the White-Nose Syndrome zone, that results from tree removal activities is exempted as long as the activity:
   a. Occurs more than 0.25 mile (0.4 km) from a known, occupied hibernacula; and
   b. Avoids cutting or destroying known, occupied roost trees during the pup season (June 1–July 31)

(2) All incidental take in areas of the country not within the White-Nose Syndrome zone is exempted
(3) Throughout the range of the NLEB, purposeful take is exempted if it results from:
    c. Removal of NLEBs from human structures;
    d. Defense of human life (e.g., public health monitoring for rabies); and
    e. Removal of hazardous trees for the protection of human life and property

The incidental take that is carried out in compliance with the 4(d) rule does not require exemption in this Incidental Take Statement. Accordingly, there are no reasonable and prudent measures or terms and conditions that are necessary and appropriate for the proposed actions associated with the NGT Project because all incidental take of the NLEB has already been exempted. The activity that is covered by the NLEB 4(d) includes 75.0 acres of tree clearing. The remainder of the following analysis only addresses incidental take of IBATs.

AMOUNT OR EXTENT OF TAKE

Incidental take of IBATs present in the action area could occur due to tree clearing and noise disturbance during clearing and construction. The Service anticipates incidental take of the IBATs will be difficult to detect for the following reasons: (1) the individuals are small and occupy summer habitats where they are difficult to find; (2) IBATs form widely dispersed maternity colonies under loose bark or in the cavities of trees, and males and non-reproductive females may roost individually which makes finding the species or occupied habitats difficult; (3) finding dead or injured specimens during or following project implementation is unlikely; (4) the extent and density of the species within its summer habitat in the action area is unknown; and (5) in many cases incidental take will be non-lethal and undetectable.

The Service anticipates that no more than 79.4 acres of habitat occupied by IBATs will be cleared as a result of the NEXUS NGT Project. We anticipate that IBATs may be killed or injured during clearing that occurs during construction of the NGT Project in the active season from April 1 to May 15 and August 16 to September 30. This is likely to occur if an occupied roost tree is felled during the summer roosting/foraging period. We anticipate that clearing during the active season will result in take in the form of death, harm, or harassment of no more than 2 IBATs within the 79.4 acres where IBAT presence is confirmed.

Monitoring to determine actual take of individual bats within an expansive area of forested habitat is a complex and arduous task. Inspecting individual trees is not considered by the Service to be a practical survey method and is not recommended as a means to determine incidental take. However, the potential roosting and foraging habitat affected can be used as a surrogate to monitor the level of take. Therefore, FERC must reinitiate consultation with the Service if more than 418.3 acres of forested habitat (exceeding NEXUS's estimated 398.3 acres by more than 5 percent or 20 acres), are removed during the project.

EFFECT OF THE TAKE

Overall, the death or injury of 2 IBATs is not likely to cause population-level effects. In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to IBAT. No critical habitat for the IBAT occurs in the action area so none would be impacted.

REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measures (RPMs) are necessary and appropriate to minimize the impacts of incidental take of IBATs during the construction of the NGT Project.

1. FERC will ensure the permittee will monitor take to verify that the authorized level of take has not been exceeded, using forested habitat as a surrogate to monitor take.

2. Implementation of all conservation measures described as part of the proposed action.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the ESA, FERC must comply with the following terms and conditions, which implement the reasonable and prudent measures. These terms and conditions are non-discretionary.

1. FERC will monitor tree clearing limits to ensure no more than 418.3 acres of trees are cleared for the project.

2. Take by injury and mortality during project construction when trees are being cleared for construction will be monitored whenever clearing occurs between April 1 and September 30. This will include ensuring that all contractors and others present during clearing activity are fully informed of the potential to encounter dead or injured bats and of NEXUS's responsibilities if dead or injured bats are encountered. Individuals present during clearing activities will be diligent in their efforts to locate dead or injured bats. If dead or injured bats are encountered, the number and location will be reported through the chain of command to NEXUS. The procedures in #2 below will also be followed. In addition to encountering dead or injured bats, those present on the project area during clearing activities will be diligent and aware of other factors that might indicate bat presence such as watching for bats flying away from areas where trees are cleared. These data will be reported to the Service as described in #2 below.

3. If a dead or impaired bat is found, care should be taken in its handling to preserve biological materials in the best possible state for later analysis of cause of death. In conjunction with the care of injured endangered or threatened species or preservation of biological materials from a

dead animal, the finder has the responsibility to ensure that evidence associated with the specimen in not unnecessarily disturbed. The dead or impaired bat should be photographed prior to disturbing it or the site. The Service is to be notified 24 hours upon locating a dead or injured bat. Initial notification must be made to the nearest U.S. Fish and Wildlife Service Office of Law Enforcement, at (740) 369-0495, then the Columbus Ohio Ecological Services Field Office at (614) 416-8993. Notification must include the date, time, precise location of the injured animal or carcass, and any other pertinent information, including age, sex, and reproductive conditions of the individual(s). Formal written notice must also be submitted.

The RPMs, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. The Service believes that the action will result in the following:

1. Removal of 79.4 acres of habitat occupied by IBATs
2. Death or injury of no more than two (2) IBATs

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid the adverse effects of a proposed action on listed species or critical habitat, to help carry out recovery plans, or to develop information.

The Service has identified the following actions that, if undertaken by FERC or NEXUS would further the conservation of the IBAT and NLEB.

1. FERC should seek opportunities to provide for bat education and outreach for staff and applicants.

2. NEXUS should seek opportunities to provide for bat education and outreach for staff, contractors, and landowners.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the conservation recommendations carried out.

REINITIATION NOTICE

This concludes formal consultation for FERC's actions outlined in your request dated October 20, 2016. As provided in 50 CFR § 402.16, reinitiation of formal consultation is required where discretionary federal agency involvement or control over an action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded (more than 418.3 acres of forested habitat is removed; and/or more than 2 IBATs are injured or killed); (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat is designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such a take must cease pending reinitiation.

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