November 30, 2017

LAKE REGION COMMUNITY HYBRID

PROJECT SUMMARY

The Lake Region Community Hybrid (LRCH) project is a small SolarWind Hybrid project that is being developed by Juhl Energy Development, Inc. (JEDI), in cooperation with Lake Region Electric Cooperative (LREC). The project will utilize the latest technology from General Electric (GE), including their Wind Integrated Solar Energy (WiSE) system which allows solar energy to be converted and/or curtailed via the same inverter and control system used by the turbine. LREC will be the purchaser of the power from the project and have the option to be the eventual owners of the project. This small project will allow LREC an option to purchase locally generated renewable energy for immediate distribution and use through their local infrastructure, helping them and their members hedge long-term energy costs, with energy generated with no fuel, no emissions, no waste, no water and no transmission costs.

A. Local Economic Impact

i. In cooperation with LREC this project is designed with their Rate Stabilization plan in mind, allowing LREC to not only purchase the energy generated by the project for the next 20 years, for a reduced rate compared to other purchase options, but also with a purchase option planned for LREC to be the eventual owner of the project and their own generation.

ii. Dunn Township will benefit directly from the project through the value of local and state taxes paid to them in addition to the positive impact and reduced energy costs resulting from locally generated Renewable Energy supplied by the project.

iii. Otter Tail County – The County will receive annual tax value for energy Production Tax applied to the project as set by the State of Minnesota. As part of the Rate Stabilization Plan for LREC the project will help achieve and maintain lower energy costs to County residents who are serviced by LREC. Additionally, the benefit of locally stationed LREC and the continuation of jobs and residency and other economic benefits of having LREC employees in Otter Tail County.

B. Names of Project Applicant/Contact

Juhl Energy Development, Inc.
Attn: Aaron Thibert
470 West 78th St., Suite 250
Chanhassen, MN 55317

C. Name of Project Owner

Lake Region Community Hybrid, LLC

D. Project Site – Property Information

i. Property Owner:

David L. Johnson

48242 215th Ave.

Pelican Rapids, MN 56572-7094

ii. Parcel Numbers – 17000190250000 and 17000190244000

iii. Legal Description – Section 19, Township 137, Range 042 – N ½ NW ¼ and S ½ NW ¼

iv. E-911 Address: None Designated to these particular parcels yet. A 911 Address will be required/registered for the specific project location.

E. Project Description

The project will include one GE 2.0MW Platform turbine, with a 116-meter rotor diameter and a 90 meter three section tower. Total height of the turbine will be 486', to the tip of the blade in vertical orientation. The Wind and Solar resource in the Pelican Rapids area is very suitable for a project of this size, with wind speeds at hub height averaging 7.24 meters per second.

Interconnection will be direct into the LREC 12.5kV underground distribution line running adjacent to the project site, along the east side of 215th Avenue. Given the ability to tie directly into the distribution level line there will be no need for any new or additional overhead wiring or the construction of a specific project substation on site. Electric power from the project will supply power to any immediate load on the 12.5kV distribution line, or run to the LREC Pelican Lake Substation and be fed out to other connected loads.

A Power Purchase Agreement (PPA) will be executed between the LRCH and LREC, with a term of 20 years. LREC has been in existence for approximately 80 years and they serve approximately 27,000 customers. The power purchased from the project will fulfill about 2% of LREC's annual energy sales. LREC is allowed to self-produce up to 5% of its energy sales annually, therefore this project will provide approximately 40% of their annual limit. Estimated annual energy production is 8,500 megawatt hours (8,500,000 kilowatt hours), roughly enough to power 770 homes (11,000 kilowatt hours annual average home use according to the U.S. Energy Information Administration's 2016 report).

A project access road for the project will be constructed and maintained by the project for the life of the project and have no economic impact on Dunn Township. A road use agreement between the project and the local Township and County will be executed, to ensure that any effects or damages resulting from project use of local roads will be repaired to previous or better conditions. Materials for construction will be sourced locally when feasible and there will be no hazardous materials brought on site. Proposed project will be sited on existing abandoned gravel pit, turning unused area into an active and beneficial site for renewable energy production. Existing approaches will be used for the project and necessary access road upgrades will be made.

Total project costs will be approximately $4.5M, and have a physical footprint of roughly 3.5 acres between the two (2) 80 acre parcels it will be sited on, including turbine foundation, solar array, project access road, required electrical equipment and a small control enclosure if required.

F. Site Layout

i. Many aspects are considered when determining potential project siting, including but not limited to Proximity to Interconnecting Substation, Local Airports, Layout of Utility Distribution Lines, Minimal impact on nearby dwellings and agricultural practices and Participating Land Owners preferences.

ii. See attached drawings, Lake Region Community Hybrid Site Maps, Attachments A1 through A3, for site layout reference and details.

G. Document of Land Ownership or Legal Control of Property

i. See Attachment B, Option for Land Lease and Wind/Solar Easement

H. Turbine Location/Elevation Details

i. GPS Coordinates – Proposed Location

1. *Latitude - 46°40'16.45"N, Longitude - 96° 02'33.98"W*

ii. Above Ground Level

1. *Total Height – 486'*
    a. *The highest point, above ground level, reached by a rotor tip or any other part of the WECS.*

I. Written Registration Verification

i. Forthcoming - MN Department of Transportation, Aeronautics Division

1. *FAA Determination must be received prior to Application and Registration with MN DOT*

J. Site Topographical Map

i. See Attachments C1 (MN DNR) and C2 (USGS), Project Site Topography Maps
   1. *No other turbines located within 10 rotor diameters of proposed WECS*

K. Site Surroundings Map

i. See Attachments D1 (Otter Tail County Map) and D2 (Site Map), LRCH Dunn Site Maps, for indication of wetlands, scenic and natural areas (including bluffs) within 1,320 feet of the proposed WECS.

L. FAA Permit Application

The LRCH project has applied for the necessary authorizations from the Federal Aviation Administration. FAA Determination process takes into consideration feedback and comments from multiple divisions and organizations when making the final determination of project impact to local airports and airfields. Divisions providing feedback in FAA Site Determination include: US Air Force, Navy, Army, DoD Energy Siting Clearinghouse, Department of Homeland Security, Office of Flight Procedures, Flight Standard, and Airports and Technical Operations Frequency Management.

1. *See Attachment E, FAA Permit Application record*
   a. *FAA – Aeronautical Study Number (ASN): 2017-WTE-9462-OE*

M. Local Communication Towers

i. There are no Communication Towers within a 2-mile radius of the proposed WECS, resulting in no expected impact to any local communication networks.

N. Engineer's Certification

i. JEDI only works with experienced, certified and licensed professionals on all aspects of project development. Engineer's Certification is available upon request.

O. Local Impact of Project

i. Public Lands: The Project will avoid any impact on Nature Conservancy Land, Wildlife Management Areas, Scientific and Natural Areas, Waterfowl Production Areas, and/or public parks.

ii. Local WECS: The nearest operating Commercial WECS is located over 100 rotor diameters away. At this distance the LRCH project will have zero impact on any

other WECS. There is no expected impact to the wind resources on adjacent properties.

iii. Acoustic Impact: Presently, noise in the proposed Project area is dominated by traffic on local roads and agricultural and equipment operations. Secondary noise in the area persists from general low-density, lakes area rural neighborhoods and farming-related activities. Ambient noise levels in the proposed Project area are typical of noise levels experienced within a predominantly rural area.

1. *A full Acoustic Analysis of the project and impact on nearby dwellings will be conducted to ensure all local and state requirements are met or exceeded. JEDI aims to maintain acoustic levels of 45 A-weighted decibels (dBA) or less for nearby dwellings. MN State Noise Standards for nighttime require that a 50dBA level may not be exceeded for more than 50 percent of a one hour survey, and 65dBA not be exceeded for more than 10 percent of a one hour survey.*
2. *The Minnesota Pollution Control Agency (MCPA) has a statewide noise regulation (Minn. Rule 7030.0050) which specifies daytime and nighttime noise levels that can not be exceeded by any source. These standards are consistent with speech, sleep, annoyance, and hearing conservation requirements for receivers within areas grouped according to land activities by the noise area classification (NAC). The NAC for household units (including farm houses) is identified as NAC 1. The L50 is the noise level exceeded for 50 percent of the time during any measurement duration, and represents the median sound level. The L10 is the sound level exceed for 10 percent of the time during any measurement duration. The wind turbines will create sources of additional noise. Please refer to Attachment F for a reference to dBA comparisons and Minn. Rule 7030.0050.*
3. *The wind turbines will emit a perceptible sound when in motion. The level of this noise varies with the speed of the turbine and the distance of the listener from the turbine. The turbines create more noise on relatively windy days; however, the ambient natural wind noise levels tend to override the turbine noise as distance from the turbine increases.*

iv. Visual Impact: The Project site is visually dominated by agricultural fields, farmsteads, fallow fields, large open vistas, and gently rolling topography. The landscape can be classified as rural open space. Local vegetation in the area is predominantly agricultural fields and wooded lots.

1. *At a distance, the wind turbines can be distinguished from vertical forms in the landscape, such as overhead transmission lines or trees. The aesthetic effect is primarily based on a subjective human response. The wind power plant will most likely have a combination of effects on the visual quality/rural character of the area.*

   From one perspective, the proposed Project site might be perceived as a visual intrusion on the natural aesthetic value of the landscape,

characterized as tubular steel structures, standing on formerly undisturbed hilltops. On the other hand, wind plants have their own aesthetic quality, distinguishing them from other non-agricultural land uses. First, the wind plant does not generate much traffic or significantly increase day-to-day human activity in the area. Therefore, the Project site will retain the rural nature of the area.

Second, although "industrial" in form and purpose, wind turbines are essentially "farming" the wind for energy. The proposed land use would not involve any ongoing use of non-renewable resources or emissions into the environment. Fossil fuels will not be refined, transported, or burned for the production of electricity. Emissions or toxic substances will not be produced by the wind plant. Although the turbines are "hi-tech" in appearance, they are compatible with the natural environment and rural area.

P. Project Technology

i. GE's WiSE technology will allow the seamless integration of 500 kW DC of Solar PV panels with two of the one 2.0 MW wind turbine. WiSE will enable the wind turbine's converter to serve as the inverter for the PV panels, and the solar energy generated by the panels will augment the wind energy produced through the converter up to the wind turbines' full nameplate capacity. The effect of the solar energy integration will result in an increase of the projects' annual energy production and net capacity factor without changing the turbine's overall nameplate capacity rating. The Solar facility will be comprised of PV modules mounted on fixed tilt ground mount racking. This facility will include GE's supervisory control and data acquisition (SCADA) systems and metering equipment. A perimeter security and safety fence (6' tall) will surround the Project solar components with access through a secured gate. The PV modules will have approximate dimensions of roughly 6.5 feet long, 3.5 feet wide, and 2 inches thick, and will be grouped into a single array.

ii. Please see Attachment G for a general overview of the GE WiSE System

Q. Decommissioning Plan

i. Refer to Attachment H for details on the LRCH Decommissioning Plan.

ATTACHMENTS

A1 - LRCH Site Layout – Turbine, Solar & Access Road

A2 – LRCH Site Layout – Otter Tail County Setbacks

A3 – LRCH Site Layout – Dwelling Clearance Detail

B - Option for Land Lease and Wind/Solar Easement

C1 - Project Site Topographic Map – MN DNR Sourced

C2 – Project Site Topographic Map – USGS Sourced

D1 - Site Wetlands Map – Otter Tail County Sourced

D2 – Site Wetlands Map – Project Detail Map

E - FAA Permit Application

F - Acoustic dBA Reference Chart and Minn. Rule 7030.0050

G - General Electric – WiSE Product Overview

H – LRCH Decommissioning Plan

For additional project information please contact:

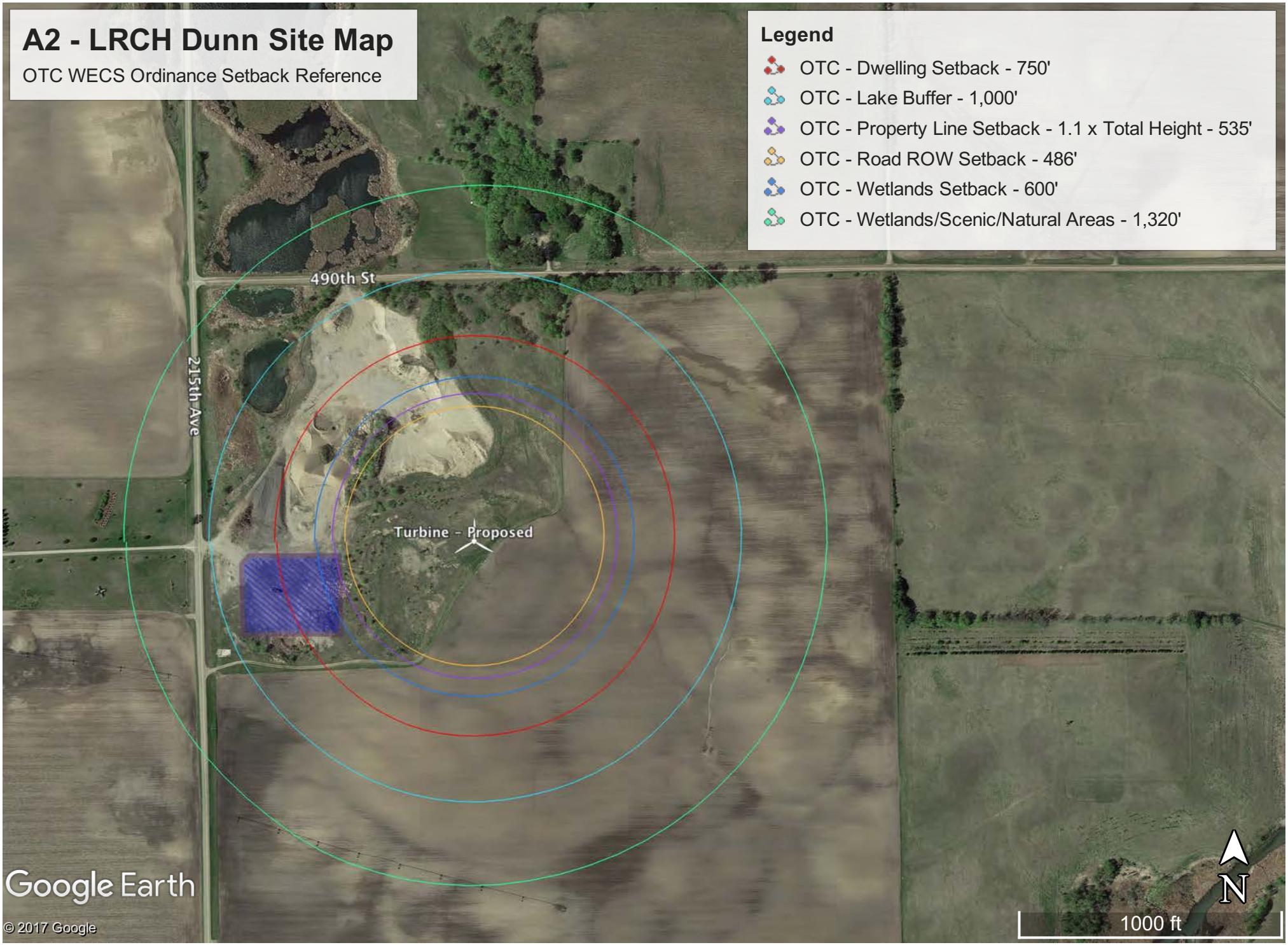
Aaron Thibert

VP Project Development

E-mail: athibert@juhlenergy.com

Cell: (218) 684-5814


A1 - LRCH Dunn Site Map
Turbine, Solar and Access Road
Legend
T1 - Access Road - 16' x 1,350'
Wide Corner Addition - Access Road (If Required)
490th St
215th Ave
Turbine - Proposed
~500kW Solar Array
LREC - 12.5kV POI
Google Earth
© 2017 Google
N
800 ft


A2 - LRCH Dunn Site Map
OTC WECS Ordinance Setback Reference
Legend
OTC - Dwelling Setback - 750'
OTC - Lake Buffer - 1,000'
OTC - Property Line Setback - 1.1 x Total Height - 535'
OTC - Road ROW Setback - 486'
OTC - Wetlands Setback - 600'
OTC - Wetlands/Scenic/Natural Areas - 1,320'
490th St
215th Ave
Turbine - Proposed
Google Earth
© 2017 Google
N
1000 ft

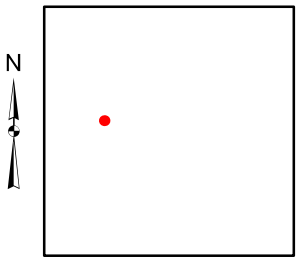

A3 - LRCH Dunn Site Map
Turbine - 1 Mile - Dwelling Clearance Detail
Kvare 3 - ~4,115
Kvare 2 - ~3,420'
Kvare 1 - ~3,330'
L. Haugrud - ~5,240'
Przepiora - ~4,460'
C. Haugrud - ~1,200' (AB)
490th St
Jorgenson - ~1,920'
Turbine - Proposed
Isaacson - ~4,240'
Johnson - ~3,040'
Google Earth
© 2017 Google
N
3000 ft

C1 - LRCH Site Topo Map

Note: Elevation images and contours were generated from LiDAR derived elevation surfaces acquired 2007-2012.

0 0.0175 0.035 0.07 0.105 Miles

Scale: 1:4,752



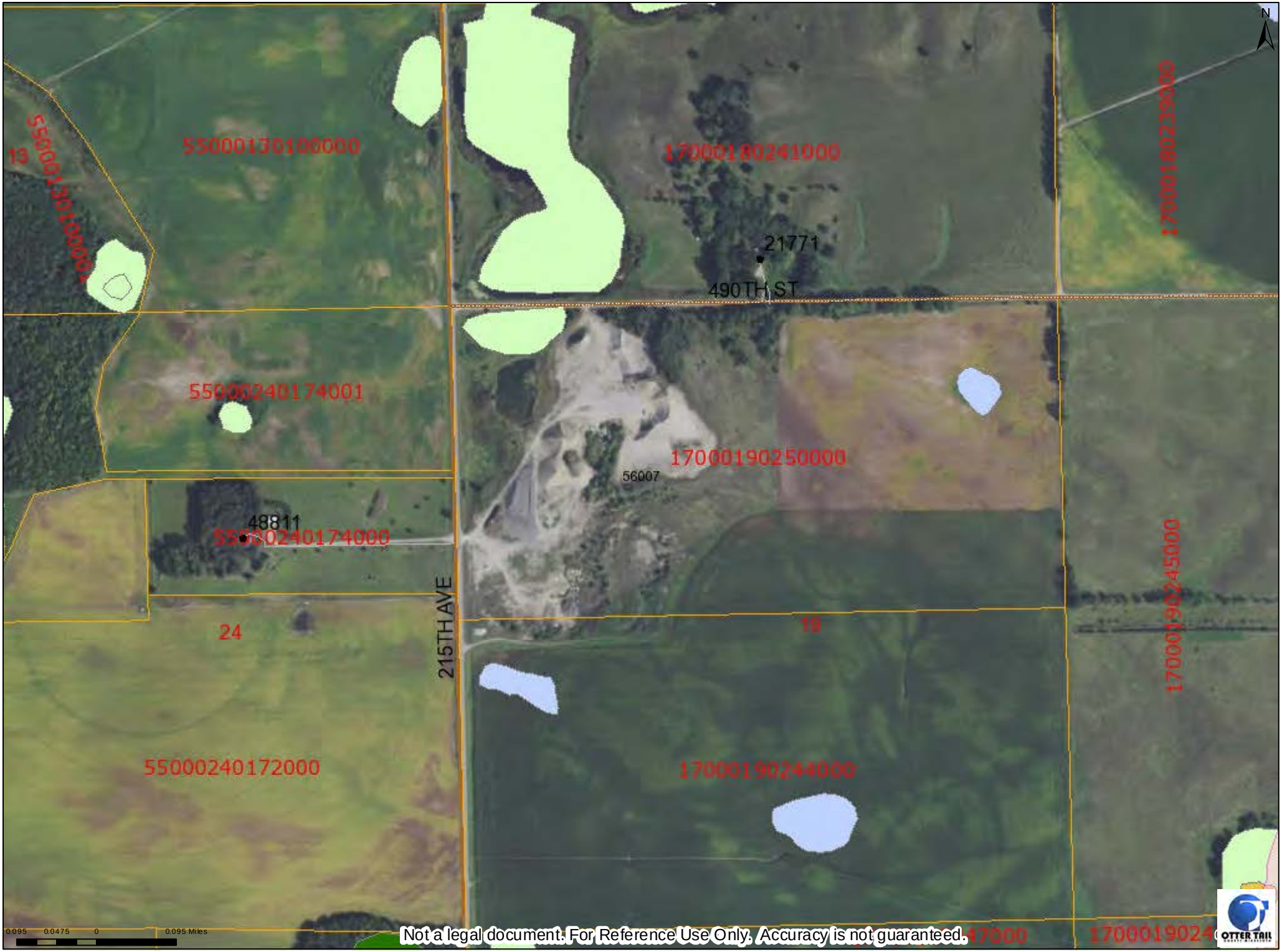
Created on 11/30/2017

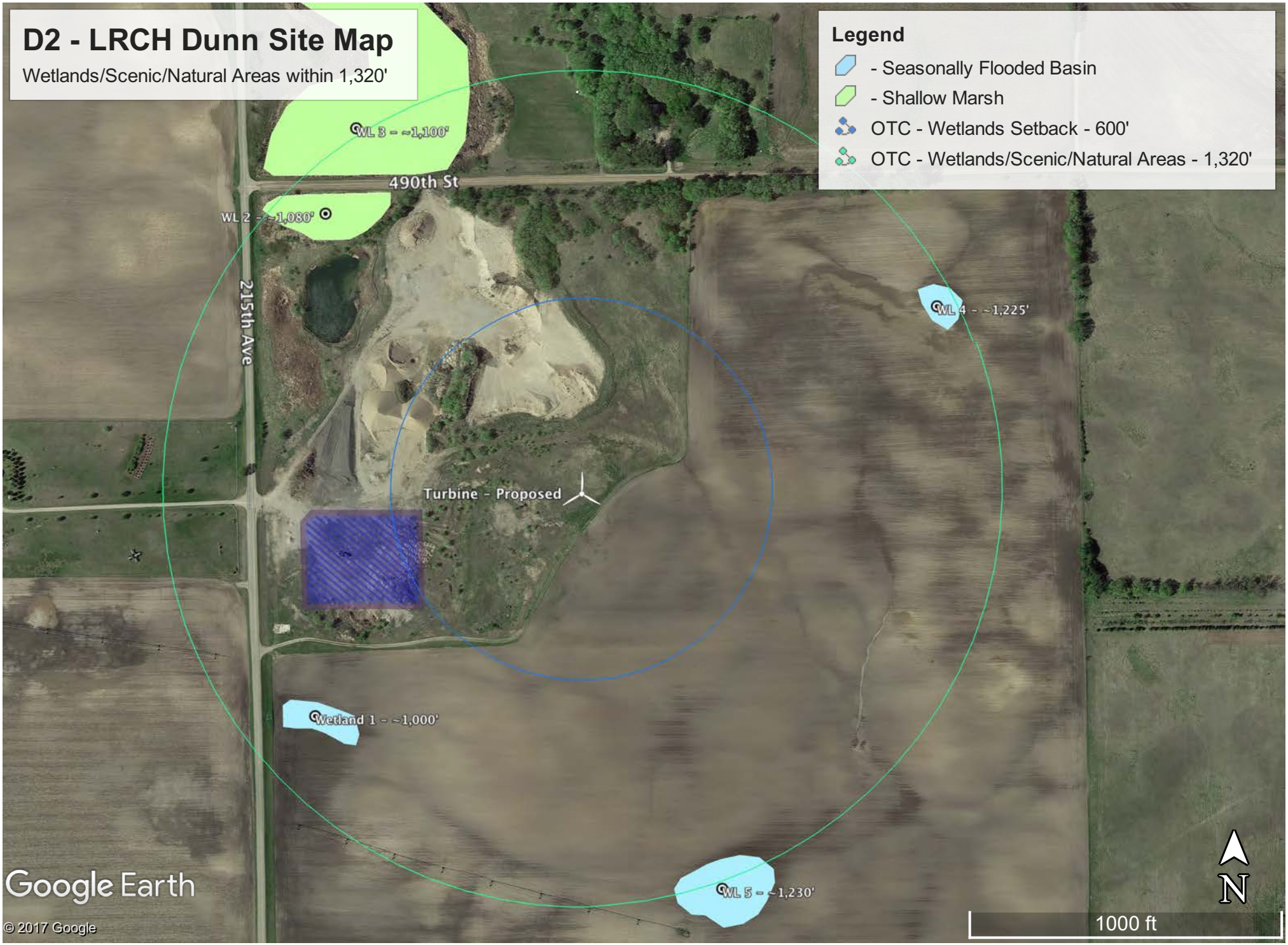
C2 - LRCH Topo Map

United States Geographical Survey - Topo Overlay

D1 - LRCH Dunn Site Map - Wetlands

http://www.co.otter-tail.mn.us




D2 - LRCH Dunn Site Map
Wetlands/Scenic/Natural Areas within 1,320'
Legend
- Seasonally Flooded Basin
- Shallow Marsh
OTC - Wetlands Setback - 600'
OTC - Wetlands/Scenic/Natural Areas - 1,320'
WL 3 - ~1,100'
490th St
WL 2 - ~1,080'
215th Ave
WL 4 - ~1,225'
Turbine - Proposed
Wetland 1 - ~1,000'
WL 5 - ~1,230'
Google Earth
© 2017 Google
N
1000 ft

Federal Aviation Administration

ATTACHMENT E

« OE/AAA

Notice of Proposed Construction or Alteration - Off Airport

Add a new Case Off Airport - Desk Reference Guide V_2017.4.0

Add a New Case Off Airport for Wind Turbines - Met Towers - Desk Reference Guide V_2017.4.0

Project Name: JUHL -000443387-17 Sponsor: Juhl Energy Development, Inc.

Details for Case : LRCH T1 - Johnson (Dunn)

Show Project Summary

Case Status

ASN:	2017-WTE-9462-OE	Date Accepted:	11/28/2017
Status:	Work In Progress	Date Determined:	
		Letters:	None
		Documents:	None
Public Comments:	None		Project Documents: None

Construction / Alteration Information

Notice Of:	Construction
Duration:	Permanent
if Temporary :	Months: Days:
Work Schedule - Start:	05/01/2018
Work Schedule - End:	11/30/2018

**For temporary cranes-Does the permanent structure require separate notice to the FAA?*
To find out, use the Notice Criteria Tool. If separate notice is required, please ensure it is filed.
If it is not filed, please state the reason in the Description of Proposal.

State Filing: Not filed with State

Structure Summary

Structure Type:	Wind Turbine
Structure Name:	LRCH T1 - Johnson (Dunn)
FDC NOTAM:	
NOTAM Number:	
FCC Number:	
Prior ASN:	

Structure Details

Latitude:	46° 40' 16.45'' N	
Longitude:	96° 2' 33.98'' W	
Horizontal Datum:	NAD83	
Site Elevation (SE):	1392 (nearest foot)	PASSED
Structure Height (AGL):	486 (nearest foot)	
Current Height (AGL): ** For notice of alteration or existing provide the current AGL height of the existing structure. Include details in the Description of Proposal*	(nearest foot)	
Minimum Operating Height (AGL): ** For aeronautical study of a crane or construction equipment the maximum height should be listed above as the Structure Height (AGL). Additionally, provide the minimum operating height to avoid delays if impacts are identified that require negotiation to a reduced height. If the Structure Height and minimum operating height are the same enter the same value in both fields.*	(nearest foot)	
Requested Marking/Lighting:	Dual medium catenary	
Other :		
Recommended Marking/Lighting:		
Current Marking/Lighting:	N/A Proposed Structure	
Other :		
Nearest City:	Dunvilla	
Nearest State:	Minnesota	
Description of Location: *On the Project Summary page upload any certified survey.*	Abandoned gravel pit area.	
Description of Proposal:	Single Turbine project.	

Proposed Frequency Bands

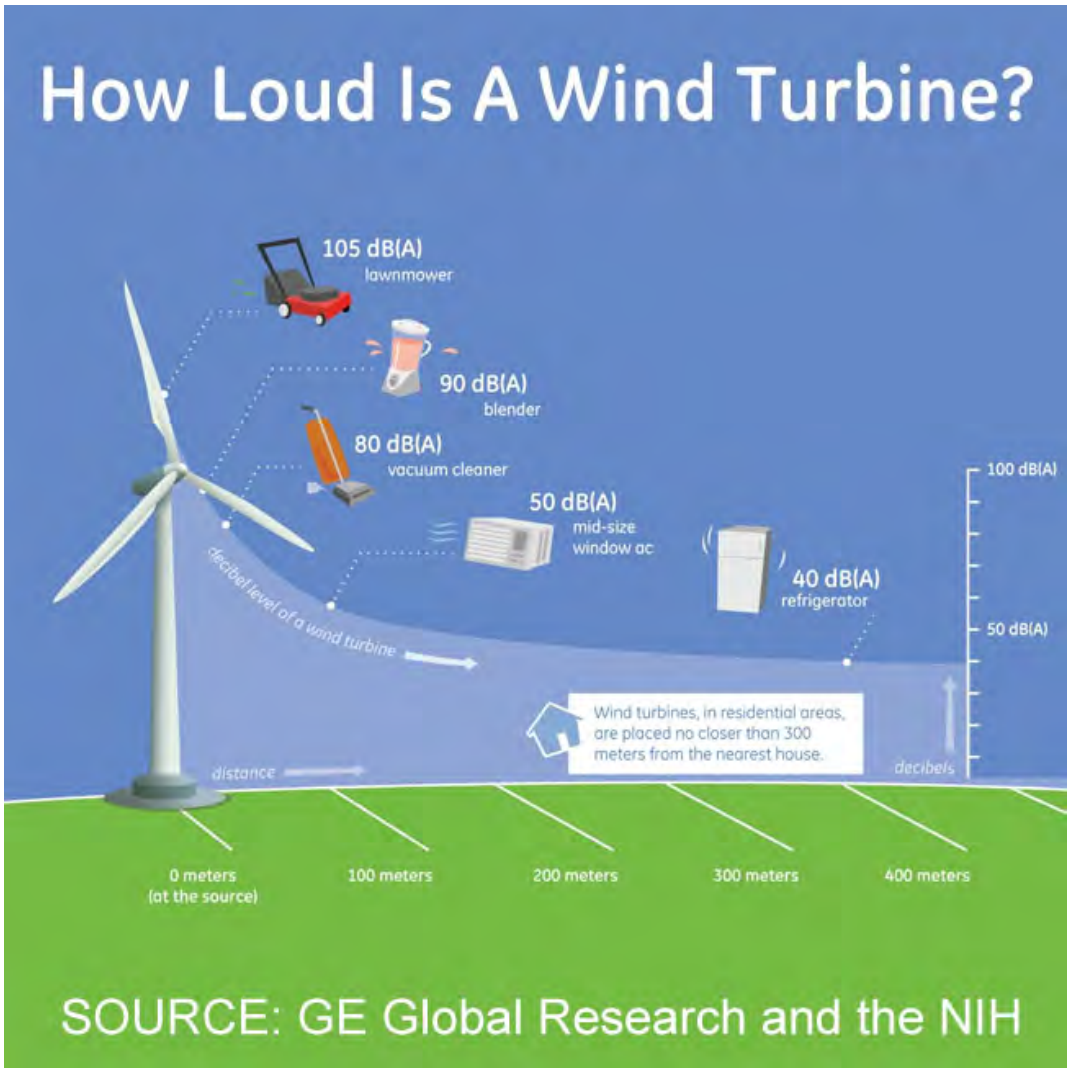
Select any combination of the applicable frequencies/powers identified in the Colo Void Clause Coalition, Antenna System Co-Location, Voluntary Best Practices, effective 21 Nov 2007, to be evaluated by the FAA with your filing. If not within one of the frequency bands listed below, manually input your proposed frequency(ies) and power using the Add Specific Frequency link.

Add Specific Frequency

Low Freq	High Freq	Freq Unit	ERP	ERP Unit

Previous Back to Search Result Next

ATTACHMENT F – Acoustic dBA Reference Chart and Minn. Rule 7030.0050



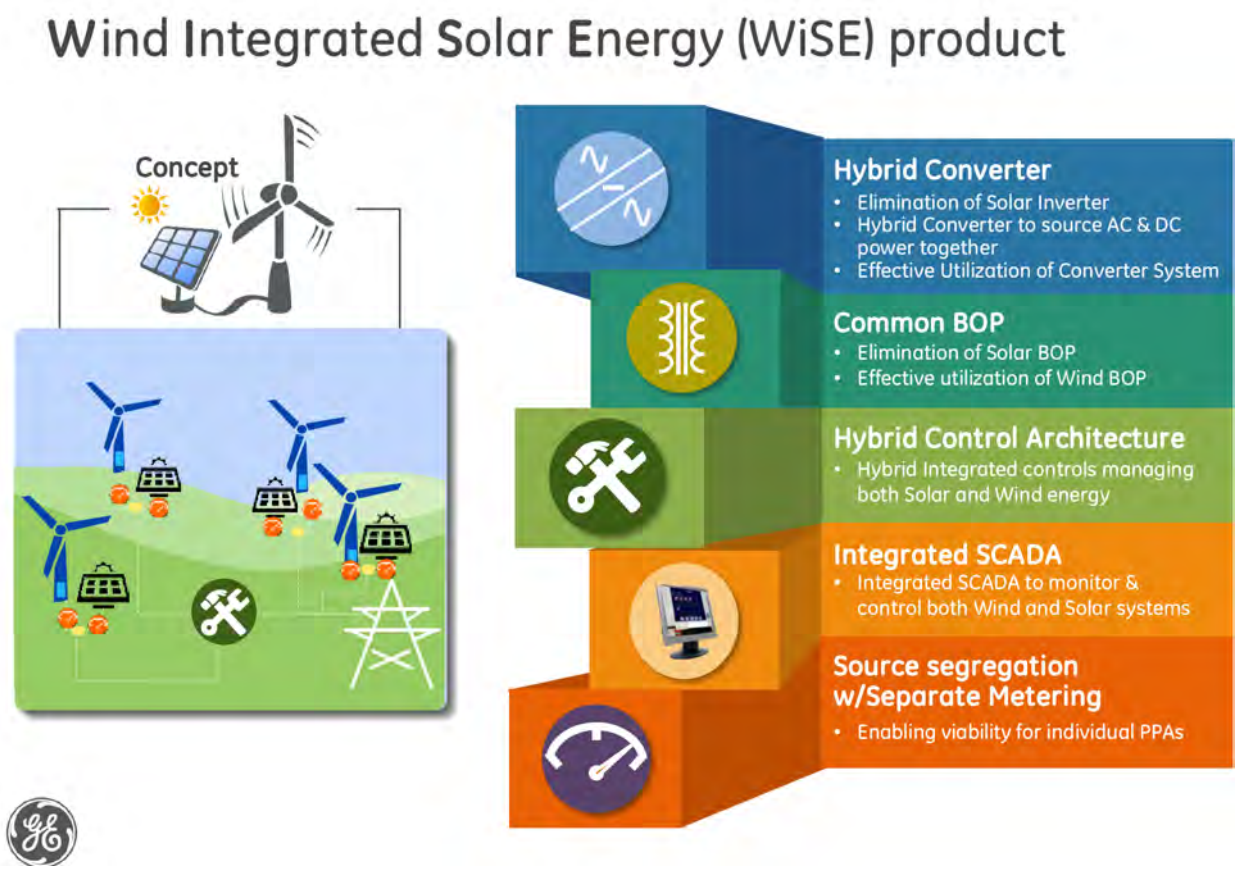
State of Minnesota Noise Standards – MPCA – Minn. Rule 7030.0050

Noise Area Classification	Daytime		Nighttime	
	L_{10}	L_{50}	L_{10}	L_{50}
1	65	60	55	50
2	70	65	70	65
3	80	75	80	75

https://www.pca.state.mn.us/sites/default/files/p-gen6-01.pdf

ATTACHMENT G

GENERAL ELECTRIC - WISE PRODUCT OVERVIEW



ATTACHMENT H - Lake Region Community Hybrid – Decommissioning Plan

Decommissioning and restoration activities will adhere to the requirements of appropriate governing authorities, and will be in accordance with applicable federal, state, and local permits. The Applicant will follow the erosion and sedimentation control measures and other requirements currently in place for construction of the Project, except as modified in a plan submitted to and approved by the Department prior to commencing removal activities.

The decommissioning and restoration process comprises removal of above-ground structures; removal of below-ground structures to a depth of four (4) feet; grading, to the extent necessary; restoration of topsoil and seeding. The process of removing structures involves evaluating and categorizing all components and materials into categories of recondition and reuse, salvage, recycling and disposal. In the interest of increased efficiency and minimal transportation impacts, components and material may be stored on-site in a pre-approved location until the bulk of similar components or materials are ready for transport. The components and material will be transported to the appropriate facilities for reconditioning, salvage, recycling, or disposal.

Above-ground structures include the turbine, pad mount transformer, control building (if any), solar array components, and wind farm-owned portions of the interconnection facilities (if any). Below-ground structures include turbine and pad mount transformer foundations; collection system conduit and cable; fiber optic facilities; and subterranean drainage structures (if any). The above-ground structures and below-ground structures are collectively referred to herein as the "Wind Farm Components".

In connection with the decommissioning of the Wind Farm Components and removal as further set forth below, in the event that on or prior to decommissioning owner provides evidence of a plan of continued beneficial use of any of the Wind Farm Components, such items shall be excepted from the requirements of decommissioning and the existing license shall be amended to reflect such revisions.

Turbine removal: Access roads and crossings to turbines will be widened to a sufficient width to accommodate movement of appropriately sized cranes, trucks, and other machinery required for the disassembly and removal of the turbines (if necessary). Control cabinets, electronic components, and internal cables will be removed. The rotor, nacelle and tower sections will be lowered to the ground where they may be transported whole for reconditioning and reuse, or disassembled/cut into more easily transportable sections for salvageable, recyclable, or disposable components.

Solar Array removal: Solar array removal will include, but not be limited to, perimeter fencing, solar racking, and solar system collection cables.

Turbine and substation foundation removal: Topsoil will be removed from an area surrounding the foundation and stored for later replacement, as applicable. Turbine foundations will be excavated to a depth sufficient to remove all anchor bolts, rebar, conduits, cable, and concrete to a depth of four (4) feet below grade. The remaining excavation will be filled with clean sub-grade material of quality comparable to the

immediate surrounding area. The sub-grade material will be compacted to a density similar to surrounding sub-grade material. All unexcavated areas compacted by equipment used in decommissioning shall be de-compacted in a manner to adequately restore the topsoil and sub-grade material to the proper density consistent and compatible with the surrounding area.

Underground collection cables: The cables and conduits contain no materials known to be harmful to the environment. As part of the decommissioning, these items will be cut back to a depth of four (4) feet. All cable and conduit buried greater than 24 inches will be left in place and abandoned or removed and recycled or scrapped if value justifies such.

Interconnection facilities: Disassembly of the interconnection facilities will include only the areas owned by the Applicant. Components (including steel, conductors, switches, transformers, fencing, control building, etc.) will be removed from the site and reconditioned and reused, sold as scrap, recycled, or disposed of appropriately at the Applicant's sole discretion. To the extent possible to remove foundations and underground components without damaging or impacting adjacent facilities, such foundations and underground components will be removed to a depth of four (4) feet and the excavation filled, contoured, and re-seeded.

Access roads: Unless requested otherwise by the underlying landowner, permanent access roads constructed to accommodate the Project will remain in place. Ditch crossings connecting access roads to public roads will be removed unless required that they remain by the landowner. Improvements to Town and County roads that were not removed after construction will remain in place.

Site Restoration Process Description: Topsoil will be removed prior to removal of structures from all work areas and stockpiled, clearly designated, and separate from other excavated material. The topsoil will be de-compacted to match the density and consistency of the immediate surrounding area. The topsoil will be replaced to original depth, and original surface contours re-established where possible. Any topsoil deficiency and trench settling shall be mitigated with imported topsoil consistent with the quality of the affected site.

Following decommissioning activities, the sub-grade material and topsoil from affected areas will be de-compacted and restored to a density and depth consistent with the surrounding areas to a maximum depth of four (4) feet. The affected areas will be inspected, thoroughly cleaned, and all construction-related debris removed.

Disturbed areas will be reseeded to promote re-vegetation of the area to a condition reasonably similar to the original condition, reasonable wear and tear excepted. In all areas restoration shall include, as reasonably required, leveling, terracing, mulching, and other necessary steps to prevent soil erosion, to ensure establishment of suitable grasses and forbs, and to control noxious weeds and pests.

The project understands that it is solely responsible for all costs related to the decommissioning and removal of the project related facilities at the proposed site.