



# 150 MW THUNDER SPIRIT WIND PROJECT, (PU-11-601)

## Permit compliance inspection report #2



33 PU-15-592 Filed 08/31/2016 Pages: 31  
Permit Compliance Inspection Report No. 2  
Houston Engineering, Inc.

157 PU-11-601 Filed 08/31/2016 Pages: 31  
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# TABLE OF CONTENTS

1 EXECUTIVE SUMMARY .....	1
2 INTRODUCTION AND PURPOSE .....	1
3 SITE VISIT SUMMARY AND CONCLUSION.....	1
4 FUTURE PLANNED ACTIVITIES.....	3
5 SITE PHOTOGRAPHY .....	4

## EXHIBITS

Exhibit 1: Site Visit Location Map

## 1 EXECUTIVE SUMMARY

The North Dakota Public Services Commission has contracted with Houston Engineering, Inc. (HEI) to perform permit compliance inspection services for the 150 MW Thunder Spirit Wind Project, (NDPSC Case No. PU-11-601). The first field inspection for the project was conducted September 2015 and the progress report was submitted on Oct. 16, 2015. The inspection included our observations of the initial construction observations and noted minor issues on site. A second site visit was conducted on July 18, 2016 following completion of the wind project. The focus of this site visit was environmental compliance inspection of the constructed wind project, including: restoration of disturbed areas, integrity of access roads, erosion issues, and impacts to cultural resource and wetland areas. Please note MDU tower numbers differ from HEI documents, all tower numbers referenced correlate with HEI maps. The following items were targeted for inspection during our site visit:

- Between Tower 19 and 2<sup>nd</sup> Street N., confirm restoration of impacted cultural site (accidental impact due to construction of a temporary tower);
- Siting near cultural sites, verify outside staked areas on Towers 6, 10, 18, 19, 21, 30, 32, and 40;
- Access road between Tower 4 and 5: observe conditions around wetland area;
- Access road between Tower 30 and 40: observe conditions around wetland area;
- Observe indications of seeding/restoration of disturbed areas; and
- Erosion issues.

All previously identified cultural sites have been avoided by construction activities. With the exception of several areas of problematic erosion areas, all areas are appropriately protected from erosion, and the spring restoration activities are evident on the landscape. Additional detailed information as to the final viability of the restoration efforts will be assessed as a part of our final site visit in the Spring of 2017.

## 2 INTRODUCTION AND PURPOSE

Houston Engineering, Inc. (HEI) was contractually hired by the North Dakota Public Services Commission (NDPSC) to complete construction inspection activities as part of the 150 MW Thunder Spirit Wind Project, (NDPSC Case No. PU-11-601). The following is a summary of the work completed to date and the anticipated timeframe for the completion of the permit compliance review. Two environmental compliance site visits have been completed, and one final compliance site visit will occur in Spring 2017 to observe the viability of the restoration activities. This inspection will be scheduled approximately one year after restoration / reclamation activities have been completed. This field inspection report (Report #2) is for the second site visit which occurred in July 18, 2016 following completion of the construction and restoration activities.

## 3 SITE VISIT SUMMARY AND CONCLUSION

HEI arrived on site at 8:30 CDT on July 18, 2016. Upon arrival, HEI inspector met with Darin Holzer from Montana-Dakota Utilities Co. (MDU) and drove throughout the post-construction project site. The following discussion correlates to the field site visit and the photographs, in the order in which they were visited on the July 18, 2016 field day. A photograph location map is provided as **Exhibit 1**.

Impacts to the cultural site adjacent to Tower 30 were avoided; construction did not approach the site and no impacts were observed. The construction area around Tower 30 is vegetated. Some areas of minor

erosion were observed in the area of the buried line between Towers 30 and 40, which is not vegetated (**Photographs 3 and 4**). A wetland crossing was bored along the buried line between these towers; no temporary or permanent impacts were observed. Another buried power line crossed a wetland (**Photograph 15**) and temporary impacts were observed. Also between Towers 30 and 40 is a culvert running under the road (**Photograph 2**). The area around this culvert is not vegetated and was found with soil stability/erosion issues; the culvert was found 66% filled with sediment and does not have sufficient capacity to convey stormwater.

No impacts were observed to the cultural site located in the vicinity of the Tower 31 roadway. Vegetation at this tower was established and observed adequate. Another culvert under the roadway between Towers 30 and 40 appears to be experiencing minor sediment loading (**Photograph 8**) as there is some minor erosion observed along the roadway. The access road was observed to be experiencing erosion of the surface aggregate (**Photograph 14**).

Impacts to cultural sites at Tower 40 were avoided and vegetation is being established.

The cultural site south of Tower 7 was not impacted by site grading. Tower 7 was observed to have little vegetation established and some bare areas. It appeared that there is little SPGM at this site, which may contribute to revegetation issues. See **Photographs 16 through 18**.

Tower 8 access road had observable erosion. A culvert at this site was observed to be 50% filled with sediment; the sediment loading does not appear to be causing overflow of the roadway. Adjacent to the tower, grading occurred near the cultural site, but no impacts were observed. See **Photographs 19 through 21**.

An underground cable was installed between Towers 6 and 7; reclamation to half of this area was observed rough with large piles of SPGM and minimal vegetation established. Half way between Towers 6 and 7 a wetland crossing was bored; no impacts were observed.

A temporary access road was constructed through a wetland site between Towers 4 and 5, which has been restored; no permanent impacts were observed.

Impacts to the cultural site at Tower 10 were avoided; grading occurred adjacent to the site and no impacts were observed. The slope adjacent to the cultural site is somewhat steep and vegetation is having a hard time establishing. Some rill erosion was observed, which may have potential to develop into larger issues and erode into the cultural site. Other reclamation areas at Tower 10 appear to be adequately vegetated. See **Photograph 25 through 28**.

The large cultural area adjacent to Towers 18 and 19 was observed to be avoided. Tower 19 was observed to have cropland covering the cultural area; no impacts were observed.

Reclamation adjacent to Tower 21 did not approach the cultural area; no impacts were observed. Vegetation at Tower 21 was observed adequate (**Photographs 31 and 32**).

In conclusion, with the exception of the areas mentioned above that had erosion problems and were lacking vegetative cover, the spring restoration activities are noticeable in the field and appear to be establishing

successfully. Additional information as to the final viability of the restoration efforts will be assessed as a part of our final site visit.

## 4 FUTURE PLANNED ACTIVITIES

HEI will perform the third and final permit compliance trip to assess the sustainability of the reclamation / restoration activities. The seeding, restoration / reclamation activities were completed in the spring of 2016; as such, HEI will complete the final site visit in the Spring of 2017.



## 6 SITE PHOTOGRAPHY



**Photo 1:** Tower 30 (facing East)  
no impacts to cultural site.



**Photo 2:** Between Tower 30 and  
31 (facing North). Significant  
erosion, culvert filling with  
sediments (approximately 66% full)



**Photo 3:** Between Tower 30 and 40 (facing Southeast) bare area.



**Photo 4:** Between Tower 30 and 40 (facing Northeast) bare area.



**Photo 5:** Tower 31 (facing Northeast).



**Photo 6:** Tower 31 (facing West).



**Photo 7:** Tower 31 (facing West).



**Photo 8:** Tower 40 (facing East)  
minor erosion; sediment loading to  
culvert.



**Photo 9:** Tower 40 (facing East).



**Photo 10:** Tower 40 (facing North).



**Photo 11:** Tower 40 (facing Northwest).



**Photo 12:** Tower 40 (facing Northwest).



**Photo 13:** Looking east at wetland that crosses collector line right-of-way between Turbines 36 and 37.



**Photo 14:**  
Tower 40 (facing Southeast)  
erosion to access road; aggregate  
surfacing erosion.



**Photo 15:** Tower 40 access road  
(facing Northeast).



**Photo 16:** Tower 7 (facing Southwest).



**Photo 17:** Tower 7 (facing Southeast).



**Photo 18:** Tower 7 (facing East).  
Seeding activities are visible,  
however germination thus far is  
patchy and bare soil is visible.



**Photo 19:** Tower 8 (facing West).



**Photo 20:** Tower 8 (facing South).



**Photo 21:** Tower 8 (facing Southwest).



**Photo 22:** Between Tower 6 and 7 (facing Northwest).



**Photo 23:** Wetland between Tower 6 and 7 (facing Northwest).



**Photo 24:** Between Tower 6 and 7 (facing Southeast).



**Photo 25:** Tower 10 (facing East).



**Photo 26:** Tower 10 (facing North).



**Photo 27:** Tower 10 (facing South).



**Photo 28:** Tower 10 (facing Northwest).



**Photo 29:** Tower 19 (facing West).



**Photo 30:** Tower 18 (facing East).



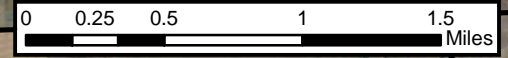
**Photo 31:** Tower 21 (facing Northwest).





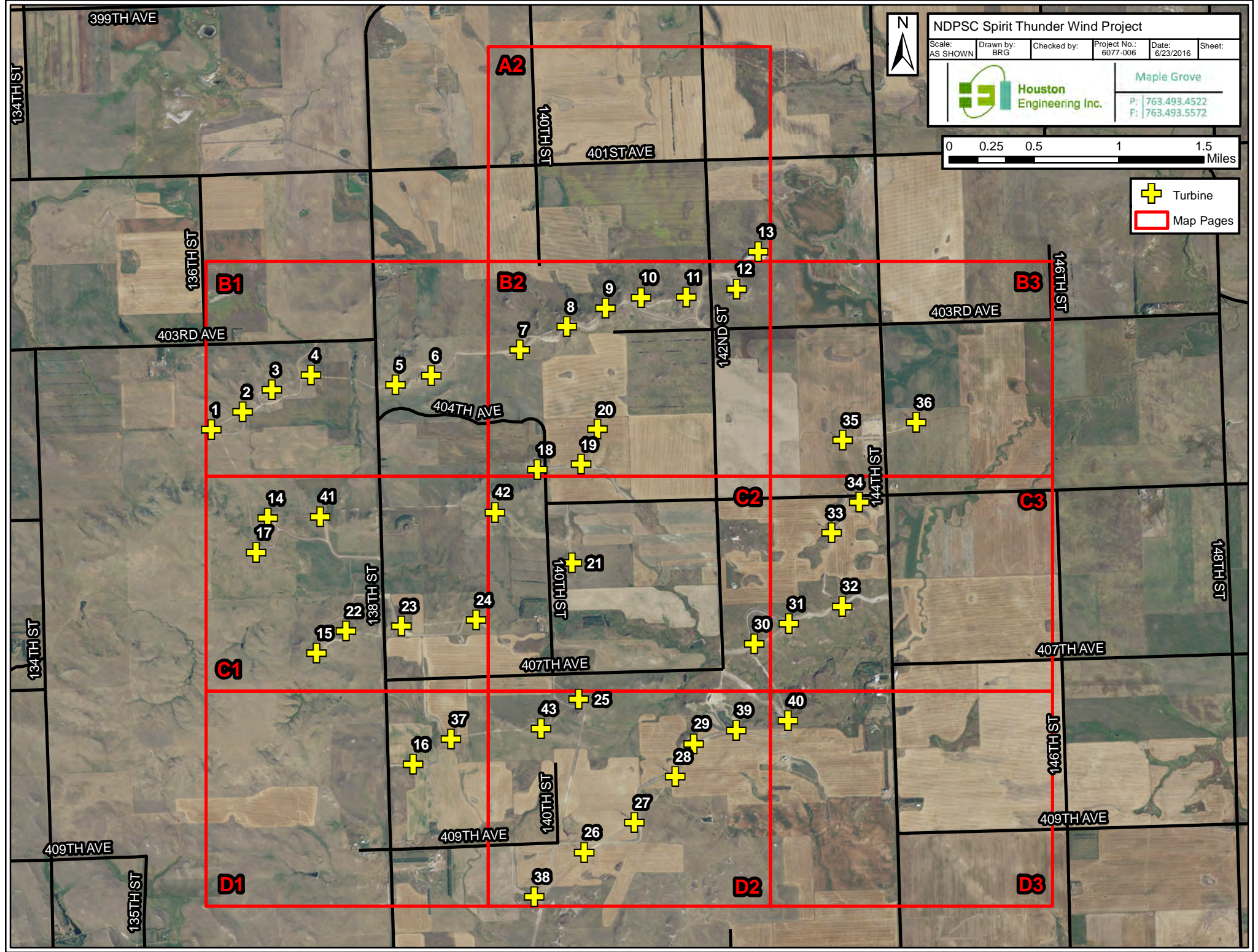
**Photo 32:** Tower 21 (facing East).

# EXHIBIT 1





 Turbine  
 Map Pages










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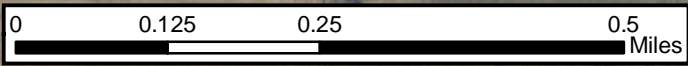
401ST AVE

142ND ST

-  Turbine
-  COAL MINE
-  Home
-  Cultural
-  Wetlands

NDPSC Spirit Thunder Wind Project - Page A2

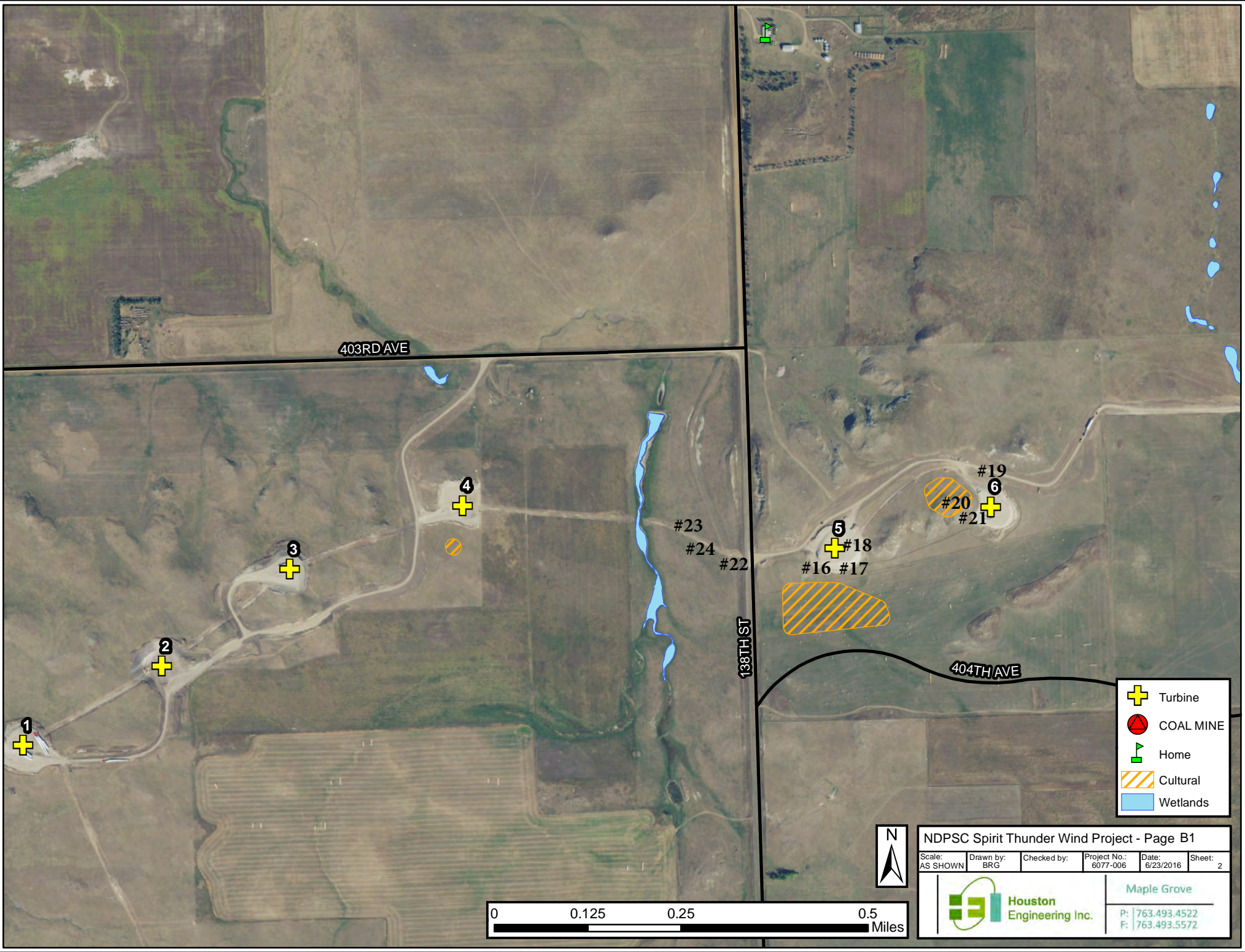
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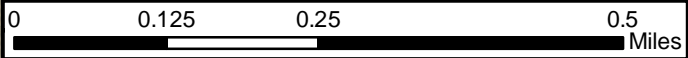


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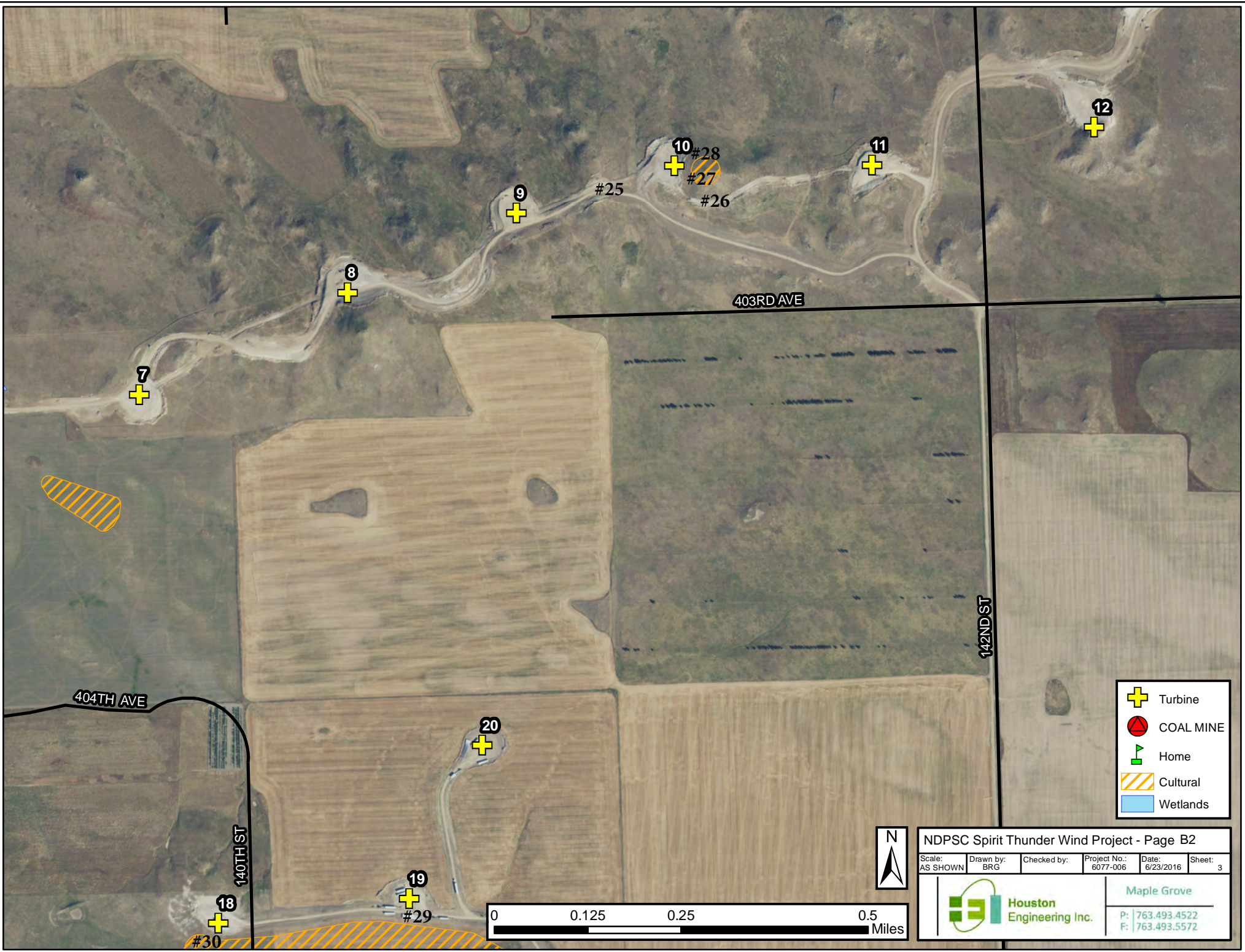







NDPSC Spirit Thunder Wind Project - Page B1

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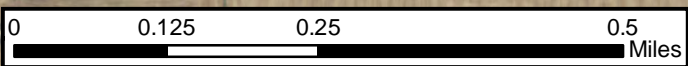
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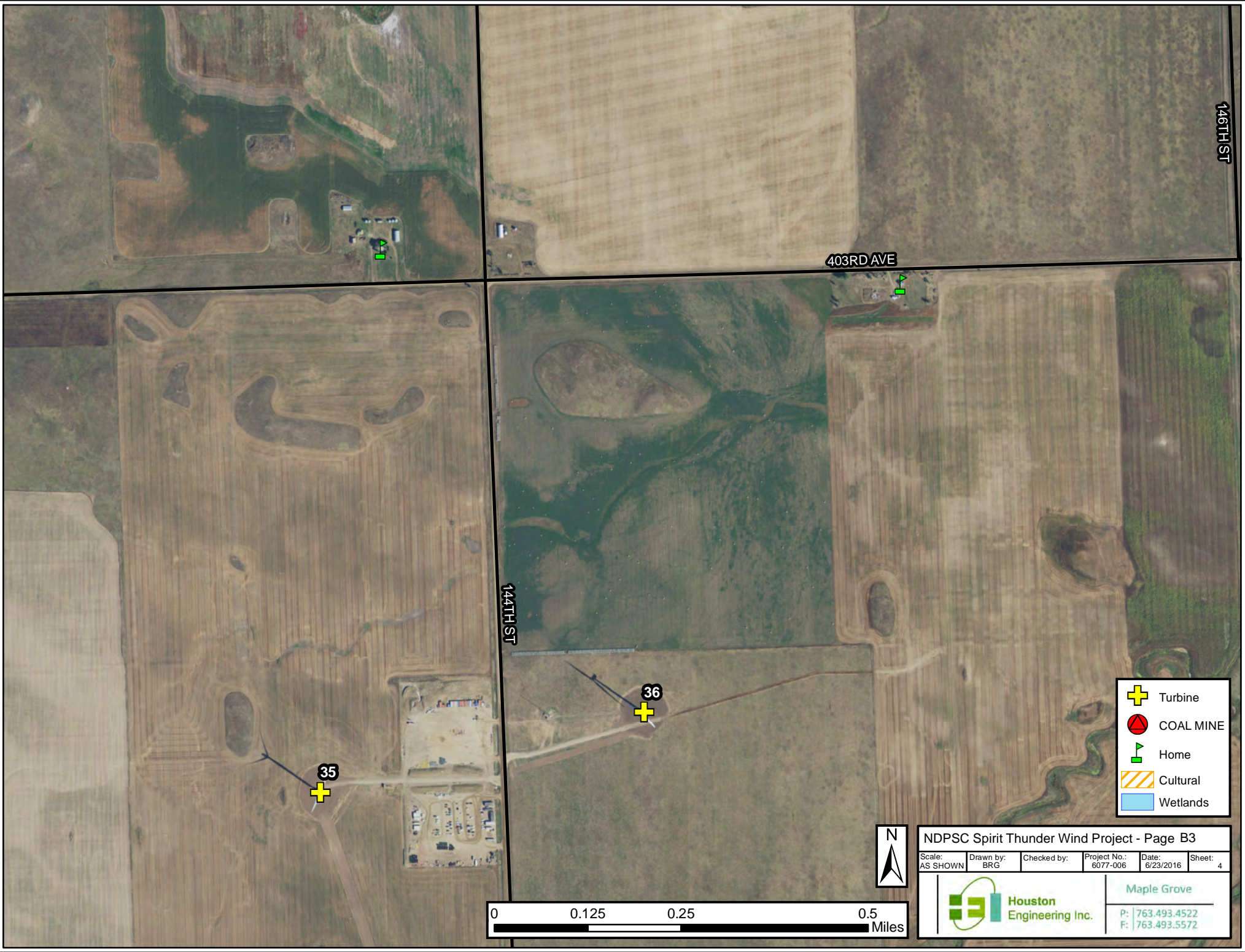
NDPSC Spirit Thunder Wind Project - Page B2






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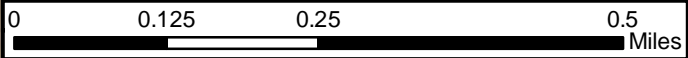


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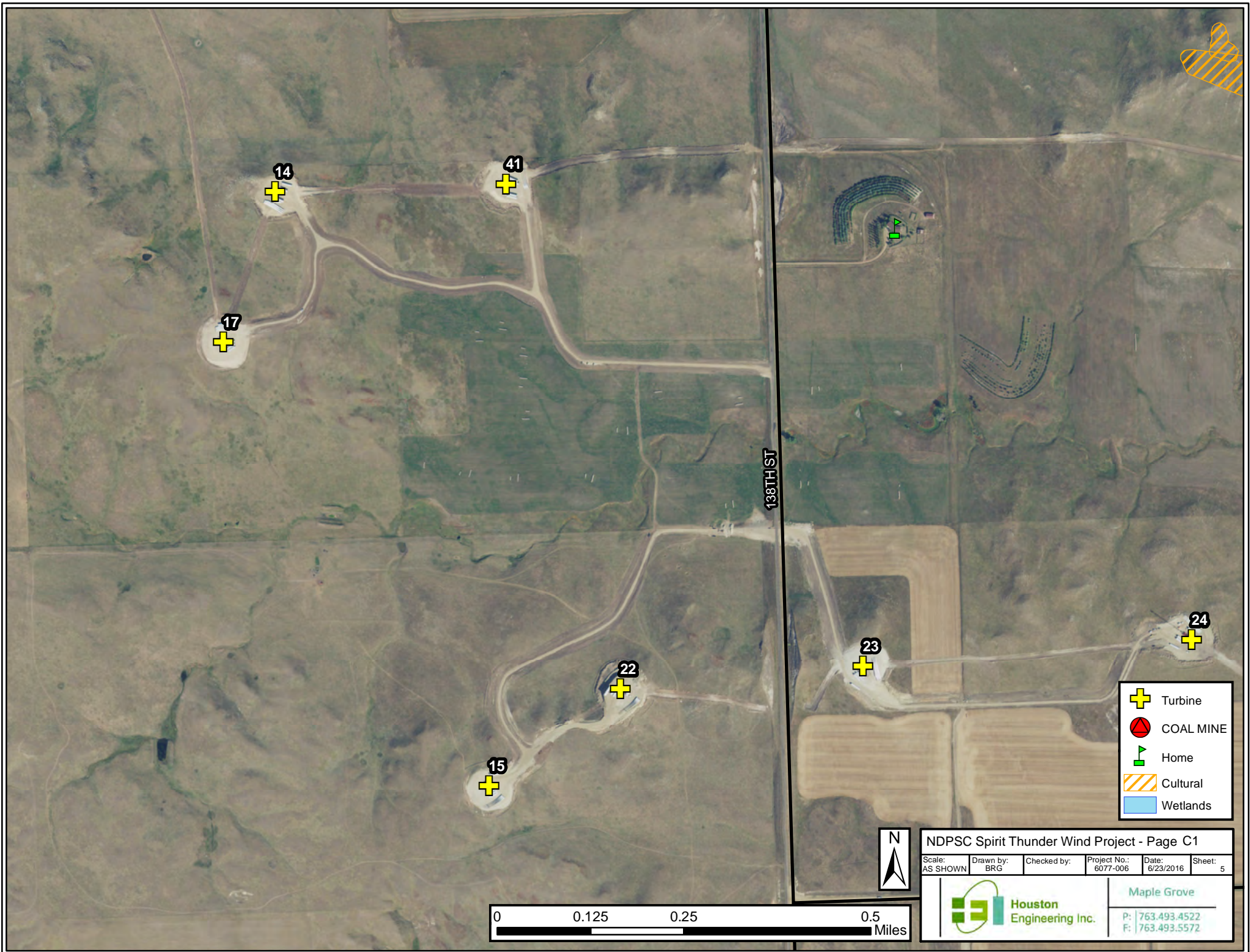







NDPSC Spirit Thunder Wind Project - Page B3

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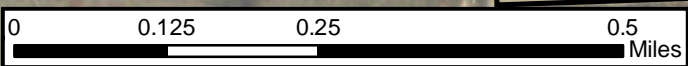


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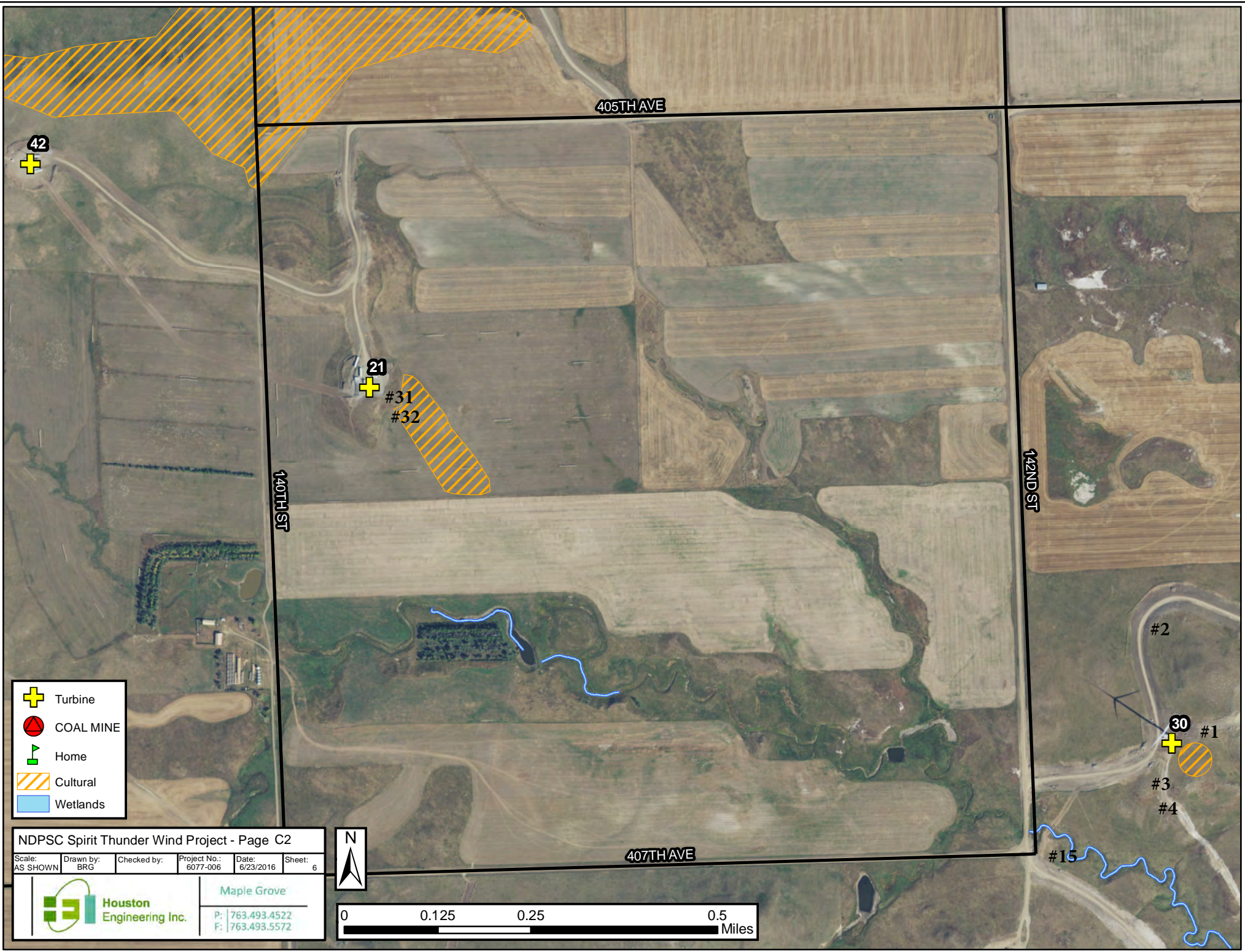


NDPSC Spirit Thunder Wind Project - Page C1

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42



21



#31

#32

140TH ST

405TH AVE

142ND ST

#2

30








#1

#3

#4

#15


407TH AVE

-  Turbine
-  COAL MINE
-  Home
-  Cultural
-  Wetlands

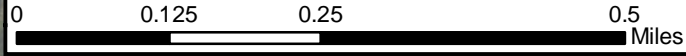
NDPSC Spirit Thunder Wind Project - Page C2

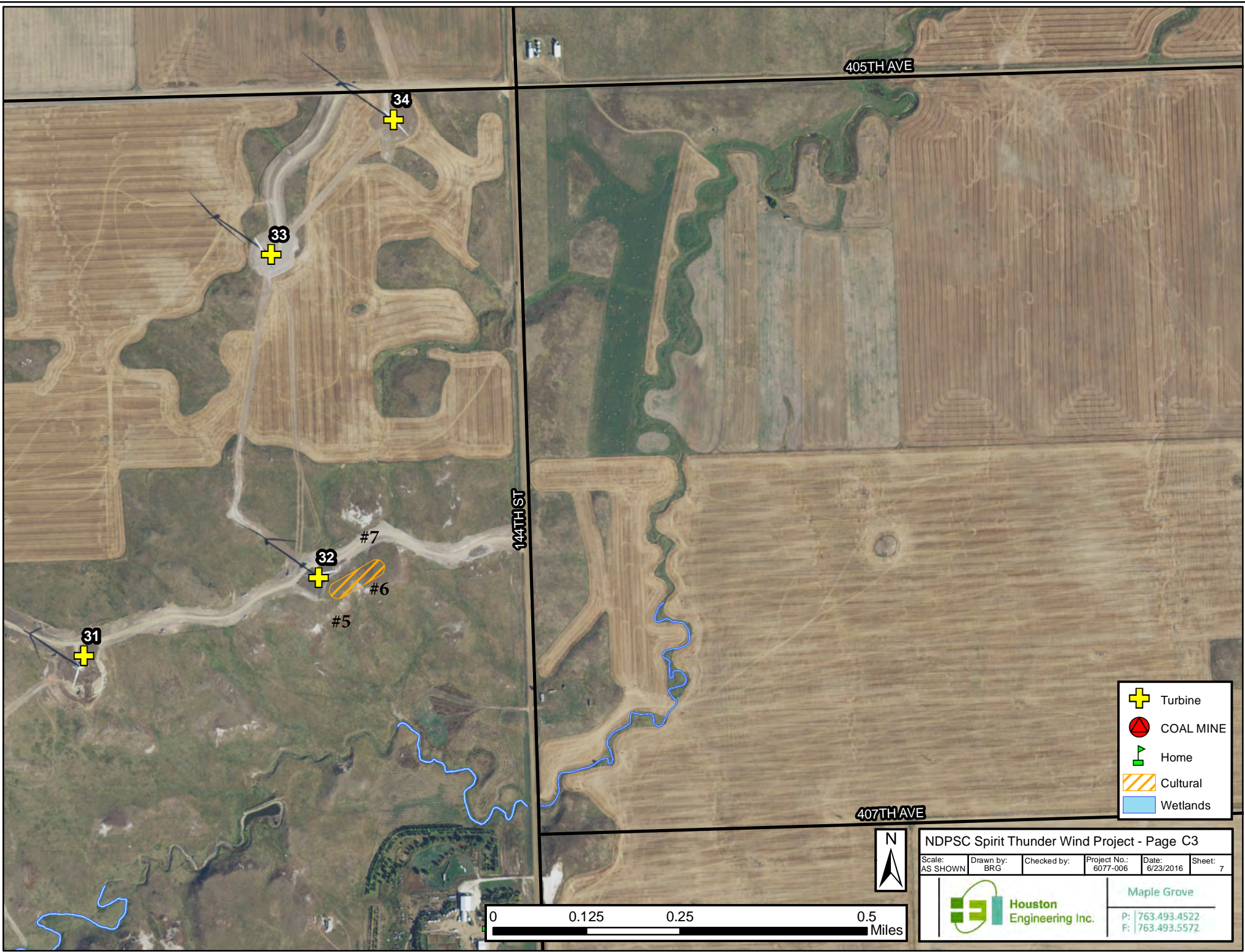
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




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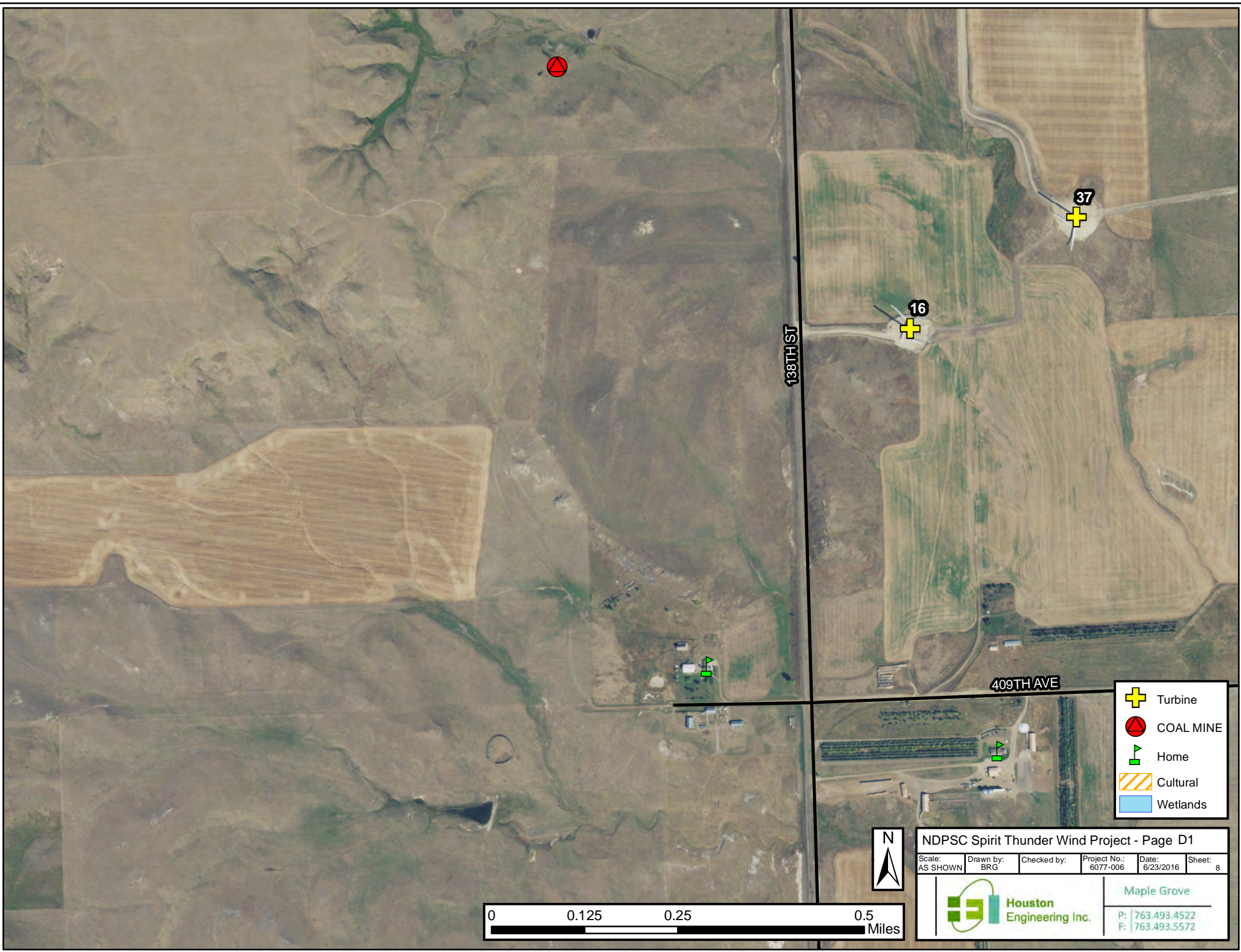
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-  Wetlands






NDPSC Spirit Thunder Wind Project - Page C3

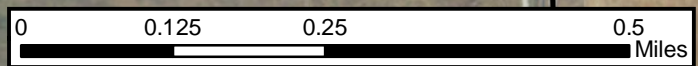
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-  Cultural
-  Wetlands



**NDPSC Spirit Thunder Wind Project - Page D1**

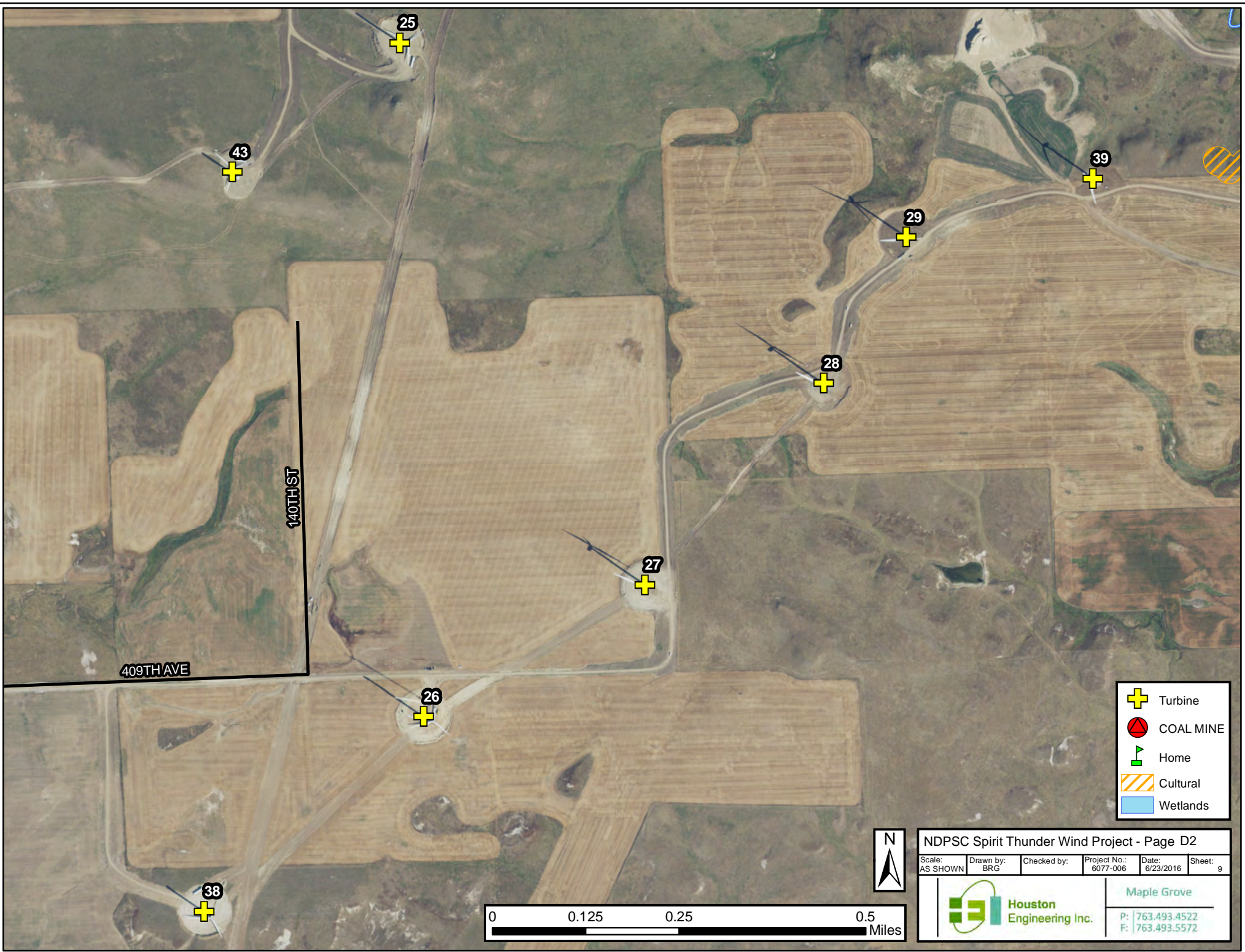
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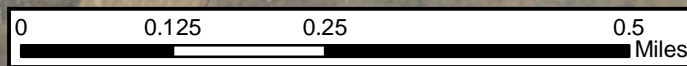
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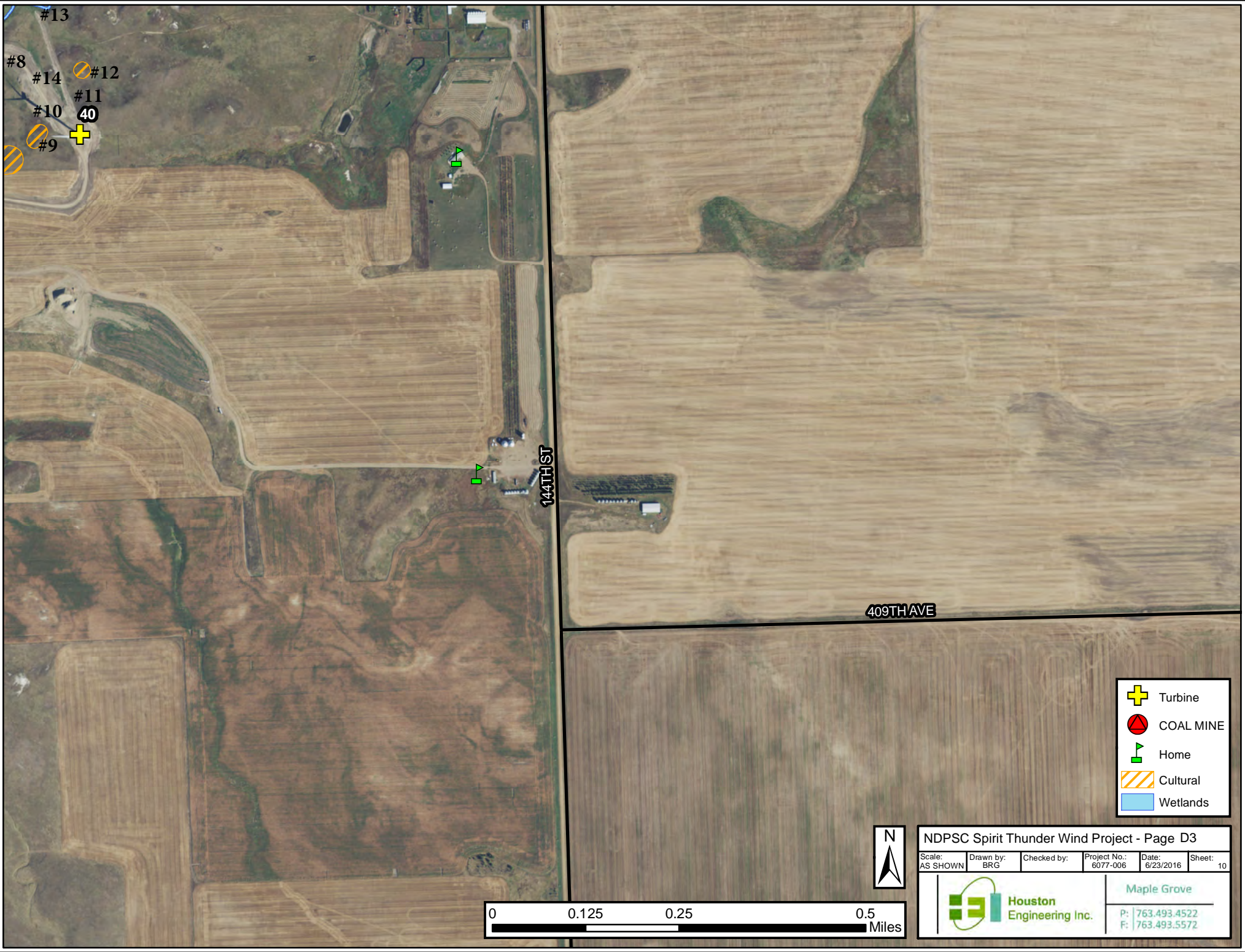
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NDPSC Spirit Thunder Wind Project - Page D2

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 #8 #14 #12  
 #10 #11  
 #9 #40

144TH ST

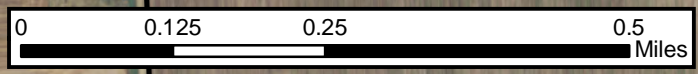
409TH AVE

-  Turbine
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-  Cultural
-  Wetlands



NDPSC Spirit Thunder Wind Project - Page D3

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