

**ECI ENGINEERING SERVICES, P.C.**

BILLINGS OFFICE: 3521 GABEL ROAD, BILLINGS, MONTANA 59102 • PHONE: 406-259-9933 • FAX: 406-259-3441

March 8, 2019

Jeffrey Veazie  
Invenergy LLC  
One South Wacker Drive, Suite 1900  
Chicago, IL 60606

Re: Alle-Catt Wind – 34.5 kV Underground Collection EMF

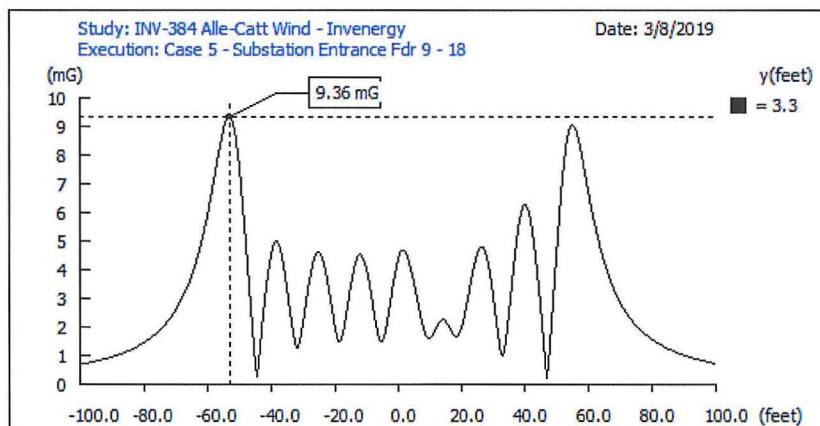
Dear Jeffrey:

ECI Engineering Services, P.C. (ECIPC) conducted an evaluation of the most congested, highest current carrying section of the Alle-Catt Wind collection system to determine the worst case electromagnetic field (EMF) during steady state conditions. The worst case was the substation entrance for Feeders 9 through 18A & B.

Per IEEE Standard 1793-2012, “IEEE Guide for Planning and Designing Transition Facilities between Overhead and Underground Transmission Lines,” Section 3.2.1, no electric field will be generated by the underground circuit, due to the cable shielding. The electric field strength was therefore not calculated. The worst case magnetic field intensity at one (1) meter above grade was calculated for the Feeder 9 through 18 Substation Entrance case.

#### Case 1; Substation Entrance

The substation entrance field strength was evaluated to a width of 100 feet, centered on the cables, with the magnetic field intensity calculated at 1 meter (3.3 feet) above grade while the cables were at peak loading. The peak field strength was 9.36 mG.



**Figure 1**  
**Substation Entrance Magnetic Field Plot**

#### OFFICE LOCATIONS NATIONWIDE

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*Jeffrey Veazie*  
March 8, 2019  
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If additional detail is needed for your permitting purposes, please feel free to reach out to us at your convenience.

Sincerely,



Ben Friederichs, P.E.  
Project Engineer

cc:    Dave Maehl, ECI  
         Andrew Leon, Invenergy LLC  
         Tom Egan, Invenergy LLC