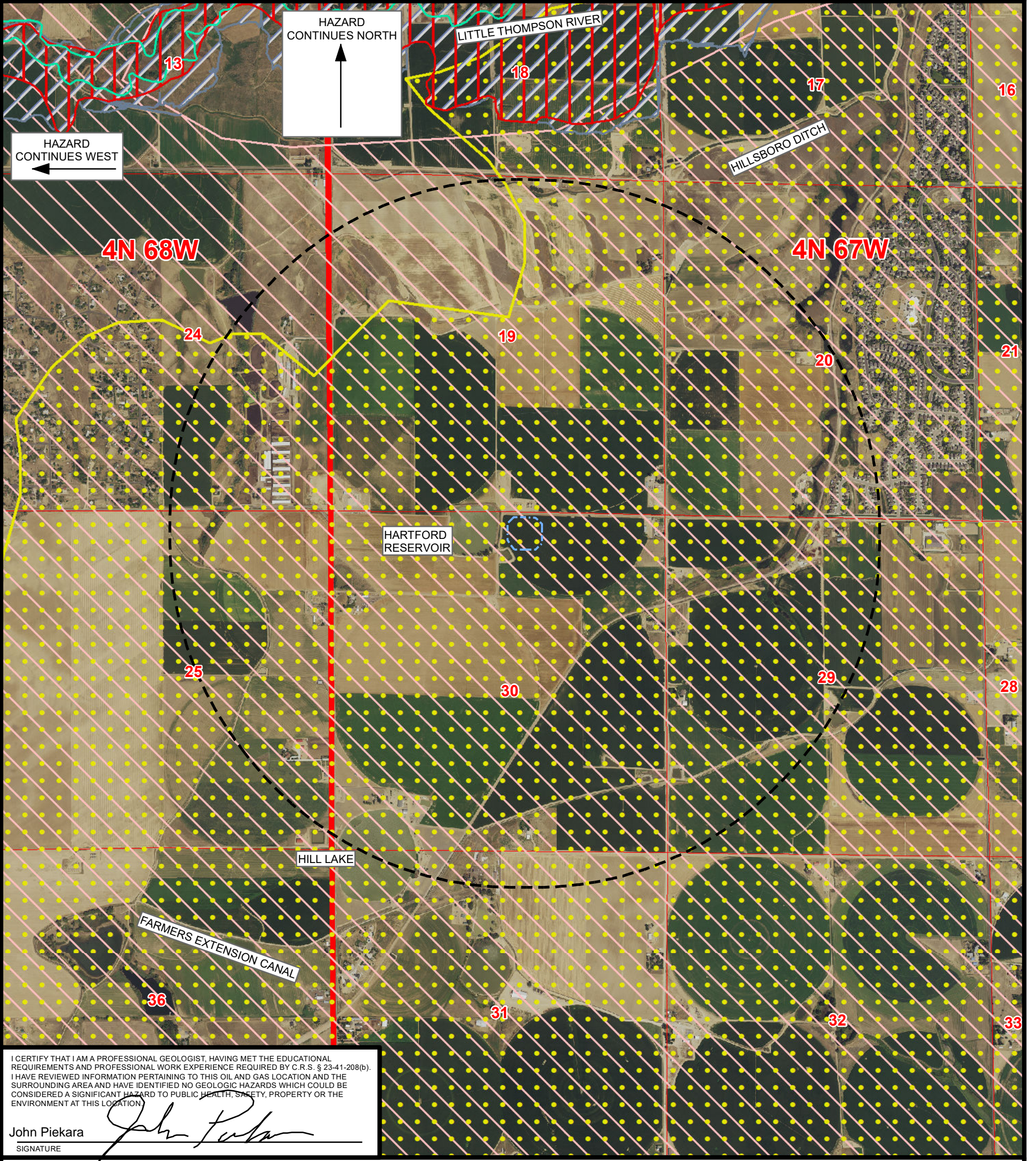


GEOLOGIC HAZARD MAP TULIP WELL PAD

SECTION 30, TOWNSHIP 4 NORTH, RANGE 67 WEST, 6TH P.M., WELD COUNTY, COLORADO



HAZARD CONTINUES WEST

HAZARD CONTINUES NORTH

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John Piekara
SIGNATURE

NOTES:
 1. COLLAPSIBLE SOILS AS MAPPED DO NOT CONSTITUTE A GEOLOGIC HAZARD. COLLAPSIBLE SOILS ARE EXTENSIVE BEYOND MAP LIMITS. (DATA SOURCE: CGS/CLIENT)
 2. PER THE COLORADO GEOLOGIC SURVEY (CGS), EG-14 COLLAPSIBLE SOILS ARE PRESENT IN THE VICINITY OF THE LOCATION. THESE SOIL TYPES ARE PRONE TO BOTH WATER EROSION AND SOIL BLOWING. KMOG WILL DEPLOY DUST MITIGATION MEASURES PROVIDED IN THE DUST MITIGATION PLAN THAT WILL MITIGATE AND MINIMIZE WIND EROSION. THE GRADING AND DRAINAGE DESIGN OF THE LOCATION, IN ADDITION TO IMPLEMENTATION OF STORMWATER CONTROLS PER KMOG'S STORMWATER MANAGEMENT PLAN, WILL MITIGATE AND MINIMIZE WATER EROSION. IN ACCORDANCE WITH KMOG'S STANDARD OPERATING PROCEDURE, AND AS OUTLINED IN THE TOPSOIL PROTECTION PLAN, A GEOTECHNICAL EXPLORATION WILL BE COMPLETED BY A GEOTECHNICAL ENGINEER PRIOR TO THE COMMENCEMENT OF PAD CONSTRUCTION CONSISTING OF MULTIPLE SOIL BORES ACROSS THE LOCATION. DURING PAD CONSTRUCTION, COLLAPSIBLE SOILS (IF PRESENT) WILL BE OVER EXCAVATED AND THROUGHOUT CONSTRUCTION ALL SOIL WILL BE MOISTURE CONDITIONED AND COMPACTED. PROPER SLOPING AND BENCHING TECHNIQUES WILL BE ADHERED TO IN ACCORDANCE WITH OSHA REGULATIONS AND STEEP EMBANKMENTS WILL BE AVOIDED. PERMANENT FACILITY EQUIPMENT WILL BE INSTALLED ON DEEP-FOUNDATION ELEMENTS CONSISTING OF HELICAL PILES. NONE OF THE IDENTIFIED SOILS WITHIN THE SURROUNDING AREA ARE CONSIDERED A SIGNIFICANT HAZARD TO PUBLIC HEALTH, SAFETY, PROPERTY, OR THE ENVIRONMENT.
 3. THIS MAP IS A COMPILATION OF PUBLICLY AVAILABLE DATA. THE ACCURACY AND COMPLETENESS OF SAID DATA HAS NOT BEEN VERIFIED BY 609 CONSULTING, LLC. EXISTING CONDITIONS MAY DIFFER FROM WHAT IS SHOWN.

Legend

- PROPOSED WORKING PAD SURFACE
- 1 MILE BUFFER - WORKING PAD SURFACE
- 100-YEAR FLOODPLAIN (EFFECTIVE, 2016)
- 100-YEAR FLOODWAY (PRELIMINARY, 2020)
- 100-YEAR FLOODPLAIN (PRELIMINARY, 2020)

COLLAPSIBLE SOILS

- EG-14 EOLIAN (WIND-BLOWN) DEPOSITS
- EG-14 DUNE AND SHEET SAND DEPOSITS
- EG-14 CRETACEOUS AND TERTIARY FORMATIONS

References:

FLOODPLAIN

- ECMC Floodplains (FEMA): <https://ecmc.state.co.us/maps.html#/gisonline>
- National Flood Hazard Layer (NFHL): <https://hazards-fema.maps.arcgis.com/apps/webappviewer/>
- Weld County: <https://www.weldgov.com/Government/Departments/Planning-and-Zoning/Floodplain-Management>

SURFACE MINES

- ECMC DRMS Mine: <https://ecmc.state.co.us/maps.html#/gisonline>
- Weld County: <https://www.weldgov.com/Government/Departments/Planning-and-Zoning>

EARTHQUAKES

- USGS: <https://www.usgs.gov/natural-hazards/earthquake-hazards/science/>

LANDSLIDES

- CGS: <https://cologeosurvey.maps.arcgis.com/apps/webappviewer/>

SUB-SURFACE MINES

- ECMC Coal Mine: <https://cologeosurvey.maps.arcgis.com/apps/webappviewer/>
- Roberts, S.B., Hynes, J.L., and Woodward, C.L. Maps Showing the Extent of Mining, Locations of Mine Shafts, Adits, Air Shafts, and Bedrock Faults, and Thickness of Overburden above Abandoned Coal Mines in the Boulder-Weld Coal Field, Boulder, Weld and Adams Counties, Colorado. 1:48,000. Denver, CO: US Geological Survey; 2001
- Ivery, J.B., and Hynes, J.L., Subsidence Hazard Map Boulder-Weld Coal Field Boulder and Weld Counties, Colorado. Map No. 7361-6 1:24,000. Colorado Geological Survey; 1974

COLLAPSIBLE SOILS

- Collapsible Soils of Colorado: <https://cologeosurvey.maps.arcgis.com/apps/webappviewer/index.html?id=a6f816b35fb64d3da096e84af6611070>
- White, J.L. and Greenman, C., Collapsible Soils in Colorado, Engineering Geology 14, Colorado Geological Survey, 2008.

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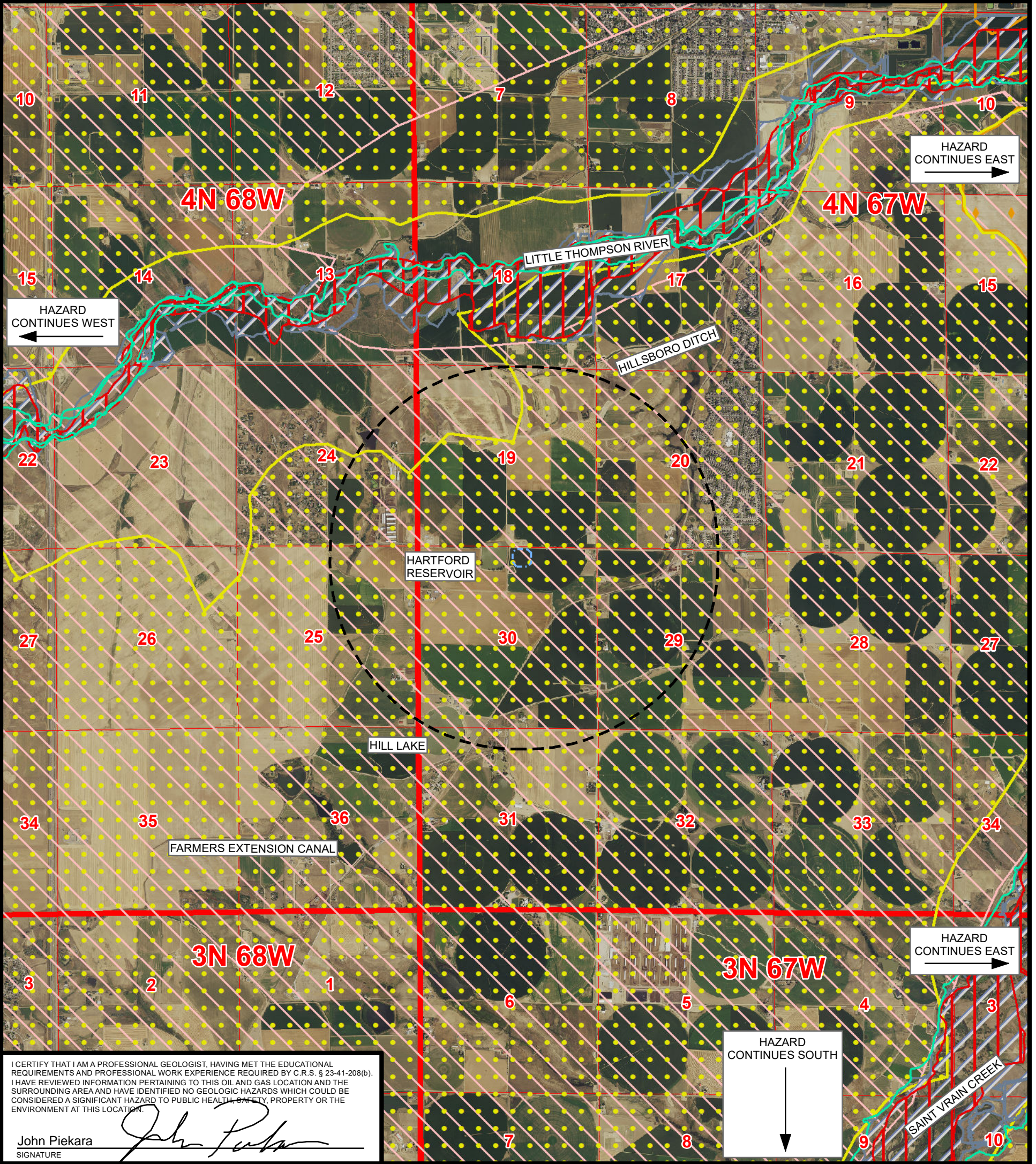
Drawn by: AK
 Revised: Date: 30 Apr 2024

NAD83 CO-Nft
 1" = 1,600ft
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N
NAD83 CO-Nft
1" = 3,000ft
0 1,500 3,000

Drawn by: AK
Revised:

Date: 30 Apr 2024
Date:

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