

NORTH VALLEY GEOTHERMAL FACILITY

BOARD OF COUNTY COMMISSIONERS | NOVEMBER 10, 2020



WOOD RODGERS



ORMAT
POWERED BY NEVADA
RENEWABLE. RELIABLE. READY FOR NEVADA.

INTRODUCTION TO ORMAT

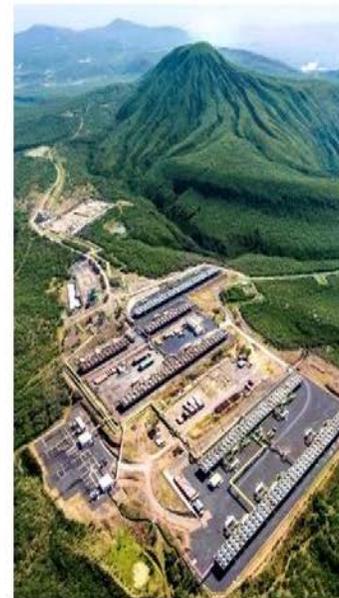
Market leader with proven track record in the geothermal energy sector

Our mission is to become a leading global renewable energy provider



55 years Of experience

\$3.68B Market Cap*



Own & Operate

914 MW



~1,410 Employees

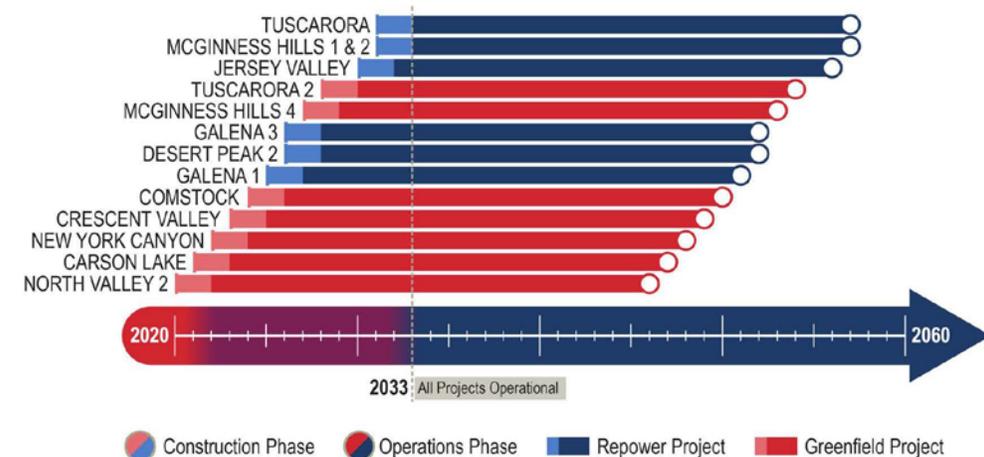
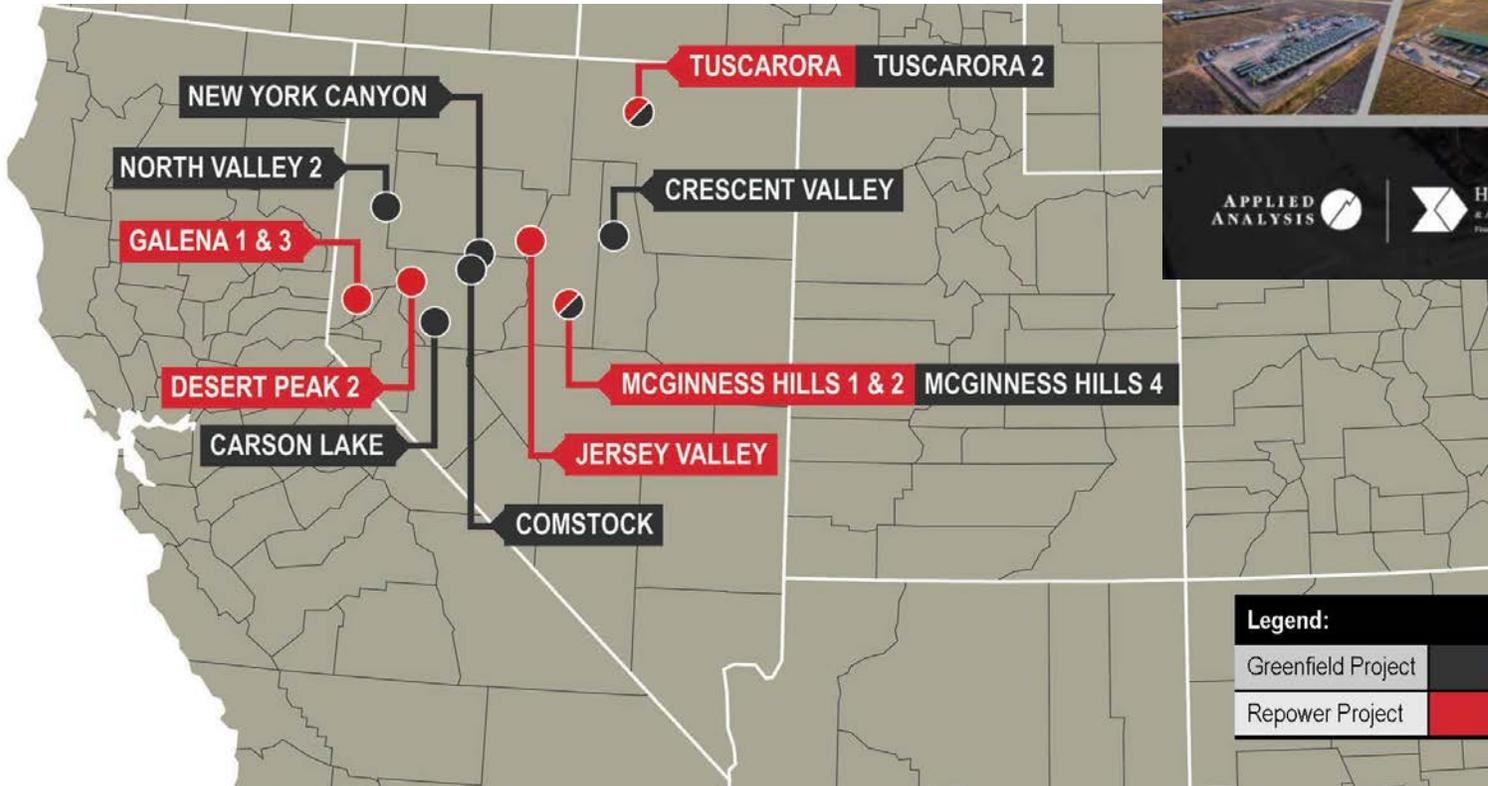
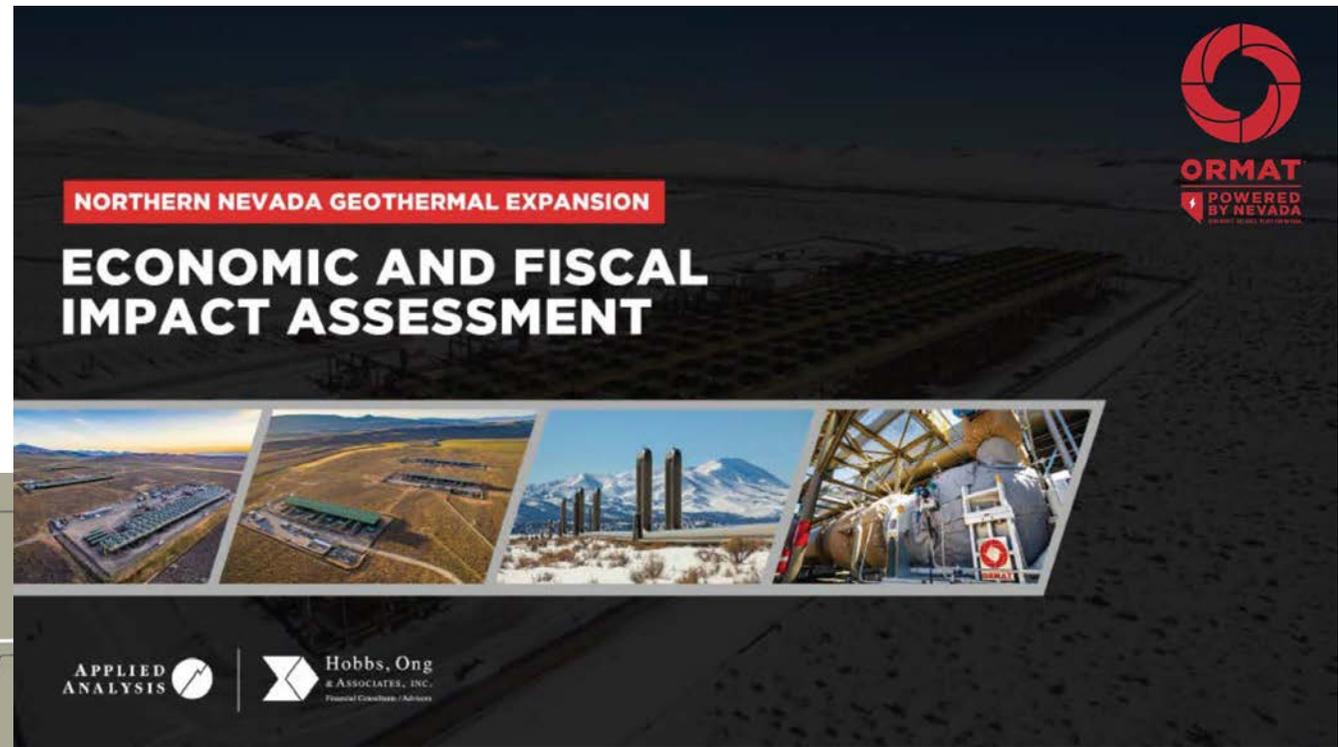


*Mar 25, 2020

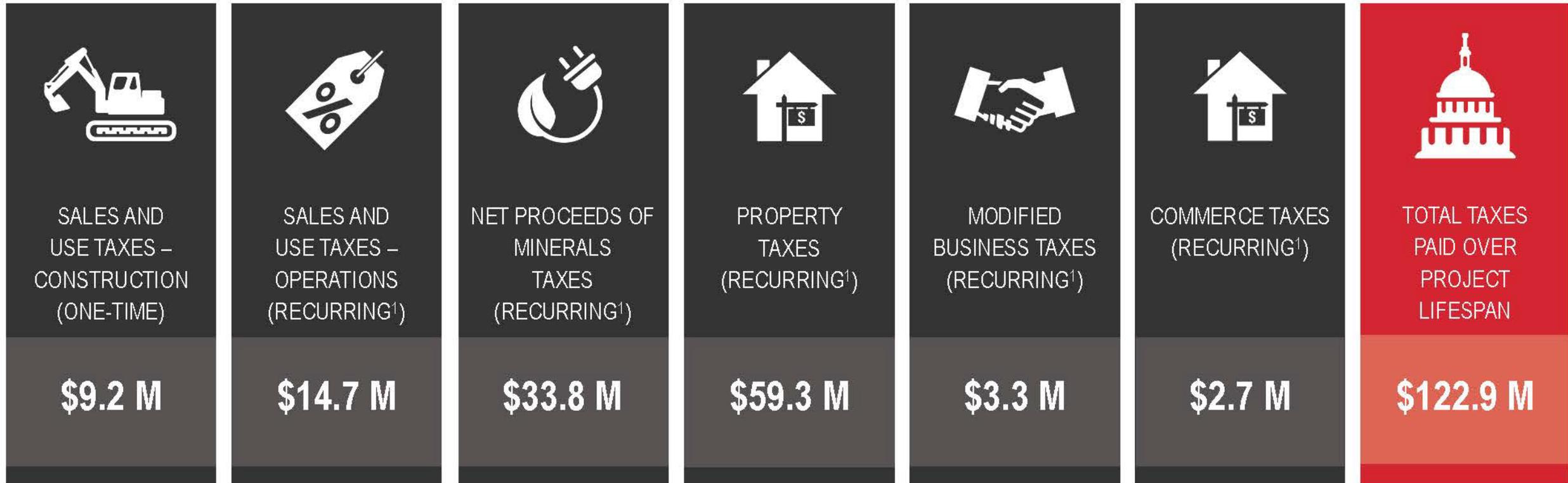
Copyright © 2020 Ormat Technologies, Inc. 1

Project Applicant

ECONOMIC IMPACT

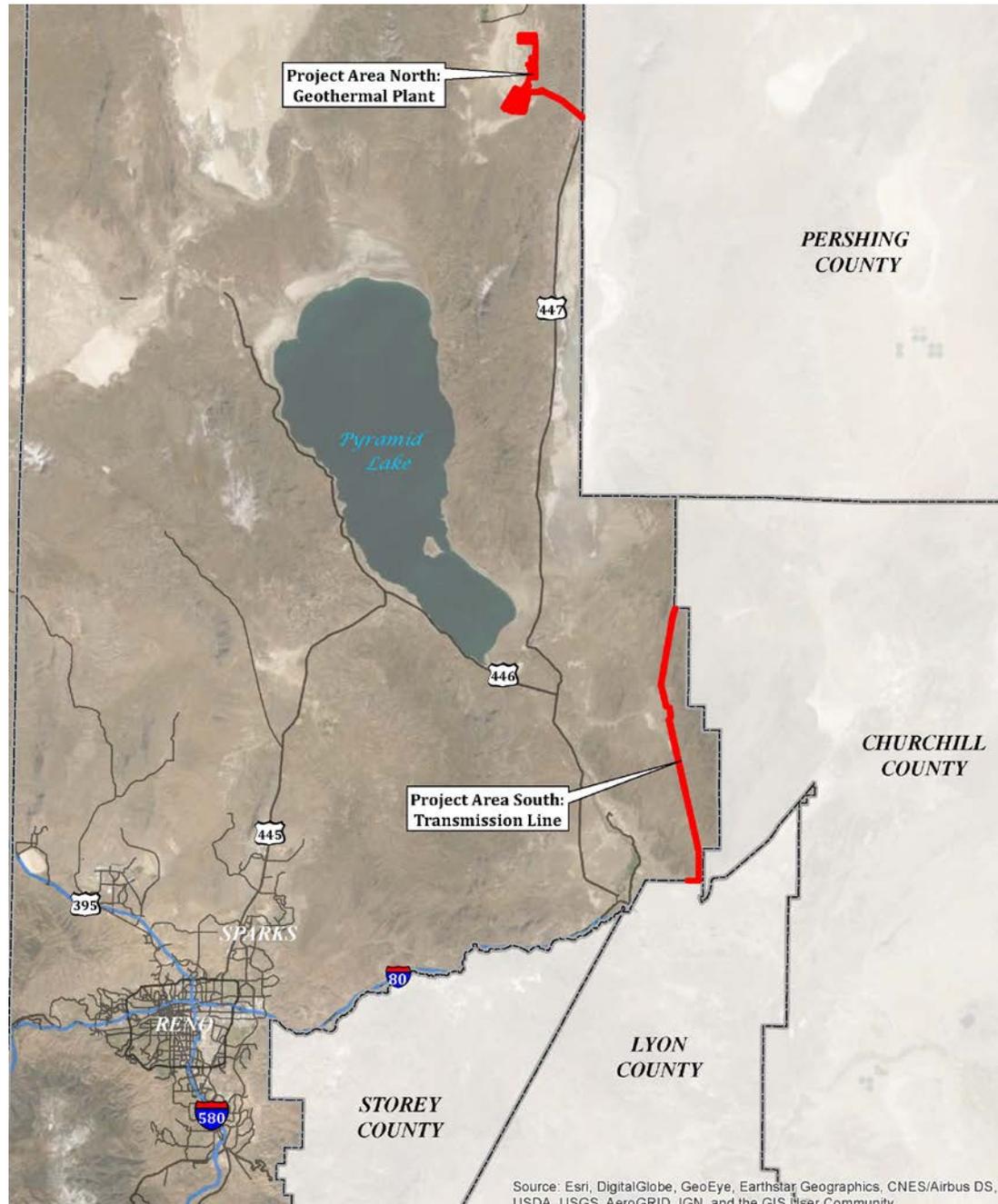


Fiscal Impact Assessment Summary | Proposed Greenfield and Repower Projects



- ~6.2 miles southwest of State Highway 447 and Rodeo Creek Road in the High Desert and Truckee Canyon Planning Areas
- Primary access to the site will utilize the existing access route off of State Highway 447
- Properties zoned General Rural in the High Desert Area Plan
- Adjacent to existing San Emidio geothermal facility

Project Location



Special Use Permit:

- “Renewable Energy Production” and the “Development of Natural Resources”
- Hazardous Material (i.e. Pentane)
- Major Grading associated with roads and well pads

Project of Regional Significance:

- Generates more than 5 MW of power
- Two substations
- Construction of new transmission line outside of existing utility corridor



Northern Portion



Southern Portion

Project Request

- Summary of proposed new facilities showing estimated area of permanent and temporary disturbance for project area as proposed/permitted in Draft EA

**Table 2-1
Proposed Disturbance in the AOI**

Component	Acre Disturbance	
	Temporary	Permanent
Power Plants ¹	30	30
Pipelines	36.8	18.4
Well Pads	105	63
Access Roads ²	13.1	13.1
Aggregate Pit	5	5
Total	189.9	129.5

Source: Ormat 2020

¹The substation and ancillary features, such as offices, restrooms, a control room, a maintenance building, and smaller auxiliary buildings, would be constructed within the power plants' footprints.

² Includes acres of disturbance from new roads and upgrades to existing roads.

Northern Portion

- Two, 24MW binary design geothermal energy generation facilities
- Specific elements include:
 - 0.5-acre substation
 - Geothermal fluid production
 - Injection wells and well pads
 - Access roads
 - Geothermal fluid pipelines
 - Ancillary support facilities
 - Overhead transmission line

Southern Portion

- Limited to overhead transmission line
 - Within existing 368 energy corridor
 - Will connect new plant to existing electrical facilities in Lyon County



Northern Portion



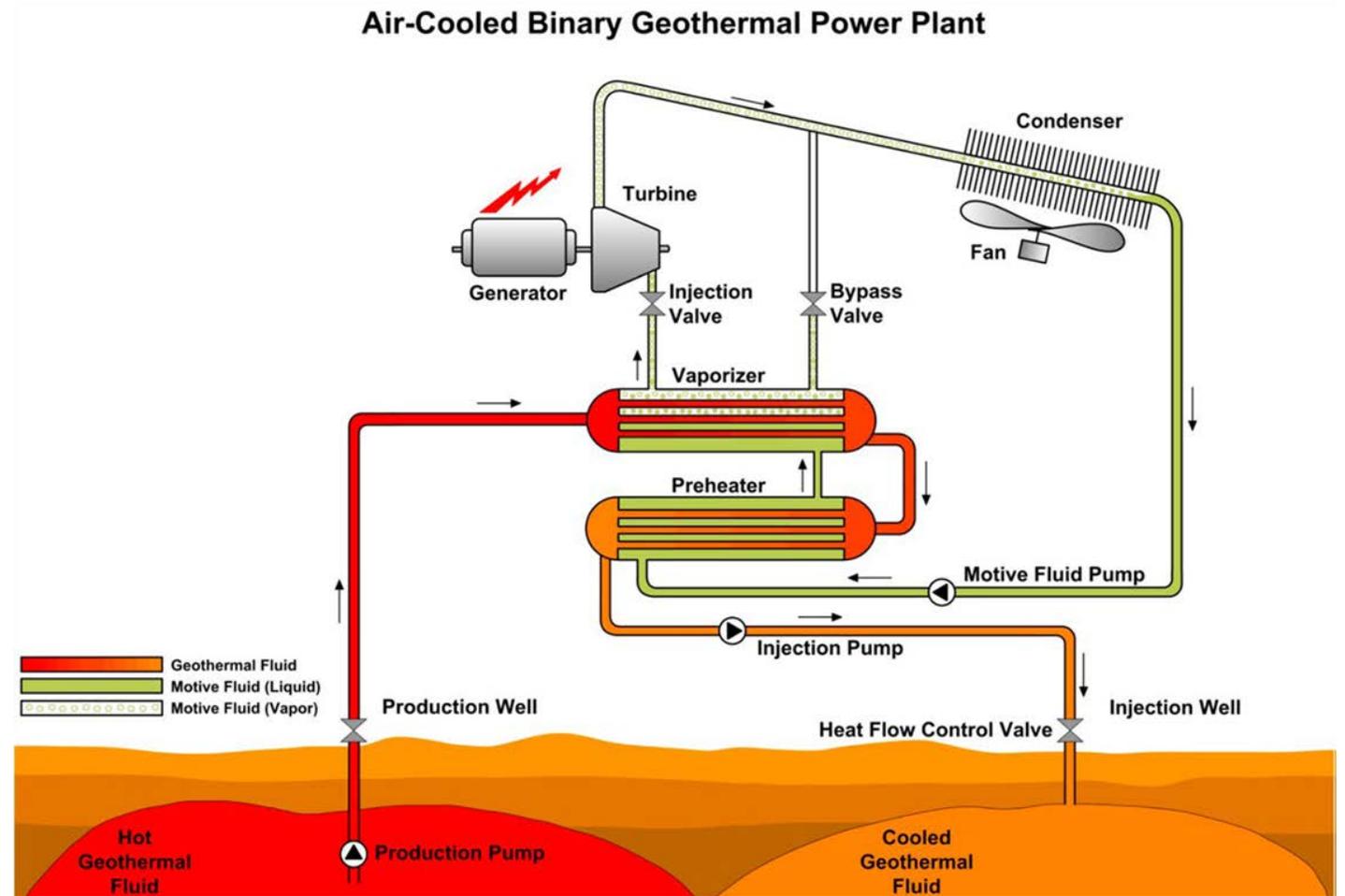
Southern Portion

Summary of Project

➤ Two, 24 MW binary, air-cooled geothermal plants (Closed loop systems)

- New technology utilizes dry (air) cooling heat rejection systems so no steam plume.
- Geothermal Fluid pumped from production well via pipelines into heat converter/exchanger
- Heat exchanger transfers heat from geothermal fluid to working fluid (pentane), causing it to “flash” to vapor
- Vapor powers the turbine to produce electricity
- Vapor is condensed back to liquid state for reuse, and geothermal fluid is returned to geothermal aquifer via pipelines and injection wells, completing the closed loop cycle

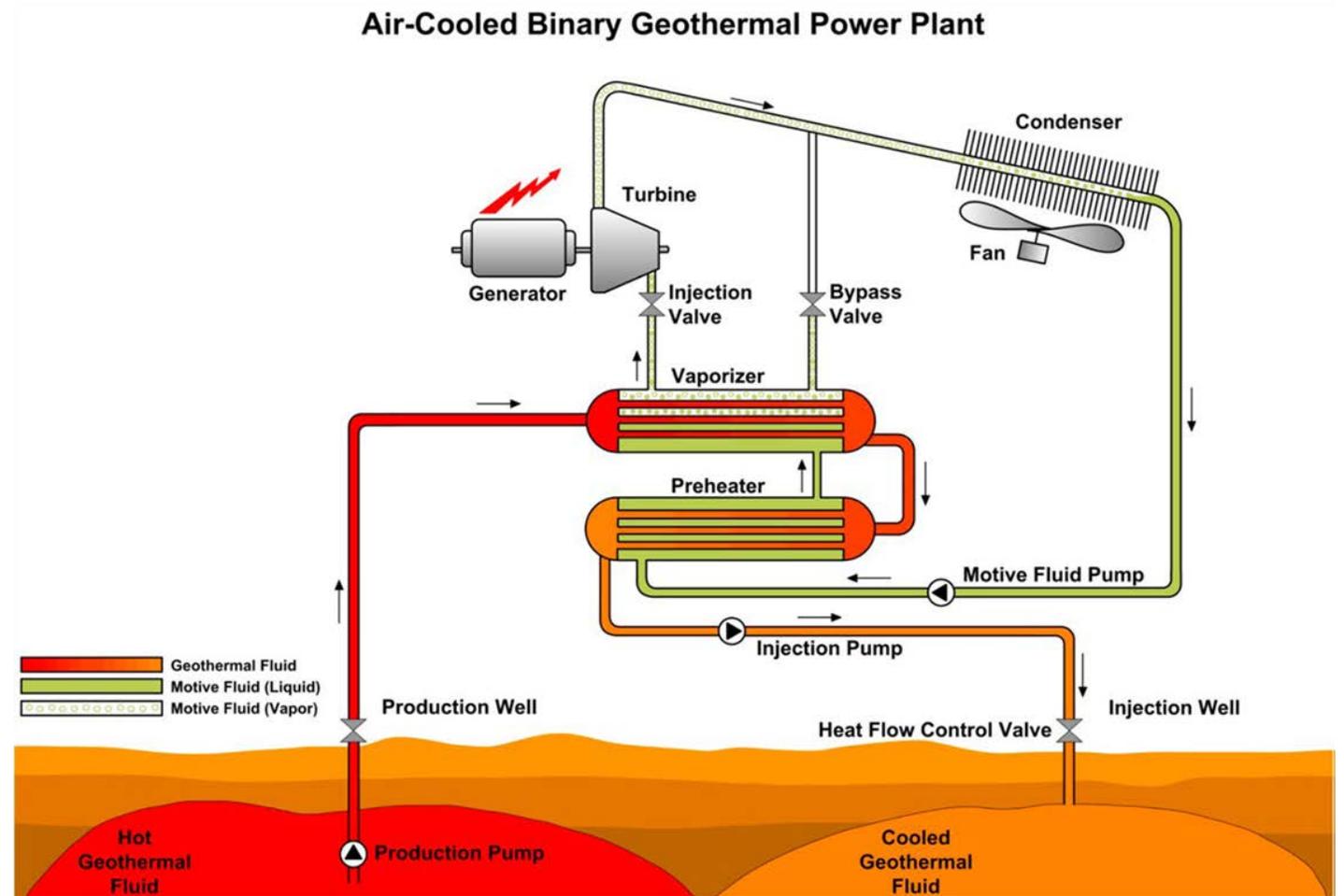
Plant Details



Pentane Gas (aka – motive fluid)

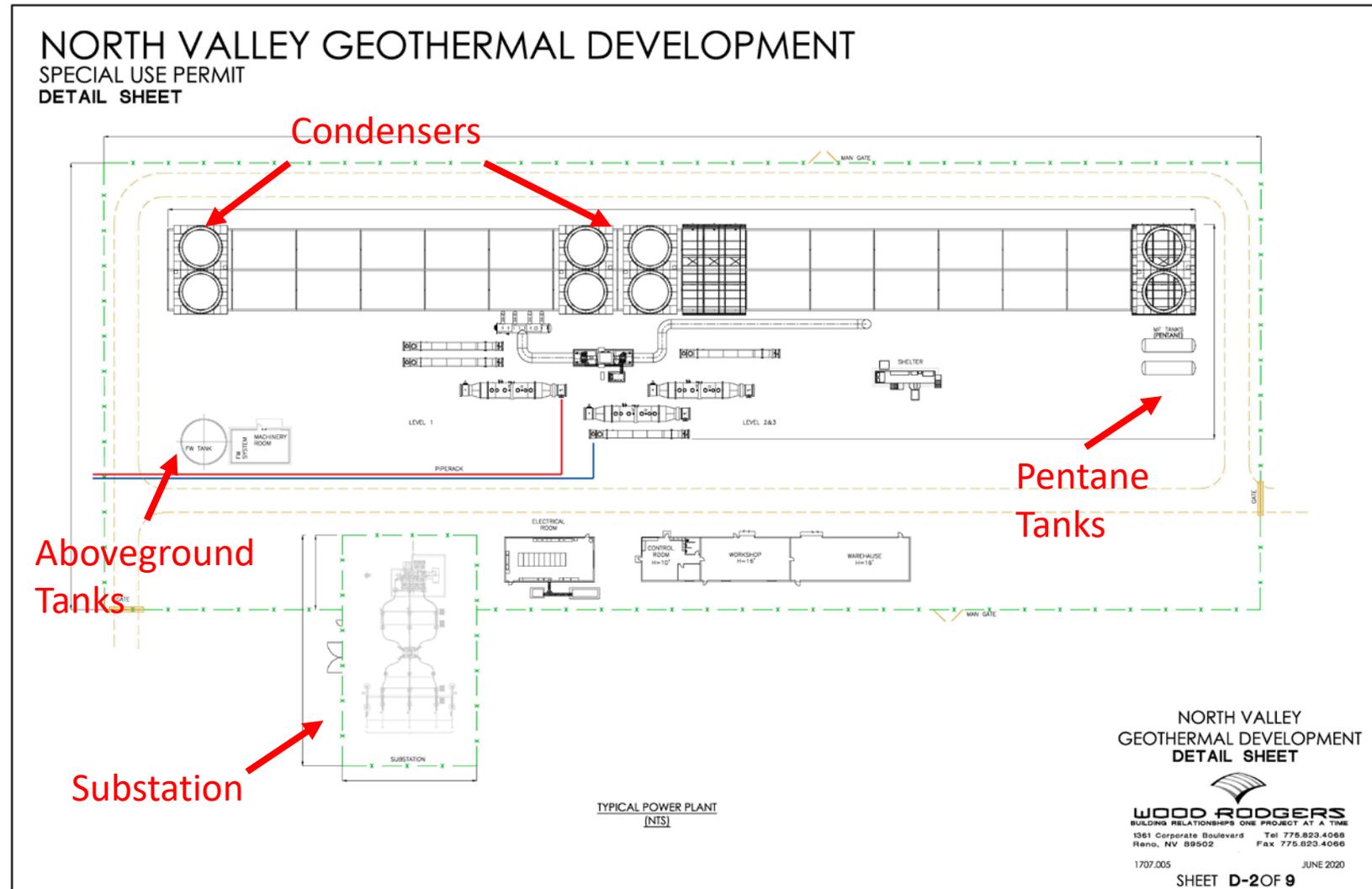
- Flammable but non-toxic
- Requires advanced permitting through State and County
- Project will include up to 720,000 lbs of pentane in system at any given time
- During maintenance, pentane pumped back and sealed from the system to ensure safe working environment and prevent losses
- No disposal of pentane; continuously used in sealed, closed-loop process
- Chemical Accident Prevention Program (CAPP) permits and Class II Operating Permit through NDEP required
 - Applicant is seasoned with protocols
 - Stellar safety record

Hazardous Materials



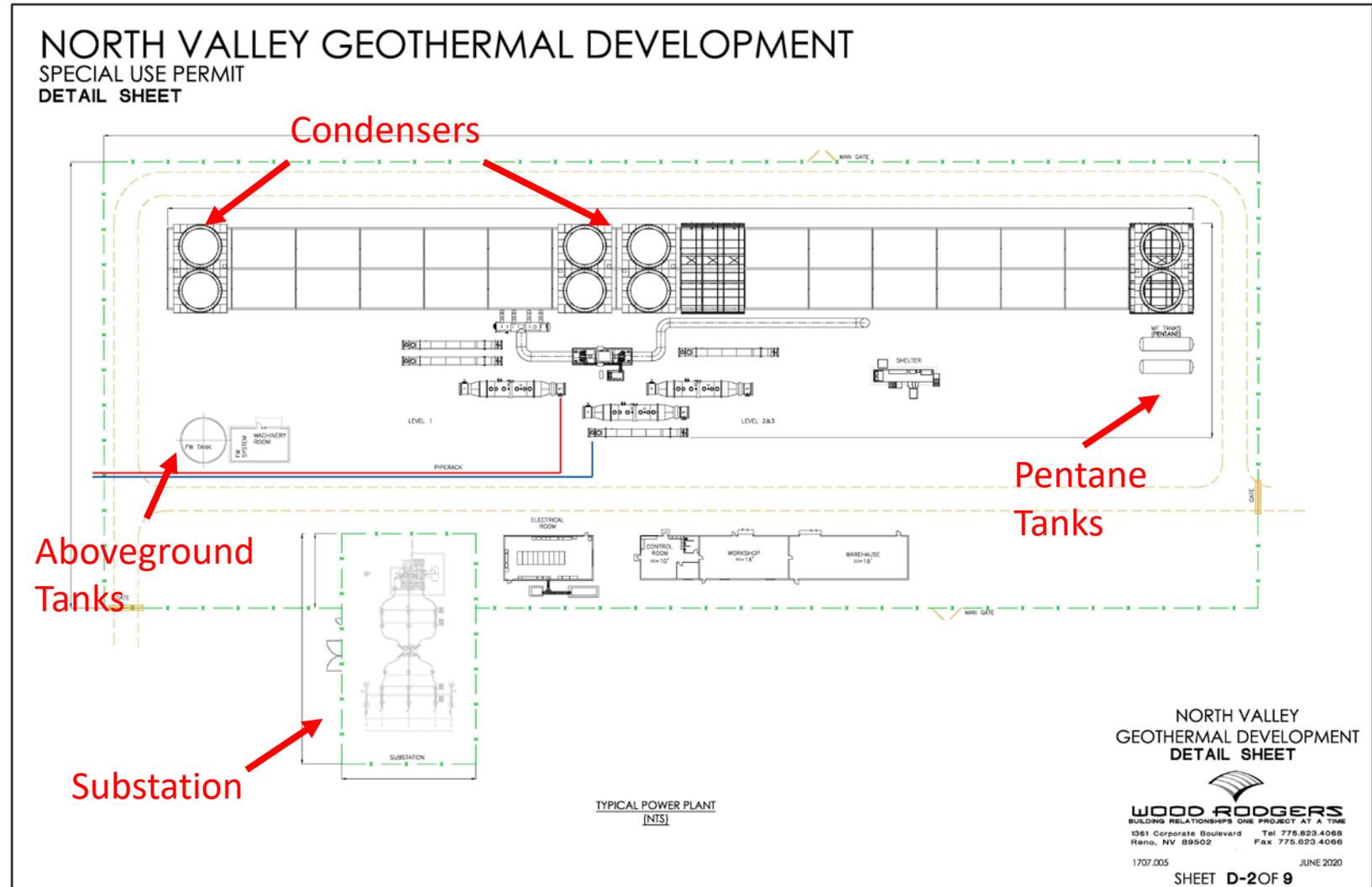
Each Plant includes:

- Buildings (including condensers) at or below 35 ft in height
- 0.5-acre substation to transform low voltage (DC) energy to higher voltage (AC) for the transmission line
- 8-ft chain link fence (no slats) topped with barbed wire (controlled-entry gates)
- Lighting will be minimal, motion controlled, and directed downward and shielded to meet Dark Sky's requirements
- Ancillary facilities (office, restrooms, electrical room, etc) located inside fence for the power plant
- Two 500-gallon aboveground storage tanks, used to backup generators and fueling on-site equipment



Additional details

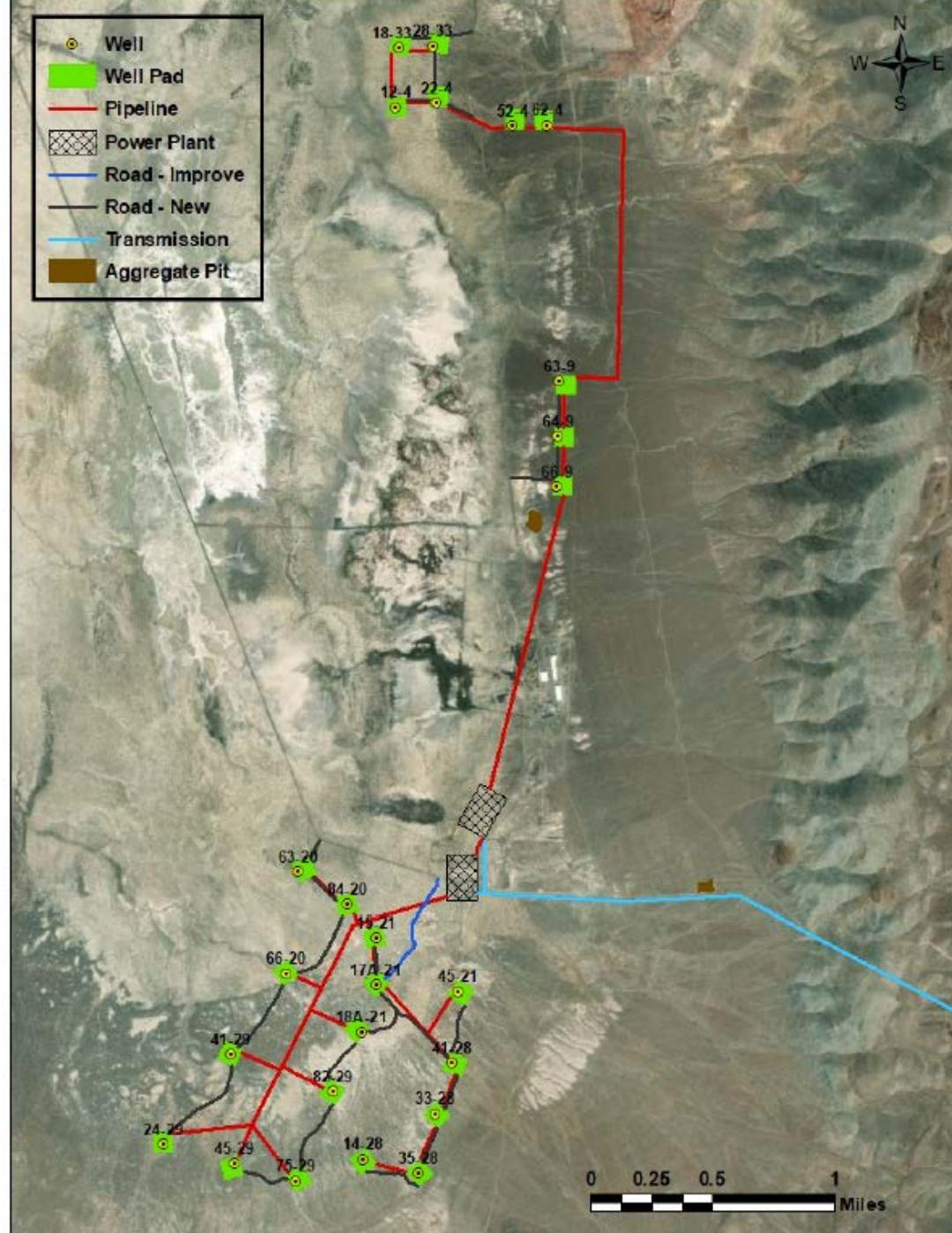
- All structures will be 35' or less in height
- Lighting will comply with Dark Skies requirements/High Desert Area Plan
- 3 parking spaces (DG) for employees
 - Parking waiver requested due to remote location and no need for paved parking availability
- No formal landscaping or screening planned; maintain natural appearance
 - Disturbed areas will be revegetated with native seed mix
- Well drilling anticipated to start Q3 2020, construction of power production facilities anticipated to start in Q3 2021, and commercial operation slated by Q2 2022



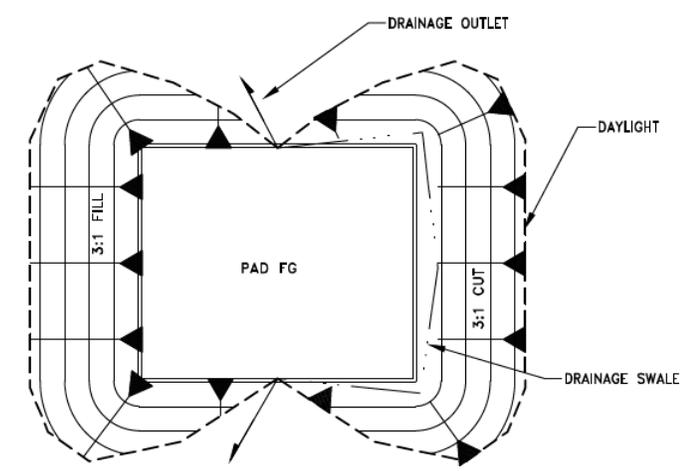
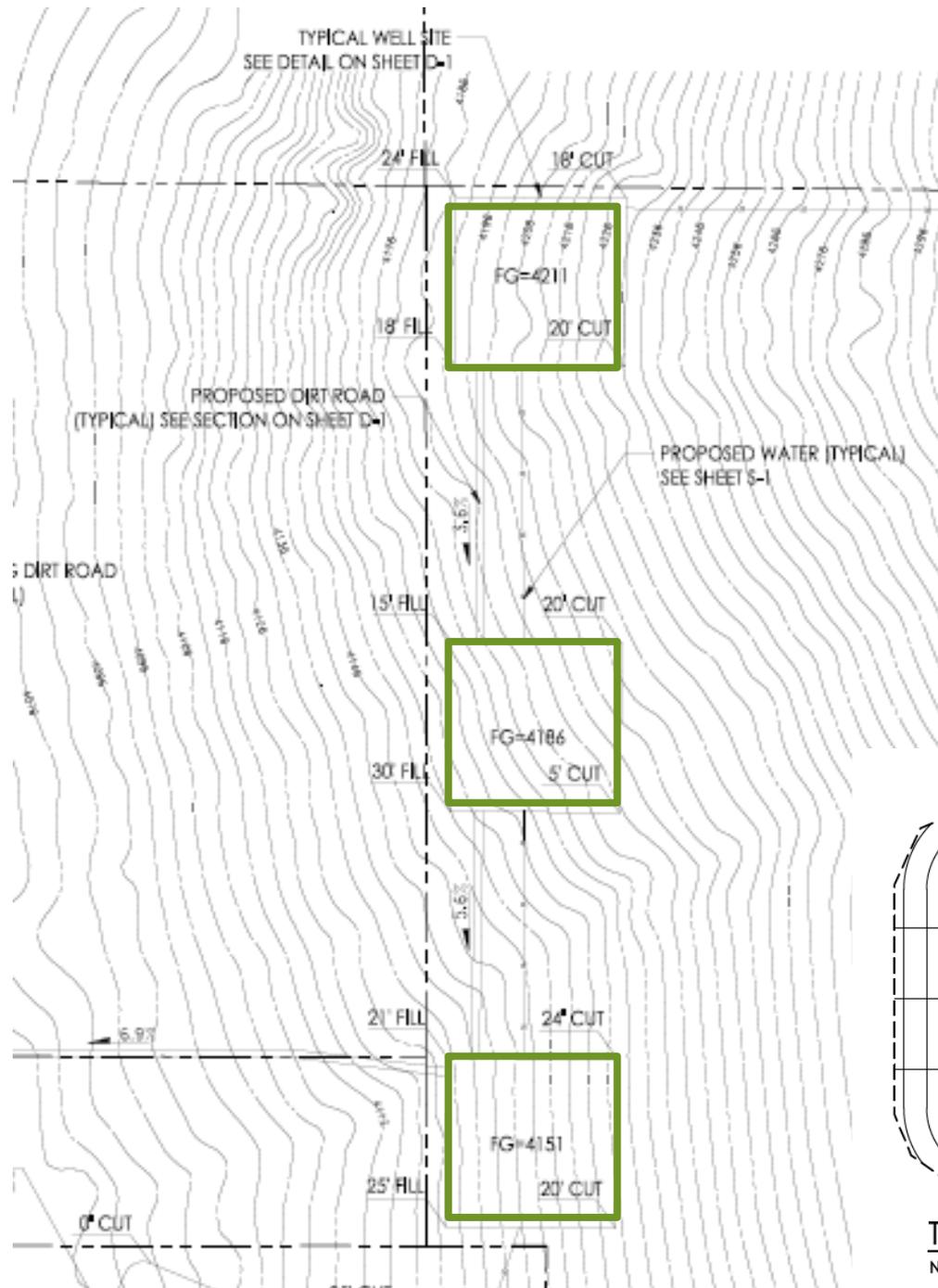
Up to 25 production and/or injection well pads

- Through EA process, identified 25 preliminary well sites
- Unlikely that all 25 wells will be necessary
- Exact location of each well is unknown as each well drilled will influence the location of the next well
- Based on EA and preliminary well pad locations, ~7.6 miles of production and injection pipelines are proposed
- Pipelines ~30 inches in diameter; located above ground along roads
- Pipelines and wellheads painted as approved by BLM EA

Wells and Well Pads



- Grading associated with project ~300,000cy (wells/well pads/roads/generation plants)
- Grading activities will require cutting of slopes to clear for new roads, well pads, plant pads, pipelines, existing road improvements and power pole placement
- Native materials will be used for site and road building materials as much as possible
- 3 pad sites are planned in terrain where that will exceed the allowed 10 ft max cut
 - Waiver requested to allow cuts up to 30' in order to minimize mass grading efforts and preserve flexibility for pad location



Grading

Planning Commission Concerns Addressed

- BLM environmental process will include additional groundwater monitoring program, in addition to required NDEP ground water monitoring
 - *This will address Pyramid Indian Tribe concerns*
- BLM Environmental Assessment (EA) schedule for completion in November
 - *EA not within the purview of special use permit process*
- Agreement reached with adjacent property owner for mineral lease and access easements; objection to the project withdrawn
- All findings can be met

Finding 4:

Issuance Not Detrimental – *That issuance of the permit will not be significantly detrimental to the public health, safety or welfare; injurious to the property or improvements of adjacent properties; or detrimental to the character of the surrounding area.*

- Underground water and geothermal resources regulated by NDEP and BLM, not Washoe County
- Special Use Permit findings require the physical development conforms with Washoe County Code – the project does (as confirmed by staff)
- Adjoining property owner has withdrawn their objections

Finding 6:

Development of Natural Resources: *That the proposed development is not unduly detrimental to surrounding properties, land uses and the environment in general.*

- Ormat's geothermal power production process does not use any natural resources. All geothermal brine is reinjected back into the aquifer.
- Environmental permitting and natural resource management is the responsibility of other State and Federal agencies.
- Mitigation for the physical development of the site (e.g. revegetation and dust/erosion control) are addressed with the project and conditions.
- Adjoining property owner has withdrawn their objections.

- Adjacent properties already operating similarly to proposed project
- Provides clean energy to about 29k homes
- Offset about 5.3 million tons of CO2
- Provides a rigorous groundwater monitoring plan to identify geothermal impacts to shallow groundwater throughout the valley (in addition to the existing NDEP monitoring program already implemented under the UIC program)
- Includes a comprehensive monitoring and mitigation program to identify, protect, and enhanced habitat for the kangaroo mouse – a state sensitive species
- Permit issuance will help NV meet goal of 50% renewable energy production by 2030



Project Benefits



WOOD RODGERS

Andy Durling
Vice President

adurling@woodrogers.com

775.823.5211 – direct