Appendix B

HDC Conceptual Development Plan
(Mackenzie Inc.)

Appendix B

MACKENZIE.

HYPERSCALE DATA CENTERS CONCEPT PLAN

To
City of Hermiston

For
Hermiston UGB Expansion

Dated
July 1, 2025

Project Number
2230329.00

MACKENZIE
Since 1960

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EXHIBITS

I. PROJECT BACKGROUND

The City of Hermiston's Economic Opportunities Analysis (EOA), adopted in September 2024, identified data centers as a target industrial use for meeting the City's long-term economic development goals. Hermiston's proximity to the Columbia River and major electrical transmission lines makes the area desirable for "hyperscale" data center campuses.

As defined by IBM, "a hyperscale data center is a massive data center that provides extreme scalability capabilities and is engineered for large-scale workloads with an optimized network infrastructure, streamlined network connectivity and minimized latency. Due to the ever-increasing demand for data storage, hyperscale data centers are in wide use globally for numerous providers and a wide variety of purposes that include artificial intelligence (AI), automation, data analytics, data storage, data processing and other big data computing pursuits."[1] Multiple hyperscale data center campuses have recently been developed in central and eastern Oregon by providers including Google, Meta, Apple, Amazon Web Services (AWS), and others.

Based in part on the Employment Lands – Buildable Lands Inventory (BLI) memo prepared by Mackenzie[2], the EOA found that Hermiston lacks large, developable industrial lots within the urban growth boundary (UGB) that could accommodate the demand and projected growth of data center development anticipated in the Columbia Basin region. Specifically, the EOA identified a need for lots with 100+ contiguous acres of buildable, industrially zoned area to accommodate hyperscale data center campuses.

As part of the EOA and BLI process, Mackenzie prepared a technical memo to identify siting criteria for this type of development.[3] The siting criteria, which are outlined below, include considerations such as location, topography, building size and configuration, utility needs, transportation needs, security, and natural hazards.

Land surrounding Hermiston's UGB was evaluated for suitability based on the data center siting criteria and Oregon's rules and statutes relating to UGB expansions. Winterbrook Planning's proposed UGB expansion area analysis identifies 643 suitable acres south of the existing UGB and north of the Umatilla River, divided among three tracts:

- Tract S1: 220 suitable acres
- Tract S2: 111 suitable acres
- Tract S3: 312 suitable acres

This report describes the opportunities and constraints for hyperscale data center campus development within the proposed UGB expansion area and the resulting Hyperscale Data Centers Concept Plan (Exhibits 1, 2A, and 2B).

[1] https://www.ibm.com/think/topics/hyperscale-data-center
[2] Technical Memo: City of Hermiston Employment Lands – Buildable Lands Inventory, dated July 3, 2024
[3] Technical Memo: Siting Criteria for Hyperscale Data Centers, dated July 9, 2024

II. SITE DEVELOPMENT PARAMETERS

Table 1, which is reproduced from the siting criteria memo, outlines criteria applicable to hyperscale data center sites. Additional discussion is provided following the table.

TABLE 1: SITING CRITERIA FOR HYPERSCALE DATA CENTERS		
Criteria		**Hyperscale Data Center**
Physical Site		
Total Site Size*	Competitive Acreage**	100+
Competitive Slope	Maximum Slope	0 - 5%
Transportation		
Trip Generation	Average Daily Trips Per Acre	15 - 45
Miles to Interstate or Freight Route	Miles	within 30
Railroad Access	Dependency	Not Required
Proximity to Marine Port	Dependency	Not Required
Proximity to International/ Regional Airport	Dependency	Not Required
Utilities		
Water	Minimum Line Size (inches diameter)	12" – 16"
	Minimum Fire Line Size (inches diameter)	10" - 12"
	High Pressure Water Dependency	Required
	Flow (gallons per day per acre)	1,000†
Sanitary Sewer (if used for wastewater or cooling water disposal)	Minimum Service Line (inches diameter)	8" - 10"
	Flow (gallons per day per acre)	500 - 1,000‡
Natural Gas	Minimum Service Line (inches diameter)	4"
	On Site	Competitive

TABLE 1: SITING CRITERIA FOR HYPERSCALE DATA CENTERS		
Criteria		**Hyperscale Data Center**
Electricity	Minimum Service Demand	60 - 240 MW
	Close proximity to substation	Required on-site
	Redundancy Dependency	Required
Telecommunications	Major Communications Dependency	Required
	Route Diversity Dependency	Required
	Fiber Optic Dependency	Required
Special Considerations		▪ Power delivery, water supply, and security are critical. ▪ May require high volume/supply of water and sanitary sewer treatment. ▪ Sites should be located outside areas of special flood hazard. ▪ Site designs typically provide a buffer between cooling equipment/backup generators and any nearby residential uses.

Terms: "Required" factors are seen as mandatory in a vast majority of cases and have become industry standards.
"Competitive" significantly increases marketability and is highly recommended. May be linked to financing in order to enhance the potential reuse of the asset in case of default.
"Not required" does not apply for the industry and/or criteria.

* Total Site: Building footprint, including buffers, setbacks, parking, mitigation, and expansion space.

** Competitive Acreage: Acreage that would meet the site selection requirements of the majority of industries in this sector.

† Water Requirements: While the Business Oregon Industrial Development Competitiveness Matrix identifies water requirements in gallons per MWh for data centers, this table uses gallons per acre.

‡ Sanitary Sewer Requirements: Water and sewer requirements are highly variable based on cooling methods and water reclamation practices and should be reviewed on a case-by-case basis for specific development requirements. Alternative approaches to wastewater management may drastically reduce the need for sanitary sewer capacity.

Existing Conditions

The UGB expansion area tracts are each relatively flat and free of natural hazards such as flooding or landslides. As discussed in greater detail below, the tracts are each served by public roads, and the necessary utilities are available or can feasibly be extended. Impacts to resources such as wetlands and canals can largely be avoided through site design. Surrounding land uses generally consist of agricultural and industrial. Tract S1 is proximate to an area within the existing Hermiston UGB that is planned for residential use (on the north side of Feedville Road). As shown on the concept plan (Exhibits 1 and 2A), separation can be provided between residential and data center development via buffering (at least 200' provided).

Zoning

Development of hyperscale data center campuses within the proposed UGB expansion area will require annexation into City limits, so campuses will be required to follow all applicable development standards and procedural requirements identified in the Hermiston Code of Ordinances (HCO). Potential zones following annexation may include the Light Industrial Zone (M-1), Heavy Industrial Zone (M-2), or a new zoning district created specifically to address the unique siting requirements associated with hyperscale data centers.

Transportation

Data center campuses benefit from direct and convenient access to nearby population centers via public roads and highways. Site suitability factors include the adequacy of existing transportation infrastructure, access flexibility including multiple points of access to adjacent public roads, and efficiency for emergency vehicle access.

Each of the study area tracts has convenient access (within five miles) to I-84 and frontage(s) on Feedville Road and/or Hermiston-Hinkle Road. According to analysis by Kittelson & Associates (Kittelson), these roads are public rights-of-way and appear to have adequate capacity to accommodate the anticipated traffic volumes. It also appears to be feasible for each tract to be configured with primary and emergency access points that do not have issues with sight distance, access management, or operational limitations.

Utilities

Utility extensions and improvements will be necessary to serve the study area tracts. The cost and difficulty vary between each tract but overall, providing the required services appears to be feasible. A summary of available utilities is included below, based on information provided by Anderson Perry & Associates.

Water

- An aquifer storage and recovery (ASR) well and booster pump station (BPS) are proposed northeast of the intersection of East Feedville Road and SE 9th Street as part of Hermiston's regional water system (RWS). This system would include a booster pump station and two reservoirs. Main line extensions would be required to serve the proposed expansion areas. The existing main line size in East Feedville Road is 16".

Sanitary Sewer

- Gravity sewer is currently available at the intersection of SE 9th Street and East Feedville Road and is proposed from Hinkle Road to its intersection with East Feedville Road. Main lines downstream of the connection point may require upsizing to handle additional flow.

Stormwater

- No public stormwater infrastructure currently serves the expansion tracts. Runoff will be contained on site via infiltration swales or drywells. If curb and gutter systems are not installed along roadways, stormwater can be accommodated in underground injection controls (UICs) or roadside swales.

Industrial (Cooling) Wastewater

- Disposal of industrial wastewater used for cooling data center equipment can be accommodated via onsite systems such as evaporation basins, discharging to wetlands, discharging to a storage pond for land application (irrigation), or discharging to the irrigation canal system.

Design Considerations

Site and Building Characteristics

The typical site size for a hyperscale data center campus is 100 acres or more, including clusters of four or more buildings at 200,000 square feet (SF) to 250,000 SF each, with 5-10 acres for dedicated electrical substations.

While sites can have a variety of shapes, the minimum dimension is determined by the length of the data center buildings. Recent examples of hyperscale data center buildings range from 1,000' to 1,150' long. Sites need to be large enough to contain these large buildings plus associated parking and circulation, utilities, supportive infrastructure, and buffers.

Site topography should be relatively flat, with a maximum grade of 5%, and site shape should accommodate large rectangular buildings. Building facilities, accompanying substations, and access roads should be located outside of areas of special flood hazard (i.e., 1% annual chance or "100-year" floodplain on Flood Insurance Rate Maps issued by the Federal Emergency Management Agency).

Due to the noise produced by cooling equipment and backup generators, site designs may require area to accommodate buffering from nearby residential zones or other sensitive uses.

Utilities

Sites require adequate supply of water, sanitary sewer, natural gas, electricity, and telecommunications (see Table 1, above). Site design must also include adequate area for stormwater and industrial wastewater facilities.

Transportation

Sites require adequate access and circulation for truck traffic and emergency vehicles. Data centers generate minimal traffic during operation, primarily consisting of employees in their personal vehicles, so frontage on high-capacity road classifications is not critical. Traffic volumes are highest during the construction phase, during which sites need to be accessible by heavy vehicles.

Security

Sites require gated access, security lighting, and enhanced security systems to ensure data remains secure and systems stay online.

Natural Hazards

Due to the need for the facility to be in continuous operation, sites must have minimal seismic, flood, or other natural hazard risk exposure.

III. CONCEPT PLAN DESCRIPTION

Mackenzie prepared the attached concept plan (Exhibits 1, 2A, and 2B) based on the siting criteria and design considerations described above. Buildings shown on the concept plan are generally 200,000 - 250,000 SF and 35' tall. Based on the available tract area and separation requirements, the concept plan illustrates the following arrangement as summarized in Table 2:

TABLE 2: CONCEPT PLAN BUILDING AREAS AND PARKING COUNT

Tract	Building Count	Building Area (SF)	Approximate Parking Count (spaces)
S1	6	1,200,000	240
S2	4	800,000	160
S3	9	1,800,000	360

Building layouts were developed to retain adequate area for water quality facilities, electrical substations, utilities, and security; and to minimize impacts to mapped wetlands and areas with slopes greater than 5%. While not shown, generators would be placed at the interior of campuses to reduce sound transmission off-site.

Buildings are set back from property lines to provide adequate area for security fencing, as well as any necessary buffering and screening. For example, buffering can be provided along the northern boundary of Tract S1 to provide separation from the nearby area planned for residential uses north of Feedville Road.

Driveway locations were designed and placed to avoid issues with sight distance, access management, or operational limitations based on analysis by Kittelson. As shown on the concept plan, each study area can accommodate driveways that provide the necessary access and circulation for passenger vehicles, freight, and emergency vehicles. Guard shacks are provided at access points to meet security needs.

Parking areas are placed around the perimeter of each building. Approximately 40 parking spaces are provided for each individual building.

The concept plan, while conceptual and subject to change, demonstrates each study area tract can accommodate hyperscale data center development.

IV. CONCLUSION

The objective of this work has been to evaluate the development potential for hyperscale data center campuses in the study area tracts identified in the exhibit maps. This evaluation shows that it is feasible to accommodate hyperscale data center campus development at each study area tract.

EXHIBIT 1

OR HWY 207

HERMISTON-HINKLE RD

US HIGHWAY 395

KELLI BLVD

FEEDVILLE RD

FEED CANAL

POTENTIAL WETLAND

S1

S2

S3

UMATILLA RIVER

LEGEND

- GS = GUARD SHACK AREA
- P = AUTO PARKING AREA
- EA = EMERGENCY ACCESS
- PA = PRIMARY ACCESS
- = BUILDINGS
- WQ = WATER QUALITY
- = YARD/SUPPORT AREAS
- = RESIDENTIAL BUFFER
- S = SUBSTATION
- = SLOPED AREAS (>5%)
- = FUTURE ACCESSORY BLDGS
- = EXISTING POWER/CELL AREA
- = FEED CANAL EASEMENT
- = FUTURE 150'/250' POWER CORRIDOR
- = EXISTING POWER EASEMENT
- = EXISTING RAILROAD

NOTES

1: TYPICAL BUILDING SIZE IS 200,000 SF - 250,000 SF EACH & 35' TALL

2: ALL ACCESS POINTS AND INTERIOR DRIVE AISLES ARE 30' IN WIDTH

3. AUTO PARKING IS LOCATED AT EACH BUILDING END (SHORT DIMENSION)

NOTE: PLANS ARE CONCEPTUAL AND SUBJECT TO CHANGE AS TRACTS DEVELOP

750 0 375 750 1500 3000

(IN FEET)
1 inch = 1500 ft.

CITY OF HERMISTON
UGB EXPANSION | HYPERSCALE DATA CENTERS CONCEPT PLAN

7/1/2025

EXPANSION AREA - OVERALL

EXHIBIT 2A

LEGEND

- GS = GUARD SHACK AREA
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- = BUILDINGS
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- = YARD/SUPPORT AREAS
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- S = SUBSTATION
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3. AUTO PARKING IS LOCATED AT EACH BUILDING END (SHORT DIMENSION)

TRACT DATA	
S1	
TRACT AREA	±240.43 AC (220 SUITABLE ACRES)
BUILDING AREA	± 1,200,000 SF
PARKING	±240 SPACES
S2	
TRACT AREA	±120.35 AC (111 SUITABLE ACRES)
BUILDING AREA	± 800,000 SF
PARKING	±160 SPACES

NOTE: PLANS ARE CONCEPTUAL AND SUBJECT TO CHANGE AS TRACTS DEVELOP

375 0 187.5 375 750 1500
(IN FEET)
1 inch = 750 ft.

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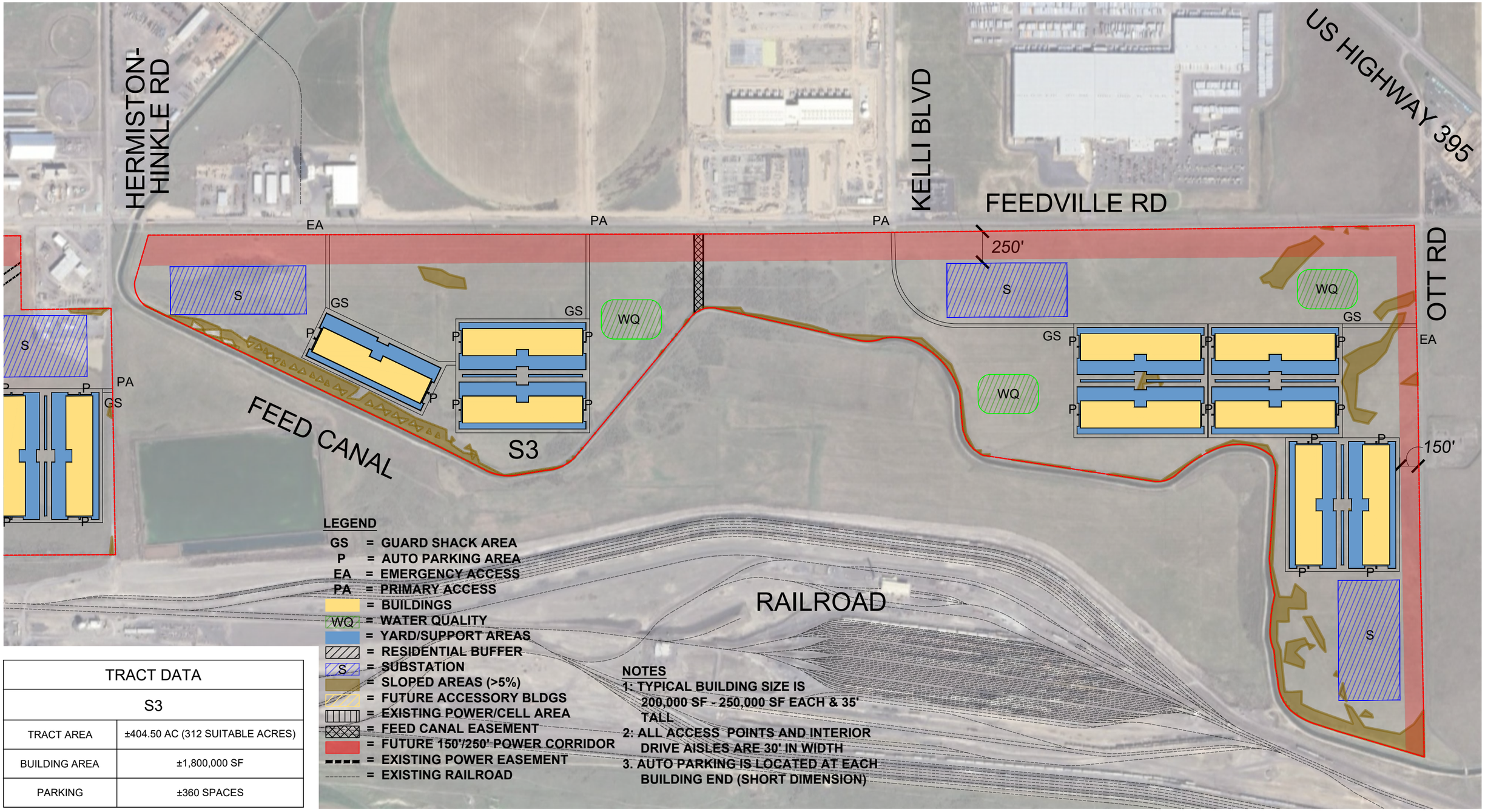
EXPANSION AREA - S1 & S2

 2230329.00

EXHIBIT 2B



LEGEND

- GS = GUARD SHACK AREA
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1: TYPICAL BUILDING SIZE IS 200,000 SF - 250,000 SF EACH & 35' TALL
2: ALL ACCESS POINTS AND INTERIOR DRIVE AISLES ARE 30' IN WIDTH
3. AUTO PARKING IS LOCATED AT EACH BUILDING END (SHORT DIMENSION)

TRACT DATA	
S3	
TRACT AREA	±404.50 AC (312 SUITABLE ACRES)
BUILDING AREA	±1,800,000 SF
PARKING	±360 SPACES

NOTE: PLANS ARE CONCEPTUAL AND SUBJECT TO CHANGE AS TRACTS DEVELOP

375 0 187.5 375 750 1500
(IN FEET)
1 inch = 750 ft.

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EXPANSION AREA - S3