DESCRIPTION OF GILROY DATA CENTER

SUBMITTED TO: CITY OF GILROY

SUBMITTED BY: **Amazon Data Services, Inc.**

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DAYZEN LLC

SECTION 1.0 PROJECT DESCRIPTION

1.1 OVERVIEW OF PROPOSED PROJECT

Amazon Data Services (ADS) proposes to build a data center campus that would support two data center buildings, two Battery Energy Storage Systems (BESS) and related improvements, hereinafter referred to as the Gilroy Data Center (GDC).

The primary goal of the GDC, as its name implies, to be a state-of-the-art data center that provides greater than 99.999 percent reliability (fine nines of reliability). The GDC has been designed to reliably meet the increased demand of digital economy, its customers and the continued growth. The GDC will house key cloud infrastructure that is integral to the economy.

The GDC's project objectives are as follows:

- Develop a state-of-the-art data center large enough to meet projected growth;
- Develop the Data Center on land that has been zoned for data center use;
- Develop a Data Center that can be constructed in phases which can be timed to match projected growth;
- To incorporate the most reliable and flexible form of backup electric generating technology considering the following evaluation criteria.
    - **Reliability**. The selected backup electric generation technology must be extremely reliable in the case of an emergency loss of electricity from the utility.
        - The backup generation must provide a higher reliability than 99.999 percent in order for the GDC to achieve an overall reliability of equal to or greater than 99.999 percent reliability.
        - The selected backup electric generation technology must have a proven built-in resilience so if any of the backup unit fails due to external or internal failure, the system will have redundancy to continue to operate without interruption.
    - **Commercial Availability and Feasibility**. The selected backup electric generation technology must currently be in use and proven as an accepted industry standard for technology sufficient to receive commercial guarantees in a form and amount acceptable to financing entities. It must be operational within a reasonable timeframe where permits and approvals are required.
    - **Technical Feasibility**. The selected backup electric generation technology must utilize systems that are compatible with one another.

1.1.1 Site Description

The GDC site is an undeveloped parcel generally located east of Arroyo Circle between the two segments of Camino Arroyo within the City of Gilroy (APN 841-69-039). The parcel is approximately 56 acres in size and up until recently was in active agricultural production but is now proposed for industrial development, consistent with the General Industrial zoning and General Plan designations on the site. The site is bounded by active agricultural lands to the east, active agricultural land and existing urban development to the south, existing urban development and Arroyo Circle to the west and existing urban development to the north. The majority of the surrounding development is zoned and designated as General Industrial with the exception of one parcel which is identified as Shopping Center Commercial. The subject parcel has access to the Camino Arroyo cul-de-sac to the north and Camino Arroyo/Arroyo Circle knuckle to the south. See Figure 1-1.

The site is near the Highway 101 corridor and immediately adjacent to industrial and commercial development. The topography is flat with views of western and eastern foothills from public viewpoints.

1.1.2 Gilroy Data Center Project Components and Phasing

The GDC will consist of the following components to be constructed in two phases:

- Two Data Center Buildings and one security building totaling approximately 438,500 square feet;
- Backup generating facilities to provide electricity to critical data center operations in the event of a loss of utility power;
- Two Battery Energy Storage Systems;
- A new Substation/Switchyard and a double circuit transmission upgrade;
- A new recycled water pipeline;
- Ancillary utility infrastructure for connection to existing stormwater and potable water pipelines;
- Security fencing;
- General Site Grading, Stormwater and Landscaping.

The GDC will be constructed in two phases. Phase I will include the first single-story data center building (Phase I Building) of approximately 218,000 square feet; the site security building; and onsite substation and switchyard; offsite transmission upgrades to the existing Pacific Gas & Electric (PG&E) transmission and distribution system; the Phase I 50 MW BESS facility; offsite extension of the recycled water pipeline; and other utility interconnections. The Phase I Building will include 25 2.5 MW diesel fired emergency generators and 1 600 kW house and life safety emergency generator capable of supporting the maximum demand of 49 MW required for full operation of the Phase I Building during times when PG&E is unable to deliver electricity. The site security building will include a separate 175 kW diesel-fired emergency generator.

Phase II of the Project is projected to be constructed within 4-7 years, based on customer demand, and will consist of the second single-story data center building; the second 50 MW BESS facility; and additional electrical equipment within the then existing substation. The Phase II Building is planned to use alternative backup generation technologies to avoid the use of diesel-fired generators. While such technologies are not yet capable of meeting the strict reliability needs of the Phase II Building, ADS understands that such technologies continue to advance and anticipates that one or more progresses to become commercially available and could meet the stringent reliability requirements by the time ADS completes its final design for the Phase II building. At this time, it appears that batteries and fuel cells have the best potential for achieving the needed reliability requirements and therefore, the project description includes descriptions of both of these technologies as potential options for Phase II.

The overall site plan for the entire development and for Phase I are shown on the civil drawings in Appendix A. Detailed descriptions of each the GDC components are provided in Section 1.2.

1.2 DETAILED DESCRIPTION OF PROJECT COMPONENTS

1.2.1 Data Center Buildings

The subject project proposes to construct two data center buildings and an on-campus security building totaling approximately 438,500 square feet. Phase 1 will include a single-story data center building of approximately 218,000 square feet, including approximately 10,000 square feet of administrative office employee amenity space and one of the two BESS facilities. Additionally as part of the construction of Phase I the approximately 2,500 square feet security building will be erected. Phase I is intended to be in operation by 2023. Phase 2, if constructed, is anticipated to be constructed within 4 to 7 years of Phase 1 based on customer demand. Phase II building will be a similar single-story data center building of approximately 218,000 square feet, including approximately 10,000 square feet of administrative office employee amenity space, and approximately 15,000 square feet of warehouse space. The second BESS is anticipated to be constructed during Phase II.

The structures would have building pad elevations raised at or above the 0.2% annual chance flood elevation, otherwise known as the 500-year floodplain elevation.

The proposed data center buildings will house computer servers for private clients in a secure and controlled structure. Phase I Building will be designed to demand a total of approximately 49 megawatts (MW) of electricity. The structures will be architecturally treated to fit the surrounding context of the site. Mechanical equipment for buildings cooling will be housed inside the building along with exhaust baffles for exiting hot air. Electrical and backup battery equipment rooms will be housed inside the building. There will be 2 water storage tanks approximately 36 feet high, with storage capacities of 60,000 gallons each, to store water for evaporative cooling.

The remainder of the site will be developed with a combination of parking, drive aisles, security guard shacks, stormwater treatment facilities, fencing and landscaping. Drive aisles will be located around the perimeter of the structures providing for looped circulation which will take access from the Camino Arroyo cul-de-sac at the north end of the project site. An emergency vehicle access route will be provided to the Camino Arroyo/Arroyo Circle knuckle to the south. The entire perimeter of the site will be enclosed with an 8-foot-high security fence and access restricted to site employees and permitted visitors. A 100-foot agricultural buffer zone and 50-foot agricultural transition area will be provided along a portion of the southern boundary and the eastern boundary which abuts active agricultural lands. Stormwater treatment facilities will be located within this 150-foot buffer.

1.2.1.1 Building Heights and Setbacks

The data center buildings would be approximately 35 feet at the roof's high point with parapets extending to a height of 45 feet at the high point. The parapet walls extend to the height ten feet above the roof level to conceal the rooftop exhaust fans, other related mechanical and electrical equipment, and the roof access stair. The Phase 1 Building will be built on the western portion of the site and will be set back approximately 100 feet from the northern property line at an adjacent lot on the western half of the lot, approximately 618 feet from the southern property line, and varying depths between 184 feet and 412 feet from the western property line with the adjacent development. The Phase II Building will be located in the eastern portion of the site and will be set back approximately 590 feet from the northern property line abutting an adjacent lot on the eastern side of the lot, approximately 618 feet from the southern property line, and approximately 215 feet from the eastern property line adjacent to agricultural land.

1.2.1.2 Site Access and Parking

Primary access to the site would be provided by two new proposed driveways, each approximately 35 feet in width, at the Camino Arroyo cul-de-sac on the northern side of the site. A third driveway entrance for emergency access would be constructed at Arroyo Circle on the southern portion of the site and would be approximately 35 feet in width. The project would provide approximately 115 parking spaces at full buildout. Parking is spaced throughout the project site with a heavy concentration of parking along the north and south sides of the Data Center buildings. The project would provide adequate Electric Vehicle, Clean Air and Vanpool parking spaces per Cal Green requirements.

The City of Gilroy public works department has requested that the project install permanent traffic calming measures adjacent to the southern project entrance on Arroyo Circle. ADS has proposed a mountable curb median and microsurface treatment (asphalt topcoat) as shown Appendix A.

1.2.1.3 Building Cooling System

Data Hall Cooling

The data center cools the significant heat load of the IT equipment utilizing a flooded room design served by data hall air handling units (DAHU). These units are installed in dedicated mechanical galleries on opposite sides of the data hall and will draw in outside air through sidewall louvers. These units are capable of supplying 100% outdoor air to the data hall and, when necessary, cool the outside air through the use of evaporative cooling with recycled water. This cooling air passes through the servers and is then exhausted from the data hall using rooftop up-blast exhaust fans (EFs).

Electrical Room Cooling

The data center utilizes multiple ductless split system DX heat pumps in the electrical rooms. The heat gain in these rooms is minimal, as there are no large transformers in the electrical rooms. This design requires five heat pumps in typical electrical rooms, and three units in catcher rooms.

Office Cooling

The data center office area utilizes a variable refrigerant volume (VRV) system with a dedicated outside air system (DOAS). The VRV system is broken up into three separate systems, each with multiple circuits. The ventilation requirements for the space are met with a ducted DOAS system.

1.2.1.4 Energy Efficiency

The data center industry utilizes a factor called as the Power Utilization Efficiency Factor (PUE) to estimate the efficiency of its data centers. The PUE is calculated by dividing the total demand of the data center by the Critical IT load. A lower PUE signifies a more energy efficient design than a higher PUE. The average PUE for the GDC at full buildout of both buildings would be 1.18. This is significantly lower than the data center industry average PUE of approximately 1.6.

1.2.2 Backup Generating Facilities

The design objective of the GDC backup electrical system is to provide sufficient equipment and redundancy to ensure that the servers housed in the GDC buildings will never be without electricity to support critical loads. The critical loads include the load to support the building operation in addition to the electricity consumed by the servers themselves. The largest of these non-server serving building loads is to provide cooling for the server rooms.

1.2.2.1 Phase I Building

ADS has conducted a thorough analysis to evaluate the potential use of a broad range of generation technologies as alternatives to diesel-fired emergency generators. The full analysis is presented in Section 2. The conclusion of the analysis is that no other generation technology can meet the stringent reliability needs of a data center at this time. Therefore, the Phase I Building is proposing the use of diesel-fired emergency generators as described in Section 1.2.2.1.

The emergency backup generators will be located on the north side in a generation yard immediately adjacent to the Phase I Building. Phase I Building will be supported by 25 (23 primary and two redundant) emergency generators and one house and life safety generator. The security building which will be constructed as part of the Phase I construction will also be supported by an emergency generator.

Each of the 25 lineup generators will be a Tier-2 emergency diesel-fired generator equipped with a Rypos HDPF/C diesel particulate filter (DPF) and a Miratech AT-IV abatement package which combines the DPF, SCR, and diesel oxidizing catalyst (DOC). The generators will be 3,634 bhp, Caterpillar Model D3516C. The critical backup generators will be Tier 4F-compliant, consistent with Bay Area Air Quality Management District requirements. The maximum peak generating capacity of each model is 2.5 MW with a steady state continuous generating capacity of 1.75 MW.

The house and life safety generator will be a 900 bhp, Caterpillar Model C-18, Tier-2 emergency diesel-fired generator equipped with a Rypos HDPF/C DPF. The maximum peak generating capacity of this model is 600kW with a continuous generating capacity of 420kW.

The security building generator will be a 280 bhp, Caterpillar model C7.1, Tier-3 emergency diesel-fired generator. The maximum peak generating capacity of this model is 175 kW.

The Site Plan in Appendix A shows the general arrangement of the emergency generators. Specification sheets for each manufacturer and evidence of the steady state continuous ratings are provided in Appendix B.

The generators will use ultra-low sulfur diesel. The generators will each be equipped with a flapper-type rain cap which is a hinged cap that opens to release exhaust vertically into the atmosphere when the generator is operating.

Each individual generator will be provided with its own package system. Within that package, the prime mover and alternator will be made ready for the call for immediate power. Each lineup generator is provided with a belly fuel tank with a storage capacity of 5,000 gallons. The house and life safety emergency generator will have a belly fuel

tank with a storage capacity of 1,000 gallons. The security building emergency generator will have a belly fuel tank with a storage capacity of 1,000 gallons.

ADS will manage the loading, storage and use of diesel fuel in accordance with all state and federal regulations and more fully described in Section 1.5.

The backup generators will be run for short periods for testing and maintenance purposes and otherwise will not operate unless there is a disturbance or interruption of the utility supply. BAAQMD's Authority to Construct and the California Air Resources Board's Airborne Toxic Control Measures (ATCM) limits each engine to no more than 50 hours annually for reliability purposes (i.e., testing and maintenance). However, it is ADS's experience that maintenance and testing of each engine rarely exceeds 12 hours annually. In addition, ADS proposes to limit operation to one engine at a time for routine testing activities, which will be conducted in accordance with manufacturer's recommendations.

1.2.2.2 Phase II Potential Backup Generation Technologies

Notwithstanding that an alternative generation technologies will not be feasible in time for the construction and operation of the Phase I Building, ADS understands that such technologies continue to advance and anticipates that one or more will progress to become commercially available and meet the stringent reliability requirements by the time ADS completes its final design for the second building. At this time, it appears that batteries and/or fuel cells have the best potential for achieving the needed reliability requirements in the future. Therefore, since ADS plans to utilize batteries and/or fuel cells for the Phase II Building if the anticipated technology progression is realized, ADS provides the following descriptions of the technology for purposes of enabling a thorough analysis of potential impacts associated with their use.

Batteries for Potential Backup Use

ADS anticipates that battery technology advancement could increase the ability to store more electricity thereby providing longer durations of electricity discharge support. Should this advancement be realized, additional BESS facilities may be able to contribute to backup power for the Phase II Building. For purposes of environmental analysis, ADS proposes the City analyze a potential BESS facility of approximately 82,000 sf to be located on the south side of the Phase II Building with facilities similar to those described in Section 1.2.3, except that there is a potential for the batteries to be stacked. The height of the facility is expected to be less than the height of the Phase II Building.

Fuel Cells for Potential Backup Use

There are two types of fuel cells. One that uses a dedicated natural gas pipeline and one that does not. As described in Section 2 neither type can meet the strict reliability requirements necessary for the Phase I Building.

However, the type of fuel cell that does not require a natural gas pipeline may hold the most promise for providing quick response emergency backup generation in the future. For purposes of environmental analysis, ADS proposes the City analyze a fuel cell facility of approximately 82,000 sf to be located at the same place used for the potential future BESS backup facility.

1.2.3 Battery Energy Storage Systems

The GDC is planned to include two future BESS facilities at two locations within the current site boundary; one within the eastern portion of the site and one within the area identified for the on-site substation. Both locations are shown on the Site Plans In Appendix A, which also includes a more detailed layout and elevation of the BESS facility to constructed as part of Phase I.

Each BESS will have a capacity of up to 50 MW with up to 670 MWh discharge capacity. It consists of 12 ESS blocks. Each ESS block consists of a cluster of bi-directional inverters with a bank of Li-ion batteries coupled with a 5MVA transformer. Lithium-Ion BESS are a fully pre-packaged solution which house battery packs, required cooling system, auxiliary power distribution system and DC power aggregation and protection system. There are multiple layers of battery management system (BMS) built into the BESS to ensure safe operating conditions and eliminate single point of failure.

The BESS will charge from the PG&E and/or California Independent System Operator (CAISO) grid. Operations shall be controlled via a centrally located Energy Management System (EMS) which shall connect with the ADS operations center and will be programmed to receive dispatch directives in the case of an energy curtailment. The EMS system monitors critical BESS ratings such as state of charge (SOC), BESS State of Health, BESS temperatures, BESS alternating current (AC) and direct current (DC) voltages, currents, cumulative grid charging percentage (as applicable), and other key performance metrics. All would be available via a supervisory control and data acquisition system (SCADA).

ADS is committed to using best-in-class technology for the BESS although the specific battery has not yet been identified. The table below provides the technology currently assumed in the design.

BESS Technology Equipment	
Batteries	CATL liquid cooled BESS or equivalent manufacturer • LFP chemistry • Or equivalent technology (e.g., NMC, etc.) • Duration: – BESS: 13 hours @ 50 MW • Peak Charge Rate: 50 MW • Peak Discharge Rate: 50 MW • Maximum SOC: 100% • Minimum SOC: 3% • # of Cycles: Up to 365 cycles per year – 1 Cycle = Discharge of BESS MWh capacity – For a 50-MW_{ac} (13-hour) BESS, 1 Cycle = 650 MWh – A cycle can be made up of many partial cycles, and energy can be utilized in any combination of power and duration without restriction on the number of starts and stops of the BESS • Roundtrip Efficiency: 85% BESS capacity shall be restored by periodic augmentation to ensure AC capacity is available.
Battery Structure	Batteries shall be housed either in purpose-built battery containers or in an outdoor enclosure with appropriate environmental controls. Battery housing space will contain an industrial-rated cooling system for batteries, fire detection and suppression system, AC and DC power distribution, and other required electrical safety and protection systems.
BESS Inverter	Central or distributed bi-directional battery storage inverters with LV/MV step-up transformer: • Central Inverter Model #: SMA SCS-3600 (or equivalent) • Distributed Inverter Model: Tesla or equivalent 75kW • Peak Efficiency: ~ 98.7% • Operation: Bi-directional, 4-quadrant capable • Response Time: <1 second • SMA transformers are manufactured in US. • Or equivalent technology

A fire detection system is also integrated in the design and manufacture of each block to monitor operational environment for smoke and fire components and safely shut down the BESS In emergency situations. The fire detection system identifies any components lagging in performance so suspect parts can be addressed via the preventative maintenance program. The fire safety system will meet all federal and state standards and the BESS facilities will comply with NFPA 855, IEEE 1547, and UL (9540, 9540A, 1741SA, 1973). Material Safety Data Sheets are provided in Appendix C.

1.2.4 Substation/Switchyard and Transmission Line Upgrades

1.2.4.1 Interim Power Supply

The data center may begin operating prior to completion of the proposed electrical substation. To provide electricity to the data center during this interim period, the project has requested an interim service from PG&E capable of supporting 15 MW of electrical load. The 21kV feeders will be supplied from the PG&E's existing Llagas Substation located approximately 1.5 miles to the southwest of the site and travel through underground conduit to the site. Where possible the feeders will reuse existing utility substructures (e.g. vaults, pull boxes, and conduit).

Once on the GDC property, the feeder would continue underground to the Medium Voltage switchgear and transformers located in the northern portion of the site. The primary environmental impact will be boring to facilitate the underground feeder and digging to set vaults for utility MV equipment, pulling cables, and splicing cables together.

1.2.4.2 PG&E Permanent Service Options

As part of the Phase I construction, ADS would construct a new substation capable of supplying electricity to the full buildout of the site. The substation will encompass approximately 4 acres on the western boundary of the site. The substation switch yard will ultimately be owned and operated by PG&E. ADS will own and operate the transformer yard, both of which will be within the area of the plans marked "substation". The substation components will include cabling, transformers, and circuit breakers. The substation will be fenced per PG&E standard which would likely be concrete block wall.

Interconnection of the new substation to the distribution grid would require PG&E to install approximately 1,000 linear feet of new overhead double circuit 115kV transmission line. The final design of the transmission line has not yet been completed. At this time, PG&E is considering installing both circuits on the same 3 new transmission poles or installing each circuit on its own set of transmission poles. If the final design selected includes each circuit on its own set of transmission poles, there will be up to 6 new transmission poles required. In either case, the incoming transmission power lines will originate from PG&E's existing 115kV Morgan Hill-Llagas line located near the site at pole 019/121 and will enter the site along a pre-negotiated easement with the adjacent property owner. See Figure 1-2, which shows the route for both options.

1.2.5 Recycled Water Pipeline

ADS has been working with the City of Gilroy and the Santa Clara Valley Water District (Valley Water), on the use of recycle water for cooling and landscaping purposes at the site. At this time the City does not provide recycled water to the site and the construction of this pipeline will provide a significant expansion to Gilroy's recycled water network. The nearest recycled water main trunk line is located near the

intersection of Camino Arroyo and Venture Way, approximately 1.5 miles south of the project site. ADS has proposed to extend the recycled water main trunk line north along Camino Arroyo to the intersection of Arroyo Circle and Camino Arroyo to be used at the site. Final routing will be determined by the City of Gilroy and Valley Water in accordance with their Recycled Water Master Plan. However, Figure 1-3 shows the most likely route for the pipeline.

1.2.6 Ancillary Utility Infrastructure

The GDC will include underground pipelines to connect to existing City infrastructure.

1.2.6.1 Water Interconnection

The existing 12-inch ductile iron water main in Camino Arroyo will be extended approximately 135 linear feet. The proposed 12-inch domestic water for the project will tee off the public water main extension. The proposed 12-inch domestic water lateral will service the Phase 1 data center building, Phase 1 security building and Phase 2 data center building.

1.2.6.2 Fire Water Interconnection

ADS proposes two separate fire systems for the GDC. A proposed 10-inch fire water line will tee off the proposed 12-inch public water main extension in Camino Arroyo. The 10-inch fire line will serve as the fire sprinkler lateral for the Phase 1 data center building, Phase 1 security building and Phase 2 data center building. The second fire system is a 12-inch fire hydrant loop. One end of the 12-inch fire hydrant loop will tee off the proposed 12-inch public water main extension in Camino Arroyo and the other end will tee off the existing 12-inch ductile iron water main in Arroyo Circle.

1.2.6.3 Sewer Interconnection

The Phase 1 security building will have a 4-inch lateral to tie into the existing sanitary sewer manhole in Camino Arroyo. The Phase 1 and Phase 2 data center buildings propose a 12-inch lateral to tie into the existing sanitary sewer manhole in Arroyo Circle.

1.2.6.4 Stormwater Interconnection

ADS proposes a 36-inch lateral to tie into the existing 60-inch storm drain main that runs in an easement through the site.

1.2.7 Security Fencing

The entire site will be secured with security fencing as part of the Phase I construction as shown on the Site Plan in Appendix A. Security fencing will be 8 foot high and constructed of tubular steel.

1.2.8 Flood Protection and Stormwater

The existing site is located within the 100-year FEMA flood plain and will require fill to raise the site above base flood elevation. Fill for both Phase I and Phase II buildings would be brought to the site as part of Phase I construction. Roughly 210,000 cubic yards of fill would be imported to the site to raise the base elevation by approximately four feet (1.5 feet above the base flood elevation). Please see Appendix D for a technical analysis evaluating flood potential.

Under Provision C.3 of the Municipal Regional Stormwater NPDES Permit (MRP), new and redevelopment projects that create or replace 10,000 square feet or more of impervious surface area are required to implement site design, source control, and Low Impact Development (LID)-based stormwater treatment controls to treat post-construction stormwater runoff. LID-based treatment controls are intended to maintain or restore the site's natural hydrologic functions, maximizing opportunities for infiltration and evapotranspiration, and using stormwater as a resource (e.g. rainwater harvesting for non-potable uses). Examples of C.3 LID measures include bioretention areas, flow-through planters, and subsurface infiltration systems.

There are no stormwater treatment facilities at the site in the existing condition. Existing rainwater runoff infiltrates into the ground or is sheet-slowed toward the southern property line.

The project proposes to construct one stormwater treatment (bioretention) area totaling approximately 201,000 sf. The bioretention area would be located along the eastern and southern property boundaries. The site would be graded to direct stormwater into the bioretention treatment area via multiple storm drain inlet and pipe networks throughout the project site. The treatment area would include perforated underdrains and overflow structures that would ultimately discharge into the public storm drain line in Arroyo Circle near the southern property boundary.

The proposed stormwater drainage plan is shown in Appendix A.

1.2.9 Landscaping

There are 18 trees present at the project site (including adjacent properties): five (5) private non-protected trees on-site, six (6) street trees adjacent to this property, one (1) street tree adjacent to a neighboring property, and six (6) trees overhanging from adjacent properties. The project proposes to remove all 18 existing trees: nine (9) existing trees, five (5) street trees and four (4) on-site trees. Trees are to be replaced per the City's tree replacement ratios. An Arborist Report is included in Appendix E.

Proposed landscaping will consist of trees and shrubs at the perimeter of the site, for screening, drought-tolerant shrubs, and groundcovers at main entries and adjacent to interior drive aisles and parking stalls. Large open spaces on-site, will be seeded with a non-irrigated mix that is tailored to the site conditions. A low-flow, efficient, potable-

water irrigation system will be designed for all landscape areas planted with container plants. The landscaping plans are shown in Appendix A.

1.3 CONSTRUCTION

1.3.1 Site Grading and Excavation

For Phase I, construction activities would last approximately 11 months. Phase II construction is estimated to be completed in approximately 10 months. Phase I is intended to be in operation by 2023. Phase 2, if constructed, is anticipated to be constructed within 4 to 7 years of Phase 1, depending on customer demand.

Mass grading of the site will include removal of initial vegetation, scarification of existing soils and placing roughly 210,000 cubic yards of engineered and compacted fill material to raise the site for flood control purposes as described in Section 1.2.8.

Excavation for utilities would extend to depths of up to 15 feet below the new base elevation. The site would be graded to direct stormwater flows towards biotreatment areas located along the northern and southern boundaries of the site.

ADS estimates the average construction workforce is estimated to be 75 personnel with a peak estimated to be 110 personnel for each phase. Since the GDC will be constructed in phases, laydown areas are anticipated to be on-site.

1.4 SITE WATER SUPPLY AND USE

1.4.1 Site Grading and Construction

Grading and construction of the GCD is estimated to utilize a total of 1.8-acre feet of water over the 21-month construction period for Phase I and Phase II.

1.4.2 GDC Operation

The GDC will require water for cooling when outside air temperatures exceed 83F. The data center will be designed to use recycled water provided by the City of Gilroy, once available, and a potable water connection will be provided as a back-up source to the recycled water supply. In the interim period, potable will be used for cooling for a portion of Phase 1, and when the recycled water pipeline is completed (expected in June of 2023), the GDC will use recycled water as its primary cooling water supply. Prior to construction of the recycled water pipeline, anticipated in 2023, the data center will limit potable water demand to not more than a total of 6.5 AFY: 1.5 AFY for cooling; 3 AFY for landscaping; and 2 AFY for domestic purposes. Once recycled water is available, cooling using recycled water will increase from 1.5 AFY to approximately 18 AFY and landscape will remain at 3 AFY but will now use recycled water. Domestic and sanitary demand using potable water will also remain at 2 AFY for both buildings.

Once the recycled water pipeline is constructed and in operation in 2023, the GDC would reduce its use of potable water from 6.5 AFY to approximately 2 AFY for the lifetime of the project.

1.5 DIESEL FUEL MANAGEMENT

ADS will prepare a Spill Prevention, Control and Countermeasure Plan (SPCC) to address the storage, use and delivery of diesel fuel for the generators.

Each generator unit and its integrated fuel tanks have been designed with doublewalls. The interstitial space between the walls of each tanks is continuously monitored electronically for the existence of liquids. This monitoring system is electronically linked to an audible and visual alarm system that alerts personnel if a leak is detected. Additionally, the standby generator units and integrated tank are housed within a self-sheltering enclosure that prevents the intrusion of storm water.

Diesel fuel will be delivered on an as-needed basis in a compartmentalized tanker truck. The tanker truck parks at the gated entrances to the generator yard for re-fueling.

There are no loading/unloading racks or containment for re-fueling events; however, a spill catch basin is located at each fill port for the generators. To prevent a release from entering the storm drain system, drains will be blocked off by the truck driver and/or facility staff during fueling events. Rubber pads or similar devices will be kept in the generation yard to allow quick blockage of the storm sewer drains during fueling events.

To further minimize the potential for diesel fuel to come into contact with stormwater, to the extent feasible, fueling operations will be scheduled at times when storm events are improbable.

Warning signs and/or wheel chocks will be used in the loading and/or unloading areas to prevent vehicles from departing before complete disconnection of flexible or fixed transfer lines. An emergency pump shut-off will be utilized if a pump hose breaks while fueling the tanks. Tanker truck loading and unloading procedures will be available at the offices.

1.6 GDC OPERATIONS

The proposed GDC operations will have three employee shifts which will be scheduled to begin and end during off-peak hours. After construction of the Phase I Building ADS anticipates up to 25 operational employees. Once the Phase II Building is completed, ADS anticipates the operational employment may grow to 50 full time employees.

In addition to employees, based on the types of project necessary to maintain the facility, there could be up to a maximum of 74 contractors on site occasionally to complete special projects.

1.7 MITIGATION INCORPORATED INTO THE PROJECT DESIGN

ADS has proposed the following Project Design Measures to ensure potential significant impacts are mitigated to acceptable levels.

1.7.1 Agriculture and Forestry Resources

PD AG-1: Consistent with the City of Gilroy's Agricultural Mitigation Policy, the project shall implement the following measures:

1) The project shall preserve farmland through one of the two options below. The options shall include all costs to cover program administration, monitoring and management of established easements as outlined in Section 1.02 (E) of the Agricultural Mitigation Policy:

    a) Option 1: Purchase an equal amount of land (1:1 ratio) of agricultural land within the "Preferred Preservation Areas" (as defined in the Agricultural Mitigation Policy) and the transfer of the ownership of this land to the Silicon Valley Land Conservancy or other City-approved agency.

    b) Option 2: Purchase of development rights to a 1:1 ratio on agricultural land within the "Preferred Preservation Areas" and the transfer of ownership of these rights to the Silicon Valley Land Conservancy or other City-approved agency.

2) At the time of any initial land use application approval, the applicant shall enter into a deferred payment or dedication agreement establishing the specific criteria and timing for implementing any required mitigation. This deferred agreement shall be recorded with the County Recorder's Office against the proposed project property. All required mitigation must be completed prior to final map approval, or if no map is required, no later than issuance of the first building permit.

3) Lands deemed acceptable for preservation are:

    a) Those lands designated as "Prime" or of "Statewide Importance" by the State Department of Conservation in the Preferred Areas; and

    b) Has an adequate water supply to support the historic agricultural use on the land. The water supply for the land shall be protected in the farmland conservation easement, the farmland deed restriction or other document evidencing the agricultural mitigation.

4) Programs with those City-approved agencies handling conservation easements in the "Preferred Preservation Areas" shall include the financial responsibility by the developers for program administration, outreach to landowners, monitoring, and management of established easements. An additional nominal fee to cover these items, the amount of which shall be established by the Silicon Valley Land

Conservancy or other City-approved agency in concert with the City, shall be required in addition to the mitigation options outlined above.

5) The project shall include Right to Farm deed restrictions as follows:

   a) All lands located within one thousand (1,000) feet of any agricultural lands deemed for preservation, as shown on the City's Farmland Preservation Area map, shall be subject to the placement of a "right to farm" deed restriction that conforms with both Santa Clara County restrictions as well as the State of California real estate transfer disclosure requirements as a condition of approval for any discretionary permit.

   b) The deed restriction shall include the following wording: "You are hereby notified that the property you are purchasing is located within 1,000 feet of agricultural land, agricultural operations or agricultural processing facilities. You may be subject to inconvenience or discomfort from lawful agricultural operations. Discomfort and inconvenience may include, but are not limited to, noise, odors, fumes, dust, smoke, burning, vibrations, insects, rodents, and/or the operation of machinery (including aircraft) during any 24-hour period. One or more of the inconveniences described may occur as a result of agricultural operations, which are in compliance with existing laws and regulations and accepted customs and standards. If you live near an agricultural area, you should be prepared to accept such inconveniences or discomfort as a normal and necessary aspect of living in an area with a strong rural character and an active agricultural sector. Lawful ground rig or aerial application of pesticides, herbicides and fertilizers occur in farming operations. Should you be concerned about spraying, you may contact the Santa Clara County Agricultural Commission."

   c) The Right to Farm Deed Restriction shall be included in all subsequent deeds and leases for this property and shall conform with both Santa Clara County restrictions as well as the State of California real estate transfer disclosure as defined by this policy.

6) The project shall include agricultural buffers as follows:

   a) To minimize future potential conflicts between agricultural and non-agricultural land uses, all new developments adjacent to designated agricultural, agricultural preserve, agricultural open space, greenbelt/agricultural buffer areas shall be required to provide an agricultural buffer/agricultural transition area.

   b) The agricultural buffer/agricultural transition area shall be a minimum of one hundred fifty (150) feet measured from the edge of the agricultural, agricultural preserve, greenbelt area. No public access shall be allowed in this transition area due to the potential for complaints about and exposure to the dust and spraying associated with agricultural activities.

c) This agricultural buffer/agricultural transition area shall be comprised of two components:

i) A one hundred (100) foot minimum wide agricultural buffer zone located adjacent to the agricultural lands or greenbelt area. The following uses in the one hundred (100) foot or greater agricultural buffer area shall be limited to:
   (a) Native plants, trees or hedge rows
   (b) Drainage channels, storm retention ponds, natural areas such as creeks or drainage swales
   (c) Railroad tracks or other utility corridors

ii) A fifty (50) foot agricultural transition area located between the one hundred (100) foot minimum agricultural buffer area and any new development. The following uses are allowed in the fifty (50) foot agricultural transition area:
   (a) Native plants, trees or hedge rows
   (b) Drainage channels, storm retention ponds natural areas such as creeks or drainage swales
   (c) Bike paths, benches, lighting, trash enclosures and fencing
   (d) Other non-residential uses determined by the Planning Commission to be consistent with the use of the property as an agricultural buffer; such as natural trails, bike paths, wildlife habitats, wildlife sanctuaries, or community service facilities like detention basins.

The agricultural buffer/transition area shall be constructed by the developer of any land adjacent to agricultural uses, subject to approved plans by the Community Development Department. This area shall be maintained by the developer according to standards approved by the City until the area is dedicated to and accepted by the City or other City approved agency at which time they shall be responsible for maintenance.

1.7.2 Air Quality

PD AIR-1: The project will implement the following measures during construction.

Basic Measures:

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
- All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads shall be limited to 15 miles per hour (mph).

- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
- Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. BAAQMD's phone number shall also be visible to ensure compliance with applicable regulations.

Exhaust Control Measures:

The following measures shall be implemented such that the off-road equipment to be used in the construction project (i.e., owned, leased, and subcontractor vehicles) shall meet the emissions values as summarized in Table 4.3-6 (in Section 4.3 Air Quality). Acceptable methods for reducing emissions include the use of late model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, add-on devices such as particulate filters, and/or other options as such become available.

- The following construction equipment used at the site during Phase I and Phase II construction shall be electric:
    - Pressure washer
    - Welder
- The following construction equipment used at the site during Phase I and Phase II shall meet U.S. EPA emission standards for Tier 3 engines and include particulate matter emissions control equivalent to CARB Level 2 verifiable diesel emission control devices that altogether achieve a 85 percent reduction in particulate matter exhaust:
    - Air compressors
    - Concrete/individual saws
    - Forklifts
    - Generator sets
    - Other construction equipment, such as concrete vibrators
    - Pavers
    - Pumps
    - Rollers

    - Sweepers/scrubbers
    - Tractors/loaders/backhoes
- The following construction equipment used at the site during Phase I shall meet U.S. EPA Tier 4 final emission standards according to one of the following options:
    - Option 1: Cranes, graders, rubber-tired dozers, tractors/loaders/backhoes
    - Option 2: Cranes, graders, rubber-tired dozers, bore/drill rigs
    - Option 3: Cranes, graders, rubber-tired dozers, excavators
- The following construction equipment used at the site during Phase II shall meet U.S. EPA Tier 4 final emissions standards:
    - Cranes
    - Scrapers

PD AIR-2: The project shall limit generator maintenance and testing such that generator maintenance and testing operation does not occur during the same hour as the Phase II building exterior construction equipment.

PD AIR-3: The project shall not conduct maintenance and testing for the listed engines during the following hours and loads to comply with the 1-hour NO_2 NAAQS:

- GEN49 – No routine maintenance and testing at 100% load from 6:00 PM – 7:00 PM.
- GEN50 – No routine maintenance and testing at 100% load from 5:00 PM – 6:00 PM.
- SEC1 (Security Generator) – No routine maintenance and testing from 5:00 PM – 7:00 AM. Although the NO_x emissions exceed BAAQMD CEQA thresholds of significance, the concentration of NO_x resulting from the project would not exceed the CAAQS or NAAQS with implementation of Project Design Measures PD AIR-1.1 and PD AIR-1.2. The ambient air quality dispersion model resulted in PM_{10} exceeding the CAAQS, however this was due to background concentration data rather than pollutant concentrations resulting from the project. Furthermore, although PM_{10} exceeded the CAAQS due to high background pollutant concentrations, project emissions of PM_{10} were below applicable SILs. Therefore, the project would not conflict with or have any adverse impact on implementation of the 2017 Bay Area Clean Air Plan nor would the project disrupt, or hinder implantation of any plan control measures with mitigation incorporated.

1.7.3 Biological Resources

PD BIO-1: The project would incorporate the following measures to reduce impacts to nesting birds.

- If removal of the trees on-site would take place between January and September, a pre-construction survey for nesting raptors will be conducted by a qualified ornithologist to identify active nesting raptor nests that may be disturbed during project implementation. Between January and April (inclusive) pre-construction surveys will be conducted no more than 14 days prior to the initiation of construction activities or tree relocation or removal. Between May and August (inclusive), pre-construction surveys will be conducted no more than thirty (30) days prior to the initiation of these activities. The surveying ornithologist shall inspect all trees in and immediately adjacent to the construction area to be disturbed by these activities, and the ornithologist shall, in consultation with the State of California, Department of Fish and Wildlife (CDFW), designate a construction-free buffer zone (typically 250 feet) around the nest until the end of the nesting activity.

- The applicant shall submit a report indicating the result of the survey and any designated buffer zones to the satisfaction of the Director of Community Development prior to the issuance of a tree removal permit by the City Arborist.

PD BIO-2: The project is subject to applicable Habitat Plan conditions and fees (including the nitrogen deposition fee) prior to issuance of any grading permits. The project applicant shall submit the Santa Clara Valley Habitat Plan Coverage Screening Form and Application for Private Projects to City of Gilroy Planning Division for approval and shall pay all applicable fees prior to the issuance of a grading permit. Applicable conditions shall be implemented in accordance with Habitat Plan requirements.

1.7.4 Cultural Resources

PD CUL-1: The following project-specific measures would be implemented during construction to avoid significant impacts to unknown subsurface cultural resources:

- A Secretary of the Interior-qualified archaeologist and a Native American cultural resources monitor shall be on site to monitor grading of native soil. The project applicant shall submit the name and qualifications of the selected archaeologist and Native American Monitor to the Director of Community Development prior to the issuance of a grading permit. Preference in selecting Native American monitors shall be given to Native Americans with:

    - Traditional ties to the area being monitored.
    - Knowledge of local historic and prehistoric Native American village sites.
    - Knowledge and understanding of Health and Safety Code, Section 7050.5 and Public Resources Code, Section 5097.9 et seq.

- Ability to effectively communicate the requirements of Health and Safety Code, Section 7050.5 and Public Resources Code, Section 5097.9 et seq.
- Ability to work with law enforcement officials and the Native American Heritage Commission to ensure the return of all associated grave goods taken from a Native American grave during excavation.
- Ability to travel to project sites within traditional tribal territory.
- Knowledge and understanding of Title 14, California Code of Regulations, Section 15064.5.
- Ability to advocate for the preservation in place of Native American cultural features through knowledge and understanding CEQA mitigation provisions.
- Ability to read a topographical map and be able to locate site and reburial locations for future inclusions in the Native American Heritage Commission's Sacred Lands Inventory.
- Knowledge and understanding of archaeological practices, including the phases of archaeological investigation.

Prior to grading, the archaeologist shall conduct a pedestrian survey over the exposed soils to determine if any surface archaeological manifestations are present.

- A qualified archaeologist shall complete mechanical presence/absence testing for archaeological deposits and cultural materials. In the event any prehistoric site indicators are discovered, additional backhoe testing will be conducted to map the aerial extent and depth below the surface of the deposits. In the event prehistoric or historic archaeological deposits are found during presence/absence testing, the significance of the find will be determined. If deemed significant, a Treatment Plan will be prepared and provided to the Director of Community Development. The key elements of a Treatment Plan shall include the following:

  - Identify scope of work and range of subsurface effects (include location map and development plan),

  - Describe the environmental setting (past and present) and the historic/prehistoric background of the parcel (potential range of what might be found),

  - Develop research questions and goals to be addressed by the investigation (what is significant vs. what is redundant information),

  - Detail field strategy used to record, recover, or avoid the finds (photogs, drawings, written records, provenience data maps, soil profiles, excavation techniques, standard archaeological methods) and address research goals.

  - Analytical methods (radiocarbon dating, obsidian studies, bone studies, historic artifacts studies [list categories and methods], packaging methods for artifacts, etc.).

- Report structure, including a technical and layman's report and an outline of document contents in one year of completion of development (provide a draft for review before a final report),

- Disposition of the artifacts,

- Appendices: site records, update site records, correspondence, consultation with Native Americans, etc.]

The archaeologist will monitor full-time all grading and ground disturbing activities in native soils associated with construction of the proposed project. If the archaeologist and Native American monitor believe that a reduction in monitoring activities is prudent, then a letter report detailing the rationale for making such a reduction and summarizing the monitoring results shall be provided to the Director of Community Development. Department of Recreation 523 forms shall be submitted along with the report for any cultural resources encountered over 50 years old.

In the event that prehistoric or historic resources are encountered during on-site construction activities, all activity within a 50-foot radius of the find shall be stopped, the Director of Community Development shall be notified, and a Secretary of the Interior-qualified archaeologist shall examine the find and record the site, including field notes, measurements, and photography for a Department of Parks and Recreation 523 Primary Record form. The archaeologist shall make a recommendation regarding eligibility for the California Register of Historical Resources, data recovery, curation, or other appropriate mitigation. Ground disturbance within the 50-foot radius can resume once these steps are taken and the Director of Community Development has concurred with the recommendations. Within 30 days of the completion of construction or cultural resources monitoring, whichever comes first, a report of findings documenting any cultural resource finds, recommendations, data recovery efforts, and other pertinent information gleaned during cultural resources monitoring shall then be submitted to the Director of Community Development. Once finalized, this report shall be submitted to the Northwest Information Center at Sonoma State University.

Prior to and for the duration of ground disturbance, the project owner shall provide Worker Environmental Awareness Program training to all existing and any new employees. This training should include: a discussion of applicable laws and penalties under the laws; samples or visual aids of artifacts that could be encountered in the project vicinity, including what those artifacts may look like partially buried, or wholly buried and freshly exposed; and instructions to halt work in the vicinity of any potential cultural resources discovery, and notify the city-approved archaeologist and Native American cultural resources monitor.

PD CUL-2: The project proposes to implement the following measure to ensure the project's impacts to human remains are less than significant:

- In the event that human remains are discovered during presence/absence testing or excavation and/or grading of the site, all activity within a 50-foot radius of the find will be stopped. The Santa Clara County Coroner will be notified and shall make a determination as to whether the remains are of Native American origin or whether an investigation into the cause of death is required. If the remains are determined to be Native American, the Coroner will notify the Native American Heritage Commission (NAHC) immediately. Once NAHC identifies the most likely descendants, the descendants will make recommendations regarding proper burial, which will be implemented in accordance with Section 15064.5(e) of the CEQA Guidelines. All actions taken under this mitigation measure shall comply with Health and Human Safety Code § 7050.5(b).

1.7.5 Geology and Soils

PD GEO-1: In order to ensure the project design conforms to the requirements of a final geotechnical engineering investigation and California and local building standards and codes, the following is proposed as mitigation incorporated into the project. Incorporation will ensure seismic hazards are reduced to less than significant levels.

- To avoid or minimize potential damage from seismic shaking, the project would be built using standard engineering and seismic safety design techniques. Building redevelopment design and construction at the site shall be completed in conformance with the recommendations of a design-level geotechnical investigation, which will be included in a report to the City. The report shall be reviewed and approved by the City of Gilroy's Building & Safety Division as part of the building permit review and issuance process. The building shall meet the requirements of applicable Building and Fire Codes, including the 2016 California Building Code, as adopted or updated by the City. The project shall be designed to withstand potential geologic hazards identified on the site and the project shall be designed to reduce the risk to life or property to the extent feasible and in compliance with the Building Code.

PD GEO-2: The project proposes to implement the following measures as best management practices to ensure impacts to paleontological resources are less than significant.

- Prior to the start of any subsurface excavations that would extend beyond previously disturbed soils, all construction forepersons and field supervisors shall receive training by a qualified professional paleontologist, as defined by the Society of Vertebrate Paleontology, who is experienced in teaching non-specialists, to ensure they can recognize fossil materials and shall follow proper notification procedures in the event any are uncovered during construction. Procedures to be conveyed to workers include halting construction within 50 feet

of any potential fossil find and notifying a qualified paleontologist, who shall evaluate its significance.

- If a fossil is found and determined by the qualified paleontologist to be significant and avoidance is not feasible, the paleontologist shall develop and implement an excavation and salvage plan in accordance with Society of Vertebrate Paleontology standards. Construction work in these areas shall be halted or diverted to allow recovery of fossil remains in a timely manner. Fossil remains collected during the monitoring and salvage portion of the mitigation program shall be cleaned, repaired, sorted, and cataloged. Prepared fossils, along with copies of all pertinent field notes, photos, and maps, shall then be deposited in a scientific institution with paleontological collections. A final Paleontological Mitigation Plan Report shall be prepared that outlines the results of the mitigation program. The Director of Planning and Inspection shall be responsible for ensuring that the paleontologist's recommendations regarding treatment and reporting are implemented.

1.7.6 Greenhouse Gas Emissions

PD GHG-1 The project owner shall participate in the Silicon Valley Clean Energy (SVCE) at the Green Start level (i.e., 100% carbon-free electricity) for electricity accounts associated with the project or enter into an electricity contract with another electricity provider that can achieve the same goals of 100% carbon-free electricity as the SVCE.

1.7.7 Hazards and Hazardous Materials

PD HAZ-1: The project proposes to implement the following measures which would reduce potentially significant soil and or groundwater impacts to construction workers to a less than significant level.

- A Site Management Plan (SMP) would be prepared to establish management practices for handling impacted groundwater and/or soil material that may be encountered during site development and soil-disturbing activities. Components of the SMP would include:
    - a detailed discussion of the site background;
    - preparation of a Health and Safety Plan by an industrial hygienist;
    - protocols for conducting earthwork activities in areas where impacted soil and/or groundwater are present or suspected;
    - worker training requirements, health and safety measures and soil handing procedures shall be described;
    - protocols shall be prepared to characterize/profile soil suspected of being contaminated so that appropriate mitigation, disposal or reuse alternatives, if necessary, can be implemented;
    - notification procedures if previously undiscovered significantly impacted soil or groundwater is encountered during construction;

    - notification procedures if previously unidentified hazardous materials, hazardous waste, underground storage tanks are encountered during construction;
    - on-site soil reuse guidelines;
    - sampling and laboratory analyses of excess soil requiring disposal at an appropriate off-site waste disposal facility;
    - soil stockpiling protocols; and
    - protocols to manage groundwater that may be encountered during trenching and/or subsurface excavation activities.

- Prior to issuance of grading permits, a copy of the SMP must be approved by the Santa Clara County Environmental Health Department, and the City of Gilroy Planning Division.

- If contaminated soils are found in concentrations above risk-based thresholds pursuant to the terms of the SMP, remedial actions and/or mitigation measures would be taken to reduce concentrations of contaminants to levels deemed appropriate by the selected regulatory oversight agency for ongoing site uses. Any contaminated soils found in concentrations above thresholds to be determined in coordination with regulatory agencies shall be either (1) managed or treated in place, if deemed appropriate by the oversight agency or (2) removed and disposed of at an appropriate disposal facility according to California Hazardous Waste Regulations and applicable local, state, and federal laws.

PD HAZ-2 To ensure that the final design of the BESS facilities shall provide adequate fire protection engineering controls, maintenance procedures, and access, prior to obtaining building permits for any BESS facility, the project owner shall include the following in its design, building permit application, and final plans for review and approval by the City of Gilroy:

- The BESS shall comply with applicable federal, state and local building codes and standards in effect at the time of the submittal of the building permit application including, but not limited to:

    - NFPA 855
    - IEEE 1547; and
    - UL (9540, 9540A, 1741SA, 1973)

- A written description of the integrated fire and thermal runaway protection system for each BESS facility;

- Adequate emergency response equipment access through the security gates and internal roadways to each BESS facility; and

- Final location of fire hydrants within the facility near each BESS facility.

1.7.8 Hydrology and Water Quality

PD HYD-1: Prior to issuance of a grading permit, a Conditional Letter of Map Revision-Fill (CLOMR-F) study shall be completed and submitted to FEMA for review and approval. After completing site grading or construction in the floodplain, a final LOMR-F study shall be completed and submitted to FEMA for review and approval to reflect the as-built conditions on the Flood Insurance Rate Map (FIRM).

1.7.9 Noise

PD NOI-1: The project shall incorporate the following measures to reduce the noise impact associated with the use of pile drivers:

- A barrier shall be included for the duration of pile driving activities with the following specifications for Phase I construction, or alternatively utilize auger cast piles instead of driven piles.

    - Barrier 1: 330 feet in length, 10 feet tall
    - Barrier 2: 165 feet in length, 10 feet tall
    - Barriers shall be placed in the locations specified by Trinity Consultants in Figure 4.7 of Noise Analysis Report

- A barrier shall be included for the duration of pile driving activities with the following specifications for Phase II construction, or alternatively utilize auger cast piles instead of driven piles.

    - Barrier 3: 560 feet in length, 13 feet tall
    - Barrier 3 shall be placed in the location specified by Trinity Consultants in Figure 4.9 of Noise Analysis Report

1.8 OTHER AGENCY INVOLVMENT

1.8.1 Bay Area Air Quality Management District

The Bay Area Air Quality Management District (BAAQMD) has authority to issue permits to construct and operate facilities that emit certain quantities and types of air emissions. The diesel-fired emergency generators proposed as part of Phase I Building will each require a permit to construct and a permit to operate from the BAAQMD.

1.8.2 California Energy Commission No Jurisdiction

The California Energy Commission (CEC) does not have jurisdiction over the GDC. The CEC has jurisdiction over thermal power plants with generating capacities in excess of 50 MW. This excludes BESS, fuel cells, solar photovoltaic, wind and hydro

generating technologies. While diesel-fired emergency generators are a thermal power plant the CEC measures generating capacity of such backup power plants by the amount of electricity the building for which it serves, can demand. In the case of the GDC Phase I Building, the maximum electrical demand is 49 MW, which is less than the CEC threshold. Therefore, the CEC does not have jurisdiction over the GDC.

2.0 ALTERNATIVES CONSIDERED

This section discusses alternatives to the proposed GDC that ADS considered in its design process. These include a reduced development alternative, a reduced backup electric generation alternative, and backup electric generation technology alternatives. This discussion focuses on alternatives that could feasibly accomplish most of the basic objectives of the project.

2.1 OVERALL PROJECT OBJECTIVES

The primary goal of the GDC, as its name implies, to be a state-of-the-art data center that provides greater than 99.999 percent reliability (fine nines of reliability). The GDC has been designed to reliably meet the increased demand of digital economy, its customers and the continued growth. The GDC will house key cloud infrastructure that is integral to the economy.

The GDC's project objectives are as follows:

- Develop a state-of-the-art data center large enough to meet projected growth;
- Develop the Data Center on land that has been zoned for data center use;
- Develop a Data Center that can be constructed in phases which can be timed to match projected growth;
- To incorporate the most reliable and flexible form of backup electric generating technology considering the following evaluation criteria.
    - **Reliability**. The selected backup electric generation technology must be extremely reliable in the case of an emergency loss of electricity from the utility.
        - The backup generation must provide a higher reliability than 99.999 percent in order for the GDC to achieve an overall reliability of equal to or greater than 99.999 percent reliability.
        - The selected backup electric generation technology must have a proven built-in resilience so if any of the backup unit fails due to external or internal failure, the system will have redundancy to continue to operate without interruption.
    - **Commercial Availability and Feasibility**. The selected backup electric generation technology must currently be in use and proven as an accepted industry standard for technology sufficient to receive commercial guarantees in a form and amount acceptable to financing entities. It must be operational within a reasonable timeframe where permits and approvals are required.
    - **Technical Feasibility**. The selected backup electric generation technology must utilize systems that are compatible with one another.

2.2 REDUCED DEVELOPMENT ALTERNATIVE

The GDC site has been selected due to its close proximity to reliable electricity provided by PG&E. Rather than construct one large building on the 56-acre site, the GDC was designed in two phases, each including one building. Development of the full site is necessary to ensure the ever-increasing demand for data center use can be met over time. A reduced development alternative would not meet the total projected demand over time and therefore would not meet the overall project objectives.

2.3 BACKUP ELECTRIC GENERATION TECHNOLOGY ALTERNATIVES

As part of the development of the GDC, ADS considered alternatives to the backup generators as proposed. As discussed more fully below, ADS considered a smaller capacity system as well as alternative generating technologies. For completeness purposes, a discussion of the No Backup Electrical Generation Alternative is also included.

2.3.1 Reduced Electric Generation Backup System

ADS considered a backup generating system with fewer emergency generators. However, any generating capacity less than the total demand of the GDC at maximum occupancy, with redundancy, would not allow ADS to provide the critical and reliable electricity needed during an emergency power outage. It is important to note that in addition to electricity that would be directly consumed by the servers themselves, the next largest electrical demand of the data center building would be related to cooling the server rooms. For the servers to reliably function, they must be kept within temperature tolerance ranges. The industry standard is to design and operate a building that can meet those ranges even during a loss of utility electric power. Therefore, for ADS to provide the reliability, it is necessary to provide a backup generating system that could meet the maximum load during full occupancy on the hottest design day and include redundancy as described in Section 2.2.4.1. A reduced capacity system would not fulfill the basic objectives of the GDC.

2.3.2 Alternative Generating Technologies

ADS considered using potentially available alternative technologies: gas-fired turbines; flywheels; gas-fired reciprocating internal combustion engines, batteries; fuel cells; and alternative fuels. None of the technologies considered could meet the overall project

objectives because they were commercially or technically infeasible and/or would not meet the necessary standard of reliability during an emergency.

Flywheels

Flywheel energy storage systems use electric energy input which is stored in the form of kinetic energy. Kinetic energy can be described as "energy of motion," in this case the motion of a spinning mass, called a rotor. The rotor spins in a nearly frictionless enclosure. When short-term backup power is required because utility power fluctuates or is lost, the inertia allows the rotor to continue spinning and the resulting kinetic energy is converted to electricity.[1]

ADS has concluded that flywheel technology would not be a viable option for the following reasons:

- Flywheel technology does not perform within the required reliability levels of ADS and is prone to system failure.
- Flywheel technology requires an extensive amount of maintenance to keep each energy storage system functioning.
- Flywheel systems cannot provide sufficient time duration (e.g. 12-24 hours or more) as a backup generation as the fly wheel motion can typically only sustain 10-30sec outages at a time.

Gas-Fired Turbines

ADS considered using natural gas-fired turbines instead of diesel generators to supply backup power for the GDC. This technology option was rejected because it would not meet the project objectives. Natural gas turbines have the advantages of quick start, better emission of NOx and CO than diesel, and ability to connect to a natural gas infrastructure that is more reliable than the electrical grid by factor of 10. However, as the backup choice, it has the following main issues: 1) The gas infrastructure may have curtailment of the natural gas supplies in case of emergency due to natural disasters, impacting the data center operations. 2) onsite storage or delivery is impossible to support long duration of backup (such as 12-24 hours or longer time). 3) It is better suited for continuous operation instead of standby mode, which makes the maintenance challenging. 4) It needs minimum load (30%), so additional load banks are required on site, leading to the change of design in terms of reliability. 5) Typical turbine engines have larger system sizes (4MW-50MW), while the smaller ones such as micro-turbines of 2.5MW will use two times more physical footprint and cost two times more, and their commercial use is yet to be certified. 6) Local AHJs in California started to push back on natural gas due to clean air regulations on reducing fossil fuel. Therefore, natural gas turbines are not considered reliable, nor technically feasible enough to meet the industry

[1] Energy Storage Association. Accessed November 2019. Available at: http://energystorage.org/energy-storage/technologies/flywheels

standard or needs of the GDC. A fixed fuel source such as a natural gas pipeline introduces another potential point of failure or load curtailment. Taking into account the natural gas outages from maintenance and repair by the utility, interruption due to construction accidents within the system, long-term damage and interruption during an earthquake, or outages caused by problems within the greater distribution system are higher probability occurrences than being able to obtain diesel fuel for longer than 24-hour outages. Therefore was rejected as not being able to meet the Project Objectives.

Gas-Fired Reciprocating Engines

ADS considered using natural gas-fired reciprocating engines instead of diesel generators to supply backup power for the GDC. This technology option was rejected because it would not meet the project objectives. While natural gas engines could achieve start up times sufficient to work with the UPS systems design and there are 2.5MW/3.1MW engines available, this alternative suffers the same lack of reliability as natural gas turbine engines described above. Therefore, natural gas reciprocating engines are not considered technically feasible or reliable enough to meet the industry standard or needs of the GDC. As discussed above, storage of sufficient natural gas on site to maintain emergency electricity to the GDC during an outage would not be tenable given the volume of natural gas that would be required.

Battery Storage

ADS considered using batteries alone as a source of emergency backup power. The primary reason batteries alone were rejected by ADS was the limited duration of battery power. Batteries can provide power quickly, which is the reason ADS has incorporated them into the overall backup electrical system design. As described in Section 2.2.4.2, batteries would be initiated at the first sign of electricity interruption. However, the current state of battery technology does not allow for very long durations of discharge at building loads as high as planned for the GDC. Maximum discharging time is about 5 hours when doubled up from one ISO container to two, which needs more physical space. In addition, Lithium-ion batteries have more restrictive California fire code regulations. Renewable non-Lithium-ion battery such as ZnMnO2 is not commercially feasible for data centers yet. Once the standalone batteries are completely discharged, the only way they can be recharged without onsite generation is if the utility electrical system is back up and running. Since it is not possible to predict the duration of an electricity outage, batteries are not a viable option for emergency electrical power. Therefore, because battery storage cannot provide the duration that may be necessary during an emergency, this technology option was rejected as technically and commercially infeasible and unable to allow the GDC to meet or exceed 99.999 percent reliability.

The proposed diesel generators provide 24 hours of backup electricity without the need for refueling. In order to provide for the same 24-hour capacity, approximately _10_ ISO

containers representing approximately ten times the amount of real estate would be required. This will trigger a scrutinizing review of California fire regulations due to the massive concentration of Lithium Ion batteries, the cost is prohibitive and the site is not optimized to accommodate this additional real estate.

Fuel Cells – Backup Replacement

ADS is very familiar with fuel cell technology because it is employed at data center locations where ADS provides services. It can provide both primary and off grid power. One example of primary power is that Equinix has partnered with Bloom Energy over the last 5 years to deploy over 45 MW of fuel cell technology at various sites around the country using fuel cells as base load.

There are other sites from Bloom Energy that run on both primary and backup such as in Home Depot. The fuel cells of Bloom Energy are solid Oxide Fuel Cells (SOFC) that operate in high temperature of 750 Deg C, they need to stay hot to provide power. As a choice of backup, Bloom Energy fuel cells need to run continuously in dual modes, as a primary source, or a standby mode when the grid is off (islanding mode). The Bloom Energy fuel cells have additional ultra capacitors to cope with the 10-20 second load transfer time to match up with diesel gens.

As a choice of backup, it has the following issues: 1) It needs to run to provide base load to stay hot. Thus the design of the data center architecture has to change in power configuration. This is why large data centers (EQUINIX, Apple, Yahoo) prefer to use Bloom Energy as primary source and maintain their existing diesel gen fleet. 2) Its footprint is a lot smaller than solar or wind, but about factor three times than the diesel gens of 2.5MW. Its weight is about fifteen metric Tons/sq ft, making the stack on top of each ISO container challenging for implementation and maintenance. 3) It relies on the natural gas as feed stock, so the issues with natural gas infrastructure and onsite storage we discussed earlier will stay. Alternatively, Bloom Energy works with bio methane, but it is a technical challenge for our data centers to have steady supply, offsite or onsite.

While Liquified Natural Gas (LNG) can be used, the footprint required to store it onsite makes it impractical and commercially infeasible at the GDC Site. Diesel fuel storage for the minimum required back-up time usually presents very few space challenges as well avoids the potential environmental impacts associated with a failure of an LNG tank at the site.

A faster type of Fuel Cells is based different mechanism, called Proton Exchange Membrane (PEM). This type is mostly used for transport, can start cold quicker, like an internal combustion engine. Amazon is familiar with Hydrogen fuel cells from Plug Power, in many fulfillment centers. There are initiatives of apply Plug Power new product to 2.5 MW backup. The issues are 1) The footprint is about two times the size of diesel gens, since PEM fuel cell system comes with two ISO container, one has fuel cell units, and the other has DC/AC inverter and lithium-ion battery to ensure quick load transfer to 10 second. 2) Onsite storage of 12 hours of liquid hydrogen will take about 40x70 yard space

for a 18,000-gallon tank, which provides fuel for two of the 2.5MW systems. 3) Safety of liquid hydrogen (6000 PSI) to the data centers needs to be explored with AHJ. Amazon has experience of such a storage facility at its fulfillment centers but not in data centers. 4) CAPEX of the new fuel cell system is about 2.5X higher than diesel gens. This technology is forward looking, does not meet the production requirement of reliability, commercial availability, and technical feasibility in near-term.

It is important to note that there are many small hydrogen fuel cell systems in the telecommunication industry, providing backup power, but so far those found have been in the 10 to 100 kW range, not scalable for a 98 MW facility.

Fuel Cells – Primary Generation/Grid Backup

ADS has evaluated generating primary electricity with fuel cells on-site and relying on the electricity grid for backup electricity. There are two primary reasons that this solution cannot achieve the Project Objectives. The first is that PG&E has communicated that it would not reserve the amount of electricity necessary to power the data center in perpetuity as a backup source. In the event of the gas line breakdown due to natural or man-made disaster, diesel gens can only provide limited backup time, we will need electricity grid as a backup. This renders the concept to be a supplemental solution from fuel cells to the grid. One primary driver of using fuel cells in EQUINIX is renewable energy. Recently there are cities such as Santa Clara deems natural gas-based fuel cells no longer a renewable energy source. Second, diesel generators will have to stay as a second source of backup as a second source. Before hydrogen grid becomes available, fuel cells as a primary generation will not satisfy the commercial feasibility and reliability requirement of more than one power source.

As currently designed, the backup generators will provide a N+1 protection scheme for the GDC. In other words, the primary electricity will be provided by the extremely reliable PG&E electric system and if that system fails, the diesel-fired emergency generators would provide the electricity that the GDC requires. Utilizing fuel cells as the primary generation and relying on the grid as backup in the event or fuel cell failure would also provide a N+1 protection scheme. However, this alternative would provide lower reliability during an earthquake - the design natural disaster for California projects. During and earthquake, it is possible that the natural gas system cannot deliver the fuel to the fuel cells at the same time that the PG&E electrical system is experiencing an outage. In that case in order to provide the same reliability as the proposed design, emergency backup generators would be necessary (N+2) to provide electricity to the GDC during the design natural disaster case.

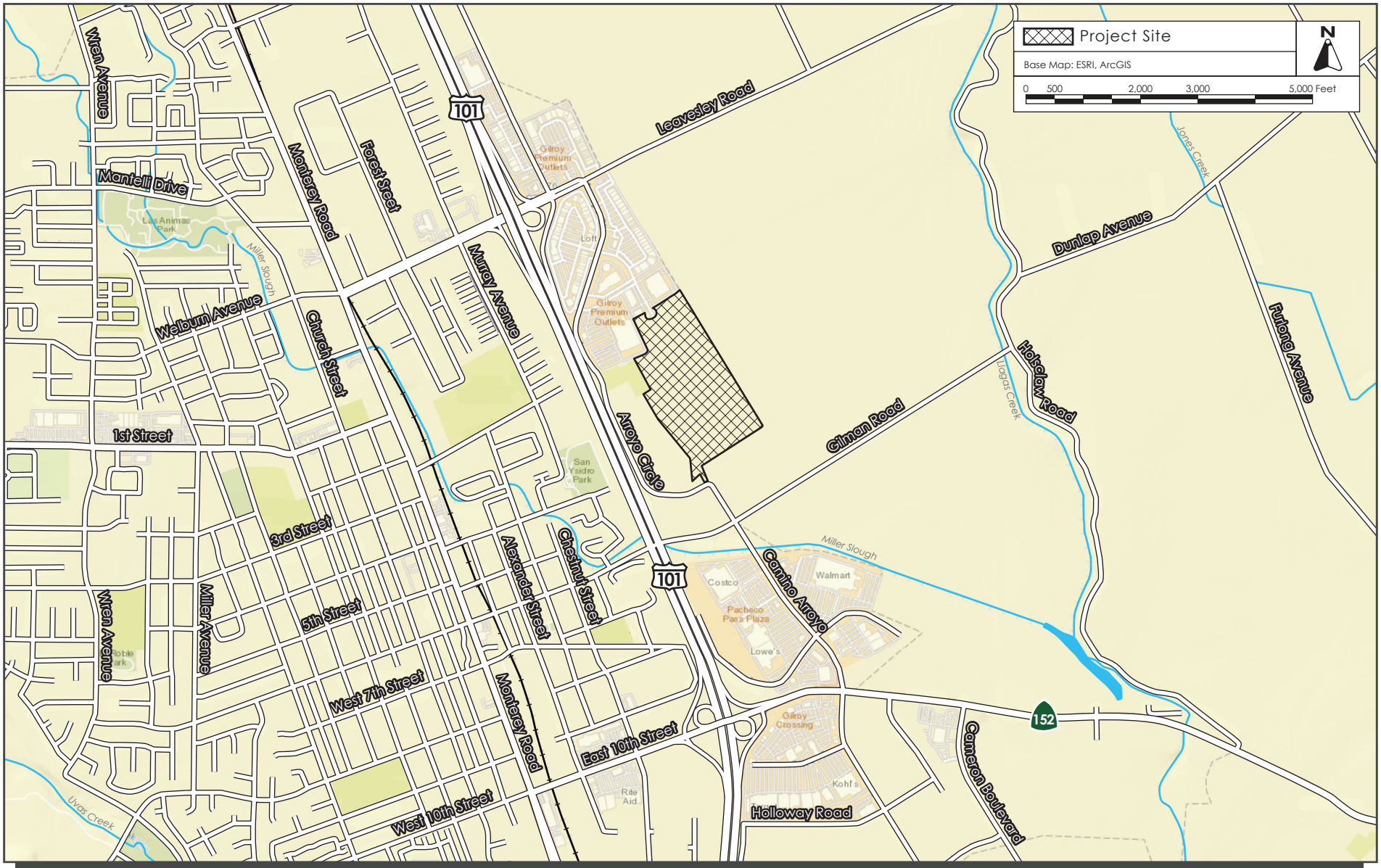
Alternative Fuels

ADS evaluated the use of biodiesel and renewable diesel (the new generation of biofuel such as Hydrotreated Vegetable Oil) as replacement for the CARB diesel proposed for use in the emergency backup generators

There are internal tests and certification processes for diesel gens of Caterpillar and Cummins to run biofuel (HVO) in the diesel gens. However, biofuel (HVO) test results are still preliminary and adoption in data centers has not started yet. In addition, emissions of HVO are similar to diesel, though HC, CO are renewable in biofuel. As the emission standards from biofuel combustion are yet to be well-established, emission guarantees would be necessary to ensure that the use of the renewable diesel would meet the needs of financing entities.

2.3.3 No Backup Electric Generation Alternative

The “No Backup Electric Generation” Alternative would leave the GDC exposed to electricity outages caused by any emergency including and earthquake. Therefore, the No Backup Electric Generation Alternative is rejected as commercially infeasible and not consistent with the primary reliability objectives of the project.



SITE VICINITY MAP

FIGURE 1-1

PG&E Transmission Upgrades **Figure 1-2**

Source: Ruggeri-Jensen-Azar, May 22, 2020.

POTENTIAL RECYCLED WATER MAIN | FIGURE 1-3