Appendix H:
Hydrology & Water Quality Technical Study

Hydrology & Water Quality Technical Study

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HC (Contra Costa)

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1.0 Introduction

At the request of HC (Contra Costa), TRC has prepared this report to address the hydrology and water quality sections required as a portion of the California Environmental Quality Act (CEQA; Public Resource Code Section 21000 et. seq.) environmental impact report (EIR) for the proposed renewable hydrogen production facility (Project) in Pittsburg, California. The purpose of this report is to describe the existing environment and assess the potential impacts to hydrology and water quality associated with the Project in accordance with CEQA requirements.

1.1 Project Location

The Project is located in a predominantly industrial area south of Suisun Bay in Pittsburg, California (Figure 1). Surrounding land use includes undeveloped industrial land to the east of the Project Area, developed industrial areas to the north and west, and developed commercial areas to the south. The Project Area is in Section 3, Township 2 North, Range 1 East, and elevations for the proposed Project Area range from 20 to 30 feet above mean sea level (MSL). Most of the Project Area is lightly to moderately developed, but currently unoccupied, with impervious surfaces present in the form of gravel roads, asphalt, and remnant concrete pads. Two abandoned water storage tanks are also present.

1.2 Project Description

The proposed project is to construct and operate a renewable hydrogen production facility to convert waste organic feedstock into carbon-negative renewable hydrogen. The process for generating renewable hydrogen includes accepting and screening waste organic feedstock for conversion; feeding the engineered municipal solid waste (EMSW) feedstock into the Omni Conversion Technologies (Omni CT) waste conversion unit and introducing steam, oxygen, and a limited amount of natural gas to produce synthetic gas (syngas); additional processing steps to prepare/clean syngas for hydrogen production; and syngas compression and a sour-gas-shift reaction to produce hydrogen-rich gas, which undergoes further purification and compression before distribution via tube-trailers. A byproduct of the renewable hydrogen process is the production of non-hazardous vitrified slag.

Under normal operations the facility will require up to 350 gallons per minute (gpm) for operations and produce two different wastewater streams: 1) process wastewater, and 2) cooling tower blowdown. Process wastewater will be treated on site and mixed with the blowdown stream to meet appropriate discharge limits before being sent to Delta Diablo Sanitation District's (DDSD) wastewater treatment plant (WWTP), adjacent to the Project Area, for disposal at a maximum discharge rate of 130 gpm. Most of the facility's water needs may be supplied from recycled or reclaimed water sources, which are currently being evaluated, or directly from the Contra Costa Water District (CCWD) or the City of Pittsburg.

2.0 Regulatory Framework

2.1 Federal Regulations and Policy

National Flood Insurance Program
The National Flood Insurance Program is managed by the Federal Emergency Management Agency (FEMA) and provides flood insurance to property owners, renters, and businesses. The Program works with communities required to adopt and enforce floodplain management regulations that help mitigate flooding effects.

Clean Water Act
The Clean Water Act (33 USC §1251 et seq.) regulates discharges of pollutants into the waters of the United States as well as quality standards for surface waters. Under the Clean Water Act, the United States Environmental Protection Agency (U.S. EPA) has implemented pollution control programs, such as setting wastewater standards for industry. U.S. EPA has also developed national water quality criteria recommendations for pollutants in surface waters. Section 303(d) of the Clean Water Act authorizes the U.S. EPA to assist states in listing impaired waters and developing Total Maximum Daily Loads (TMDLs) for these waterbodies. A TMDL establishes the maximum amount of a pollutant allowed in a waterbody and serves as the starting point or planning tool for restoring water quality. The San Francisco Bay Regional Water Quality Control Board (SFRWQCB) has classified the San Francisco Bay and many of its tributaries as impaired for various water quality constituents, as required by the Clean Water Act.

National Pollutant Discharge Elimination System
Created in 1972 by the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) stormwater program specifies minimum standards for the quality of discharged waters. It requires states to establish standards specific to waterbodies and designate the types of pollutants to be regulated, including total suspended solids and oil. Under NPDES, all point sources that discharge directly into waterways are required to obtain a permit regulating their discharge. NPDES permits fall under the jurisdiction of the State Water Resources Control Board (SWRCB) or Regional Water Quality Control Boards when the discharge occurs within the 3-nautical-mile territorial limit.

NPDES also requires permits for discharges from construction activities that disturb one or more acres, and discharges from smaller sites that are part of a larger common plan of development or sale. To obtain coverage under the Construction General Permit, a project-specific Stormwater Pollution Prevention Plan (SWPPP) must be prepared to minimize impacts from discharges.

2.2 California Regulations and Policy

California Sustainable Groundwater Management Act
Encompassing multiple state Senate and House bills, the Sustainable Groundwater Management Act (SGMA) was passed in 2014 and set forth a statewide framework to help protect groundwater resources over the long-term. SGMA requires local agencies to form groundwater sustainability agencies (GSAs) for the high and medium priority basins. GSAs are responsible for developing and implementing groundwater sustainability plans.

California Water Code

The Porter-Cologne Act (California Water Code, Division 7, §13000-16104) is the principal law governing water quality regulation in California. It establishes a comprehensive program to protect water quality and the beneficial uses of water. The Porter-Cologne Act applies to surface waters, wetlands, and groundwater and to both point and nonpoint sources of pollution. California Water Code section 13142.5 provides marine water quality policies stating that wastewater discharges shall be treated to protect present and future beneficial uses, and, where feasible, to restore past beneficial uses of the receiving waters. The highest priority is given to improving or eliminating discharges that adversely affect wetlands, estuaries, and other biologically sensitive sites; areas important for water contact sports; areas that produce shellfish for human consumption; and ocean areas subject to massive waste discharge.

California Water Code section 13170.2 directs the SWRCB to formulate and adopt a water quality control plan for the ocean waters of California. The SWRCB first adopted this plan, known as the California Ocean Plan, in 1972, and the most recent update of the California Ocean Plan was completed in 2019. The California Ocean Plan establishes water quality objectives for California's ocean waters, provides the basis for regulation of wastes discharged into coastal waters, and identifies applicable beneficial uses of marine waters and sets narrative and numerical water quality objectives to protect beneficial uses.

Bay Protection and Toxic Cleanup Program Legislation

In 1989, the SWRCB was required to develop sediment quality objectives (SQOs) as part of a comprehensive program to protect beneficial uses in enclosed bays and estuaries. These objectives are required for "toxic pollutants" and were identified in toxic hot spots or that were identified as pollutants of concern by the SWRCB. In 2009, the SWRCB adopted SQOs and an implementation policy for bays and estuaries in the State (Part 1). Part 1 includes narrative SQOs for the protection of aquatic life and human health, identification of the beneficial uses that these objectives are intended to protect, and requirements for program of implementation.

Antidegradation Policy (Resolution No. 68-16)

This policy requires the continued maintenance of existing high-quality waters. It provides conditions under which a change in water quality is allowable. A change must:

- Be consistent with maximum benefit to the people of the state;
- Not unreasonably affect present and anticipated beneficial uses of water; and
- Not result in water quality less than that prescribed in water quality control plans or policies.

Drinking Water Policy (Resolution No. 88-63)

This policy established that all surface and ground waters in the state are considered suitable, or potentially suitable, for municipal or domestic supply and should be designated for this use, with certain exceptions. The exceptions for groundwater are:

- The groundwater's total dissolved solids (TDS) exceed 3,000 milligrams per liter (mg/L) (5,000 microSiemens per centimeter (µS/cm), electrical conductivity), and it is not reasonably expected by the Water Boards to supply a public water system; or

- There is contamination, either by natural processes or by human activity (unrelated to the specific pollution incident), that cannot reasonably be treated for domestic use through implementation of best management practices (BMPs) or best economically achievable treatment practices; or
- The water source does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day; or
- The aquifer is regulated as a geothermal energy-producing source or has been exempted administratively pursuant to 40 Code of Federal Regulations (CFR), Section 146.4 for the purpose of underground injection of fluids associated with the production of hydrocarbon or geothermal energy, provided that these fluids do not constitute a hazardous waste under 40 CFR, Section 261.3.

Water Reclamation Policy (Resolution No. 77-1)
This resolution adopted in 1977 requires the State and Regional Water Boards to encourage water recycling projects for beneficial use using wastewaters that would otherwise be discharged to marine or brackish receiving waters or evaporation ponds. The resolution also specifies using recycled water to replace or supplement the use of fresh water or better water quality water, and to preserve, restore, or enhance in-stream beneficial uses, including fish, wildlife, recreation, and esthetics associated with any surface water or wetlands.

Bay and Estuaries Policy (Resolution 74-43 and 95-84)
The “Water Quality Control Policy for the Enclosed Bays and Estuaries of California” (Bays and Estuaries Policy), adopted in 1974 and amended in 1995, provides water quality principles and guidelines for the prevention of water quality degradation and the protection of beneficial uses of waters.

Thermal Plan (1975)
The “Water Quality Control Plan for the Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California” (known as the Thermal Plan), adopted in 1972 and amended in 1975, specifies water quality objectives, effluent quality limits, and discharge prohibitions related to elevated temperature waste discharges to interstate waters, enclosed bays, and estuaries.

Powerplant Cooling Policy (Resolution No, 75-58)
The “Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Powerplant Cooling” (Powerplant Cooling Policy), adopted in 1975, specifies the State Water Board’s position on powerplant cooling, specifying that fresh inland waters should be used for cooling only when other alternatives are environmentally undesirable or economically unsound.

2.3 Local Regulations and Policy

San Francisco Bay Basin Water Quality Control Plan 2019
The Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan; SFRWQCB Board, 2019) is the Board's master water quality control planning document. It designates beneficial uses and water quality objectives (WQOs) for waters of the State, including surface waters and groundwater. It also includes programs of implementation to achieve WQOs. The Porter-Cologne Water Quality Act requires the development and periodic review of Basin Plans

that designate beneficial uses of California's major rivers and groundwater basins and establish numerical WQOs for those waters. The 2019 version of the Basin Plan incorporating all amendments approved by the Office of Administrative Law was approved as of November 5, 2019.

Municipal Regional Stormwater NPDES Permit
In May 2022, the SFRWQCB issued the Municipal Regional Stormwater NPDES Permit (Order No. R2-2022-0018; NPDES Permit No. CAS612008) to regulate stormwater discharges from municipalities and local agencies in Alameda, Contra Costa, San Mateo and Santa Clara counties, and the cities of Fairfield, Suisun City and Vallejo.

San Francisco Bay Plan
The San Francisco Bay Plan (Bay Plan) was prepared by the San Francisco Bay Conservation and Development Commission (BCDC 2019). The two objectives of the Bay Plan are to protect the Bay as a great natural resource for the benefit of present and future generations, as well as to develop the Bay and its shoreline to their highest potential with a minimum of Bay filling. Findings and policies related to these objectives are outlined and discussed in the most recent update of the Bay Plan.

3.0 Study Area and Methods

TRC performed a desktop analysis of publicly available resources to describe and assess the existing hydrological resources for the Project Area (Figure 2). Key resources included aerial imagery provided by Google Earth; the 2019 San Francisco Bay Basin Plan; SWRCB's GeoTracker website, and the 2018 Integrated Report for Clean Water Act Sections 305(b) and 303(d).

4.0 Existing Hydrological Resources

The Project Area is located just north of the Pittsburg-Antioch Highway, approximately two miles east of downtown Pittsburg, California and approximately 0.62 miles south of the New York Slough. The subsections below describe the existing surface water bodies and groundwater subbasins of the Project Area and the surrounding region, as well as the water quality of the existing resources in and around the Project Area.

4.1 Surface Water

The Project Area lies within the Kirker Creek watershed, which covers approximately 33 square miles in eastern Contra Costa County. The watershed is part of the larger San Francisco Bay watershed and drains the northern foothills of Mt. Diablo and portions of the City of Pittsburg and the City of Antioch. The watershed includes suburban development, range land in the foothills of Mt. Diablo, and highly urbanized and industrial areas in the coastal wetland areas (SFRWQCB, 2008). The surface water resources of the Kirker Creek watershed include both perennial and intermittent streams, many of which are channelized or engineered, that drain into Suisun Bay via Kirker Creek and the New York Slough.

San Francisco Bay

The San Francisco Bay encompasses approximately 1,600 square miles, and its estuary system is the terminus for approximately 40 percent of California watersheds, including the Sacramento and San Joaquin Rivers of the Central Valley. Some freshwater flows through the Delta and into the Bay, but much is diverted from the Bay for agricultural, residential, and industrial purposes, as well as delivery to other cities in southern California as part of state and federal water projects (ABAG 2017). Interactions between Delta outflow and Pacific Ocean tides determine how far saltwater intrudes into the Delta. Therefore, the salinity of the water can vary widely depending on the volume of freshwater runoff, which depends on factors such as precipitation, reservoir releases and upstream diversions (ABAG 2017).

The San Francisco Bay is in a highly industrialized area and has a history of human impacts from both regulated point sources and nonpoint-source runoff, which can carry pollutants, including heavy metals, motor oil, paints, chemicals, debris, grease and/or detergents to local waters. The SFRWQCB has classified the San Francisco Bay and many of its tributaries as impaired for various water quality constituents, as required under Section 303(d) of the Clean Water Act. The San Francisco Bay is identified as impaired for multiple contaminants, including mercury, polychlorinated biphenyls (PCBs), selenium, various pesticides, and other pollutants (SWRCB, 2021).

Suisun Bay

Suisun Bay is a complex estuary of the greater San Francisco Bay and is located approximately 0.62 miles north of the Project Area. Fresh water from the Sacramento, San Joaquin, and Napa rivers discharge to Suisun Bay before flowing out to the Pacific Ocean through the central portion of the San Francisco Bay. The water quality of Suisun Bay is affected by nutrient loading, sedimentation, and contamination, including pesticides, metals, and polycyclic aromatic hydrocarbons (PAHs) from urban, industrial, and agricultural runoff. Suisun Bay has been identified in the 2018 California Integrated Report as an impaired water body for several pollutants under Section 303(d) of the Clean Water Act, including furans, PCBs, and dioxins (SWRCB, 2021).

Existing beneficial uses identified for Suisun Bay in the San Francisco Bay Basin Plan include Industrial Service Supply[1], Industrial Process Supply[2], Commercial and Sport Fishing, Estuarine Habitat, Fish Migration, Preservation of Rare and Endangered Species, Fish Spawning, Wildlife Habitat, Contact and Non-Contact Recreation, and Navigation. The existing beneficial uses identified for New York Slough include Commercial and Sport Fishing, Estuarine Habitat, Fish Migration, Preservation of Rare and Endangered Species, Contact and Non-Contact Recreation, and Navigation (SFRWQCB, 2019).

[1] Uses of water for industrial activities that do not depend primarily on water quality, e.g., cooling water, fire protection,
etc.

[2] Uses of water for industrial activities that depend primarily on water quality.

Kirker Creek

Kirker Creek, which historically flowed immediately east of the proposed Project Area into Dowest Slough, has been channelized and diverted to the east along the Pittsburg-Antioch Highway on the south side of the Project Area. The historic Kirker Creek channel still exists on the east side of the Project Area and drains into the southern reaches of Dowest Slough. Based on site photographs taken for the wetland delineation study, the historic Kirker Creek channel is typically dry but likely flows intermittingly during precipitation events (TRC, 2022).

Kirker Creek has been identified in the 2018 California Integrated Report as an impaired water body for several pollutants under Section 303(d) of the Clean Water Act, including toxicity and pyrethroids. These pollutants are likely a result of urban, industrial, and agricultural runoff (SWRCB, 2021). Existing beneficial uses for Kirker Creek include Preservation of Rare and Endangered Species, Warm Water Habitat, Wildlife Habitat, and Contact and Non-Contact Recreation (SFRWQCB, 2019).

4.2 Groundwater

The Project Area is underlain by the Pittsburg Plain Groundwater Subbasin (Basin), within the greater San Francisco Bay Basin. The Pittsburg Plain Subbasin is bounded by Suisun Bay on the north, the Tracy basin on the east, and the Clayton bason on the west. The southern boundary extends inland from the Suisun Bay one to three miles (DWR, 2003). The existing and potential beneficial uses for the Basin include Municipal and Domestic Water Supply, Industrial Process Water Supply, Industrial Service Water Supply, and Agricultural Water Supply (SFRWQCB, 2003).

The aquifer system of the Pittsburg Plain Subbasin is formed by a transitional depositional environment between the Coast Range and Great Valley physiographic provinces. Sediments are derived from alluvial outwash from the Coast Range hills south of the Project Area and from the fluvial influence of the Sacramento-San Joaquin River system, which joins Suisun Bay north of the Project Area. This transitional setting is reflected in the interbedded, fine- and coarse-grained sediments of the Pittsburg Plain. Groundwater recharge is derived primarily from streambed percolation and the New York Slough, and the direction of the groundwater gradient is generally north towards New York Slough.

Based on the Department of Toxic Substances Control's (DTSC) Statement of Basis for the neighboring USS-POSCO Industries (UPI) site located approximately 0.8 miles northwest of the Project Area, two primary groundwater-bearing units have been identified (DTSC, 2015a): an upper groundwater-bearing zone (upper aquifer, shallow and intermediate zones); and a deeper groundwater-bearing zone (main sand and gravel aquifer). Groundwater monitoring activities conducted in July of 2022 at the neighboring KNA California, Inc. facility, immediately west of the Project Area, indicate that groundwater is first encountered at an approximate elevation between 1 and 12 feet above mean sea level (MSL; AEC, 2022).

4.3 Water Supply

The City of Pittsburg (the City) provides potable water to residential, commercial, industrial, and institutional customers within the City limits. Its service area is approximately 15.6 square miles. The City relies on surface water provided by CCWD and groundwater from two groundwater

wells. CCWD maintains intakes in the Delta as a source of its surface water supply; however, the quality of freshwater in the Delta is dependent on the operation of existing Central Valley Project/State Water Project storage reservoirs, which are impacted by changes in snowpack and upstream river conditions. Sea level rise also has the potential to render CCWD's existing Delta intake unusable due to saltwater intrusion. Groundwater and surface water from CCWD are blended at the City's water treatment plant and treated before being delivered to customers (City of Pittsburg, 2021). In 2020, the City delivered approximately 9,232 acre-feet (AF) per year of potable water, which was a 5.2 percent (%) increase from 2015 (City of Pittsburg, 2021).

Delta Diablo Sanitation District operates a recycled water system that provides treated wastewater for irrigation and other non-potable uses. The system provides up to 8,600 AF per year of tertiary treated recycled water to two power plants and 20 acres of parks and landscaped areas. Treatment includes modern primary and secondary treatment of wastewater and tertiary flocculation, filtration, and disinfection to remove bacteria and viruses. The SWRCB oversees production, conveyance, quality control, and proper use of recycled water (DDSD, 2023b). A summary of DDSD's recycled water quality is provided in Table 1.

4.4 Climate and Precipitation

The Project Area is in Pittsburg, California, which has a Mediterranean climate characterized by mild, wet winters and hot, dry summers. The average annual rainfall for Pittsburg is 13.2 inches, most of which falls between November and April. The average summer temperatures range from highs in the upper 90s Fahrenheit (F) to lows in the mid 50s F. Winter temperatures range from the 60s F to the low 30s F (City of Pittsburg, 2021). Overnight lows rarely drop below freezing (32 F) due to the modulating effect of the Suisun Bay and the Delta.

In the San Francisco Bay Area, sea level rise due to climate change is expected to result in higher tides and more frequent flooding, particularly during storm events. According to a report by the San Francisco Estuary Institute, sea level rise could cause flooding and erosion in many areas of Suisan Bay and exacerbate existing environmental problems in the bay, such as habitat loss, erosion, and water quality issues, particularly saltwater intrusion. In Suisun Bay, sea level rise is projected to be particularly significant due to its shallow depth and the surrounding low-lying topography.

5.0 Discussion

This section includes a discussion of the Project's potential impacts to hydrology and water quality as presented in the CEQA Checklist.

a) Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?

The Project Area is west of the historic channel of Kirker Creek, which likely flows intermittingly during precipitation events and discharges to the New York Slough via Dowest Slough. Both Kirker Creek and Suisun Bay are considered Section 303(d) impaired waterbodies, but have existing beneficial uses including Wildlife Habitat, Preservation of Rare and Endangered Species, and Contact and Non-Contact Recreations.

The Project has the potential to impact surface water quality during construction and during operation. Construction activities may result in increased erosion and sedimentation, which can negatively impact surface water quality by increasing turbidity and reducing water clarity. This would be addressed by implementing effective erosion and sediment control measures, such as silt fences, sediment basins, and vegetative buffers. Wastewater from the proposed project would be treated to meet appropriate discharge limits, then sent to DDSD wastewater treatment facility for disposal. Interconnection for wastewater sewer to the DDSD system would mitigate potential impacts from wastewater discharges.

Accidental spills or leaks of hazardous materials during construction or operation could impact surface water quality. Although construction and operation of the proposed project involves the handling of hazardous materials, like natural gas, chemical additives, machine oils, and lubricants, release risk in significant quantities is limited. This risk would be minimized through proper handling and storage of materials, and by having a Spill Prevention, Control and Countermeasure Plan (SPCC) in place. The handling and storage of EMSW as feedstock, and biochar as a byproduct, has the potential to impact surface water quality, if managed poorly. However, proper management of these materials and implementation of BMPs would mitigate potential impacts to surface water quality.

b) Would the project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

In accordance with the project description in Section 1.2, under normal operations the proposed project could require up to 350 gpm for operations that would be supplied from recycled or reclaimed water sources, or directly from the CCWD or the City of Pittsburg. The Project does not include the installation of any groundwater extraction wells for water supply purposes.

The proposed use of recycled or reclaimed water for project operations would not increase the burden on either surface water supplies and groundwater supplies within the Bay-Delta system and the Pittsburg Plain aquifer system, respectively. DDSD currently operates a recycled water system that provides up to 8,600 AF per year, or approximately 5,332 gpm, of treated wastewater for irrigation and other non-potable uses (DDSD, 2023b); an additional 350 gpm equates to about a 6.5% increase in water supply. If recycled or reclaimed water is unavailable, it is unclear whether the City of Pittsburg has capacity to provide 350 gpm for operations. In 2020, the City provided 9,232 AF per year, or approximately 5,720 gpm, of potable water to its customers, an additional 350 gpm equates to about 6% increase in potable water supply. Some potable water would need to be provided by the City of Pittsburg for domestic use, but the amount would be negligible and is not expected to impact potable water supplies in the area. Further analysis of operation water supplies is ongoing to ensure minimal impacts to groundwater supplies.

The Project would alter surface conditions in the Project Area, which are currently comprised of vacant land, gravel access roads, asphalt, two existing water storage tanks, and miscellaneous abandoned concrete pads. New structures, paved parking areas and access roads would lead to less permeable surface conditions that may affect groundwater recharge. However, as previously noted, groundwater recharge in this area is primarily derived from streambed

percolation and the New York Slough. Therefore, the proposed projects is not anticipated to have a significant effect on overall groundwater levels in the Pittsburg Plain subbasin.

c) Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would:

i. Result in substantial erosion or siltation on- or offsite?

Kirker Creek was diverted south of the Project Area where it now flows east along the Pittsburg-Antioch Highway before turning north and discharging to the New York Slough. The historic Kirker Creek channel, which likely runs intermittingly, is located just east of the Project Area and discharges to the New York Slough via Dowest Slough.

Based on the Project boundaries shown on Figure 2, the proposed primary access road runs west from Arcy Lane parallel to the diversion channel for Kirker Creek and crosses the historic stream bed of Kirker Creek south of the Project Area. An appropriately sized culvert would be installed under the primary access road to maintain flow. Based on these preliminary plans, the Project could slightly alter the existing drainage pattern of the site, but it is not anticipated that its construction or operation of the proposed project would result in substantial erosion of siltation on- or offsite.

ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite?

The low-lying land around the historic Kirker Creek channel is a flood plain and considered a Special Flood Hazard Area according to FEMA Flood Insurance Rate Map for Contra Costa County (Appendix A). The Project would increase impervious surfaces at the site and result in increased surface runoff. However, based on the preliminary information available, the Project would be designed to avoid changes to the existing drainage pattern and reduce risk from overflow. Additionally, the Project would be designed in compliance with the required codes and standards to minimize the potential for structure damage and safety risks as a result of flooding. Further analysis may be appropriate to assess the increased volume of surface water runoff based on the proposed footprint of the Project, the available drainage capacity of the historic Kirker Creek channel and flood plain, and the effect of downstream constrictions, e.g., culverts.

iii. Create or contribute runoff water, which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

If managed poorly, the handling and storage of waste organic materials as feedstock and biochar as byproduct may be sources of polluted runoff. Other hazardous materials stored on site for operations, such as fuels, oils, and other chemicals may provide additional sources of polluted runoff if spills or leaks occur. The storm water management system would be designed to minimize contact with stored materials. A SPCC Plan and a Storm Water Pollution Prevention Plan (SWPPP) would be implemented to prevent or minimize the discharge of oil and other pollutants in

stormwater runoff. Additionally, a Hazardous Materials Management Plan (HMMP) describing hazardous material use, transport, management and disposal protocols would be prepared prior to the start of construction.

iv. Impede or redirect flood flows?

Kirker Creek has already been diverted south of the Project Area; however, the historic stream channel likely flows intermittingly during precipitation events. The layout of the primary access road crosses historic channel of Kirker Creek south of the Project Area. An appropriately sized culvert would need be installed under the primary access road to not impede or redirect flow.

d) In flood hazard, tsunami, or seiche risk zones, would the project risk release of pollutants due to project inundation?

FEMA has produced Flood Insurance Rate Maps (FIRMs) that show existing Special Flood Hazard Areas (SFHAs). Based on the FIRM provided in Appendix A, both Kirker Creek to the south and historic Kirker Creek to the east of the Project Area are designated as Zone AE. Flood zone AE is considered a SFHA, which means that there is at least a 1% chance of annual flooding in that area. This is also commonly referred to as the "100-year floodplain" because there is a 1% chance of a flood of that magnitude occurring in any given year. FEMA Zone AE is different from Zone A in that it takes into account additional factors that can contribute to flood risk, such as wave action, storm surge, and coastal erosion.

The Project Area itself is located west of the historic Kirker Creek and designated as FEMA Zone X, which is not considered a SFHA because the risk of flooding is lower, generally less than 0.2% chance of annual flooding. Because the Project Area is not in an existing flood hazard area the proposed Project is not anticipated to risk release of pollutants due to project inundation.

e) Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

The Project Area within Contra Costa County is within the limits of San Francisco Bay Basin managed by the SFRWQCB's Basin Plan (SFRWQCB, 2019). The Basin Plan is the master policy document that contains descriptions of the legal, technical, and programmatic bases of water quality regulation in the region. State policy for water quality control in California is directed toward achieving the highest water quality consistent with maximum benefit to the people of the state, and the beneficial uses identified in the Basin Plan for surface waters, groundwaters, marshes, and wetlands serve as a basis for establishing water quality objectives and discharge prohibitions to attain these goals.

The beneficial uses identified for Kirker Creek and the New York Slough include Warm Water Habitat, Wildlife Habitat, Commercial and Sport Fishing, Estuarine Habitat, Fish Migration, Preservation of Rare and Endangered Species, Contact and Non-Contact Recreation, and Navigation. Chapter 3 of the Basin Plan identifies the water quality objectives for surface waters and groundwater, including numerical water quality objectives for select toxic pollutants.

Based on the project description provided in Section 1.2 above, process wastewater will be treated on site and mixed with the blowdown stream to meet appropriate discharge limits before being sent to DDSD's WWTP for disposal and will not be discharged to surface waters under a NPDES permit.

6.0 References

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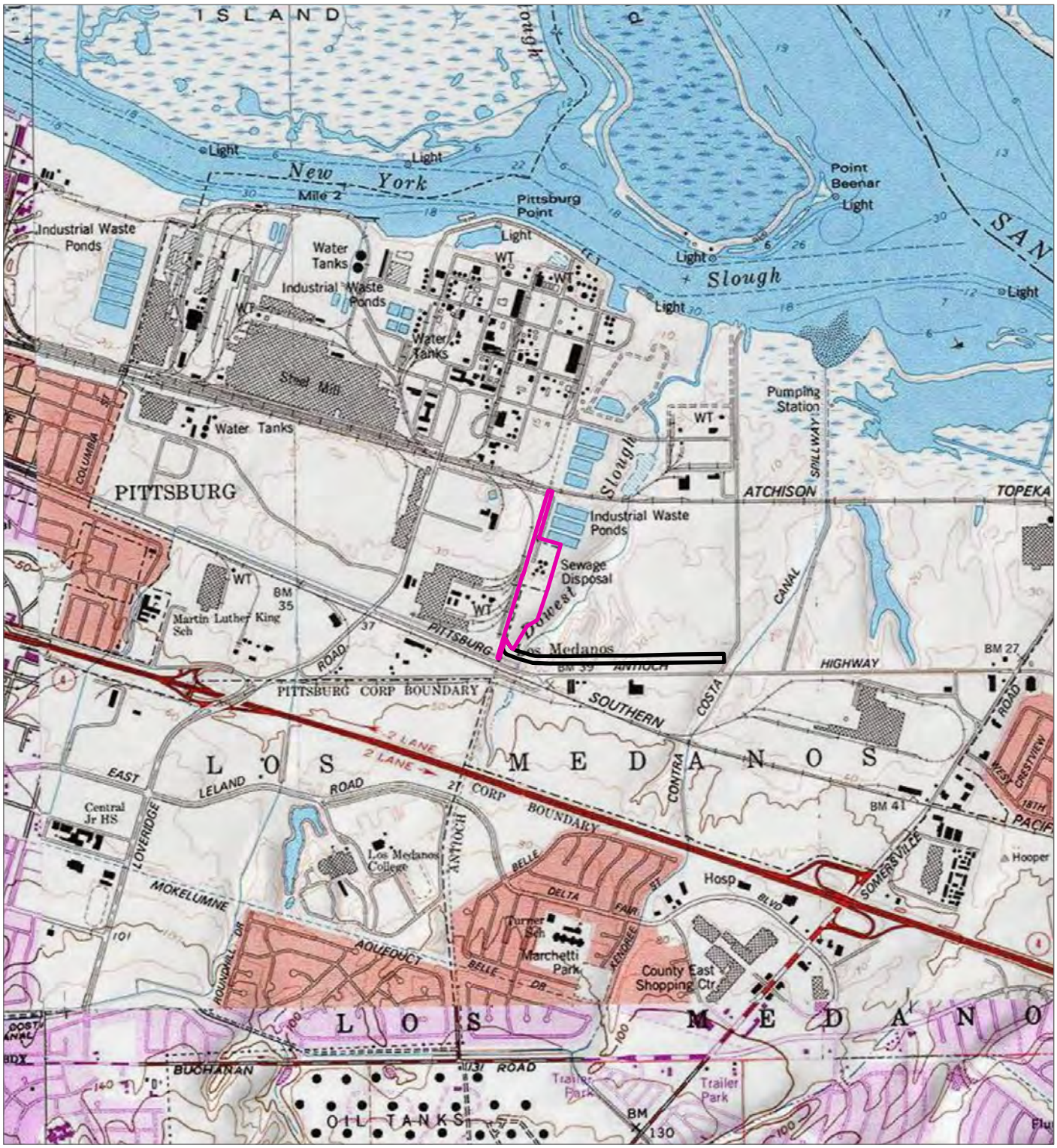
TABLES

Table 1
Recycled Water Quality Data, Calendar Year 2020
Delta Diablo Sanitation District

Constituent	Unit	Average	Range
pH	standard unit	7.4	7.2 - 7.6
Alkalinity (as CaCO3)	mg/L	238	220 - 250
Total Hardness (as CaCO3)	mg/L	185	150 - 200
Calcium	mg/L	38	31 - 46
Magnesium	mg/L	23	18 - 24
Manganese	ug/L	53	42 - 64
Potassium	mg/L	17	16 - 19
Sodium	mg/L	163	140 - 190
Conductivity	µmhos/cm	1516	1414 - 1664
Total Dissolved Solids	mg/L	724	670 - 790
Chloride	mg/L	198	120 - 289
Sulfate	mg/L	196	170 - 240
Silica (as SiO2)	mg/L	17	15 - 20
Total Nitrogen	mg/L	48	42 - 53
Total Kjeldahl Nitrogen	mg/L	47	41 - 52
Ammonia	mg/L	41	36 - 47
Nitrate (as N)	mg/L	2.07	0.83 - 7.10
Nitrite (as N)	mg/L	1.63	0.03 - 6.70
Phosphate	mg/L	0.18	0.03 - 0.88
Total Coliform Bacteria	MPN	1.4	<1 - 37.3
Turbidity	NTU	0.71	0.26 - 1.28

Abbreviations:
mg/L = milligrams per liter
µmhos = microhms per centimeter µg/L = micrograms per liter
MPN = most probable number
NTU = Nephelometric Turbidity Units

FIGURES



PROJECT SITE

PRIMARY ACCESS ROAD

N

0 1,000 2,000

FEET

1:24,000 1" = 0'

BASE MAP: USGS COLOR ORTHO IMAGERY
DATA SOURCES: TRC

PROJECT:

H CYCLE
RENEWABLE HYDROGEN PRODUCTION PROJECT

TITLE:

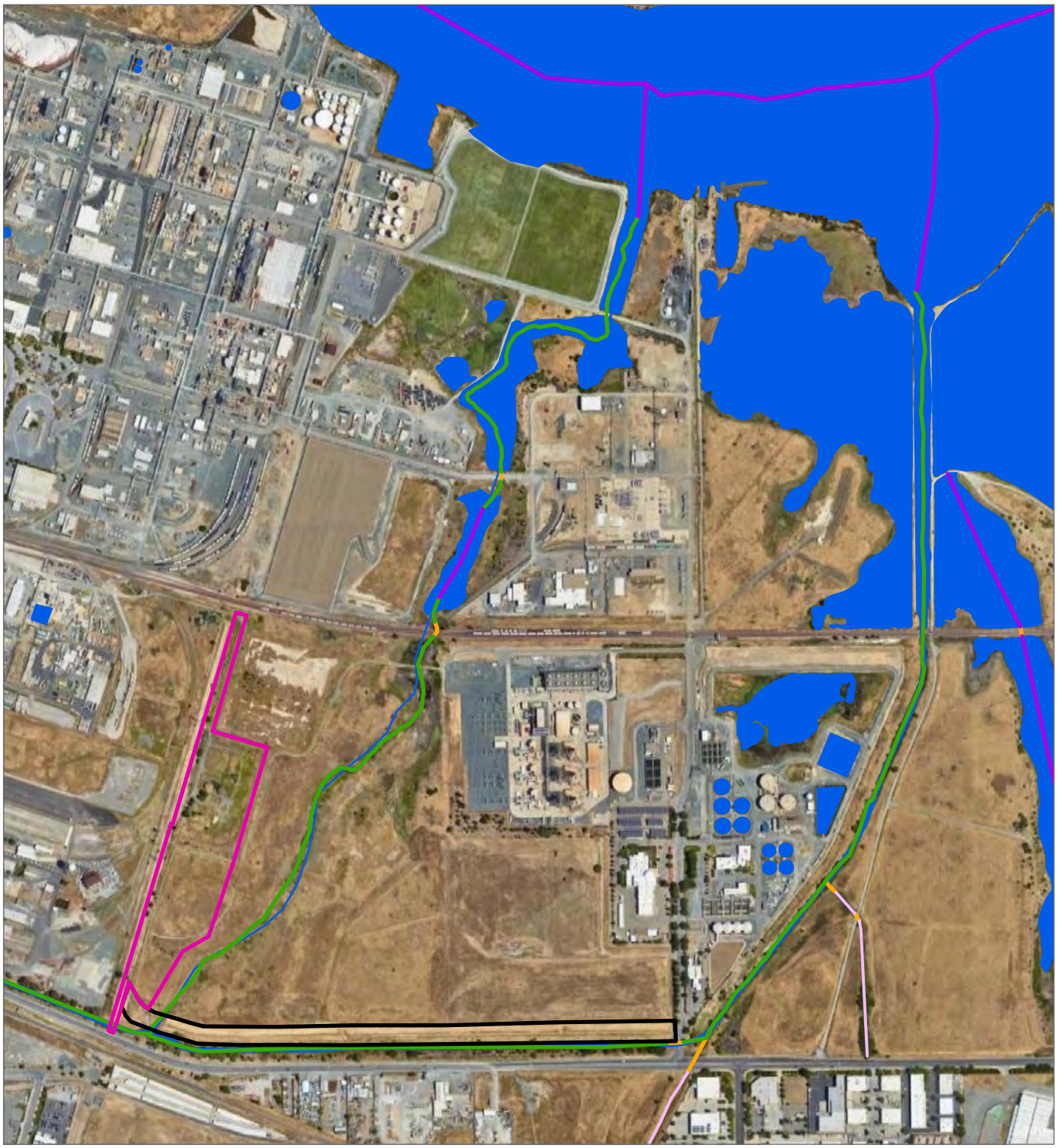
PROJECT OVERVIEW MAP

DRAWN BY:	R. BLAKE	PROJ. NO.:	482082
CHECKED BY:	A. ARFMAN		
APPROVED BY:	E. BERGQUIST		**FIGURE 1**
DATE:	MAY 2023		

TRC SOLUTIONS, INC
1850 GATEWAY BLVD, SUITE 1000
CONCORD, CA 94520

FILE: PITTSBURG RECORD SEARCH

COORDINATE SYSTEM: NAD 1983 UTM ZONE 10N; MAP ROTATION: 0
SAVED BY: RBLAKE ON 5/31/2023, 15:57:49 PM; FILE PATH: T:\1-PROJECTS\H-CYCLE\482082_PITTSBURG\12-APRX\PITTSBURG RECORD SEARCH\PITTSBURG RECORD SEARCH APRX; LAYOUT NAME: FIG 1 PROJECT OVERVIEW MAP WATER QUALITY

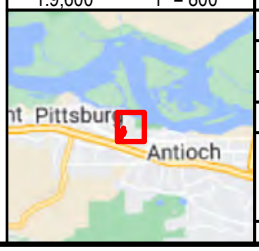


- Project Site
- Primary Access Road
- NWI
- Connector
- Canal/Ditch
- Stream/River
- Artificial Path

BASE MAP: USGS COLOR ORTHO IMAGERY
DATA SOURCES: TRC

N

0 300 600
FEET
1:9,600 1" = 800'



PROJECT:
H CYCLE
RENEWABLE HYDROGEN PRODUCTION PROJECT

TITLE:
NWI AND NHD MAP

DRAWN BY:	R. BLAKE	PROJ. NO.:	482082
CHECKED BY:	A. ARFMAN		
APPROVED BY:	E. BERGQUIST		
DATE:	MAY 2023		

FIGURE 2

TRC SOLUTIONS, INC
1850 GATEWAY BLVD, SUITE 1000
CONCORD, CA 94520

FILE: PITTSBURG RECORD SEARCH

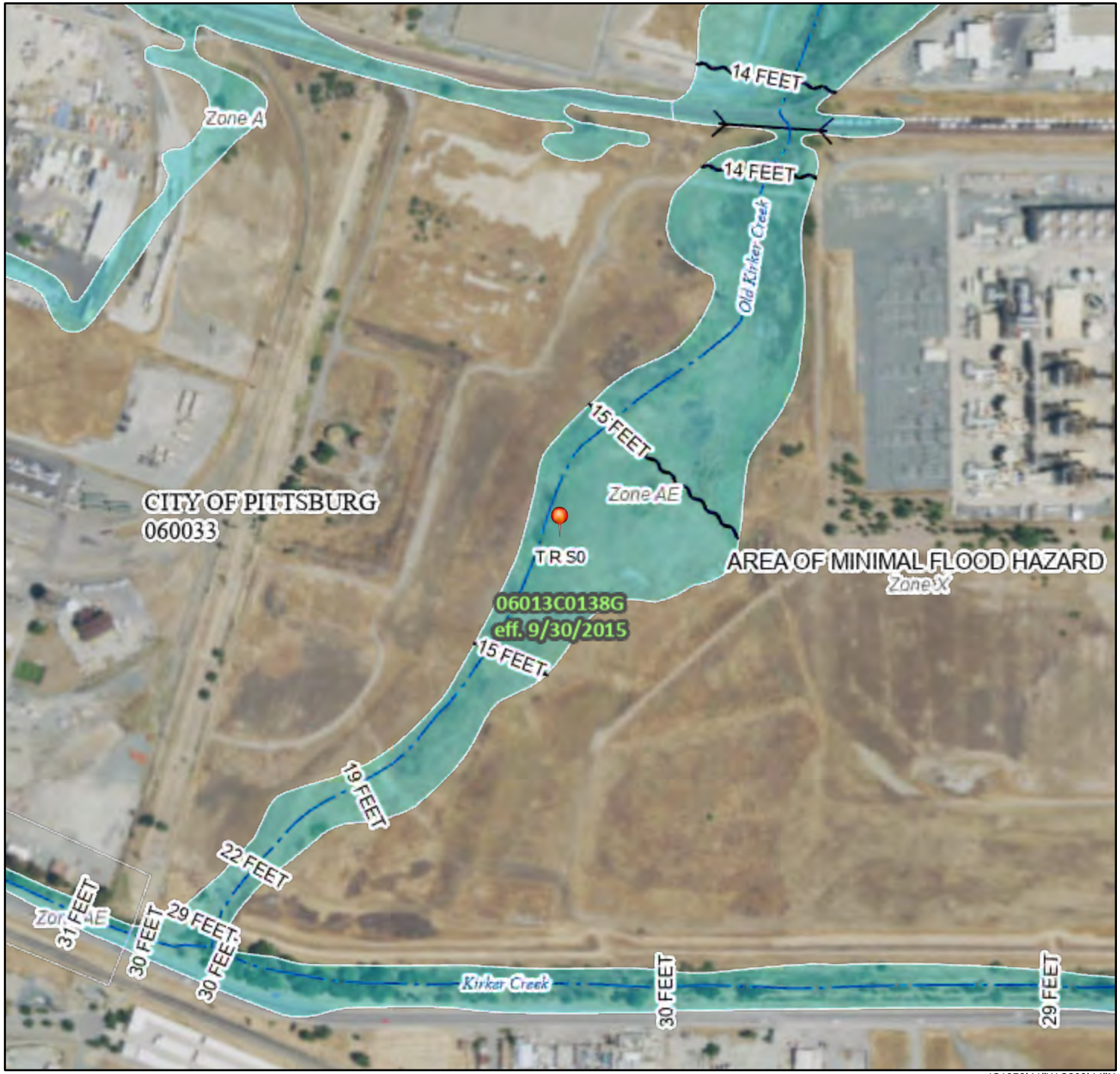
COORDINATE SYSTEM: NAD 1983 UTM ZONE 10N; MAP ROTATION: 0
SAVED BY: RBLAKE ON 5/31/2023, 15:57:49 PM; FILE PATH: T:\1-PROJECTS\H-CYCLE\482082_PITTSBURG\12-APRX\PITTSBURG RECORD SEARCH\PITTSBURG RECORD SEARCH APRX; LAYOUT NAME: FIG 2 NWI AND NHD MAP WATER QUALITY

APPENDIX A: FEMA Flood Insurance Rate Map

National Flood Hazard Layer FIRMette

FEMA

121°51'18"W 38°1'12"N



121°50'41"W 38°0'44"N

Feet

0 250 500 1,000 1,500 2,000

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 4/10/2023 at 11:36 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.