APPENDIX A

NOTICE OF PREPARATION

County of Santa Clara

Department of Planning and Development
Planning Division

County Government Center, East Wing, 7th Floor
70 West Hedding Street
San Jose, California 95110-1705
(408) 299-5770 FAX (408) 288-9198
www.sccplanning.org

NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT FOR THE Z-BEST COMPOSTING FACILITY MODIFICATIONS PROJECT

Date: October 15, 2018
Project Applicant: Zanker Road Resource Management LTD
File Number: 6498-17P
Assessor's Parcel Numbers: 841-37-028, 841-37-029, and 841-37-010

As the Lead Agency, the County of Santa Clara will prepare an Environmental Impact Report (EIR) for the Z-Best Compost Facility Modifications Project (proposed project). The proposed project site is the existing Z-Best Composting Facility at 980 Highway 25, which currently operates under a County-issued Use Permit. The proposed project includes modification of Z-Best's existing composting process from the current windrow method to an aerated static pile process, as well as associated changes in operations and site design. The proposed new process, which is described on pages 2-3, would occur within the already developed area of the existing composting facility. The proposed new process would result in a throughput increase from the current maximum of 1,500 tons to 2,750 tons per day, which would require an additional 59 trucks per day. The project proponent has proposed that the increased truck trips be confined to the hours of 8 p.m. to 4 a.m.

The County is soliciting guidance from your agency on the scope and content of the environmental information to be included in the EIR that is relevant to your area of interest, or to your agency's statutory responsibilities in connection with the proposed project. The project description summary and probable environmental effects that will be analyzed in the EIR are attached.

A Public Scoping Session to solicit comments for the Notice of Preparation will be held at the Gilroy Library, 350 W. 6th Street, Gilroy on Tuesday, October 30 from 6:30 p.m. to 8:00 p.m. In accordance with the California Environmental Quality Act (CEQA), comments on the Notice of Preparation (NOP) must be received within 30 days of receipt of this notice. Written and/or email comments on the NOP should be provided to the County at the earliest possible date, but must be received by 5 p.m. on November 16, 2018. Agencies that will need to consider the final EIR when deciding whether to issue permits or other approvals for the project should provide the name of a contact person. Please address comments to:

County of Santa Clara
Department of Planning and Development
Attention: David Rader
County Government Center
70 West Hedding Street, San Jose, CA 95110
Email: david.rader@pln.sccgov.org

Prepared by: David M. Rader

Approved by: Manira Sandhir

Board of Supervisors: Mike Wasserman, Cindy Chavez, Dave Cortese, Ken Yeager, S. Joseph Simitian
County Executive: Jeffrey V. Smith

INTRODUCTION

The purpose of an Environmental Impact Report (EIR) is to inform decision-makers and the general public of the environmental effects of a proposed project that an agency may implement or approve. The EIR process is intended to provide information sufficient to (a) evaluate a proposed project and the potential for significant impacts on the environment, (b) to examine methods of reducing adverse impacts, and (c) to consider alternatives to the project. In accordance with the requirements of CEQA, the EIR for the Z-Best Composting Process Conversion Project will include the following:

A project description;

A description of existing environmental setting, potential project-level and cumulative environmental impacts, and mitigation measures;

Alternatives to the proposed project; and

CEQA-required environmental findings, including (a) significant environmental effects that cannot be avoided if the project is implemented; (b) significant irreversible and irretrievable commitments of resources; (c) growth-inducing impacts; and (d) effects found not to be significant.

PROJECT LOCATION

The project site is located at 980 Highway 25, southeast of the city of Gilroy and northwest of the city of Hollister, in unincorporated Santa Clara County. Figure 1 shows the regional location. Figure 2 shows the project site boundaries and vicinity. The project site encompasses assessor's parcels 841-37-029 (approximately 137 acres) and 841-37-010 (approximately 99 acres). Both parcels are designated Agricultural Large Scale under the County of Santa Clara General Plan and zoned Exclusive Agriculture with a 40 acre combining district (A-40Ac).

PROJECT DESCRIPTION

The proposed project includes modifications to the existing composting facility Use Permit to convert the current composting process from a windrow composting system to a static aerated pile composting system using technology from Engineered Compost Systems. Composting is the transformation of raw organic materials (e.g., yard trimmings) into biologically-stable, humus-rich substances suitable for growing plants. The existing windrow composting system at Z-Best requires that the windrows (long piles of raw organic material in bags) be periodically turned to improve porosity and oxygen content. Aerated static pile composting, on the other hand, would biodegrade organic material without physical manipulation during primary composting as it would use a ventilation system to circulate air within compost piles.

Composting Process

The proposed aerated composting process would be installed within southwest quadrant of the developed area of the existing composting facility, west of Area 1, as shown on Figure 3 (Site Plan). The proposed new composting process would occur in two stages:

> **Primary Composting.** In the first stage, pre-processed feedstocks (organic material) would be stacked in piles within rows of attached cement bunkers, approximately 10 feet in height. The bunkers would be grouped in zones, and each zone would have a ventilation system with an electrically powered fan and a series of ducts connected to each bunker. A front-end loader would build up the piles to a height of approximately nine feet. Each pile would be covered with a six-inch bio-layer (clean cover material) intended to provide insulation to ensure adequate pathogen control and temperatures, and to function as an in-situ biofilter layer to reduce odors from volatile organic chemical released from the top of the pile.
>
> At the primary composting stage, the ventilation system would provide negative aeration, drawing air down through the compost piles, which would be purified in a temperature controlled biofilter before

release. An irrigation system mounted on the bunker walls would provide automatic top watering of the piles to add moisture before pile break-down or to increase the moisture in the bio-layer for additional absorption of emissions. The proposed process is designed to operate with a 17-day retention of material in the primary composting stage.

Secondary Composting. After completing the primary composting process, the material would be moved by a front-end loader to a secondary composting zone (labeled as "Extended Bed CASP" on Figure 3) and piled to a maximum height of 9.5 feet. Secondary composting would take place in an extended bed aerated static pile with positive aeration, where air would be blown up through each compost pile. According to the project proponent, positive aeration can be used at this stage because it is expected that the primary composting process would have substantially deodorized and stabilized the material. Also, according to the project proponent, the material would not be covered with an insulating bio-layer at this stage because it is expected that it will have already met all pathogen reduction requirements during the primary composting stage.

Operations

The proposed new process would result in an increase in throughput of finished compost from the current maximum of 1,500 tons allowed under the existing Use Permit, to 2,750 tons per day. This increase would require an additional 59 truck trips per day, which the project proponent has proposed be confined to the hours of 8 p.m. to 4 a.m. The proposal includes a request to modify the use permit to allow a maximum of 90 employees to be on site, which would be an increase of 32 employees above current conditions.

Grading and Drainage

Changes to the composting area would involve replacing approximately 180,000 square feet of existing impervious surfaces (sidewalks, equipment pads, etc.). The proposed project would not result in a net change to total impervious or pervious surfaces. Grading would be required to establish pads for the new composting system and to provide on-site drainage and stormwater detention. The project proponent anticipates that the current site can accommodate all required stormwater detention, with primary on-site detention occurring in the modified Detention Basin 1, with additional flood storage capacity provided on-site to the north of Area 1, as shown on Figure 3. However, in the event this proves infeasible, additional stormwater retention would be provided by a 98.8-acre North Flood Storage Basin (assessor's parcel number 841-37-010), which is shown on Figure 4. This parcel is located immediately north/northeast of the existing operations site and the highway.

Site Access

Access to the project site is provided via one existing entrance, which intersects with SR 25 on the south side approximately 700 feet west of the intersection of Bolsa Road and SR 25. The project proponent is not proposing to change this access but is proposing adjacent construction of deceleration / acceleration lanes on SR 25. The project site entrance is located within the area of a Caltrans-approved Hollister to Gilroy State Route 25 Route Adoption project, which would involve potential widening and realignment of SR 25 from San Felipe Road (in Hollister) to the end of SR 25 at US 101 in Santa Clara County. Truck traffic originating from and bound for the project site is currently restricted from using Bolsa Road. All new truck and vehicular traffic originating from and bound for the project site would continue to be restricted to the use of only SR 25 to SR 156 and US 101. However, if the Caltrans project is constructed, it is anticipated that Bolsa intersection with SR 25 would shift east, and project traffic bound for and originating from the Z-Best facility would utilize the new Bolsa Road intersection with the realigned SR 25.

Permitting

The proposed project would require a major use permit and architecture and site approval modification and grading approval from the County of Santa Clara. Additional permits or permit modifications may be required from the County Local Enforcement Agency / CalRecycle (revised Solid Waste Facility Permit), the Central Coast Regional Water Quality Control Board, the Bay Area Air Quality Management District, and Caltrans (District 4).

POTENTIAL ENVIRONMENTAL IMPACTS

The EIR will include a discussion of the environmental setting/baseline for the proposed project, a summary of applicable regulations (federal, state, regional, and local), and an analysis of the potential impacts of the project. Mitigation will be recommended to reduce or eliminate project impacts, where feasible. The specific potential environmental impacts evaluated in detail in the EIR will be determined based on evaluation of the proposed project using an Initial Study environmental checklist (to be included in the Draft EIR) and on the comments received on this NOP. At this time, it is anticipated that the EIR will focus on the following topics.

Aesthetics. The EIR will evaluate the significance of changes to public views of the project site and changes to the character of the project site as seen from public roadways in the vicinity. Light and glare impacts will also be evaluated.

Agricultural Resources. The EIR will evaluate impacts to important farmland from development of the North Flood Storage Basin option, if pursued by the project proponent.

Air Quality and Greenhouse Gas Emissions. Construction-related emissions would be evaluated for installation of the new composting system and other site improvements. Emissions from operations, including from increased truck trips and employee vehicle trips would be quantified against Bay Area Air Quality Management District thresholds. The air quality analysis would also evaluate odor impacts from the proposed new composting operations.

Biological Resources. The portion of the proposed project south of State Route 25 would take place within the existing developed footprint Therefore, the environmental analysis would analyze potential biological impacts from development and operation of the North Flood Storage Basin option, if pursued by the project proponent.

Tribal and Other Cultural Resources. Any tribal or other cultural resources that are known or have the potential to occur on the project site will be assessed, and the potential impacts that may occur to known and unanticipated resources as a result of project implementation will be evaluated.

Hydrology and Water Quality. The potential impacts of implementation of the proposed project with respect to modification of existing drainage patterns, decreased water quality, runoff, and flooding will be evaluated.

Noise. Existing noise and vibration conditions on the project site and the nearby vicinity will be described, including information on the location of existing sensitive receptors and major noise sources, ambient noise levels, and natural factors that relate to the attenuation thereof. Construction-related noise and ground vibration will be analyzed using published reference noise and vibration levels for typical construction equipment. The project's potential to generate operations-related noise increases from the modified composting process and additional truck trips traffic will also be evaluated to determine whether noise standards could be exceeded.

Transportation and Circulation. The EIR will evaluate site access and circulation with a focus on impacts to SR 25 from the additional truck trips. The traffic assessment would evaluate intersection levels of service for existing and projected peak-hour traffic volumes with the proposed facility expansion at the project driveway and at Bolsa Road intersection, with and without the SR realignment. An analysis of Vehicle Miles Traveled will be included for informational purposes.

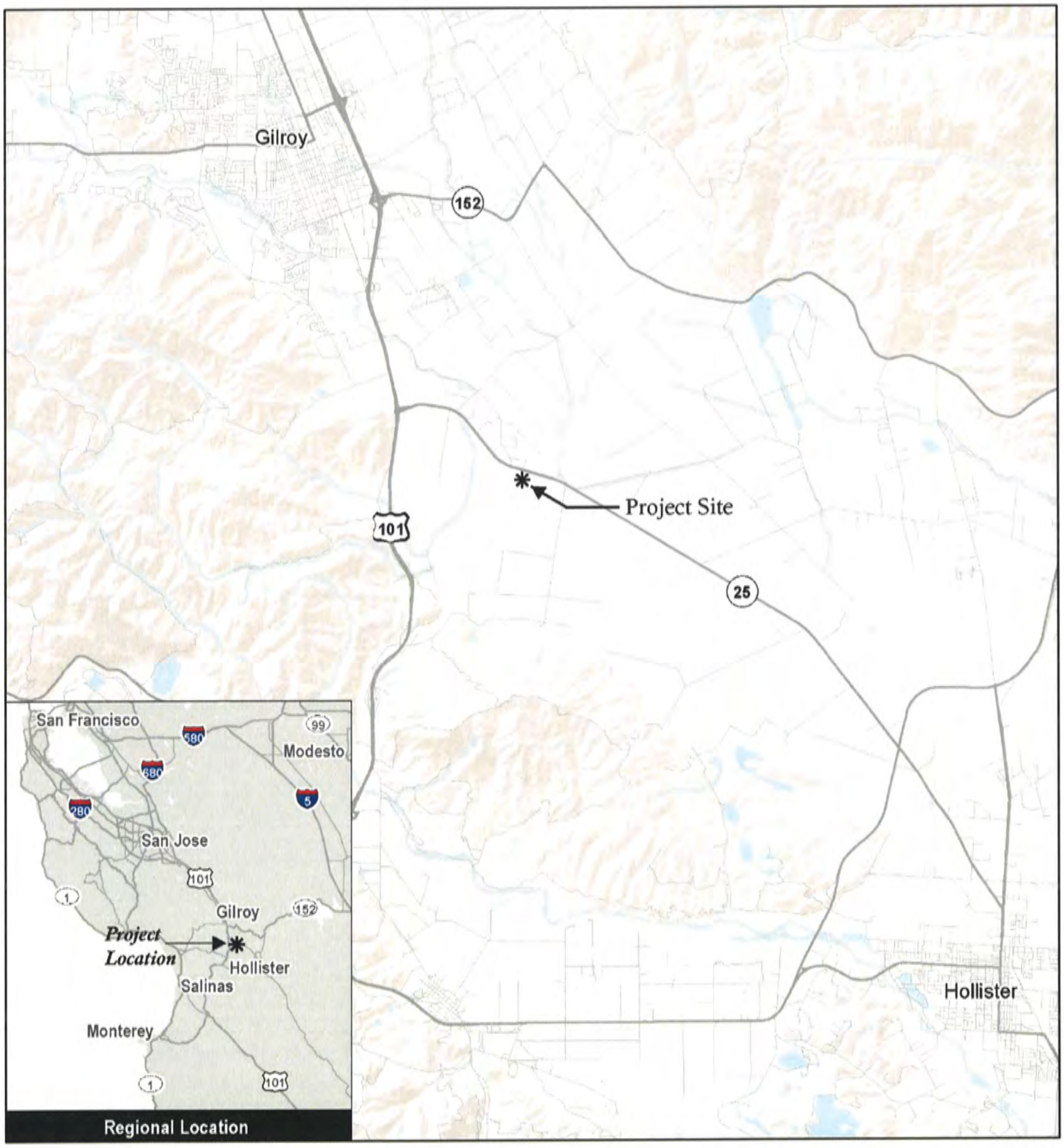
Utilities and Energy. Potential future demand from the proposed project will be compared to estimates of existing use on the site and regional planning documents to determine if the project would result in significant increases in demand for water, water treatment, natural gas, and electricity.

In addition to the evaluation of potential impacts, the following analyses will be included in the EIR.

Cumulative Impacts. This section of the EIR will discuss, issue by issue, the potential for the proposed project, when combined with other development identified in the cumulative setting, to either result in new, or contribute to existing, cumulatively considerable adverse effects on the environment.

Alternatives. CEQA requires that an EIR describe a range of reasonable alternatives to a project (or project location) that feasibly attain most of the objectives, but could avoid or reduce at least one environmental impact (see CEQA Guidelines Section 15126.6).

Growth Inducement. This section will qualitatively evaluate the project's potential to induce growth and any subsequent environmental impacts that would occur (pursuant to CEQA Guidelines Section 15126[d]).



Source: EMC Planning, ESRI 2018

Figure 1 - Project Site Location

Source: EMC Planning, ESRI 2018

Figure 2 - Project Site Vicinity

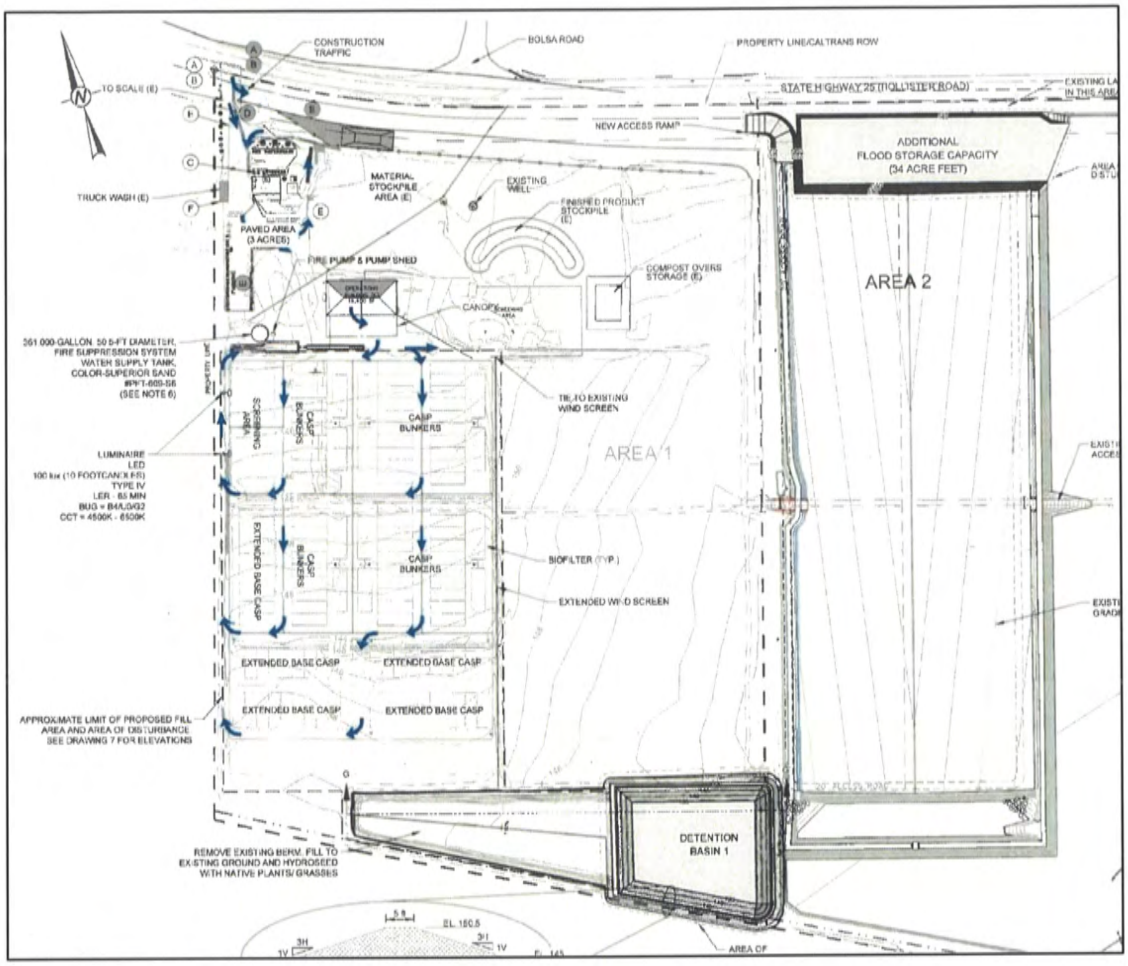


Figure 3 - Site Plan

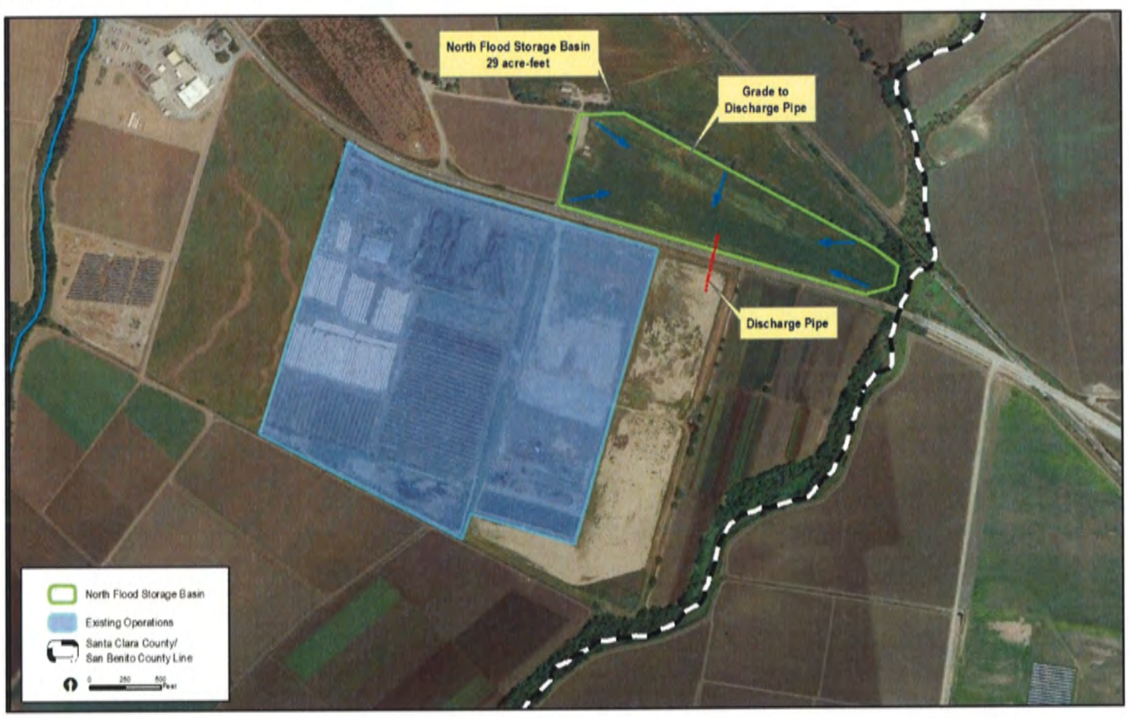


Figure 4 - North Storage Flood Basin Option

STATE OF CALIFORNIA
GOVERNOR'S OFFICE *of* PLANNING AND RESEARCH

EDMUND G. BROWN JR.
GOVERNOR

KEN ALEX
DIRECTOR

Notice of Preparation

October 16, 2018

To: Reviewing Agencies

Re: Z-Best Composting Facility Modifications Project
SCH# 2018102041

Attached for your review and comment is the Notice of Preparation (NOP) for the Z-Best Composting Facility Modifications Project draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

David Rader
Santa Clara County
70 W. Hedding Street
7th Floor, East Wing
San Jose, CA 95112

with a copy to the State Clearinghouse in the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the environmental document review process, please call the State Clearinghouse at (916) 445-0613.

Sincerely,

Scott Morgan
Director, State Clearinghouse

Attachments
cc: Lead Agency

Document Details Report
State Clearinghouse Data Base

SCH# 2018102041
Project Title Z-Best Composting Facility Modifications Project
Lead Agency Santa Clara County

Type NOP Notice of Preparation

Description The proposed project site is the existing Z-Best Composting Facility at 980 Highway 25, which currently operates under a County-issued Use Permit. The proposed project includes modification of Z-Best's existing composting process from the current windrow method to an aerated static pile process, and associated changes in operations and site design. The proposed new composting process would occur within the already developed area of the existing composting facility. The proposed new process would result in a throughput increase from the current max of 1,500 tons to 2,750 tons per day, which would require an additional 59 trucks per day. The project proponent has proposed that the increased truck trips be confined to the hours of 8 pm to 4 am.

Lead Agency Contact

Name David Rader
Agency Santa Clara County
Phone 408-299-5779 **Fax**
email
Address 70 W. Hedding Street
7th Floor, East Wing
City San Jose **State** CA **Zip** 95112

Project Location

County Santa Clara
City Gilroy
Region
Cross Streets Bolsa Rd and Hwy 25
Lat / Long
Parcel No. 841-37-029
Township **Range** **Section** **Base**

Proximity to:

Highways 25
Airports
Railways
Waterways Pajaro River
Schools
Land Use Ag large scale/A-40Ac

Project Issues Aesthetic/Visual; Agricultural Land; Air Quality; Archaeologic-Historic; Biological Resources; Drainage/Absorption; Flood Plain/Flooding; Noise; Soil Erosion/Compaction/Grading; Solid Waste; Toxic/Hazardous; Traffic/Circulation; Water Quality; Cumulative Effects; Other Issues

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Reviewing Agencies Resources Agency; Department of Conservation; Department of Parks and Recreation; Department of Water Resources; Department of Fish and Wildlife, Region 3; Native American Heritage Commission; California Highway Patrol; Caltrans, District 4; California Energy Commission; Air Resources Board, Major Industrial Projects; Resources, Recycling and Recovery; State Water Resources Control Board, Division of Drinking Water; Department of Toxic Substances Control; Regional Water Quality Control Board, Region 3; Department of Pesticide Regulation; Department of Food and Agriculture

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Date Received 10/16/2018 **Start of Review** 10/16/2018 **End of Review** 11/14/2018

Note: Blanks in data fields result from insufficient information provided by lead agency.

Print Form

Appendix C

Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH # 2018102041

Project Title: Z-Best Composting Facility Modifications Project

Lead Agency: County of Santa Clara — Contact Person: David Rader
Mailing Address: 70 W. Hedding Street, East Wing, 7th Floor — Phone: (408) 299-5779
City: San Jose — Zip: 95110 — County: Santa Clara

Project Location: County: Santa Clara — City/Nearest Community: Gilroy
Cross Streets: Bolsa Road and Highway 25 — Zip Code: 95020
Longitude/Latitude (degrees, minutes and seconds): ___° ___′ ___″ N / ___° ___′ ___″ W Total Acres: ___
Assessor's Parcel No.: 841-37-029 — Section: ___ Twp.: ___ Range: ___ Base: ___
Within 2 Miles: State Hwy #: 25 — Waterways: Pajaro River
Airports: ___ Railways: ___ Schools: ___

Document Type:

CEQA: ☒ NOP ☐ Early Cons ☐ Neg Dec ☐ Mit Neg Dec ☐ Draft EIR ☐ Supplement/Subsequent EIR (Prior SCH No.) ___ Other: ___

NEPA: ☐ NOI ☐ EA ☐ Draft EIS ☐ FONSI

Other: ☐ Joint Document ☐ Final Document ☐ Other: ___

Governor's Office of Planning & Research

OCT 16 2018

STATE CLEARINGHOUSE

Local Action Type:

☐ General Plan Update ☐ General Plan Amendment ☐ General Plan Element ☐ Community Plan
☐ Specific Plan ☐ Master Plan ☐ Planned Unit Development ☐ Site Plan
☐ Rezone ☐ Prezone ☒ Use Permit ☐ Land Division (Subdivision, etc.)
☐ Annexation ☐ Redevelopment ☐ Coastal Permit ☒ Other: Grading approval

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Development Type:

☐ Residential: Units ___ Acres ___
☐ Office: Sq.ft. ___ Acres ___ Employees ___
☐ Commercial: Sq.ft. ___ Acres ___ Employees ___
☐ Industrial: Sq.ft. ___ Acres ___ Employees ___
☐ Educational: ___
☐ Recreational: ___
☐ Water Facilities: Type ___ MGD ___
☐ Transportation: Type ___
☐ Mining: Mineral ___
☐ Power: Type ___ MW ___
☐ Waste Treatment: Type ___ MGD ___
☐ Hazardous Waste: Type ___
☒ Other: Modification of an existing composting facility

Project Issues Discussed in Document:

☒ Aesthetic/Visual
☒ Agricultural Land
☒ Air Quality
☒ Archeological/Historical
☒ Biological Resources
☐ Coastal Zone
☒ Drainage/Absorption
☐ Economic/Jobs
☐ Fiscal
☒ Flood Plain/Flooding
☐ Forest Land/Fire Hazard
☐ Geologic/Seismic
☐ Minerals
☒ Noise
☐ Population/Housing Balance
☐ Public Services/Facilities
☐ Recreation/Parks
☐ Schools/Universities
☐ Septic Systems
☐ Sewer Capacity
☒ Soil Erosion/Compaction/Grading
☒ Solid Waste
☒ Toxic/Hazardous
☒ Traffic/Circulation
☐ Vegetation
☒ Water Quality
☐ Water Supply/Groundwater
☐ Wetland/Riparian
☐ Growth Inducement
☐ Land Use
☒ Cumulative Effects
☒ Other: Energy

Present Land Use/Zoning/General Plan Designation:

Agriculture Large Scale / A-40Ac

Project Description: *(please use a separate page if necessary)*

The proposed project site is the existing Z-Best Composting Facility at 980 Highway 25, which currently operates under a County-issued Use Permit. The proposed project includes modification of Z-Best's existing composting process from the current windrow method to an aerated static pile process, and associated changes in operations and site design. The proposed new composting process would occur within the already developed area of the existing composting facility. The proposed new process would result in a throughput increase from the current maximum of 1,500 tons to 2,750 tons per day, which would require an additional 59 trucks per day. The project proponent has proposed that the increased truck trips be confined to the hours of 8 p.m. to 4 a.m.

Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.

Revised 2010

NOP Distribution List

County: Santa Clara CR

SCH# 2018102041

Resources Agency

Resources Agency
Nadell Gayou

☐ **Dept. of Boating & Waterways**
Denise Peterson

☐ **California Coastal Commission**
Allyson Hitt

☐ **Colorado River Board**
Elsa Contreras

☒ **Dept. of Conservation**
Crina Chan

☐ **Cal Fire**
Dan Foster

☐ **Central Valley Flood Protection Board**
James Herota

☐ **Office of Historic Preservati-**
Ron P

Dept of Par
Environment
Section

☐ **S.F. Bay Dev't. Co**
Steve Gold

☒ **Dept. of Wa Resources**
Resources A
Nadell Gayou

Fish and Game

☐ **Depart. of Fish**
Scott Flint
Environmental Se
Division

☐ **Fish & Wildlife Re**
Curt Babcock

☐ **Fish & Wildlife Region 1E**
Laurie Harnsberger

☐ **Fish & Wildlife Region 2**
Jeff Drongesen

☒ **Fish & Wildlife Region 3**
Craig Weightman

☐ **Fish & Wildlife Region 4**
Julie Vance

☐ **Fish & Wildlife Region 5**
Leslie Newton-Reed
Habitat Conservation Program

☐ **Fish & Wildlife Region 6**
Tiffany Ellis
Habitat Conservation Program

☐ **Fish & Wildlife Region 6 I/M**
Heidi Calvert
Inyo/Mono, Habitat Conservation Program

☐ **Dept. of Fish & Wildlife M**
William Paznokas
Marine Region

Other Dep

Make (17 copies (1 copy goes in file))

Boards

☐ **Delta Protection Commission**
Erik Vink

☐ **Delta Stewardship Council**
Anthony Navasero

☒ **California Energy Commission**
Eric Knight

☒ **Native American Heritage Comm.**
Debbie Treadway

Public Utilities Commission
Supervisor

☐ **Santa Monica Bay Restoration**
Guangyu Wang

☐ **State Lands Commission**
Jennifer Deleong

☐ **Tahoe Regional Planning Agency (TRPA)**
Cherry Jacques

Cal State Transportation Agency CalSTA

☐ **Caltrans - Division of Aeronautics**
Philip Crimmins

☐ **Caltrans – Planning HQ LD-IGR**
Christian Bushong

☒ **California Highway Patrol**
Suzann Ikeuchi
Office of Special Projects

Dept. of Transportation

☐ **Caltrans, District 1**
Rex Jackman

☐ **Caltrans, District 2**
Marcelino Gonzalez

☐ **Caltrans, District 3**
Susan Zanchi

☒ **Caltrans, District 4**
Patricia Maurice

☐ **Caltrans, District 5**
Larry Newland

☐ **Caltrans, District 6**
Michael Navarro

☐ **Caltrans, District 7**
Dianna Watson

☐ **Caltrans, District 8**
Mark Roberts

☐ **Caltrans, District 9**
Gayle Rosander

☐ **Caltrans, District 10**
Tom Dumas

☐ **Caltrans, District 11**
Jacob Armstrong

☐ **Caltrans, District 12**
Maureen El Harake

Cal EPA

Air Resources Board

☐ **Airport & Freight**
Jack Wursten

☐ **Transportation Projects**
Nesamani Kalandiyur

☒ **Industrial/Energy Projects**
Mike Tollstrup

☒ **California Department of Resources, Recycling & Recovery**
Kevin Taylor/Jeff Esquivel

☐ **State Water Resources Control Board**
Regional Programs Unit
Division of Financial Assistance

☒ **State Water Resources Control Board**
Cindy Forbes – Asst Deputy
Division of Drinking Water

☐ **State Water Resources Control Board**
Div. Drinking Water #________

☐ **State Water Resources Control Board**
Student Intern, 401 Water Quality Certification Unit
Division of Water Quality

☐ **State Water Resouces Control Board**
Phil Crader
Division of Water Rights

☒ **Dept. of Toxic Substances Control Reg. #________**
CEQA Tracking Center

☐ **Department of Pesticide Regulation**
CEQA Coordinator

Regional Water Quality Control Board (RWQCB)

☐ **RWQCB 1**
Cathleen Hudson
North Coast Region (1)

☐ **RWQCB 2**
Environmental Document Coordinator
San Francisco Bay Region (2)

☒ **RWQCB 3**
Central Coast Region (3)

☐ **RWQCB 4**
Teresa Rodgers
Los Angeles Region (4)

☐ **RWQCB 5S**
Central Valley Region (5)

☐ **RWQCB 5F**
Central Valley Region (5)
Fresno Branch Office

☐ **RWQCB 5R**
Central Valley Region (5)
Redding Branch Office

☐ **RWQCB 6**
Lahontan Region (6)

☐ **RWQCB 6V**
Lahontan Region (6)
Victorville Branch Office

☐ **RWQCB 7**
Colorado River Basin Region (7)

☐ **RWQCB 8**
Santa Ana Region (8)

☐ **RWQCB 9**
San Diego Region (9)

☒ Other DTSC-Pesticides
____
____

☐ ________
Conservancy

Last Updated 5/22/18

From: Anna Montes
To: Rader, David
Subject: File#6498-17P Z-Best Composting Facicilty
Date: Tuesday, October 23, 2018 4:06:28 PM

Thank you for you letter dated October 15, 2018, we own one of the impacted properties regarding this proposed Use Permit. Our main concern is for the heavy traffic flow and the back up already present on Highway 25. This use permit would increase the back up and be detrimental to all, not only those on Highway 25, but those who commute using Highway 25. The smell is horrific as well and already is an issue. Why increase all this negativity?

Thank you
Jose and Anna Montes
Managing members of AMG ENTERPRISE LLC

From:	kevingconant
To:	Rader, David
Cc:	Wasserman, Mike; roland.velasco@cityofgilroy.org
Subject:	I object to Z-Best"s application for expansion
Date:	Sunday, October 28, 2018 9:57:18 PM

As a resident and property owner in the unincorporated area of Gilroy, directly affected by this application, I wish to express my objection to Z-Best's application to expand their facility and change their processing of compost, thereby increasing the number of diesel trucks in my community.

One need only to breath deep and smell the air near Alviso and Milpitas to ask whether there is an offensive odor of a water pollution control plant, a dump, and a Z-Best composting facility nearby. Most likely, because the prevailing winds never make it to the Supervisor's office or San Jose city hall in downtown San Jose, Willow Glen, Almaden Valley, Saratoga or Los Gatos, does anyone of any political consequence ever get any traction in the current situation of the reduction/conversion of waste in Santa Clara County.

You are currently considering allowing Z-Best to expand their current facility and a change of process in south Santa Clara County. One would only have to live downwind from this facility to know that this request is ludicrous, offensive and potentially harmful to our health, environment and property values.

What has BAAQMD said regarding the offensive smell from any expansion of this facility, let alone, a new process and additional commercial vehicle traffic? What are the mitigations?

Where is the empirical data that this will not further create more odor of rotting/composting material downwind?

I have complained numerous times to the BAAQMD of the odor from Z-Best and the facility on Prunedale Avenue in east Gilroy, that was once the dump east of Gilroy, now a composting facility as well.

I object, wholeheartedly to this proposal and desire you to enter my objection into the record, as I cannot attend the public meeting regarding this application.

Please reply to me that you have received this correspondence and assure me in writing that my objection has been entered into the public record.

I expect an answer to my questions in writing and desire to be contacted.

Kevin Conant

3330 Leavesley Road

Gilroy, CA 95020-9000

(408) 391-7992

STATE OF CALIFORNIA
Edmund G. Brown Jr., Governor
NATIVE AMERICAN HERITAGE COMMISSION
Cultural and Environmental Department
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691
Phone (916) 373-3710
Email: nahc@nahc.ca.gov
Website: http://www.nahc.ca.gov
Twitter: @CA_NAHC

October 26, 2018

David Rader
Santa Clara County
70 W. Hedding Street, 7th Floor, East Wing
San Jose, CA 95112

RE: SCH# 2018102041 Z-Best Composting Facility Modifications Project, Santa Clara County

Dear Mr. Rader:

The Native American Heritage Commission (NAHC) has received the Notice of Preparation (NOP), Draft Environmental Impact Report (DEIR) or Early Consultation for the project referenced above. The California Environmental Quality Act (CEQA) (Pub. Resources Code §21000 et seq.), specifically Public Resources Code §21084.1, states that a project that may cause a substantial adverse change in the significance of a historical resource, is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.1; Cal. Code Regs., tit.14, §15064.5 (b) (CEQA Guidelines §15064.5 (b)). If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, an Environmental Impact Report (EIR) shall be prepared. (Pub. Resources Code §21080 (d); Cal. Code Regs., tit. 14, § 5064 subd.(a)(1) (CEQA Guidelines §15064 (a)(1)). In order to determine whether a project will cause a substantial adverse change in the significance of a historical resource, a lead agency will need to determine whether there are historical resources within the area of potential effect (APE).

CEQA was amended significantly in 2014. Assembly Bill 52 (Gatto, Chapter 532, Statutes of 2014) (AB 52) amended CEQA to create a separate category of cultural resources, "tribal cultural resources" (Pub. Resources Code §21074) and provides that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment. (Pub. Resources Code §21084.2). Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource. (Pub. Resources Code §21084.3 (a)). **AB 52 applies to any project for which a notice of preparation, a notice of negative declaration, or a mitigated negative declaration is filed on or after July 1, 2015.** If your project involves the adoption of or amendment to a general plan or a specific plan, or the designation or proposed designation of open space, on or after March 1, 2005, it may also be subject to Senate Bill 18 (Burton, Chapter 905, Statutes of 2004) (SB 18). **Both SB 18 and AB 52 have tribal consultation requirements**. If your project is also subject to the federal National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA), the tribal consultation requirements of Section 106 of the National Historic Preservation Act of 1966 (154 U.S.C. 300101, 36 C.F.R. §800 et seq.) may also apply.

The NAHC recommends consultation with California Native American tribes that are traditionally and culturally affiliated with the geographic area of your proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources. Below is a brief summary of portions of AB 52 and SB 18 as well as the NAHC's recommendations for conducting cultural resources assessments.

Consult your legal counsel about compliance with AB 52 and SB 18 as well as compliance with any other applicable laws.

AB 52

AB 52 has added to CEQA the additional requirements listed below, along with many other requirements:

1. Fourteen Day Period to Provide Notice of Completion of an Application/Decision to Undertake a Project: Within fourteen (14) days of determining that an application for a project is complete or of a decision by a public agency to undertake a project, a lead agency shall provide formal notification to a designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, to be accomplished by at least one written notice that includes:
    a. A brief description of the project.
    b. The lead agency contact information.
    c. Notification that the California Native American tribe has 30 days to request consultation. (Pub. Resources Code §21080.3.1 (d)).
    d. A "California Native American tribe" is defined as a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of Statutes of 2004 (SB 18). (Pub. Resources Code §21073).

2. Begin Consultation Within 30 Days of Receiving a Tribe's Request for Consultation and Before Releasing a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report: A lead agency shall begin the consultation process within 30 days of receiving a request for consultation from a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project. (Pub. Resources Code §21080.3.1, subds. (d) and (e)) and prior to the release of a negative declaration, mitigated negative declaration or Environmental Impact Report. (Pub. Resources Code §21080.3.1(b)).
    a. For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code §65352.4 (SB 18). (Pub. Resources Code §21080.3.1 (b)).

3. Mandatory Topics of Consultation If Requested by a Tribe: The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:
    a. Alternatives to the project.
    b. Recommended mitigation measures.
    c. Significant effects. (Pub. Resources Code §21080.3.2 (a)).

4. Discretionary Topics of Consultation: The following topics are discretionary topics of consultation:
    a. Type of environmental review necessary.
    b. Significance of the tribal cultural resources.
    c. Significance of the project's impacts on tribal cultural resources.
    d. If necessary, project alternatives or appropriate measures for preservation or mitigation that the tribe may recommend to the lead agency. (Pub. Resources Code §21080.3.2 (a)).

5. Confidentiality of Information Submitted by a Tribe During the Environmental Review Process: With some exceptions, any information, including but not limited to, the location, description, and use of tribal cultural resources submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with Government Code §6254 (r) and §6254.10. Any information submitted by a California Native American tribe during the consultation or environmental review process shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public. (Pub. Resources Code §21082.3 (c)(1)).

6. Discussion of Impacts to Tribal Cultural Resources in the Environmental Document: If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document shall discuss both of the following:
    a. Whether the proposed project has a significant impact on an identified tribal cultural resource.
    b. Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to Public Resources Code §21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource. (Pub. Resources Code §21082.3 (b)).

7. Conclusion of Consultation: Consultation with a tribe shall be considered concluded when either of the following occurs:
   a. The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or
   b. A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. (Pub. Resources Code §21080.3.2 (b)).

8. Recommending Mitigation Measures Agreed Upon in Consultation in the Environmental Document: Any mitigation measures agreed upon in the consultation conducted pursuant to Public Resources Code §21080.3.2 shall be recommended for inclusion in the environmental document and in an adopted mitigation monitoring and reporting program, if determined to avoid or lessen the impact pursuant to Public Resources Code §21082.3, subdivision (b), paragraph 2, and shall be fully enforceable. (Pub. Resources Code §21082.3 (a)).

9. Required Consideration of Feasible Mitigation: If mitigation measures recommended by the staff of the lead agency as a result of the consultation process are not included in the environmental document or if there are no agreed upon mitigation measures at the conclusion of consultation, or if consultation does not occur, and if substantial evidence demonstrates that a project will cause a significant effect to a tribal cultural resource, the lead agency shall consider feasible mitigation pursuant to Public Resources Code §21084.3 (b). (Pub. Resources Code §21082.3 (e)).

10. Examples of Mitigation Measures That, If Feasible, May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:
    a. Avoidance and preservation of the resources in place, including, but not limited to:
       i. Planning and construction to avoid the resources and protect the cultural and natural context.
       ii. Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.
    b. Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:
       i. Protecting the cultural character and integrity of the resource.
       ii. Protecting the traditional use of the resource.
       iii. Protecting the confidentiality of the resource.
    c. Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.
    d. Protecting the resource. (Pub. Resource Code §21084.3 (b)).
    e. Please note that a federally recognized California Native American tribe or a non-federally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed. (Civ. Code §815.3 (c)).
    f. Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated. (Pub. Resources Code §5097.991).

11. Prerequisites for Certifying an Environmental Impact Report or Adopting a Mitigated Negative Declaration or Negative Declaration with a Significant Impact on an Identified Tribal Cultural Resource: An Environmental Impact Report may not be certified, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:
    a. The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code §21080.3.1 and §21080.3.2 and concluded pursuant to Public Resources Code §21080.3.2.
    b. The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.
    c. The lead agency provided notice of the project to the tribe in compliance with Public Resources Code §21080.3.1 (d) and the tribe failed to request consultation within 30 days. (Pub. Resources Code §21082.3 (d)).

The NAHC's PowerPoint presentation titled, "Tribal Consultation Under AB 52: Requirements and Best Practices" may be found online at: http://nahc.ca.gov/wp-content/uploads/2015/10/AB52TribalConsultation_CalEPAPDF.pdf

SB 18

SB 18 applies to local governments and requires local governments to contact, provide notice to, refer plans to, and consult with tribes prior to the adoption or amendment of a general plan or a specific plan, or the designation of open space. (Gov. Code §65352.3). Local governments should consult the Governor's Office of Planning and Research's "Tribal Consultation Guidelines," which can be found online at: https://www.opr.ca.gov/docs/09_14_05_Updated_Guidelines_922.pdf

Some of SB 18's provisions include:

1. Tribal Consultation: If a local government considers a proposal to adopt or amend a general plan or a specific plan, or to designate open space it is required to contact the appropriate tribes identified by the NAHC by requesting a "Tribal Consultation List." If a tribe, once contacted, requests consultation the local government must consult with the tribe on the plan proposal. **A tribe has 90 days from the date of receipt of notification to request consultation unless a shorter timeframe has been agreed to by the tribe.** (Gov. Code §65352.3 (a)(2)).
2. No Statutory Time Limit on SB 18 Tribal Consultation. There is no statutory time limit on SB 18 tribal consultation.
3. Confidentiality: Consistent with the guidelines developed and adopted by the Office of Planning and Research pursuant to Gov. Code §65040.2, the city or county shall protect the confidentiality of the information concerning the specific identity, location, character, and use of places, features and objects described in Public Resources Code §5097.9 and §5097.993 that are within the city's or county's jurisdiction. (Gov. Code §65352.3 (b)).
4. Conclusion of SB 18 Tribal Consultation: Consultation should be concluded at the point in which:
    - **a.** The parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or
    - **b.** Either the local government or the tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning the appropriate measures of preservation or mitigation. (Tribal Consultation Guidelines, Governor's Office of Planning and Research (2005) at p. 18).

Agencies should be aware that neither AB 52 nor SB 18 precludes agencies from initiating tribal consultation with tribes that are traditionally and culturally affiliated with their jurisdictions before the timeframes provided in AB 52 and SB 18. For that reason, we urge you to continue to request Native American Tribal Contact Lists and "Sacred Lands File" searches from the NAHC. The request forms can be found online at: http://nahc.ca.gov/resources/forms/

NAHC Recommendations for Cultural Resources Assessments

To adequately assess the existence and significance of tribal cultural resources and plan for avoidance, preservation in place, or barring both, mitigation of project-related impacts to tribal cultural resources, the NAHC recommends the following actions:

1. Contact the appropriate regional California Historical Research Information System (CHRIS) Center (http://ohp.parks.ca.gov/?page_id=1068) for an archaeological records search. The records search will determine:
    - **a.** If part or all of the APE has been previously surveyed for cultural resources.
    - **b.** If any known cultural resources have already been recorded on or adjacent to the APE.
    - **c.** If the probability is low, moderate, or high that cultural resources are located in the APE.
    - **d.** If a survey is required to determine whether previously unrecorded cultural resources are present.

2. If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
    - **a.** The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure.
    - **b.** The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.

3. Contact the NAHC for:
    a. A Sacred Lands File search. Remember that tribes do not always record their sacred sites in the Sacred Lands File, nor are they required to do so. A Sacred Lands File search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with the geographic area of the project's APE.
    b. A Native American Tribal Consultation List of appropriate tribes for consultation concerning the project site and to assist in planning for avoidance, preservation in place, or, failing both, mitigation measures.

4. Remember that the lack of surface evidence of archaeological resources (including tribal cultural resources) does not preclude their subsurface existence.
    a. Lead agencies should include in their mitigation and monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources per Cal. Code Regs., tit. 14, §15064.5(f) (CEQA Guidelines §15064.5(f)). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American with knowledge of cultural resources should monitor all ground-disturbing activities.
    b. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the disposition of recovered cultural items that are not burial associated in consultation with culturally affiliated Native Americans.
    c. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the treatment and disposition of inadvertently discovered Native American human remains. Health and Safety Code §7050.5, Public Resources Code §5097.98, and Cal. Code Regs., tit. 14, §15064.5, subdivisions (d) and (e) (CEQA Guidelines §15064.5, subds. (d) and (e)) address the processes to be followed in the event of an inadvertent discovery of any Native American human remains and associated grave goods in a location other than a dedicated cemetery.

If you have any questions or need additional information, please contact me at my email address: Debbie.Treadway@nahc.ca.gov.

Sincerely,

Nancy Gonzalez

for Debbie Treadway
Enviromental Scientist

cc: State Clearinghouse

Public Scoping Meeting for the Environmental Impact Report on the Z-Best Composting Facility Modifications Project

SCOPING COMMENTS (Please print clearly and legibly)

Please hand in during the meeting or mail (address on back) or email by ***November 16, 2018.***

Name: Jason Retterer

Organization (if any): Johnson, Rovella, Retterer, Rosenthal + Gilles, LLP

Address (optional): 318 Cayuga St.

City, State, Zip: Salinas, CA 93901

E-mail: jason@jrgattorneys.com

This comment form is being furnished to obtain suggestions and information from the public on the scope of issues and alternatives that will be addressed in the EIR. All comments received, including names and addresses, will become part of the official administrative record and may be made available to the public.

Comments (Please print clearly and legibly)

The Draft EIR must address the potential direct and indirect impacts on agricultural resources. Accordingly, the Draft EIR must address potential impacts of the expanded throughput on adjacent agricultural land, including the potential for pathogens to be transferred to off-site ag land by wind or through underlying groundwater. The EIR should specifically address whether and to what extent buffers are required to preserve the integrity of the row crops and farmland offsite. Currently, based on food safety requirements, the farmer to the south must maintain a 20-40 foot wide buffer due to the existence

(*More space on reverse side*)

existence of Z-Best. This land has been taken out of production. Of specific concern is an activity that is being placed closer to the adjacent farmland. The Draft EIR should also explore whether other mitigation like perimeter fencing is required to prevent air borne transport of debris and potential pathogens to adjacent farm land.

Thank you.

Send comments to:

David Rader
County Government Center, East Wing, 7th Floor
70 W. Hedding Street, San Jose 95110
david.rader@pln.sccgov.org

CalRecycle

DEPARTMENT OF RESOURCES RECYCLING AND RECOVERY

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P.O. BOX 4025, SACRAMENTO, CALIFORNIA 95812

November 14, 2018

David Rader
County of Santa Clara
Department of Planning and Development
70 West Hedding Street
San Jose, CA 95112

Subject: SCH No. 2018102041 –Notice of Preparation of an Environmental Impact Report for the Z-Best Composting Facility Modifications Project. Facility No. 43-AA-0015, Santa Clara County.

Dear Mr. Rader:

Thank you for allowing the Department of Resources Recycling and Recovery (CalRecycle) staff to provide comments on the proposed project and for your agency's consideration of these comments as part of the California Environmental Quality Act (CEQA) process.

PROJECT DESCRIPTION

County of Santa Clara Department of Planning and Development, acting as Lead Agency, has prepared and circulated a Notice of Preparation (NOP) of an Environmental Impact Report (EIR) in order to comply with CEQA and to provide information to, and solicit consultation with, Responsible Agencies in the approval of the proposed project.

The proposed project site is the existing Z-Best Composting Facility at 980 Highway 25, which currently operates under a County-issued Use Permit. The proposed project includes modification of Z-Best's existing composting process from the current windrow method to an aerated static pile process, and associated changes in operations and site design. The proposed new composting process would occur within the already developed area of the existing composting facility. The proposed new process would result in a throughput increase from the current max of 1,500 tons to 2,750 tons per day, which would require an additional 59 trucks per day. The project proponent has proposed that the increased truck trips be confined to the hours of 8 p.m. to 4 a.m.

COMMENTS

Composting Process

The proposed project description states that the "primary composting" process will utilize "a six-inch bio-layer (clean cover material) intended to provide insulation to ensure adequate pathogen control and temperatures, and to function as an in-situ biofilter layer to reduce odors from volatile organic chemical released from the top of the pile." Staff requests a description of the

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"clean cover material" to be used as the biofilter layer, as well a description of the periodic maintenance of the biofilter to ensure efficiency in reducing potential odor emissions.

Pursuant to Title 14 California Code of Regulations (14 CCR), section 17863.4, the facility's Odor Impact Minimization Plan (OIMP) will also need to be revised accordingly to reflect the proposed changes in composting process and incoming waste tonnage.

Operations

The project description states that the proposed new composting process will result in an increase in throughput of finished compost from the current maximum of 1,500 tons per day to 2,750 tons per day. Staff requests a description of estimated quantities of feedstock and additives that will be processed as a result of the proposed daily tonnage increase. The project description also needs to clarify that the proposed increase in daily tonnage from 1,500 tons per day to 2,750 tons per day pertains to incoming feedstock (to be processed into compost) and not the amount of finished compost (after undergoing the composting process and meeting environmental sampling standards). The current Solid Waste Facilities Permit allows the facility to receive a maximum of 1,500 tons per day of composting feedstock through the gate.

The project description further states that the proposed waste tonnage increase would require an additional 59 truck trips per day. In the interest of clarity, staff requests the inclusion of the total number of vehicles per day allowed at the facility with the approval of this project.

Solid Waste Regulatory Oversight

The Santa Clara County, Environmental Health Division is the Local Enforcement Agency (LEA) and is responsible for providing regulatory oversight of solid waste handling activities, including inspections. Please contact the LEA, Jaji Murage, at 408.918.3405 to discuss the regulatory requirements for the proposed project.

Prior to implementation of the proposed project, the operator shall submit an application package to the LEA in order to revise their current Solid Waste Facilities Permit pursuant to Title 27 California Code of Regulations (27 CCR), section 21570, which shall be processed by the LEA pursuant to 27 CCR, section 21650.

CONCLUSION

CalRecycle staff thanks the Lead Agency for the opportunity to review and comment on the environmental document and hopes that this comment letter will be useful to the Lead Agency preparing the EIR and in carrying out their responsibilities in the CEQA process.

CalRecycle staff requests copies of any subsequent environmental documents, copies of public notices and any Notices of Determination for this proposed project.

If the environmental document is certified during a public hearing, CalRecycle staff requests 10 days advance notice of this hearing. If the document is certified without a public hearing, CalRecycle staff requests 10 days advance notification of the date of the certification and proposed project approval by the decision making body.

If you have any questions regarding these comments, please contact me at 916.341.6427 or by e-mail at eric.kiruja@calrecycle.ca.gov.

Sincerely,

Eric Kiruja

Eric Kiruja
Permitting & Assistance Branch – North Unit
Waste Permitting, Compliance & Mitigation Division
CalRecycle

cc: Patrick Snider, Supervisor: Permitting & Assistance Branch – North Unit

Jaji Murage, County of Santa Clara LEA

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Teresa Barrett
Shirlee Zane

Jack P. Broadbent
EXECUTIVE OFFICER/APCO

Connect with the
Bay Area Air District:

November 15, 2018

David Rader
Department of Planning and Development
County Government Center
70 West Hedding Street
San Jose, CA 95110

RE: NOP on Z-Best Composting Modifications

Dear Mr. Rader,

Bay Area Air Quality Management District (Air District) staff has reviewed the notice of preparation (NOP) for a draft environmental impact report (DEIR) on the Z-Best Composting Facility Modifications (Project). This DEIR will examine the potential impacts from conversion of an existing composting operation using windrows-based composting methods to one using aerated static piles. The planned modification includes an increase in maximum daily throughput from 1,500 to 2,750 tons per day (tpd), an estimated doubling in truck trips per day, and a proposal to restrict truck trips to between 8pm to 4am. The Project will be required to obtain an authority to construct and a permit to operate from the Air District for its composting operation. We recommend that the project proponent initiate the permit application as soon as practicable.

While the NOP contains many details about the project, the project description does not identify some critical information about the project, such as (i) the parts of the existing facility that are being expanded and/or replaced, (ii) the materials being brought in for processing, and (iii) the anticipated products and their markets. Air District staff recommends that the project description in the DEIR include this information and the air quality analysis consider it within the impact discussion.

Air District staff recommends that the following information be provided in the DEIR:

- An evaluation of proximity of nearby receptors including schools, residential areas and businesses, and potential impacts of air pollutant emissions and odors.
- An estimate of construction-related emissions of particulate matter, ozone precursors (NOx/ROG), and greenhouse gases in pounds per day and tons per year.
- An estimate of daily and annual emissions of particulate matter, ozone precursors (NOx/ROG), and greenhouse gases in pounds per day and tons per year from all on-road and off-road mobile sources of emissions.

- A cumulative emission estimate of all on-road and off-road mobile sources of emissions for particulate matter, ozone precursors (NOx/ROG), and greenhouse gases associated with the existing operations and the proposed Project.
- An estimate of total vehicle miles traveled (VMT) by vehicle class. This VMT assessment should be based on where the material to be composted will be coming from and where the finished products will be transported once the composting is completed. This analysis should not be limited to just VMT in the Bay Area Air Basin (Air Basin). All vehicle miles traveled within or outside the Air Basin should be estimated and used in the emission estimate for on-road air quality impacts.
- A project-alone and a cumulative health risk analysis to assess the potential health impacts associated with any increase in emissions at the facility on nearby sensitive receptors or sensitive receptors along State Route 25.
- Identification of all emission sources at the existing facility by source name (including the permitted source number, where available). If the proposed aerated composting process retires and/or replaces current processes, the DEIR should be explicit about sources being retained and those being replaced.
- An estimate of the potential air emissions associated with any new or modified transfer station (e.g., the tipping building), whether off-site or on-site.
- An estimate of current actual air emissions, the current permitted air emissions, and the air emissions for the proposed project from both new or modified sources. If the proposed aerated composting process retires and/or replaces current processes, any associated emissions reductions associated with their retirement and replacement should be clearly detailed.
- The emission factors used to estimate emissions, the emission calculation formulas, parameters, assumptions and bases (such as throughputs), particularly for emissions associated with the existing windrows and with the proposed aerated static piles. If any parameter and/or emission factor is different than from current source permitting (see Engineering Evaluation for 2017 Permit Application 28251), a detailed explanation and justification for the difference should be provided. If the project will include emissions testing, please describe the testing method and protocol that will be used.
- All emission estimates should be clearly associated with its source name and permitted source number. Throughput for each emission source should detail feedstock material type and rate. The DEIR should clearly describe any Best Available Control Technology emissions controls included in the project. If biofilters will be used, please supply information about their design and maintenance schedule.
- Details about the handling and storing of feedstock, product, and byproduct materials, such as pile design characteristics (e.g., height and length, among others) and pile management methods (e.g., limits on residence time, pile tagging, etc).
- An assessment of available land and alternative configurations that can buffer management of feedstock piles and of product and/or byproduct piles against shocks in inflows and outflows. The goal should be to prevent disruptions to best practices in material handling and storage.
- The impact of the proposed material delivery schedule between 8pm and 4am on the storage of materials, either on-site or off-site, given that organic materials may be collected by scavengers outside the hours of 8pm to 4am.
- Operational changes that may occur due to the planned expansion from 1,500 to 2,750 tpd, with a focus on how the expansion will impact permitted operations. The current air permit limits operation to

this facility to 10 hours per calendar day and 56 hours per calendar week, and we encourage the EIR to reconcile these limits with the proposal for delivery between 8pm-4 am.

Air District staff is available to assist the County in addressing these comments, and we recommend that the County and its consultants meet with Air District staff to discuss them. For such discussion or for assistance with any questions that arise, please contact Chad White, Senior Environmental Planner, at 415-749-8619 or cwhite@baaqmd.gov.

Sincerely,

Greg Nudd
Deputy Air Pollution Control Officer

cc: BAAQMD Director Margaret Abe-Koga
BAAQMD Director Cindy Chavez
BAAQMD Director Liz Kniss
BAAQMD Director Rod Sinks

SBCOG
Council of
San Benito
County Governments

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November 15, 2018

David Rader
Santa Clara County
Department of Planning and Development
70 West Hedding Street, East Wing, 7th Floor
San Jose, CA 95110

RE: Z- Best Composting Facility Modifications Project; File Number 6498-17P

Dear Mr. Rader:

The Council of San Benito County Governments (COG) is the Regional Transportation Planning Agency for San Benito County. One of our priority highway corridors in San Benito County is State Route 25. In 2016, COG completed a study of State Route 25 and identified needed safety and operational improvements to the area near the intersection of Bolsa Road and the entrance to the Z-Best facility. A copy of the Highway 25 Widening Design Alternatives Analysis Study is available online at www.sanbenitocog.org.

In May 2017, COG reviewed the Traffic Operations and Site Access Analysis prepared for the Z-Best Composting Major Use Permit Modification application. The COG Board of Directors voted unanimously to send a letter opposing any expansion of operations at Z-Best due to traffic constraints, safety concerns and the overall impact to local residents using Highway 25 as the primary route to/from Santa Clara County.

In response to the Notice of Preparation dated October 15, 2018, San Benito COG submits the following comments for consideration when preparing the Environmental Impact Report for the proposed Project.

1. Impacts of Ingress/Egress at SR 25: COG is concerned that traffic entering and exiting the project area onto State Route 25 will adversely impact the flow of traffic on the highway, including vehicles that are stopped making a left turn into the facility. The traffic analysis should fully evaluate the proposed construction of acceleration and deceleration lanes on SR 25 for the driveway, as well as the opportunity to consolidate access with other commercial properties adjacent to the Z-best property. In addition, the EIR should consider improvements needed to better address visibility of the project driveway along State Route 25.

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2. Proposed Highway Improvements: COG coordinated with Caltrans and Santa Clara Valley Transportation Authority to prepare an EIR for the Highway 25 Safety and Operational Enhancements Project. The EIR was certified in 2005. That project identified intersection improvements and other safety measures in the project area, including access to both the Z-Best property and its neighboring farm to the north, Uesugi Farms. COG recommends that the EIR for the Z-Best project evaluate the alternatives outlined in the 2005 Highway 25 Safety and Operational Enhancements Project EIR and more recently reviewed and recommended in COG's 2016 Highway 25 Widening Design Alternatives Analysis.

3. Peak Traffic Periods: COG recommends that the hours of 5 a.m. to 9 a.m. be evaluated as the A.M. peak period, as the roadway is used by long-distance commuters traveling earlier in the day. In the P.M. peak, COG recommends that the hours of 2 p.m. to 8 p.m. be evaluated.

4. Employee Traffic: the Traffic and Circulation element of the EIR should evaluate site access and circulation with a focus on impacts to SR 25 both from additional truck trips as well as for additional employee trips to and from the facility.

5. COG also recommends that the elimination of left turns from the facility to Northbound SR 25 be evaluated in the traffic and circulation element of the EIR.

6. Aesthetics: the facility is located at the gateway to San Benito County and as such its aesthetics and odor-production should be evaluated in this context within the EIR.

7. The EIR should evaluate impacts to State Route 25 operations related to construction.

Should you have any questions, please contact Mary Gilbert, Executive Director, at (831) 637-7665, extension 207.

Sincerely,

Jaime De La Cruz

Council of San Benito County Governments
330 Tres Pinos Rd, Suite C7
Hollister, CA 95023

DEPARTMENT OF TRANSPORTATION
DISTRICT 4
OFFICE OF TRANSIT AND COMMUNITY PLANNING
P.O. BOX 23660, MS-10D
OAKLAND, CA 94623-0660
PHONE (510) 286-5528
FAX (510) 286-5559
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www.dot.ca.gov

Making Conservation
a California Way of Life.

November 16, 2018

SCH # 2018102041
GTS # 04-SCL-2016-00487
GTS ID: 2423
PM: SCL – 25 – 0.63

David Rader
Santa Clara County
70 W. Hedding Street
7th Floor, East Wing
San Jose, CA 95112

Z-Best Composting Facility Modifications Project – Notice of Preparation (NOP)

Dear David Rader:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the above referenced Project. In tandem with the Metropolitan Transportation Commission's (MTC) Sustainable Communities Strategy (SCS), Caltrans' mission signals a modernization of our approach to evaluate and mitigate impacts to the State Transportation Network (STN). Caltrans' *Strategic Management Plan 2015-2020* aims to reduce Vehicle Miles Traveled (VMT) in part, by tripling bicycle and doubling both pedestrian and transit travel by 2020. Our comments are based on the October 15, 2018 NOP.

Project Understanding
The proposed project site is the existing Z-Best Composting Facility at 980 State Route (SR) 25, which currently operates under a County-issued Use Permit. The proposed project includes modification of Z-Best's existing composting process from the current windrow method to an aerated static pile process, and associated changes in operations and site design. The proposed new composting process would occur within the already developed area of the existing composting facility. The proposed new process would result in a throughput increase from the current maximum of 1,500 tons to 2,750 tons per day, which would require an additional 59 trucks per day. The project proponent has proposed that the increased truck trips be confined to the hours of 8 pm to 4 am. The interchange of US Route (US) 101 and SR 25 is approximately two miles driving distance to the west of the project site.

State Highway Access
Any proposed access improvements, including the proposed southbound left-turn lane on SR 25, must conform with the latest *Caltrans Highway Design Manual*. This project proposes a northbound left-turn lane on SR 25 into the project driveway; please make sure the storage length can accommodate all projected trucks arriving per cycle without impacting SR 25, if not,

a longer storage lane is required. Regarding the proposed northbound SR 25 "Lane Reduction Arrows" and "Length of a Lane Reduction Transition", we recommend using distances shown in the latest *California Manual of Uniform Traffic Control Devices* (CA MUTCD), Figure 3B-14. Any deviations from those distances will require review and approval from Caltrans. Plans should show State right-of-way (ROW), dimensions and configuration of both project access and State ROW, number of lanes, shoulder widths, existing obstructions including trees, and sufficient detail of proposed improvements to ensure that they are feasible and that sufficient ROW exists to complete the improvements as envisioned in the analysis.

Freight Mobility
Please analyze the Average Annual Daily Truck Trips (AADTT) entering and exiting the Z-Best facility and the potential impacts to the SR 25 and US 101 corridors as well as surrounding local streets and roads in both Santa Clara County and neighboring counties. An analysis of proposed truck weights, types, and configurations and potential impacts to pavement conditions for the previously mentioned highways and local roads is also advised. All analyses should measure the impacts of trucks both entering and exiting the proposed facility during the construction phase of the proposed project and during normal facility operating conditions.

Any considerations on how the proposed facility can help improve freight sustainability, operations and efficiency in California is welcomed. Caltrans is dedicated to moving freight on a modern, safe, integrated, and resilient system that supports the economy, jobs, and healthy, livable communities. In the Caltrans *Strategic Management Plan* (2015-2020), Caltrans has established an objective to improve economic prosperity of the State and local communities through a resilient and integrated transportation system. Freight system competitiveness, transportation system efficiency, and a return on transportation investments are key performance measures established for freight in support of the Caltrans *Strategic Management Plan*.

Hydraulics
The project is located within the 100-year floodplain and between Uvas Creek and Pajaro River. Any impact to the base floodplain and natural flow of the creeks due to the development and site geographical modifications shall be evaluated. Site drainage plans shall be submitted to Caltrans for review to ensure that there is no adverse impact to the state highway and its drainage facilities.

Lead Agency
As the Lead Agency, the County of Santa Clara is responsible for all project mitigation, including any needed improvements to the STN. The project's fair share contribution, financing, scheduling, implementation responsibilities and lead agency monitoring should be fully discussed for all proposed mitigation measures.

Encroachment Permit
Please be advised that any work or traffic control that encroaches onto the State ROW requires an encroachment permit that is issued by Caltrans. To obtain an encroachment permit, a completed encroachment permit application, environmental documentation, and six (6) sets of

plans clearly indicating the State ROW, and six (6) copies of signed and stamped traffic control plans must be submitted to: Office of Encroachment Permits, California DOT, District 4, P.O. Box 23660, Oakland, CA 94623-0660. To download the permit application and obtain more information, visit http://www.dot.ca.gov/hq/traffops/developserv/permits/.

Thank you again for including Caltrans in the environmental review process. Should you have any questions regarding this letter, please contact Jake Freedman at 510-286-5518 or jake.freedman@dot.ca.gov.

Sincerely,

PaC

PATRICIA MAURICE
District Branch Chief
Local Development - Intergovernmental Review

c: State Clearinghouse

City of Hollister
Development Services

339 Fifth Street, Hollister, CA. 95023 Telephone (831) 636-4360 • Fax (831) 634-4913

November 16, 2018

To: County of Santa Clara
Department of Planning and Development
Attn: David Rader
County Government Center
70 West Hedding Street
San Jose, California 95110

From: City of Hollister Development Services Department
339 Fifth Street
Hollister, California 95023

RE: Notice of Preparation of an Environmental Impact Report for the Z-Best Composting Facility Modifications Project

Dear Mr. Rader,

The City of Hollister received a Notice of Preparation for the preparation of an Environmental Impact Report for the Z-Best Composting Facility Modifications Project on October 16, 2018. The City of Hollister Development Review Committee reviewed the Notice of Preparation in order to prepare a written response to the Notice of Preparation.

The City of Hollister appreciates the opportunity to respond to the Notice of Preparation for the Z-Best Composting Facility Modifications Project. The City of Hollister recognizes that the facility is several miles from the corporate limits of the City, but the facility does have an effect on our businesses and residents. Since the 1970's an increasing number of residents living in City of Hollister commute on Highway 25 to jobs in the Santa Clara Valley due primarily to the long-standing lack of housing production in relation to job generation. The corridor Z-Best operation is located close to the boundary between Santa Clara and San Benito Counties on the primary commute corridor to the Santa Clara Valley. The City of Hollister requests that the Environmental Impact Report address the following:

1. Project Description:
   a. Include maps that clearly illustration the location, length and design of the proposed acceleration and deceleration lanes and the timing for the improvement. When will the improvements be completed?

2. Aesthetics
   a. The Z-Best operation is close to the end of Santa Clara County but is near the Gateway to San Benito County. The combination of odor and appearance of the existing operations detract from the aesthetics leading to San Benito County. This affects the perception of prospective businesses, travelers visiting Pinnacles National Park, Hollister Hills State Vehicular Recreation Areas and our wine trails. It is recognized that the operation exists and CEQA analysis is limited to evaluating the existing plus project conditions. Careful consideration of the aesthetics of the operation on one of the primary corridors leading to the City of Hollister would be greatly appreciated.

3. Air Quality/Project Description
   a. The project proposes to convert the composting process from a windrow composting system to a state aerated pile composting system using technology from Engineered Compost Systems. The odors at the existing facility affect drivers with allergies driving to and from the City of Hollister and there have been ongoing complaints in the community about the objectionable smell from the existing operation. Describe in the EIR the consistency of the existing operation with air quality standards for odor and the existing

plus project impact of odor and the health effects of the concentrated emissions/odors to drivers that use the corridor daily to commute that have allergic reactions to the facility. Describe in the EIR the effectiveness of the proposed system with the proposed scale of the operation. Evaluate other alternative compost strategies.

b. What type of monitoring and remediation will be used if odor impacts and allergic reactions remain/increase?

4. Traffic and Circulation
   a. The project proposes to limit truck traffic from the hours of 8pm to 4am. How will this be monitored and enforced? A large number of commuters use the corridor to travel to work early in the morning. 24-hour traffic counts at the intersection should be used to establish whether there are peak hours besides the typical 7-9am and 4-6pm.
   b. Debris on Highway 25 near the Z-Best operations has posed safety hazards to residents in our community, especially on a motorcycle. Please describe the measures to limit transport of debris onto the highway and safety impacts and mitigation measures.

The City of Hollister appreciates the opportunity to submit comments on the Notice of Preparation. Please contact the City Development Services Department at (831) 636-4360 should you have any questions regarding this letter.

Sincerely,

Eva Kelly

Eva Kelly
City of Hollister Development Services Department

APPENDIX B

Air Quality and Greenhouse Gas Emissions Report
Truck Traffic Health Risk Assessment
Composting Operations Toxic Air Contaminant Emissions Evaluation
Peer Review of Odor Dispersion Report
Odor Air Dispersion Report

EMC PLANNING GROUP INC.
A LAND USE PLANNING & DESIGN FIRM

301 Lighthouse Avenue Suite C Monterey California 93940
Tel 831·649·1799 Fax 831·649·8399 www.emcplanning.com

To: **David Rader, Senior Planner**

From: **Ron Sissem, Principal**

Date: **March 23, 2020**

Re: **Peer Review of SCS Emissions Report**

Message:

At the request of the County, EMC Planning Group has conducted an independent review of the *Emissions from Proposed Changes to Z-Best Facility in Gilroy, California* dated December 20, 2019 prepared by SCS Engineers on behalf of Z-Best Products to verify the technical accuracy of the information, and identify any apparent deficiencies, errors and omissions affecting the completeness, methodologies, findings and adequacies of the analysis.

As a part of the review, EMC Planning Group requested revisions to reflect correct site acreage, peak truck traffic emissions, and typos. The county staff was advised of the necessary revisions or additions to the report. In turn, SCS Engineers modified the report to address the requested revisions.

This review letter and updated report from SCS Engineers are a part of the administrative record for the EIR. As revised, the *Emissions from Proposed Changes to Z-Best Facility in Gilroy, California* as revised is appropriate for use as reference in the EIR.

MEMORANDUM

December 20, 2019
File No. 01219043.00

Mr. John Doyle
Operations Manager
Z-Best Products
980 State Highway 25
Gilroy, California

Subject: Emissions from Proposed Changes to Z-Best Facility in Gilroy, California

Dear Mr. Doyle:

Z-Best Composting (Z-Best) has prepared a Notice of Preparation (NOP) for proposed changes (Project) at the Z-Best facility at 980 State Highway 25, Gilroy (Site). The Bay Area Air Quality Management District (BAAQMD) provided comments on the California Environmental Quality Act (CEQA) Notice of Preparation (NOP) for the Project in a November 15, 2018 letter to the County of Santa Clara Department of Planning and Development. At the request of Z-Best, SCS Engineers (SCS) has prepared this response to BAAQMD questions.

The project includes the removal of the existing municipal solid waste (MSW) and foodwaste in-vessel composting system (CTI bag system) and the construction of a primary covered aerated static pile (CASP) and a secondary (curing) aerated static pile composting for MSW and foodwaste composting. The CASP system would have negative aeration with emissions controlled by biofilters for primary (active) composting and positively aerated static piles for secondary (curing) composting. The Project also includes site improvements, such as modifications to the detention basin. The Project will result in the capacity to compost an additional 875 tons per day (tpd) of MSW and/or foodwaste.

This additional 875 tpd of composting capacity would be permitted as an increase in the monthly capacity for the site. Composting reactive organic gas (ROG) emissions occur over the composting cycle, so it is appropriate to evaluate the daily change in ROG emissions based on this daily average composting rate. The project would also increase the peak daily composting rate, but this peak daily rate is independent of the monthly throughput rate.

Construction-Related Emissions

The BAAQMD requested that the emissions from the construction of the Project be quantified.

To calculate the construction emissions from the Project, SCS evaluated the project the California Emission Estimator Model (CalEEMod). The emissions calculated include mobile sources and on-road emissions related to construction, including emissions from worker commutes and the importation of soil. The emissions were calculated using construction information including the area of surface disturbed, equipment counts, and the duration of construction activities provided by Z-Best and Golder Engineering, who prepared project drawings. The pollutants analyzed include ROG, oxides of nitrogen (NO_x), carbon monoxide (CO), sulfur dioxide (SO_2), respirable particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), and greenhouse gas (GHG).

A summary of basic project information is shown in Table 1.

Table 1. Basic Project Information

Parameter	Value
Location	Santa Clara County
Climate Zone	4
Land Use Type	General Light Industry
Lot Acreage	157.32

John Doyle provided an expected construction schedule and equipment counts. Construction would occur in three phases: grading, trenching, and paving. The duration and equipment count for each phase are shown in Table 2.

Table 2. Construction Phases and Equipment

Parameter	Grading	Trenching	Paving
Duration (months)	3	2	3
Graders	1		
Off-highway trucks (water truck)	1		
Other construction equipment (compactor)	1		
Rubber tired dozer	1		
Scraper	5		
Tractors/Loaders (includes excavator)		2	
Off-highway trucks (concrete pump truck)			1
Other construction equipment (concrete finisher)			1
Paver			1
Paving Equipment			1

The project includes the use of a water truck, which would mitigate dust emissions from soil operations and off-road vehicle travel. These mitigation measures were included in CalEEMod emission calculations. Emissions for the Project construction phase and off-site construction emissions are shown in Table 3 on an annual and a per day basis for summer and winter emissions. CalEEMod outputs, including all input parameters, are included in Attachment A.

On-Road Emissions

The BAAQMD also requested the quantification of emissions from on-road vehicles. On-road vehicle emissions were calculated using the vehicle miles traveled (VMT) provided by Hexagon Engineering and emission factors Emission Factor (EMFAC) model. Employee trips are assumed to be light duty auto (LDA). Haul vehicles are assumed to be tractor trailers. A summary of the VMT by and emission factor by trip type is shown in Table 4. The emissions are shown in Table 5. The EMFAC output is included in Attachment B.

Table 3. Construction Emissions

Period	ROG	NO_x	CO	SO_2	Fugitive PM_{10} (dust)	Exhaust PM_{10}	Total PM_{10}	Fugitive $PM_{2.5}$ (dust)	Exhaust $PM_{2.5}$	Total $PM_{2.5}$	Total GHG[1]
Annual (tons/year)	0.393	2.01	2.73	0.008	0.261	0.168	0.429	0.082	0.154	0.236	747
Summer (lb/day)	8.44	111	56.7	0.176	6.28	3.63	9.92	1.99	3.34	5.33	17,773
Winter (lb/day)	8.47	111	56.9	0.175	6.28	3.63	9.92	1.99	3.35	5.33	17,638
Off-Site (lb-day)	0.768	22.67	5.48	0.066	1.66	0.076	1.74	0.453	0.073	0.525	7,004

[1]Annual GHG Emissions shown in Metric tons of CO2 equivalent (MTCO2e) per year, daily emissions in pounds of CO2 equivalent per day

Table 4. On-Road VMT and Emission Factors

Trip Type	VMT/day	Emission Factors (g/VMT)						
		ROG	NO_x	CO	SO_2	Exhaust PM_{10}	Exhaust $PM_{2.5}$	Total GHG
Existing								
Employees	3090	0.0133	0.0536	0.761	0.00273	0.00161	0.00148	276
Trucks	7348	0.161	4.58	0.597	0.0133	0.0952	0.0911	1410
Post Project								
Employees	4076	0.0133	0.0536	0.761	0.00273	0.00161	0.00148	276
Trucks	15060	0.161	4.58	0.597	0.0133	0.0952	0.0911	1410

Table 5. On-Road Emissions

Trip Type	Emissions (lb/day)						
	ROG	NO_x	CO	SO_2	Exhaust PM_{10}	Exhaust $PM_{2.5}$	Total GHG
Existing							
Employees	0.091	0.36	5.18	0.019	0.011	0.010	1,879
Trucks	2.61	74.13	9.66	0.22	1.54	1.47	22,821
Post Project							
Employees	0.12	0.48	6.83	0.025	0.014	0.013	2,478
Trucks	5.34	151.93	19.80	0.44	3.16	3.02	46,772
Trucks (peak days)	6.93	197.20	25.71	0.57	4.10	3.92	60,711

Listing of Emission Sources

The BAAQMD has requested a listing of emission sources at the existing facility by source name and permitted source number. Emission sources for both the existing facility and the post-Project facility are listed in Table 6.

The Project includes the removal of S-28, the enclosed vessel for composting, the construction of the CASP and biofilter system, upgrading the overs screen, and the addition of a new electric trommel screen. The Site is also in the process of adding a new grinder and diesel engine to power the grinder, which is unrelated to the Project but has been included in Table 6 for completeness.

Table 6. Existing and Proposed Emission Sources

Emission Source	Permit Number	Existing	Post-Project
Green Waste Trommel Screen w/Water Spray	S-3	x	x
Green Waste Compost Windrows (15 acres) w/Water Spray	S-4	x	x
Finished Compost and Mulch Stockpiles (5 Acres) w/Water Spray	S-5	x	x
MSW Building Sort Line Disc Screen	S-8	x	x
Conveyors, MSW (2x), Green Waste/Compost (13x), MSW/Compost (13x)	S-10	x	x
Composted Green Waste 1" Overs Rotary Screen w/Water Spray	S-13	x	x
Composted MSW Fines Denzimetric Table #1 w/Baghouse	S-15	x	x
Green Waste Trommel Screen (60') w/Water Spray	S-18	x	x
Composted MSW BHS 1" Disc Screen	S-19	x	x
Mobile Diesel Engine, Peterson 6701B	S-20	x	x
Mobile Grinding Operation	S-22	x	x
Composted MSW Trommel Screen w/Water Spray	S-23	x	x
Composted MSW Fines Densimetric Table #2 w/Baghouse	S-24	x	x
Composted Green Waste Wind Shifter w/Baghouse	S-25	x	x
Finished Green Waste Compost Trommel Screen w/Water Spray	S-26	x	x
Composted MSW Trommel Screen w/Water Spray	S-27	x	x
Enclosed Vessel Composting Operating (CTI Bag)	S-28	x	
Unprocessed MSW Stockpiles	S-29	x	x
Composted MSW Stockpiles	S-30	x	x
Unprocessed Green Waste Stockpiles	S-31	x	x
Processed Green Waste Stockpiles	S-32	x	x
MSW Bag Breaker	S-33	x	x
Composted MSW BHS 1 inch Overs Screen w/Water Spray	S-34	x	modified
Covered Negative Aerated Static Pile Composting (Active Phase)	new		new
Aerated Static Pile Composting (Curing Phase)	new		new
Composted MSW Trommel Screen w/Water Spray (same as S-23)	new		new

Evaluation of Compost Process

The CASP composting process with a biofilter and abatement through a biofilter is the level of emissions control currently required by BAAQMD. The BAAQMD has determined that he best available control technology (BACT) for composting process is a CASP with a positive pressure system with a biofilter cover (typically finished compost), or CASP with a negative pressure system and an engineered biofilter to control emissions.

SCS was provided a source test report by Horizon Air Measurement Services, Inc. for a facility in Southern California that Z-Best believes is comparable to the proposed facility. Emission factors for ROG, called precursor organic compounds (POCs) in the BAAQMD, determined from that source test are used to calculate emissions from the CASP (active) and positive pressure ASP (curing) phases of the composting process as shown in Table 7. The emission factor for tipping piles prescribed by the California Air Resources Board (CARB), and required for use by the BAAQMD, is used for the emission factors from piles tipped in the tipping building. The factor is typically based pounds per ton per day emissions, but since Z-Best plans to process all incoming waste within 24 hours, we show the emission factor as simply lb/ton. Waste will also be tipped directly onto the CASP piles, which will result in no emissions from tipped waste before it is added to the active curing phase.

Please note that the emission factors derived from the aforementioned source test are abnormally low compared to data SCS has seen for similar operations. These factors are also significantly lower than the CARB-prescribed factors for POCs, which the BAAQMD has required for permitting for other compost facilities in the BAAQMD. ECS believes that the tested composting facility and the Site are significantly better designed and that the engineered systems result in much lower emissions than systems with only “rudimentary” engineering and process control. If the BAAQMD accepts these factors, they will become permit limits, and Z-Best will be required to do testing annually to prove they can meet these levels on a continuous basis. Because of the potential challenge of passing a source test with such a low emission factor, the emission factor was increased by a factor of 50 percent.

The active composting process is mitigated by a CASP system mitigates 80 percent of VOC emissions per CARB and BAAQMD evaluations. The curing composting process will be mitigated by a positive pressure ASP with a moist compost cover layer, which provides mitigation of 50 percent of VOC emissions. The source test being used in this analysis did not provide independent testing of the curing piles, so the emission factor for the curing pile is assumed to be the same as for active composting. Curing piles have lower emission rates than the active, so the use of the emission factor for the active composting phase is a conservative assumption and is expected to overestimate VOC emissions.

BAAQMD has not published a BACT determination for composting. Several other facilities have been permitted in the BAAQMD with BACT defined as a CASP as BACT for the active composting phase. BAAQMD has not proposed BACT for the curing phase, and the use of a positive ASP with moist compost layer exceeds the mitigation required by BAAQMD.

POC emissions from the composting process, both before and after mitigation, are shown in Table 7.

Table 7. POC Emissions from Composting Process

Phase	Emission Factor (lb/wet ton of material)	Daily Throughput (tpd)	Uncontrolled Daily Emission (lb/day)	Control Efficiency	Controlled Daily Emission (lb/day)	Controlled Annual Emissions (tons/year)
In-building tipping	0.2	219	43.8	0	43.75	7.98
Negative CASP (Active Phase)	0.0151	875	13.2	80%	2.64	0.48
Positive ASP (Curing Phase)	0.0151	875	13.2	50%	6.61	1.21
Total			70.2		53.00	9.67

CLOSING

This additional information was provided to address emissions-related questions from the BAAQMD about the proposed modification of the Z-Best composting facility in Gilroy, California. The emissions information for construction and on-road emissions, and the information about permitted sources can be incorporated into or referenced ban appropriate CEQA document for the proposed modification of the facility.

If you have any questions or concerns about this evaluation, please contact the undersigned at 562-637-4561.

Sincerely,

Raymond H. Huff, R.E.P.A.
Vice President
SCS Engineers
Sincerely,

Patrick S. Sullivan, R.E.P.A., C.P.P., B.C.E.S.
Senior Vice President
SCS Engineers

attachments

Attachment A

CalEEMod Output

Z-Best Gilroy

Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	0.00	1000sqft	157.32	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Acreage from Golder Drawing 5A - AERATED STATIC PILE COPOSTING PERMIT PACKAGE

Construction Phase - grading expected to take 3 months
trenching expected to take 2 months
construction expected to take 59 working days

Off-road Equipment - Equipment counts based on highest number of equipment planned for each phase
Grading "other construction equipment" is compactor

Off-road Equipment - Off Highway Truck is concrete pumping trucks (estimated 250 hp)
Other construction equipment is ride on concrete finishers (37 hp)

Off-road Equipment - equpment use from description of construction activities provided by email on 2/25/18

Trips and VMT - trip counts provided by site

Grading -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	5
tblConstructionPhase	NumDays	620.00	78.00
tblConstructionPhase	NumDays	440.00	69.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblLandUse	LotAcreage	0.00	157.32
tblOffRoadEquipment	HorsePower	402.00	250.00
tblOffRoadEquipment	HorsePower	172.00	37.00
tblOffRoadEquipment	LoadFactor	0.38	0.42
tblOffRoadEquipment	LoadFactor	0.42	0.36
tblOffRoadEquipment	OffRoadEquipmentType		Pavers
tblOffRoadEquipment	OffRoadEquipmentType		Paving Equipment
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Grading
tblOffRoadEquipment	PhaseName		Grading
tblOffRoadEquipment	PhaseName		Trenching
tblOffRoadEquipment	PhaseName		Paving
tblOffRoadEquipment	PhaseName		Paving
tblOffRoadEquipment	PhaseName		Paving
tblOffRoadEquipment	PhaseName		Paving
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	0.00	6,200.00
tblTripsAndVMT	VendorTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	23.00	33.00
tblTripsAndVMT	WorkerTripNumber	5.00	25.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.3926	5.0050	2.7257	8.1700e-003	0.5433	0.1675	0.7107	0.1759	0.1542	0.3301	0.0000	743.4052	743.4052	0.1587	0.0000	747.3718
Maximum	**0.3926**	**5.0050**	**2.7257**	**8.1700e-003**	**0.5433**	**0.1675**	**0.7107**	**0.1759**	**0.1542**	**0.3301**	**0.0000**	**743.4052**	**743.4052**	**0.1587**	**0.0000**	**747.3718**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.3926	4.8362	2.7257	8.1700e-003	0.2612	0.1675	0.4287	0.0822	0.1542	0.2364	0.0000	743.4046	743.4046	0.1587	0.0000	747.3712
Maximum	**0.3926**	**4.8362**	**2.7257**	**8.1700e-003**	**0.2612**	**0.1675**	**0.4287**	**0.0822**	**0.1542**	**0.2364**	**0.0000**	**743.4046**	**743.4046**	**0.1587**	**0.0000**	**747.3712**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**3.37**	**0.00**	**0.00**	**51.92**	**0.00**	**39.68**	**53.29**	**0.00**	**28.39**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**4-1-2020**	**6-30-2020**	4.6448	4.6448
2	**7-1-2020**	**9-30-2020**	0.3505	0.2876
		Highest	4.6448	4.6448

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	4/1/2020	6/30/2020	6	78	
2	Trenching	Trenching	7/1/2020	8/31/2020	6	53	
3	Paving	Paving	9/1/2020	11/19/2020	6	69	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 429

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Graders	1	8.00	187	0.41
Grading	Off-Highway Trucks	1	8.00	402	0.38
Grading	Other Construction Equipment	1	8.00	172	0.42
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	5	8.00	367	0.48
Trenching	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Off-Highway Trucks	1	8.00	250	0.42
Paving	Other Construction Equipment	1	8.00	37	0.36
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	9	33.00	0.00	6,200.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	2	5.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	2	25.00	50.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Water Unpaved Roads

3.2 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4623	0.0000	0.4623	0.1537	0.0000	0.1537	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2994	3.4312	1.9957	4.3000e-003		0.1387	0.1387		0.1276	0.1276	0.0000	377.9513	377.9513	0.1222	0.0000	381.0072
Total	**0.2994**	**3.4312**	**1.9957**	**4.3000e-003**	**0.4623**	**0.1387**	**0.6010**	**0.1537**	**0.1276**	**0.2812**	**0.0000**	**377.9513**	**377.9513**	**0.1222**	**0.0000**	**381.0072**

3.2 Grading - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0258	0.8996	0.1842	2.4400e-003	0.0526	2.9200e-003	0.0555	0.0145	2.8000e-003	0.0172	0.0000	236.4395	236.4395	0.0108	0.0000	236.7099
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.2700e-003	3.0700e-003	0.0322	1.0000e-004	0.0102	7.0000e-005	0.0103	2.7100e-003	6.0000e-005	2.7800e-003	0.0000	8.7535	8.7535	2.1000e-004	0.0000	8.7589
Total	**0.0300**	**0.9026**	**0.2164**	**2.5400e-003**	**0.0628**	**2.9900e-003**	**0.0657**	**0.0172**	**2.8600e-003**	**0.0200**	**0.0000**	**245.1930**	**245.1930**	**0.0110**	**0.0000**	**245.4688**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1803	0.0000	0.1803	0.0599	0.0000	0.0599	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2994	3.4312	1.9957	4.3000e-003		0.1387	0.1387		0.1276	0.1276	0.0000	377.9508	377.9508	0.1222	0.0000	381.0067
Total	**0.2994**	**3.4312**	**1.9957**	**4.3000e-003**	**0.1803**	**0.1387**	**0.3190**	**0.0599**	**0.1276**	**0.1875**	**0.0000**	**377.9508**	**377.9508**	**0.1222**	**0.0000**	**381.0067**

3.2 Grading - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0258	0.8996	0.1842	2.4400e-003	0.0526	2.9200e-003	0.0555	0.0145	2.8000e-003	0.0172	0.0000	236.4395	236.4395	0.0108	0.0000	236.7099
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.2700e-003	3.0700e-003	0.0322	1.0000e-004	0.0102	7.0000e-005	0.0103	2.7100e-003	6.0000e-005	2.7800e-003	0.0000	8.7535	8.7535	2.1000e-004	0.0000	8.7589
Total	**0.0300**	**0.9026**	**0.2164**	**2.5400e-003**	**0.0628**	**2.9900e-003**	**0.0657**	**0.0172**	**2.8600e-003**	**0.0200**	**0.0000**	**245.1930**	**245.1930**	**0.0110**	**0.0000**	**245.4688**

3.3 Trenching - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0111	0.1116	0.1208	1.6000e-004		7.0600e-003	7.0600e-003		6.4900e-003	6.4900e-003	0.0000	14.4612	14.4612	4.6800e-003	0.0000	14.5781
Total	**0.0111**	**0.1116**	**0.1208**	**1.6000e-004**		**7.0600e-003**	**7.0600e-003**		**6.4900e-003**	**6.4900e-003**	**0.0000**	**14.4612**	**14.4612**	**4.6800e-003**	**0.0000**	**14.5781**

3.3 Trenching - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.4000e-004	3.2000e-004	3.3200e-003	1.0000e-005	1.0500e-003	1.0000e-005	1.0600e-003	2.8000e-004	1.0000e-005	2.9000e-004	0.0000	0.9012	0.9012	2.0000e-005	0.0000	0.9018
Total	**4.4000e-004**	**3.2000e-004**	**3.3200e-003**	**1.0000e-005**	**1.0500e-003**	**1.0000e-005**	**1.0600e-003**	**2.8000e-004**	**1.0000e-005**	**2.9000e-004**	**0.0000**	**0.9012**	**0.9012**	**2.0000e-005**	**0.0000**	**0.9018**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0111	0.1116	0.1208	1.6000e-004		7.0600e-003	7.0600e-003		6.4900e-003	6.4900e-003	0.0000	14.4612	14.4612	4.6800e-003	0.0000	14.5781
Total	**0.0111**	**0.1116**	**0.1208**	**1.6000e-004**		**7.0600e-003**	**7.0600e-003**		**6.4900e-003**	**6.4900e-003**	**0.0000**	**14.4612**	**14.4612**	**4.6800e-003**	**0.0000**	**14.5781**

3.3 Trenching - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.4000e-004	3.2000e-004	3.3200e-003	1.0000e-005	1.0500e-003	1.0000e-005	1.0600e-003	2.8000e-004	1.0000e-005	2.9000e-004	0.0000	0.9012	0.9012	2.0000e-005	0.0000	0.9018
Total	**4.4000e-004**	**3.2000e-004**	**3.3200e-003**	**1.0000e-005**	**1.0500e-003**	**1.0000e-005**	**1.0600e-003**	**2.8000e-004**	**1.0000e-005**	**2.9000e-004**	**0.0000**	**0.9012**	**0.9012**	**2.0000e-005**	**0.0000**	**0.9018**

3.4 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0423	0.3698	0.3178	6.5000e-004		0.0178	0.0178		0.0164	0.0164	0.0000	57.4057	57.4057	0.0186	0.0000	57.8698
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0423**	**0.3698**	**0.3178**	**6.5000e-004**		**0.0178**	**0.0178**		**0.0164**	**0.0164**	**0.0000**	**57.4057**	**57.4057**	**0.0186**	**0.0000**	**57.8698**

3.4 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.4400e-003	0.1874	0.0501	4.3000e-004	0.0103	8.9000e-004	0.0112	2.9700e-003	8.5000e-004	3.8100e-003	0.0000	41.6266	41.6266	1.9900e-003	0.0000	41.6763
Worker	2.8600e-003	2.0600e-003	0.0216	6.0000e-005	6.8400e-003	4.0000e-005	6.8800e-003	1.8200e-003	4.0000e-005	1.8600e-003	0.0000	5.8663	5.8663	1.4000e-004	0.0000	5.8699
Total	**9.3000e-003**	**0.1895**	**0.0717**	**4.9000e-004**	**0.0171**	**9.3000e-004**	**0.0180**	**4.7900e-003**	**8.9000e-004**	**5.6700e-003**	**0.0000**	**47.4928**	**47.4928**	**2.1300e-003**	**0.0000**	**47.5462**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0423	0.2010	0.3178	6.5000e-004		0.0178	0.0178		0.0164	0.0164	0.0000	57.4056	57.4056	0.0186	0.0000	57.8698
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0423**	**0.2010**	**0.3178**	**6.5000e-004**		**0.0178**	**0.0178**		**0.0164**	**0.0164**	**0.0000**	**57.4056**	**57.4056**	**0.0186**	**0.0000**	**57.8698**

3.4 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.4400e-003	0.1874	0.0501	4.3000e-004	0.0103	8.9000e-004	0.0112	2.9700e-003	8.5000e-004	3.8100e-003	0.0000	41.6266	41.6266	1.9900e-003	0.0000	41.6763
Worker	2.8600e-003	2.0600e-003	0.0216	6.0000e-005	6.8400e-003	4.0000e-005	6.8800e-003	1.8200e-003	4.0000e-005	1.8600e-003	0.0000	5.8663	5.8663	1.4000e-004	0.0000	5.8699
Total	**9.3000e-003**	**0.1895**	**0.0717**	**4.9000e-004**	**0.0171**	**9.3000e-004**	**0.0180**	**4.7900e-003**	**8.9000e-004**	**5.6700e-003**	**0.0000**	**47.4928**	**47.4928**	**2.1300e-003**	**0.0000**	**47.5462**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	14.70	6.60	6.60	59.00	28.00	13.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.610498	0.036775	0.183084	0.106123	0.014413	0.005007	0.012610	0.021118	0.002144	0.001548	0.005312	0.000627	0.000740

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Z-Best Gilroy

Santa Clara County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	0.00	1000sqft	157.32	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Acreage from Golder Drawing 5A - AERATED STATIC PILE COPOSTING PERMIT PACKAGE

Construction Phase - grading expected to take 3 months
trenching expected to take 2 months
construction expected to take 59 working days

Off-road Equipment - Equipment counts based on highest number of equipment planned for each phase
Grading "other construction equipment" is compactor

Off-road Equipment - Off Highway Truck is concrete pumping trucks (estimated 250 hp)
Other construction equipment is ride on concrete finishers (37 hp)

Off-road Equipment - equpment use from description of construction activities provided by email on 2/25/18

Trips and VMT - trip counts provided by site

Grading -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	5
tblConstructionPhase	NumDays	620.00	78.00
tblConstructionPhase	NumDays	440.00	69.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblLandUse	LotAcreage	0.00	157.32
tblOffRoadEquipment	HorsePower	402.00	250.00
tblOffRoadEquipment	HorsePower	172.00	37.00
tblOffRoadEquipment	LoadFactor	0.38	0.42
tblOffRoadEquipment	LoadFactor	0.42	0.36
tblOffRoadEquipment	OffRoadEquipmentType		Pavers
tblOffRoadEquipment	OffRoadEquipmentType		Paving Equipment
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Grading
tblOffRoadEquipment	PhaseName		Grading
tblOffRoadEquipment	PhaseName		Trenching
tblOffRoadEquipment	PhaseName		Paving
tblOffRoadEquipment	PhaseName		Paving
tblOffRoadEquipment	PhaseName		Paving
tblOffRoadEquipment	PhaseName		Paving
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	0.00	6,200.00
tblTripsAndVMT	VendorTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	23.00	33.00
tblTripsAndVMT	WorkerTripNumber	5.00	25.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	8.4447	110.6535	56.6554	0.1760	13.5151	3.6320	17.1470	4.3927	3.3441	7.7368	0.0000	17,679.2801	17,679.2801	3.7610	0.0000	17,773.3058
Maximum	**8.4447**	**110.6535**	**56.6554**	**0.1760**	**13.5151**	**3.6320**	**17.1470**	**4.3927**	**3.3441**	**7.7368**	**0.0000**	**17,679.2801**	**17,679.2801**	**3.7610**	**0.0000**	**17,773.3058**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	8.4447	110.6535	56.6554	0.1760	6.2836	3.6320	9.9156	1.9892	3.3441	5.3334	0.0000	17,679.2801	17,679.2801	3.7610	0.0000	17,773.3058
Maximum	**8.4447**	**110.6535**	**56.6554**	**0.1760**	**6.2836**	**3.6320**	**9.9156**	**1.9892**	**3.3441**	**5.3334**	**0.0000**	**17,679.2801**	**17,679.2801**	**3.7610**	**0.0000**	**17,773.3058**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**53.51**	**0.00**	**42.17**	**54.71**	**0.00**	**31.06**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	4/1/2020	6/30/2020	6	78	
2	Trenching	Trenching	7/1/2020	8/31/2020	6	53	
3	Paving	Paving	9/1/2020	11/19/2020	6	69	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 429

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Graders	1	8.00	187	0.41
Grading	Off-Highway Trucks	1	8.00	402	0.38
Grading	Other Construction Equipment	1	8.00	172	0.42
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	5	8.00	367	0.48
Trenching	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Off-Highway Trucks	1	8.00	250	0.42
Paving	Other Construction Equipment	1	8.00	37	0.36
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	9	33.00	0.00	6,200.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	2	5.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	2	25.00	50.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Water Unpaved Roads

3.2 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					11.8548	0.0000	11.8548	3.9400	0.0000	3.9400			0.0000			0.0000
Off-Road	7.6770	87.9800	51.1712	0.1103		3.5558	3.5558		3.2714	3.2714		10,682.5628	10,682.5628	3.4550		10,768.9368
Total	**7.6770**	**87.9800**	**51.1712**	**0.1103**	**11.8548**	**3.5558**	**15.4107**	**3.9400**	**3.2714**	**7.2114**		**10,682.5628**	**10,682.5628**	**3.4550**		**10,768.9368**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.6530	22.6030	4.5765	0.0631	1.3892	0.0744	1.4636	0.3807	0.0712	0.4519		6,730.7351	6,730.7351	0.2996		6,738.2241
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1147	0.0704	0.9076	2.6700e-003	0.2711	1.6900e-003	0.2728	0.0719	1.5600e-003	0.0735		265.9821	265.9821	6.5100e-003		266.1448
Total	**0.7677**	**22.6734**	**5.4841**	**0.0658**	**1.6603**	**0.0761**	**1.7364**	**0.4526**	**0.0728**	**0.5254**		**6,996.7172**	**6,996.7172**	**0.3061**		**7,004.3690**

3.2 Grading - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.6234	0.0000	4.6234	1.5366	0.0000	1.5366			0.0000			0.0000
Off-Road	7.6770	87.9800	51.1712	0.1103		3.5558	3.5558		3.2714	3.2714	0.0000	10,682.5628	10,682.5628	3.4550		10,768.9368
Total	**7.6770**	**87.9800**	**51.1712**	**0.1103**	**4.6234**	**3.5558**	**8.1792**	**1.5366**	**3.2714**	**4.8080**	**0.0000**	**10,682.5628**	**10,682.5628**	**3.4550**		**10,768.9368**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.6530	22.6030	4.5765	0.0631	1.3892	0.0744	1.4636	0.3807	0.0712	0.4519		6,730.7351	6,730.7351	0.2996		6,738.2241
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1147	0.0704	0.9076	2.6700e-003	0.2711	1.6900e-003	0.2728	0.0719	1.5600e-003	0.0735		265.9821	265.9821	6.5100e-003		266.1448
Total	**0.7677**	**22.6734**	**5.4841**	**0.0658**	**1.6603**	**0.0761**	**1.7364**	**0.4526**	**0.0728**	**0.5254**		**6,996.7172**	**6,996.7172**	**0.3061**		**7,004.3690**

3.3 Trenching - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4190	4.2103	4.5594	6.2100e-003		0.2662	0.2662		0.2449	0.2449		601.5370	601.5370	0.1946		606.4008
Total	**0.4190**	**4.2103**	**4.5594**	**6.2100e-003**		**0.2662**	**0.2662**		**0.2449**	**0.2449**		**601.5370**	**601.5370**	**0.1946**		**606.4008**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0174	0.0107	0.1375	4.0000e-004	0.0411	2.6000e-004	0.0413	0.0109	2.4000e-004	0.0111		40.3003	40.3003	9.9000e-004		40.3250
Total	**0.0174**	**0.0107**	**0.1375**	**4.0000e-004**	**0.0411**	**2.6000e-004**	**0.0413**	**0.0109**	**2.4000e-004**	**0.0111**		**40.3003**	**40.3003**	**9.9000e-004**		**40.3250**

3.3 Trenching - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4190	4.2103	4.5594	6.2100e-003		0.2662	0.2662		0.2449	0.2449	0.0000	601.5370	601.5370	0.1946		606.4008
Total	**0.4190**	**4.2103**	**4.5594**	**6.2100e-003**		**0.2662**	**0.2662**		**0.2449**	**0.2449**	**0.0000**	**601.5370**	**601.5370**	**0.1946**		**606.4008**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0174	0.0107	0.1375	4.0000e-004	0.0411	2.6000e-004	0.0413	0.0109	2.4000e-004	0.0111		40.3003	40.3003	9.9000e-004		40.3250
Total	**0.0174**	**0.0107**	**0.1375**	**4.0000e-004**	**0.0411**	**2.6000e-004**	**0.0413**	**0.0109**	**2.4000e-004**	**0.0111**		**40.3003**	**40.3003**	**9.9000e-004**		**40.3250**

3.4 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2252	10.7180	9.2121	0.0189		0.5169	0.5169		0.4755	0.4755		1,834.1714	1,834.1714	0.5932		1,849.0016
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.2252**	**10.7180**	**9.2121**	**0.0189**		**0.5169**	**0.5169**		**0.4755**	**0.4755**		**1,834.1714**	**1,834.1714**	**0.5932**		**1,849.0016**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1827	5.3718	1.3579	0.0127	0.3062	0.0255	0.3317	0.0882	0.0244	0.1125		1,345.5498	1,345.5498	0.0613		1,347.0833
Worker	0.0869	0.0534	0.6876	2.0200e-003	0.2054	1.2800e-003	0.2067	0.0545	1.1800e-003	0.0557		201.5016	201.5016	4.9300e-003		201.6249
Total	**0.2696**	**5.4251**	**2.0455**	**0.0148**	**0.5115**	**0.0268**	**0.5383**	**0.1426**	**0.0256**	**0.1682**		**1,547.0514**	**1,547.0514**	**0.0663**		**1,548.7082**

3.4 Paving - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2252	5.8263	9.2121	0.0189		0.5169	0.5169		0.4755	0.4755	0.0000	1,834.1714	1,834.1714	0.5932		1,849.0016
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.2252**	**5.8263**	**9.2121**	**0.0189**		**0.5169**	**0.5169**		**0.4755**	**0.4755**	**0.0000**	**1,834.1714**	**1,834.1714**	**0.5932**		**1,849.0016**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1827	5.3718	1.3579	0.0127	0.3062	0.0255	0.3317	0.0882	0.0244	0.1125		1,345.5498	1,345.5498	0.0613		1,347.0833
Worker	0.0869	0.0534	0.6876	2.0200e-003	0.2054	1.2800e-003	0.2067	0.0545	1.1800e-003	0.0557		201.5016	201.5016	4.9300e-003		201.6249
Total	**0.2696**	**5.4251**	**2.0455**	**0.0148**	**0.5115**	**0.0268**	**0.5383**	**0.1426**	**0.0256**	**0.1682**		**1,547.0514**	**1,547.0514**	**0.0663**		**1,548.7082**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	14.70	6.60	6.60	59.00	28.00	13.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.610498	0.036775	0.183084	0.106123	0.014413	0.005007	0.012610	0.021118	0.002144	0.001548	0.005312	0.000627	0.000740

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Light Industry	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Light Industry	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Z-Best Gilroy

Santa Clara County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	0.00	1000sqft	157.32	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Acreage from Golder Drawing 5A - AERATED STATIC PILE COPOSTING PERMIT PACKAGE

Construction Phase - grading expected to take 3 months
trenching expected to take 2 months
construction expected to take 59 working days

Off-road Equipment - Equipment counts based on highest number of equipment planned for each phase
Grading "other construction equipment" is compactor

Off-road Equipment - Off Highway Truck is concrete pumping trucks (estimated 250 hp)
Other construction equipment is ride on concrete finishers (37 hp)

Off-road Equipment - equpment use from description of construction activities provided by email on 2/25/18

Trips and VMT - trip counts provided by site

Grading -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	5
tblConstructionPhase	NumDays	620.00	78.00
tblConstructionPhase	NumDays	440.00	69.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblLandUse	LotAcreage	0.00	157.32
tblOffRoadEquipment	HorsePower	402.00	250.00
tblOffRoadEquipment	HorsePower	172.00	37.00
tblOffRoadEquipment	LoadFactor	0.38	0.42
tblOffRoadEquipment	LoadFactor	0.42	0.36
tblOffRoadEquipment	OffRoadEquipmentType		Pavers
tblOffRoadEquipment	OffRoadEquipmentType		Paving Equipment
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Grading
tblOffRoadEquipment	PhaseName		Grading
tblOffRoadEquipment	PhaseName		Trenching
tblOffRoadEquipment	PhaseName		Paving
tblOffRoadEquipment	PhaseName		Paving
tblOffRoadEquipment	PhaseName		Paving
tblOffRoadEquipment	PhaseName		Paving
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	0.00	6,200.00
tblTripsAndVMT	VendorTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	23.00	33.00
tblTripsAndVMT	WorkerTripNumber	5.00	25.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	8.4700	111.2206	56.9371	0.1748	13.5151	3.6332	17.1483	4.3927	3.3453	7.7380	0.0000	17,543.5636	17,543.5636	3.7747	0.0000	17,637.9308
Maximum	**8.4700**	**111.2206**	**56.9371**	**0.1748**	**13.5151**	**3.6332**	**17.1483**	**4.3927**	**3.3453**	**7.7380**	**0.0000**	**17,543.5636**	**17,543.5636**	**3.7747**	**0.0000**	**17,637.9308**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	8.4700	111.2206	56.9371	0.1748	6.2836	3.6332	9.9168	1.9892	3.3453	5.3345	0.0000	17,543.5636	17,543.5636	3.7747	0.0000	17,637.9308
Maximum	**8.4700**	**111.2206**	**56.9371**	**0.1748**	**6.2836**	**3.6332**	**9.9168**	**1.9892**	**3.3453**	**5.3345**	**0.0000**	**17,543.5636**	**17,543.5636**	**3.7747**	**0.0000**	**17,637.9308**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**53.51**	**0.00**	**42.17**	**54.71**	**0.00**	**31.06**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	4/1/2020	6/30/2020	6	78	
2	Trenching	Trenching	7/1/2020	8/31/2020	6	53	
3	Paving	Paving	9/1/2020	11/19/2020	6	69	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 429

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Graders	1	8.00	187	0.41
Grading	Off-Highway Trucks	1	8.00	402	0.38
Grading	Other Construction Equipment	1	8.00	172	0.42
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	5	8.00	367	0.48
Trenching	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Off-Highway Trucks	1	8.00	250	0.42
Paving	Other Construction Equipment	1	8.00	37	0.36
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	9	33.00	0.00	6,200.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	2	5.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	2	25.00	50.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Water Unpaved Roads

3.2 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					11.8548	0.0000	11.8548	3.9400	0.0000	3.9400			0.0000			0.0000
Off-Road	7.6770	87.9800	51.1712	0.1103		3.5558	3.5558		3.2714	3.2714		10,682.5628	10,682.5628	3.4550		10,768.9368
Total	**7.6770**	**87.9800**	**51.1712**	**0.1103**	**11.8548**	**3.5558**	**15.4107**	**3.9400**	**3.2714**	**7.2114**		**10,682.5628**	**10,682.5628**	**3.4550**		**10,768.9368**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.6710	23.1545	4.9249	0.0620	1.3892	0.0756	1.4648	0.3807	0.0724	0.4531		6,616.6469	6,616.6469	0.3137		6,624.4887
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1220	0.0860	0.8410	2.4500e-003	0.2711	1.6900e-003	0.2728	0.0719	1.5600e-003	0.0735		244.3538	244.3538	6.0600e-003		244.5053
Total	**0.7930**	**23.2405**	**5.7659**	**0.0645**	**1.6603**	**0.0773**	**1.7376**	**0.4526**	**0.0739**	**0.5266**		**6,861.0007**	**6,861.0007**	**0.3197**		**6,868.9940**

3.2 Grading - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.6234	0.0000	4.6234	1.5366	0.0000	1.5366			0.0000			0.0000
Off-Road	7.6770	87.9800	51.1712	0.1103		3.5558	3.5558		3.2714	3.2714	0.0000	10,682.5628	10,682.5628	3.4550		10,768.9368
Total	**7.6770**	**87.9800**	**51.1712**	**0.1103**	**4.6234**	**3.5558**	**8.1792**	**1.5366**	**3.2714**	**4.8080**	**0.0000**	**10,682.5628**	**10,682.5628**	**3.4550**		**10,768.9368**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.6710	23.1545	4.9249	0.0620	1.3892	0.0756	1.4648	0.3807	0.0724	0.4531		6,616.6469	6,616.6469	0.3137		6,624.4887
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1220	0.0860	0.8410	2.4500e-003	0.2711	1.6900e-003	0.2728	0.0719	1.5600e-003	0.0735		244.3538	244.3538	6.0600e-003		244.5053
Total	**0.7930**	**23.2405**	**5.7659**	**0.0645**	**1.6603**	**0.0773**	**1.7376**	**0.4526**	**0.0739**	**0.5266**		**6,861.0007**	**6,861.0007**	**0.3197**		**6,868.9940**

3.3 Trenching - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4190	4.2103	4.5594	6.2100e-003		0.2662	0.2662		0.2449	0.2449		601.5370	601.5370	0.1946		606.4008
Total	**0.4190**	**4.2103**	**4.5594**	**6.2100e-003**		**0.2662**	**0.2662**		**0.2449**	**0.2449**		**601.5370**	**601.5370**	**0.1946**		**606.4008**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0185	0.0130	0.1274	3.7000e-004	0.0411	2.6000e-004	0.0413	0.0109	2.4000e-004	0.0111		37.0233	37.0233	9.2000e-004		37.0463
Total	**0.0185**	**0.0130**	**0.1274**	**3.7000e-004**	**0.0411**	**2.6000e-004**	**0.0413**	**0.0109**	**2.4000e-004**	**0.0111**		**37.0233**	**37.0233**	**9.2000e-004**		**37.0463**

3.3 Trenching - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4190	4.2103	4.5594	6.2100e-003		0.2662	0.2662		0.2449	0.2449	0.0000	601.5370	601.5370	0.1946		606.4008
Total	**0.4190**	**4.2103**	**4.5594**	**6.2100e-003**		**0.2662**	**0.2662**		**0.2449**	**0.2449**	**0.0000**	**601.5370**	**601.5370**	**0.1946**		**606.4008**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0185	0.0130	0.1274	3.7000e-004	0.0411	2.6000e-004	0.0413	0.0109	2.4000e-004	0.0111		37.0233	37.0233	9.2000e-004		37.0463
Total	**0.0185**	**0.0130**	**0.1274**	**3.7000e-004**	**0.0411**	**2.6000e-004**	**0.0413**	**0.0109**	**2.4000e-004**	**0.0111**		**37.0233**	**37.0233**	**9.2000e-004**		**37.0463**

3.4 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2252	10.7180	9.2121	0.0189		0.5169	0.5169		0.4755	0.4755		1,834.171 4	1,834.171 4	0.5932		1,849.001 6
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.2252**	**10.7180**	**9.2121**	**0.0189**		**0.5169**	**0.5169**		**0.4755**	**0.4755**		**1,834.171 4**	**1,834.171 4**	**0.5932**		**1,849.001 6**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	5.4223	1.5577	0.0124	0.3062	0.0259	0.3321	0.0882	0.0248	0.1130		1,308.575 9	1,308.575 9	0.0663		1,310.232 8
Worker	0.0924	0.0652	0.6371	1.8600e-003	0.2054	1.2800e-003	0.2067	0.0545	1.1800e-003	0.0557		185.1165	185.1165	4.5900e-003		185.2313
Total	**0.2852**	**5.4875**	**2.1948**	**0.0142**	**0.5115**	**0.0272**	**0.5387**	**0.1426**	**0.0260**	**0.1686**		**1,493.692 4**	**1,493.692 4**	**0.0709**		**1,495.464 1**

3.4 Paving - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2252	5.8263	9.2121	0.0189		0.5169	0.5169		0.4755	0.4755	0.0000	1,834.1714	1,834.1714	0.5932		1,849.0016
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.2252**	**5.8263**	**9.2121**	**0.0189**		**0.5169**	**0.5169**		**0.4755**	**0.4755**	**0.0000**	**1,834.1714**	**1,834.1714**	**0.5932**		**1,849.0016**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	5.4223	1.5577	0.0124	0.3062	0.0259	0.3321	0.0882	0.0248	0.1130		1,308.5759	1,308.5759	0.0663		1,310.2328
Worker	0.0924	0.0652	0.6371	1.8600e-003	0.2054	1.2800e-003	0.2067	0.0545	1.1800e-003	0.0557		185.1165	185.1165	4.5900e-003		185.2313
Total	**0.2852**	**5.4875**	**2.1948**	**0.0142**	**0.5115**	**0.0272**	**0.5387**	**0.1426**	**0.0260**	**0.1686**		**1,493.6924**	**1,493.6924**	**0.0709**		**1,495.4641**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	14.70	6.60	6.60	59.00	28.00	13.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.610498	0.036775	0.183084	0.106123	0.014413	0.005007	0.012610	0.021118	0.002144	0.001548	0.005312	0.000627	0.000740

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Light Industry	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Light Industry	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Attachment B

EMFAC Output

EMFAC2017 (v1.0.2) Emission Rates
Region Type: Air District
Region: BAY AREA AQMD
Calendar Year: 2020
Season: Annual
Vehicle Classification: EMFAC2011 Categories
Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HTSK and RUNLS, g/vehicle/day for IDLEX, RESTL and DIURN

Region	Calendar Y	Vehicle Cat	Model Year	Speed	Fuel	ROG_RUNEX	CO_RUNEX	NOx_RUNEX	CO2_RUNEX	CH4_RUNEX	PM10_RUNEX	PM2_5_RUNEX	SOx_RUNEX	SOx_STREX	N2O_RUNEX
BAY AREA /	2020	LDA	Aggregatec	Aggregatec	GAS	0.013321179	0.760834107	0.053576977	276.358803	0.003284054	0.001605795	0.001476507	0.002734794	0.000581507	0.005456194
BAY AREA /	2020	T7 tractor	Aggregatec	Aggregatec	DSL	0.161086208	0.597015221	4.579019292	1409.592818	0.007482037	0.095204504	0.091086	0.013317134	0	0.221568361

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M E M O

Date: August 22, 2019
Updated February 26, 2020

To: **Tanya Kalaskar**
EMC PLANNING GROUP INC.
301 Lighthouse Avenue, Suite C
Monterey, California 93940

From: James A. Reyff
Illingworth & Rodkin, Inc.
1 Willowbrook Court, Suite 120
Petaluma, CA 94954

RE: Z-Best Composting Facility - Gilroy, CA

SUBJECT: Health Risk Assessment for Increased Truck Traffic Job#19-153

This memo addresses the health risk impacts from increase truck traffic caused by the Z-Best Composting Facility project. The purpose of the proposed project is to modify Z-Best's existing municipal solid waste (MSW) composting operations to enable more efficient composting. This is planned to be achieved by converting the existing Compost Technologies, Inc. composting process and technology, which utilizes composting bags, with an Engineered Composting System process and technology, which consists of aerated static pile (ASP) technology. The ASP technology and operations modifications would enable Z-Best to increase its current permitted MSW composting capacity from 1,500 tons per day to 2,750 tons per day. The proposed expansion would result in an increase of 32 additional employees. The additional employees would result in 64 new daily trips (32 inbound and 32 outbound trips). Under normal conditions the proposed project would generate 100 additional trucks per day, or 200 truck trips (100 inbound and 100 outbound) per day. In addition, for 20 days per year there would be an additional 57 trucks per day, or 114 trips per day, in addition to the normal 200 trips per day. All of this traffic would use State Route 25. A traffic study prepared by Hexagon indicates that 83 percent of the traffic would be traveling to the west and 17 percent would travel east of the project site. Truck traffic is expected to occur at night from about 6:00 p.m. to 9:00 a.m.

The primary health risk impacts to off-site sensitive receptors associated with this action would be caused by heavy-duty diesel trucks. Diesel particulate matter (DPM), emitted by these trucks, is a potent toxic air contaminant (TAC) that increases cancer risk. While automobiles are also a source of TACs, the impact they pose compared to trucks is insubstantial due to the much lower emission rates and types of TACs they emit. Therefore, this screening health risk assessment evaluated the effects of emissions from diesel trucks to sensitive receptors near the highway.

As previously discussed, the project would generate 200 daily heavy-duty truck trips, assumed to occur 365 days per year, with an additional 114 trips per day for 20 days per year, over a project lifetime of 30 years. These were assumed to include a mix of heavy heavy-duty diesel trucks (HHDT) and medium heavy-duty diesel trucks (MHDT) category trucks. Travel emissions were estimated for 55-mph and 35-mph speeds, based on rates generated by the Caltrans version of the EMFAC2017 vehicle emissions model, known as CT-EMFAC. The model was run for Santa Clara County assuming 100% Truck category 2, which is a mix of HHDT and MHDT. The analysis year was 2020 only, as future decreases in truck emissions were not incorporated into this analysis. CT-EMFAC provides emission rates for mobile source air toxics (MSATs) that include diesel particulate matter.

The U.S. EPA AERMOD dispersion model was used to predict DPM and $PM_{2.5}$ concentrations at sensitive receptors (residences) in the vicinity of the project truck travel. The AERMOD model is a BAAQMD-recommended model for use in modeling analysis of these types of emission activities for CEQA projects.[1] Annual DPM and $PM_{2.5}$ concentrations from truck traffic were computed using the model at sensitive receptors. Some groups of people are more affected by air pollution than others. The State has identified the following people who are most likely to be affected by air pollution: children under 16, the elderly over 65, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, and elementary schools. Residential locations are assumed to include infants and small children. Residences along State Route 25 both east and west of the project site were included as sensitive receptors. Figure 1 shows the locations of residences along State Route 25 that may be affected by the project truck trips.

The modeling used two sets of meteorological data:

(1) A five-year data set (2013 - 2017) of hourly meteorological data from San Martin Airport prepared for use with the AERMOD model by the Bay Area Air Quality Management District (BAAQMD). The airport is about 8.7 to 9.7 miles north of the western State Route 25 roadway segments that were used for modeling impacts at receptors 1 through 4 (see Figure 1).
(2) A five-year data set (2009 - 2014)[2] of hourly meteorological data from Hollister Municipal Airport prepared for use with the AERMOD model by the California Air Resources Board. The airport is about 1.5 to 2.0 miles southeast of the eastern State Route 25 roadway segments were used for modeling impacts at receptors 5 through 7 (see Figure 1). Receptor 8 was not included in the modeling since it is more than 1,000 feet from State Route 25.

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1 Bay Area Air Quality Management District (BAAQMD), 2012, *Recommended Methods for Screening and Modeling Local Risks and Hazards, Version 3.0.* May.
2 The five years of data were comprised of the period from February 1, 2009 through January 31, 2014.

Project operation was assumed to occur for 365 days per year and that the trucks would be traveling on State Route 25 during the nighttime from about 6:00 p.m. to 9:00 a.m. The emissions from truck travel were modeled with the AERMOD model using line-area sources representing the expected truck travel routes within about 1,000 feet of the residential receptors (see Figures 2, 3, and 4). DPM and $PM_{2.5}$ concentrations were calculated at sensitive receptors using receptor heights of 1.5 meters (4.9 feet) to represent the breathing heights of the residents in nearby single-family homes. Residential receptors are assumed to include all receptor types with almost continuous exposure.

Figures 2, 3, and 4 show locations of modeled roadway segments (emission sources) and sensitive receptors (Figures 2 and 3 are for receptors west and Figure 4 is for receptors east). Also shown in the figures are the receptors that would be most affected by the project TAC and $PM_{2.5}$ emissions along the roadway segment modeled.

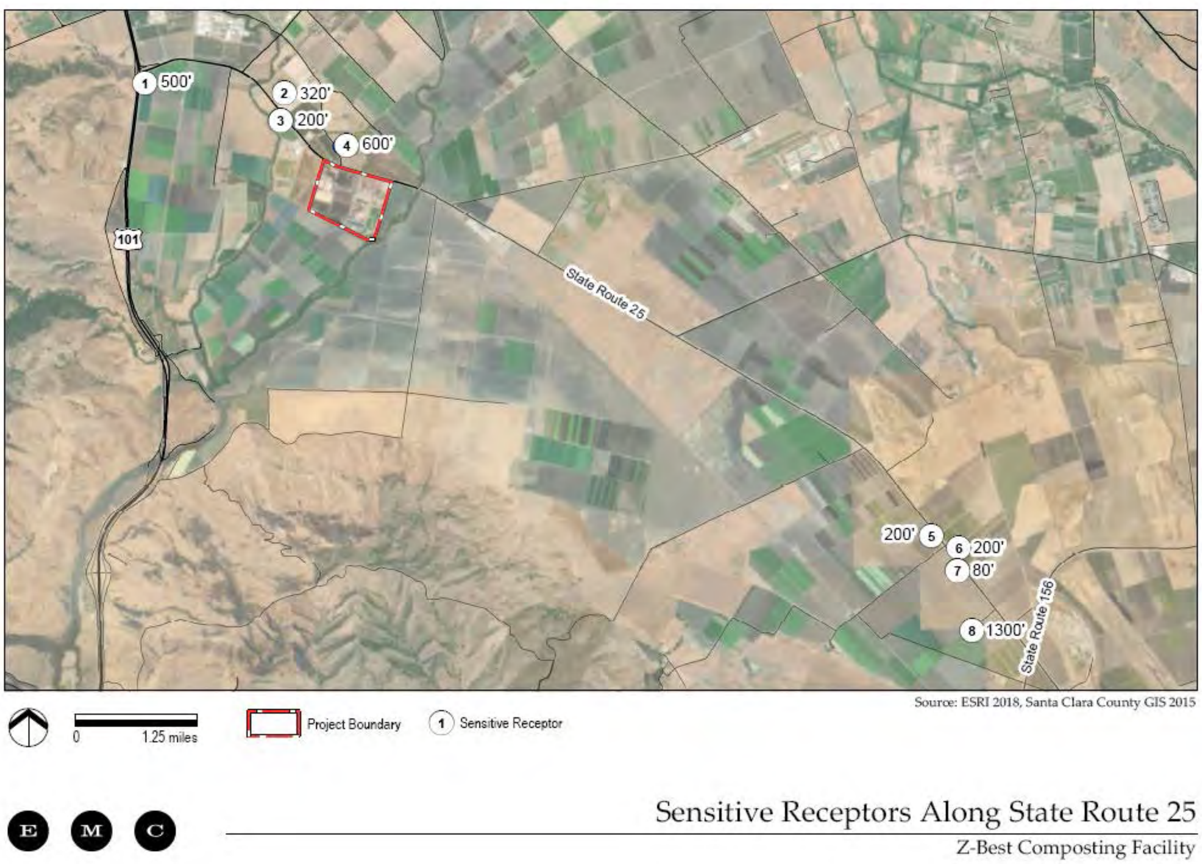

Figure 1


Roadway Segments and Receptor Location Modeled for West Receptor #1
4091700
4091600
4091500
4091400
4091300
4091200
UTM - Northing (meters)
Road Segments
Used for Modeling
Residential Receptor Location used for Modeling
629000
629100
629200
629300
UTM - Easting (meters)

Figure 2

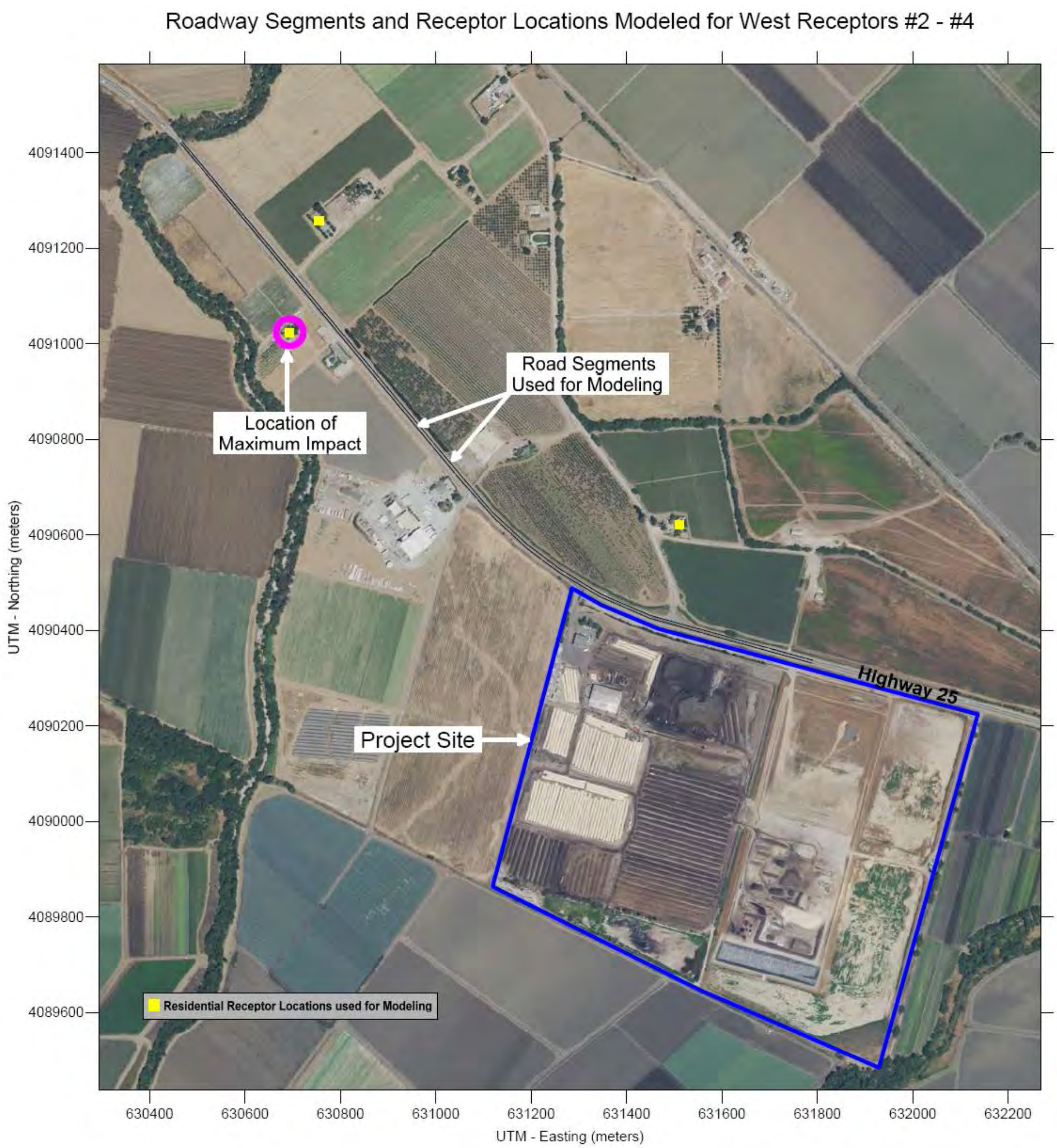
Roadway Segments and Receptor Locations Modeled for West Receptors #2 - #4
Road Segments Used for Modeling
Location of Maximum Impact
Project Site
Highway 25
Residential Receptor Locations used for Modeling
UTM - Northing (meters)
UTM - Easting (meters)
4091400
4091200
4091000
4090800
4090600
4090400
4090200
4090000
4089800
4089600
630400
630600
630800
631000
631200
631400
631600
631800
632000
632200

Figure 3

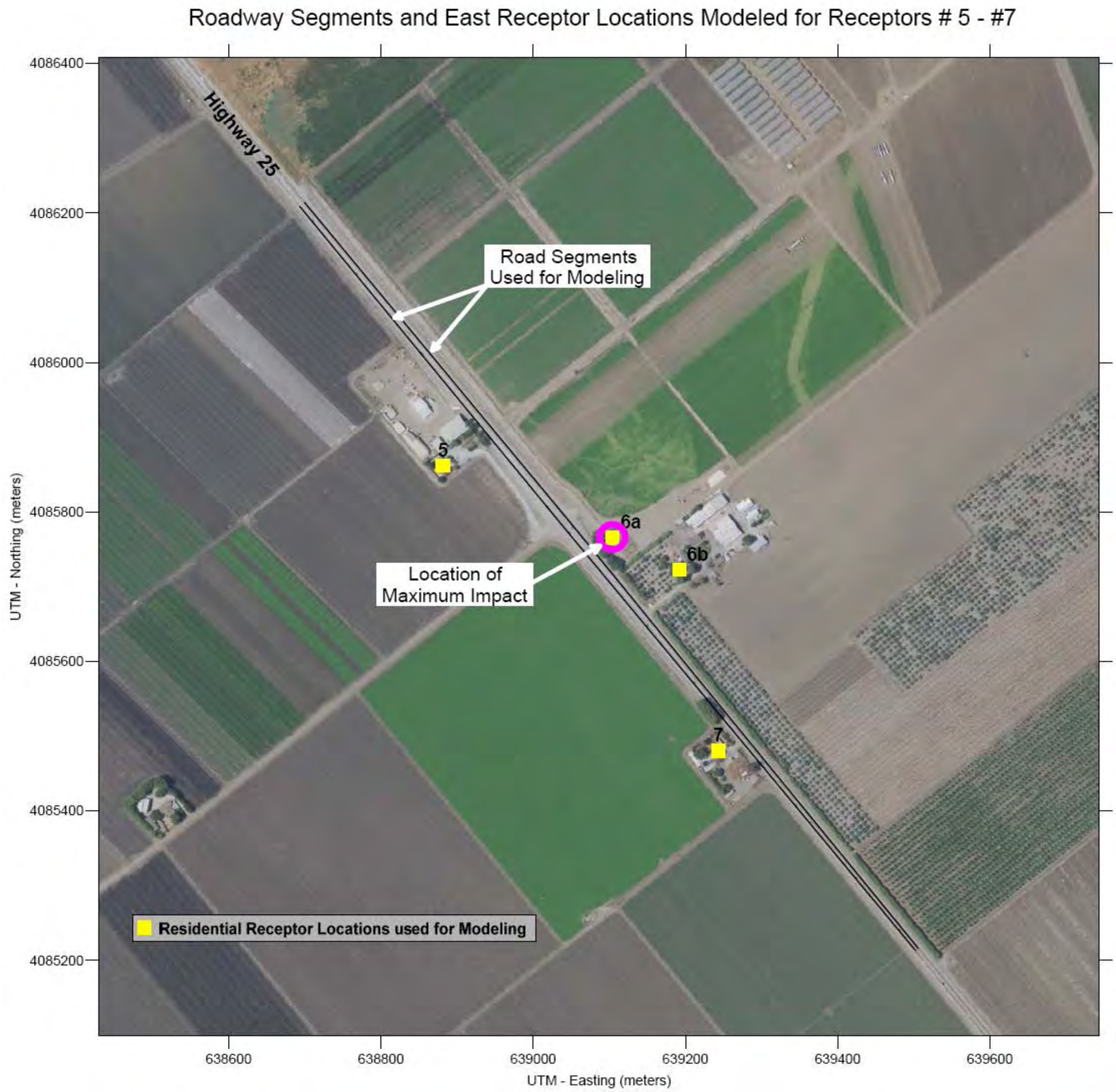

Figure 4

Increased cancer risks from the truck traffic emission sources were calculated using the modeled maximum annual DPM concentrations and BAAQMD recommended risk assessment methods and parameters described in *Attachment 1*. These methods evaluate cancer risk due to DPM exposure and incorporate age sensitivity factors methods for infant (third trimester to two years of age) and children (two years of age to 16 years). The sensitive receptor identified with the maximum increased cancer risk caused by the project traffic is referred to as the Maximally Exposed Individual (MEI). The maximum cancer risk would occur at receptor #3 and is considered to be the location of the MEI. All other receptors would have lesser impacts with respect to increase cancer risk caused by the project. The $PM_{2.5}$ concentration and non-cancerous health risk impacts (i.e. Hazard Index) were also calculated. These results are also based on the maximum annual concentration but include sources of $PM_{2.5}$ besides DPM (e.g., brake and tire wear and re entrained roadway dust). The maximum $PM_{2.5}$ concentration and Hazard Index occur at the same location as the cancer risk MEI, receptor #3.

Table 1 reports the community risk impacts in terms of MEI for cancer risk, maximum annual $PM_{2.5}$ concentration and maximum annual Hazard Index for the project truck traffic. *Attachment 2* includes the truck traffic health risk assessment assumptions and computations.

Table 1. Project Traffic Health Risk Impacts at the Location of Maximum Impact

Source	**Lifetime Cancer Risk at MEI (per million)** [1]	**Maximum Annual**	
		$PM_{2.5}$ ($\mu g/m^3$)	**Hazard Index**
State Route 25 Segment - west			
Project Increase	7.0	0.04	<0.01
BAAQMD Single-Source Threshold	*>10.0*	*>0.3*	*>1.0*
Significant?	*No*	*No*	*No*

Supporting Documentation

Attachment 1 is the methodology used to compute community risk impacts, including the methods to compute lifetime cancer risk from exposure to project emissions.

Attachment 2 is the summary of the health risk assessment inputs and outputs. AERMOD dispersion modeling files for this assessment are not included, but are available upon request and would be provided in digital format.

Attachment 1: Health Risk Calculation Methodology

A health risk assessment (HRA) for exposure to Toxic Air Contaminates (TACs) requires the application of a risk characterization model to the results from the air dispersion model to estimate potential health risk at each sensitive receptor location. The State of California Office of Environmental Health Hazard Assessment (OEHHA) and California Air Resources Board (CARB) develop recommended methods for conducting health risk assessments. The most recent OEHHA risk assessment guidelines were published in February of 2015.[3] These guidelines incorporate substantial changes designed to provide for enhanced protection of children, as required by State law, compared to previous published risk assessment guidelines. CARB has provided additional guidance on implementing OEHHA's recommended methods.[4] This HRA used the 2015 OEHHA risk assessment guidelines and CARB guidance. The BAAQMD has adopted recommended procedures for applying the newest OEHHA guidelines as part of Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants.[5] Exposure parameters from the OEHHA guidelines and the recent BAAQMD HRA Guidelines were used in this evaluation.

<u>Cancer Risk</u>

Potential increased cancer risk from inhalation of TACs is calculated based on the TAC concentration over the period of exposure, inhalation dose, the TAC cancer potency factor, and an age sensitivity factor to reflect the greater sensitivity of infants and children to cancer causing TACs. The inhalation dose depends on a person's breathing rate, exposure time and frequency and duration of exposure. These parameters vary depending on the age, or age range, of the persons being exposed and whether the exposure is considered to occur at a residential location or other sensitive receptor location.

The current OEHHA guidance recommends that cancer risk be calculated by age groups to account for different breathing rates and sensitivity to TACs. Specifically, they recommend evaluating risks for the third trimester of pregnancy to age zero, ages zero to less than two (infant exposure), ages two to less than 16 (child exposure), and ages 16 to 70 (adult exposure). Age sensitivity factors (ASFs) associated with the different types of exposure are an ASF of 10 for the third trimester and infant exposures, an ASF of 3 for a child exposure, and an ASF of 1 for an adult exposure. Also associated with each exposure type are different breathing rates, expressed as liters per kilogram of body weight per day (L/kg-day) or liters per kilogram of body weight per 8-hour period for the case of worker or school child exposures. As recommended by the BAAQMD for residential exposures, 95th percentile breathing rates are used for the third trimester and infant exposures, and 80th percentile breathing rates for child and adult exposures. For children at schools and daycare facilities, BAAQMD recommends using the 95th percentile 8-hour breathing rates. Additionally, CARB and the BAAQMD recommend the use of a residential exposure duration of

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3 OEHHA, 2015. *Air Toxics Hot Spots Program Risk Assessment Guidelines, The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*. Office of Environmental Health Hazard Assessment. February.
4 CARB, 2015. *Risk Management Guidance for Stationary Sources of Air Toxics*. July 23.
5 BAAQMD, 2016. *BAAQMD Air Toxics NSR Program Health Risk Assessment (HRA) Guidelines*. December 2016.

30 years for sources with long-term emissions (e.g., roadways). For workers, assumed to be adults, a 25-year exposure period is recommended by the BAAQMD. For school children a 9-year exposure period is recommended by the BAAQMD.

Under previous OEHHA and BAAQMD HRA guidance, residential receptors are assumed to be at their home 24 hours a day, or 100 percent of the time. In the 2015 Risk Assessment Guidance, OEHHA includes adjustments to exposure duration to account for the fraction of time at home (FAH), which can be less than 100 percent of the time, based on updated population and activity statistics. The FAH factors are age-specific and are: 0.85 for third trimester of pregnancy to less than 2 years old, 0.72 for ages 2 to less than 16 years, and 0.73 for ages 16 to 70 years. Use of the FAH factors is allowed by the BAAQMD if there are no schools in the project vicinity have a cancer risk of one in a million or greater assuming 100 percent exposure (FAH = 1.0).

Functionally, cancer risk is calculated using the following parameters and formulas:

Cancer Risk (per million) = $CPF \times Inhalation\ Dose \times ASF \times ED/AT \times FAH \times 10^{6}$

Where:

CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = $C_{air} \times DBR^{*} \times A \times (EF/365) \times 10^{-6}$

Where:

C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
8HrBR = 8-hour breathing rate (L/kg body weight-8 hours)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

* An 8-hour breathing rate (8HrBR) is used for worker and school child exposures.

The health risk parameters used in this evaluation are summarized as follows:

Parameter	*Exposure Type →*	Infant		Child	Adult
	Age Range →	3rd Trimester	0<2	2 < 16	16 - 30
DPM Cancer Potency Factor $(mg/kg\text{-}day)^{-1}$		1.10E+00	1.10E+00	1.10E+00	1.10E+00
Daily Breathing Rate (L/kg-day) 80th Percentile Rate		273	758	572	261
Daily Breathing Rate (L/kg-day) 95th Percentile Rate		361	1,090	745	335
8-hour Breathing Rate (L/kg-8 hours) 95th Percentile Rate		-	1,200	520	240
Inhalation Absorption Factor		1	1	1	1
Averaging Time (years)		70	70	70	70
Exposure Duration (years)		0.25	2	14	14*
Exposure Frequency (days/year)		350	350	350	350*
Age Sensitivity Factor		10	10	3	1
Fraction of Time at Home (FAH)		0.85-1.0	0.85-1.0	0.72-1.0	0.73*

* For worker exposures (adult) the exposure duration and frequency are 25 years 250 days/year and FAH is not applicable.

Non-Cancer Hazards

Non-cancer health risk is usually determined by comparing the predicted level of exposure to a chemical to the level of exposure that is not expected to cause any adverse effects (reference exposure level), even to the most susceptible people. Potential non-cancer health hazards from TAC exposure are expressed in terms of a hazard index (HI), which is the ratio of the TAC concentration to a reference exposure level (REL). OEHHA has defined acceptable concentration levels for contaminants that pose non-cancer health hazards. TAC concentrations below the REL are not expected to cause adverse health impacts, even for sensitive individuals. The total HI is calculated as the sum of the HIs for each TAC evaluated and the total HI is compared to the BAAQMD significance thresholds to determine whether a significant non-cancer health impact from a project would occur.

Typically, for residential projects located near roadways with substantial TAC emissions, the primary TAC of concern with non-cancer health effects is diesel particulate matter (DPM). For DPM, the chronic inhalation REL is 5 micrograms per cubic meter ($\mu g/m^3$).

Annual $PM_{2.5}$ Concentrations

While not a TAC, fine particulate matter ($PM_{2.5}$) has been identified by the BAAQMD as a pollutant with potential non-cancer health effects that should be included when evaluating potential community health impacts under the California Environmental Quality Act (CEQA). The thresholds of significance for $PM_{2.5}$ (project level and cumulative) are in terms of an increase in the annual average concentration. When considering $PM_{2.5}$ impacts, the contribution from all sources of $PM_{2.5}$ emissions should be included. For projects with potential impacts from nearby local roadways, the $PM_{2.5}$ impacts should include those from vehicle exhaust emissions, $PM_{2.5}$ generated from vehicle tire and brake wear, and fugitive emissions from re-suspended dust on the roads.

Attachment 2: Modeling Inputs Assumptions and Summary of Output

```
         File Name:   Santa Clara (SF) - 2020 - Annual.EF
CT-EMFAC2017 Version:   1.0.2.27401
          Run Date:   2/20/2020 5:34:37 PM
              Area:   Santa Clara (SF)
     Analysis Year:   2020
            Season:   Annual

=======================================================================

Vehicle Category        VMT Fraction            Diesel VMT Fraction     Gas VMT Fraction
                        Across Category         Within Category         Within Category
         Truck 1             0.000                   0.456                   0.544
         Truck 2             1.000                   0.944                   0.044
       Non-Truck             0.000                   0.013                   0.966

=======================================================================

              Road Type:        Major/Collector
     Silt Loading Factor:                   CARB        0.032 g/m2
Precipitation Correction:                   CARB        P = 64 days     N = 365 days

=======================================================================

Fleet Average Running Exhaust Emission Factors (grams/veh-mile)

       Pollutant Name        35 mph          55 mph
                PM2.5      0.051048        0.070217
                 PM10      0.053358        0.073393
                  TOG      0.183346        0.111236
        1,3-Butadiene      0.000332        0.000218
         Acetaldehyde      0.011762        0.007584
             Acrolein      0.000007        0.000005
              Benzene      0.003325        0.002163
            Diesel PM      0.053827        0.073597
         Ethylbenzene      0.000550        0.000363
         Formaldehyde      0.023592        0.015221
          Naphthalene      0.000163        0.000100
                  POM      0.000386        0.000296
                 DEOG      0.159814        0.103026

=======================================================================

Fleet Average Running Loss Emission Factors (grams/veh-hour)

       Pollutant Name   Emission Factor
                  TOG          0.237727
        1,3-Butadiene          0.000000
              Benzene          0.002377
         Ethylbenzene          0.003899
          Naphthalene          0.000333

=======================================================================

Fleet Average Tire Wear Factors (grams/veh-mile)

       Pollutant Name   Emission Factor
                PM2.5          0.006679
                 PM10          0.026716

=======================================================================

Fleet Average Brake Wear Factors (grams/veh-mile)

       Pollutant Name   Emission Factor
                PM2.5          0.037827
                 PM10          0.088263

=======================================================================

Fleet Average Road Dust Factors (grams/veh-mile)

       Pollutant Name   Emission Factor
                PM2.5          0.124766
                 PM10          0.831771

=============================END======================================
```

Z-Best Compost Facility - Morgan Hill, CA
2020 Increased Project Truck Emissions - DPM

Road Segment	Road Segment Length (ft)	Road Segment Length (m)	Modeled Road Width (ft)	Initial[a] Vertical Height (m)	Initial[a] Vertical Dispersion (m)	Release[a] Height (m)	Percent of Daily Trucks (%)	No. of Trucks Trips	Travel Speed (mph)	DPM[b] Emission Factor (g/veh-mi)	Truck Travel DPM Emissions Daily (g/day)	Daily (lb/day)	Hourly (lb/hr)	Annual (lb/year)
On-Ramp & Northbound Highway 25-Rec #1	2312	705	31.7	6.8	3.16	3.4	83%	85.6	35	0.05383	2.017	0.00445	2.97E-04	1.62
Off-Ramp & Southbound Highway 25-Rec #1	1783	543	31.7	6.8	3.16	3.4	83%	85.6	35	0.05383	1.556	0.00343	2.29E-04	1.25
Norhtbound Highway 25-Rec #s 2-4	5794	1766	31.7	6.8	3.16	3.4	83%	85.6	55	0.07360	6.913	0.01524	1.02E-03	5.56
SouthboundHighway 25-Rec #s 2-4	5794	1766	31.7	6.8	3.16	3.4	83%	85.6	55	0.07360	6.913	0.01524	1.02E-03	5.56
Norhtbound Highway 25-Rec #s 5-7	4209	1283	31.7	6.8	3.16	3.4	17%	17.5	55	0.07360	1.029	0.00227	1.51E-04	0.83
SouthboundHighway 25-Rec #s 5-7	4209	1283	31.7	6.8	3.16	3.4	17%	17.5	55	0.07360	1.029	0.00227	1.51E-04	0.83

[a] Line-area source parameters based on EPA 2015

[b] Emission factor from CT-EMFAC2017 for running exhaust for 2020

Truck Information

Normal Trucks per day =	100
Normal Truck Trips per day =	200
Normal Annual Trucks =	36,500
Additional Trucks per Year* =	1,140
Total Trucks per Year =	37,640
Total Trucks per day =	103.1
Operation Days =	365
Delivery Truck Hours (hrs/day)** =	15

* Additional 57 truck per day (114 trucks trips per day) for 20 days per year

** Truck operation from 6 PM to 9 AM

References:

EPA 2015 - *Transportation Conformity Guidance for Quantitative Hot-spot Analyses in PM2.5 and PM10 Nonattainment and maintenance Areas* , November 2015

Z-Best Compost Facility - Morgan Hill, CA
2020 Increased Project Truck Emissions - PM2.5 Emissions

Road Segment	Road Segment Length (ft)	Segment Length (m)	Modeled Road Width (ft)	Initial[a] Vertical Height (m)	Initial[a] Vertical Dispersion (m)	Release[a] Height (m)	Percent of Daily Trucks (%)	No. of Daily Trucks	Travel Speed (mph)	PM2.5[b] Emission Factors (g/veh-mi)				Truck Travel Fugitive PM2.5 Emissions			
										Vehicle Exhaust	Tire & Brake Wear	Fugitive Road Dust	Total PM2.5 Emissions	Daily (g/day)	Daily (lb/day)	Hourly (lb/hr)	Annual (lb/year)
On-Ramp & Northbound Highway 25-Rec #1	2312	705	31.7	6.8	3.16	3.4	83%	85.6	35	0.05105	0.04451	0.12477	0.22032	8.257	0.01820	1.21E-03	6.64
Off-Ramp & Southbound Highway 25-Rec #1	1783	543	31.7	6.8	3.16	3.4	83%	85.6	35	0.05105	0.04451	0.12477	0.22032	6.368	0.01404	9.36E-04	5.12
Norhtbound Highway 25-Rec #s 2-4	5794	1766	31.7	6.8	3.16	3.4	83%	85.6	55	0.07022	0.04451	0.12477	0.23949	22.494	0.04959	3.31E-03	18.10
SouthboundHighway 25-Rec #s 2-4	5794	1766	31.7	6.8	3.16	3.4	83%	85.6	55	0.07022	0.04451	0.12477	0.23949	22.494	0.04959	3.31E-03	18.10
Norhtbound Highway 25-Rec #s 5-7	4209	1283	31.7	6.8	3.16	3.4	17%	17.5	55	0.07022	0.04451	0.12477	0.23949	3.347	0.00738	4.92E-04	2.69
SouthboundHighway 25-Rec #s 5-7	4209	1283	31.7	6.8	3.16	3.4	17%	17.5	55	0.07022	0.04451	0.12477	0.23949	3.347	0.00738	4.92E-04	2.69

[a] Line-area source parameters based on EPA 2015

[b] Emission factor forvehicle exhaust, tire and brake wear from CT-EMFAC2017 for 2020

Truck Information

Normal Trucks per day =	100
Normal Truck Trips per day =	200
Normal Annual Trucks =	36,500
Additional Trucks per Year* =	1,140
Total Trucks per Year =	37,640
Annual Average Trucks per day =	103.1
Operation Days =	365
Delivery Truck Hours (hrs/day) =	15

* Additional 57 truck per day (114 trucks trips per day) for 20 days per year

** Truck operation from 6 PM to 9 AM

Truck Fugitive PM2.5 Emission Information

Truck Tire Wear Emission Factor (g/veh-mi) =	0.00668
Truck Brake Wear Emission Factor (g/veh-mi) =	0.03783
Truck Road Dust Emission Factor (g/veh-mi) =	0.12477
Total Fugitive PM2.5 Emissions (g/veh-mi) =	0.16927

References:

EPA 2015 - *Transportation Conformity Guidance for Quantitative Hot-spot Analyses in PM2.5 and PM10 Nonattainment and maintenance Areas*, November 2015

Z-Best Composting, Morgan Hill - Cancer Risks from Project Operation
Project Truck Traffic
Residential Receptor #1 (1.5 meter receptor heights)

Cancer Risk Calculation Method

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

Cancer Potency Factors $(mg/kg\text{-}day)^{-1}$

TAC	CPF
DPM	1.10E+00

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - <2**	**2 - <16**	**16 - 30**
Parameter				
ASF	10	10	3	1
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
ED =	0.25	2	14	14
AT =	70	70	70	70
FAH =	0.85	0.72	0.72	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

MEI Cancer Risk From: Project Truck Traffic

Exposure Duration (years)	Age	Age Sensitivity Factor	DPM Annual Conc (ug/m3)	DPM Cancer Risk (per million)
0.25	-0.25 - 0*	10	0.00532	0.06
2	1 - 2	10	0.00532	1.26
14	3 - 16	3	0.00532	1.39
14	17 - 30	1	0.00532	0.21
Total Increased Cancer Risk				**2.9**

* Third trimester of pregnancy

Maximum PM2.5 Concentration ($\mu g/m^3$) = 0.02179

Z-Best Composting, Morgan Hill - Cancer Risks from Project Operation
Project Truck Traffic
Residential Receptors #2 - #4 (1.5 meter receptor heights)

Cancer Risk Calculation Method

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

Cancer Potency Factors $(mg/kg\text{-}day)^{-1}$

TAC	CPF
DPM	1.10E+00

	Infant/Child			Adult
Age -->	3rd Trimester	0 - <2	2 - <16	16 - 30
Parameter				
ASF	10	10	3	1
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
ED =	0.25	2	14	14
AT =	70	70	70	70
FAH =	0.85	0.72	0.72	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

MEI Cancer Risk From: Project Truck Traffic

Exposure Duration (years)	Age	Age Sensitivity Factor	DPM Annual Conc (ug/m3)	DPM Cancer Risk (per million)
0.25	-0.25 - 0*	10	0.01277	0.15
2	1 - 2	10	0.01277	3.02
14	3 - 16	3	0.01277	3.33
14	17 - 30	1	0.01277	0.51
Total Increased Cancer Risk				**7.0**

* Third trimester of pregnancy

Maximum PM2.5 Concentration ($\mu g/m^3$) = 0.04149

Z-Best Composting, Morgan Hill - Cancer Risks from Project Operation
Project Truck Traffic
Residential Receptors #5 - #7 (1.5 meter receptor heights)

Cancer Risk Calculation Method

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

Cancer Potency Factors $(mg/kg\text{-}day)^{-1}$

TAC	CPF
DPM	1.10E+00

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - <2**	**2 - <16**	**16 - 30**
Parameter				
ASF	10	10	3	1
DBR* =	361	1090	572	261
A =	1	1	1	1
EF =	350	350	350	350
ED =	0.25	2	14	14
AT =	70	70	70	70
FAH =	0.85	0.72	0.72	0.73

* 95th percentile breathing rates for infants and 80th percentile for children and adults

MEI Cancer Risk From: Project Truck Traffic

Exposure Duration (years)	Age	Age Sensitivity Factor	DPM Annual Conc (ug/m3)	DPM Cancer Risk (per million)
0.25	-0.25 - 0*	10	0.00136	0.02
2	1 - 2	10	0.00136	0.32
14	3 - 16	3	0.00136	0.35
14	17 - 30	1	0.00136	0.05
Total Increased Cancer Risk				**0.7**

* Third trimester of pregnancy

Maximum PM2.5 Concentration ($\mu g/m^3$) = 0.00442

June 10, 2020

Mr. Ron Sissem, MRP
Principal
EMC Planning Group, Inc.
301 Lighthouse Avenue, Suite C
Monterey, CA 93940

Subject: Toxic Air Contaminant (TAC) Emissions Evaluation for Proposed Capacity Expansion of the Z-Best Composting (Z-Best) Facility

Dear Mr. Sissem:

At the request of the County, Yorke Engineering, LLC (Yorke) performed an independent review for EMC Planning Group, Inc. (EMC) of the potential impacts on TAC emissions resulting from the proposed increase in permitted composting capacity (Project) at the Z-Best Composting (Z-Best) facility in Gilroy, CA. EMC is assisting the County of Santa Clara Department of Planning and Development with the preparation of an Environmental Impact Report (EIR) for the Project.

PROPOSED COMPOSTING CAPACITY INCREASE

Yorke understands that the Project will result in the capacity to compost an additional 875 tons per day (tpd) of municipal solid waste (MSW) and/or food waste. This additional 875 tpd of composting capacity would be permitted as an increase in the monthly capacity for the site. The Project includes the removal of the existing MSW and food waste in-vessel composting system (CTI bag system), and the construction of a covered aerated static pile (CASP) under negative aeration with emissions controlled by biofilters for primary (active) composting of MSW and food waste, and positively aerated static piles (ASPs) with a biofilter cover (finished compost) for secondary (curing) composting.

The Z-Best facility also accepts green waste, which after processing to remove uncompostable material is composted in an existing open windrow system. Other wastes, primarily inert material, is separated from the waste feed streams and transported offsite.

The current facility capacity for MSW and food waste is 700 tpd. This is also the current MSW/food waste sublimit allowed in the current facility's total waste limit on peak days. Thus, the peak MSW and food waste that would be allowed after implementation of the Project is the sum of the current limit of 700 tpd and the proposed additional capacity of 875 tpd, or 1,575 tpd. Yorke understands that the Project proposes no permitted increase in the daily capacity for green waste composting including on peak days.

COMPOSTING AIR EMISSIONS ESTIMATION METHODOLOGY

Methodology Overview

Prior to discussing the specific calculations and assumptions used for Pre- and Post-Project TAC emissions, this section presents an overview description of the methodology to provide context.

Precursor Organic Compounds

Emissions of precursor organic compounds (POCs) occur over the composting cycle. All composting TACs currently assessed by the Bay Area Air Quality Management District (BAAQMD) and other California air districts are chemicals in a class of compounds called "reactive organic gases" (ROG), with the exception of ammonia. ROG are called "precursor organic compounds" (POCs) in BAAQMD regulations. In other California air districts and under U.S. Environmental Protection Agency (USEPA) regulations, these same compounds are referred to as volatile organic compounds (VOCs). These are all different names for the same class of compounds. This can be confusing when examining assessments from different agencies, so important to point out in the context of this Project.

ROG, VOC, and POC are organic compounds[1] that can undergo photochemical reaction with nitrogen oxides (NOx) in the atmosphere in the presence of sunlight to form photochemical oxidants, which are respiratory irritants. POCs are considered "criteria air pollutants", since they are "precursors" to an air pollutant with an ambient air quality standard, photochemical oxidants measured as ozone[2].

Ammonia

Ammonia is also a chemical released over the composting cycle, and is also a TAC. It is formed by nitrogen in the waste feed. The chemical formula for ammonia is NH_3 (one nitrogen atom and three hydrogen atoms), so ammonia is <u>not</u> an organic molecule. Although the content of the waste stream is chiefly organic with a high carbon content, some of the organic compounds in the waste streams contain nitrogen, and that nitrogen can form ammonia in the composting emissions. The amount of ammonia in the emissions depends on the carbon-to-nitrogen ratio (C/N) in the feed streams, as well as how well the composting is aerated. That is, how well air is mixed into the composting process. The better the aeration, the lower the ammonia (as well as POC) emissions. This is discussed further in this report.

Basic Calculation Methodology Approach

The basic methodology to estimate TAC emissions begins with the application of POC and ammonia "emission factors" to the amount of waste being composted. Higher POC and ammonia emission factors are applied to the amount of waste in the composting cycle. Lower POC and ammonia emission factors are applied the waste feed storage piles on the tipping floor, as waste decomposition can begin there prior to being placed into active compositing. If emissions are controlled by an air pollution control device after being emitted from composting, as is the case with the Post-Project configuration, then a control

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[1] An organic compound is made up of carbon atoms, with other major atoms being hydrogen, oxygen, and/or nitrogen. Organic compounds can also include also other atoms depending on the compound. The majority of emissions from composing are organic compounds due to the high organic content of the waste streams being composted.

[2] Ozone is a molecule made up of three oxygen atoms and is highly reactive. Normal oxygen is comprised of two oxygen atoms, and is a stable gas. Ozone is the primary photochemical oxidant in "smog." Ozone is colorless, but the presence of NOx pollutants, which help to form ozone in reaction with sunlight, is brown, giving smog its brown appearance.

efficiency is applied. For example, if the process is 80 percent controlled, then 20 percent of the composting emissions will vent to the atmosphere.

For TAC emissions estimates, the amount of ammonia emissions estimated by the emission factors and control device efficiencies are used directly in the TAC emissions assessment. The other TACs are fractions of the POC emissions. Thus, the estimated TAC emissions after any air pollution control device are determined by using the POC emissions and the results from a UC Davis composting study.[3] The UC Davis study reports each measured individual VOC constituent as a percentage of the total VOC emissions. Note that the study reports "VOCs" that contribute to photochemical oxidant formation, and thus, these are the same as POCs as discussed in this report for BAAQMD permitting purposes. The emissions of those POCs that are TACs are estimated by applying those corresponding weight fractions from the UC Davis study. The TACs that are POCs include: isopropyl alcohol, methanol, naphthalene, propene, and acetaldehyde.

More specifics on the emission factors and control equipment assumptions used for the Pre- and Post-Project emissions are described further in the following two sections

Pre-Project MSW/Food Waste Emissions Calculation Description

As depicted earlier, current MSW and food waste composting at Z-Best occurs in the CTI bag system. To assess potential POC emissions from the CTI bags, emission factors were taken from a California Air Resources Board (CARB) report, *ARB Emissions Inventory Methodology for Composting Facilities*, March 2015 (CARB Report). CARB averaged emission factors from various studies on green waste composting to recommend a POC emission factor of 3.58 pounds of POC per ton of waste composted (lb/ton) over the composting (active and curing) cycle. For storage piles on the tipping floor, a POC emission factor of 0.2 pounds per ton per day for tipping piles is recommended in the CARB Report. Since Z-Best processes incoming waste within 24 hours, the emission factor was used simply as 0.2 lb/ton. TAC emissions from these POC emissions were determined as described earlier using the UC Davis composting study.[3]

The recommended ammonia emission factor in the CARB Report is 0.78 lb/ton. Ammonia emissions from storage piles were not addressed in the CARB Report. An ammonia emission factor of 0.02 lb/ton was used from BAAQMD Application 26437 (for Waste Management of Alameda County – Altamont Pass).

The existing composting at Z-Best does not employ air pollution control devices, thus no control factors were applied. Attachment 1 provides full details on emissions from the CTI bags resulting from the currently permitted throughput of 700 tpd of MSW and food waste using the cited emission factors, along with example calculations. The estimated emission results are summarized in the "POC and TAC Emission Estimates" section below.

Post-Project MSW/Food Waste Emissions Calculations

The BAAQMD, as a Responsible Agency, provided comments on the California Environmental Quality Act (CEQA) Notice of Preparation (NOP) for the Project in a November 15, 2018, letter to the County of Santa Clara Department of Planning and Development. At the request of Z-Best,

[3] Kumar, Anuj, et al, "Volatile organic compound emissions from green waste composting: Characterization and ozone formation", Atmospheric Environment, January 7, 2011, Table 4.

SCS Engineers (SCS) prepared responses to the BAAQMD letter, as updated in SCS' December 20, 2019 response letter (SCS Letter). The following summarizes MSW/food waste composting air emissions calculations from the proposed aerated static pile (ASP) systems as presented in the SCS Letter.

SCS cited a source test report by Horizon Air Measurement Services, Inc., for a facility in Southern California similar to the proposed ASP systems at the Gilroy facility. POC emission factors determined from that source test were used to calculate POC emissions from the CASP (active) and positive pressure ASP (curing) phases of the composting process as presented in Table 1 for the additional 875 tpd of MSW/food waste composting in the proposed new ASP systems, reproduced from the SCS December 20, 2019 letter. For active phase composting, a biofilter is proposed for emissions control, providing 80 percent POC emissions reduction as stated in the SCS letter as well as in the above-referenced CARB Report. For the curing phase, a moist compost cover layer is proposed for emissions control providing 50 percent POC emissions reduction as stated in the SCS letter, slightly lower than in the above-referenced CARB Report. For storage piles on the tipping floor, the POC emission factor of 0.2 lb/ton described above was used. Waste will also be tipped directly onto the CASP piles, which results in no emissions from tipped waste before added to the active phase. There is no emissions control proposed for the tipping floor, as shown in Table 1.

Table 1. POC Emissions from the Additional 875 tpd MSW/Food Waste Composting*

Phase	Emission Factor (lb/wet ton of material)	Daily Throughput (tpd)	Uncontrolled Daily Emission (lb/day)	Control Efficiency	Controlled Daily Emission (lb/day)	Controlled Annual Emissions (tons/year)
In-building tipping	0.2	219	43.8	0	43.75	7.98
Negative CASP (Active Phase)	0.0151	875	13.2	80%	2.64	0.48
Positive ASP (Curing Phase)	0.0151	875	13.2	50%	6.61	1.21
Total			70.2		53.00	9.67

* Reproduced from December 20, 2019, SCS Letter.

For ammonia, the tipping floor storage pile emissions were estimated by Yorke from the ammonia emission factor of 0.02 lb/ton described in the Pre-Project emissions section. The SCS Letter did not provide an ammonia emission factor for composting. It was set equal to the POC emission factor for the new ASP systems for the reasons discussed in the following paragraph.

The low POC composting emissions from the proposed ASP systems result from much enhanced aeration and increased aerobic (i.e., high oxygen) conditions, which in turn, reduces organic emissions. Ammonia is produced from the nitrogen content in the waste, which will be lower than the carbon content in an organic waste stream. Thus, per ton of waste feed, ammonia emissions are lower than POC emissions. The same enhanced aeration that reduces POC emissions will also reduce ammonia emissions, since ammonia formation results from anaerobic (low oxygen) conditions. Setting the ammonia emission factor equal to the POC emission factor is, therefore, conservative (i.e., should overestimate ammonia emissions).

Yorke assumed 53 percent control of ammonia emissions from active composting, consistent with the CARB Report. Ammonia control for the curing phase by compost cover was estimated using the ammonia efficiency by biofilter multiplied by the ratio of POC emissions control by cover compost divided by POC control by biofilter.

Attachment 1 provides full details on the calculation of estimated emissions from the proposed new ASP systems resulting from the additional 875 tpd of MSW/food waste, and for the full proposed future capacity of 1,575 of MSW and food waste upon inclusion of the current 700 tpd capacity in the Post-Project configuration. Included in Attachment 1 are example calculations for both the additional 875 tpd of waste feed and the final 1,575 tpd configuration. For the additional 875 tpd, numbers presented the Table 1 from the SCS Letter are reproduced in Attachment 1. The estimated emissions results are summarized in the "POC and TAC Emission Estimates" section below.

POC AND TAC EMISSIONS ESTIMATES

The permitted Pre-Project POC emissions at an operating capacity of 700 tpd of MSW/food waste were estimated at 2,541 lb/day and 463.7 tons/year facility-wide, based on the assumptions used.

The proposed Post-Project POC emissions at an operating capacity of 1,575 tpd of MSW/food waste were estimated at 95.5 lb/day and 17.43 tons/year facility-wide, based on the assumptions used, which included the new proposed ASP systems with additional emissions control.

Table 2 shows the estimated difference in TAC emissions between Pre- and Post-Project conditions. Calculation details are presented in Attachment 1.

Table 2. TAC Emissions: Current 700 tpd and Future 1575 tpd MSW/Food Waste Composting

Compounds	Pre-Project		Post-Project		Difference	
	Hourly Emissions (lb/hr)	Annual Emissions (lb/yr)	Hourly Emissions (lb/hr)	Annual Emissions (lb/yr)	Hourly Emissions (lb/hr)	Annual Emissions (lb/yr)
Isopropanol	44.8	392,000	1.68	14,700	-43.1	-377,300
Methanol	13.5	25,700	0.509	4,460	-13.0	-21,240
Naphthalene	0.529	1,000	0.0199	174	-0.51	-826
Propene	0.233	441	0.00875	76.7	-0.224	-364.3
Acetaldehyde	0.148	281	0.00557	48.8	-0.142	-232.2
Ammonia	22.9	201,000	1.46	12,800	-21.4	-188,200

The Pre-Project TAC emissions are already accounted for in the currently permitted operation. The proposed action will create the capacity for an additional 875 tpd of MSW/food waste. Table 3 shows the estimated post-project TAC emissions for the 875 tpd increase in MSW/food waste, a subset of the total Post-Project emissions in Table 2. Calculation details are presented in Attachment 1. This is discussed further in the Findings section.

Table 3. TAC Emissions from Future Additional 875 tpd MSW/Food Waste Composting

Compounds	Hourly Emissions (lb/hr)	Annual Emissions (lb/yr)
Isopropanol	0.935	8,190
Methanol	0.283	2,480
Naphthalene	0.0111	96.8
Propene	0.00486	42.6
Acetaldehyde	0.00309	27.1
Ammonia	0.809	7,090

FINDINGS ON TAC EMISSIONS

TAC Emissions Change from Pre-Project to Post-Project Permitted Throughputs

The key findings of this assessment for CEQA are summarized in Table 2. Pre-Project TAC emissions were estimated assuming 700 tpd of MSW/food waste composted in CTI bags using composting emission factors recommended in the March 2015 CARB Report, supplemented with the other cited information. The Post-Project TAC emissions were estimated assuming the baseline 700 tpd throughput plus the proposed additional 875 tpd, for a Post-Project total of 1,575 tpd composted in the new ASP systems. As previously noted, source test data were used to establish a much lower POC emission factor as explained in the December 2019 SCS Letter. Thus, there are lower POC-based TAC emissions, and lower ammonia emissions.

Table 2 shows substantial reductions in all TAC emissions between the Pre-Project and Post-Project cases for composting activity. This net reduction in TAC emissions creates a net air quality benefit with implementation of the Project.

TAC Emissions from Processing the Additional 875 tpd of MSW and Food Waste

Table 3 shows TAC emissions associated with only the proposed additional 875 tpd waste throughput to be treated in the new ASP systems. This subset of the overall change from Pre-Project to Post-Project conditions in Table 2. The additional 875 tpd capacity will be considered by the BAAQMD in air permitting, since the current 700 tpd is already operating. The BAAQMD will evaluate potential health risks with the proposed additional throughput and would need to find health risks acceptable in order to grant an air permit. Again, the currently permitted 700 tpd would also be composted in the new ASP systems as a result of the Project, which is not reflected in Table 3. As depicted in Table 2, those accompanying future emission reductions would more than offset the TAC emissions estimated for the additional 875 tpd capacity increase in Table 3.

CONCLUSIONS

Yorke evaluated documentation on composting air emissions associated with the proposed Project and applied currently accepted methodologies to estimate the Post-Project emissions to assess the potential change in TAC emissions from Pre-Project conditions. This showed that all TAC emissions from the composting process would be reduced after Project implementation. This net reduction in TAC emissions with implementation of the Project would create a net air quality benefit. Exposures to TACs from facility composting operations will be reduced substantially from the current conditions.

CLOSING

Should you have any additional questions on the above, please contact me at (510) 853-1277 or Raj Rangaraj at (949) 420-9519, or through the email addresses below.

Sincerely,

John Koehler

John Koehler, Sc.D.
Senior Engineer
Yorke Engineering, LLC
JKoehler@YorkeEngr.com

cc: Dr. Raj Rangaraj, Yorke Engineering, LLC, RRangaraj@YorkeEngr.com

Enclosures:

1. Attachment 1 – POC and TAC Emission Estimates

ATTACHMENT 1 – POC AND TAC EMISSION ESTIMATES

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EXISTING MSW/FOOD WASTE PROCESSING

Note: Example Calculations on Next Page

INPUTS - CTI Bags (MSW & Food Waste)

Process Parameters	Values	Units
Daily Max Throughput	700	tons/day
Annual Max Throughput	255,500	tons/yr
Tipping Floor Throughput[1]	175.2	tons/day
Tipping Floor Throughput	63,948	tons/year
Operating Days	365	days/year
Composting POC EF[2]	**3.58**	lb/ton
Composting NH3 EF[2]	**0.78**	lb/ton
POC Stockpile EF[2]	**0.20**	lb/ton
NH3 Stockpile EF[3]	**0.02**	lb/ton

References: [1]SCS Letter, 12/20/2019; to estimate the 700 tpd daily maximum, the 219 tpd tipping floor throughput in SCS Letter for 875 tpd was prorated to 700 tpd.
[2]CARB, Emissions Inventory Methodology for Composting Facilities, March 2015
[3]BAAQMD Application 26437 (for Waste Management of Alameda County – Altamont Pass)

Table 1: POC and NH3 Composting Emissions

Pollutant	Emission Factor (lb/ton processed)	Uncontrolled Emissions (tpy)	Uncontrolled Emissions (lbs/day)	Uncontrolled Tipping Floor Emissions (tpy)	Uncontrolled Tipping Floor Emissions (lbs/day)	Total Emissions (lbs/day)	Total Emissions (tons/year)
Composting POC	3.58	457.3	2506	--	--	2506	457.3
Composting NH3	0.78	99.6	546	--	--	546	99.6
Tipping Floor POC	0.20	--	--	6.39	35.0	35.0	6.39
Tipping Floor NH3	0.02	--	--	0.64	3.50	3.50	0.64
					Total POC:	2541.0	463.7
					Total NH3:	549.50	100.3

Table 2: TAC Composting Emissions

Compounds	% VOC***	lb/hr**	lb/yr
Isopropyl alcohol*	42.31%	4.48E+01	3.92E+05
Methanol*	12.79%	1.35E+01	2.57E+04
Naphthalene*	0.50%	5.29E-01	1.00E+03
Propene*	0.22%	2.33E-01	4.41E+02
Acetaldehyde*	0.14%	1.48E-01	2.81E+02
Ammonia*	NA	2.29E+01	2.01E+05

* Toxic Air Contaminants (TACs) regulated by BAAQMD.

** Maximum daily POC is divided by 24 hours since composting is continuous although loading processes are not.

***As percent total VOC from: Kumar, Anuj, et al, “Volatile organic compound emissions from green waste composting: Characterization and ozone formation”, Atmospheric Environment, January 7, 2011, Table 4.

(Note: VOCs are the same as POCs under BAAQMD regulation.)

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EXISTING MSW/FOOD WASTE PROCESSING

EXAMPLE CALCULATIONS

Composting POC

POC Composting Emission Factor (lb/ton)		Throughput tons/day		POC lbs/day
3.58	x	700	=	2506.0

POC lbs/day		Operating Days per Year		lbs per ton		POC tons/year
2506.0	x	365	÷	2000	=	457.3

Composting Ammonia (NH3)

NH3 Composting Emission Factor (lb/ton)		Throughput tons/day		NH3 lbs/day
0.78	x	700	=	546.0

NH3 lbs/day		Operating Days per Year		lbs per ton		NH3 tons/year
546.0	x	365	÷	2000	=	99.6

Tipping Floor POC

POC Composting Emission Factor (lb/ton)		Throughput tons/day		POC lbs/day
0.20	x	175.2	=	35.0

POC lbs/day		Operating Days per Year		lbs per ton		POC tons/year
35.0	x	365	÷	2000	=	6.39

TAC Emissions Calculation (Isopropyl Alcohol)

IPA (Percent POC)		Daily POC* (lb/day)		Days per Year		IPA lbs/year		IPA ** lbs/hr
42.31%	x	2541.0	x	365	=	3.92E+05	=	44.8

* Composting plus Tipping Floor

** 8760 hrs/yr

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POST-PROJECT ADDITONAL MSW/FOOD WASTE PROCESSING

Note: Example Calculations on Next Page

INPUTS - CASP System with Biofilter (MSW & Food Waste)

Process Parameters	Values	Units
Daily Max Throughput	875	tons/day
Annual Max Throughput	319,375	tons/yr
Tipping Floor Throughput[1]	219	tons/day
Tipping Floor Throughput	79,935	tons/year
Operating Days	365	days/year
Composting POC EF[1]	**0.0151**	lb/ton
Composting NH3 EF[1,2]	**0.0151**	lb/ton
POC Stockpile EF[3]	**0.20**	lb/ton
NH3 Stockpile EF[4]	**0.02**	lb/ton

References: [1]SCS Letter, 12/20/2019
[2]Assumes with New CASP system, NH3 emissions not higher than POC emissions; set to POC emissions as a maximum value.
[3]CARB, Emissions Inventory Methodology for Composting Facilities, March 2015
[4]BAAQMD Application 26437 (for Waste Management of Alameda County – Altamont Pass)

Control Efficiencies

Device	POC[5]	NH3[6]
Biofilter	80%	53%
Compost Cover	50%	33.1%

References: [5]SCS Letter, 12/20/2019
[6] Biofilter NH3 efficiency from CARB 2015; Compost cover NH3 efficiency assumes biofilter efficiency for NH_3 ratioed by Compost Cover POC/Biofilter POC.

Table 1: POC and NH3 Composting Emissions

Pollutant	Emission Factor (lb/ton processed)	Composting Uncontrolled Emissions (tpy)	Composting Uncontrolled Emissions (lbs/day)	Controlled Active Phase Emissions (tpy)	Controlled Active Phase Emissions (lbs/day)	Controlled Curing Phase Emissions (tpy)	Controlled Curing Phase Emissions (lbs/day)	Uncontrolled Tipping Floor Emissions (tpy)	Uncontrolled Tipping Floor Emissions (lbs/day)	Total Emissions (lbs/day)	Total Emissions (tons/year)
Composting POC	0.0151	2.41	13.2	0.482	2.64	1.21	6.61	--	--	9.25	1.688
Composting NH3	0.0151	2.41	13.2	1.133	6.21	1.61	8.84	--	--	15.05	2.746
Tipping Floor POC	0.20	--	--	--	--	--	--	7.99	43.8	43.80	7.99
Tipping Floor NH3	0.02	--	--	--	--	--	--	0.799	4.38	4.38	0.80
									Total POC:	53.0	9.68
									Total NH3:	19.4	3.55

Table 2: TAC Composting Emissions

Compounds	% VOC***	lb/hr**	lb/yr
Isopropyl alcohol*	42.31%	9.35E-01	8.19E+03
Methanol*	12.79%	2.83E-01	2.48E+03
Naphthalene*	0.50%	1.11E-02	9.68E+01
Propene*	0.22%	4.86E-03	4.26E+01
Acetaldehyde*	0.14%	3.09E-03	2.71E+01
Ammonia*	NA	8.09E-01	7.09E+03

* Toxic Air Contaminants (TACs) regulated by BAAQMD.
** Maximum daily POC is divided by 24 hours since composting is continuous although loading processes are not.
***As percent total VOC from: Kumar, Anuj, et al, "Volatile organic compound emissions from green waste composting: Characterization and ozone formation", Atmospheric Environment, January 7, 2011, Table 4.
(Note: VOCs are the same as POCs under BAAQMD regulation.)

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POST-PROJECT ADDITONAL MSW/FOOD WASTE PROCESSING

EXAMPLE CALCULATIONS

Composting POC Active Phase

POC Composting Emission Factor (lb/ton)		Throughput tons/day		1.0 - Control Efficiency		POC lbs/day
0.0151	x	875	x	20%	=	2.64

Composting POC Curing Phase

POC Composting Emission Factor (lb/ton)		Throughput tons/day		1.0 - Control Efficiency		POC lbs/day
0.0151	x	875	x	50%	=	6.61

Total Composting Emissions

Active+Curing POC lbs/day		Operating Days per Year		lbs per ton		POC tons/year
9.25	x	365	÷	2000	=	1.688

Composting Ammonia (NH3) Curing Phase

NH3 Composting Emission Factor (lb/ton)		Throughput tons/day		1.0 - Control Efficiency		NH3 lbs/day
0.0151	x	875	x	47%	=	6.21

NH3 lbs/day		Operating Days per Year		lbs per ton		NH3 tons/year
6.21	x	365	÷	2000	=	1.133

Tipping Floor POC

POC Composting Emission Factor (lb/ton)		Throughput tons/day		1.0 - Control Efficiency		POC lbs/day
0.20	x	219	x	100%	=	43.80

POC lbs/day		Operating Days per Year		lbs per ton		POC tons/year
43.8	x	365	÷	2000	=	7.99

TAC Emissions Calculation (Isopropyl Alcohol)

IPA (Percent POC)		Daily POC* (lb/day)		Days per Year		IPA lbs/year		IPA ** lbs/hr
42.31%	x	53.0	x	365	=	8.19E+03	=	0.935

* Composting (Active+Curing) plus Tipping Floor

** 8760 hrs/yr

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POST-PROJECT TOTAL MSW/FOOD WASTE PROCESSING

Note: Example Calculations on Next Page

INPUTS - CASP System with Biofilter (MSW & Food Waste)		
Process Parameters	**Values**	**Units**
Daily Max Throughput	1,575	tons/day
Annual Max Throughput	574,875	tons/yr
Tipping Floor Throughput[1]	394.2	tons/day
Tipping Floor Throughput	143,883	tons/year
Operating Days	365	days/year
Composting POC EF[2]	**0.0151**	lb/ton
Composting NH3 EF[2,3]	**0.0151**	lb/ton
POC Stockpile EF[4]	**0.20**	lb/ton
NH3 Stockpile EF[5]	**0.02**	lb/ton

References: [1]Combined tipping floor throughputs for the "Existing" and "Added MSW" cases.
[2]SCS Letter, 12/20/2019
[3]Assumes with New CASP system, NH3 emissions not higher than POC emissions; set to POC emission factor as a maximum
[4]CARB, Emissions Inventory Methodology for Composting Facilities, March 2015
[5]BAAQMD Application 26437 (for Waste Management of Alameda County – Altamont Pass)

Control Efficiencies		
Device	**POC[6]**	**NH3[7]**
Biofilter	80%	53%
Compost Cover	50%	33.1%

References: [6]SCS Letter, 12/20/2019
[7] Biofilter NH3 efficiency from CARB 2015; Compost cover NH3 efficiency assumes biofilter efficiency for NH_3 ratioed by Compost Cover POC/Biofilter POC.

Table 1: POC and NH3 Composting Emissions

Pollutant	Emission Factor (lb/ton processed)	Composting Uncontrolled Emissions (tpy)	Composting Uncontrolled Emissions (lbs/day)	Controlled Active Phase Emissions (tpy)	Controlled Active Phase Emissions (lbs/day)	Controlled Curing Phase Emissions (tpy)	Controlled Curing Phase Emissions (lbs/day)	Uncontrolled Tipping Floor Emissions (tpy)	Uncontrolled Tipping Floor Emissions (lbs/day)	Total Emissions (lbs/day)	Total Emissions (tons/year)
Composting POC	0.0151	4.34	23.8	0.868	4.76	2.17	11.89	--	--	16.65	3.038
Composting NH3	0.0151	4.34	23.8	2.040	11.18	2.90	15.90	--	--	27.08	4.943
Tipping Floor POC	0.20	--	--	--	--	--	--	14.39	78.8	78.84	14.39
Tipping Floor NH3	0.02	--	--	--	--	--	--	1.439	7.88	7.88	1.44
									Total POC:	95.5	17.43
									Total NH3:	35.0	6.38

Table 2: TAC Composting Emissions

Compounds	% VOC***	lb/hr**	lb/yr
Isopropyl alcohol*	42.31%	1.68E+00	1.47E+04
Methanol*	12.79%	5.09E-01	4.46E+03
Naphthalene*	0.50%	1.99E-02	1.74E+02
Propene*	0.22%	8.75E-03	7.67E+01
Acetaldehyde*	0.14%	5.57E-03	4.88E+01
Ammonia*	NA	1.46E+00	1.28E+04

* Toxic Air Contaminants (TACs) regulated by BAAQMD.
** Maximum daily POC is divided by 24 hours since composting is continuous although loading processes are not.
***As percent total VOC from: Kumar, Anuj, et al, "Volatile organic compound emissions from green waste composting: Characterization and ozone formation", Atmospheric Environment, January 7, 2011, Table 4.

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POST-PROJECT TOTAL MSW/FOOD WASTE PROCESSING

EXAMPLE CALCULATIONS

Composting POC Active Phase

POC Composting Emission Factor (lb/ton)		Throughput tons/day		1.0 - Control Efficiency		POC lbs/day
0.0151	x	1575	x	20%	=	4.76

Composting POC Curing Phase

POC Composting Emission Factor (lb/ton)		Throughput tons/day		1.0 - Control Efficiency		POC lbs/day
0.0151	x	1575	x	50%	=	11.89

Total Composting Emissions

Active+Curing POC lbs/day		Operating Days per Year		lbs per ton		POC tons/year
16.65	x	365	÷	2000	=	3.038

Composting Ammonia (NH3) Curing Phase

NH3 Composting Emission Factor (lb/ton)		Throughput tons/day		1.0 - Control Efficiency		NH3 lbs/day
0.0151	x	1575	x	47%	=	11.18

NH3 lbs/day		Operating Days per Year		lbs per ton		NH3 tons/year
11.18	x	365	÷	2000	=	2.040

Tipping Floor POC

POC Composting Emission Factor (lb/ton)		Throughput tons/day		1.0 - Control Efficiency		POC lbs/day
0.20	x	394.2	x	100%	=	78.84

POC lbs/day		Operating Days per Year		lbs per ton		POC tons/year
78.8	x	365	÷	2000	=	14.39

TAC Emissions Calculation (Isopropyl Alcohol)

IPA (Percent POC)		Daily POC* (lb/day)		Days per Year		IPA lbs/year		IPA ** lbs/hr
42.31%	x	95.5	x	365	=	1.47E+04	=	1.68

* Composting (Active+Curing) plus Tipping Floor

** 8760 hrs/yr

July 31, 2019

Mr. Ron Sissem, MRP
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Subject: Review of Odor Modeling

Dear Mr. Sissem:

At the request of the County, Yorke Engineering, LLC (Yorke) performed an independent peer review of the revised odor modeling analysis for EMC Planning Group, Inc. (EMC) on the proposed modifications at the Z-Best Composting (Z-Best) facility in Gilroy, CA. EMC is assisting the County of Santa Clara Department of Planning and Development with the preparation of an Environmental Impact Report (EIR) for the Project. Yorke assessed the data used to determine odor emissions for the sources modeled, source parameters for the air dispersion modeling, consistency of other modeling inputs with the Bay Area Air Quality Management District (BAAQMD) requirements, and adequacy of the revised analysis relative to accepted professional standards.

Yorke determined that the emissions workbook (ZBEST ODOR MODEL METRICS June 2019) and final Englobe Corporation (Englobe) report, *Air Dispersion Modelling Report: Z-Best Composting Facility*, dated June 2019, adequately documented the methodology and steps used to complete the odor analysis. Therefore, there is no need to independently review the AMS/EPA Regulatory Model (AERMOD) modeling files. Yorke has no recommendations regarding revisions or additions to the report.

PROJECT BACKGROUND

EMC is preparing a Draft Environmental Impact Report (DEIR) on behalf of the County of Santa Clara for proposed modifications to the Z-Best facility, located in a rural area of Gilroy. The modifications involve installation of aerated static pile (ASP) composting technology to replace CTI bags. A negative ASP venting to a biofilter is planned for primary composting (active phase), and positive ASP is proposed for secondary composting (curing phase). These systems are designed by Engineered Composting Systems (ECS). This is expected to reduce volatile organic compound (VOC) and odorous emissions compared to current facility operations. Work to date to assess current and future facility odors has included odor sampling at the existing CTI bags, and, to represent future ASP emissions, sampling at other similar ECS facilities processing similar feedstock. These results with additional input from ECS were incorporated into an Odor Report dated February 24, 2017 (2017 Odor Report), prepared by Englobe. Review of this work by the BAAQMD resulted in questions on the odor analysis, for which ECS provided input. Atmospheric Dynamics, Inc. (ADI), on behalf of EMC, provided additional comments as documented in Table 1-1 of the revised Odor Report. Englobe has revised the odor modeling to address the review comments provided by ADI and prepared a revised odor report dated June 2019. EMC requested that Yorke independently assess the revised odor modeling report.

ODOR MODELING METHODOLOGY

The odor modeling methodology is based on guidance for determining odor thresholds and use of regulatory air dispersion modeling programs. The following sections summarize our review of the odor modeling methodology followed in preparing the revised odor report.

Odor Standard

Initially, the methodology used by Englobe was based on the California Air Resources Board (CARB) and South Coast Air Quality Management District (SCAQMD) documented odor threshold of 5 dilutions to threshold (D/T)[1,2] and modeling the odor concentration to meet that D/T standard. However, consistent with the ADI review letter issue #1 ("Use 4 OU instead of 5"), a D/T of 4 OU/m^3 was used in the revised odor report as a more conservative approach[3]. This standard establishes an odor threshold requirement of four volumes of odor free air to one volume of exhaust air to reach the odor detection threshold consistent with typical practice for projects within the BAAQMD jurisdiction.

Air Dispersion Modeling Analysis

To demonstrate compliance with an odor standard of 4 D/T at the fenceline, Englobe used AERMOD to simulate air dispersion conditions associated with stack release characteristics and site (building) geometry. AERMOD is a steady-state plume dispersion model that incorporates air dispersion calculations based on planetary boundary layer turbulence structure and scaling concepts. AERMOD includes the treatment of both surface and elevated sources, and both simple and complex terrain. AERMOD, like most dispersion models, uses mathematical formulations to characterize the atmospheric processes that disperse pollutants emitted by a source. Using odor emission rates (OU/s), exhaust parameters, terrain characteristics, and meteorological inputs, AERMOD calculates down-wind pollutant concentrations at specified receptor locations. AERMOD is recommended by both the USEPA and BAAQMD for stationary source air dispersion modeling. At the time of modeling for the revised odor report, the latest version of AERMOD was utilized (version 18081).

Receptor Grid

For the revised odor report, Englobe used a nested receptor grid with tiered spacing up to 5,000 meters from the center of the facility. Minimum receptor spacing in areas of maximum concentration should be at least 100 meters, which this nested receptor grid satisfies. In addition, 10 additional discrete receptors were added for the closest

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[1] Amoore, J.E., The Perception of Hydrogen Sulfide odor in Relation to Setting an Ambient Standard, (1985), Prepared for the California Air Resources Board.

[2] South Coast Air Quality Management District (1993). California Environmental Quality Act (CEQA) Air Quality Handbook.

[3] OU = odor unit. Synonymous with D/T. Four D/T equals 4 OU per cubic meter of air (OU/m^3).

neighboring properties to adequately capture maximum odor impacts. For facilities in rural areas with scattered receptors, this is consistent with BAAQMD practice.

Meteorological (MET) data

For the revised odor report, preprocessed MET data (5th-generation Mesoscale Model or MM5) for a six-year averaging period (2010-2015) from Lakes Environmental was used by Englobe. The MM5 MET data was utilized as the Gilroy meteorological station is no longer recording site data. Utilizing MM5 MET data is a common practice in air dispersion modeling and is widely accepted by the U.S. EPA and local air districts.

Terrain Considerations

For the revised odor report, elevations for all receptors, buildings, and emission sources were imported directly into AERMOD View™ by Englobe using the WebGIS import feature from the 30-meter National Elevation Dataset (NED) files from the United States Geological Survey (USGS). All geographical coordinates referenced were in the UTM coordinate system with the NAD83 datum. In addition, a secondary treatment of terrain data was performed for the facility for the stockpile heights (not accounted for in the NED files) as this will have impacts on the ground level odor concentrations. This is a common practice used in air dispersion modeling and is widely accepted by local air districts.

On-Site Buildings

For the revised odor report, all significant buildings (Primary MSW processing building and office building) were included in the dispersion model by Englobe for the purpose of estimating building downwash. Downwash can occur due to wind flow over a structure that can draw pollutant plumes closer to the ground. Building downwash effects were assessed using the Building Profile Input Program for PRIME (BPIPPRM). This is standard practice used in air dispersion modeling.

Source Information and Release Parameters

Table 2-1 and Table 2-2 of the revised odor modeling report summarizes the sources and emission rates used in AERMOD by Englobe for both the current odor and proposed odor emission sources. The revised odor report included figures showing how the sources were configured for input to the dispersion model. The updated modeling odor emission rates for both the current and proposed odor emission sources were calculated as described below.

Odor Emission Rate- Existing

Odor emission rates emanating from the CTI bags were calculated as follows:

$$E = [(O*V)/A]*C$$

Where:

E = Odor emission rate (OU/s/m^2)

O = Odor measurement within headspace (OU/m^3)

V = Volumetric air flow into each bag (m^3/min)

A = Area per bag (m^2)

C = min/60 sec

Odor Emission Rate- Proposed (Primary and Secondary Composting)

Odor emission rates emanating from active phase composting using negatively aerated static piles venting to biofilters and curing phase composting using positively aerated static piles were calculated as follows:

E = [(O*V*(1-CE))/A]*C

Where:

E = Odor emission rate (OU/s/m^2)

O = Odor measurement from aeration duct (OU/m^3)

V = Volumetric air flow into duct or ASP (m^3/min)

CE = Control Efficiency of biofilter (assumed as 85% for biofilter and 0% (i.e. unabated) for curing phase)

A = Area per biofilter or ASP (m^2)

C = min/60 sec

Additional comments in the ADI review letter were identified as issues #2, #3 and #4 (“Difficulty in reviewing table 2-1”, “Emanation rates for CTI bags and ASP biofilters”, “ASP and biofilter sizes”, respectively).

In the 2017 odor report, the CTI bags were modeled as three separate sources defined by the age of the content with the emission rates derived from actual measurement data. For the revised odor report, the odor emission rates for the CTI bags were averaged and modeled as a single source rather than as three separate sources. This approach is reasonable.

The revised odor report updated the odor emission rates for the proposed ASP composting sources from literature values to odor sampling measurements taken at ECS reference facilities. The revised emission rates are presented in Tables 2-1 and 2-2 of the revised odor report. The emission rate values presented are consistent with the emissions workbook where the equations above are implemented. While we have reviewed the workbook, we have not reviewed the source of the OU data used in the calculations. The abatement efficiency assumptions are consistent with practice.

The graphical locations of the modeled and excluded sources for the current facility are presented in Map 1 while the proposed sources along with the excluded sources are presented in Map 2 of the revised odor report. The dimensions of the ASP and biofilters were also adequately represented in Map 2 of the revised odor report and are more specifically documented in the emission workbook. It should be noted that some green waste sources were excluded from this analysis (ADI review letter issue #5) since those sources are present in the current and proposed facility and will operate unchanged.

ODOR MODELING RESULTS

In the revised odor report, air dispersion modeling results in units of odor concentrations (odor units per cubic meter, OU/m^3) were compared to the odor detection threshold by Englobe. Odor compounds disperse quickly with short timescales that are nearly instantaneous in nature. Therefore, AERMOD was run with the lowest averaging period (1-hour) available in the model. A 6-year average run was also conducted for both the current and proposed operations at the facility.

Updates in emission rates with the current CTI system for the revised modeling resulted in minimal differences in the maximum hourly and 6-year average odor concentrations compared to that in the 2017 odor report. This is to be expected as the odor emission rates for the CTI system were similar to that reported in the initial 2017 odor report.

With the proposed system, odor impacts were reduced compared to the initial analysis presented in the 2017 odor report. The reduction can be attributed to the lower odor emission rates used in the revised modeling. The methodology used to calculate the odor emission rates incorporated odor measurements that better reflect the emission rates specific to the facility.

CONCLUSION

The revised odor report by Englobe included updating the odor threshold from 5 OU/m^3 to 4 OU/m^3 and revising the odor emission rates for both the current and proposed sources. Odor emission rates for the current emission sources (CTI bags) were derived from measurements, and averaged and modeled as a single source rather than separate sources. For the proposed system (negative ASP with biofilter for active phase and positive ASP for curing phase), the odor emission rates were updated from literature values to odor sampling measurements from similar facilities. In addition, Englobe's revised modeling, as reflected in the revised odor report, did not include the impacts from the green waste windrows and other unaffected emission sources at the facility. Since these green waste windrows and other unaffected emission sources will continue to operate unchanged in the proposed facility, their exclusion from an evaluation of the potential odor impacts of proposed changes to the composting technology is appropriate.

Englobe's air dispersion modeling results suggest that the 6-year and 1-hour average for the proposed system are well below 4 OU/m^3 for the discrete neighboring receptors. Concentration isopleths in the revised odor report suggest that the 6-year average modeled concentrations are well below 4 OU/m^3 for the nested grid while the 1-hour average modeled concentrations may be between 4 OU/m^3 and 5 OU/m^3 for a few nested receptors outside the west-side fenceline (the revised odor report is not sufficiently documented to investigate this further). Further, the modeling results for the proposed ASP system indicate significantly lower concentrations than for the current CTI bag system. This may be attributed to the lower modeled odor emission rates calculated for the revised analysis. Overall, Yorke finds the Englobe analysis presented in the revised Odor Report adequately addresses the ADI comments and the overall methodology used in the odor assessment is generally consistent with current practice.

PEER REVIEW STATEMENT

At the request of the County, Yorke Engineering, LLC, has conducted an independent peer review of Englobe's June 2019 Odor Report for the modifications proposed by Z-Best Project to verify the technical accuracy of the information, and identify any apparent deficiencies, errors and omissions affecting the completeness, methodologies, findings and adequacies of the analysis. The ultimate goal of the peer review is to help ensure that the information contained in the June 2019 Odor Report meets accepted professional standards for use in the EIR.

This peer review letter is part of the administrative record for the EIR. Based on the peer review conducted, Yorke Engineering concludes Englobe's June 2019 Odor Report as revised is appropriate for use as reference in the EIR.

CLOSING

Should you have any questions or concerns, please contact me at (510) 853-1277 or Raj Rangaraj at (949) 420-9519, or through the email addresses below.

Sincerely,

John Koehler

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Z-Best Composting Facility

AIR DISPERSION MODELLING REPORT Z-BEST COMPOSTING FACILITY

Current & Proposed Expansion Gilroy, California, USA

JUNE 2019

129-P-0018788-0-01-001-00

FINAL REPORT

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Revision and publication register		
Revision N°	**Date**	**Modification And/Or Publication Details**
2017	2017-02-24	First published version of this report
0A	2019-06-10	Preliminary revision of the report following ADI review
00	2019-06-17	Final revision of the report following ADI review

Table of contents

1 Introduction & facility description

Along with the Engineered Compost Systems' (ECS) Memo, this section provides a description of the mandate and its purpose.

1.1 Mandate & purpose

The mandate for the original 2017 report consisted of modelling and comparing the odor dispersion resulting from the emissions of the existing Municipal Solid Waste (MSW) composting process compared against the proposed expansion of the composting process using ECS compost technology. This new report has the same mandate but has been revised following the review that was performed by ADI (letter dated Dec. 10 2018).

ECS collected air samples and measured air flow from the existing Z-Best facility and a nearby MSW facility with ECS compost technology (Mariposa, CA, Landfill). ECS had the air samples analyzed for odor based on dynamic olfactometry which reports odor unit (OU). This data was provided to Englobe for input in an air model based on odor emissions from identified sources ($OU/s/m^2$, OU/s). Odoriferous species are reactive and will deposit on available surfaces, thus reducing the odor level at receptors located downwind of the sources (Final Odor Emission Technical Report, Jones & Stokes, 2007). Odor is also comprised of a wide variety of compounds that have widely varying detection thresholds, making generalized odor unit (OU) a much more relevant measure of odor impact.

The main objective of this study was to better show and compare the current odor footprint of the MSW composting process with the modelled odor footprint resulting from the proposed technology upgrade and expansion of the MSW composting process without the influencing factors of facility components (and odor sources) that will not be altered. MSW is currently processed in CTI bags, which will be replaced in the upgraded and expanded facility with a two-stage aerated static pile (ASP) from ECS. The ECS system consists of a negatively aerated covered aerated static pile primary composting (CASP) venting to static biofilters. The secondary composting process (curing) is a positively aerated static pile (ASP). Odor data were all pulled from actual measurements on similar composting site; please refer to Appendix A for the memo from ECS wherein the data sources and the data are presented. A copy of each of these reports are also included in this appendix.

Graphical dispersion of odors of the current process and proposed expansion process were modelled using the latest version of AERMOD (version 18081).

It should be noted that the purpose of this study was not to provide professional advice or conformity to any state or federal regulation, its objective was to compare two scenarios of odor dispersion.

1.2 Description of the facility, topography and local environment

The Z-Best Composting Facility (Z-Best) is in Santa Clara County near the City of Gilroy.

The site is flat, and subject to strong winds at times. These wind conditions have been modelled in this exercise by the addition of a meteorological dataset of 6 years (from 2010 to 2015).

Agricultural activities border the facility on all sides. Potential receptors have been added to the model, based on a review of aerial photography, and previous studies.

1.3 Context

As previously stated in this section, the purpose of this study is to compare two different composting technologies regarding their odor emission dispersion following the review from ADI of the report that was prepared in 2017. The table below presents an overview at how each of these interrogations were integrated in the review of this report.

Table 1-1: Overview of the interrogations from ADI

ADI review letter issue #	ADI comment	Englobe actions in this new report
1	Use 4 OU instead of 5	The threshold for odor unit was adjusted throughout this report.
2	Difficulty in reviewing table 2-1	An Excel file containing all the calculations is included with the report
3	Emanation rates for CTI bags and ASP biofilters	All emanations rates are now based on odor assessment, refer to appendix A for all details.
4	ASP and biofilter sizes	All dimensions for the entirety of the units is supplied in appendix B
5	Modifications to greenwaste	The facility expansion is only for MSW processed by ECS system as a replacement for the CTI bags system on similar footprint. The new waste is tipped straight into ECS bunkers for immediate processing. There are no changes to the greenwaste and thus it and all related equipment and sources have been removed from this modeling exercise.

Key odor emission rates included for this study (primary and secondary composting) were provided by ECS. The dispersion model output integrates odor emission rates for all modelled sources, whilst considering all existing local conditions such as prevailing winds, topography, exhaust locations, and buildings.

2 Initital identification of sources and contaminants

A list of all potential sources of odor has been established based on the information provided by the client for both processes. Maps 1 and 2 indicate the location of all potential sources considered in this study, and they are listed in Tables 2-1 and 2-2.

2.1 Discussion on sources & contaminant modelled

As stated previously, all possible sources have not been considered since the proposed change in the MSW composting technology does not modify the odor emission rate for unrelated greenwaste sources. The tipping building was also removed from the calculations as its throughput will not be affected by increased total requested throughput. Additional feedstock beyond what is processed currently by the tipping building will be directed straight into ECS CASP bunkers, bypassing the tipping building entirely. Following the ADI comments, only the sources associated to the CTI bags system or the CASP biofilters and ASP surfaces were modeled. All other sources that remains constant following the change to the MSW composting process were excluded.

The only aspect of air emissions considered in this study was odor.

3 Assessment of the significance of contaminants and sources

The Tables 2-1 and 2-2 summarizes the information about the assessment of sources, and their respective emission rates. Site and facility information was provided by ECS.

Table 2-1: Current odor emission sources modelled and odor emission rates (CTI system only – no change to greenwaste windrow planned and thus not modelled)

Source ID	Description	Emission rate modelled 2019 [OU/s*m^2]	Data Source	Emission rate modelled 2017 (Original facility) [OU/s*m^2]	Data Source
4	Positively aerated CTI BAG surface emission (average 0-120 days for simplification)	7	I	-	
4_A1	Positively aerated CTI BAG surface emission 0-40 days	-		7.14	II
4_A2	Positively aerated CTI BAG surface emission 40-80 days	-		6.69	II
4_A3	Positively aerated CTI BAG surface emission 80-120 days	-		6.35	II

* Data Source I: Average of data sources in Data Source II. The bags do not move locations as they age, so over the course of a year, it is better to model these sources as one combined area source, rather than location specific age specifc sources.

* Data Source II: Odor Samples collected in Tedlar bags and lung chamber send to IDES, Ontario, CA for analysis. appendix A

Table 2-2: Proposed odor emission sources modelled and odor emission rates (ECS system only – no change to greenwaste windrow planned and thus not modelled)

Source ID	Description	Emission rate modelled 2019	Data Source	Emission rate modelled 2017	Data Source
		[OU/s*m²]		[OU/s*m²]	
BIO1	Negatively aerated CASP to biofilter surface emission	0.13	III	2.31	V
BIO2	Negatively aerated CASP to biofilter surface emission	0.13	III	2.31	V
BIO3	Negatively aerated CASP to biofilter surface emission	0.13	III	2.31	V
BIO4	Negatively aerated CASP to biofilter surface emission	0.13	III	2.31	V
BIO5	Negatively aerated CASP to biofilter surface emission	0.13	III	2.31	V
BIO6	Negatively aerated CASP to biofilter surface emission	0.13	III	2.31	V
BIO7	Negatively aerated CASP to biofilter surface emission	0.13	III	2.31	V
BIO8	Negatively aerated CASP to biofilter surface emission	0.13	III	2.31	V
BIO9	Negatively aerated CASP to biofilter surface emission	0.13	III	2.31	V
BIO10	Negatively aerated CASP to biofilter surface emission	0.13	III	2.31	V
BIO11	Negatively aerated CASP to biofilter surface emission	0.13	III	2.31	V
BIO12	Negatively aerated CASP to biofilter surface emission	0.13	III	2.31	V
ASP1	Positively aerated curing ASP surface emission	0.16	IV	0.12	V
ASP2	Positively aerated curing ASP surface emission	0.16	IV	0.12	V
ASP3	Positively aerated curing ASP surface emission	0.16	IV	0.12	V
ASP4	Positively aerated curing ASP surface emission	0.16	IV	0.12	V
ASP5	Positively aerated curing ASP surface emission	0.16	IV	0.12	V

Notes:

Data Source III: Odor sampling at ECS reference facilities in washington state 2014-2018. See xls file.

Data Source IV: odor sampling at ecs reference facility at Mariposa, CA, 2017, values in ides report, appendix A

Data Source V: odor estimates from various studies and literature

In the previous report the odor threshold was based on a report by the California Air Resources Board (CARB)[1], which highlighted current approaches on odors and suggested thresholds of annoyance, AERMOD criteria were refined. The CARB study suggested that the level at which odor reaches a 'nuisance' level is approximately five times the threshold of detection (5 OU). In addition, the California's South Coast Air Quality Management District[2] states that at a value of 5 OU/m^3 Dilution/Threshold (D/T), people become consciously aware of the presence of an odor; between 5 to 10 OU/m^3 D/T, odors may be strong enough to evoke a complaint.

Based on these assumptions, Englobe previously selected a comparative value of 5 OU/m^3 D/T on an average of 6 years, and 10 OU/m^3 to 20 OU/m^3 for the 99.5 % and 98 % 1 hour maximum yearly average. Although, following ADI review of the 2017 report, the comparative value was lowered to 4 OU/m^3.

3.1 Discussion on other sources of contaminants (negligible and neighbouring sources)

Local environment and land use nearby the site facility are mainly agricultural. Agricultural activities can be a source of odors in the environment. Similar to the Z-Best Facility secondary sources that were not included, and are predictably static, these activities are not considered in this study. Again, the focus was a comparison, not a total area analysis at a single snapshot in time.

[1] Amoore, J.E., The Perception of Hydrogen Sulfide odor in Relation to Setting an Ambient Standard, (1985), Prepared for the California Air Resources Board

[2] South Coast Air Quality Management District (1993). California Environmental Quality Act (CEQA) Air Quality Handbook.

4 Operating conditions, emission rates estimation & data quality

4.1 Operating conditions

4.1.1 Current operation process

Some MSW enters the reception building where it is screened/sorted to segregate recyclable materials. This sorted MSW is combined with pre-sorted MSW and transferred to the CTI bags for composting. After composting the bags are opened, left to air for a day and then screened and stockpiled in large blocks prior to final screening and glass removal.

The green waste process will not be discussed as it is not relevant and static in the baseline and upgraded facility.

4.1.2 Proposed expansion process

The main difference from the baseline scenario and the upgraded facility is the replacement of the CTI bags composting with two phases of ASP composting; the first phase with negative aeration capturing process air and scrubbing it with a biofilter and the second phase with positive aeration to maintain BMP conditions.

The upgraded facility has the capability to process close to four times the current CTI bag throughput, largely due to reduced retention time and substantially faster stabilization rates that accompany higher aeration rates, lower temperatures, higher oxygen concentrations, and more uniform aeration distribution.

4.2 Emission rates calculation & assumptions

All emission sources of this study are presented in Table 2-1 and 2-2 and on Maps 1 and 2 (Appendix B). Please note that all sources that were removed in this revision are shown in red.

5 Sources variable emission factors and operating hours

For both the CTI bags and the ASP biofilters systems, the emissions are considered to be constant over a 24h hour period.

5.1 Meteorological data

Dispersion models based on Gaussian plume equations need a complete set of meteorological data that covers an extended period to be able to consider specific meteorological conditions. A 6-year period prognostic-modeled meteorological data (MM5) was purchased from Lakes Environmental, the standard choice for dispersion modelling exercises such as this. Lakes Environmental are the maker of the AERMOD software. MM5 data is well accepted as a meteorological data by the USEPA Air Quality Group.[3]

There are several reasons why MM5 data are used as prognostic meteorological model data:

- there are no meteorological stations available in your area;
- there is no other representative meteorological station site available for your site;
- the available station data is out of date;
- the available station data does not cover enough years;
- the available station data does not meet data quality standards (e.g. poor treatment of calms).

In this study, MM5 data has been selected since the Gilroy meteorological station is no longer registered and does not record any more data.

The MM5 dataset is a limited-area, non-hydrostatic, terrain-following modelling system that solves the full set of physical and thermodynamic equations governing atmospheric motions. In this study, the sensitivity of the model to surface roughness length variations is higher for low level releases, thus passing MM5 data through AERMET with more localized surface characteristics is more appropriate (Journal of the Air & Waste Management Association, volume 57/2007, p.593). You will find hereafter all meteorological data input for this study:

[3] https://www.weblakes.com/services/met_data.html, consulted on February 21, 2017.

Table 5-1: Calculated Met Station Parameters for the Z-Best Facility, Gilroy (CA)

Met Data Type:	▪ AERMET-Ready (Surface & Upper Air Data) ▪ Lakes Pre-processed MM5
Start-End Date:	Jan 01, 2010 -Dec 31, 2015 (6 years)
Latitude:	36.948 N
Longitude:	121.524 W
Datum:	WGS 84
Site Time Zone:	UTC/GMT UTC -8 hour(s)
Closest City & Country:	Gilroy (USA)
Anemometer Height:	15 m
Station Base Elevation:	131 m
Upper Air Adjustment:	+8 hours

MM5-Processed Grid Cell

- Grid cell centre (Lat, Lon): 36.948 N, 121.524 W
- Grid cell dimension: 12 km x 12 km
- Output period: Jan 01, 2010 to Dec 31, 2015
- Type MM5 Mesoscale Model[4]

Hourly Surface Met Data (*.sam)

- Format: SAMSON (surface met data for preprocessing by AERMET)
- Anemometer height: 15 meters
- Base elevation above MSL: 131 meters
- Time Zone: UTC/GMT UTC -8 hour(s) (data reported in local time)
- Output interval: hourly

Sector and Surface Parameters

- 1 sector: 5km radius from site: Cultivated land
- Albedo: 0.28
- Bowen ratio: 0.78
- Surface Roughness : 0.0725

The wind rose associated with the meteorological data set is presented in Appendix B.

[4] http://www.mmm.ucar.edu/mm5/mm5-home.html

5.2 Topographical data

In order to model odor dispersion for the composting operations of the Z-Best facility, the primary data source that has been used was a 10 km x 10 km cell sourced from the National Elevation Dataset (NED)[5] of the United States Geological Survey (USGS). The NED is a seamless dataset of the best conterminous United States, Alaska, Hawaii, and territorial islands raster elevation data available. The NED is updated on a nominal two-month cycle to integrate newly available and improved elevation source data.

The NED is derived from diverse sources of data that are processed through a common coordinate system and elevation units. NED data is distributed in geographic coordinates (decimal degrees) in compliance with the 1983 North American Datum (NAD 83). All elevation values are in meters and, over the United States, are referenced to the 1988 North American Vertical Datum (NAVD 88). NED data used in this project has a resolution of one arc-second (about 30 meters).

A secondary treatment of terrain data has been performed to integrate elevations or summits that can affect odor dispersion around the Z-Best facility. Hence, all heights of stockpiles located on the northern portion of the site were integrated into the NED terrain model. It should be noted that these stockpiles may act as a natural barrier for other odor sources at the site.

[5] https://nationalmap.gov/elevation.html

5.3 Receptors grid & discrete receptors

One nested grid was defined using the parameters presented in Table 5-2.

Table 5-2: Receptors Grid & Discrete Receptors

Bounding Box (m from center of the site)	Receptor Spacing (m)
250	50
750	75
2,000	150
3,000	250
5,000	500

Another set of ten discrete receptors was added to the locations of the closest neighbouring properties located near the Z-Best facility.

Figures maps 3 to 6 illustrate all the discrete receptor locations.

5.4 Building considerations

To consider local building downwash effects, the model required information on the dimensions and location of the building located on the northern portion of the site, near the entrance. In addition, the adjacent office building was also considered. No other temporary building or structure was incorporated in the model. Table 5-3 presents the on-site building dimensions considered in the model.

In this study, the most dominant building for the downwash effects is the Processing building.

Table 5-3: Building Considerations

Building	X-length (m)	Y-length (m)	Height (m)
Building – Primary MWS Processing	60	30	8
Office Building	25	25	4

6 Emission summary tables, conclusion and recommendations

The main goal of this study was to compare the baseline and the proposed expansion in terms of odor dispersion. Table 6-1 presented below details the results for all discrete receptors, for both the baseline and proposed expansion processes.

As it can be observed in Table 6-1, all individual results for each of the 10 discrete receptors show reduced odor concentrations associated with the upgraded and expanded facility. Reduction in odor is consistent for the average as well as for the maximum (worst case) 1-hour results. These results suggest that the proposed facility improvements will improve the ambient air quality near the Z-Best facility.

Table 6-2 and 6-3 presents a comparison for maximum concentration between this model and the previous model. Finally, table 6-4 and 6-5 shows the contribution of each source for both the current and proposed systems.

6.1 Current operation results

Results for the current operation are summarized and presented on Map 1 and 2 in Appendix B.

Map 4 shows the average results over a 6-year period (2010-2015) for the baseline operation at the Z-Best facility. As it can be observed on this figure, five of the discrete receptors are located within the 4 OU/m^3 isopleth. This result suggests (and based on the guideline stated in section 3) that under the current operation process, some odors could be detected in the area. However, it is important to note that no odor complaints have been assigned to the Z-Best facility in recent years in history.

However, it should be noted that an average concentration is not the most representative form of human perception of odors. For this reason, Englobe also presented the maximum results over a 1-hour period 98 percentile.

Baseline Map 3 presents the 98 percentiles of the maximum results over a 1-hour period. This time, two of the discrete receptors are located within the 20 OU/m^3 isopleth. This is an indication that the maximum odor levels are limited to specific isolated meteorological conditions and could thus be considered as exceptional conditions.

6.2 Proposed expansion operation results

Results for the proposed expansion operation are summarized and presented on Map 5 and 6 in Appendix B.

Upgraded Facility Map 6 shows the average results over a 6-year period (2010-2015) for the proposed expansion operation at the Z-Best facility. As can be observed on this figure, none of the discrete receptors are located within the 4 OU/m^3 isopleth. This result suggests that under the proposed expansion operation process, the ambient air quality will be improved near the Z-Best Facility.

Upgraded Facility Map 5 represents the 98 percentiles of the maximum results over a 1-h period. This time, none of the discrete receptors are located within the 20 OU/m^3 isopleth. This result can be interpreted as an indication that discrete receptors should not be affected by odor annoyance resulting from the proposed expansion at the Z-Best Facility.

The proposed expansion process was modelled and compared to the current process. The results should not be interpreted to show total site wide odor emitted currently or in the future. It shows distinctly improved results for odor dispersion for the ambient air near the site. If this process is to be implemented at the Z-Best Composting Facility, it is expected, since this study demonstrates an improvement by using the new composting technology, that no additional mitigation measures will be necessary to reduce odor impacts.

There are various activities that are not modelled because accurate data on odor emission rates are impossible to collect, including the pickup and movement of material by loader bucket between primary and secondary composting. But the surface area of a 10 yards loader bucket is insignificant at a site of this scale.

Table 6-1: Summary of Air Modelling Results

			CURRENT OPERATIONS PROCESS		PROPOSED EXPANSION PROCESS	
Discrete Receptors	X	Y	6-year average (100%)	1-hour max. (98%)	6-year average (100%)	1-hour max. (98%)
	m	m	OU/m³	OU/m³	OU/m³	OU/m³
1_1	630955,08	4090585,94	4	36	0.31	0.04
1_2	631089,96	4090774,34	4	48	0.46	0.03
1_3	633098,92	4089746,20	1	8	0.08	0.01
1_4	630682,84	4089085,47	1	1	0.01	0.01
1_5	630794,78	4090967,63	2	8	0.07	0.02
1_6	630710,34	4091021,18	2	6	0.06	0.02
1_7	630239,74	4092054,79	<1	1	0.00	0.00
1_8	629203,40	4092287,34	<1	<1	0.00	0.00
1_9	628867,38	4094021,74	<1	<1	0.00	0.00
1_10	627689,19	4092446,29	<1	<1	0.00	0.00

Table 6-2: Comparison with previous results (current CTI system)

Period	Method	Maximum Concentration 2019	Maximum Concentration 2017
		[OU/m^3]	[OU/m^3]
1 h	98 percentiles	681	631
6 years	average	118	110

Table 6-3: Comparison wtih previous results (proposed ECS system)

Period	Method	Maximum Concentration 2019	Maximum Concentration 2017
		[OU/m³]	[OU/m³]
1h	98 percentiles	6	159
6 years	average	1	47

Table 6-4: Source contribution for current CTI system

Source ID	Concentration	Contribution
	[OU/m³]	[%]
4	1278	100

Table 6-5: Source contribution for proposed ECS system

Source ID	Concentration	Contribution
	[OU/m³]	[%]
ASP4	8	45
ASP3	4	24
ASP2	4	24
ASP5	1	6
ASP1	<1	<1
BIO8	<1	<1
BIO7	<1	<1
BIO12	<1	<1
BIO1	<1	<1
BIO10	<1	<1
BIO11	<1	<1
BIO2	<1	<1
BIO3	<1	<1
BIO4	<1	<1
BIO5	<1	<1
BIO6	<1	<1
BIO9	<1	<1

Appendix A ECS Memo and odor assessment report

engineered**COMPOST**systems

Project Memo 251-8

DATE:	6/17/19	ECS PROJ. NO.:	P251
BY:	Geoff Hill	PROJECT NAME:	Odor model
TO:	John Doyle, ZBest	COPY TO:	
SUBJECT:	Explanation of changes to the re-issued ZBest odor model		

RESPONSE REQUESTED

Yes	X	No		Hard Copy		E-Mail	X	Phone Call	

Summary

In 2016 ECS was tasked to develop an improved odor report in order to update a document by Jones and Stokes, authored in 2007. This 2007 report contained no actual analysis or site specific data. ECS encouraged ZBest to select odor modelling as the most advanced means of odor analysis, as odor models were becoming more commonplace in eastern Canada (Ontario and Quebec specifically) where odor is regulated at the property line. ZBest approved and ECS selected Englobe (a Quebec Canada company) to conduct the odor modelling analysis. The odor model was completed and submitted in early 2017; its objective is summarized in the next section of this memo. Due to a rather extensive review in 2018 by ADI, the odor model was updated and resubmitted. This memo serves to accompany the updated odor model and provide context and a summary of why changes were made and what the changes were.

It is important to note that this facility does not have odor complaints filed against it, as other Bay Area composting facilities do.

The 2017 ZBest odor model

The objective of the 2017 odor model was to document the impact of changing from the CTI bag system to the ECS system within the context of a large greenwaste composting facility. The greenwaste windrow operation will not change with the facility upgrade. At the time of modelling, many of the emission sources odor flux rates were not actually known and numerous assumptions were made including:

- Emission rate of the windrows, which while not know, was held constant for both current and future operations due to the fact that no changes are proposed, and thus negated the need for a site specific odor flux rate.
- Emission rate of tipping building (same rational as above)
- Emission rates of the stockpiles of MSW and greenwaste (same rationale as above)
- Emission rate of the ECS negative CASPs venting to a permanent wood chip biofilter, which was assumed to emit at the same odor rate (pre biofilter) as the CTI system. This assumption was made in order to simplify the evaluation, knowing that the biofilter achieves ~90% reduction in odor, despite ECS knowledge that odor generation rates (per mass and time) are 1-2 orders of magnitude lower with the properly engineered process controls which accompany all ECS systems

(dynamic control of aeration supply rate, high dynamic range of CFM/cy, coupled with homogenous aeration distribution through our Low Friction Trench floor).

The 2019 ZBest odor model

Upon review of ADI's comments on the 2017 model, it became clear that what was needed was not a full facility odor model, but a much more accurate technology (system) specific odor model which evaluated *only* the change in composting equipment from the CTI bag to the ECS system. In the 2017 odor model it was impossible to isolate the impact of the technology change because of the influence of the greenwaste windrows and other (constant) emission sources. As the data for the greenwaste was not actually site specific data, and does not change with the CTI / ECS upgrade, it was decided to remove it entirely from the analysis so as to clarify exactly what the changes are to be in the odor plume between CTI and ECS equipment.

With the removal of all sources which do no change between current CTI operations and planned ECS equipment, it was possible to use only real source specific data for the odor model, thereby increasing its accuracy and value in this planning exercise. The odor flux data assigned to the CTI bags was collected in 2016 during VOC sampling and analyzed by IDES following EN13725 odor protocols (the only exception is that the number of odor analysts were fewer). The odor flux data assigned to the ECS negative CASP vented to permanent biofilters was collected in 2015 at representative ECS facilities in Washington processing food waste and sent to IDES following the same EN13725 with reduced odor analysts. The odor flux data assigned to the ECS positive ASP vented through its surface (unabated) was collected from the Mariposa facility where MSW is composted outdoors, following the same EN13725 procedures and analyzed by IDES. The IDES report containing the Mariposa and CTI bag odor values are included.

We are also providing a live version of the Excel file which was used to calculate the final odor emission rates for each surface source. The calculations were made in different ways, as is explained below.

CTI bag surface emission: measured odor value per IDES report (OU/volume) x airflow (volume/time)= OU/time. OU/time * Area of bags = odor flux rate (OU/Time/Area)

ECS primary CASP to Biofilter surface emission: the most representative data for odor generation from a negative ECS system is odor per mass aerated per time as the depth of a pile can vary considerably between sites and the aeration system aerates a volume (which has a density and mass), not a surface. The Excel file can be followed from reference facility odor values through to the final selected odor value (OU/min/mt). The value of 50 OU/min/mt, selected for the ECS facility at ZBest, was conservatively high based on data from two other ECS systems with same technology and similar feedstock. For reference, the CTI system's value for odor generation per unit mass and time was ~350 ou/min/mt, which is not quite 10x higher, but which was around what was expected (10x higher than the ECS system) given the lack of process control, severe heterogeneity (maldistribution). A peer reviewed literature reference (will full text download access) which gives further explanation of how odor can be 10-100x higher in an un-optimized process follows:
https://www.researchgate.net/publication/232810830_Effects_of_pH_and_microbial_composition_on_odour_in_food_waste_composting

ECS ASP vented unabated out surfcea: concentration from Mariposa odor sampling (data in IDES report) * flow rate (calculated based on mechanical design) * Area of ASP = OU/Time/Area.

Odor Assessment Report

Engineering Compost Systems

Sidarta S. Medina SO1524

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Document Reference

Customer:	Engineering Compost Systems
Customer contact	Geoff Hill
Customer address:	4220 24th Avenue West Seattle, Washington 98199
Project:	Odor Assessment – air compost samples.
Project number:	SO-1524
Reference:	SCENTROID, 2016. *Odor assessment - compost air samples for by Scentroid for ECS (2)., Jan 20th 2017, Markham ON., Canada.*
Version	Final
Revision number:	V.1.0
Author:	Sidarta E. Medina
Reviewed by:	Ardevan Bakhtari
Project director:	Ardevan Bakhtari

Approved for issue by: **Date:**

Ardevan Bakhtari

Jan 20th, 2017

Ardevan Bakhtari PhD.
President
Scentroid

Contents

Tables

Acronyms Used

Term	**Definition**
ASTM	American Society for Testing and Materials
EN	European Norm
LPM	Liters per Minute
MDL	Method Detection Limit
ORIS	Odor Reference Intensity Scale
PPBV	Parts per Billion by Volume
QA	Quality Assurance
QA/QC	Quality Control/Quality Assurance

Chemical nomenclature

OU_E/m^3	odor units – is the number of times that a sample of odor must be diluted to reduce its concentration to its detection threshold

1. Introduction.

Scentroid was commissioned by Engineering Compost Systems (ECS) to assess air samples sent by the customer. The assessment was carried out at Scentroid Research Center to evaluate odour concentration from the bag containing the sample. As per customer request, odour concentration was carried out by only one assessor partially following the EN13725:2003 standard, therefore the results only corresponds to the individual detection threshold.

2. Project description

The scope of the project consisted in the following objective:

- **Objective One:** To obtain odor concentration per each sample.

The analysis was performed on Jan 17th, 2017. Samples were conditioned at room temperature during 30 minutes at 22.5° Celsius with an average relative humidity of 35.5%.

Odor Concentration:

Odor concentration evaluation was performed according the EN13725:2003[1] modified standard. This approach involve a controlled mixture of odorous air with non-odorous air to achieve known discrete dilutions, which are presented to a human subjects for evaluation (assessors). The process starts with exposure of odor assessors to a highly diluted air sample, where odor-containing air cannot be distinguish from odorless air. The assessors are methodically presented with progressively lower dilution levels (greater odorous air content) in measured steps. The odor unit level of odor concentration (OU/m^3) correspond to an odor concentration in which the observer detects air is no longer the same as it was before. A total of 3 rounds were conducted to assess the odour concentration from the samples contained in the bags. The results of the 3 rounds are presented in Table 2

[1] C. (2013). EN13725:2003 Air Quality - Determination of odor concentration by dynamic Olfactometry.

The OU/m3 is a unitless ratio calculated as:

$$OU/m^3 = \frac{\text{Volume of odorous air + Volume of filtered air}}{\text{Volume of odorous air}}$$

Detection of an odor at high dilution indicates the presence of a strong odor. Conversely, detection at low dilution indicates a relatively weak odor.

Odor assessor, was selected in accordance the methodology described in the EN 13725:2003 Standard. The sensitivity of the assessor met the quality criteria of sensitivity (0,020 µmol/mol a 0,080µmol/mol) and variability (<2.3). Special attention was given in the assessor selection regarding their age, gender and heath condition. The assessor was screened using the triangular force choice method in a SCENTORID SC300 mobile olfactometer on April 20th, 2016. The assessor was screened using a mixture of N-butanol (Sigma-Aldrich CAS-No. 71-36-3) evaporated in nitrogen to create a concentration of 40 ppm. A Teflon bag with stainless steel fitting SCENTROID Model BGF10 was used as a sample container.

Instruments Used for the Assessment.

A SM100i olfactometer was used for the assessment of odour concentration from the bag sent by ECS. This instrument has the capability to assess ambient odor samples or samples from a sampling bag. The instrument complies with the specifications of the 6.5.2 section “Dilution Apparatus” of the EN13725:2003 and the sections 6.5.1 “Olfactometer Construction,” 6.5.2, “Dilution range,” 6.5.3, “interface between the nose and olfactometer,” 6.5.4, “Decision limit,” and 6.5.5, “Calibration procedures”.

The instrument allows the administrator to conduct Yes/No tests according the EN13725:2003 presenting blanks randomly within the dilution series. The instrument is managed using the SM100i application developed by Studio Okolje that runs in Android OS. This application works with a Bluetooth interface that connects the instrument with the Android device. The Android device manages a servo controller that controls the dilutions and blanks presented to the assessor. Likewise, the equipment works using odorless air that is contained in a high pressure 4500 psi cylinder with 20 minutes duration to provide to the assessor with the necessary air flow to reach 20.0L/min. The air contained in the cylinder is filtered twice using an activated carbon filter to ensure 100% clean air.

3. Results:

Once all the specimens were conditioned and prepared. The samples were assessed finding the following:

Engineering Compost Systems

Item No.	Description	ou_E/m^3 Low D	High D	Z_{ITE} R1	Low D	High D	Z_{ITE} R2	Low D	High D	Z_{ITE} R3	$\bar{Z}_{ITE}$
1	MARIPOSA 2 REGULAR	47	83	62	47	83	62	47	83	62	62
2	MARIPOSA 1 FAST	83	162	116	47	83	62	83	162	116	94
3	CTI (1)	2926	4479	3620	2926	4479	3620	2926	4479	3620	3620
4	ZBEST DOWNWIND	390	625	494	264	390	321	264	390	321	370
5	ZBEST CTI 2	2926	4479	3620	2211	2926	2543	2211	2926	2543	2861

Table 1 Odour concentration results

Appendix B Figures

Project components

- Included source
- Excluded source
- Excluded ponctual source
- 4 — All three surfacic sources for the CTI bags were combined into one

ZBest Composting Facility

Atmospheric particle dispersion studies

Map 1
Excluded sources in current CTI System

Sources :

Base : Google Maps, @Google 2019

Inventories : Englobe, 2019

Cartography : Englobe

June 2019

Englobe

Projet manager : A. Milliard | Date : 2019-06-13

Prepared by : C. Blanchet | Drawn by : J.F. Bazin | Verified by : L. Savoie

Master Serv.	Project	Otp			Disc.	Type	N° drawing	Rev.
46	P-0018788	0	01	100	EN	D	0101	00

File : \\que7-fil-001\Projets\129\P-0018788_Zbest products\z5_CAD\GO\2_Carto\P18788_c1_ZBest_Current_190521.mxd

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Project components

- Included source
- Excluded source
- Excluded ponctual source

ZBest Composting Facility

Atmospheric particle dispersion studies

Map 2
Excluded sources in proposed ECS System

Sources :

Base : Google Maps, @Google 2019

Inventories : Englobe, 2019
Cartography : Englobe

June 2019

Englobe

Projet manager : A. Milliard						Date : 2019-06-13	
Prepared by : C. Blanchet		Drawn by : J.F. Bazin				Verified by : L. Savoie	
Master Serv.	Project	Otp			Disc.	Type	N° drawing	Rev.
46	P-0018788	0	01	100	EN	D	0101	00

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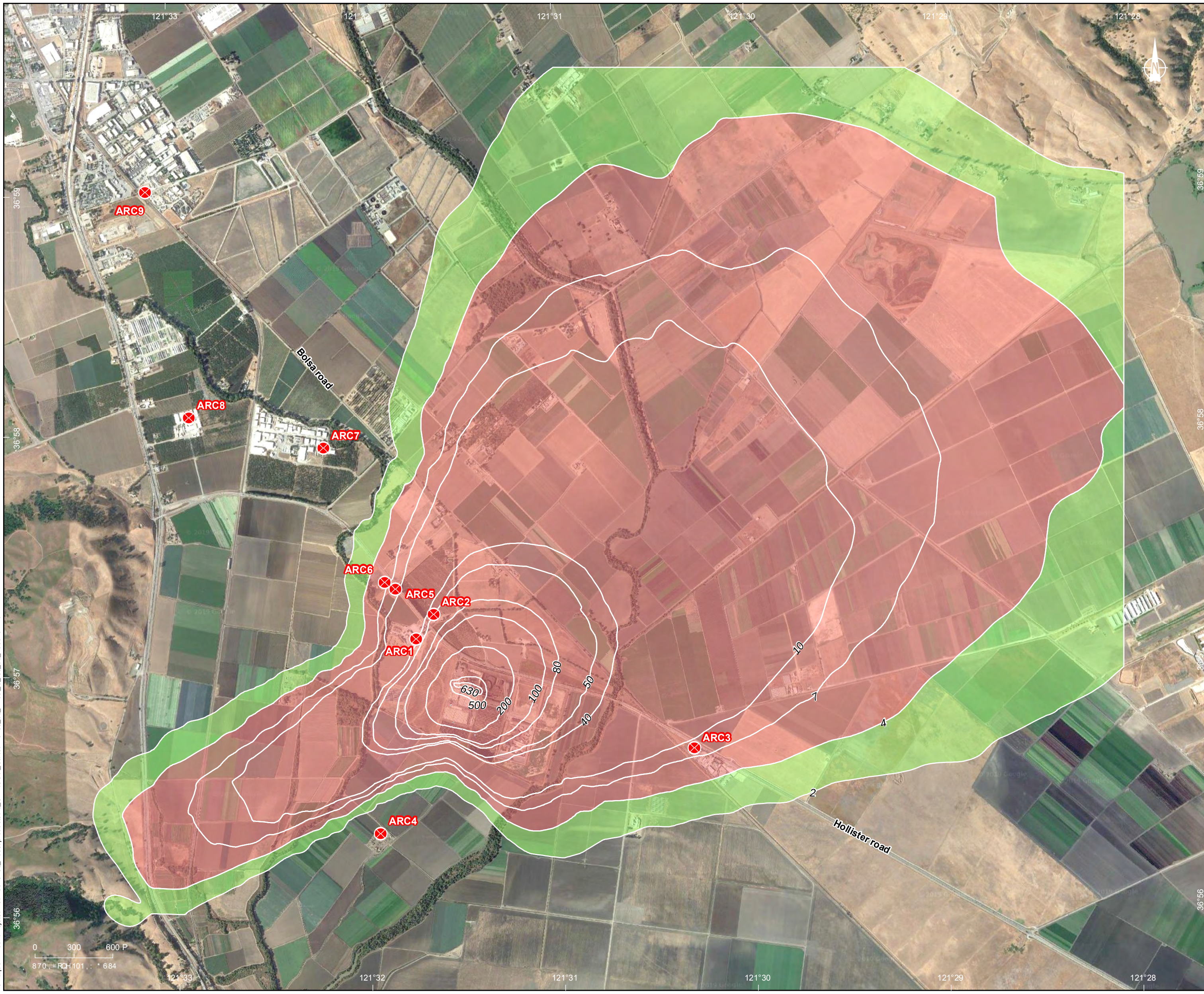

Project components

ARC1

Maximum concentration value : 681 ou/m^3

ZBest Composting Facility

Map 3

Maximum 98 percentile odor concentration (ou/m^3) in current CTI System

Sources :

Base : Google Maps, @Google 2019

Inventories : Englobe, 2019

Cartography : Englobe

June 2019

Englobe

2019-06-13

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File : \\que7-fil-001\Projets\129\P-0018788_Zbest products\z5_CAD\GO\2_Carto\P18788_c4_ZBest_C_Iso_Av_190611.mxd

Project components

Maximum concentration value : 118 ou/m^3

ZBest Composting Facility

Map 4

Maximum averaging percentile odor concentration (ou/m^3) in current CTI System

Sources :

Base : Google Maps, @Google 2019

Inventories : Englobe, 2019

Cartography : Englobe

June 2019

Englobe

46	P-0018788	0	01	100	EN	D	0401	00

2019-06-13

Project components

Maximum concentration value : 6 ou/m³

ZBest Composting Facility

Map 5

Maximum 98 percentile odor concentration (ou/m³) in proposed ECS System

Sources :

Base : Google Maps, @Google 2019

Inventories : Englobe, 2019

Cartography : Englobe

June 2019

Englobe

46	P-0018788	0	01	100	EN	D	0501	00

File : \\que7-fil-001\Projets\129\P-0018788_Zbest products\z5_CAD\GO\2_Carto\P18788_c5_ZBest_P_Iso_98_190610.mxd

Project components

ARC1

Maximum concentration value : 1 ou/m³

ZBest Composting Facility

Map 6

Maximum averaging percentile odor concentration (ou/m³) in proposed ECS system

Sources :

Base : Google Maps, @Google 2019

Inventories : Englobe, 2019
Cartography : Englobe

June 2019

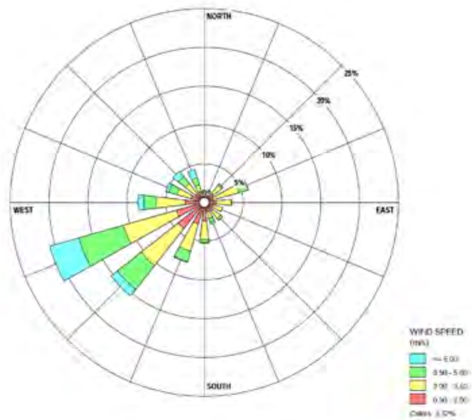
Englobe

2019-06-13

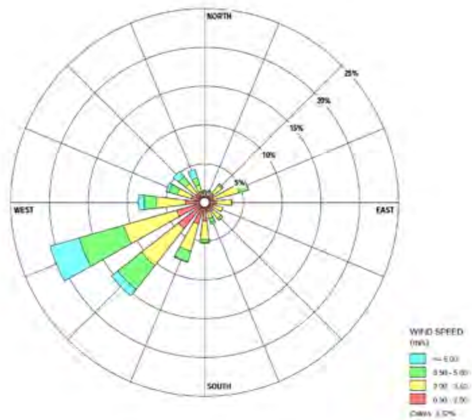
46	P-0018788	0	01	100	EN	D	0601	00

File : \\que7-fil-001\Projets\129\P-0018788_Zbest products\z5_CAD\GO\2_Carto\P18788_c6_ZBest_P_Iso_Av_190610.mxd

Wind rose (2010)



Wind rose (2011)



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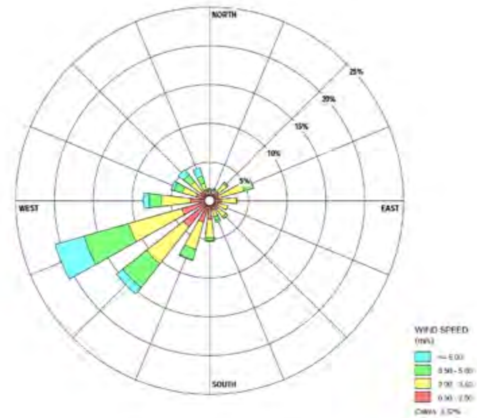

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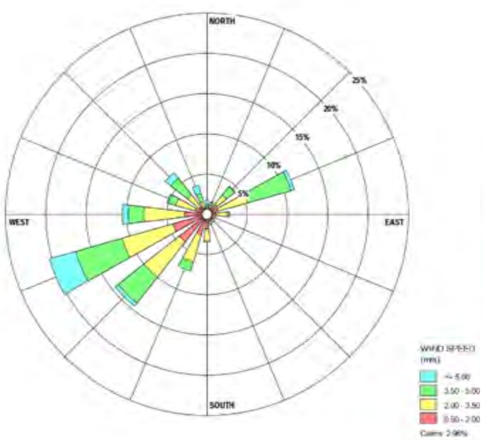

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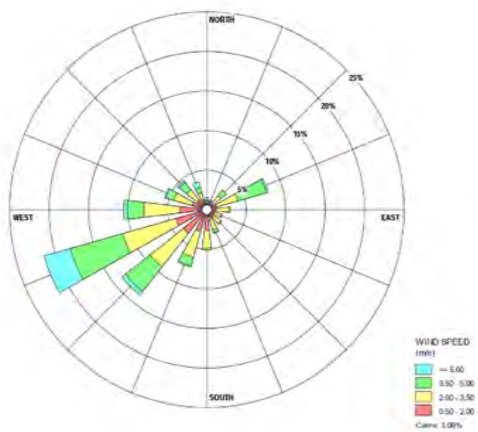
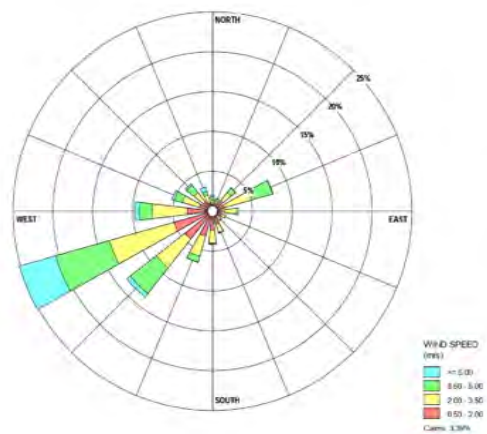


Wind rose (2015)



ZBest Composting Facility

Atmospheric particle dispersion studies

Map 7
Wind roses of the years used for modelisation

Sources :

Base : Google Maps, @Google 2019

Inventories : Englobe, 2019
Cartography : Englobe

June 2019

Projet manager : A. Milliard — Date : 2019-06-14

Prepared by : C. Blanchet — Drawn by : J.F. Bazin — Verified by : L. Savoie

Master Serv.	Project	Otp			Disc.	Type	Drawing Num	Rev.
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APPENDIX C

CRLF Habitat Assessment
Verification of Absence of Sensitive Species and Habitat
Biological Report for Site Access Change and State Highway 25 Improvements

Memorandum

To: John Doyle, Zanker Road Management

Subject: Z-Best Composting Facility Modification: Verification of Absence of Sensitive Species and Habitat Covered by the SCVHP

Date: February 27, 2017

This memo addresses item number 14 in the County Response [File 6498-16PA – Pre-application Summary for Use Permit Modification for Z- Best's Composting Facility located at 980 State Highway, Gilroy (APN 841-37-028, 841- 37-029)]. This memo discusses the presence of sensitive species and habitats covered by the Santa Clara Valley Habitat Plan for the Z-Best Compost Products Composting Facility Aerated Static Pile Project (Santa Clara County File 6498-16P4) in support of the Santa Clara Valley Habitat Plan Coverage Screening Form (enclosed).

The proposed project is located at 980 State Highway, Gilroy, Santa Clara County, California (APNs 841-37-028 and 841-37-029). The proposed project includes construction of an Engineered Compost Systems (ECS) aerated floor at the location of the current composting facility. The foot print of the project is shown in the Proposed Site Plans (Golder Associates Project 133-97640).

Existing Conditions

The proposed project footprint is located entirely within an existing developed and active composting facility area, designated as "agriculture developed" land cover type and occurs in "Urban Area" Land Cover Fee Zone. Currently the area is disturbed and processed regularly with movement of soils and composting material and foot and equipment traffic. Little to no general wildlife habitat value lies within the composting facility as there is no vegetation and disturbance is high. The Agency HCP Geobrowser website designates a "grain, row-crop, hay and pasture, disked/short-term fallowed" and "pond" land cover types immediately south of the proposed project footprint and "permanent development area."

A stormwater control feature (detention basin) lies to the south of the project area and is categorized as "pond" by the Agency HCP geobrowser. However, this feature provides little habitat for wildlife. An assessment of the basin for its value as wildlife habitat was conducted by WRA in 2014. No amphibians of any species were observed during the field visits to the detention basin. No emergent aquatic invertebrates (dragonflies, damselflies, mayflies, caddisflies, stoneflies), or evidence of these animals (molt casts left over my metamorphosing invertebrates) were observed. It is likely that the biotic and abiotic processes occurring at the detention basin severely limits the food web needed to support any wildlife, in both quantity and diversity. Additionally, no emergent vegetation was observed at the detention basin. Because the banks of the detention basin are nearly completely devoid of emergent aquatic vegetation or other structural habitat components, the basin and its immediate surroundings provide little suitable nesting habitat for birds, and no suitable nesting habitat for tricolored blackbird (*Agelaius tricolor*). A row of planted trees separates the basin and a lay-down yard from the exiting composting activities to the north. Given that this row of trees is narrow and surrounded by composting facility activities, it is unlikely to support special-status species and would not be considered a sensitive habitat as defined by the HCP. An analysis of aerial photographs (Google Earth 2017) shows that conditions in the detention basin has not changed since 2014.

The detention basin serves as the primary recipient of the resultant leachate from the composting process. It is pumped and recycled continuously, such that the leachate concentrates in the detention basin. The result is that the water observed at the detention basin is highly turbid (nearly black) with dissolved organic materials. Even though the basin is mapped as sensitive pond habitat on the HCP Geobrowser, it is in the opinion of WRA that the stormwater control feature has no potential to support aquatic wildlife species. In addition, potential for special status birds and other wildlife is very low due to lack of emergent vegetation.

WRA has assessed that the detention basin would not meet the definition of a "waters of the United States" because it is a stormwater control feature constructed to convey, treat, or store stormwater that was created in dry land (33 CFR 328.3).

A "grain, row-crop, hay and pasture, disked/short-term fallowed" area is located south of the proposed project and west of the basin. It is now being used as a lay-down or staging yard with little to no substantial habitat value and could likely be re-characterized as "agriculture developed" instead of the existing cover type. A field survey by WRA biologists to verify this finding and document it may be necessary.

The project footprint, including the "permanent development area" is expected to occur only within the existing developed composting facility, and will be more than 100 feet from the detention basin and lay-down/staging yard. Therefore, the project will be outside any land cover fee zone subject to the HCP. While the "permanent development area" will encroach into the neighboring parcel to the west, which is categorized as "grain, row-crop, hay and pasture, disked/short-term fallowed" land cover type, the land would not be included within the development area per the HCP (Chapter 6, Page 6-31):

> Plans do not need to show buffer areas (50 feet for permanent improvements and 10 feet for temporary improvements) that cross property boundaries (e.g., a house 30 feet from a property line only needs to show the buffer area up to the property line).

This brief analysis assumes that no fees will be paid based on the neighboring properties.

Conclusion

The "permanent development area" (project footprint plus a 50-foot buffer) of the proposed project is designed to be located 50 feet from any potential sensitive land cover types and therefore will not impact sensitive land cover types or covered species, specifically the pond and tricolored blackbird survey areas. The project is not a covered project under the Habitat Plan and no additional actions regarding the Habitat Plan is needed

Please contact me at 415.524.7205 or email at avent@wra-ca.com if you need more clarification or if you have questions.

Sincerely,

Sean Avent
Associate Biologist

Enclosure: 1) Proposed Site Plans (Golder Associates Project 133-97640)
2) Santa Clara Valley Habitat Plan Coverage Screening Form

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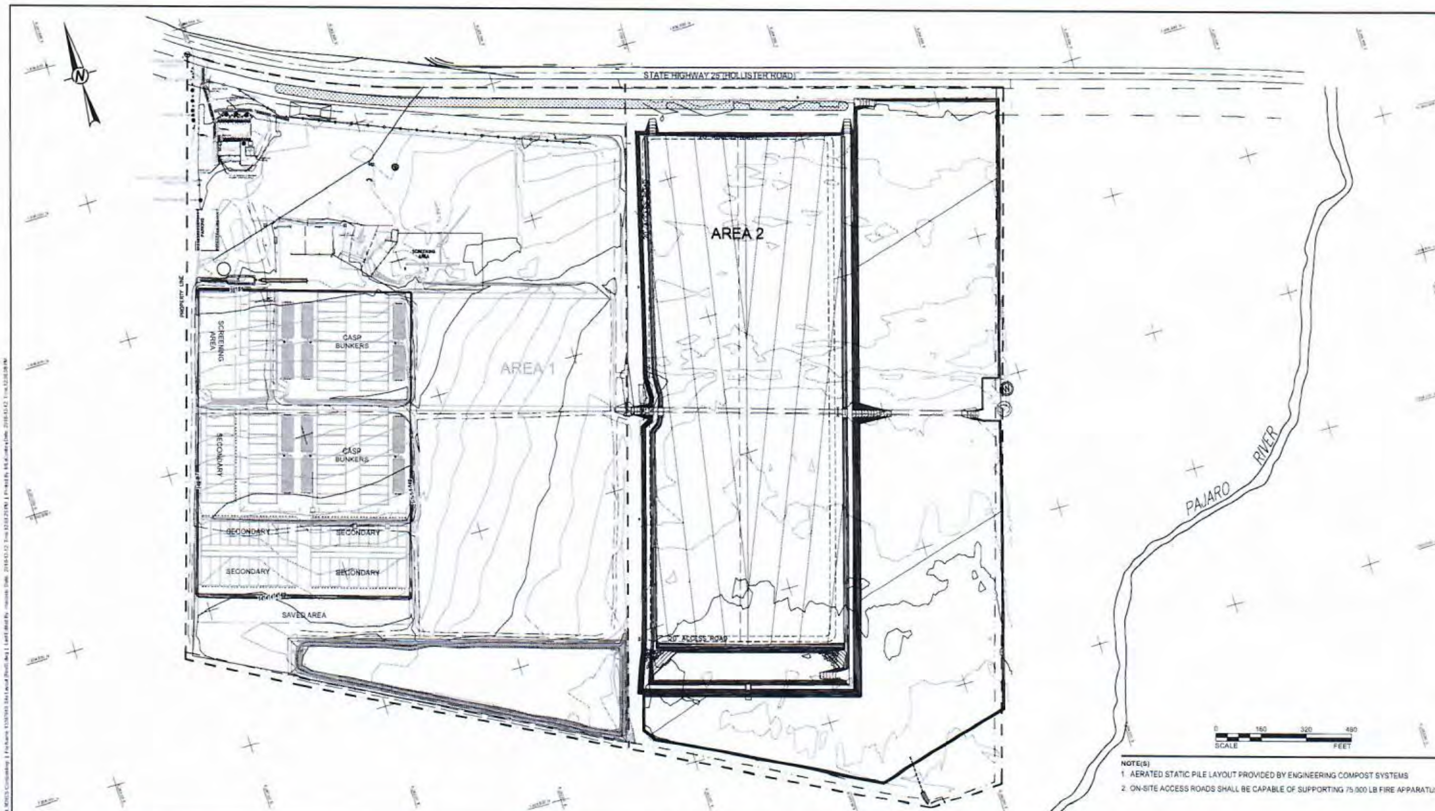
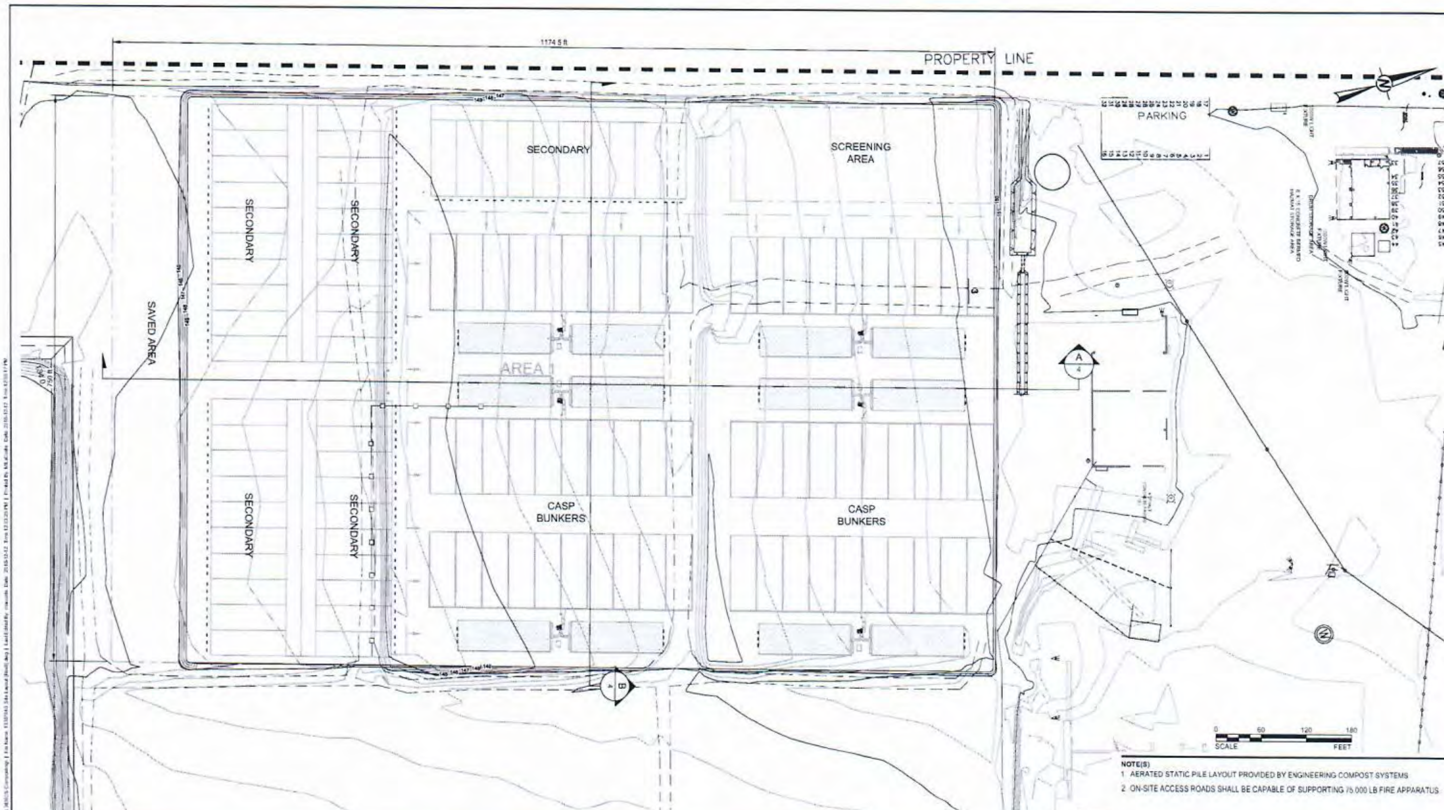


NOTE(S)

1. AERATED STATIC PILE LAYOUT PROVIDED BY ENGINEERING COMPOST SYSTEMS
2. ON-SITE ACCESS ROADS SHALL BE CAPABLE OF SUPPORTING 75,000 LB FIRE APPARATUS

CLIENT Z-BEST COMPOST PRODUCTS COMPOSTING FACILTY GILROY, CALIFORNIA	zanker	PROJECT AERATED STATIC PILE PERMIT PACKAGE
CONSULTANT Golder Associates	SUNNYVALE 425 LAKESIDE DRIVE SUNNYVALE, CALIFORNIA 94085 USA [+1] (408) 220-9223 www.golder.com	TITLE PROPOSED SITE PLAN
REV YYYY-MM-DD DESCRIPTION	DESIGNED PREPARED REVIEWED APPROVED	PROJECT NO 133-97640 REV ---- of DRAWING 2



NOTE(S)

1. AERATED STATIC PILE LAYOUT PROVIDED BY ENGINEERING COMPOST SYSTEMS
2. ON-SITE ACCESS ROADS SHALL BE CAPABLE OF SUPPORTING 75,000 LB FIRE APPARATUS

REV	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED

CLIENT
Z-BEST COMPOST PRODUCTS
COMPOSTING FACILTY
GILROY, CALIFORNIA

zanker

CONSULTANT

Golder Associates

SUNNYVALE
425 LAKESIDE DRIVE
SUNNYVALE, CALIFORNIA 94085
USA
[+1] (408) 220-9223
www.golder.com

PROJECT
AERATED STATIC PILE PERMIT PACKAGE

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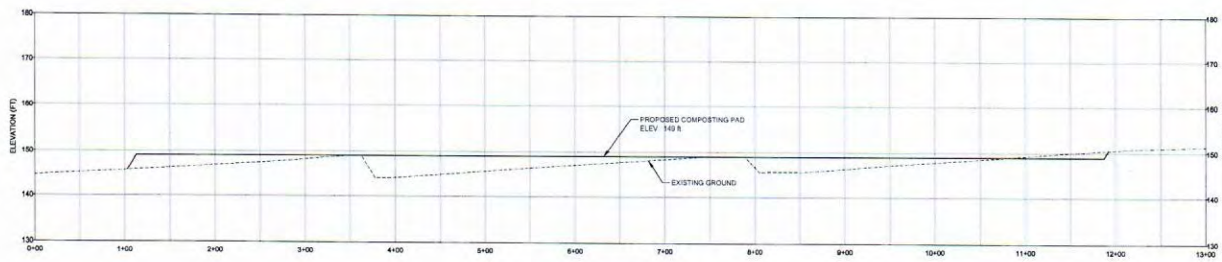
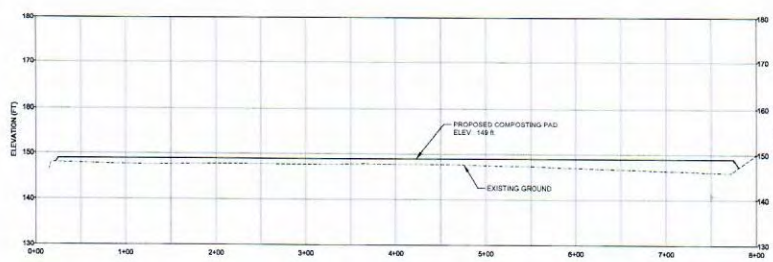
COMPOSTING PAD GRADING PLAN

PROJECT NO	REV	of	DRAWING
133-97640	----		3



HORZ SCALE 1"=50' | VERT SCALE 1"=10' (A / 4) SECTION A-A'



HORZ SCALE 1"=50' | VERT SCALE 1"=10' (B / 4) SECTION B-B'

REV YYYY-MM-DD DESCRIPTION DESIGNED PREPARED REVIEWED APPROVED

CLIENT
Z-BEST COMPOST PRODUCTS
COMPOSTING FACILTY
GILROY, CALIFORNIA

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CONSULTANT

Golder Associates

SUNNYVALE
425 LAKESIDE DRIVE
SUNNYVALE, CALIFORNIA 94085
USA
[+1] (408) 220-9223
www.golder.com

PROJECT
AERATED STATIC PILE PERMIT PACKAGE

TITLE
SECTIONS

PROJECT NO 133-97640 | REV ---- | of | DRAWING 4

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SANTA CLARA VALLEY
HABITAT AGENCY

City of Gilroy

City of Morgan Hill

City of San José

County of Santa Clara

Santa Clara Valley Water District

Santa Clara Valley Transportation Authority

Santa Clara Valley Habitat Plan
COVERAGE SCREENING FORM

Habitat Plan Application File Number
(Assigned by jurisdiction)

Planning Office File Number
(Assigned by jurisdiction)

To determine if a project is eligible for coverage under the Santa Clara Valley Habitat Plan ("Habitat Plan"), complete and submit this form to the planning or building office of the applicable local jurisdiction (County of Santa Clara, City of Gilroy, City of Morgan Hill, or City of San José) as soon as possible in the development process.

*This form is used to evaluate if a private development project located within the Habitat Plan Permit Area is classified as a "covered project" under the Habitat Plan. Certain projects within the Habitat Plan Permit Area may **not** be covered projects under the Habitat Plan due to their location and size. This form is used to determine one of two conclusions and courses of action regarding a proposed project:*

*(1) A project **is not** a covered project under the Habitat Plan. Submit this form to the applicable local jurisdiction. No additional action regarding the Habitat Plan is needed.[1]*

*(2) A project **is** a covered project under the Habitat Plan. Submit this form to the applicable planning or building office along with the Application for Private Projects when submitting applications for planning approvals.*

1. Project Type (subdivision, conditional use permit, etc.) Compost Facility
2. Project Location (address / Assessor's Parcel Number) 980 State Highway 25, Gilroy / APN's 84137028 and 84137029
3. Project Description (including proposed use) Installation of an Engineered Compost Systems (ECS) aerated floor at the existing developed composting facility. The project will not affect sensitive species or habitat - Land Cover Verification attached.

A. Project Location

On the Private Development Areas map[2], where is the project located? (check the applicable box below)

Area 1: Private Development Covered	☐	*Go to Question C, page 2*
Area 2: Rural Development Equal to or Greater Than 2 Acres Covered	☐	*Go to Question B, page 2*
Area 3: Rural Development Not Covered	☒	*Go to Conclusion 1, page 3*
Area 4: Urban Development Equal to or Greater Than 2 Acres Covered	☐	*Go to Question B, page 2*

[1] See disclaimer under Conclusion 1 below regarding Endangered Species Act requirements.

[2] The Private Development Areas map can be viewed on the Habitat Agency Geobrowser at www.hcpmaps.com or at each of the planning and building offices (County of Santa Clara, City of Gilroy, City of Morgan Hill, or City of San José).

B. Size of the Permanently Disturbed Footprint

What is the total size of the permanently disturbed footprint (not parcel size; see box below), in acres?

____

If the size of the permanently disturbed area is less than 2 acres, go to Conclusion 1, page 3.
If the size of the permanently disturbed area is 2 acres or greater, go to Conclusion 2, page 3.

> ***Calculating the Size of the Permanently Disturbed Footprint:*** *The permanently disturbed area is not the parcel size. It is determined by calculating the total land area that will be permanently affected by the proposed development project.*
>
> *This area includes all new buildings, new impervious surfaces (parking areas, roads, sidewalks, pools, etc.), and other areas that will be permanently affected by the project (lawns or formal landscaping areas, etc.). Refer to Exhibit A for calculating the Permanently Disturbed Footprint.*
>
> *This area shall be shown on plans submitted with this Coverage Screening Form.*
>
> *If necessary, the planning or building office reviewing this Coverage Screening Form may require this area to be calculated by a licensed professional (architect, engineer, surveyor) to verify accuracy.*

C. Additions[3]

i. Is the project site currently developed?

- ☐ **YES** *Go to Question ii below*
- ☐ **NO** *Go to Conclusion 2, page 3*

ii. Does the project consist of total new impervious surface <u>less than</u> 5,000 square feet for (a) a building addition or (b) a new building within 50 feet of existing buildings?[4]

- ☐ **YES** *Provide area below in iii and go to Conclusion 1, page 3*
- ☐ **NO** *Go to Conclusion 2, page 3*

iii. What is the total impervious surface (see box below) that will be added (in square feet)? ______________________________

> ***Calculating Impervious Surface:*** *New impervious surfaces include all new buildings and paved areas (asphalt and concrete), such as parking areas, driveways, roads, sidewalks and pools.*
>
> *This area shall be shown on the plans submitted with this Coverage Screening Form.*
>
> *If necessary, the planning department reviewing the Coverage Screening Form may require impervious surface area to be calculated by a licensed professional (architect, engineer, surveyor) to verify accuracy.*

---

[3] A developed site means a site has existing permanent improvements, such as buildings and impervious areas, that were legally established prior to the Operative Date of the Habitat Plan (October 14, 2013). Review of building permits or aerial photos may be required by the planning department for verification.

[4] Building addition and new building area is cumulative effective October 14, 2013.

■ **CONCLUSION 1** Project **is not** a covered project under the Habitat Plan.

Submit this Coverage Screening Form to the planning or building office with the applicable planning application (such as use permit, subdivision, etc.) for the project. Planning staff will evaluate and confirm the project is not a Covered Project. Verification of the absence of sensitive habitats, which may include photos and aerials of the site, may be required.

Sensitive Habitats: If the proposed project affects any wildlife and/or plant species covered by the Habitat Plan, or any unmapped burrowing owl occupied nesting habitat, serpentine, riparian, stream, pond, or wetland land covers on the property, then coverage under the Habitat Plan is required. Go to Conclusion 2, below.

Projects that are not covered projects under the Habitat Plan must still comply with Federal and State Endangered Species Act requirements. If a project has the potential to take a federally or state-listed plant or wildlife species, the applicant must contact the U.S. Department of Fish and Wildlife and/or the California Department of Fish and Wildlife to determine whether an endangered species permit should be obtained.

☐ **CONCLUSION 2** Project **is** a covered project under the Habitat Plan.

Submit this Coverage Screening Form to the planning or building office with the planning application (such as use permit, subdivision, etc.). Work with planning or building office staff to complete the *Application for Private Projects,* which includes the *Fees and Conditions Worksheet*—a planning tool that provides guidance for land cover mapping requirements, fees, and conditions that may apply to your project.

Property Owner John Doyle for Zanker Road Resource Managemnt, Ltd.

Property Owner Signature ________ Date 2-28-17

Applicant John Doyle for Zanker Road Resource Managemnt, Ltd.

Applicant Signature ________ Date 2-28-17

Planning/Building Office Contact Information

City of Gilroy	City of Morgan Hill	City of San Jose	County of Santa Clara
7351 Rosanna St.	17575 Peak Ave.	200 E. Santa Clara St., T-3	70 West Hedding St., 7th Floor
Gilroy, CA 95020	Morgan Hill, CA 95037	San Jose, CA 95113	San Jose, CA 95110
Tel: (408) 846-0451	Tel: (408) 778-6480	Tel: (408) 535-3555	Tel: (408) 299-5770
Fax: (408) 846-0429	Fax: (408) 779-7236	Fax: (408) 292-6055	Fax: (408) 288-9798
www.ci.gilroy.ca.us/planning	www.morganhill.ca.gov	www.sanjoseca.gov/planning	www.sccplanning.org

If the project is not a covered project under the Habitat Plan and "opt-in" coverage from the Habitat Plan is desired, work with the applicable planning or building office to complete the Application for Private Projects and submit it to the planning or building office with the planning application. Opt-in coverage is not guaranteed and will be authorized by the local jurisdiction in consultation with the Habitat Agency.

For Staff Verification Use Only

Project is Covered ☐ Project is Not Covered ☐ No Sensitive Habitats Located on Project Site ☐ Date ________

Project Planner ________

Phone Number ________ Email ________

SOURCES FOR THIS FORM: This form incorporates the policies contained within Chapter 2, *Land Use and Covered Activities*, of the Santa Clara Valley Habitat Plan, specifically subsection *Private Development Subject to the Plan*, beginning on Page 2-42.

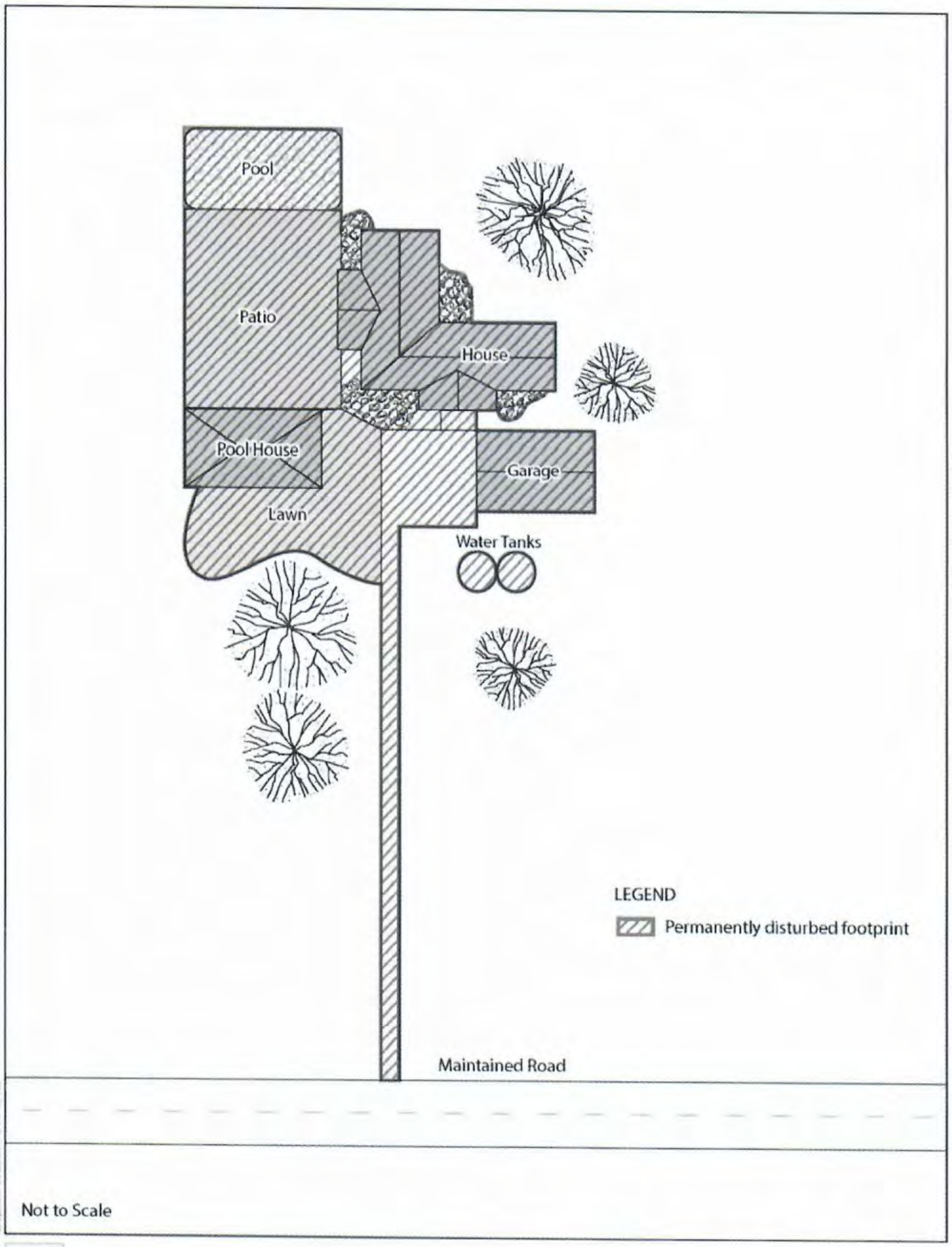

Exhibit A
Permanently Disturbed Footprint

Note: The permanently disturbed footprint, as shown in Exhibit A, is used to determine if your project is eligible for coverage under the Habitat Plan. Please refer to the Fees and Conditions Worksheet Exhibit 1 to determine how to calculate fees, impacts, and conditions if your project is eligible for coverage under the Habitat Plan.

July 3, 2014

Greg Ryan
Zanker Road Resource Management, Ltd.
675 Los Esteros Road
San Jose, CA 95134

RE: CALIFORNIA RED-LEGGED FROG HABITAT ASSESSMENT AT THE Z-BEST COMPOSTING FACILITY, SANTA CLARA COUNTY, CALIFORNIA

Dear Mr. Ryan,

The purpose of this letter is to provide a technical assessment of the potential habitat for the federally threatened California red-legged frog (*Rana* draytonii; CRLF) at the Z-Best Composting Facility located south of Gilroy in Santa Clara County, California (Study Area). Currently, under the proposed Santa Clara County HCP, the entirety of the existing facility is modeled as CRLF Secondary Habitat, with the existing industrial detention basin in the southern portion of the facility modeled as CRLF Primary Habitat. Based on an assessment of the Study Area and a focused CRLF day/night survey performed on June 9, 2014, it is WRA's opinion that the Study Area is not suitable CRLF aquatic or upland habitat.

Study Area Overview

Z-Best is proposing to expand compost processing operations into 28 acres of an 80-acre parcel east of the current operational footprint (see attached figure), as well as complete improvements to their existing composting operations on the 77-acre Area 1. Expansion into Area 2 will not increase the quantity of composted materials. Instead, the proposed expansion is intended to create a more efficient operation.

The Study Area is located in southern Santa Clara County and is bordered to the north by Highway 25, and the vast majority of land use surrounding the Study Area is actively irrigated row-crop agriculture. The southeastern corner of the Study Area abuts the Pajaro River and in a general context is located between the Pajaro and Carnadero Creek.

The Study Area is bisected by a north-south irrigation ditch that originates north of Highway 25 and terminates in a perpendicular confluence with a roughly east-west trending irrigation ditch along the southern property boundary. This east-west irrigation ditch receives agricultural irrigation run-off from the south and flows between the Pajaro River and Carnadero Creek. These ditches are maintained for storm-water and are only wetted immediately after storm-events and after extensive irrigation on the fields to the south of the Study Area.

The western half of the Study Area supports Z-Best's current composting operations, which largely consist of compost wind-rows in various stages of the composting process. The northwestern corner supports a warehouse, weigh-station and administrative offices. The southern portion of the western Study Area supports a large industrial detention basin, from which water is pumped in support of the composting process. This basin does not drain into any adjacent waterbodies except in extreme flood events.

The detention basin receives input from three sources; seasonal rainfall, occasional groundwater added to maintain the pond-level, and primarily from compost leachate. Water is circulated (pumped) from the pond and applied to the compost to facilitate in the decomposition process. A byproduct of this process is leachate, a dark brown liquid that seeps out from the compost and is directed back into this basin via informal channels or overland run-off. Aside from input from rainwater and groundwater, this is a closed-loop process and the leachate continues to concentrate in the pond as it is re-applied to the wind-rows, and drains back into the detention basin.

Species Information

Historically CRLF extended along the coast of Marin County and inland from Shasta County southward to northwestern Baja California in Mexico (Jennings and Hayes 1994). According to the U.S. Fish and Wildlife ruling to designate Critical Habitat for CRLF (2006); there are four Primary Constituent Elements (PCEs) considered to be essential for the conservation of the species (USFWS 2006):

- Aquatic breeding habitat;
- Non-breeding aquatic habitat for foraging and shelter;
- Upland habitat for foraging; and
- Dispersal habitat for movement to other breeding habitats.

Aquatic breeding habitat consists of low-gradient freshwater bodies, including natural and manmade (e.g., stock) ponds, backwaters within streams and creeks, marshes, lagoons, and dune ponds. Aquatic breeding habitat must hold water for a minimum of 20 weeks in most years. Aquatic non-breeding habitat may or may not hold water long enough for this species to hatch and complete its aquatic life cycle, but it provides shelter, foraging, predator avoidance, and aquatic dispersal for juvenile and adult CRLF. Non-breeding aquatic features enable CRLF to survive drought periods (USFWS 2006). Upland habitats include areas within 200 feet of aquatic and riparian habitat and are composed of grasslands, woodlands, and/or vegetation that provide shelter, forage, and predator avoidance (USFWS 2006). Dispersal habitat includes accessible upland or riparian habitats between occupied locations within 0.7 mile of each other that allow for movement between these sites. Dispersal habitat includes various natural and altered habitats such as agricultural fields, which do not contain barriers to dispersal. Moderate to high-density urban or industrial developments, large reservoirs and heavily traveled roads without bridges or culverts are considered barriers to dispersal (USFWS 2006).

Habitat Assessment

There are numerous known occurrences of CRLF within five miles of the Study Area (CNDDB 2014), though it is worthwhile to note that all but one of these occurrences are from stock ponds or sag ponds within undeveloped rangeland, and not from the areas dominated by active farming. No designated Critical Habitat occurs within five miles of the site. The Study Area is discussed in additional detail below in the context of the four PCEs for CRLF:

Aquatic Breeding Habitat

The Pajaro River corridor is located in the far southeast portion of the Study Area, although no records of CRLF have been documented along the Pajaro River within 1.7 miles of the Study Area, these areas are hydrologically connected, therefore the presence of CRLF cannot be ruled out. Within the context of the proposed Project, the potential for CRLF being present along the Pajaro River is not being disputed, but is analyzed below for completeness.

The Pajaro in the vicinity of the Study Area is relatively low-gradient and has banks that support dense stands of native and non-native riparian vegetation. The result is a relatively complex river system that contains backwater and slackwater areas that are potentially suitable for CRLF breeding. However because of the timing of seasonal high-flows and corresponding high water-velocity and the known presence of fish predators (e.g. steelhead), it is likely that reproductive success of CRLF along the Pajaro River is very low. In the greater vicinity of the Study Area, stock ponds and sag ponds offer higher quality aquatic breeding habitat.

The irrigation ditches within the Study Area are wholly unsuitable as aquatic breeding habitat for CRLF. These ditches are maintained for storm-water and irrigation run-off. As such, they have a trapezoidal shaped channel and are maintained free of vegetation. These channels only convey water immediately following storm-events and during heavy irrigation of the surrounding fields. They lack the depth and hydroperiod to support CRLF breeding or larval development. As verified during the June 9, 2014 site-visit, the hydrology of the ditch that runs along the southern property boundary cycles between wet and dry as often as daily during the growing season, as crops are irrigated during the day and not at night. The north-south ditch was entirely dry and likely only conveys water during major storm events.

The detention basin in the southern portion of the Study Area serves as the primary recipient of the resultant leachate from the composting process. It is pumped and recycled continuously, such that the leachate concentrates in the detention pond. The result is that the water observed at the detention basin during the June 9, 2014 site visit is highly turbid (nearly black) with dissolved organic materials. The water is also strongly odiferous with volatile organic compounds, such as ammonia.

Water samples were recently taken (John Doyle, pers.comm. 7/1/2014) and are currently being analyzed. However based on the observed condition and my extensive experience with CRLF and its habitats, the biotic and abiotic conditions of the pond are unsuitable for CRLF to complete its lifecycle.

The observed turbidity alone would be likely to preclude sufficient light penetration into the water column to allow for the growth of periphyton, the preferred food for CRLF larvae. The anaerobic processes that result in the production of volatile organic compounds such as ammonia suggest that dissolved oxygen levels are insufficient for the development of CRLF eggs and larvae. Additionally, during the June 9, 2014 survey, no amphibians of any species, including the ubiquitous Pacific chorus frog (*Pseudacris regilla*) were observed. In fact, in all likelihood, the detention basin within the Study Area is likely a population sink for amphibians.

Non-breeding Aquatic Habitat

The Pajaro River and Carnaderos Creek are the only aquatic features in the vicinity that provide perennial or seasonal hydration and foraging habitat for CRLF. The irrigation ditches are maintained to be free of vegetation, which eliminates any structural protection from predators or availability of food resources. Additionally, the irrigation ditches do not provide reliable hydration habitat as only the east-west channel along the southern property boundary contains water and only immediately following heavy irrigation of the adjacent fields. The north-south ditch that bisects the Study Area only conveys water immediately after storm events.

As discussed in more detail above, the detention basin located within the southern portion of the Study Area likely acts as a population sink for CRLF and other amphibians. The unfavorable water quality certainly limits the availability of invertebrate prey, which was confirmed during the June 9, site-visit. No emergent aquatic invertebrates (dragonflies, damselflies, mayflies, caddisflies, stoneflies), or evidence of these taxa (molt casts left over my metamorphosing invertebrates) were observed. It is likely that the biotic and abiotic processes occurring at the detention basin severely limits the food web needed to support CRLF, in both quantity and diversity. Additionally, since the banks of the detention basin are nearly completely devoid of emergent aquatic vegetation, small mammal burrows, leaf litter or other structural habitat components, the pond or its immediate surrounds does not provide CRLF with suitable cover from terrestrial or avian predators.

Upland Habitat

Suitable upland habitat for CRLF typically consists of structural components where CRLF can shelter in the short-term to avoid predation, buffer against thermal extremes (both hot and cold), provide hydration, and offer foraging opportunities. Upland habitat may also provide opportunities for long-term aestivation, where CRLF can shelter during unfavorable conditions (drought, low prey availability, etc.). Examples of suitable upland habitat features include; burrows, leaf-litter, root-balls, deep desiccation cracks, dense vegetation (e.g. blackberry tickets), or structures (e.g. rocks, woody debris) to shelter under. The Study Area is nearly devoid of such features.

The irrigation ditches are maintained free of vegetation, and do not support either burrows or leaf-litter. The banks of the detention basin support ornamental trees, but the ground itself is completely bare, maintained free of low-growing vegetation, and lacks burrows, desiccation cracks, rocks or woody debris that could provide shelter to CRLF. The undeveloped eastern portion of the Study Area is disked annually and does not support perennial vegetation or burrows of other habitat components capable of supporting short or long-term occupancy of CRLF.

The only suitable upland habitat for CRLF within the Study Area is in the extreme southeastern corner, within the Pajaro River riparian corridor. The vegetation cover and structure, presence of leaf-litter, root-balls and low-growing vegetation (e.g. blackberry and cape-ivy), provide ideal cover for CRLF. Additionally, the abundance diversity of plants and presence of standing water foster a food web suitable to support CRLF.

Dispersal Habitat

Both Carnadero Creek and the Pajaro River support documented occurrences of CRLF downstream of the Study Area (CNDDB 2014), and since the Study Area is located between these two waterways, overland dispersal between them cannot be ruled out. Any dispersal of CRLF between Carnadero Creek and the Pajaro River would most likely occur via the network of existing irrigation ditches.

Overland movements through the Study Area would likely only occur during storm events when the rains prompt CRLF to disperse or migrate to aquatic breeding sites. Movements across the uplands of the Study Area, such as the open, disked field that makes up the entirety of the eastern half of the site, would expose these individuals to avian (e.g. corvids), terrestrial (e.g. raccoons and skunks) and feral (e.g. cats) predators.

Additionally, dispersing individuals would encounter and fall into one of the several perpendicular irrigation ditches located between the Pajaro River and Carnaderos Creek. Because of the loose soils and steep banks, it is likely that dispersing individuals would be unable to climb out and would be forced to continue along the bottom of the ditches until it reaches its destination, desiccates, or is predated.

Conclusions and Recommendations

Though it is known that both the Pajaro River and Carnaderos Creek in the vicinity of the Study Area support CRLF, the ongoing agricultural uses of the lands between these waterways and south of Highway 25 has rendered these areas unsuitable for CRLF, and likely create a population sink for this species.

The created detention basin in the southern portion of the Study Area is used as part of the industrial composting process and concentrates leachate, the anaerobic byproduct of the composting process. In my ten years of experience surveying and assessing habitat for CRLF, this detention basin is perhaps the worst aquatic feature that I have ever surveyed for CRLF. Results of the water quality sampling are expected back shortly, but based on the observed biotic and abiotic conditions, the detention basin is unsuitable to support this species, and in all likelihood any amphibians attempting to utilize this detention basin as habitat succumb to acute or chronic toxicity or disease, as evidenced by the complete absence of amphibians observed during the June 9 assessment and survey.

Based on the proposed placement of the Z-Best Facility expansion, it is in my professional opinion that no CRLF aquatic or upland habitat will be impacted and the conversion of the disked field in the eastern portion of the Study Area to create additional compost wind-rows will not create any additional barriers to CRLF dispersal.

Please do not hesitate to contact me if you have any questions or if you require any additional information.

Sincerely,

Rob Schell - Herpetologist and Wildlife Biologist

Literature Cited

Jennings, M.R. and M.P. Hayes. 1994. Amphibian and reptile species of special concern in California. Final Report to the California Department of Fish and Game, Inland Fisheries Division, Rancho Cordova, CA.

U.S. Fish and Wildlife Service. (USFWS). 2006. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the California Red-Legged Frog, and Special Rule Exemption Associated With Final Listing for Existing Routine Ranching Activities; Final Rule. Federal Register 71: 19244-19346.

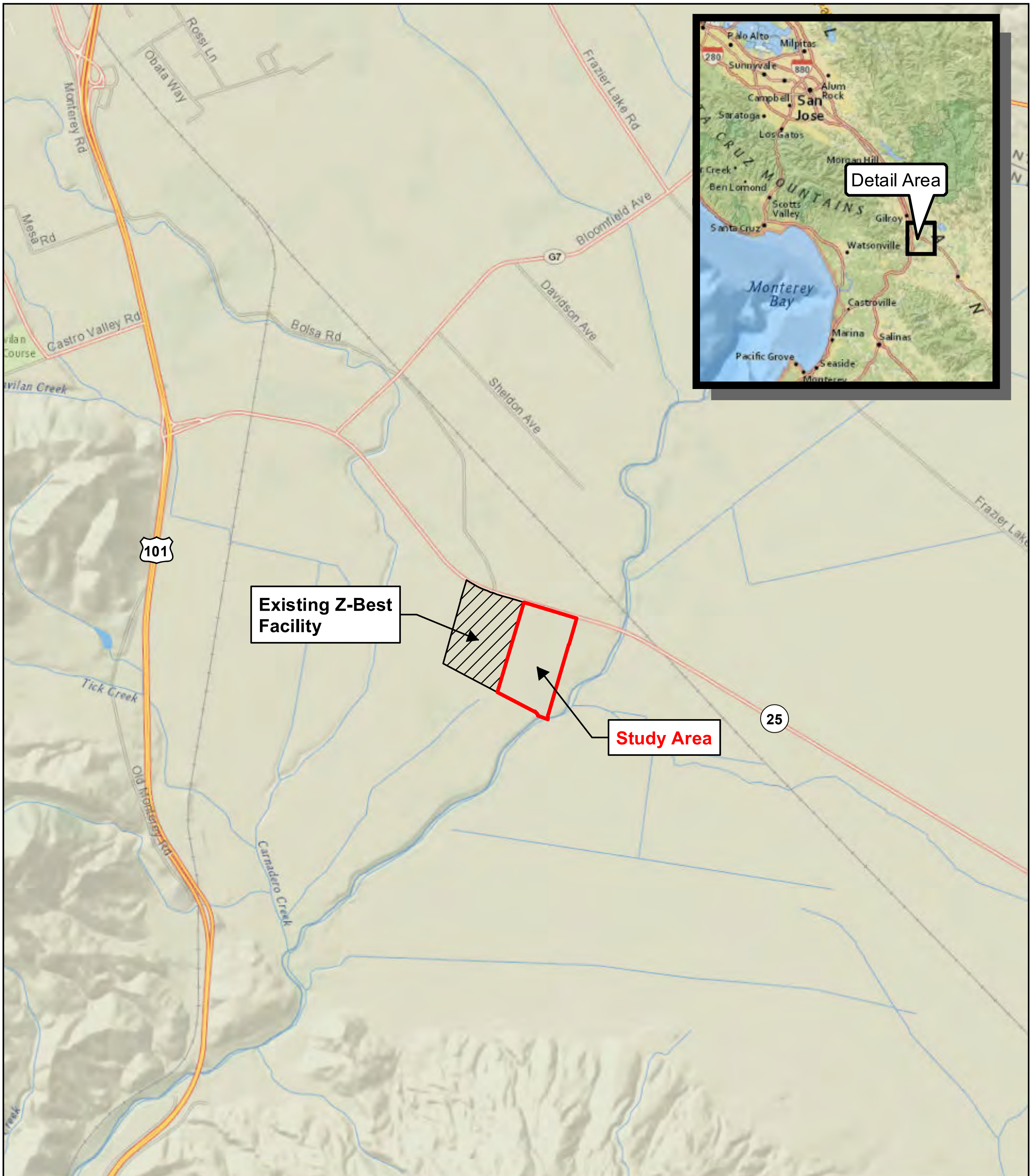

Figure 1. Study Area Location Map

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Miles

Z-Best Composting
Santa Clara County, California

ENVIRONMENTAL CONSULTANTS

Map Date: June 2013
Map By: Derek Chan
Base Source: ESRI/National Geographic

Path: L:\Acad 2000 Files\23000\23132\GIS\ArcMap\Fig1_LocMap_20130627.mxd

E M C

Planning for Success.

April 1, 2020

Dave Rader
Senior Planner
County of Santa Clara
Department of Planning and Development
70 W. Hedding St., 7th Floor, East Wing
San Jose, CA 95110

Re: Biological Report for Site Access Change at the Z-Best Composting Facility: 980 State Route 25, County of Santa Clara

Dear Mr. Rader:

This report summarizes the results of a reconnaissance-level biological survey of areas that would be affected by proposed site access/driveway and State Route 25 improvements at the Z-Best facility. On February 6, 2020, EMC Planning Group senior biologist Gail Bellenger conducted a survey of the impact areas shown on Figure 1, Project Entrance/Driveway and SR 25 Improvements Areas of Impact. This biological report letter is a supplement to a prior reconnaissance-level biological resources survey and analysis conducted to examine potential biological resources impacts from implementing a range of other activities at the Z-Best site by EMC Planning Group in 2019. Additional relevant documents include the following:

- WRA. July 3, 2014. *California Red-legged Frog Habitat Assessment at the Z-Best Composting Facility, Santa Clara County, California* ("2014 WRA report"),
- WRA. February 27, 2017. *Memorandum: Z-Best Composting Facility Modification: Verification of Absence of Sensitive Species and Habitat covered by the SCVHP*,
- California Department of Fish and Wildlife (CDFW) *California Natural Diversity Database* (CDFW 2020),

- California Native Plant Society (CNPS) *Inventory of Rare and Endangered Plants* (CNPS 2020), and
- U.S. Fish and Wildlife Service (USFWS) *Endangered Species Program* (USFWS 2020a) and *National Wetlands Inventory* (USFWS 2020b).

Proposed New Site Access and State Route 25 Improvements

A new site access driveway to the Z-Best facility is proposed approximately 600 feet south of the existing entrance and exit. This site access would constitute a new fourth leg of the existing three-legged State Route 25/Bolsa Road intersection. The new on-site driveway would be approximately 600 feet long. The driveway would traverse the site parallel to State Route 25, then connect with the existing driveway to the site. The existing entrance would be closed once the new access is operational. The new access will cross over the existing storm water drainage ditch that borders the southern side of State Route 25. A 24-inch storm drain pipe carrying stormwater flow through the ditch will be installed underneath the entrance. When the existing entrance is closed, the existing storm drainage pipe that conveys storm water through the ditch under the existing driveway will be removed.

The improvements on State Route 25 consist of right- and left-turn acceleration and deceleration lanes that separate traffic flow into and out of the Z-Best site and into and out of Bolsa Road from through traffic on State Route 25. To accommodate the improvements, SR 25 will need to be widened on both sides along its frontage with the Z-Best facility. Widening both sides of the highway will require that new pavement be placed on both sides and storm drainage improvements constructed. For these improvements to occur, the existing storm drainage channels on both sides of the highway will need to be filled in and replaced with storm drainage piping. Low retaining walls will be placed at the edge of the new pavement to control and direct storm water into drains and the storm drain pipes. On the southern side of the highway, the paving and retaining wall/storm drain pipe improvements will extend approximately 1,800 feet. On the northern side of the highway, the paving and retaining wall/storm drain pipe improvements will extend approximately 1,600 feet. Storm drainage pipes are assumed to be 24-inch reinforced concrete.

Biological Survey

EMC Planning Group biologist Gail Bellenger conducted a reconnaissance-level field survey of the impact areas on February 6, 2020 to determine if conditions for California red-legged frog (*Rana draytonii*) as described in the 2014 WRA report are applicable to the impact areas, to document existing plant communities and wildlife habitats, and to evaluate the potential for other special-status biological resources to occur. Qualitative estimates of plant cover, structure, and spatial changes in species composition were used to determine plant communities and wildlife habitats. Habitat quality and disturbance level were also noted. Figure 2, Representative Site Photographs – South of SR 25 and Figure 3, Representative Site Photographs – North of SR 25, include representative photos of the areas surveyed.

Existing Conditions

The proposed new access driveway parallel to and south of SR 25 is planned within a heavily disturbed area containing a compacted gravel road used by vehicles. To widen SR 25, new paving will be required along both the northern and southern sides of the highway. The road shoulders currently consist of compacted dirt and gravel with scattered non-native grasses.

Storm water drainage ditches approximately 15-feet wide run parallel along both sides of the highway. To accommodate the paving, the ditches will be filled and replaced with 24-inch storm water drainage pipes. At the time of the survey, the drainage ditches were dry but densely vegetated with ruderal (weedy) species such as cheeseweed *(Malva parviflora*), bristly ox-tongue (*Helminthotheca echiodies*), filaree (*Erodium botrys*), and chard (*Beta vulgaris*), most likely an agricultural escapee. Scattered cattail (*Typha* sp.) remnants were periodically interspersed with the ruderal species along the drainage ditch north of SR 25. A row of planted poplar trees used for visual screening of the compost facility is present along the south side of SR 25.

An approximately 0.2-acre wetland area was identified east of the intersection of Bolsa Road and SR 25. The wetland contained evidence of wetland species (cattails), however the identification of additional wetland species potentially present was not possible due to the time of the year. The wetland area location is shown on Figures 1-3.

Bird species noted included American crow (*Corvus brachyrhynchos*), seagull *(Larus occidentalis*), and mourning dove (*Zenaida macroura*). No mammal or amphibian species were observed, but several gopher mounds were noted in the grassy area in the center of the proposed driveway impact area. No other small mammal burrows were found.

Special-Status Species

Special-status species in this report are those listed as endangered, threatened, or rare, or as candidates for listing by the USFWS or CDFW under the state and/or federal endangered species acts. The special-status designation also includes CDFW Species of Special Concern and Fully Protected species, CNPS Rare Plant Rank 1B and 2B species, and other locally rare species that meet the criteria for listing as described in Section 15380 of CEQA Guidelines. Special-status species are generally rare, restricted in distribution, declining throughout their range, or have a critical, vulnerable stage in their life cycle that warrants monitoring.

Special-Status Plants

Special-status plant species potentially occurring in the project vicinity were evaluated for potential to occur within the impact areas. Special-status plant species typically occur in relatively undisturbed native habitat areas. The entire compost facility has been heavily disturbed as a result of facility operations. The impact areas along SR 25 and the driveway expansion have also been frequently disturbed and support only limited ruderal species. Therefore, it is anticipated that no special-status plant species will be impacted by the associated improvements.

California Red-Legged Frog

California red-legged frog is federally listed as threatened and is a California Species of Special Concern. The SR 25 impact areas are not located within federally designated critical habitat for this species. California red-legged frog is California's largest native frog and is generally restricted to riparian and lacustrine (lake) habitats. This species prefers deep, still pools, usually greater than two feet in depth, and creeks, rivers or lakes below 5,000 feet in elevation. Breeding habitats require freshwater emergent vegetation or thick riparian vegetation, especially willow thickets adjacent to shorelines. California red-legged frogs can survive in seasonal bodies of water that dry up for short periods if a permanent water body or dense vegetation is nearby. Dispersal distances are typically less than 0.3 miles (0.5 kilometer) from a pond, with a few individuals moving up to 1.2–1.9 miles (2–3 kilometers) overland, with movement occurring predominantly along creek drainages. Individuals are often found during the summer in foraging habitat not suitable for breeding, and therefore, are presumed to move seasonally between summer foraging and winter breeding habitats (USFWS 2002).

A search of the CNDDB indicates there are known occurrences of California red-legged frog within 1.5 miles of the SR 25 impact areas, with the closest recorded sightings approximately 1.2 miles to the southwest (2017) and southeast (1997). In addition, occurrences of California red-legged frog have been documented downstream in both Carnadero Creek and the Pajaro River (CNDDB 2020).

In general, potential California red-legged frog habitat is divided into three types: breeding habitat, upland habitat and dispersal habitat. The 2014 WRA report addressed the potential for the occurrence of California red-legged frog within the compost facility boundary and general vicinity. According to the 2014 WRA report, potential breeding habitat is absent within the compost facility boundary. The facility is also nearly devoid of potential upland habitat; the only suitable upland habitat for California red-legged frog is in the extreme southeastern corner, within the Pajaro River riparian corridor, which is outside of the compost facility and SR 25 impact areas (WRA 2014).

The compost facility and SR 25 impact areas are situated between the Pajaro River and Carnadero Creek; therefore, the potential for overland dispersal between them cannot be dismissed. According to the 2014 WRA report, any dispersal of California red-legged frog between Carnadero Creek and the Pajaro River would most likely occur via the network of existing irrigation and drainage ditches. However, because these ditches are regularly maintained to reduce vegetation and have loose soils and steep banks, it is likely that dispersing individuals would be unable to climb out and would be forced to continue along the bottom of the ditches until reaching an outlet, desiccate, or are predated (WRA 2104).

The drainage ditches were dry at the time of the 2020 survey and it is unlikely that they or the small wetland would retain water long enough to support California red-legged frog breeding. Agricultural activities and frequent disturbance immediately adjacent to the SR 25 corridor have limited the presence of features utilized as upland habitat, such as burrows, leaf-litter, deep soil cracks, dense vegetation or debris for individuals to shelter within or under. Although some small mammal activity was observed, it is unlikely that the area is utilized as upland habitat. However, because the SR 25 impact areas are located between Carnadero Creek and the Pajaro River, the drainage ditches along both sides of SR 25 are considered potential dispersal habitat corridors.

Burrowing Owl

Western burrowing owl is a California Species of Special Concern. Burrowing owls live and breed in burrows in the ground, especially in abandoned ground squirrel burrows. Optimal habitat conditions include large open, dry, and nearly level grasslands or prairies with short to moderate vegetation height and cover, areas of bare ground, and populations of burrowing mammals. Areas with active colonies of California ground squirrels or human-made structures such as culverts that could be utilized for nesting provide suitable nesting habitat.

The nearest observation of burrowing owl was recorded in 2007, approximately 1.5 miles to the south of the compost facility and the Survey Areas. Infrequent, scattered burrows were found in the flood storage expansion area and within the driveway and small wetland area in Survey Area 2. These burrows were likely created by voles or other small rodents. These small pockets of available prey are not likely to provide adequate habitat for foraging or habitation. There was no sign or observation of burrowing owls during field surveys, and this species is not expected to occur. However, this species is highly mobile and may move into the SR 25 impact areas at any time.

Migratory Nesting Birds

Many bird species are migratory and fall under the jurisdiction of the Migratory Bird Treaty Act, protections for birds of prey, and/or are considered Fully Protected Species. Although no nesting activity was observed during the surveys, several avian species were observed. Non-native grassland and ruderal vegetation will be removed as a result of construction within the impact areas, and approximately 10 ornamental poplar trees would be removed and replaced around the radius of the turn section of the new driveway. Various bird species may nest throughout the impact areas, including in structures, on open ground, or in any type of vegetation, including trees.

Wetlands and Waterways

Wetlands are identified by the presence of hydrophytic vegetation, hydric soils (soils intermittently or permanently saturated by water), and wetland hydrology. Waterways or drainage channels are defined by their ordinary high-water marks on channel banks and their connection to other waterways or aquatic features.

Within the impact areas, long linear drainage ditches approximately 15 feet wide are present parallel to the north and to the south of SR 25. The ditches are periodically cleared and vegetation present at the time of the survey was dominated by ruderal species. The ditches north of SR 25 also supported scattered cattails. No standing water was observed. These ditches appear to connect to Carnadero Creek and the Pajaro River and may be considered jurisdictional by one or more resource agencies.

An approximately 0.02-acre wetland area was identified east of the intersection of Bolsa Road and SR 25. The area was wet but did not contain ponded water. Remnants of wetland vegetation (cattails) were identifiable, though the time of year precluded additional plant identification. If the wetland area supports the necessary criteria, one or more resource agencies may consider this feature jurisdictional.

Mitigation Measures

California Red-Legged Frog

If California red-legged frog is present within the impact areas, construction activities could result in the loss or disturbance of individual animals. This would be a potentially significant adverse environmental impact. Implementation of the following mitigation measures would reduce the potential impact to a less-than-significant level.

BIO-1 Before construction activities begin within the impact areas, a qualified biologist shall conduct a training session for all construction personnel. At a minimum, the training shall include a description of special-status species potentially occurring in the project vicinity, including, but not limited to California red-legged frog and nesting birds and raptors. Their habitats, general measures that are being implemented to conserve species as they relate to the project, and the boundaries within which construction activities will occur will be explained. Informational handouts with photographs clearly illustrating the species' appearances shall be used in the training session. All new construction personnel shall undergo this mandatory environmental awareness training.

The qualified biologist will train biological monitors selected from the construction crew by the construction contractor (typically the project foreman). Before the start of work each day, the monitor will check for animals under any equipment such as vehicles and stored pipes within active construction zones. The monitor will also check all excavated steep-walled holes or trenches greater than one foot deep for trapped animals. If a California red-legged frog is observed within an active construction zone, the qualified biologist will be notified immediately and all work within 100 feet of the individual will be halted and all equipment turned off until the individual has left the construction area.

BIO-2 A qualified consulting biologist will conduct preconstruction surveys following the guidance documented in the *Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog* (USFWS 2005) no more than two weeks (14 days) prior to the start of construction activities. The impact areas, specifically the drainage ditches and small wetland area, will be surveyed for potential migratory and/or upland activity.

If California red-legged frog is found, the applicant will coordinate with the USFWS and/or CDFW to determine the appropriate course of action per the requirements of FESA and/or CESA (e.g., obtaining Incidental Take Permits) and implement the permit requirements prior to ground disturbance.

BIO-3 The project proponent shall obtain an Incidental Take Permit from the U.S. Fish and Wildlife Service (USFWS) for potential project impacts to California red-legged frog, and implement all avoidance, minimization, and compensatory mitigation measures required by these permits. Avoidance and minimization measures may include, but not be limited to, the following from the *USFWS Programmatic Biological Opinion for Issuance of Permits under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act, including Authorizations Under 22 Nationwide Permits, for Projects that May Affect the Threatened California Red-legged Frog in Nine San Francisco Bay Area Counties, California* (USFWS 2014):

- A qualified biologist will be on site during all activities within 200 feet from the outer edge of potential habitat that may result in take of the

California red-legged frog, including the drainage ditches and small wetland area.

- To the extent possible, all ground-disturbing work within 200 feet from the outer edge of potential habitat (specifically the drainage ditches and small wetland area) will be avoided between November 1 and March 31, the time period when California red-legged frogs are most likely to be moving through upland areas. No construction activities will occur within 200 feet from the outer edge of potential habitat (specifically the drainage ditches and small wetland area) during rain events or within 24-hours following a rain event.

- To minimize harassment, injury, death, and harm in the form of temporary habitat disturbances, all project-related vehicle traffic will be restricted to established roads, construction areas, equipment staging, storage, parking, and stockpile areas.

- If a California red-legged frog is encountered, all activities which have the potential to result in the harassment, injury, or death of the individual will be immediately halted. A qualified biologist will then assess the situation and select a course of action that will avoid or minimize adverse effects to the animal.

- Uneaten human food and trash attracts crows, ravens, coyotes, and other predators of the California red-legged frog. A litter control program will be instituted at each construction site. All workers will ensure their food scraps, paper wrappers, food containers, cans, bottles, and other trash are deposited in covered or closed trash containers. The trash containers will be removed from the construction site at the end of each working day.

- Where needed, loss of soil from run-off or erosion will be prevented with straw bales, straw wattles, or similar means provided they do not entangle, block escape or dispersal routes of the California red-legged frog.

- No insecticides or herbicides will be used within the impact areas during construction or long-term operational maintenance where there is the potential for these chemical agents to enter the drainage ditches or small wetland area that contain potential habitat for the California red-legged frog.

- No pets will be permitted at the construction site, to avoid and minimize the potential for harassment, injury, and death of the California red-legged frog.

- For on-site storage of pipes, conduits, and other materials that could provide shelter for special-status species, an open-top trailer will be used to elevate the materials above ground. This is intended to reduce the potential for animals to climb into the conduits and other materials.

- To the maximum extent possible, night-time construction will be minimized or avoided because dusk and dawn are often the times when the California red-legged frog is most actively moving and foraging.

- Plastic monofilament netting (erosion control matting), loosely woven netting, or similar material in any form will not be used at the construction site because California red-legged frogs can become entangled and trapped in them. Materials utilizing fixed weaves (strands cannot move), polypropylene, polymer, or other synthetic materials will not be used.

- Trenches or pits one foot or deeper that are going to be left unfilled for more than 48 hours will be securely covered with boards or other material to prevent the California red-legged frog from falling into them.

Burrowing Owl

If burrowing owl is present on or adjacent to the compost facility or Survey Areas, construction activities could result in the loss or disturbance of individual animals. This would be a significant adverse environmental impact. Implementation of the following mitigation measure would reduce the potential impact to a less-than-significant level.

BIO-4 To avoid/minimize impacts to burrowing owls potentially occurring on or adjacent to the impact areas, the project proponent shall retain a qualified consulting biologist to conduct a two-visit (i.e. morning and evening) presence/absence survey at areas of suitable habitat on and adjacent to the impact areas no less than 14 days prior to the start of construction or ground disturbance activities. Surveys shall be conducted according to methods described in the *Burrowing Owl Survey Protocol and Mitigation Guidelines* (CBOC 1993) and the *Staff Report on Burrowing Owl Mitigation* (CDFW 2012).

Because burrowing owls occupy habitat year-round, seasonal no-disturbance buffers, as outlined in the *Burrowing Owl Survey Protocol and Mitigation Guidelines* (CBOC 1993) and the *Staff Report on Burrowing Owl Mitigation* (CDFW 2012), shall be in place around occupied habitat prior to and during any ground disturbance activities. The following table includes buffer areas based on the time of year and level of disturbance (CDFG 2012), unless a qualified biologist approved by CDFW verifies through non-invasive measures that either: 1) birds have not begun egg laying and incubation; or 2) that juveniles from the occupied burrows are foraging independently and are capable of independent survival.

Location	Time of Year	Level of Disturbance		
		Low	Med	High
Nesting Sites	April 1 – Aug 15	200 m	500 m	500 m
Nesting Sites	Aug 16 – Oct 15	200 m	200 m	500 m
Nesting Sites	Oct 16 – Mar 31	50 m	100 m	500 m

If burrowing owl are found to occupy the compost facility or SR 25 impact areas and avoidance is not possible, burrow exclusion may be conducted by qualified biologists only during the non-breeding season, before breeding behavior is exhibited and after the burrow is confirmed empty through non-invasive methods, such as surveillance. Occupied burrows will be replaced with artificial burrows at a ratio of one collapsed burrow to one constructed artificial burrow (1:1). Evicted burrowing owls may attempt to colonize or re-colonize an area that will be impacted, thus ongoing surveillance of the compost facility or SR 25 impact areas during project activities will be conducted at a rate sufficient to detect burrowing owls if they return.

If surveys locate occupied burrows in or near construction areas, consultation with the CDFW shall occur to interpret survey results and develop a project-specific avoidance and minimization approach.

Roosting Bats

Potential habitat for western mastiff bat and pallid bat occurs in mature trees present within the impact areas. If special-status bats are present or in the vicinity, tree removal and other construction activities could result in the loss of individual animals. This would be a significant adverse environmental impact. Implementation of the following mitigation measure would reduce the potential impact to a less-than-significant level.

Mitigation Measure

BIO-5 Approximately 14 days prior to tree removal activities, a qualified biologist shall conduct a habitat assessment for bats and potential roosting sites in trees to be removed and in trees within 50 feet of the construction footprint. These surveys shall include a visual inspection of potential roosting features (bats need not be present) and a search for presence of guano within the project site, construction access routes, and 50 feet around these areas. Cavities, crevices, exfoliating bark, and bark fissures that could provide suitable potential nest or roost habitat for bats shall be surveyed. Assumptions can be made on what species is present due to observed visual characteristics along with habitat use, or the bats can be identified to the species level with the use of a bat echolocation detector such as an "Anabat" unit. Potential roosting features found during the survey shall be flagged or marked.

- If no roosting sites or bats are found, a letter report confirming absence shall be prepared and no further mitigation is required.

- If bats or roosting sites are found, bats shall not be disturbed without specific notice to and consultation with CDFW.

- If bats are found roosting outside of the nursery season (May 1 through October 1), the CDFW shall be consulted prior to any eviction or other action. If avoidance or postponement is not feasible, a Bat Eviction Plan shall be submitted to CDFW for written approval prior to project implementation. A request to evict bats from a roost includes details for excluding bats from the roost site and monitoring to ensure that all bats have exited the roost prior to the start of activity and are unable to re-enter the roost until activity is completed. Any bat eviction shall be timed to avoid lactation and young-rearing. If bats are found roosting during the nursery season, they shall be monitored to determine if the roost site is a maternal roost. This could occur by either visual inspection of the roost bat pups, if possible, or by monitoring the roost after the adults leave for the night to listen for bat pups. Because bat pups cannot leave the roost until they are mature enough, eviction of a maternal roost cannot occur during the nursery season. Therefore, if a maternal roost is present, a 50-foot buffer zone (or different size if determined in consultation with the CDFW) shall be established around the roosting site within which no construction activities including tree removal or structure disturbance shall occur until after the nursery season.

Protected Nesting Birds

Protected nesting birds, including raptor species, have the potential to nest in structures, on open ground, or in any type of vegetation, including trees, during the nesting bird season (January 15 through September 15). If nesting birds protected by state and federal regulations are present within or adjacent to the impact areas during soil-disturbing or construction activities, the proposed project may directly result in loss of active nests, or indirectly result in nest abandonment and thereby cause loss of fertile eggs or nestlings. This would be a significant adverse environmental impact. Implementation of the following mitigation measure would reduce the potential impact to a less-than significant level.

BIO-6 Construction activities can cause direct or indirect impacts to nesting birds. Any tree removal, pruning, grading, grubbing, or demolition within the impact areas shall be conducted outside of the bird nesting season (January 15 through September 15) to the greatest extent feasible. If this type of construction, or noise resulting from construction activities, occurs during the bird nesting season, then a qualified biologist shall conduct pre-construction surveys for nesting birds to ensure that no nests would be disturbed during project activities. Sustained noise can cause indirect impacts by creating stress in birds.

If project-related work is scheduled during the nesting season (February 15 to August 30 for small bird species such as passerines; January 15 to September 15 for owls; and February 15 to September 15 for other raptors), or if construction activities are suspended for at least 15 days and recommence during the nesting season, a qualified biologist shall conduct nesting bird surveys. Two surveys for active nests of such birds shall occur within 15 days prior to the start of construction, with the second survey conducted within 48 hours prior to the start of construction. Appropriate minimum survey radii surrounding each work area are typically 250 feet for passerines, 500 feet for smaller raptors, and 1,000 feet for larger raptors. Surveys shall be conducted at the appropriate times of day to observe nesting activities when birds are most active. Off-site locations where access is not available may be surveyed from within the site or from public areas. A report documenting survey results and plan for active bird nest avoidance (if needed) shall be completed by the qualified biologist prior to initiation of construction activities.

If the qualified biologist documents active nests within the impact areas or in nearby surrounding areas, an appropriate buffer between each nest and active construction shall be established. The buffer shall be clearly marked and maintained until the young have fledged and are foraging independently. Prior to construction, the qualified biologist shall conduct baseline monitoring of each nest to characterize normal bird behavior and establish a buffer distance, which allows the birds to exhibit normal behavior.

The qualified biologist shall monitor the nesting birds daily during construction activities and increase the buffer if birds show signs of unusual or distressed behavior (e.g. defensive flights and vocalizations, standing up from a brooding position, and/or flying away from the nest). If buffer establishment is not possible, the qualified biologist or construction foreman shall have the authority to cease all construction work in the area until the young have fledged and the nest is no longer active.

Jurisdictional Wetlands and Waters

Construction within the impact areas would require installation of new culverts and will result in fill of potentially jurisdictional drainage ditches and a small wetland. If considered jurisdictional by the USACE and/or RWQCB, permits may be required for construction of the new access driveway and widening of SR 25. Impacts to jurisdictional wetlands and waterways are considered significant adverse impacts. Implementation of the following mitigation measure would reduce the impact to a less-than-significant level.

BIO-7 Prior to initiation of ground disturbance or construction activities within the new access driveway and SR 25 impact areas, the project proponent shall retain a qualified biologist to determine the extent of drainage ditches and potential wetlands regulated by the USACE and RWQCB. If the USACE claims jurisdiction, the project proponent shall retain a qualified biologist to obtain a Clean Water Act Section 404 Nationwide Permit. If the impacts to the drainage ditches and potential wetlands do not qualify for a Nationwide Permit, the project proponent shall proceed with the qualified biologist in obtaining an Individual Permit from the USACE. The project proponent shall then retain a qualified biologist to coordinate with the RWQCB to obtain a Clean Water Act Section 401 Water Quality Certification.

To compensate for temporary and/or permanent impacts to wetlands and other waters of the U.S. that will be impacted as a result of the proposed project, mitigation will be provided as required by the regulatory permits. Mitigation would be provided through one of the following mechanisms:

a. A Wetland Mitigation and Monitoring Plan will be developed that will outline mitigation and monitoring obligations for temporary impacts to wetlands and other waters as a result of construction activities. The Wetland Mitigation and Monitoring Plan would include thresholds of success, monitoring and reporting requirements, and site-specific plans to compensate for wetland losses resulting from the project. The Wetland Mitigation and Monitoring Plan will be submitted to the appropriate regulatory agencies for review and approval during the permit application process.

b. To compensate for permanent impacts, the purchase and/or dedication of land to provide suitable wetland restoration or creation will ensure a no net loss of wetland values or functions. If restoration is available and feasible, a minimum 1:1 impact to mitigation ratio would apply to projects for which mitigation is provided in advance.

The project proponent shall comply with terms and conditions of the permits, including measures to protect and maintain water quality, restore work sites, and mitigation to offset temporary and/or permanent wetland impacts. The project proponent shall be responsible for implementation of this mitigation measure prior to issuance of a grading permit, with oversight by the County of Santa Clara.

Please contact me with any questions or comments. I can be reached at 831-649-1799 ext. 221 or by email at bellenger@emcplanning.com.

Sincerely,

Gail Bellenger

Gail Bellenger, M.A.
Senior Biologist

References

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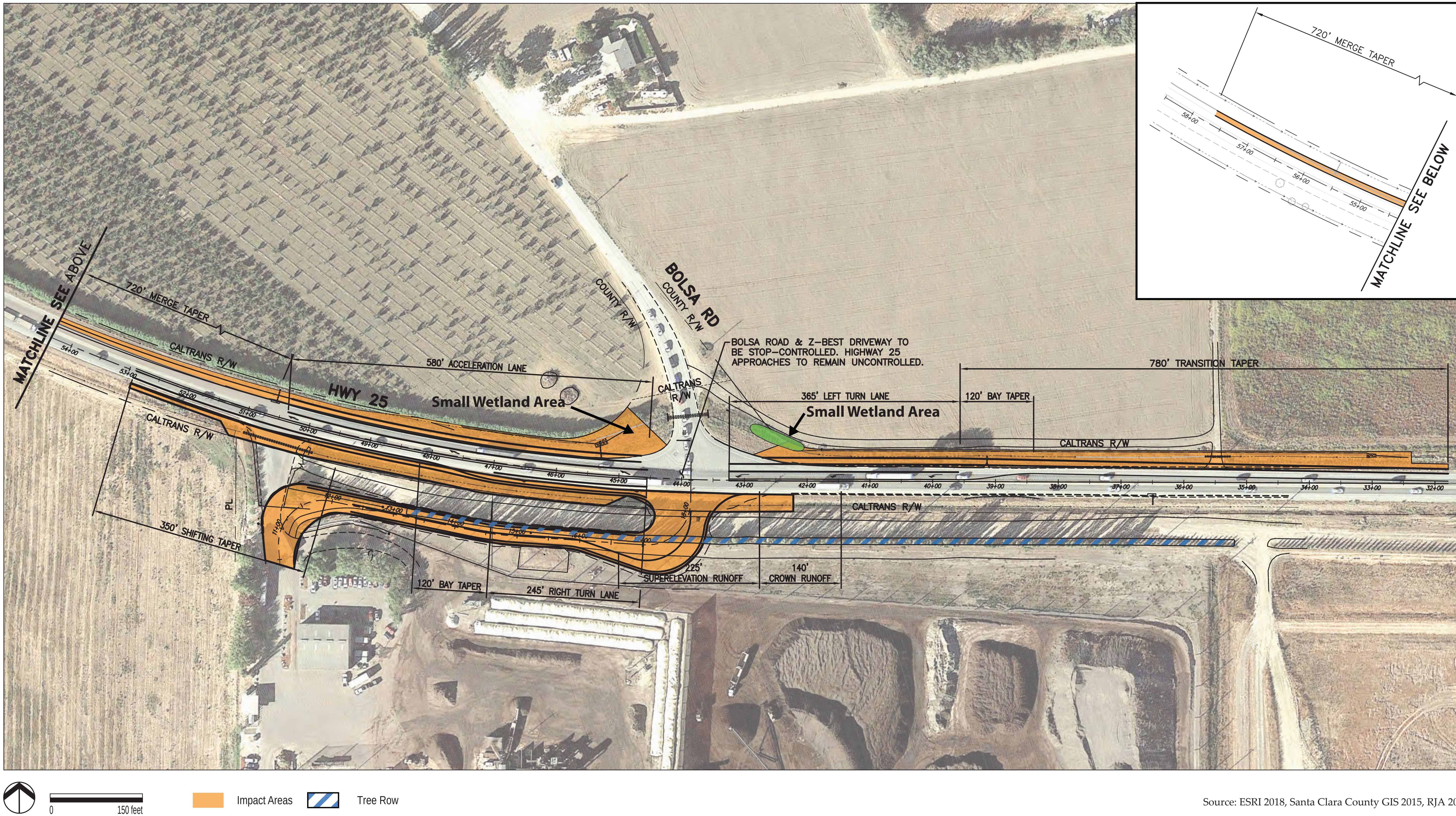
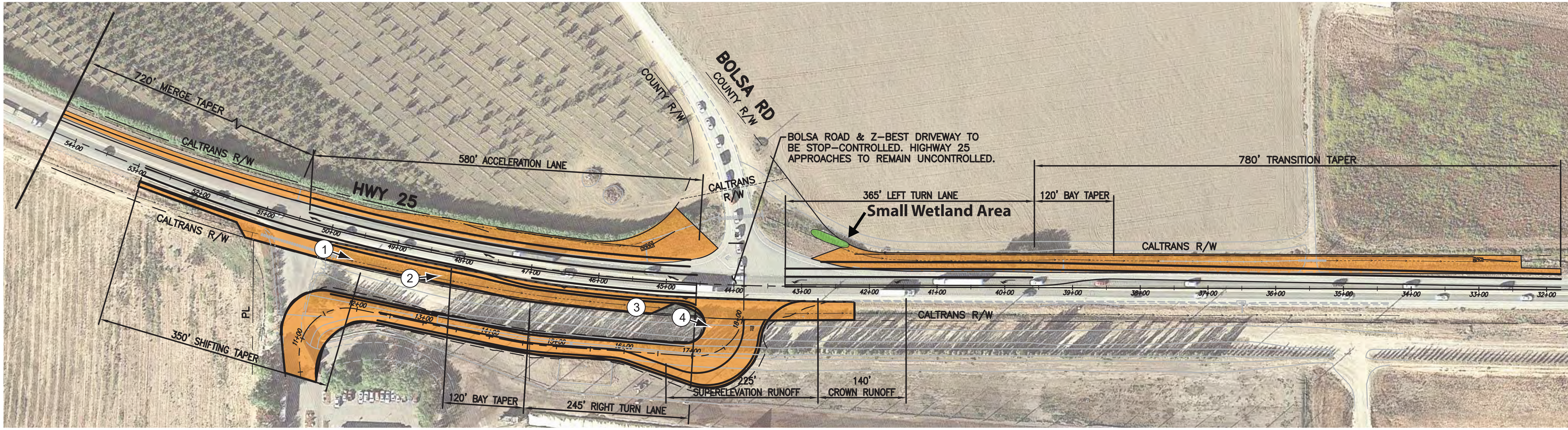


Source: ESRI 2018, Santa Clara County GIS 2015, RJA 2020

E M C

Figure 1
Proposed Improvements and Survey Area



① View east along SR 25 of planted landscape trees and access road

② Drainage ditch parallel to SR 25

③ Compacted gravel and non-native grasses along road shoulder

④ Unpaved access road south of SR 25 and landscape trees

Source: ESRI 2019, Santa Clara County GIS 2015, RJA 2020
Photographs: EMC Planning Group 2020

Figure 2
Representative Survey Area Photographs – South Side of SR 25

Z-Best Composting Facility Modifications EIR – Supplemental Biological Resources Report

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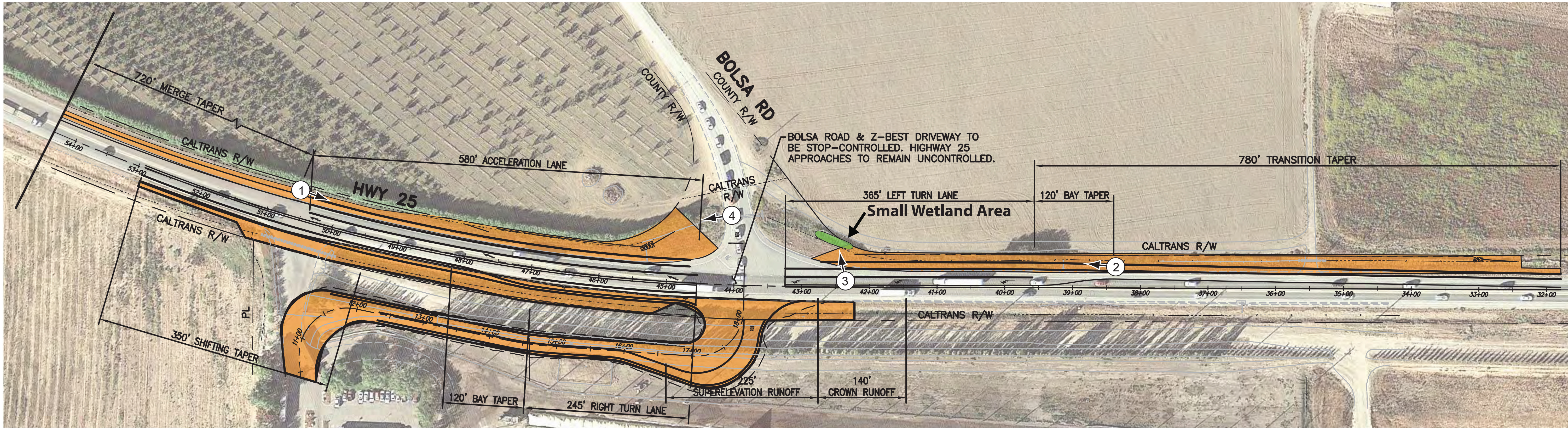

Impact Areas

(1) Drainage ditch on north side of SR-25, looking east

(2) Drainage ditch and wetland on north side of SR-25, looking west

(3) Small wetland area associated with drainage ditch (Google Earth 2019)

(4) Looking west along drainage ditch from culvert under Bolsa Road

Source: ESRI 2019, Santa Clara County GIS 2015, RJA 2020
Photographs: EMC Planning Group 2020

Figure 3
Representative Survey Area Photographs – North Side of SR 25

APPENDIX D

Power Use Comparison: ECS versus CTI Composting

engineered COMPOST systems

Estimated Power Use Comparison: ECS Primary CASP & Secondary ASP versus CTI Bags

Model Date	7/11/2019
By	Eric Hake, Tim O'Neijll
Project Name	Z-Best, Zanker Recycling
Client Contact	John Doyle

	Retention Time	Throughput (7 day basis)	Total Air Delivered During Retention Time	Air Delivery Ratio	Est. Annual Power Consumption	Power Consumption Ratio	Power Consumption per Daily Tonnage
System	days	tons/day	cubic ft air / ton feedstock	ECS : CTI	kWh/Year	ECS : CTI	kWh/tons/day
CTI Bag System	98	625	24,000	96 : 1	461,000	4 : 1	700
Phase I: ECS Active & Curing	34		2,300,000		1,800,000		3,000
Phase II: ECS Active & Curing	34	1,450	3,300,000		4,300,000		3,000

APPENDIX E

PEER REVIEW OF SELECT HYDROLOGY AND WATER QUALITY TECHNICAL ANALYSES

FLOODPLAIN IMPACT ANALYSIS FOR Z-BEST COMPOST FACILITY EXPANSION

NO NET FILL/NO RISE CERTIFICATION

To: Ron Sissem, EMC Planning

From: Sujoy Roy, Ph.D. and Michael Ungs

Date: 3/13/2020

Subject: Peer Review of Select Hydrology and Water Quality Technical Analyses from the Z-Best Project Applicant

The Z-Best Compositing Facility in Gilroy, CA is in the process of obtaining permits to expand their operations by converting the existing Municipal Solid Waste (MSW) composting system to an Engineered Compost System (ECS) using an aerated floor technology. They are in ongoing negotiations with the Santa Clara County Planning and County Land Development Engineering to address outstanding issues, which include those involving surface and groundwater hydrology and water quality. Tetra Tech has been tasked to assist in reviewing these issues by performing six tasks, listed below, that will be described and addressed in this memorandum.

1. Evaluate the proposed modified holding capacity of Detention Basin #1 based on the proposed as-built dimensions and elevations of the basin and ascertain whether it will be of sufficient volume to accommodate runoff from the project site under design storm conditions pursuant to the 2015 SWQCB Compost Order;

2. Review the proposed ECS CASP composting system specifications/design and proposed increase in feedstock input volume to ascertain whether the project has potential to increase leachate volume or leachate concentration in improved Detention Pond #1 relative to existing operations. Discuss potential environment effects of such increases, if any;

3. Review the project plans/ECS system design to determine adequacy of storm water runoff and leachate collection improvements planned for delivering both from the ECS system pad location to Detention Basin #1 in terms of volume and potential effects on surface and groundwater quality;

4. Qualitatively discuss the change in potential for groundwater contamination under existing Detention Basin #1 conditions (unlined) and under post Detention Pond #1 improvement conditions where the pond will be lined as required by the 2015 Compost Order;

5. Evaluate the future effect of sediment accumulation on the holding capacity of modified Detention Basin #1 and discuss maintenance activities that may be required to maintain holding capacity. Discuss disposal needs/requirements for excavated sediment as needed;

6. Review the applicant's specifications for the proposed new flood water storage facility located at the northern boundary of Area 2. Evaluate the applicant's revised No Net Fill/No Rise Certification to verify the adequacy of the flood storage facility design. Identify any other design issues for the storage facility which should be investigated to assess potential environmental impacts, if any; and

7. Prepare letter report with conclusions of document review and additional analysis. (This letter.)

Tetra Tech Lafayette
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Tel 925-280-7411 tetratech.com

The following table of acronyms and abbreviations are provided to clarify specific terms and to make the report easier to read by decreasing the repetition of lengthy expressions.

Acronyms and Abbreviations

BAAQMD	Bay Area Air Quality Management District
BGS	Below Ground Surface
Basin 1	Proposed Detention Basin #1 to be constructed with a liner
BFE	Base Flood Elevation based on NAVD88
BOD	Biological Oxygen Demand
CASP	Covered Aerated Static Pile
CCR	California Code of Regulations
CTI	Composite Technology International
eASP	Extended bed Aerated Static Pile
ECS	Engineered Compost Systems
EGWCA	Existing Green Waste Composting Area
Green Material	Defined in 14 CCR §17852(v) as any plant material that is separated at the point of generation, contains no greater than 1 percent of physical contaminants by weight, and meets the requirements of section 17868.5.
MSW	Mixed Solid Waste
NAVD88	North American Vertical Datum of 1988
NOP	Notice Of Preparation
SCCGOV	Santa Clara County *Department* of *Planning* and Development
TDS	Total Dissolved Solids
TPD	Tons Per Day
Z-Best	Z-Best Composting Facility

A description of each task is listed in italicized text, followed by a summary of the conclusions, and a detailed discussion and response to the Task.

Task 1. *Evaluate the proposed modified holding capacity of Detention Basin #1 based on the proposed as-built dimensions and elevations of the basin and ascertain whether it will be of sufficient volume to accommodate runoff from the project site under design storm conditions pursuant to the 2015 SWQCB Compost Order;*

Conclusion-Tetra Tech's volume estimate for new Basin 1 is virtually identical to that given in Golder (2019, Drawing 12), of 12,264,500 gallons. The 100-year and 25-year storm event volume calculations are consistent with estimates reported by Golder, and if the detention basin is empty, storm runoff from both storms can be contained, as required by the 2015 State Board Compost Order.

Detention Basin 1 receives stormwater from Area 1, identified to be 70.2 acres (2016 Golder Technical Report, Appendix B). The 2015 State Board Compost Order requires a "detention pond, containment berm, and drainage conveyance systems to contain a 25-year, 24-hour peak storm event." For the specific location of the facility (36.9520º Latitude; -121.5268º Longitude), NOAA Atlas 14 estimates a 24-hour 25-year rainfall of 4.78 inches, and a 100-year rainfall of 6.3 inches (https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html). The runoff coefficient estimated by Golder (of 0.72) is reasonable for the mix of surfaces in the facility. Based on the rainfall magnitudes and receiving water area of Area 1 and direct precipitation to an area equal to the original Detention Pond 1 (6.5 acres), the stormwater volumes are estimated as follows:

- 100-year event: 9.76 million gallons
- 25-year event: 7.34 million gallons

This is consistent with the 100-year estimate provided in Golder 2018 memorandum titled "Detention Basin 1 Water Balance Calculations-100 year, 24-hour Storm Event."

The proposed Basin 1 is stated in Golder (2019, Drawing 12) to have a holding capacity of 12,264,500 gallons for leachate and stormwater. The bottom elevation is given as 134.5 feet and the upper water level elevation is given as 148.5 feet, which corresponds to the BFE of 148.4 feet. The Basin is also shown to be constructed with an additional 2 feet of freeboard above the BFE value.

Tetra Tech independently estimated the holding capacity of the new Basin 1 by digitizing the one-foot contour lines from the basin diagram shown in Golder (2019, Drawing 12) and re-scaled using the scale bar located in the lower right corner of the drawing. These digitized areas were multiplied by the differences in elevation between each contoured layer and then summed to give the total volume. This estimate was within 2 percent of the 12,264,500-gallon volume listed in the comment field of the drawing. Tetra Tech concludes that the new Basin 1 drawing from in Golder (2019, Drawing 12) has the capacity to hold 12,264,000 gallons.

Based on the above calculations, Tetra Tech independently estimates that the proposed Detention Basin 1, <u>if empty</u>, can store runoff from a 100-year or a 25-year storm event. This is the design basis required in the 2015 State Board Compost Order (https://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2015/wqo2015_0121_dwq.pdf).

However, it is important to confirm that the basin is empty following the proposed lining for this project. Observations from 16 years of archived Google Earth images of the old Basin 1 indicate that the basin surface remained 100 percent covered with liquid during the months of Nov 2002, July 2003, July 2004, Nov 2004, Aug 2005, Dec 2005, Aug 2006, June 2007, Oct 2007, Sept 2010, Nov 2010, Sept 2011, Nov 2016, and Sept 2017. These photographic observations are contrary to the Golder (2016) water balance prediction that the old Basin 1 would be empty in May and remain dry until January of the following year due to the high potential evaporation rate. In part, this discrepancy is attributed not to rainfall but to groundwater seepage, which occurred because of the unlined nature of the historical pond and the relatively high groundwater table. In future, with the lining of Detention Basin 1, it is expected that this seepage will be minimized and that the pond will be dry during several months of the year when minimal rainfall and high potential evaporation rates occur.

Task 2. *Review the proposed ECS CASP composting system specifications/design and proposed increase in feedstock input volume to ascertain whether the project has potential to increase leachate volume or leachate concentration in improved Detention Pond #1 relative to existing operations. Discuss potential environment effects of such increases, if any;*

Conclusion-Tetra Tech concurs there will be substantially less leachate volume entering the new Basin 1 per ton of processed compost. The increased tonnage capacity of the facility will be countered by the lower per ton leachate volume, such that the total leachate generation may not be higher than produced in the present facility. The final effect on leachate concentration in Basin 1 is not very clear but the concentrations will most likely increase over time as the leachate evaporates and is recycled for dust control and compost moisturization. Regardless of change in water quality, the lining of Detention Pond 1 will prevent the release of these liquids into groundwater.

It appears there will be substantially less leachate volume going into the new Basin 1 per ton of compost processed. This is based on the proposed changes listed above for the CASP portion of Area 1. Golder (2016) states that Z-Best is currently permitted to accept a maximum of 1,500 tons/day (TPD) with a total permitted capacity of 576,000 cubic yards. The proposed project seeks to increase the maximum daily throughput from 1,500 to 2,750 TPD. In terms of leachate collection, the ECS system produces a composting process that is more aerated than the current CTI system being used. Golder (2019, Drawing 9) illustrates the design for a negative aeration system along the undersurface of every CASP bunker and below grade floor details of the eASP section in Area 1. Furthermore, Golder (2019, Drawing 7) illustrates the construction of a French drain, storm drain pipelines, collection sumps, drainage pump stations, and concrete curbs throughout the CASP region of Area 1. This will result in the generation of leachate with a lower volume of runoff liquid (from 25 to 75% less). The specific volume of leachate will depend on the total composted materials and the actual gain in efficiency of leachate generation, but assuming an approximate halving of the leachate generation and an approximate doubling of throughput and capacity, it is possible that there is not much net change in the leachate volume produced.

The water quality of the leachate is another aspect to be considered once the new project is implemented. The only known set of leachate samples taken from the old Basin 1 were collected on July 2, 2014, analyzed, and reported by BC LAB (2014). The leachate samples clearly indicate elevated concentrations in water analysis for general chemistry constituents (e.g., BOD, Ca, Cl, K, Na, P, & TDS). It should be obvious that the mass of chemicals leached out from the compost will increase approximately in proportion to the mass of compost being processed by the facility. Leachate is generated during the complex process of adding moisture to the compost, collecting excess moisture generated during the digestion process, capture and adding the stormwater runoff from approximately 45 acres of surface soils, dust, and compost particulate in Area 1, and from the concentration of non-volatile chemicals by atmospheric evaporation from pooled leachate in the new basin. This is further complicated by the addition of rainfall directly into the approximate 3.5-acre surface area of the basin and the mixing of fresh groundwater and recycled leachate pumped from the basin before its use in Area 1 of the facility. There is no simple way to predict the change in leachate concentration over time in the old Basin 1 because the leachate flowing into the basin could become diluted with the addition of direct rainfall over its six acre surface area; recycled when pumped out for plant reuse in dust control and compost moisturization; and become more concentrated when its water content evaporates to the atmosphere. The impact on leachate concentration in Basin 1 is not very clear but it is reasonable to expect that it will increase over time as leachate evaporates and is recycled for dust control and compost moisturization. However, even if the concentrations are higher, the construction of the lined Detention Pond 1 will prevent the release of these liquids into groundwater.

Task 3. *Review the project plans/ECS system design to determine adequacy of storm water runoff and leachate collection improvements planned for delivering both from the ECS system pad location to Detention Basin #1 in terms of volume and potential effects on surface and groundwater quality;*

Conclusion-Stormwater and excess leachate from the project area is intercepted and conveyed to Detention Basin 1. The capacity of this basin is adequate to handle storm flows and minimize the potential of water quality impacts to the Pajaro River. Tetra Tech discovered an oversight issue in the most recent Golder (2019) drawings such that no conveyance or pump system is shown within the EGWCA portion of Area 1 to capture stormwater runoff or leachate and transfer it to the new Basin 1.

Currently, all stormwater runoff from Area 1 is intercepted and routed along ditches its southern boundary and discharged through a culvert into the northwest corner of the old Basin 1. During the wet season, the volumetric capacity of Detention Pond 1 is sufficient to handle large storm flows (25-year and 100-year storms) as well as excess leachate created during the composting process. During the dry season, water may need to be applied to the compost, from Detention Pond 1 or from groundwater. In terms of water quality, additional adverse effects to surface water and groundwater in future are not expected because of the construction of an adequately sized and lined detention basin. (See caveat below for EGWCA area, where no changes are planned, but there is a need for a pump to transfer water to the new Detention Pond 1.) Note that this comment specifically addresses impacts as consequences of future changes to the facility, and not to legacy impacts to groundwater, which are not addressed through this project.

For the future of Basin 1, Golder (2019, Drawings 4 and 7) shows no French drains, storm drains, drainage pipes, or pump stations extending into or within the EGWCA. As a result, all stormwater and leachate runoff from EGWCA will simply flow downgradient along the 20-foot access roads and overland to the southeast corner of the EGWCA. The ground surface in the southeastern corner of the EGWCA is at least five feet below the top of the berm for both the new Basin 1 and the existing Detention Basin 2. Hence, overland stormflow and leachate will bypass both basins and discharge directly into the southern border of the property boundary. Z-Best responded in SCCGOV (2019) to the apparent oversight to intercept stormwater runoff from the Green Waste portion of Area 1. They state that a pump system would be installed to deliver stormwater up and over the proposed berm of the new Basin 1. However, this pump system or any other conveyance system to intercept stormwater in EGWCA are not yet shown in the most recent Golder (2019) drawings.

Task 4. *Qualitatively discuss the change in potential for groundwater contamination under existing Detention Basin #1 conditions (unlined) and under post Detention Pond #1 improvement conditions where the pond will be lined as required by the 2015 Compost Order.;*

Conclusion- The lining of Detention Pond 1 will stop the percolation of leachate into groundwater, and thus minimize future new groundwater quality impacts from the facility. Tetra Tech concludes that simply removing 1/3 the length of the old Basin 1 sediment will have little impact on the legacy concentration of leachate chemicals in the local groundwater and their movement. This project does not address legacy contamination present in groundwater at the site.

Golder (2015, 2016) states "The site is situated on Holocene-age alluvial deposits from modern stream flow and floodplain processes. The site is mapped as underlain by Medium-grained Alluvium [labeled as a type Qham soil] which is described as unconsolidated, moderately sorted, moderately permeable fine sand, silt, and clayey silt with occasional thin beds of sand." However, five test pits in Area 2 reveal soils in the top six feet to be more fine-grained and clay-rich than "Qham" soils.

When the old Basin 1 was first constructed, it had a surface area of approximately 6.3 acres and a capacity to hold approximately 1.34 million gallons (Golder, 2017). The basin has been used to store stormwater runoff, intercepted surface eroded materials, and recycled compost leachate for more than 19 years. As shown in Golder (2017, Drawing 3), Basin 1 was constructed without a liner. The most western end of the basin was dug to an approximate elevation of 134 feet compared to the local ground surface of 145 feet. There is no apparent reference for the sloping sides of Basin 1 having been treated by any special method that would have limited the horizontal flow through those portions of the basin sides that are below the local ground surface. Hence, there always has been the potential for horizontal seepage both out of and back into the basin. According to Golder (2016), the local groundwater table was encountered at depths between 6 and 8 feet BGS in May 2013 and between 5 and 8 feet BGS in May 2016. In comparison, the bottom of Basin 1 lies between 8 and 10 feet BGS. This suggests there has been the potential for leachate to escape horizontally into the water table and that the basin bottom lies below the water table during portions of the year. In confirmation of this hypothesis, it should be noted from the discussion related to Task 2 above that archived Google Earth images clearing indicate the bottom of Basin 1 to be 100% covered with liquid during the May-to-January period for many years despite being subjected to high potential evaporation rates.

In the future, approximately a 1/3 length of the current Basin 1 will be dug up and replaced with a new lined basin that is both deeper and higher. Sediment in the remaining 2/3 length of the current basin will be left in place, the basin filled with dirt to the local ground surface, and the top surface planted with grass. *Going forward,* this will effectively block the percolation of liquid from the pond into the surrounding groundwater.

Legacy contamination in bottom section of the pond to be filled in, and in the groundwater will remain, and not be affected by this project. Because of the long-term exposure to leachate runoff, one should expect the soil sediment along the bottom of the basin to have soil concentrations for non-volatile chemicals that are in equilibrium with the maximum leachate concentrations. These contaminated sediments will leach out their chemical concentrations into the bottom of the old basin and ultimately into the local groundwater if the contaminated sediment is exposed to either rainstorm water or to re-circulating groundwater. There are no published records of groundwater samples having been taken near Basin 1. Because of close proximity of the local water table to the bottom of Basin 1 and the 19-year period in which Basin 1 was used, the potential for two-way flow of liquids into and out of the basin, the large acreage of the source, and small seepage velocity of the groundwater, one would also expect to find shallow groundwater concentrations to approach those of the leachate concentrations in Basin 1.

Task 5. *Evaluate the future effect of sediment accumulation on the holding capacity of modified Detention Basin #1 and discuss maintenance activities that may be required to maintain holding capacity. Discuss disposal needs/requirements for excavated sediment as needed;*

Conclusion-Sediments will accumulate at the bottom of the Detention Pond 1, although a low rate because of the nature of compost leachate (high dissolved solids and organic materials) and because significant changes in water holding capacity in the existing pond have not been reported. However, some sediment may accumulate and will need to be tracked over time. Sediment removal, if needed, must be performed with hand tools to not damage the line. Sediment disposal must be performed after a chemical analysis of the sediment to test the presence of any contaminants at hazardous levels.

The lined Detention Pond 1 will continue to accumulate sediments present in its inflow at the pond bottom. In theory, the accumulated sediment could reduce effective volume of the pond, and thus its capacity for preventing releases during large storm events. Although the specific depth of sediment accumulated has not been documented, the previous unlined pond has operated for several years without loss of notable storage capacity being reported in any of the project documents made available. This fact, and given the nature of compost leachate with high dissolved solids and organic matter (Chatterjee et al., 2013), suggests that inorganic sediment buildup is expected to occur at a gradual rate. Over time, however, it is possible that the buildup is sufficient and that removal is needed. Because of the need to protect the lined bottom, we are in agreement with the Golder approach of using hand tools to excavate sediments. Further, these sediments need to be analyzed for chemical contaminants, especially trace metals, prior to identifying a suitable location for final disposal.

Task 6. *Review the applicant's specifications for the proposed new flood water storage facility located at the northern boundary of Area 2. Evaluate the applicant's revised No Net Fill/No Rise Certification to verify the adequacy of the flood storage facility design. Identify any other design issues for the storage facility which should be investigated to assess potential environmental impacts, if any;*

Conclusion-Tetra Tech verified that the proposed Flood Storage Basin can indeed hold 34 acre-feet of flood water that is mentioned by Golder (2019, Drawing 5B), and that this is adequate to address the change in capacity noted in the updated Schaaf and Wheeler Floodplain Impact Analysis (2018).

The Z-Best facility lies in the floodplain of the Pajaro River, and Santa Clara County has a no-net fill policy in place for construction activities in the floodplain. To mitigate for the loss of floodplain storage on account of grading activities at the site, Schaaf and Wheeler prepared a Floodplain Impact Analysis and estimated the need for 29 acre-feet of new flood storage at a location north of Highway 25 (2017). They revised their calculations for a new location of the flood water storage of 34 acre-feet, south of Highway 25 contiguous to the Z-Best property (to avoid the need for a highway crossing). This amount of storage was shown to have no net change in the water surface elevation of the Pajaro River, computed using the standard Army Corps of Engineers HEC-RAS model. Tetra Tech is in agreement with the general approach and the calculations.

Golder (2019, Drawing 5B) states in a comment field that the Flood Storage Basin capacity is 34 acre-feet. To compute the flood holding capacity, diagrams from the more detailed illustrations of Golder (2019, Drawing 10C) show the bottom of the Flood Basin with an elevation of 138 feet and the top set at 148.48 feet. The Basin is shown to have a simple rectangular shape and its sides drawn with a 1V/2H slope. Tetra Tech digitized the diagram for Basin 2 given in Golder (2019, Drawing 10C), scaled the measurements, and calculated the volume to be within 1.3 percent of the 34 acre-feet value listed in the comment field of Golder (2019, Drawing 5B). Tetra Tech's independent analysis verifies that the proposed Flood Storage Basin illustrated in Golder (2019) can hold 34 acre-feet of floodwater.

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Golder, 2015, Doc "GW Monitoring Plan - See Appendix_1-27-16.pdf", 26 pages long. Within this document there is a 24-page report titled "Groundwater Protection Monitoring Plan, Z-Best Composting Facility, Gilroy, California"; dated December 2015, by Golder Associates.

Golder, 2016, Doc "2016-10-11_Technical Report_FINAL-Golder.pdf" labeled Technical Report, Z-Best Composting Facility, dated October 2016, 110 pages. The PDF contains a 13-page document with the subject titled: "Detention Basin 1 and 2 Water Balance Calculation, Revision 1", dated 10/11/2016 by Golder Associates.

Golder, 2017, document titled "Aerated Static Pile Composting Permit Drawings, Z-Best Products, Santa Clara County, Gilroy, California, June 2017", 12 pages, prepared by Golder Associates Inc., Sunnyvale, CA.

Drawing 3, titled: "Existing Site Plan".

Golder, 2019, document labeled the “Aerated Static Pile Composting Preliminary Grading Plan, Z-Best Products, Santa Clara County, Gilroy, California, September 2018”, 15 pages, stamped 3/31/2019; prepared by Golder Associates Inc., Sunnyvale, CA.

Drawing 4, titled: “Existing Site Plan”;
Drawing 5B, titled: “Area 2 Flood Storage Basin”;

Drawing 7, titled: “Grading and Drainage Plan”;

Drawing 9, titled: “Details [for both primary CASP bunkers and secondary eASP piles]”;

Drawing 10C, titled: “Area2 Flood Storage Basin Sections”;

Drawing 12, titled: “Proposed Detention Basin 1- Plan and Section”.

SCCGOV, 2018, “Doc 2A ECS Memo Responses to ZBest EIR Questions_R3.PDF”, has the email subject: “Z-Best Use Permit/ASA EIR Data Needs List (6498-16P), dated July 11, 2018”. This document presents on July 25, 2018 the ECS response to question Q3 from Ron Sissem concerning ECS Section 36e-Management of Contact Water, 8 pages.

SCCGOV, 2019, “Z-Best Memo 1, Responses to 12-12-18 email re NOP.pdf”, County of Santa Clara, Department of Planning and Development, dated 4/15/2019, Zbest Input/Responses to NOP Comment Period 12-12-18 email request, 8 pages.

Schaaf and Wheeler, 2017, “Floodplain Impact Analysis for Z-Best Compost Facility Expansion near Gilroy” Memo dated, 2/7/2017.

Schaaf and Wheeler, 2017, “Z-Best Compost Facility Phase 2 Expansion” Memo dated, 9/14/2018.

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CONSULTING CIVIL ENGINEERS

MEMORANDUM

TO:	John Doyle Zanker Road Landfill	DATE:	February 7, 2017
FROM:	Sarah L. Rahimi, PE Charles D. Anderson, PE	JOB#:	ZANK.02.17
SUBJECT:	Floodplain Impact Analysis for Z-Best Compost Facility Expansion near Gilroy		

Introduction

Zanker Road Resource Management, Limited proposes to grade a level pad for composting operations as part of its Z-Best Compost Facility Phase 2 expansion project. The Z-Best facility is located within the Pajaro River floodplain near Gilroy in Santa Clara County. Phase 1 expansion at the site was completed in 2012 and included grading 25 acres between the previously existing operations and the Pajaro River. The proposed Phase 2 expansion includes grading 20 acres and is located to the west of the Phase 1 expansion as shown in Figure 1. Schaaf & Wheeler has been contracted to assess the potential impacts of the Phase 2 grading on the floodplain within the Project vicinity and the required mitigation measures necessary to meet Santa Clara County's no net fill policy.

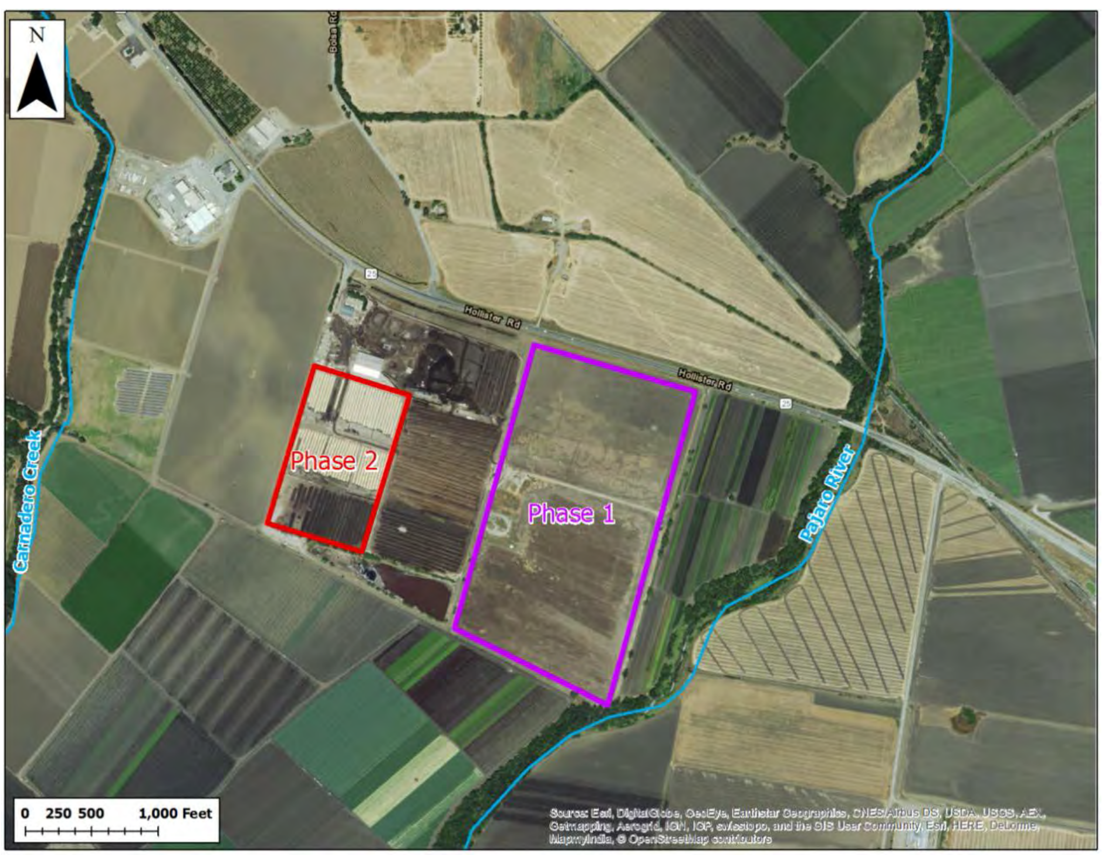

Figure 1. Study Area - Location of Phase 1 and Phase 2 Expansions

Phase 2 Project Description

The general project site is located immediately south of California Highway 25 (Hollister Road) and adjacent to the Pajaro River, which forms the boundary between Santa Clara and San Benito Counties. The area of the Phase 2 expansion is generally bounded by existing composting operations and an open agricultural field to west. This location is currently mapped as Special Flood Hazard Zone A (base flood elevations undetermined) on the effective Flood Insurance Rate Map (FIRM) for unincorporated Santa Clara County (Figure 2).

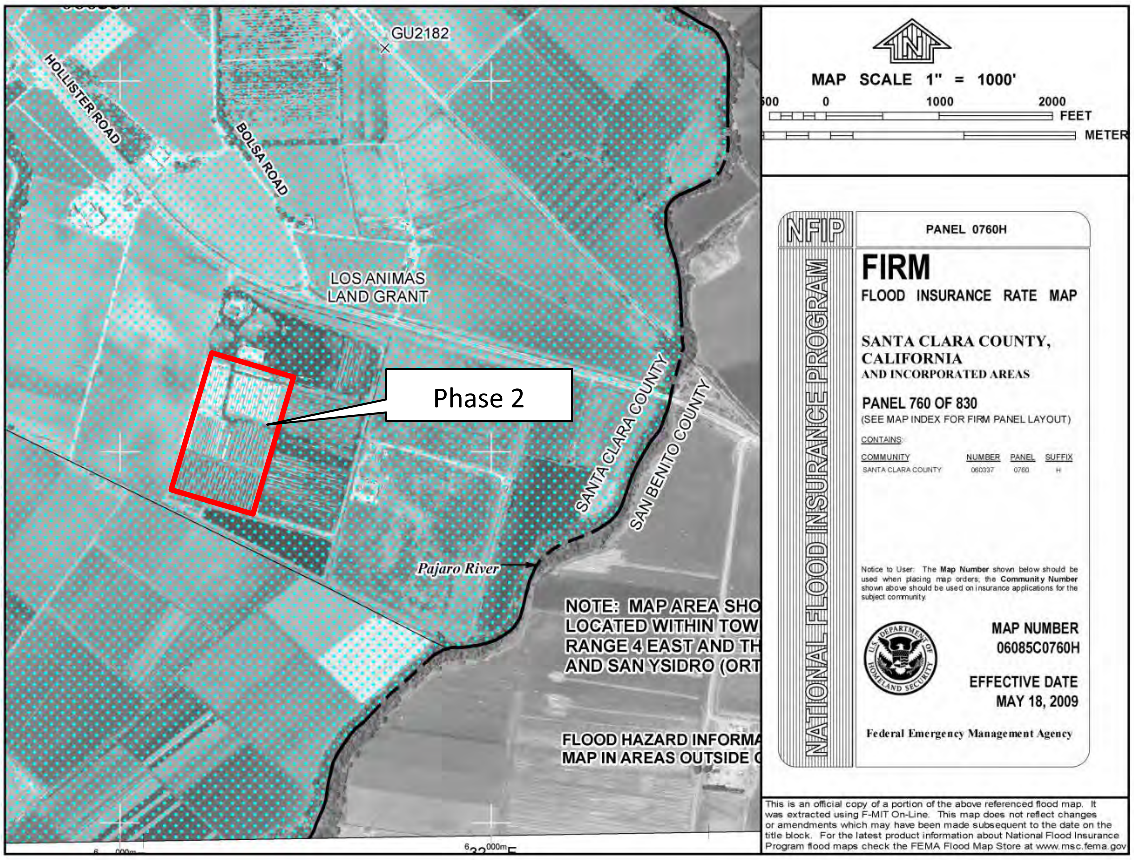

Figure 2. FIRM with the Phase 2 Expansion Shown

Phase 2 Project Objectives

The basic objective of the grading for the Phase 2 Project is to provide a level pad for composting operations of at least 20 acres in area while meeting the requirements of the Santa Clara County floodplain management ordinance.

In essence, project grading aims to raise the composting operations pad above the base (100-year) flood elevation without compromising existing floodplain storage. The currently effective May 18, 2009 FIRM does not provide a base flood elevation (BFE) within the Project area. Based on the previous work completed for the Phase 1 expansion at this site, a BFE was established for the entire site based approximate methods following procedures outlined in FEMA 265. Based on the detailed hydraulic study completed for the Phase 1 expansion work, a BFE of 148.5 feet (NAVD) was determined to exist across the entire site. It may also be noted that the approximate Flood Hazard Zone A shown in Figure 2 is often colloquially known as “Soap Lake” and is referred to by this name within this memorandum.

Hydraulic Impact Analysis

Hydraulic Model Configuration

Steady state hydraulic models of the Pajaro River and its overbanks, representing pre-Phase 1 and post-Phase 1 expansion (now existing) conditions, have been used for this flood study to evaluate potential floodplain impacts due to proposed Phase 2 grading activities. The models span from an upstream limit at California Highway 25 to a downstream limit at U.S. Highway 101. Hydraulic model development is detailed in the memorandum titled *Grading and Flood Study Summary Report* dated April 26, 2011. An effective Flood Insurance Study (FIS) peak discharge of 30,500 cfs is used to model the 100-year flood event on the Pajaro River. As necessary, the following conversion per the FIS is used to convert elevations from the NGVD datum to NAVD datum: NAVD = NGVD + 2.85 feet.

Existing conditions reflect the completion of the Phase 1 expansion grading, as represented on topographic plans prepared by Golder Associates, dated December 12, 2016. Additional cross sections have been added to the model geometry to capture the Phase 2 pad expansion. Post-project conditions assume that the Phase 2 expansion pad will be graded to the proposed elevation of 149 feet NAVD (or 146.25 feet NGVD) with side slopes of 2:1 (horizontal to vertical). The bounding upstream and downstream cross sections of the Phase 2 pad in the model have been modified to reflect this grading as shown in the upstream bounding cross section (Figure 3) and the downstream bounding cross section (Figure 4).

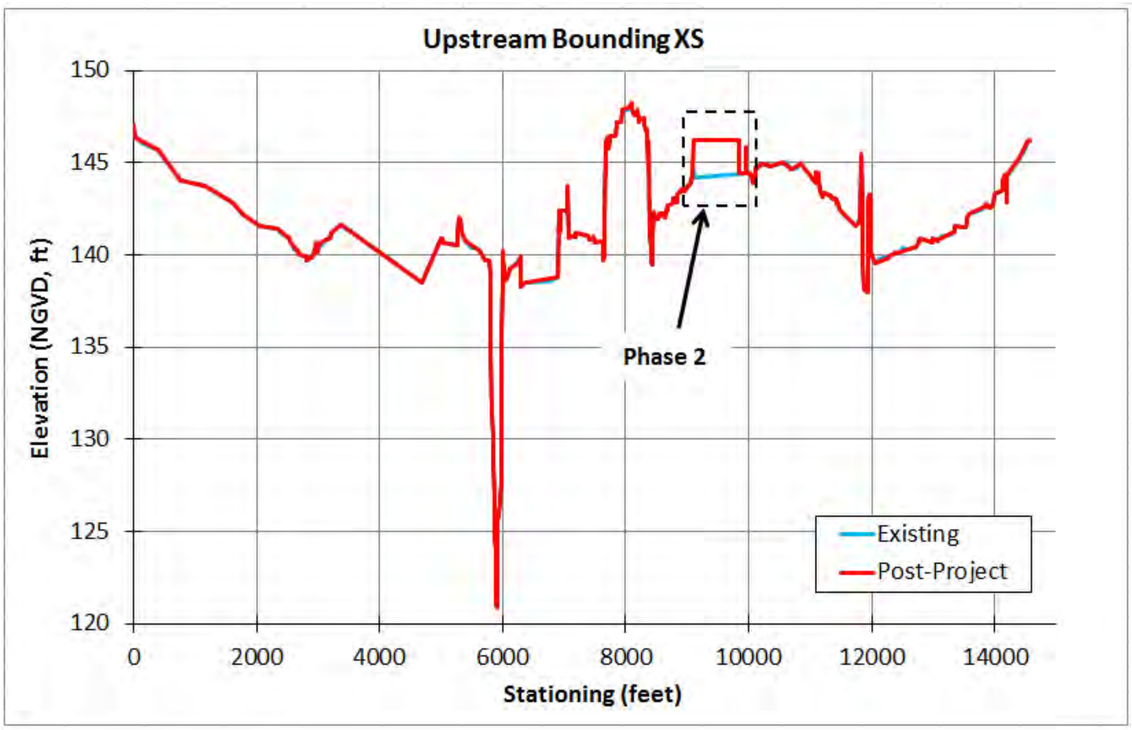

Figure 3. Existing and Post-Project Condition Upstream Bounding Cross Section of Phase 2 Pad

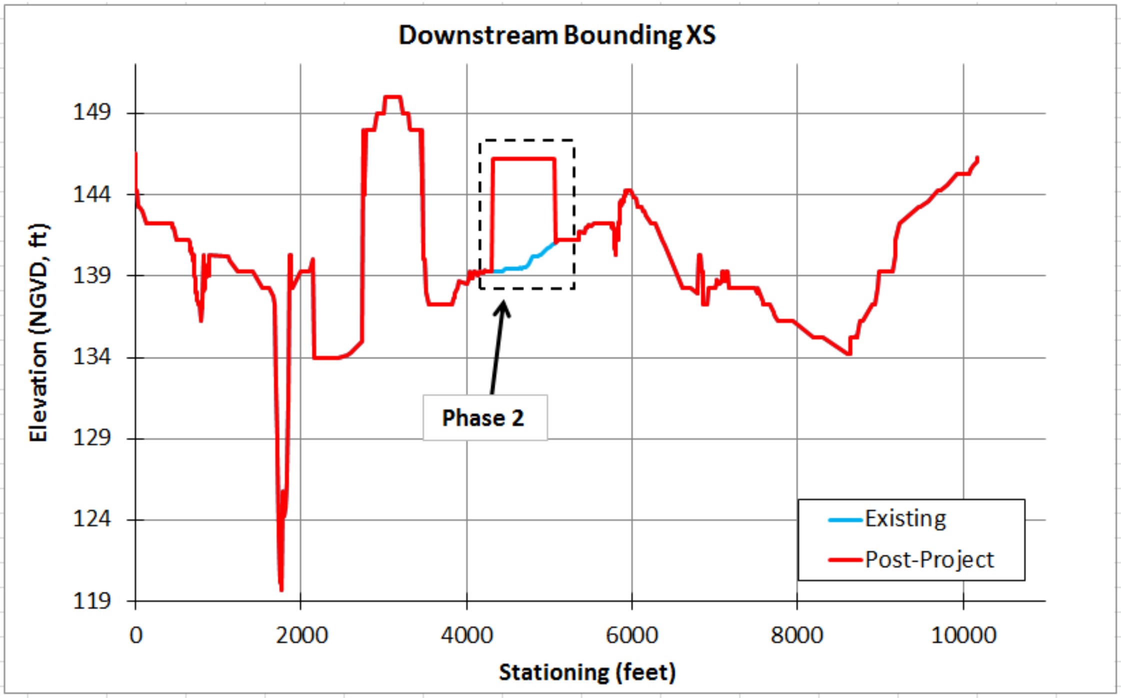

Figure 4. Existing and Post-Project Condition Downstream Bounding Cross Section of Phase 2 Pad

Hydraulic Model Results

The Phase 2 expansion of the Project shows no significant impact to the existing water surface elevation as shown in Figure 5. The maximum increase in water surface elevation between the existing and post-project scenarios is approximately 0.01 foot at one cross section, which is considered negligible. (The Santa Clara Valley Water District previously established a threshold of significance at 0.1 foot change.) Table 1 summarizes the HEC-RAS model results which compare the pre-project (existing) water surface elevations to post-fill water surface elevations on the NGVD datum.

Table 1. Existing and Post-Project Scenario 100-yr Event WSELs

Model River Station XS	Scenario 1: Existing WSEL (feet NGVD)	Scenario 2: Post-Project WSEL (feet NGVD)	Difference (feet)
16944	145.63	145.63	0.00
16198	145.61	145.61	0.00
15698*	145.59	145.60	0.01
14403*	145.56	145.56	0.00
14214	145.56	145.56	0.00
11414	145.55	145.55	0.00
9114	145.55	145.55	0.00
7614	145.55	145.55	0.00
5514	145.54	145.54	0.00
3864	145.50	145.50	0.00
3264	145.24	145.24	0.00
1734	144.45	144.45	0.00
434	144.00	144.00	0.00

**Bounding cross sections of proposed Phase 2 grading pad*

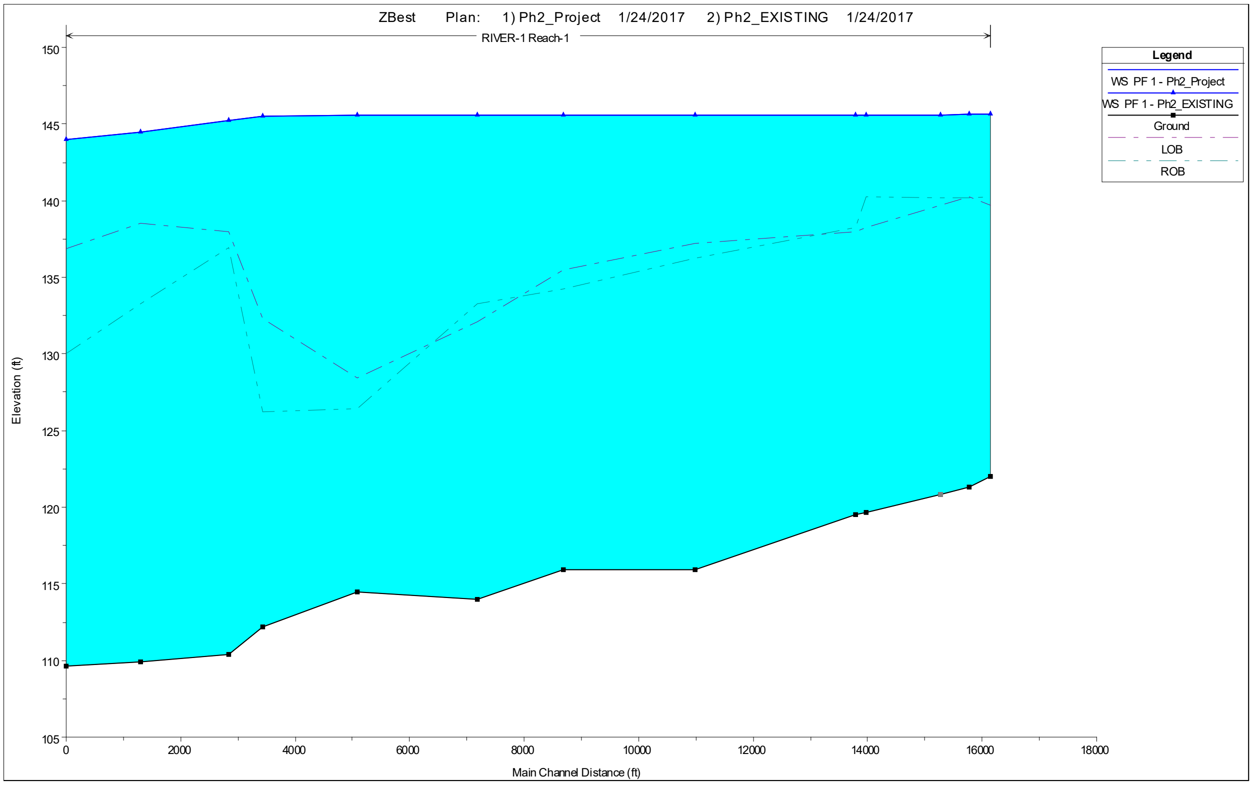

Figure 5. 100-yr WSELs through Soap Lake for the Existing and Post-Project Scenarios

Evaluation of Proposed Project Grading Plans

Project grading aims to raise the composting operations pad above the base (100-year) flood elevation of 148.5 feet NAVD without compromising existing floodplain storage.

To have zero impact on the existing floodplain, two things must be demonstrated:

1. There is no net decrease in Soap Lake floodplain storage with proposed fill; and
2. There is no net decrease in flow conveyance across the Project site after fill is placed.

Floodplain Storage Calculations

To determine the change in floodplain storage, the existing and post-project ground surfaces are compared. Using the topographic information provided by Golder Associates, a digital elevation model of the existing ground surface has been developed, and similarly, using the proposed grading for the Phase 2 pad described previously, a digital elevation model of the post-fill ground surface has also been developed. Using these digital elevation models, the amount of volume below the BFE of 148.5 feet NAVD is calculated for both the existing and post-project conditions. Finally, the post-project value is subtracted from the existing conditions value to determine the one-percent floodplain storage removed by the planned facility expansion. Approximately 29 acre-feet of fill is required below the BFE, which represents the loss of net floodplain storage from Soap Lake.

Note that 29 acre-feet of lost storage is equivalent to about 47,000 cubic yards of fill placed above the existing grade to the base flood elevation of 148.5 feet NAVD. The total volume of fill placed to raise the Phase 2 pad to an elevation of 149 feet NAVD is approximately 60,000 cubic yards. Portions of the existing ground within the Phase 2 pad envelope are already above the base flood elevation.

Required Storage of Flood Waters On-Site

The preservation of floodplain storage requires the excavation of roughly 29 acre-feet of native material outside of the expanded operations pad. Figure 6 shows a potential location for this flood storage replacement area. This boundary shown on the figure represents approximately 28 surface acres.

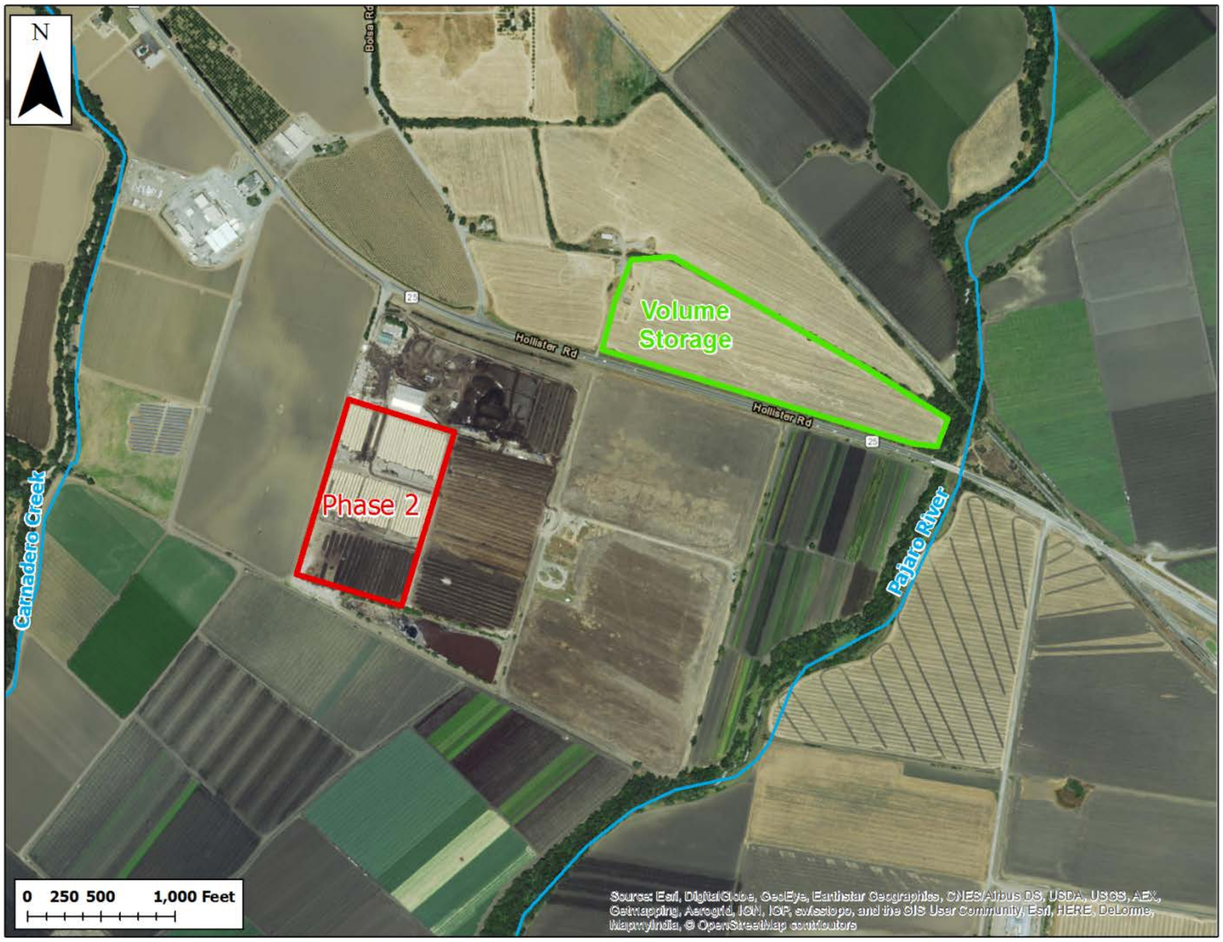

Figure 6. Potential Location of Floodplain Storage Replacement Area

The configuration of the flood storage replacement area is variable. Larger footprints require a smaller average depth, or a deeper excavation requires a smaller footprint. To avoid a new drainage outfall to the Pajaro River, and the suite of necessary permits, it is possible to drain the new flood storage area across California Highway 25 into the Phase 1 flood storage replacement area. The lowest bottom elevation of the Phase 1 basin adjacent to Highway 25 is 139 feet NAVD. It appears that the lowest existing ground elevation on the north side of Highway 25 within the boundary area shown on Figure 6 is about 141 feet NAVD, so there appears to be sufficient fall for gravity drainage. Grading and drainage details are pending storage area siting, more specifically location and elevation.

Preservation of Flood Flow Conveyance

The preservation of flood flow conveyance is demonstrated by the hydraulic modeling results summarized in Table 1. After placing fill to elevate Phase 2 operations above the base flood elevation, there is no significant change in base flood elevations, with a maximum increase in base flood elevation of 0.01 foot, and this negligible increase is limited to the northernmost boundary of the new fill. There is no change in base flood elevations at California Highway 25 or downstream of the Z-best site.

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NO NET FILL / NO RISE CERTIFICATION

PROJECT:	Z-Best Compost Facility Phase 2 Expansion	DATE:	September 14, 2018
PREPARED:	Sarah Rahimi, PE; Charles D. Anderson, PE	JOB#:	ZANK.03.17

Introduction

As part of the Z-Best Compost Facility Phase 2 Expansion Project (Project), fill is being placed in the regulatory floodplain for a composting pad. This document certifies that the Project does not violate Santa Clara County's no-net fill policy, self-mitigates a potential impact to base flood elevations, and there is no rise in base flood elevations.

Project Description

Z-Best Compost Facility, located in Gilroy, is grading a level pad for composting operations. Their facility expansion project is taking place in two phases, Phase 1 and Phase 2, both of which entail grading level pads above the base flood elevation on the project site. The Phase 1 expansion at the site included grading 25 acres between their pre-existing operations and the Pajaro River. The proposed Phase 2 expansion includes grading an additional 20 acres and is located to the west of the Phase 1 expansion as shown in Figure 1.

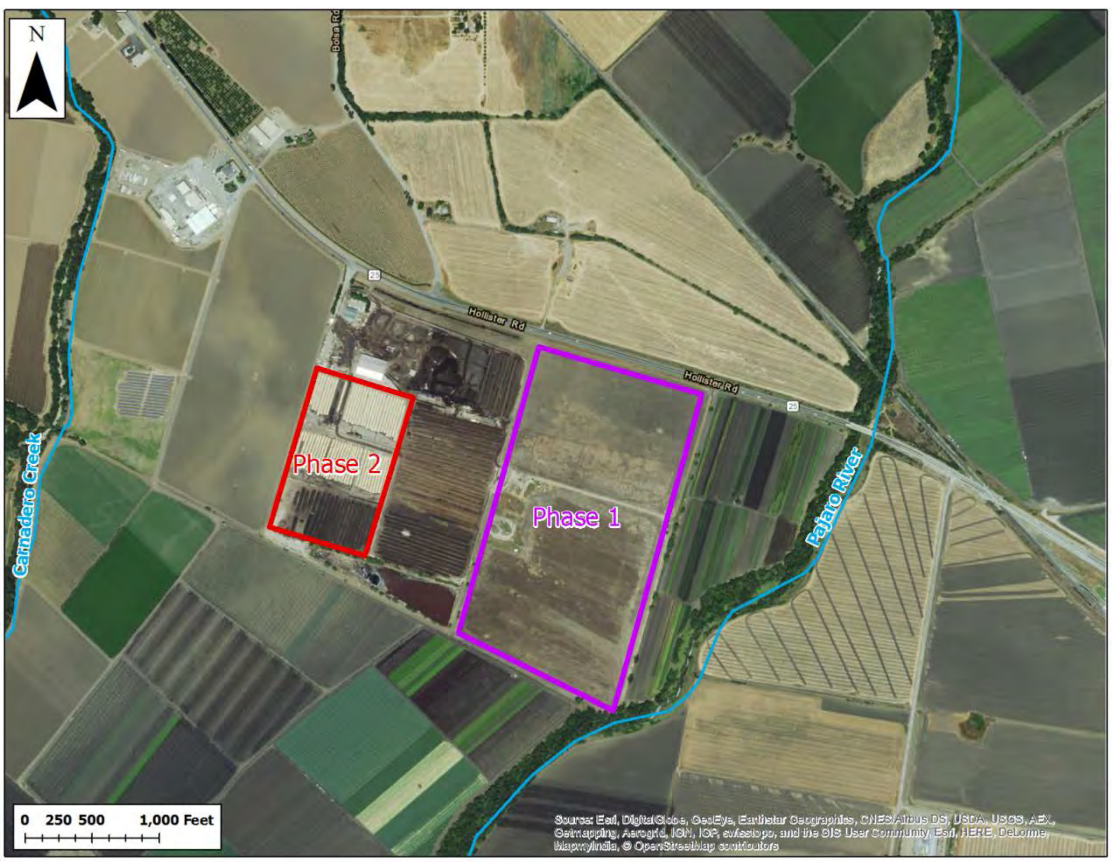

Figure 1. Z-Best Composting Pad Expansion - Phases 1 and 2

To meet Santa Clara County's no-net fill policy and mitigate fill placement for the second phase of expansion, flood storage capacity was originally proposed north of California Highway 25. To avoid having to deal with a Caltrans pipe crossing, Z-Best will move the flood storage area from the north side of Highway 25 to the south side of Highway 25 at the location shown in Figure 2. This analysis updates the *Floodplain Impact Analysis for Z-Best Compost Facility Expansion* report originally completed in February 2017 with the relocated floodplain storage area. Since no new fill is being placed, a new CLOMR-F is not applicable.

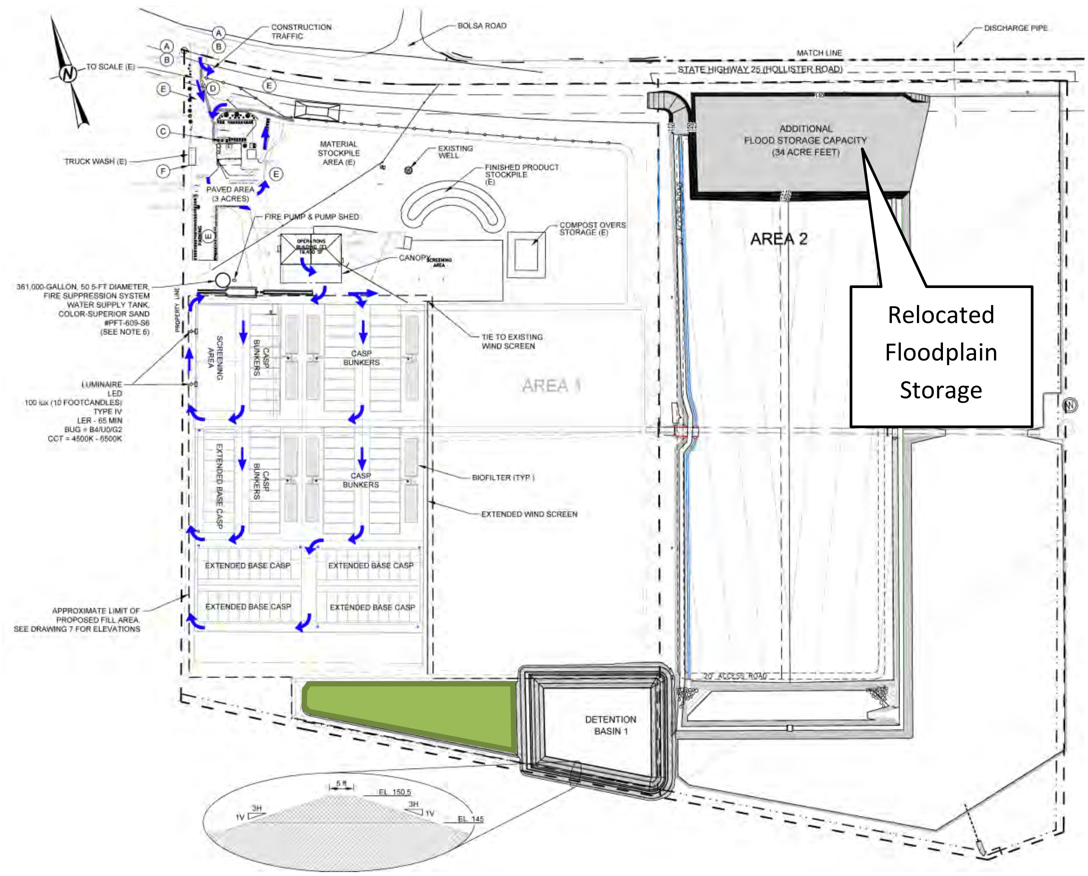

Figure 2. Relocated Floodplain Storage Area

Detention Basin 1, completed during Phase 1 expansion and shown in Figure 2, will be reconfigured as part of Phase 2 expansion. (The detention basin stores stormwater runoff from the composting pad for treatment.) Z-Best determined that the necessary stormwater storage capacity could be achieved within the eastern portion of Detention Basin 1 once its berm was raised to protect the basin from the 100-year flood and provide two feet of freeboard. The western portion of the original basin (shaded in green on Figure 2) will be restored to its original condition by removing the berm and hydroseeding the area with native plants and grasses.

Floodplain Storage

Per the 2017 Floodplain Impact Analysis, approximately 29 acre-feet of floodplain storage will be lost due to the placement of pad fill for the Phase 2 expansion project. The preservation of floodplain storage (no-net fill) therefore requires the excavation of roughly 29 acre-feet of native material. Z-Best is proposing to excavate 34 acre-feet of material, so there is actually a net increase in floodplain storage.

The reconfiguration of Detention Basin 1 also adds a relatively small volume to available 100-year floodplain storage since the basin floor is well below the base flood elevation and the berms that used to protect the basin from 100-year flooding will be removed. Thus the project *increase* in floodplain storage is something in excess of 5 acre-feet.

Hydraulic Impact Analysis

Steady state hydraulic models of the Pajaro River and its overbanks, representing post-Phase 1 expansion (now existing) conditions, have been used for this flood study to evaluate potential floodplain impacts from the Project. The Project scenario includes the proposed Phase 2 grading, relocated floodplain storage area and reconfigured Detention Basin 1. Additional cross sections have been added to the model geometry to capture the relocated floodplain storage area. Figure 3 shows the relocated the floodplain storage at the upstream bounding cross section.

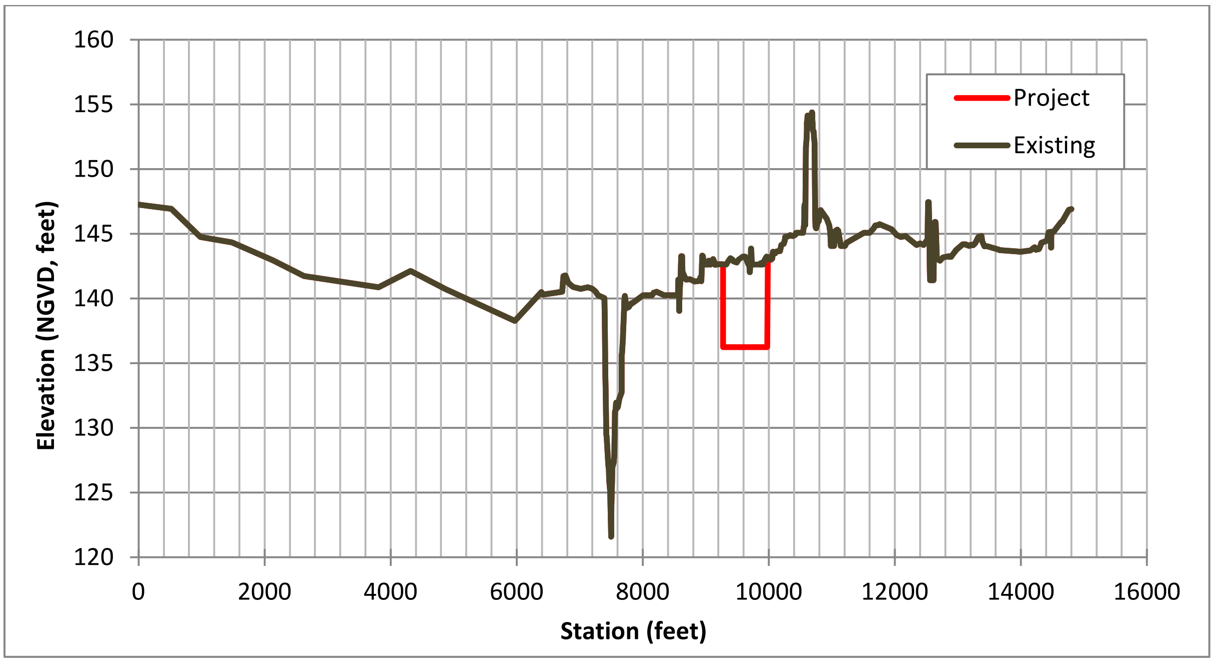

Figure 3. Upstream Cross Section of Proposed Floodplain Storage

Hydraulic Model Results

The Phase 2 expansion of the Project and floodplain storage relocation shows no significant impact to the existing water surface elevation as shown in Figure 4. The maximum increase in water surface elevation between the existing and project scenarios is approximately 0.01 foot at two cross sections, which is considered negligible. (The Santa Clara Valley Water District previously established a threshold of significance at 0.1 foot change.) Table 1 summarizes the HEC-RAS model results which compare the pre-project (existing) water surface elevations to post-fill water surface elevations on the NGVD datum.

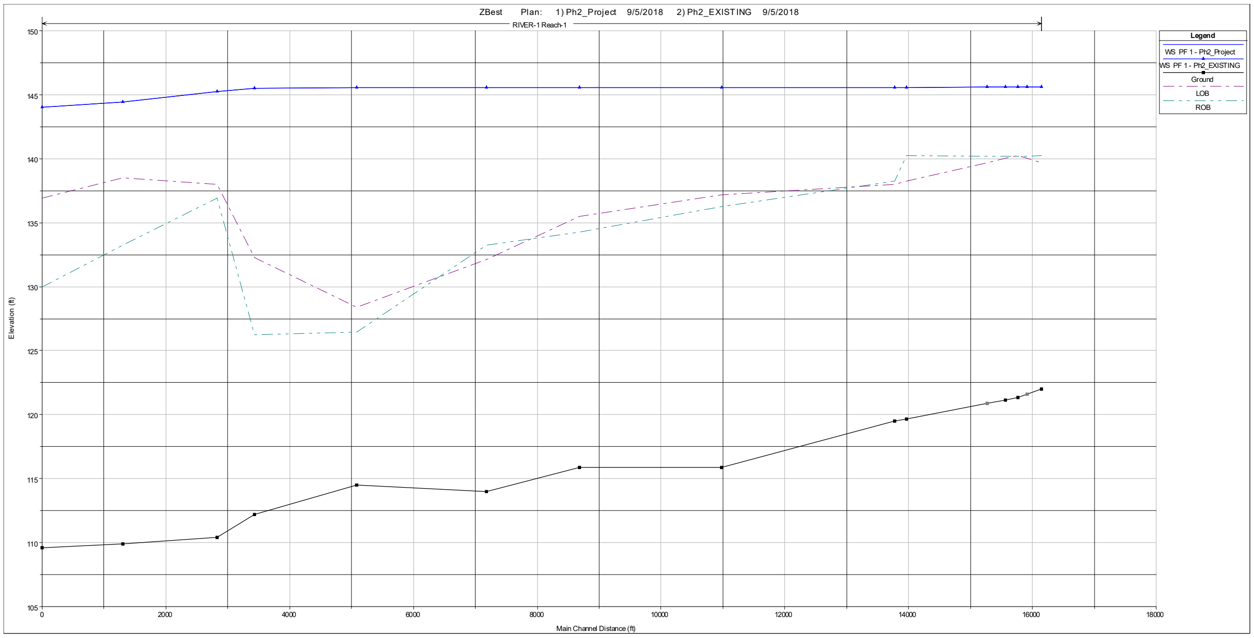

Figure 4. 100-yr WSELs for Pajaro River in the Existing and Post-Project Conditions

Table 1. Existing and Post-Project Scenario 100-YR Event WSELs

Model River Station XS	Existing WSEL (NGVD ft)	Project WSEL (NGVD ft)	Difference
16944	145.63	145.63	0.00
16492.4*	145.62	145.62	0.00
16198*	145.61	145.61	0.00
15998	145.60	145.61	0.01
15698**	145.59	145.60	0.01
14403**	145.56	145.56	0.00
14214	145.56	145.56	0.00
11414	145.55	145.55	0.00
9114	145.55	145.55	0.00
7614	145.55	145.55	0.00
5514	145.54	145.54	0.00
3864	145.50	145.50	0.00
3264	145.24	145.24	0.00
1734	144.45	144.45	0.00
434	144.00	144.00	0.00

**Bounding cross sections of proposed floodplain storage*

***Bounding cross sections of proposed Phase 2 grading pad*

Conclusion

Based on the hydraulic analysis, the relocated floodplain storage and the Phase 2 grading have a negligible impact to the 100-yr water surface elevation. There is no rise in base flood elevations and a negative net fill volume. Furthermore, since no new fill is being placed, a new CLOMR-F is not required.

APPENDIX F

2019 Noise Report
2019 Traffic Noise Analysis
Response to Peer Review of 2018 Noise Assessment
Peer Review of 2018 Noise Assessment

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NOISE ASSESSMENT STUDY
FOR THE PROPOSED

Z-BEST PRODUCTS FOOD WASTE STATIC AERATION COMPOSTING FACILITY MODIFICATION

980 STATE ROUTE 25, SANTA CLARA COUNTY

Prepared by
Jeffrey K. Pack

July 24, 2019
Project No. 48-073-R2

TABLE OF CONTENTS

EXECUTIVE SUMMARY

This report presents the results of a revised noise assessment study, in compliance with the California Environmental Quality Act (CEQA), for the proposed food waste composting operations modifications at the Z-Best Products facility at 980 State Route (Highway) 25 in Santa Clara County. The purpose of this revision is to correct a mathematical error discovered during the peer review process and make a slight modification to one of the composting operations hours to maintain a less than significant impact after correction of the error. This study includes an analysis of the existing ambient noise environment at the nearest residential receptor along Bolsa Road to the north of the facility, analyses of the existing noise levels generated by the food waste composting facility, predictions of the project-generated noise levels and evaluations of the noise levels and noise exposures against the standards of the Santa Clara County Noise Ordinance, the Santa Clara County Noise Element of the General Plan and CEQA.

The plans for the project, as they relate to noise, include removal of the compost bagging operations, installation of permanent concrete composting bunkers and increase hours of operations of material intake and product loading. Sorting of the raw and composted materials will remain unchanged with the exception of part of the screening process which is proposed to have extended hours.

The results of the study reveal that the existing noise levels generated by the facility are within the limits of the Santa Clara County Noise Ordinance and Noise Element at the nearest and most impacted residential receptor. Generally, noise from the facility is inaudible at the residence during the daytime due to traffic on Highway 25. Occasional backing beepers are audible, but not measurable. The project-generated noise levels and noise exposures will also be within the limits of the Santa Clara County Noise Ordinance and Noise Element, respectively. The increase in the overall noise exposure will be within the allowable increases of the County noise policies in relation to CEQA compliance.

The following report includes background information on acoustics, noise standards applicable to the project, existing noise exposures at the residence, project-generated noise impacts and conclusions. There will be no significant increases in the noise environments at the residence. Noise mitigation measures will not be required.

In terms of the CEQA compliance checklist, the project indicates the following:

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	Less Than Significant
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	Less Than Significant
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	Less Than Significant
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	Less Than Significant
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	No impact
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	No impact

II. Background Information on Acoustics

Noise is defined as unwanted sound. Airborne sound is a rapid fluctuation of air pressure above and below atmospheric pressure. Sound levels are usually measured and expressed in decibels (dB) with 0 dB corresponding roughly to the threshold of hearing.

Most of the sounds which we hear in our normal environment do not consist of a single frequency, but rather a broad range of frequencies. As humans do not have perfect hearing, environmental sound measuring instruments have an electrical filter built in so that the instrument's detector replicates human hearing. This filter is called the "A-weighting" network and filters out low and very high frequencies. All environmental noise is reported in terms of A-weighted decibels, notated as “dBA”. All sound levels used in this report are A-weighted unless otherwise noted. Table I on page 4 shows the typical human response and noise sources for A-weighted noise levels.

Although the A-weighted noise level may adequately indicate the level of noise at any instant in time, community noise levels vary continuously. Most environmental noise includes a mixture of noise from distant sources that create a relatively steady background noise from which no particular source is identifiable. To describe the time-varying character of environmental noise, the statistical noise descriptors, L_1, L_{10}, L_{50} and L_{90} are commonly used. They are the A-weighted noise levels exceeded for 1%, 10%, 50% and 90% of a stated time period. The continuous equivalent-energy level (L_{eq}) is that level of a steady state noise which has the same sound energy as a time-varying noise. It is often considered the average noise level and is used to calculate the Day-Night Levels (DNL) and the Community Noise Equivalent Levels (CNEL). The Santa Clara Noise Ordinance uses the L_2, L_8, L_{25} and L_{50} descriptors to quantify noise source durations of 1 min./hr., 5 min./hr., 15 min./hr. and 30 min./hr., respectively.

TABLE I

The A-Weighted Decibel Scale, Human Response, and Common Noise Sources

Noise Level, dBA	Human Response	Noise Source
120-150+	Painfully Loud	Sonic Boom (140 dBA)
100-120	Physical Discomfort	Motorcycle at 20 ft. (110 dBA) Nightclub Music (105 dBA)
70-100	Annoying	Diesel Pump at 100 ft. (95 dBA) Freight Train at 50 ft. (90 dBA) Food Blender (90 dBA) Jet Plane at 1000 ft. (85 dBA) Freeway at 50 ft. (80 dBA) Alarm Clock (80 dBA)
50-70	Intrusive	Average Traffic at 100 ft. (70 dBA) Pass. Car, 30 mph @ 25 ft. (65 dBA) Vacuum Cleaner (60 dBA) Suburban Background (55 dBA)
0-50	Quiet	Normal Conversation (50 dBA) Light Traffic at 100 ft. (45 dBA) Refrigerator (45 dBA) Desktop Computer (40 dBA) Whispering (35 dBA) Leaves Rustling (20 dBA) Threshold of Hearing (0 dBA)

In determining the daily level of environmental noise, it is important to account for the difference in response of people to daytime and nighttime noises. During the nighttime, exterior background noises are generally lower than the daytime levels. However, most household noise also decreases at night and exterior noise becomes very noticeable. Further, most people sleep at night and are very sensitive to noise intrusion. To account for human sensitivity to nighttime noise levels, the Day-Night Level (DNL) noise descriptor was developed. The DNL is also called the L_{dn}. Either is acceptable, however, DNL is more popular worldwide. The DNL divides the 24-hour day into the daytime period of 7:00 a.m. to 10:00 p.m. and the nighttime period of 10:00 p.m. to 7:00 a.m. The nighttime noise levels are penalized by 10 dB to account for the greater sensitivity to noise at night. The Community Noise Equivalent Level (CNEL) is another 24-hour average which includes a 5 dB evening (7:00 p.m. - 10:00 p.m.) penalty and a 10 dB nighttime penalty. Both the DNL and the CNEL average the daytime, evening and nighttime noise levels over a 24-hour period to attain a single digit *noise exposure*. The proper notations for the Day-Night Level and the Community Noise Equivalent Level are <u>dB DNL</u> and <u>dB CNEL</u>, respectively, as they can only be calculated using A-weighted decibels. It is, therefore, considered redundant to notate <u>dB(A) DNL</u> or <u>dB(A) CNEL</u>.

The effects of noise on people can be listed in three general categories:

- subjective effects of annoyance, nuisance, dissatisfaction;
- interference with activities such as speech, sleep, learning, relaxing;
- physiological effects such as startling, hearing loss.

The levels associated with environmental noise, in almost every case, produce effects only in the first two categories. Workers in industrial plants, airports, etc., can experience noise in the last category. Unfortunately, there is, as yet, no completely satisfactory way to measure the subjective effects of noise, or of the corresponding reactions of annoyance and dissatisfaction. This is primarily due to the wide variation in individual thresholds of annoyance and differing individual past experiences with noise.

An important way to determine a person's subjective reaction to a new noise is to compare it to the existing environment to which one has adapted, i.e., the "ambient". In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by the receivers.

With regard to increases in A-weighted noise levels, the Environmental Protection Agency has determined the following relationships that will be helpful in understanding this report.

- Except in carefully controlled laboratory experiments, a change of 1 dB cannot be perceived.

- Outside of the laboratory, a 3 dB change is considered a just-perceptible difference.

- A change in level of at least 5 dB is required before any noticeable change in community response would be expected.

- A 10 dB change is subjectively heard as approximately a doubling in loudness, and would almost certainly cause an adverse change in community response.

The adding or subtracting of sound levels is not simply arithmetic. The sound levels, in decibels, must be converted to Bels, the anti-log's of which are then calculated. The manipulation is then performed (arithmetic addition or subtraction), the logarithm of the sum or difference is calculated. The final number is then multiplied by 10 to convert Bels to decibels. The formula for adding decibels is as follows:

$\text{Sum} = 10\log(10^{SL/10} + 10^{SL/10})$ where, SL is the Sound Level in decibels.

For example, 60 dB + 60 dB = 63 dB, and 60 dB + 50 dB = 60 dB. Two sound sources of the same level are barely noisier than just one of the sources by itself. When one source is 10 dB higher than the other, the less noisy source does not add to the noisier source.

III. Noise Standards, Goals & Policies

A. Santa Clara County Noise Ordinance

The findings were also evaluated against the standards of the County of Santa Clara Noise Ordinance, Ref. (a), which limits the short-term maximum (dBA) noise at residential properties (receiving land use) to various levels depending upon the time of day, the duration of the noise and the noise type, as shown in Table II, below.

TABLE II		
Santa Clara County Noise Ordinance Limits		
Duration of Noise	Daytime (7:00 AM – 10:00 PM)	Nighttime (10:00 PM – 7:00 AM)
30 min./hr. (L_{50})	55 dBA	45 dBA
15 min./hr. (L_{25})	60 dBA	50 dBA
5 min./hr. (L_{8})	65 dBA	55 dBA
1 min./hr. (L_{2})	70 dBA	60 dBA
Maximum (L_{max})	75 dBA	65 dBA
The above noise limits are reduced by 5 dB if the noise contains a steady whine, screech, hum, music or speech, but are increased by 5 dB if the noise source and noise receptor are in different zoning districts.		

As the residential receptor and the project site are in the same zoning district and the noise sources do not contain "annoying" type noise, no adjustments to the Noise Ordinance limits are applicable.

B. County of Santa Clara General Plan

The findings presented below were evaluated against the standards of the County of Santa Clara Noise Element, Ref. (b), which utilizes the Day-Night Level (DNL) noise descriptor to define acceptable noise exposures for noise sensitive land uses. The DNL is a 24-hour time-weighted average descriptor commonly used to describe community noise environments. The standards specify a limit of 55 decibels (dB) DNL at residential land uses. The DNL is defined further in Appendix B.

The noise standards of the Santa Clara County General Plan Noise Element are in terms of noise exposure, using the 24 hour average metric DNL. The noise standards of the Santa Clara County Noise Ordinance are in terms of noise level, reported as dBA. Noise in terms of dBA and in DNL, although related, are different and must not be confused.

C. California Environmental Quality Act (CEQA)

The project-generated noise exposures were evaluated against the guidelines of the California Environmental Quality Act (CEQA). CEQA does not limit noise levels or noise exposures nor does it quantify noise exposure or noise level increases over the ambient to define noise impacts. CEQA evaluates a project as a significant noise impact if it "...caused a substantial increases in the ambient noise levels...". The quantification of the threshold of significance is left up to the local jurisdiction. The County of Santa Clara Noise Element provides thresholds of significance in the General Plan. The thresholds of significance shall be applied at the existing residential areas to the south and east. Note that CEQA noise evaluations are based on the Noise Element standards using the Day-Night Level descriptor. Noise Ordinance values, which are used primarily for noise annoyance, are not evaluated for CEQA purposes

The County of Santa Clara considers significant noise impacts to occur if a project would:

- Cause the DNL at noise sensitive receptors to increase by five dB DNL or more where the noise levels would remain "Normally Acceptable"; or

- Cause the DNL at noise sensitive receptors to increase by three dB DNL or more where the noise levels equal or exceed the "Normally Acceptable" level.

If the project causes either of the above criteria to occur, the project will be considered a significant noise impact to the receptor area(s) where it occurs and mitigation measures will be required.

As the existing noise exposures at the residential receptor is 67 dB DNL, the noise exposure limit for CEQA evaluation is the ambient + 3 dB. The project-generated noise exposure will be limited to 67 dB DNL at the Bolsa Road residential building envelope.

Note that 67 dB + 67 dB = 70 dB (ambient +3).

Because the 55 dB DNL limit of the Noise Element is more stringent, 55 dB DNL is used herein as the project-generated noise exposure limit for acceptability.

IV. Acoustical Setting

A. Site and Project Descriptions

The project site is located at 980 State Route (Highway) 25 in an unincorporated area of Gilroy in Santa Clara County, as shown on the Site Plan, Ref. (c). The site currently contains three buildings that are used for offices, sorting operations. The site is relatively flat and at-grade with the surrounding land uses. The surrounding land uses are agricultural adjacent to the west, south and east. Rural residential/agricultural use (the residential receptor) is across Highway 25 to the north.

The Z-Best Products operations occur mostly behind (to the south) of the product material piles and operations building, which range from approximately 20 ft. to approximately 40 ft. high. These piles of compost materials and the building provide significant noise shielding of the operations that take place behind them (in relation to the residential receptor).

The planned project description, as provided by the project sponsor, Ref. (d), includes the replacement of the bag style food waste composting equipment and operations with a concrete bunker food waste composting system using aeration fans. An increase in operational hours is also part of the facility's project plan. Most of the equipment used for the composting operations will remain with the exception of the bagging machine, which is one of the louder items of equipment currently being used.

There are nine main operations of the facility as listed below.

1) Trucking. Large semi-tractor trailer and dump trucks enter and exit the facility off of Highway 25, get weighed at the scale and washed. An analysis of employee vehicles is not included in this study as the volume of employee vehicles is relatively small in relation to traffic on Highway 25 and has been determined to be a non-issue. 6:00 AM to 5:00 PM.

2) Sorting and extraction of non-compostable materials. Occurs primarily in the Operations Building. 6:00 AM to 11:00 AM, 12:00 PM to 5:00 PM.

3) Bagging of compostable materials using a truck and bagging machine. 6:00 AM to 6:00 PM.

4) Sweeping. A front end loader sweeps the grounds of debris. 8:00 AM to 12:00 PM, 1:00 PM to 6:00 PM.

5) Bag opening. An excavator is used to open the plastic compost bags and loads the composted materials into a truck. 6:00 AM to 11:00 AM.

6) Transporting composted materials to the screening area. 6:00 AM to 12:00 PM.

7) Screening. 6:00 AM to 12:00 PM (1" and final screens), then 1:00 PM to 5:00 PM, 6:00 PM to 11:00 PM, 12:00 AM to 5:00 AM for the final screens.

8) Finish Loading. Final products are removed from the facility using a loader to load trucks. 6:00 AM to 12:00 PM.

9) Non-compostable Loading. 6:00 AM to 3:00 PM.

V. Existing Noise Environment

A. Existing Noise Levels at the Residential Receptor Location

To determine the existing noise environment at the residential receptor location, continuous recordings of the sound levels were made at a location approximately 150 ft. from the residential building envelope at a power pole along the edge of Bolsa Road. This location is 570 ft. from the facility's north property line along Highway 25 and was chosen for security of the sound measuring equipment. The noise measurement location is shown on Figure 1 on page 11. Note that the second measurement location was for the purpose of measuring the facilities operational noise and is discussed in a subsequent section of this study. The measurements were made on December 19-20, 2016 for a continuous period of 24 hours and included measurements during the daytime and nighttime periods of the DNL index.

The ambient (and project) sound levels were recorded and analyzed using Larson-Davis Model 812 Precision Integrating Sound Level Meters. The meters yield, by direct readout, a series of descriptors of the sound levels versus time, which include the L_2, L_8, L_{25}, and L_{50}, i.e., those levels that are exceeded 2%, 8%, 25%, and 50% of the time, corresponding to the time duration values of the Noise Ordinance – 1 min/hr., 5 min./hr., 15 min./hr. and 30 min./hr., respectively The meters also yield the maximum and minimum levels, and the continuous equivalent-energy levels (L_{eq}), which are used to calculate the DNL. The measured L_{eq}'s are shown in the data tables in Appendix C.

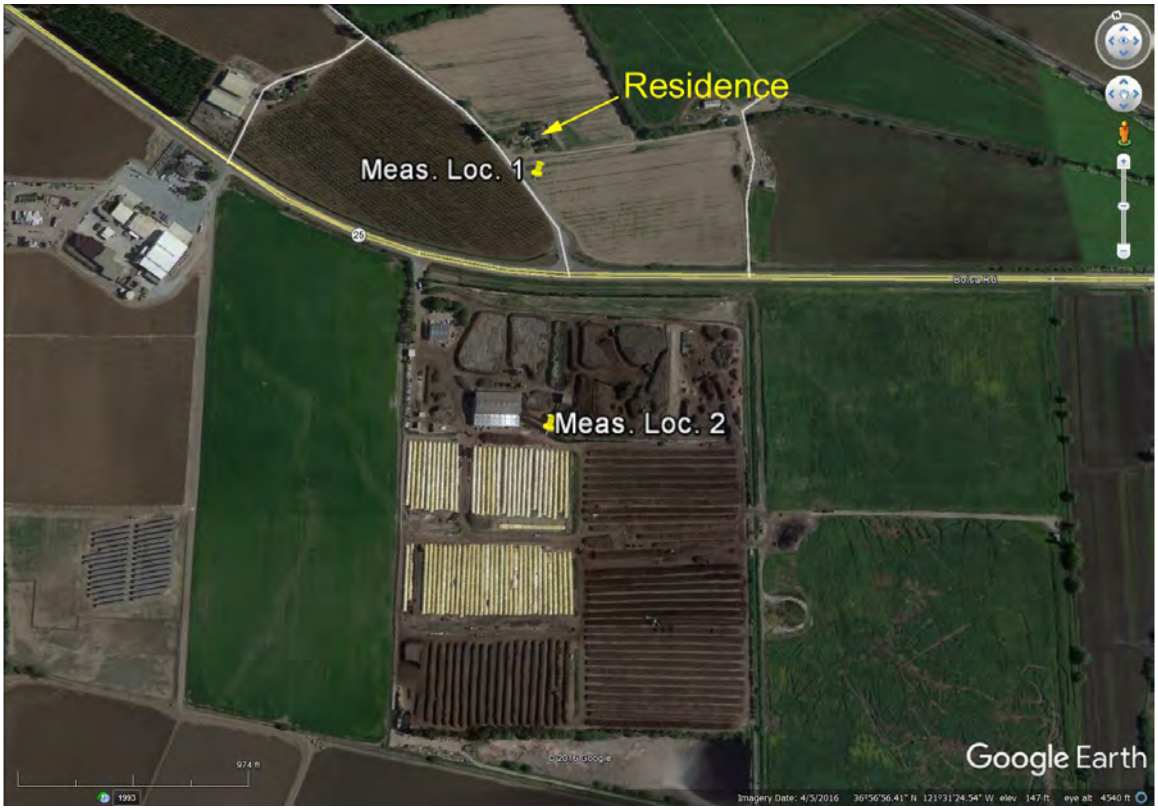


FIGURE 1 – Noise Measurement Locations

The existing ambient sound levels measured near the residential receptor – measurement Location 1, are shown in Table II on page 13.

As shown, the L_{eq}'s at measurement Location 1 ranged from 58.5 to 65.2 dBA during the daytime and from 54.2 to 63.4 dBA at night.

The sound levels in the area are produced primarily by traffic on Highway 25, with the maximum sound levels due to traffic on Bolsa Road, as the sound meter was very close to the Bolsa Road right-of-way.

TABLE III
Location: Bolsa Road Receptor, Measurement Location 1
Existing Ambient Sound Levels, dBA

TIME	Leq	Lmax	L2	L8	L25	L50
7:00 AM	64.4	83.6	72.6	65.2	63.0	61.5
8:00 AM	63.9	85.6	71.1	64.7	62.2	60.5
9:00 AM	60.9	82.1	67.5	62.8	59.9	57.6
10:00 AM	60.9	87.4	67.6	61.8	58.7	56.5
11:00 AM	61.6	85.7	70.3	62.8	58.6	55.9
12:00 PM	58.5	81.2	65.0	60.7	57.2	54.6
1:00 PM	60.7	82.5	68.0	62.9	59.7	57.5
2:00 PM	61.8	84.4	70.4	62.4	59.9	57.8
3:00 PM	63.9	88.8	72.9	64.0	60.3	58.5
4:00 PM	64.5	84.2	74.3	67.8	61.8	59.8
5:00 PM	65.2	84.0	74.3	70.3	63.1	60.1
6:00 PM	62.8	81.3	71.5	64.7	62.0	60.2
7:00 PM	61.6	81.3	65.9	63.9	62.3	60.5
8:00 PM	60.2	79.1	64.6	62.3	60.7	58.9
9:00 PM	59.6	85.1	63.8	61.9	59.9	57.6
10:00 PM	60.5	92.8	63.8	61.4	59.1	56.6
11:00 PM	55.7	78.9	61.3	58.6	56.0	53.0
12:00 AM	54.3	70.8	60.3	58.6	55.5	52.3
1:00 AM	54.2	72.5	61.2	58.1	54.7	51.2
2:00 AM	56.3	78.8	62.8	60.1	56.9	53.4
3:00 AM	57.9	74.2	63.2	63.5	58.9	56.8
4:00 AM	60.5	77.1	65.0	63.8	61.7	59.8
5:00 AM	62.9	83.7	66.8	64.7	62.5	61.4
6:00 AM	63.4	82.5	69.8	65.2	62.8	61.2

Since the facility's noise levels are generally inaudible at the receptor location, sound level measurements of individual sources could not be performed with any accuracy. The only sound audible was a backing beeper. However, the two times that a backing beeper was heard was during traffic passbys on Highway 25 when a measurement of the backing beeper could not be made.

During periods of traffic lulls, the background sound levels at the receptor measurement location ranged from 39-52 dBA, with the highest sound levels due to the chirping of birds perched on the power pole, power lines and tree in front of the natural material compost piles.

To determine the existing facility sound levels at the residential receptor location, sound level measurements were made of individual sources and during a continuous 24-hour period at the screening area. Table IV, below, provides the results of the sound measurements of the individual sources of noise at the facility at the indicated distances. Backing beeper sound levels are included in the data and are indicated mostly by the L_{max} sound levels for those types of equipment.

TABLE IV
Z-BEST PRODUCTS SOURCE SOUND LEVELS, dBA

Source	Operation Activity	Leq	Lmax	L2	L8	L25	L50	Reference Dist.
Truck	Entering	73	86	75	74	72	71	20
Truck	Exiting	75	89	78	76	75	74	20
Truck	Frontage	74	87	75	74	73	72	20
Truck	Scale, washing	76	93	79	78	76	76	20
Truck	compost loading	74	86	82	78	73	72	25
excavator	Line Sort	75	79	77	76	75	74	15
Loader	Line sort	74	86	82	78	73	72	25
Truck	Line Sort	69	79	76	73	69	65	100
Trucks	Bagging	76	88	84	81	79	77	20
Bagging Machine	Bagging	90	93	77	76	75	74	20
Loader	Sweeping	74	86	82	78	73	72	25
Excavator	Bag Opening	75	79	77	76	75	74	15
Loader	Transp Compost	74	86	82	78	73	72	25
Dump Trucks		88	94	96	93	88	86	25
Screens	Screening	67	67	67	67	67	67	100
Loader		74	86	82	78	73	72	25
Loader	Finish Loading	74	86	82	78	73	72	25
Truck		73	86	75	74	72	71	20
Loader	Non-compost Load	74	86	82	78	73	72	25
Truck		73	86	75	74	72	71	20

The above measured sound levels were calculated for the residential receptor location taking distance and noise shielding factors from the facility buildings and material stockpiles into consideration. Table V on page 15 provides the existing noise levels from the facility operations at the residential receptor location. These noise levels can be compared to the measured noise levels shown in Table III. The facility noise levels are within the L_{max}, L_2, L_8, L_{25} and L_{50} limits of the Santa Clara County Noise Ordinance. See the daytime and nighttime limits lines at the bottom of the Table.

TABLE V Z-BEST PRODUCTS SOUND LEVELS AT RESIDENTIAL RECEPTOR, dBA EXISTING CONDITIONS							
		Leq	Lmax	L2	L8	L25	L50
Truck	Entering	38	52	41	39	38	37
Truck	Exiting	41	55	44	42	41	40
Truck	Frontage	40	53	41	39	39	38
Truck	Scale, washing	39	57	42	41	39	39
Truck	compost loading	40	52	48	45	40	38
excavator	Line Sort	18	22	20	19	18	18
Loader	Line sort	22	34	30	26	21	20
Truck	Line Sort	29	39	36	33	29	25
Trucks	Bagging	30	42	38	35	33	31
Bagging Machine	Bagging	43	47	30	29	29	28
Loader	Sweeping	29	41	37	33	28	27
Excavator	Bag Opening	26	29	28	27	26	25
Loader	Transp Compost	29	40	36	33	28	26
Dump Trucks		45	51	53	50	45	42
Screens	Screening	39	39	39	39	39	39
Loader		29	40	36	33	28	26
Loader	Finish Loading	22	33	29	26	21	19
Truck		18	32	21	19	18	17
Loader	Non-compost Load	34	46	42	38	33	32
Truck		31	45	33	32	30	30
	DAYTIME LIMIT	na	75	70	65	60	55
	NIGHTTIME LIMIT	na	65	60	55	50	45
Highest sound levels shown in black fields							

B. Existing Noise Exposures

To calculate the baseline noise exposures at the residential receptors for the determination of project-related noise impacts, the DNL's for the survey locations were calculated by decibel averaging of the L_{eq}'s as they apply to the various time periods of the DNL index. A 10 decibel nighttime weighting factor was applied and the DNL was calculated using the formula shown in Appendix B. The measured L_{eq}'s and DNL calculations are shown in the data tables in Appendix C.

The results of the calculations indicate that the noise exposure at measurement Location 1 near the residential receptor location along Bolsa Road is 67 dB DNL.

The noise exposure at measurement Location 2 within the facility located approximately 100 ft. from the center of the screens was calculated to be 73 dB DNL. The L_{eq}'s ranged from 61.3 to 69.5 dBA during the daytime and from 62.9 to 69.3 dBA at night.

The analysis of the existing facility hourly average (L_{eq}) noise levels calculated for the residential receptor location along Bolsa Road is shown in Table VI, below. The existing noise exposure was calculated to be 48 dB DNL. Thus, the facility's existing noise exposure is within the 55 dB DNL limit of the Santa Clara County Noise Element and is more than 10 decibels below the existing ambient noise exposure, i.e., the facility does not add to the Highway 25 traffic generated noise.

TABLE VI
EXISTING CONDITIONS DNL ANALYSIS - RESIDENTIAL RECEPTOR

Time	Trucking	Line Sorting	Bagging	Sweeping	Bag Opening	Compost Transport	Screening	Finish Loading	Non-Compost Transport	TOTAL Leq
7:00 AM	42	30	29		26	45	39	23	36	48
8:00 AM	42	30	29	29	26	45	39	23	36	48
9:00 AM	42	30	29	29	26	45	39	23	36	48
10:00 AM	42	30	29	29	26	45	39	23	36	48
11:00 AM	42	30			26	45	39	23	36	48
12:00 PM	42	30	29	29					36	44
1:00 PM	42	30	29	29			39	23	36	45
2:00 PM	42	30	29	29			39		36	45
3:00 PM	42	30	29	29			39			44
4:00 PM	42	30	29	29			39			44
5:00 PM			29	29						32
6:00 PM							39			39
7:00 PM							39			39
8:00 PM							39			39
9:00 PM							39			39
10:00 PM							39			39
11:00 PM										
12:00 AM							39			39
1:00 AM							39			39
2:00 AM							39			39
3:00 AM							39			39
4:00 AM							39			39
5:00 AM										
6:00 AM	42	30	29		26	45	39	23	36	48
									DNL =	48

VI. Noise Impacts

A. Impacts to the Project

None

B. Project-Generated Noise Levels and Noise Exposures

The proposed project, as it relates to noise, includes the cessation of the bagging system and replacing it with a concrete bunker composting system. The bagging machine will be removed. Loaders will load and unload the bunkers. The new system replaces the smaller fans associated with each bag, with fewer larger fans. The rest of the equipment associated with the operation will remain the same. There will also be extended hours of operation of some of the current activities. The noise levels of these operations are not expected to change, but will extend the hours of operation. The compost transport operation hours have been modified to start at 6:00 AM rather than 5:00 AM, Ref. (e). The elimination of one nighttime hour of compost transporting prevents a significant increase in the overall noise exposure. The proposed Site Plan (cropped for clarity) is shown on Figure 2 on page 19.

The static aeration system will have two types of fans. The Primary Process Fans will be Twin City Model BCS 100 hp fans generating 33,000 CFM of air flow. There will be six of these fans dispersed about the composting area. The Secondary Ambient Air Fans will Twin City Model BCS 20 hp fans generating 7,100 CFM of air flow. The fans' sound data are shown below.

TABLE VII

Aeration Fan Sound Power Levels, dB (un-weighted)

Octave Bands	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	Lwa
Primary	109	104	102	99	99	96	91	85	103
Secondary	97	95	95	94	92	90	87	82	97

Lwa = A-weighted total Sound Power Level

The Sound Power levels were converted to Sound Pressure Levels using standard methodologies taking the acoustical environment between the fans and the receptor location into consideration. Distance, sound absorption and noise shielding by the Operations Building and material stockpiles are the primary factors for calculating the sound pressure levels at the receptor location.

Table VIII provides the calculated A-weighted sound pressure levels (sound levels) at the residential receptor location for each fan and the combined fan sound level. As the fans will operate continuously for 24 hours per day, the L_{max}, L_{eq}, L_2, L_8, L_{25} and L_{50} values will be equivalent. Note that the secondary fans will be grouped in six pairs plus two individual fans.

The bunker loading and unloading noise levels will be due to trucks and loaders.

TABLE VIII
Compost Fan Noise Levels at the Residential Receptor, dBA

Primary Fans	Sound Level	Dist.	Dist to Receptor	Noise Barrier	Sound Level at Receptor
1	92	5	1160	7	35
2	92	5	1590	14	28
3	92	5	1610	14	28
4	92	5	1570	10	32
5	92	5	2140	11	29
6	92	5	2040	8	32
Secondary Fans					
1,2	89	5	1880	15	26
3,4	89	5	2050	14	26
5,6	89	5	2350	14	25
7,8	89	5	2410	14	25
9.1	89	5	2320	13	26
11,12	89	5	1220	17	27
13	89	5	2300	11	28
14	89	5	2480	11	27
				TOTAL =	41

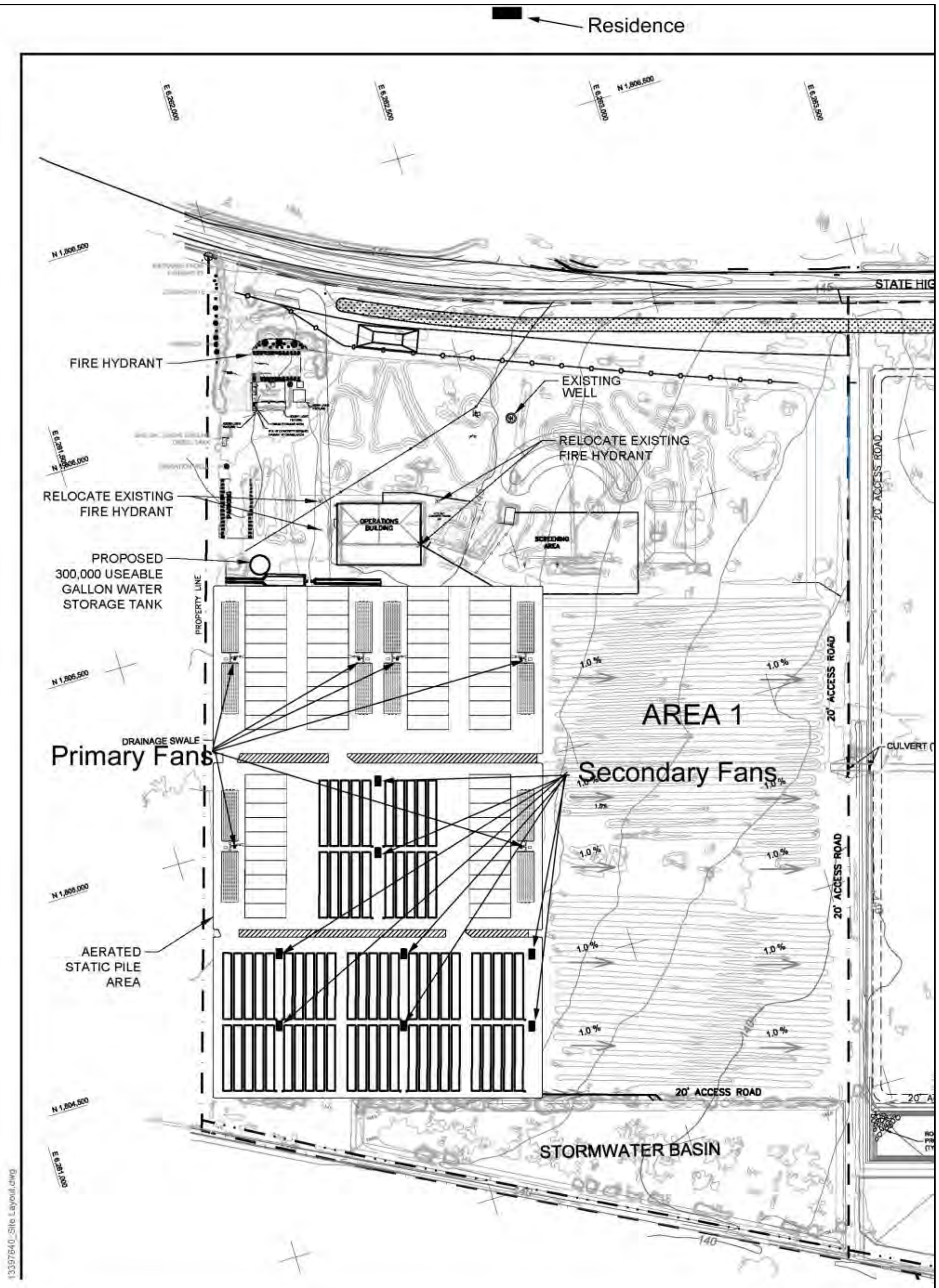


FIGURE 2

PROPOSED SITE PLAN

Table IX, below, provides the hourly average noise levels for each operation/noise source under the proposed project scenario. The bagging and sweeping operations have been replaced with the bunker loading and unloading and the noise levels from the new fans. The total noise exposure was calculated to be 52 dB DNL. The project-generated noise exposure will be within the 55 dB DNL limit of the Santa Clara County Noise Element and as the noise exposure and will be more than 10 decibels below the existing ambient noise exposure of 67 dB DNL at the receptor location, the project will not add to the existing ambient. The increase in the total noise exposure due to the project over the existing facility noise exposure will be less than 5 decibels. These are **Less Than Significant Impacts.** Noise mitigation measures will not be required.

TABLE IX

PROJECT CONDITIONS DNL ANALYSIS - RESIDENTIAL RECEPTOR

Time	Trucking	Line Sorting	Compost Transport	Screening	Finish Loading	Non-Compost Transport	Bunker Loading	Bunker Unloading	Fan Noise	TOTAL Leq
7:00 AM	42		45	39	23	36	35	35	41	49
8:00 AM	42	30	45	39	23	36	35	35	41	49
9:00 AM	42	30	45	39	23	36	35	35	41	49
10:00 AM	42	30	45	39	23	36	35	35	41	49
11:00 AM	42		45	39	23	36	35	35	41	49
12:00 PM	42	30	45	39	23	36	35	35	41	49
1:00 PM	42	30	45	39	23	36	35	35	41	49
2:00 PM	42	30	45	39	23	36	35	35	41	49
3:00 PM	42	30	45	39	23	36	35	35	41	49
4:00 PM	42	30	45	39	23	36	35	35	41	49
5:00 PM			45	39			35	35	41	48
6:00 PM				39			35	35	41	44
7:00 PM	42			39			35	35	41	46
8:00 PM				39			35	35	41	44
9:00 PM				39			35	35	41	44
10:00 PM	42			39			35	35	41	46
11:00 PM							35	35	41	43
12:00 AM				39			35	35	41	44
1:00 AM	42			39			35	35	41	46
2:00 AM				39			35	35	41	44
3:00 AM				39			35	35	41	44
4:00 AM	42			39			35	35	41	46
5:00 AM		30		39			35	35	41	44
6:00 AM	42	30	45	39	23	36	35	35	41	49
									DNL =	52

As the noise levels from trucking operations (entering and exiting the facility) could be the most impactful source associated with the project for the receptor location, the difference in the total noise exposure for trucking only between the existing operations and the proposed operations is a 4 decibel increase in the DNL from 41 dB to 45 dB. This increase is due to the addition of nighttime operations. However, the nighttime trucking operations will remain at least 10 decibels below the existing ambient noise levels during both daytime and nighttime hours.

The L_{max}, L_2, L_8, L_{25} and L_{50} values for the noise sources will be similar to current levels shown in Table V as the amount of noise generated in any hour will not increase over the current worst-case hour applied to both daytime and nighttime hours. Thus, the noise levels will be in compliance with the daytime and nighttime standards of the Santa Clara County Noise Ordinance. Noise mitigation measures will not be required.

The sound levels of the fans and bunker loading/unloading operations will be somewhat lower in sound level than the existing bagging operation. The overall sound level of these sources is expected to reduce slightly. However, the 4 decibel increase in the total noise exposure between the existing operation and the proposed operation is due to the extended hours of operation.

VII. Conclusions

In conclusion, these analyses indicate that the proposed modifications to the composting operations at the Z-Best Products facility will result in less than significant impacts to the nearest residential receptor to the north of the site across Bolsa Road. The project will not add to the noise environment at this location due to the background noise levels produced by Highway 25 traffic. The project will be in compliance with the standards of the Santa Clara County Noise Ordinance and Noise Element and the County policies in relation to the CEQA thresholds for significant noise impacts.

This report presents the results of a noise assessment study for the Z-Best Products static aeration composting operation proposal at 980 State Route 25 in Santa Clara County. The study findings are based on field measurements and other data and are correct to the best of our knowledge. However, changes in the operational scenario, operational hours, noise regulations or other future changes beyond our control may result in long-range noise levels different from our estimates. If you have any questions or would like an elaboration on this report, please call me.

Sincerely,

EDWARD L. PACK ASSOC., INC.

Jeffrey K. Pack
President

APPENDIX A

References:

(a) Noise Ordinance of the County of Santa Clara, Chapter VII, Section B11-192, 1981

(b) Noise Element of the General Plan, County of Santa Clara, December 20, 2004

(c) Site Plan, Z-Best Compost Products Composting Facility, by Golder Associates, June, 2016

(d) Information on the Proposed Operations Provided by Mr. Beto Ochoa, Z-Best Products, by email to Edward L. Pack Associates, Inc., December 23, 2016 and by Personal Communication with Edward L. Pack Associates, Inc., December 19, 2016

(e) Information on the Modified Hours of Compost Transport Operations Provided by Mr. John Doyle, Z-Best Products, by email to Edward L. Pack Associates, Inc., July 24, 2019.

APPENDIX B

Noise Standards, Terminology, Instrumentation,

1. Noise Standards

A. Santa Clara County Noise Element Standards

The Land Use Compatibility Standards of the Santa Clara County Noise Element, use the Day-Night Level (DNL) noise descriptor and identify an exterior noise environment of up to 55 dB DNL as satisfactory for residential uses. Where the noise level at a proposed development site is below 55 dB DNL, mitigation measures are not required. The exterior noise level range between 55 and 65 dB DNL is identified as "cautionary", and over 65 dB is "critical".

Industrial land use noise exposures are limited to 70 dB DNL.

For interior exposures in residential buildings, a compatibility level of 45 dB DNL is specified.

2. Terminology

A. Statistical Noise Levels

Due to the fluctuating character of urban traffic noise, statistical procedures are needed to provide an adequate description of the environment. A series of statistical descriptors have been developed which represent the noise levels exceeded a given percentage of the time. These descriptors are obtained by direct readout of the Sound Level Meters and Noise Analyzers. Some of the statistical levels used to describe community noise are defined as follows:

L_1 - A noise level exceeded for 1% of the time.

L_{10} - A noise level exceeded for 10% of the time, considered to be an "intrusive" level.

L_{50} - The noise level exceeded 50% of the time representing an "average" sound level.

L_{90} - The noise level exceeded 90 % of the time, designated as a "background" noise level.

L_{eq} - The continuous equivalent-energy level is that level of a steady-state noise having the same sound energy as a given time-varying noise. The L_{eq} represents the decibel level of the time-averaged value of sound energy or sound pressure squared and is used to calculate the DNL and CNEL.

B. Day-Night Level (DNL)

Noise levels utilized in the standards are described in terms of the Day-Night Level (DNL). The DNL rating is determined by the cumulative noise exposures occurring over a 24-hour day in terms of A-Weighted sound energy. The 24-hour day is divided into two subperiods for the DNL index, i.e., the daytime period from 7:00 a.m. to 10:00 p.m., and the nighttime period from 10:00 p.m. to 7:00 a.m. A 10 dBA weighting factor is applied (added) to the noise levels occurring during the nighttime period to account for the greater sensitivity of people to noise during these hours. The DNL is calculated from the measured L_{eq} in accordance with the following mathematical formula:

$$\text{DNL} = \Big[[(10\log_{10}(10^{\Sigma Leq(7\text{-}10)})) \text{ x } 15] + [((10\log_{10}(10^{\Sigma Leq(10\text{-}7)})) + 10) \text{ x } 9]\Big]/24$$

C. A-Weighted Sound Level

The decibel measure of the sound level utilizing the "A" weighted network of a sound level meter is referred to as "dBA". The "A" weighting is the accepted standard weighting system used when noise is measured and recorded for the purpose of determining total noise levels and conducting statistical analyses of the environment so that the output correlates well with the response of the human ear.

3. Instrumentation

The on-site field measurement data were acquired by the use of one or more of the precision acoustical instruments shown below. The acoustical instrumentation provides a direct readout of the L exceedance statistical levels including the equivalent-energy level (L_{eq}). Input to the meters was provided by a microphone extended to a height of 5 ft. above the ground. The meter conforms to ANSI S1.4 for Type 1 instruments. The "A" weighting network and the "Fast" response setting of the meter were used in conformance with the applicable ISO and IEC standards. All instrumentation was acoustically calibrated before and after field tests to assure accuracy.

Bruel & Kjaer 2231 Precision Integrating Sound Level Meter
Larson Davis LDL 812 Precision Integrating Sound Level Meter
Larson Davis 2900 Real Time Analyzer
Larson Davis 831 Precision Integrating Sound Level Meter

APPENDIX C

Noise Measurement Data and Calculation Tables

DNL CALCULATIONS

CLIENT: Z-BEST PRODUCTS
FILE: 48-073
PROJECT: COMPOSTING MODIFICATION
DATE: 21/19-20/2016
SOURCE: EXISTING AMBIENT

LOCATION 1 Bolsa Rd Residence

TIME	Leq	10^Leq/10		
7:00 AM	64.4	2754228.7		
8:00 AM	63.9	2454708.9		
9:00 AM	60.9	1230268.8		
10:00 AM	60.9	1230268.8		
11:00 AM	61.6	1445439.8		
12:00 PM	58.5	707945.8		
1:00 PM	60.7	1174897.6		
2:00 PM	61.8	1513561.2		
3:00 PM	63.9	2454708.9		
4:00 PM	64.5	2818382.9		
5:00 PM	65.2	3311311.2		
6:00 PM	62.8	1905460.7		
7:00 PM	61.6	1445439.8		
8:00 PM	60.2	1047128.5		
9:00 PM	59.6	912010.8	SUM=	26405762.5
10:00 PM	60.5	1122018.5	Ld=	74.2
11:00 PM	55.7	371535.2		
12:00 AM	54.3	269153.5		
1:00 AM	54.2	263026.8		
2:00 AM	56.3	426579.5		
3:00 AM	57.9	616595.0		
4:00 AM	60.5	1122018.5		
5:00 AM	62.9	1949844.6		
6:00 AM	63.4	2187761.6	SUM=	8328533.2
			Ld=	69.2

Daytime Level=	74.2
Nighttime Level=	79.2
DNL=	**67**
24-Hour Leq=	61.6

LOCATION 2 On-site at Screening Area

TIME	Leq	10^Leq/10		
7:00 AM	65.6	3630780.5		
8:00 AM	64.0	2511886.4		
9:00 AM	66.2	4168693.8		
10:00 AM	61.3	1348962.9		
11:00 AM	64.7	2951209.2		
12:00 PM	67.0	5011872.3		
1:00 PM	63.4	2187761.6		
2:00 PM	64.7	2951209.2		
3:00 PM	61.9	1548816.6		
4:00 PM	64.3	2691534.8		
5:00 PM	65.7	3715352.3		
6:00 PM	68.5	7079457.8		
7:00 PM	67.0	5011872.3		
8:00 PM	67.6	5754399.4		
9:00 PM	69.5	8912509.4	SUM=	59476318.8
10:00 PM	66.7	4677351.4	Ld=	77.7
11:00 PM	62.9	1949844.6		
12:00 AM	67.8	6025595.9		
1:00 AM	67.1	5128613.8		
2:00 AM	68.4	6918309.7		
3:00 AM	69.3	8511380.4		
4:00 AM	65.6	3630780.5		
5:00 AM	66.3	4265795.2		
6:00 AM	66.5	4466835.9	SUM=	45574507.5
		1.0	Ld=	76.6

Daytime Level=	77.7
Nighttime Level=	86.6
DNL=	**73**
24-Hour Leq=	66.4

December 3, 2019

Ron Sissem
Principal
EMC PLANNING GROUP INC.
301 Lighthouse Avenue, Suite C
Monterey, California 93940

RE: TRAFFIC NOISE ANALYSIS, Z-BEST PRODUCTS FACILITY MODIFICATION, SANTA CLARA COUNTY, CALIFORNIA

Dear Mr. Sissem:

As you have requested, WJV Acoustics, Inc. (WJVA) has performed an analysis of traffic noise exposure in relation to proposed Z-Best facility modifications in Santa Clara County. The analysis calculates and compares existing traffic noise exposures at noise-sensitive receptor locations along State Route 25 (SR 25) to anticipated traffic noise exposures after the completion of proposed facility modifications, specifically, the proposed increase in employee trips and truck trips along SR 25.

The Noise Element of the Santa Clara County General Plan establishes noise level criteria in terms of the Day-Night Average Level (L_{dn}) metric. The L_{dn} (DNL) is the time-weighted energy average noise level for a 24-hour day, with a 10 dB penalty added to noise levels occurring during the nighttime hours (10:00 p.m.-7:00 a.m.). The L_{dn} represents cumulative exposure to noise over an extended period of time and is therefore calculated based upon *annual average* conditions. Noise Levels provided in this analysis are described in terms of the L_{dn}. The General Plan establishes an exterior noise level exposure criterion of 55 dB L_{dn} for residential land uses.

Appendix A provides definitions of the acoustical terminology used in this report. Unless otherwise stated, all sound levels reported in this analysis are A-weighted sound pressure levels in decibels (dB). A-weighting de-emphasizes the very low and very high frequencies of sound in a manner similar to the human ear. Most community noise standards utilize A-weighted sound levels, as they correlate well with public reaction to noise. Appendix B provides typical A-weighted sound levels for common noise sources.

Traffic Noise Exposure:

Noise exposure from traffic on State Route 25 (SR 25) was calculated for Existing and Existing plus project (peak season) conditions using the FHWA Traffic Noise Model and traffic data obtained from project Traffic Analysis (Hexagon Transportation Consultants) and Caltrans. WJVA utilized the Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA-RD-77-108). The FHWA Model is a standard analytical method used for roadway traffic noise calculations. The model is based upon reference energy emission levels for automobiles, medium trucks (2 axles) and heavy trucks (3 or more axles), with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. The FHWA Model was developed to predict hourly L_{eq} values for free-flowing traffic conditions, and is generally considered to be accurate within ±1.5 dB.

The project would include occasional peak season conditions resulting in additional vehicle and truck trips during such conditions. According to the project applicant, work shift times could be adjusted up to twenty (20) days per year. The increased intake in materials during the peak days would result in an additional 57 truck trips (in addition to the increased typical daily operations of the proposed project). In order to assess worst-case project conditions, WJVA analyzed expected increases in traffic noise exposure that could occur as a result of the implementation of the “peak season” conditions, expected to occur approximately twenty days per year.

The project would typically result in an increase of 64 additional employee trips per day and 200 additional truck trips per day. Additionally, during peak season, the project would result in an increase of 314 truck trips over existing volumes. Of the 64 additional employee trips, 42 would occur during nighttime hours of 10:00 p.m. to 7:00 a.m. and 22 would occur during the daytime hours of 7:00 a.m. to 10:00 p.m. (specifically, between 3:00 p.m. and 4:00 p.m.). Of the additional 314 truck trips (peak season conditions), 182 trips would occur during daytime hours and 132 trips would occur during nighttime hours. 81% of additional peak season truck trips along SR 25 would occur to the west of the project site, and 19% of additional peak season truck trips along SR 25 would occur to the east of the project site.

WJVA utilized Caltrans traffic count data and truck volume percentages for SR 25 in the vicinity of the project site to analyze existing traffic noise exposure. WJVA applied the above-described additional employee trips and truck trips to the existing vehicle counts obtained from Caltrans to calculate the anticipated increase in project-related traffic noise exposure along SR 25. Noise levels were calculated at various sensitive-receptor locations and setback distances. The setback distances and locations of noise-sensitive receptors were provided by EMC Planning Group, and were based on a Google Earth survey. The sensitive receptors and distances described in Table I are representative of the residences located closest to SR 25. The results of the calculations are provided in Table I. A figure providing the analyzed sensitive-receptor locations is provided as Figure 1.

TABLE I

**EXISTING AND EXISTING PLUS (PEAK SEASON) PROJECT TRAFFIC NOISE LEVELS
Z-BEST PRODUCTS FACILITY MODIFICATION
SANTA CLARA COUNTY**

Receptor	Distances (Feet) From SR 25	L_{dn}, dB		Change	Significant Impact?
		Existing	With Project		
1	500	59.6	60.3	0.7	No
2	320	62.5	63.2	0.7	No
3	200	65.6	66.3	0.7	No
4	600	58.4	59.1	0.7	No
5	200	65.6	65.7	0.1	No
6	200	65.6	65.7	0.1	No
7	80	71.6	71.7	0.1	No
8	1300	53.4	53.5	0.1	No

Source: WJV Acoustics, Inc.
Hexagon Transportation Consultants
Caltrans

Reference to Table I indicates the peak season project-related increases in traffic along SR 25 (additional employee trips and truck trips) would be expected to result in an increase in traffic noise exposure of approximately 0.7 dB at sensitive-receptor locations along SR 25 to the west of the project site and by 0.1 dB at sensitive-receptor locations along SR 25 east of the project site. This is not considered a significant increase in traffic noise exposure.

Although noise levels at most sensitive-receptor locations along SR 25 exceed the County's 55 dB L_{dn} exterior noise level standard, such exceedances are not the result of the project and are therefore not considered to be a significant impact resulting from the project. Additionally, the slight measurable increase in traffic noise level exposure as a result of the project (0.1 to 0.7 dB) would not be noticeable to nearby noise-sensitive receptors. Generally speaking, the human ear cannot discern changes (decreases or increases) in noise levels less than 3 dB.

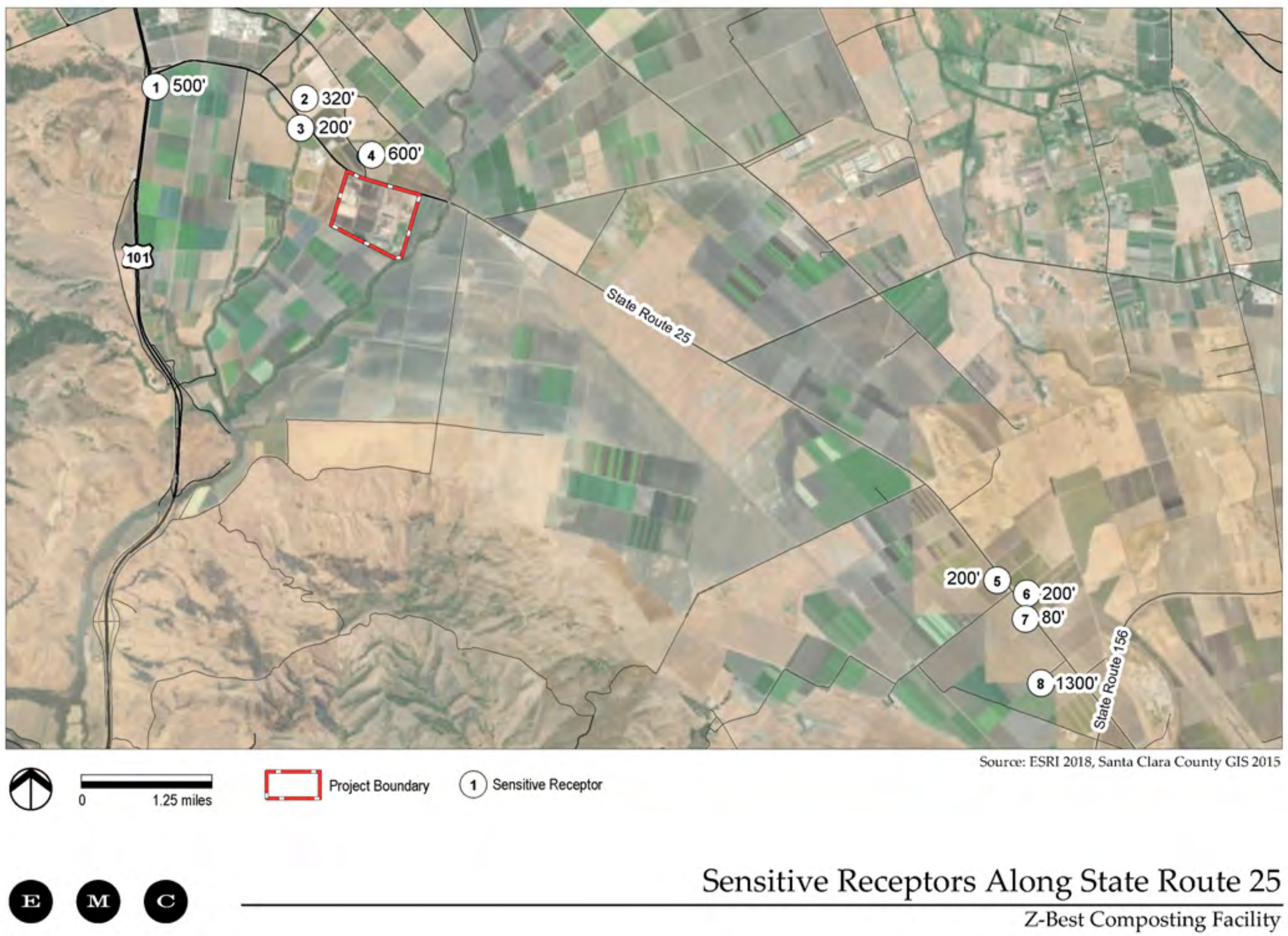
Please contact me at 559-627-4923 or walter@wjvacoustics.com if there are questions or additional information is required.

Sincerely,

WJV ACOUSTICS, INC.

Walter J. Van Groningen
President

FIGURE 1: LOCATIONS OF NOISE-SENSITIVE RECEPTORS (ANALYZED IN (TABLE I)



APPENDIX A

ACOUSTICAL TERMINOLOGY

AMBIENT NOISE LEVEL: The composite of noise from all sources near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

CNEL: Community Noise Equivalent Level. The average equivalent sound level during a 24-hour day, obtained after addition of approximately five decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and ten decibels to sound levels in the night before 7:00 a.m. and after 10:00 p.m.

DECIBEL, dB: A unit for describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).

LDN/L_{dn}: Day/Night Average Sound Level. The average equivalent sound level during a 24-hour day, obtained after addition of ten decibels to sound levels in the night after 10:00 p.m. and before 7:00 a.m.

L_{eq}: Equivalent Sound Level. The sound level containing the same total energy as a time varying signal over a given sample period. L_{eq} is typically computed over 1, 8 and 24-hour sample periods.

NOTE: The CNEL and LDN represent daily levels of noise exposure averaged on an annual basis, while L_{eq} represents the average noise exposure for a shorter time period, typically one hour.

L_{max}: The maximum noise level recorded during a noise event.

L_n: The sound level exceeded "n" percent of the time during a sample interval (L_{90}, L_{50}, L_{10}, etc.). For example, L_{10} equals the level exceeded 10 percent of the time.

A-2

ACOUSTICAL TERMINOLOGY

NOISE EXPOSURE CONTOURS: Lines drawn about a noise source indicating constant levels of noise exposure. CNEL and LDN contours are frequently utilized to describe community exposure to noise.

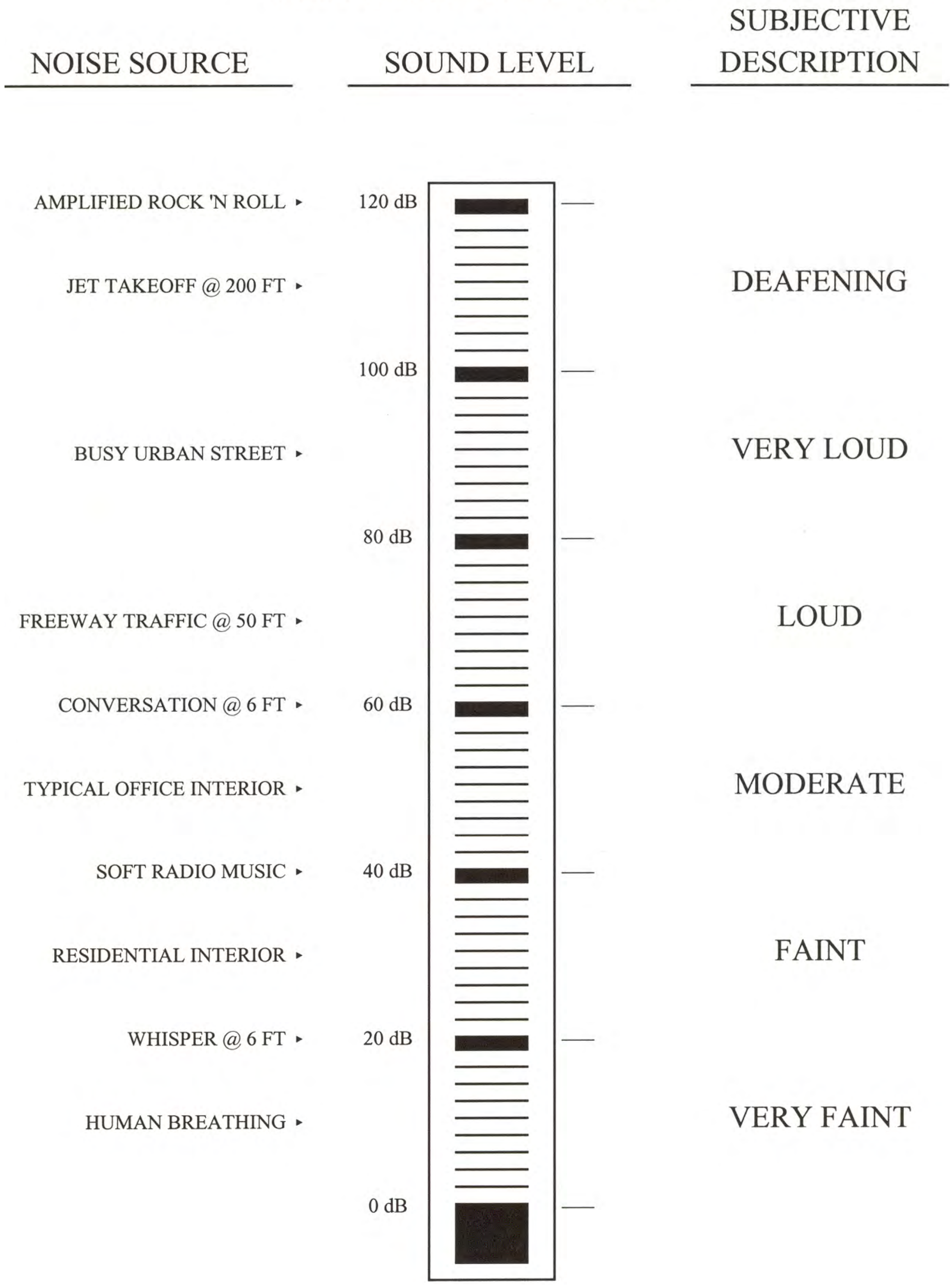
NOISE LEVEL REDUCTION (NLR): The noise reduction between indoor and outdoor environments or between two rooms that is the numerical difference, in decibels, of the average sound pressure levels in those areas or rooms. A measurement of "noise level reduction" combines the effect of the transmission loss performance of the structure plus the effect of acoustic absorption present in the receiving room.

SEL or SENEL: Sound Exposure Level or Single Event Noise Exposure Level. The level of noise accumulated during a single noise event, such as an aircraft overflight, with reference to a duration of one second. More specifically, it is the time-integrated A-weighted squared sound pressure for a stated time interval or event, based on a reference pressure of 20 micropascals and a reference duration of one second.

SOUND LEVEL: The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the response of the human ear and gives good correlation with subjective reactions to noise.

SOUND TRANSMISSION CLASS (STC): The single-number rating of sound transmission loss for a construction element (window, door, etc.) over a frequency range where speech intelligibility largely occurs.

APPENDIX B
EXAMPLES OF SOUND LEVELS



EDWARD L. PACK ASSOCIATES. INC.

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SAN JOSE, CA 95125

Acoustical Consultants

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www.packassociates.com

June 13, 2017
Project No. 48-073-1

Mr. Beto Ochoa
Z-Best Products
980 State Route 25
Gilroy, CA 95020

Subject: Response to Comments, Noise Assessment Study for the Proposed Z-Best Products Food Waste Static Aeration Composting Facility Modifications, Santa Clara County

Dear Beto:

This letter will provide you with our responses to the comments made by the County of Santa Clara Planning staff. The comments were forwarded to me from you on June 5, 2017 via email.

Comment 5.c.i: "…include: A list of all noise generating activities on-site and analyze the additional employee trips, truck deliveries at night, truck weighing and washing."

Response: The list of on-site noise generating activities, including truck operations, weighing and washing and their respective sound levels, are provided in Table IV on page 14 and Table V on page 15. Table V indicates that all of the sound levels generated by the project will be within the standards of the Santa Clara County Noise Ordinance. Compare the noise levels in the black fields with the limits shown at the bottom of the Table.

Comment 5.c.ii: "The scope includes night deliveries which is stated to be the most impactful to sensitive receptors (page 20 of the Noise Assessment Study). Please include recommendations as to how to avoid this impact to the sensitive receptors."

Response: Page 20 of the report states that, "…trucking operations (entering and exiting the facility) could be the impactful source associated with the project…". In other words, of all of the noise sources associated with the project, trucking operations could generate the highest levels. The report does not state that there is a significant impact to the receptor(s). The report stated that the project will result in a 4 decibel increase in trucking noise, which is due to the inclusion of nighttime operations. The resultant noise levels will remain at least 10 decibels below the ambient at the receptor(s) during daytime and nighttime hours. There will be no impact to the residences. Thus, noise mitigation measures are not required.

Comment 5.c.iii: Please expand on the type of noise the new large fans will make and provide any recommendations as to reduce the noise generated from these fans (see also comment 5b).

Response: The fan noise analysis is provided in detail on Pages 17, 18 and 19. The type of noise created by fans is usually a “whirring” sound. As shown in Table VII, the Primary fans will generate slightly more low frequency sound than the secondary fans. The fan sound levels at the receptor location are provided on Table VIII. Outdoor sound levels below 40 dBA are usually barely audible, if at all. There will be no noise exceedances from the fans and given their very low sound levels, noise mitigation measures are not required and are unnecessary. A plan indicating the locations of the fans is provided on Figure 2, Page 19. Comment 5b has to do with hydrology, not acoustics.

Comment 5.c.iv: Provide a site plan identifying sensitive receptors and the location of noise monitoring equipment used in the study.

Response: Because of the large area, for simplicity and easier viewing a Google map showing the site, nearest residential receptor and noise monitoring locations were provided on Figure 1 on Page 12.

This concludes our responses to the Santa Clara County Planning Department comments on the noise study for the project. If you need any additional information, please call me.

Sincerely,

EDWARD L. PACK ASSOC., INC.

Jeffrey K. Pack

Jeffrey K. Pack
President

August 6, 2018

Mr. Ron Sissem
Principal
EMC PLANNING GROUP INC.
301 Lighthouse Avenue, Suite C
Monterey, California 93940

RE: NOISE STUDY PEER REVIEW, Z-BEST PRODUCTS FACILITY MODIFICATION, SANA CLARA COUNTY, CALIFORNIA

Dear Mr. Sissem:

As requested, WJV Acoustics, Inc. (WJVA) has conducted a third-party review of the Noise Assessment Report (report) prepared by Edward L. Pack Associates, Inc. (dated January 12, 2017) for the Z-Best Products Composting Facility Modification project located in Santa Clara County. Additionally, WJVA has verified existing ambient noise levels described in the report. This letter summarizes our comments and findings.

Application of Noise Exposure Criteria

WJVA reviewed the determination of applicable noise level standards provided in the report and found no inconsistencies, errors or omissions. The report properly applies the Santa Clara County noise level standards for the project, as provided in the County's General Plan and Code of Ordinances.

Existing Noise Environment

WJVA reviewed the report's discussion of existing noise environment (page 11) and provides the following comments:

- In order to assess the accuracy of the existing (ambient) noise levels provided in the report, WJVA conducted verification noise measurements at the same two (2) monitoring sites analyzed in the report. WJVA conducted 24-hour noise measurements using automated sound level meters at the two monitoring sites. The existing noise levels were measured by WJVA on July 24, 2018 at Site 1 (closest off-site residence) and

Site 2 (vicinity of screening activities). WJVA measured noise levels at Site 1 to be 69 dB L_{dn} (described to be 67 dB L_{dn} in the report). WJVA measured noise levels at Site 2 to be 73 dB L_{dn} (described to be 73 dB L_{dn} in the report). The slight variation in reported noise levels at Site 1 is considered to be reasonable and due to temporal variations in factors such as traffic volumes and wind and climatic conditions. WJVA measured noise levels at Site 2 to be the same as those described in the report. Therefore, existing ambient noise levels described in the report are determined to be accurate and reasonable.

- WJVA reviewed the analysis of existing project-related noise levels at the closest off-site sensitive receiver and found the analysis and findings to be reasonable with no determined errors or omissions.

<u>Noise Impacts</u>
WJVA reviewed the report's discussion of noise impacts (page 17) and provides the following comments:

- It is unclear how the total hours and distribution of hours for each equipment operation (described in Table IX) was determined. The report does not provide a source describing which equipment operations will be occurring during which hours with the proposed modifications.

- Table IX contains errors in the findings of the total L_{eq} for numerous hours. WJVA added the noise source sound levels provided in Table IX, and determined that numerous hours were added incorrectly. However, it was also determined that the errors had no significance to the overall findings of the report. WJVA utilized the reported noise levels, added the sources per hour and calculated project-related noise levels to be 53 dB L_{dn} at the closest resident (reported to be 52 dB L_{dn} in Table IX).

- WJVA agrees with the findings of the report in such that the project will not result in any measurable increase in existing traffic noise levels or existing traffic volumes. However, demonstrating such via standard methods of analysis will contribute to the overall findings of the report. WJVA utilized the FHWA Traffic Noise Model and traffic data provided by the project traffic analysis (Hexagon Transportation Consultants, 2/7/17) to calculate a worst-case assessment of project-related increases in traffic noise at the closest off-site residence (near ambient monitoring site 1) and determined that the project could result in an increase in traffic noise of approximately 0.2 dB L_{dn}. Such an increase does not result in a significant impact.

<u>Conclusions and Recommendations:</u>

The report provides a sufficient discussion and application of appropriate noise standards relevant to the project. Additionally, the report accurately describes the existing noise environment at the closest off-site residence, essential to the determination of findings.

WJVA finds the overall findings of the report to be reasonable and accurate. However, the author should clarify as to how the total hours and distribution of hours for each equipment operation (described in Table IX) was determined. It is assumed that the hours were provided in the project application or by the project owner, but is not stated. As this is key to determining overall project-related noise exposure at the nearby residence, the report should provide a source describing which equipment operations will be occurring during which hours with the proposed modifications.

This concludes our third-party review of the Edward L. Pack Associates Traffic Noise Study for the “Z-Best Products Composting Facility Modification” project (dated January 12, 2017). Please do not hesitate to contact me at (559) 627-4923 or walter@wjvacoustics.com if you have any questions or would like additional information.

Sincerely,

WJV ACOUSTICS, INC.

Walter J. Van Groningen
President

APPENDIX G

Response to Peer Review of 2020 Traffic Analysis
Peer Review of 2020 Traffic Analysis
2020 Traffic Analysis
Response to Peer Review of 2017 Traffic Analysis
Peer Review of 2017 Traffic Analysis
2017 Traffic Analysis
Transportation Improvement Plan Set

HEXAGON TRANSPORTATION CONSULTANTS, INC.

Memorandum

Date: March 30, 2020

To: John Doyle, Z-best

From: Robert Del Rio, T.E.

Subject: Response to Peer Review Letter for the Z-Best Compost Facility Application (File No. 6498-17P)

This memo is being provided in response to the second peer review letter prepared for the proposed Z-Best Compost Facility Expansion. The peer review letter dated March 17, 2020 and prepared by Keith Higgins, consisted of a review of the January 30, 2020 traffic operations study. The peer review listed a total of 16 comments. The following is a summary of responses to the peer review comments.

- Comment 1 discusses existing and projected peak hour traffic and congestion along SR 25. The referenced traffic conditions currently exist and are projected to occur without the proposed project. The comment is noted, however there are no additional issues identified in the comment that warrant addressing in a revised operations study.

- Comment 2 references the future widening of SR 25 and associated improvements. The comment is noted, however there are no additional issues identified in the comment that warrant addressing in a revised operations study.

- The project's trip generation estimates and alignment with peak traffic conditions along SR 25 are discussed in Comment 3. The comment is noted, however there are no additional issues identified in the comment that warrant addressing in a revised operations study.

- The proposed relocation of the project site's access point from its existing location along SR 25 to the Bolsa Road intersection with SR 25 are discussed in Comment 4. The comment discusses the planned access point configuration and anticipated safety and operations of the relocated site access point. The future operations and safety at the site access point are accurately described in the comment. There are no additional issues identified in the comment that warrant addressing in a revised operations study.

- The use of Bolsa Road by existing site traffic as wells as traffic associated with the proposed project expansion are discussed in Comments 5 and 6. The comments note that the proposed relocation of the project access point to Bolsa Road may result in a minimal increase in the use of Bolsa Road by project traffic. However, the project proposes to continue to prohibit the use of Bolsa Road by trucks originating from and bound for the project site. Thus, as stated in the comment, the project will result in little to no increased usage of Bolsa Road by employees and trucks associated with the project.

- Comments 7 and 11-16 reference the planned design of the relocated project access point to Bolsa Road. The comments will be considered in the ultimate access point design along with Caltrans review. However, there are no additional issues identified in the comment that warrant addressing in a revised operations study.

- The remaining comments, 8-10, address minor textual and formatting considerations. However, the comments do not identify significant issues that warrant addressing in a revised operations study.

Keith Higgins
Traffic Engineer

March 20, 2020

Ron Sissem
EMC Planning Group
301 Lighthouse Avenue, Suite C
Monterey, CA 93940

Re: Z-Best Traffic Operations and Site Access Analysis Peer Review, Santa Clara County, CA

Dear Ron,

As you requested, this is a peer review of the “Z-Best Traffic Operations and Site Access Analysis,” State Route 25, Santa Clara County, California, prepared by Hexagon Transportation Consultants, Inc., January 30, 2020 (herein referred to as the “Operations Analysis”). Supplemental information was also reviewed, including the “Response to Peer Review Comments on the Z-Best Compost Facility Application (File No. 6498-17P), Hexagon Transportation Consultants, Inc., January 25, 2019 (herein referred to as the “Response to Comments”).

General comments are also provided for the latest version of “Figure 4 - Conceptual Bolsa Road/Relocated Project Driveway Improvements,” Ruggeri-Jensen-Azar (herein referred to as the “Conceptual Plan”), which is dated January 14, 2020. This supersedes the November 16, 2019 version included in the Operation Analysis.

The following are my comments on the above-referenced Operations Analysis.

1. Pg. 1, Scope of Study – Changes in shift hours will occur that move the arrival and departure times further from the traditional 7-9 am and 4-6 pm street peak hours of traffic. However, peak traffic conditions occur much earlier and for a longer time along SR 25. This is due to its regional function and because commuters leave Hollister as early as 5 am to avoid northbound US 101 traffic congestion and/or to arrive at employment centers in Silicon Valley before traditional work starting times. The study intersections should be analyzed during Project peak hour conditions.

2. Pg. 4, Potential SR 25 Widening and Realignment - The study includes analyzing the existing highway network and the existing SR 25 after its conversion to a frontage road with the proposed SR 152 Trade Corridor. That project includes the US 101 / SR 25 interchange reconstruction, widening US 101 to 6 lanes and the realignment and widening of SR 25 to 4 lanes in Santa Clara County near Z-Best. It only has funding through the environmental phase. With the recent passage of San Benito County Measure G, the SR 25 Widening and Realignment portion in San Benito County has funding and is expected to be constructed by 2030. In order to expedite the major widening project, it will require issuing bonds and obtaining matching State funds. However, the San Benito County Council of Governments

(SBCOG), the project sponsor, has limited bonding capacity. It therefore must implement the project in phases. At this time, SBCOG is considering constructing an interchange at the State Route 25/State Route 156 intersection. This will be discussed at the SBCOG Board meeting on March 19, 2020. SBCOG has an ad-hoc committee with Caltrans District 4 (Santa Clara County, in which Z-Best is located), Caltrans District 5 (San Benito County), Santa Clara Valley Transportation Authority (VTA) to finalize the strategic plan for delivery of Measure G projects in cooperation with VTA improvements at the US 101 / State Route 25 interchange. A final strategic plan that addresses funding limitations is expected to be delivered to the SBCOG Board for adoption in early summer, 2020.

3. Pg. 3, Existing Trip Generation Estimates – Truck scale data is now 4 to 5 years old. The applicant has stated that project activity levels have not changed over the past four years. It would be helpful for the applicant to provide documentation.

4. Pg. 3, Existing Trip Generation – Study intersection traffic counts were collected in August 2015, which is over 4 years old. It would be helpful for the validity of intersection volumes to be documented as well. For informational purposes, the daily traffic volumes on Highway 25 along the project frontage for the most recent five years reported on the Caltrans Traffic Volumes website are tabulated below. This indicates that Highway 25 traffic volumes increased by 20.8% over the most recent four-year period for which data is available. It is likely that the trend has continued since 2017 to the present time. Increased traffic demand on Highway 25 would likely result in more peak spreading. In other words, peak traffic conditions may now extend for longer periods during the day, including earlier in the morning and the afternoon when the project is proposing to have its work shifts occur.

   Traffic volume increases on Highway 25 would likely not appreciably change the findings and conclusions. However, provision of current traffic volume data would be helpful for informational purposes.

   The proposed driveway improvements including channelization on Highway 25 will require a Caltrans Encroachment Permit. Caltrans may require updated traffic forecasts during its plan check process.

Year	AADT	Percent Change from Previous Year	Percent Change Since 2013
2017	27,300	5.0%	20.8%
2016	26,000	9.2%	15.0%
2015	23,800	3.0%	5.3%
2014	23,100	2.2%	2.2%
2013	22,600		

Highway 25 Average Annual Daily Traffic (AADT) at Project

5. Pg. 8, Proposed SR 25 Site Access Improvements – The project driveway is proposed to be realigned to become a fourth (south) leg at the existing Bolsa Road intersection. The proposed improvement includes a westbound Highway 25 left turn lane for traffic entering the project as well as a westbound left turn acceleration lane for traffic exiting the project and heading westbound on Highway 25. An eastbound Highway 25 right turn lane is also proposed. An eastbound Highway 25 left turn lane is not included due to the very low volume that makes this movement.

   The proposed westbound left turn lane will provide a refuge for westbound Highway 25 vehicles waiting for gaps in eastbound traffic to turn into the Project. This will be a safety improvement compared to existing conditions.

   The proposed westbound median acceleration lane will allow vehicles making a left turn as they exit the Project to cross one direction of Highway 25 traffic at a time, which is considered a two-step left turn movement. This will be a safety improvement compared to existing conditions.

   No eastbound Highway 25 left turn lane at Bolsa Road is proposed. This is a very low existing movement that may be reduced because exiting Project traffic destined to Bolsa Road that currently turns right followed by an eastbound left onto Bolsa Road would become a through movement directly onto Bolsa Road. The lack of a left turn would essentially be equivalent to existing conditions.

   No eastbound median acceleration lane is proposed to be provided for vehicles exiting Bolsa Road to proceed eastbound on Highway 25. This is similar to existing conditions. However, these vehicles will be required to yield to westbound left turns waiting to enter the Project. These vehicles currently enter the Project downstream (west) of Bolsa Road, so have already cleared the Bolsa Road intersection. This will result in a slight increase in delay for Bolsa Road traffic attempting to proceed eastbound on Highway 25. Very few westbound left turns will be entering the Project during the PM peak hours when peak demand on Bolsa Road occurs, so this should only result in a slight increase in delay and corresponding reduced safety for this movement from the Project driveway relocation. When considering the beneficial safety effects of the channelization improvements, the proposed driveway relocation plus shift changes will result in an overall improvement in safety.

   The Highway 25 / Bolsa Road intersection already meets peak hour signal warrants. The relocation of the Project driveway will result in some increase in delay for the Bolsa Road movement. This would further indicate more consideration being given to signalization. However, given that there are 8-hour warrants as well as other warrants and operational considerations, Caltrans has typically had a policy of not installing traffic signals based only on the peak hour warrant. Caltrans' decision to not install a traffic signal at this intersection is consistent with their decision to not signalize other intersections along Highway 25, including Wright Road, Flynn Road and Shore Road in the "Route 25 Safety and Operations Project Study Report" prepared by Caltrans in 2005. In that study Caltrans recommended acceleration and deceleration lanes on Highway 25 at Bolsa Road and median left turn lane at the Z-Best and Uesugi Farms driveways.

In this case, the intersection will need to be monitored to determine if a signal is the appropriate traffic control.

6. Pg. 8, Proposed SR 25 Site Access Improvements – The relocation of the Project driveway to be directly across from Bolsa Road could result in some additional Project traffic using Bolsa Road. However, Project trucks are currently prohibited from using Bolsa Road. The Project employee volumes are low. Traffic entering the site from the north via Bolsa Road can currently turn left into the site. Any Project traffic that would use Bolsa Road would need to cross both directions of Highway 25 traffic. This is a major disincentive for inbound Project traffic to use Bolsa Road. Outbound traffic will have a median acceleration lane to assist in heading westbound on Highway 25. This will be an easier movement than attempting to cross both directions of Highway 25 traffic to enter northbound Bolsa Road. Very few, if any, additional Project trips would use Bolsa Road with the proposed realignment of the Project driveway to be the fourth leg at Bolsa Road.

7. Pg. 11, Figure 3, "Trip Distribution and Traffic Volumes Under Project Conditions" – A small amount of through traffic may occur between the north leg of Bolsa Road and the Proposed Project Entrance. This would affect the volume diagram for the Proposed Bolsa Road Project Entrance. This will not affect the levels of service but should be noted on Figure 3.

8. Pg. 13, Existing and Project Conditions Traffic Volumes - The Existing and Project traffic volumes reflect project volumes during the peak hours between 7 and 9am and 4 and 6pm. The project's street morning peak hour volumes will total 1 inbound and 1 outbound trip. The project's street evening peak hour volumes will total 0 inbound and 20 outbound trips. However, the project's morning peak hour will occur between 6 and 7am and will total 40 inbound trips and 7 outbound trips. The project's afternoon peak hour volume will occur between 3 and 4pm and total 0 inbound trips and 47 outbound trips. The study already indicates that the project driveway will operate at Level of Service F at certain times, so no additional level of service analysis is required. However, the project volumes during the project's peak hours should be used to determine channelization storage requirements. Project peak hourly truck volumes should also be included in the storage requirement determination.

9. Pg. 14, Figure 5 "Conceptual Existing Project Driveway Improvements" – Consider removing this from the report if it is no longer a proposed alternative or provide a discussion regarding why it is no longer a consideration.

10. Pg. 16, Existing Project Entrance Alternative, first sentence – Add "during the PM peak hour" after LOS F.

11. Pg. 16, Signal Warrant Analysis – The second paragraph indicates that the SR 25 / Bolsa Road intersection currently meets peak hour signal warrants. A traffic signal is not recommended in the report or apparently supported by Caltrans with the proposed relocation of the project entrance to this intersection. However, given that a signal is warranted, traffic conditions should be monitored

12. Pg. 17, Intersection Operations (Queuing) Analysis – The analysis should include storage requirements during project peak hours as well as street peak hours to ensure that the maximum queues are considered in the design of the left turn storage.

13. Pg. 17, Intersection Operations (Queuing) Analysis – The assumed length of the queue should include one truck plus one car. Each car should be assumed to have a length of 25 feet. Measurements of on-site trucks using Google Earth indicate that trucks are over 70 feet in length. The minimum storage may need to be 100 feet. Deceleration and storage lengths will be reviewed and approved by Caltrans during the Encroachment Permit plan check process.

14. Pg. 18, Highway Design Manual Standards – The Caltrans Highway Design Manual Index 101.1 indicates that the design speed should be above the observed operating speed. This often is higher than the posted speed limit. The design speed will be reviewed and approved by Caltrans during the Encroachment Permit plan check process. This applies to sight distance, approach taper lengths and deceleration lane lengths.

15. Pg. 19, Lane Width – The minimum lane width is 10 feet. However, the turn lanes will carry a moderate amount of truck traffic. This is more important for the westbound left turn acceleration lane because trucks entering this lane from the Project could not be parallel to the travel lanes for a distance along the acceleration lane. Lane widths will be approved by Caltrans.

16. Pg. 19, Storage Length – See Comment 14 above.

17. Pg. 20, Potential SR 25 Widening and Realignment – See Comment 2 above.

At the request of the County, Keith Higgins, Traffic Engineer, has conducted an independent peer review of the "Z-Best Traffic Operations and Site Access Analysis," State Route 25, Santa Clara County, California, prepared by Hexagon Transportation Consultants, Inc., January 30, 2020 (herein referred to as the "Operations Analysis"). Supplemental information was also reviewed, including the "Response to Peer Review Comments on the Z-Best Compost Facility Application (File No. 6498-17P), Hexagon Transportation Consultants, Inc., January 25, 2019 (herein referred to as the "Response to Comments") submitted by Z-Best Products to verify the technical accuracy of the information, and identify any apparent deficiencies, errors and omissions affecting the completeness, methodologies, findings and adequacies of the analysis. The ultimate goal of the peer review is to help ensure that the information contained in the report met accepted professional standards for use in the EIR.

As part of the peer review, Keith Higgins, Traffic Engineer, advised County staff of any revisions or additions to the report that were necessary. Keith Higgins, Traffic Engineer, has submitted this peer review letter to the County to document its comments. In turn, Hexagon Transportation Consultants, Inc. will respond to the peer review comments and/or revise the analysis. The primary requested information is updated traffic count data for purposes of Caltrans' future encroachment permit process. The latest status of the major Highway 25 widening project is also provided in this comment letter, indicating that the proposed Z-Best driveway improvements will be handling main line Highway 25 traffic, rather than located on a frontage road, for a longer period than initially anticipated. This will not materially change the conclusions of the Hexagon reports.

This peer review letter and anticipated responses/analysis revisions from Hexagon Transportation Consultants, Inc. are part of the administrative record for the EIR. Based on the peer review conducted; Keith Higgins, Traffic Engineer, concludes that the "Z-Best Traffic Operations and Site Access Analysis," State Route 25, Santa Clara County, California, prepared by Hexagon Transportation Consultants, Inc., January 30, 2020 (herein referred to as the "Operations Analysis") with supplemental information included in the "Response to Peer Review Comments on the Z-Best Compost Facility Application (File No. 6498-17P), Hexagon Transportation Consultants, Inc., January 25, 2019 (herein referred to as the "Response to Comments") as revised is anticipated to be appropriate for use as reference in the EIR.

Please call me if you have any questions. Thank you for the opportunity to assist you.

Sincerely,

Keith Higgins

Keith Higgins, PE, TE

HEXAGON TRANSPORTATION CONSULTANTS, INC.

Memorandum

Date: January 30, 2020

To: John Doyle, Z-Best Products

From: Robert Del Rio. T.E.

Subject: Z-Best Traffic Operations and Site Access Analysis

Introduction

Hexagon Transportation Consultants, Inc. has completed a traffic operations and site access analysis for the proposed facility expansion and site operations at the existing Z-Best Compost Facility located along State Route (SR) 25, south of the City of Gilroy in southern Santa Clara County, California. The proposed project consists of material processing operation improvements on the existing site to more efficiently process a larger volume of material. Access to the project site is currently provided via one stop-controlled full access entrance along the south side of SR 25 (for ease of reference, SR 25 will be referred to as an east/west roadway within this report) located approximately 600 feet west of the Bolsa Road intersection with SR 25. As part of the proposed facility expansion, the project also is proposing to replace the existing access point along SR 25 with a new access point that will align with Bolsa Road via a new fourth leg at the existing SR 25 and Bolsa Road intersection. The project site location is presented in Figure 1.

The purpose of the traffic operations analysis is to determine the magnitude of project traffic currently on the adjacent roadway system and estimate the amount of additional traffic that would be added to the roadway system as a result of the proposed facility and operations expansion (hereafter referred to as the proposed project). Existing operational and/or safety constraints at the existing site access point and the proposed new access point at Bolsa Road and on the surrounding roadways and intersections also was evaluated. The analysis of the transportation system is based on applicable local and regional standards.

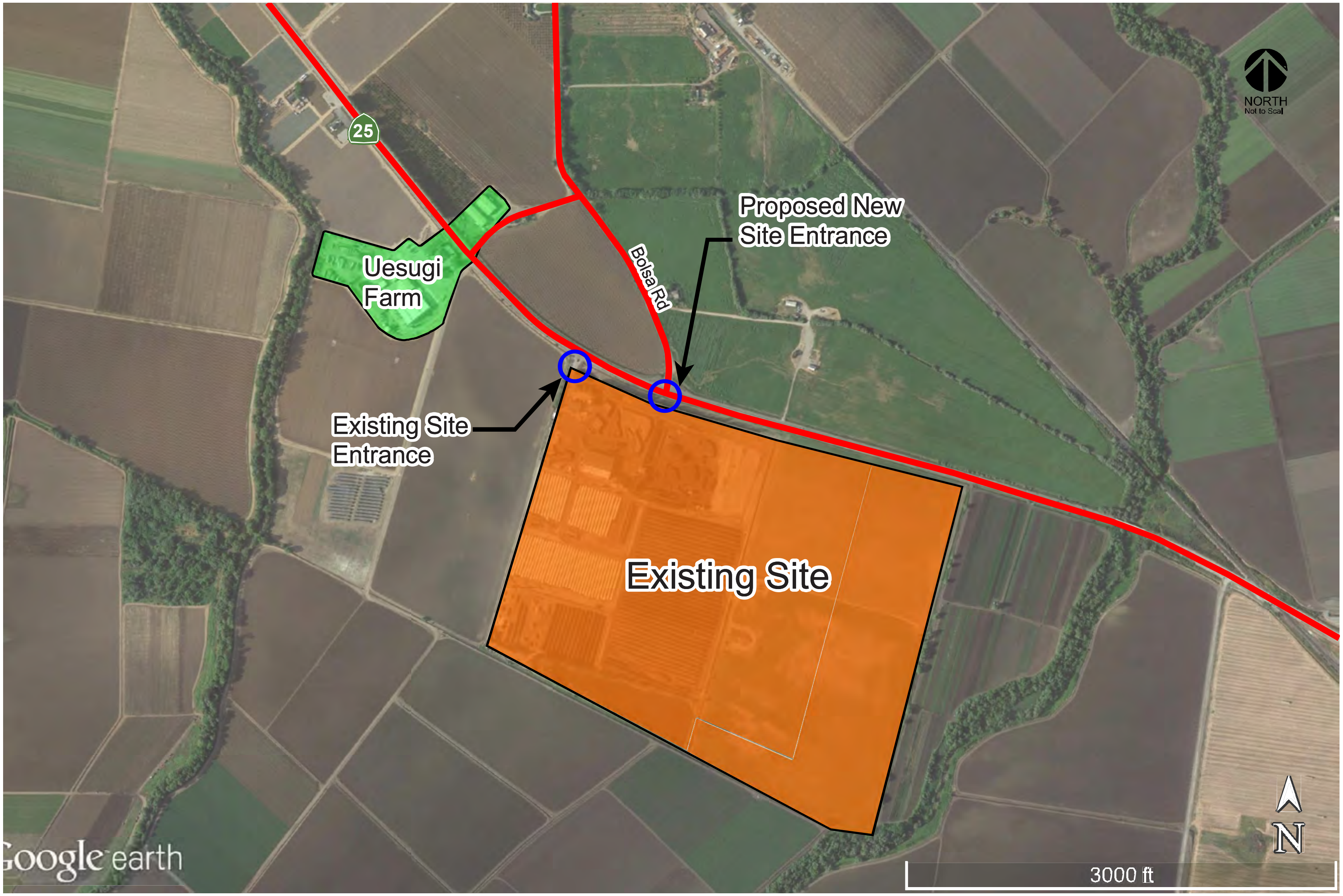
Scope of Study

The traffic operations analyses at the site access points consist of peak hour level of service analysis, signal warrant checks, and queuing analysis. The analysis includes an evaluation of traffic conditions during the AM (7:00AM to 9:00 AM) and PM (4:00 PM to 6:00 PM) peak commute periods at the following two intersections:

SR 25 and Existing Project Entrance
SR 25 and Bolsa Road/Proposed Bolsa Road Project Entrance

Additionally, highway segments along SR 25, east and west of the project site, also were evaluated to identify any existing deficiencies and to quantify the amount of additional traffic that is projected to be added by the proposed project.

Figure 1
Z-Best Site Location



Study Scenarios

The following study scenarios study were evaluated:

Existing Conditions: Existing conditions represent existing peak-hour traffic volumes obtained from intersection turn movement counts completed in 2015.

Existing Plus Project Conditions: Existing plus project conditions represent existing peak-hour traffic volumes with the addition of the traffic estimated to be generated by the proposed facility expansion. This scenario assumes no changes to the existing roadway network or the existing project access.

Existing Plus Project with a Proposed Access Point at Bolsa Road Conditions: Existing plus project conditions with the adjustment of traffic volumes to reflect a new project access point at Bolsa Road.

Trip Generation, Distribution, and Assignment

Existing Facility Operations

Currently, the Z-Best facility is permitted to receive up to 1500 tons per day of feedstock material, inert material for facility maintenance, and additives used in finished products. Feedstock includes both green waste and municipal solid waste (MSW). Up to 2,500 tons per day of material may be received a maximum of 15 days per year and subset peak tonnages are set at 1,300 tons per day for green waste, 700 tons per day of MSW, and 500 tons per day of other material. The current hours of operation for the Z-Best facility are Monday through Friday 6 AM to 5 PM and Saturday 6 AM to 12 PM. The existing use permit allows the processing building to operate from 6 AM to 10 PM, the overall facility from 6 AM to 6 PM, and the windrow materials receiving, screening and turning (on-site) to be 24 hours a day. The facility is currently operated by 58 full-time employees (allowable maximum number of employees by current use permit is 60 employees) in five shift times (5 AM to 5 PM, 7 AM to 5 PM, 5 PM to 5 AM, 5 PM to 1:30 AM, and 6 AM to 5 PM), with the majority of the employees (30 employees) working between 5 AM and 5 PM. The existing work shift times and number of employees per shift are summarized in Table 1.

Existing Trip Generation Estimates

Project trips currently utilizing the project entrance and on the surrounding roadway system were determined based upon truck scale data provided by Z-Best and count data collected at the project entrance.

The truck scale data provided by Z-Best includes the daily number of inbound and outbound trucks by hour that passed over the on-site scales during the period of October 2013 through September 2014, which, according to Z-Best staff, represent peak operations of the facility over the past two years. The existing count data was collected in August 2015 and consists of (1) peak-hour intersection turn-movement counts collected at the site's entrance during the AM peak period (7:00 AM to 9:00 AM) and the PM peak period (4:00 PM to 6:00 PM) and (2) 24-hour vehicle composition video counts also collected at the site's entrance. The new 24-hour vehicle composition data were compared with the truck data provided by Z-Best to validate the truck scale data. The number of daily and peak hour trips to the site associated with all other non-truck traffic also were obtained from the new traffic counts.

Other non-truck vehicular trips associated with the site include cars or smaller trucks driven by employees or vendors and parts and supply deliveries. Both the truck scale data provided by Z-Best and new count data are contained in the Appendix. The existing site trip generation data is summarized in Table 2.

Table 1
Existing and Proposed Employee Work Shift Times

Hours of Operation	Existing Conditions [1]					Proposed Daily Conditions [2]					Peak Season Conditions [2]		
12:00 AM to 1:00 AM			SHIFT	SHIFT				SHIFT	SHIFT				SHIFT
1:00 AM to 2:00 AM			3	4 4				3	4				3
2:00 AM to 3:00 AM													
3:00 AM to 4:00 AM													
4:00 AM to 5:00 AM	30 *					47 *			13		45 *		
5:00 AM to 6:00 AM	SHIFT		5		2 *	SHIFT		10		2 *	SHIFT		15
6:00 AM to 7:00 AM	1	17 *			SHIFT	1	18*			SHIFT	1		
7:00 AM to 8:00 AM		SHIFT			5		SHIFT			5		30 *	
8:00 AM to 9:00 AM		2					2					SHIFT	
9:00 AM to 10:00 AM												2	
10:00 AM to 11:00 AM													
11:00 AM to 12:00 PM													
12:00 PM to 1:00 PM													
1:00 PM to 2:00 PM													
2:00 PM to 3:00 PM													
3:00 PM to 4:00 PM						47							
4:00 PM to 5:00 PM			5 *	4 *				10 *			45		
5:00 PM to 6:00 PM	30	17	SHIFT	SHIFT	2		18	SHIFT		2			15 *
6:00 PM to 7:00 PM			3	4				3				30	SHIFT
7:00 PM to 8:00 PM									13*				3
8:00 PM to 9:00 PM									SHIFT				
9:00 PM to 10:00 PM									4				
10:00 PM to 11:00 PM													
11:00 PM to 12:00 AM													

Notes:
[1] Existing facility shift times and number of employees per shift (assumes employees will arrive at the site 15 minutes prior to the beginning of their work shifts and leave the site 15 minutes after completion of their work shift).
[2] Proposed facility shift times and assumed number of employees per shift (assumes employees will arrive at the site 15 minutes prior to the beginning of their work shifts and leave the site 15 minutes after completion of their work shift).
* Number of employees per work shift.

Table 2
Existing Site-Generated Trips

				Peak Hours					
	Daily			AM			PM		
Type	In	Out	Total	In	Out	Total	In	Out	Total
Total Vehicle Trips									
Driveway Counts[1]	192	198	390	10	9	19	9	27	36
Heavy Truck Trips									
Truck Trips (Counts)[2]	104	105	209	6	8	14	5	5	10
Truck Trips (Scale Data)[3]	132	132	264	13	13	26	10	10	20

Notes:
AM = one peak-hour between 7:00 - 9:00 am
PM = one peak-hour between 4:00 - 6:00 pm
Daily = 24-hour total
1 Based on peak hour intersection turn-movement and 24-hour daily counts completed at the project site entrance in August 2015.
2 Based on vehicle composition obtained from 24-hour daily counts completed ar project site entrance in August 2015.
3 Based on truck scale data provided by Z-Best (October 1st, 2013 to December 31st, 2013).

The count data collected at the site entrance indicates that the facility currently generates 390 daily vehicle trips with 19 trips occurring during the AM peak hour and 36 trips occurring during the PM peak hour.

Based on the vehicle composition data collected at the site entrance, approximately 209 daily truck trips are currently generated by the facility. The truck scale data indicated a peak of 264 daily truck trips. The number of truck trips obtained from the traffic counts is approximately 20% less than that indicated by the truck scale data. However, the truck scale data is reflective of a period of peak operations for the facility over the past two years.

Hourly site-generated trips, both truck and non-truck trips, were estimated by correlating the 24-hour count information collected at the site entrance with the current number of employees and their shift-times. Based on this information, all components of traffic currently accessing and leaving the project site throughout the day were estimated (see Table 3). It is estimated that approximately 208 truck trips and 182 non-truck trips (116 employee trips and 66 “other” trips), for a total of 390 total trips, are currently generated by the Z-Best Facility on an average weekday.

Proposed Facility Expansion Operations – Typical Day

The proposed facility and operations expansion (the project), involves replacing the current method of composting MSW with a more advanced, far more efficient method of composting. The current CTI composting system is proposed to be replaced with a “State of the Art” ECS composting method. With these proposed improvements, Z-Best will be able to compost more than double the amount of MSW feedstock within the same time period and within the same footprint on the site. Subsequently, Z-Best is proposing an increase in the daily feedstock tonnage limit from 1,500 tons per day to 2,750 tons per day. The additional feedstock tonnage is proposed to be received only during non-peak traffic hours (9:00 am to 3:00 pm and 8:00 pm to 4:00 am).

The number of employees also is proposed to increase from the current 58 employees (60 allowed by the use permit) to 80-85 employees (with a maximum of 90 employees allowed by the use permit). The

Table 3
Typical Daily Site-Generated Trips

Hours of Operation		Existing Conditions [1]						Proposed Conditions [2]													
					Total Site Trips			Non-Truck Trips				Truck Trips				Total Site Trips			Net Additional Trips		
		Non-Truck Trips (Based on Driveway Counts)	Truck Trips (Based on Driveway Counts)	Total	In	Out	Total	Additional Employee Trips	Existing Employee Trips/New Shift Times	Other Non-Truck Trips	Total Future Non-Truck Trips	Additional Truck Trips	Existing Truck Trips/Off-Peak Hours Restriction	Total Future Truck Trips	Total	In	Out	Total	In	Out	Total
12:00 AM	Arrivals	0	1	1	1	0	1			0	0	7	7	14	14	14	14	28	13	14	27
to 1:00 AM	Departures	0	0	0						0	0	7	7	14	14						
1:00 AM	Arrivals	0	0	0	0	1	1			0	0	7	7	14	14	14	14	28	14	13	27
to 2:00 AM	Departures	0	1	1						0	0	7	7	14	14						
2:00 AM	Arrivals	0	0	0	0	0	0			0	0	7	7	14	14	14	14	28	14	14	28
to 3:00 AM	Departures	0	0	0						0	0	7	7	14	14						
3:00 AM	Arrivals	0	3	3	3	5	8			0	0	7	7	14	14	14	14	28	11	9	20
to 4:00 AM	Departures	4	1	5						0	0	7	7	14	14						
4:00 AM	Arrivals	5	5	10	10	5	15	17	30	0	47		5	5	52	52	18	70	42	13	55
to 5:00 AM	Departures	0	5	5				9	4	0	13		5	5	18						
5:00 AM	Arrivals	2	5	7	7	3	10		2	0	2		5	5	7	7	15	22	0	12	12
to 6:00 AM	Departures	0	3	3				5	5	0	10		5	5	15						
6:00 AM	Arrivals	33	7	40	40	7	47	1	17	0	18		5	5	23	23	5	28	-17	-2	-19
to 7:00 AM	Departures	0	7	7						0	0		5	5	5						
7:00 AM	Arrivals	**4**	**6**	**10**	**10**	**11**	**21**			0	0			0	0	0	0	0	-10	-11	-21
to 8:00 AM	Departures	**3**	**8**	**11**						0	0			0	0						
8:00 AM	Arrivals	6	6	12	12	5	17			**1**	**1**			**0**	**1**	**1**	**1**	**2**	-11	-4	-15
to 9:00 AM	Departures	3	2	5						**1**	**1**			**0**	**1**						
9:00 AM	Arrivals	6	13	19	19	20	39			6	6	8	5	13	19	19	20	39	0	0	0
to 10:00 AM	Departures	7	13	20						7	7	8	5	13	20						
10:00 AM	Arrivals	9	7	16	16	23	39			9	9	7	5	12	21	21	23	44	5	0	5
to 11:00 AM	Departures	11	12	23						11	11	7	5	12	23						
11:00 AM	Arrivals	4	8	12	12	16	28			4	4	7	5	12	16	16	18	34	4	2	6
to 12:00 PM	Departures	6	10	16						6	6	7	5	12	18						
12:00 PM	Arrivals	4	10	14	14	15	29			4	4	7	5	12	16	16	17	33	2	2	4
to 1:00 PM	Departures	5	10	15						5	5	7	5	12	17						
1:00 PM	Arrivals	3	12	15	15	13	28			3	3	7	6	13	16	16	17	33	1	4	5
to 2:00 PM	Departures	4	9	13						4	4	7	6	13	17						
2:00 PM	Arrivals	3	8	11	11	10	21			2	2	7	6	13	15	15	14	29	4	4	8
to 3:00 PM	Departures	3	7	10						1	1	7	6	13	14						
3:00 PM	Arrivals	3	5	8	8	13	21			0	0			0	0	0	47	47	-8	34	26
to 4:00 PM	Departures	6	7	13				17	30	0	47			0	47						
4:00 PM	**Arrivals**	**5**	**5**	**10**	**10**	**27**	**37**	5	5	0	10			0	10	10	0	10	0	-27	-27
to 5:00 PM	**Departures**	**22**	**5**	**27**						0	0			0	0						
5:00 PM	Arrivals	0	1	1	1	20	21			**0**	**0**			**0**	**0**	**0**	**20**	**20**	**-1**	**0**	**-1**
to 6:00 PM	Departures	18	2	20				**1**	**19**	**0**	**20**			**0**	**20**						
6:00 PM	Arrivals	1	0	1	1	2	3			1	1			0	1	1	0	1	0	-2	-2
to 7:00 PM	Departures	1	1	2						0	0			0	0						
7:00 PM	Arrivals	0	0	0	0	0	0	9	4	0	13			0	13	13	0	13	13	0	13
to 8:00 PM	Departures	0	0	0						0	0			0	0						
8:00 PM	Arrivals	0	1	1	1	1	2			0	0	8	8	16	16	16	16	32	15	15	30
to 9:00 PM	Departures	0	1	1						0	0	8	8	16	16						
9:00 PM	Arrivals	0	0	0	0	0	0			0	0	7	7	14	14	14	14	28	14	14	28
to 10:00 PM	Departures	0	0	0						0	0	7	7	14	14						
10:00 PM	Arrivals	0	1	1	1	1	2			0	0	7	7	14	14	14	15	29	13	14	27
to 11:00 PM	Departures	1	0	1						1	1	7	7	14	15						
11:00 PM	Arrivals	0	0	0	0	0	0			0	0	7	7	14	14	14	14	28	14	14	28
to 12:00 AM	Departures	0	0	0						0	0	7	7	14	14						
TOTAL DAILY TRIPS:		**182**	**208**	**390**	**192**	**198**	**390**	**64**	**116**	**66**	**246**	**200**	**208**	**408**	**654**	**324**	**330**	**654**	**132**	**132**	**264**

Notes:
[1] Existing hourly project site traffic activity was estimated based on the existing 24-hour vehicle composition traffic counts conducted at the project site entrance in August 2015, in combination with information provided by Z-Best on their current number of employees, employee shift times, and hours of operation.
[2] Hourly site traffic projections associated with the proposed Z-Best facility operations expansion. These projections are based on the anticipated increase in the number of employees and number of trucks accessing the site daily, the proposed new employee shift times, and the restriction of all inbound truck traffic to the site during the off-peak hours only (8:00PM - 4:00AM) and outbound truck traffic to the hours of (4:00AM - 7:00AM and 9:00 AM to 3:00 PM).

proposed new work shift times would be the following: 5 AM to 3 PM, 7 AM to 5 PM, 5 PM to 5 AM, 8 PM to 4:30 AM and 6 AM to 5 PM. The work shift times are used to estimate the peak hour traffic that may be generated by the proposed facility expansion. The proposed work shift times and assumed number of employees per shift are summarized in Table 1.

Proposed Facility Expansion Trip Generation Estimates – Typical Day

The additional traffic associated with the expansion of the facility operations were estimated and assigned to the roadway network based on anticipated increase in the number of employees, employee work shift times, additional truck traffic, and assuming all new additional truck traffic would be generated outside of the commute hours between 9:00 am to 3:00 pm and 8:00 pm to 4:00 am.

It is anticipated that with the expanded operations, the facility would generate an additional 100 trucks per day including 57 trucks associated with Green Waste and 43 trucks associated with the delivery of finished product and landfill material (trash/ADC). The existing and additional truck trips would access the site throughout the entire day, with the exception of the commute periods between 7-9 AM and 3-8PM. However, there are currently truck trips that occur between the hours of 4-7 AM that would continue to occur with the proposed facility expansion. Based on this assumption, the time restrictions truck trips represent no more than an additional 16 truck trips per hour.

The proposed expansion would also increase the number of employees from the existing 58 employees to a maximum of 90 employees (although the applicant anticipates the plant to operate with no more than 85 employees). This represents an increase of 32 additional employees. The additional employees would result in the addition of 64 daily trips (32 inbound and 32 outbound trips) to the project site. Employee trips were estimated based on the proposed work shift times (5 AM to 3 PM, 7 AM to 5 PM, 5 PM to 5 AM, 8 PM to 4:30 AM and 6 AM to 5 PM) and assuming employees would arrive at the site within 15 minutes before the beginning of their shift time and leave the site within 15 minutes of the end of their shift time. The proposed new shift times were assumed to also apply to all current employees.

With the proposed expansion, the Z-Best Facility is projected to generate a total of two trips during the morning peak hour (7:00 AM to 9:00 AM) and 20 trips during the evening peak hour (4:00 PM to 6:00 PM). This represents a decrease of approximately 19 trips during the AM peak hour and 17 trips during the PM peak hour when compared to existing conditions. The projected decrease in peak hour trips is due to the change in work shift times associated with the proposed expansion. The hourly trip generation estimates with the proposed facility expansion are summarized in Table 3.

It should be noted that a maximum of 47 trips are currently generated in the morning hours between 4:00-9:00 AM and 37 trips during the early evening hours between 3:00-8:00 PM. With the proposed facility expansion and operations, the maximum number of trips during the morning hours would increase to 70 trips while the maximum number of trips during the early evening hours would increase to 47 trips. However, these increases in trips would occur outside of the standard morning and evening commute periods.

Proposed Facility Operations and Trip Generation Estimates – Peak Season Day

Work shift times could be adjusted up to 20 days per year to handle peak leaf season in the fall and heavy volume in the spring. The daily work shift times may be adjusted during the peak season to occur between 5:00 AM and 4:00 PM, 8:00 AM and 6:00 PM, and 6:00 PM and 5:00 AM. The adjusted peak season shift times along with anticipated employees for each shift are also shown in Table 1.

In addition, the project proposes to increase the daily feedstock tonnage limit from the 2,750 tons per day during typical daily operations to 3,500 tons per day for up to 20 days per year to handle peak leaf season in the fall and heavy volume in the spring. The increased tonnage during these 20 days would result in an additional 57 truck trips. However, the increase in tonnage and associated additional truck trips during peak season would have no effect on peak hour traffic conditions since the proposed expansion includes the restriction of all existing as well as the additional truck trips due to the proposed expansion to the hours outside the morning commute period between 7:00-9:00 AM and evening commute period between 3:00-8:00 PM.

The peak season operations of the proposed expansion would result in 9 and 8 additional trips during the morning peak hour (7:00 AM – 9:00 AM) and the evening peak hour (4:00 PM – 6:00 PM), respectively, when compared to the currently generated 21 and 37 trips during the same periods. However, the addition of the additional trips that would be added to the roadway network during the peak hours would occur infrequently, up to a maximum of 20 days per year during peak season operations. The small number of additional trips due to the peak season operations would not have a significant effect on roadway operations.

The hourly trip generation estimates with the proposed facility expansion during the peak season are summarized in Table 4.

Trip Distribution and Assignment

The distribution of employee, non-truck traffic, is currently distributed equally to SR 25 north and south of the project site. The majority of trucks originating from and bound for the project site currently use SR 25 to and from US 101. A smaller number of trucks use SR 25 to SR 156. The proposed expansion is not proposing significant changes to the existing travel routes used by employees or trucks. The existing directional distribution was applied to the future volume projections, with implementation of the proposed expansion, to assign new project traffic at the project entrance and to the roadway network. The distribution of all project traffic during the peak season would be the same as the traffic distribution during the non-peak season. The existing and anticipated trip distribution patterns are presented in Figures 2 and 3, respectively.

Project Access Improvement Operations Evaluation

A traffic operations analyses at the site access points consisting of peak hour level of service analysis, signal warrant checks, and queuing analysis was completed. Each of the components of the site access operations analyses are described in the following sections.

Proposed SR 25 Site Access Improvements

As part of the proposed facility expansion, the project also is proposing to replace its existing access point along SR 25 with a new access point that will align with Bolsa Road via a new fourth leg at the existing SR 25 and Bolsa Road intersection. The new access point has been discussed with Caltrans and they have preliminarily agreed that the proposed alignment of a new the project access point with Bolsa Road would improve operations along SR 25 in the vicinity of Bolsa Road and the existing project access point by providing a controlled access point to the project site. The proposed new intersection also would include exclusive left-turn lanes along SR 25 that would not only increase intersection capacity but also would minimize the disruption of through traffic along SR 25. Providing access to the project site that aligns with Bolsa Road via a four-legged intersection would improve operations and safety for project traffic, in particular since the majority of vehicular trips generated by the project site are large trucks. The existing project site access point will be closed with the implementation of the new project access point at the Bolsa Road intersection. A conceptual plan for the proposed project access point at the SR 25 and Bolsa Road intersection is shown in Figure 4.

Z-Best also has developed plans for safety/operational improvements at the existing project site entrance on SR 25 in coordination with Caltrans should the proposed new access point at Bolsa Road

Table 4
Peak Season Site-Generated Trips

Hours of Operation		Existing Conditions[1] Non-Truck Trips (Based on Driveway Counts)	Truck Trips (Based on Driveway Counts)	Total	Total Site Trips In	Out	Total	Peak Season Conditions[2] Non-Truck Trips: Additional Employee Trips	Existing Employee Trips/New Shift Times	Other Non-Truck Trips	Total Future Non-Truck Trips	Truck Trips: Additional Truck Trips	Existing Truck Trips/Off-Peak Hours Restriction	Total Future Truck Trips	Total	Total Site Trips In	Out	Total	Net Additional Trips In	Out	Total
12:00 AM	Arrivals	0	1	1	1	0	1			0	0	11	7	18	18	18	18	36	17	18	35
to 1:00 AM	Departures	0	0	0						0	0	11	7	18	18						
1:00 AM	Arrivals	0	0	0	0	1	1			0	0	11	7	18	18	18	18	36	18	17	35
to 2:00 AM	Departures	0	1	1						0	0	11	7	18	18						
2:00 AM	Arrivals	0	0	0	0	0	0			0	0	11	7	18	18	18	18	36	18	18	36
to 3:00 AM	Departures	0	0	0						0	0	11	7	18	18						
3:00 AM	Arrivals	0	3	3	3	5	8			0	0	11	7	18	18	18	18	36	15	13	28
to 4:00 AM	Departures	4	1	5						0	0	11	7	18	18						
4:00 AM	Arrivals	5	5	10	10	5	15	17	28	0	45		5	5	50	50	5	55	40	0	40
to 5:00 AM	Departures	0	5	5						0	0		5	5	5						
5:00 AM	Arrivals	2	5	7	7	3	10			0	0		5	5	5	5	20	25	-2	17	15
to 6:00 AM	Departures	0	3	3				5	10	0	15		5	5	20						
6:00 AM	Arrivals	33	7	40	40	7	47			0	0		5	5	5	5	5	10	-35	-2	-37
to 7:00 AM	Departures	0	7	7						0	0		5	5	5						
7:00 AM	**Arrivals**	**4**	**6**	**10**	**10**	**11**	**21**	**10**	**20**	**0**	**30**			**0**	**30**	**30**	**0**	**30**	**20**	**-11**	**9**
to 8:00 AM	**Departures**	**3**	**8**	**11**						**0**	**0**			**0**	**0**						
8:00 AM	Arrivals	6	6	12	12	5	17			1	1			0	1	1	1	2	-11	-4	-15
to 9:00 AM	Departures	3	2	5						1	1			0	1						
9:00 AM	Arrivals	6	13	19	19	20	39			6	6	13	5	18	24	24	25	49	5	5	10
to 10:00 AM	Departures	7	13	20						7	7	13	5	18	25						
10:00 AM	Arrivals	9	7	16	16	23	39			9	9	11	5	16	25	25	27	52	9	4	13
to 11:00 AM	Departures	11	12	23						11	11	11	5	16	27						
11:00 AM	Arrivals	4	8	12	12	16	28			4	4	11	5	16	20	20	22	42	8	6	14
to 12:00 PM	Departures	6	10	16						6	6	11	5	16	22						
12:00 PM	Arrivals	4	10	14	14	15	29			4	4	11	5	16	20	20	21	41	6	6	12
to 1:00 PM	Departures	5	10	15						5	5	11	5	16	21						
1:00 PM	Arrivals	3	12	15	15	13	28			3	3	11	6	17	20	20	21	41	5	8	13
to 2:00 PM	Departures	4	9	13						4	4	11	6	17	21						
2:00 PM	Arrivals	3	8	11	11	10	21			2	2	11	6	17	19	19	18	37	8	8	16
to 3:00 PM	Departures	3	7	10						1	1	11	6	17	18						
3:00 PM	Arrivals	3	5	8	8	13	21			0	0			0	0	0	0	0	-8	-13	-21
to 4:00 PM	Departures	6	7	13						0	0			0	0						
4:00 PM	**Arrivals**	**5**	**5**	**10**	**10**	**27**	**37**			**0**	**0**			**0**	**0**	**0**	**45**	**45**	**-10**	**18**	**8**
to 5:00 PM	**Departures**	**22**	**5**	**27**				**17**	**28**	**0**	**45**			**0**	**45**						
5:00 PM	Arrivals	0	1	1	1	20	21	5	10	0	15			0	15	15	0	15	14	-20	-6
to 6:00 PM	Departures	18	2	20						0	0			0	0						
6:00 PM	Arrivals	1	0	1	1	2	3			1	1			0	1	1	30	31	0	28	28
to 7:00 PM	Departures	1	1	2				10	20	0	30			0	30						
7:00 PM	Arrivals	0	0	0	0	0	0			0	0			0	0	0	0	0	0	0	0
to 8:00 PM	Departures	0	0	0						0	0			0	0						
8:00 PM	Arrivals	0	1	1	1	1	2			0	0	12	8	20	20	20	20	40	19	19	38
to 9:00 PM	Departures	0	1	1						0	0	12	8	20	20						
9:00 PM	Arrivals	0	0	0	0	0	0			0	0	11	7	18	18	18	18	36	18	18	36
to 10:00 PM	Departures	0	0	0						0	0	11	7	18	18						
10:00 PM	Arrivals	0	1	1	1	1	2			0	0	11	7	18	18	18	19	37	17	18	35
to 11:00 PM	Departures	1	0	1						1	1	11	7	18	19						
11:00 PM	Arrivals	0	0	0	0	0	0			0	0	11	7	18	18	18	18	36	18	18	36
to 12:00 AM	Departures	0	0	0						0	0	11	7	18	18						
TOTAL DAILY TRIPS:		**182**	**208**	**390**	**192**	**198**	**390**	**64**	**116**	**66**	**246**	**314**	**208**	**522**	**768**	**381**	**387**	**768**	**189**	**189**	**378**

Notes:
[1] Existing hourly project site traffic activity was estimated based on the existing 24-hour vehicle composition traffic counts conducted at the project site entrance in August 2015, in combination with information provided by Z-Best on their current number of employees, employee shift times, and hours of operation.
[2] Hourly site traffic projections associated with the proposed Z-Best facility operations expansion during peak season. These projections are based on the anticipated increase in the number of employees and number of trucks accessing the site daily during peak season up to 20 days per year, the anticipated employee shift times during peak season, and the restriction of all inbound truck traffic to the site during the off-peak hours only (8:00PM - 4:00AM) and outbound truck traffic to the hours of (4:00AM - 7:00AM and 9:00 AM to 3:00 PM).

Figure 2
Trip Distribution and Traffic Volumes Under Existing Conditions

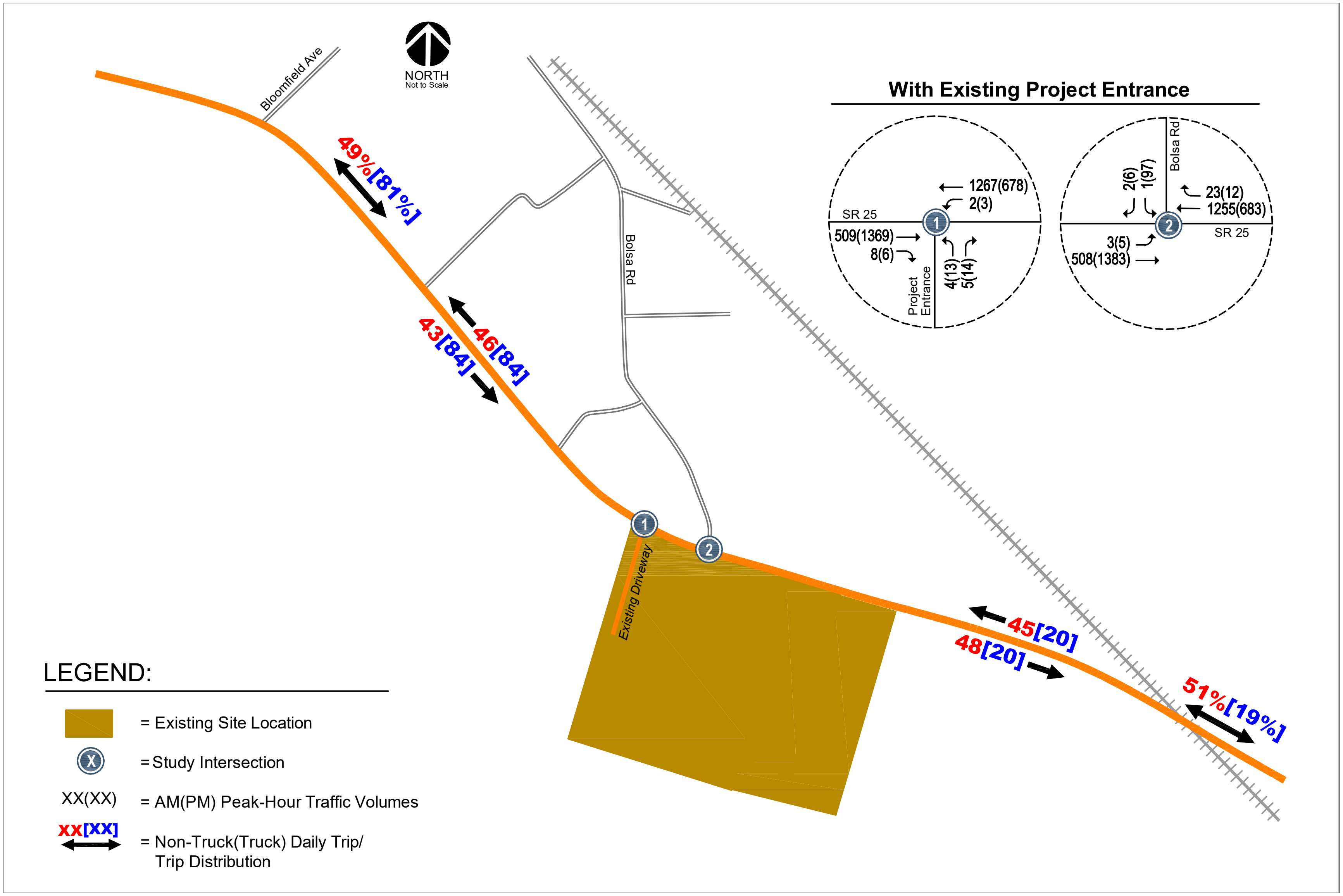


Figure 3
Trip Distribution and Traffic Volumes Under Project Conditions

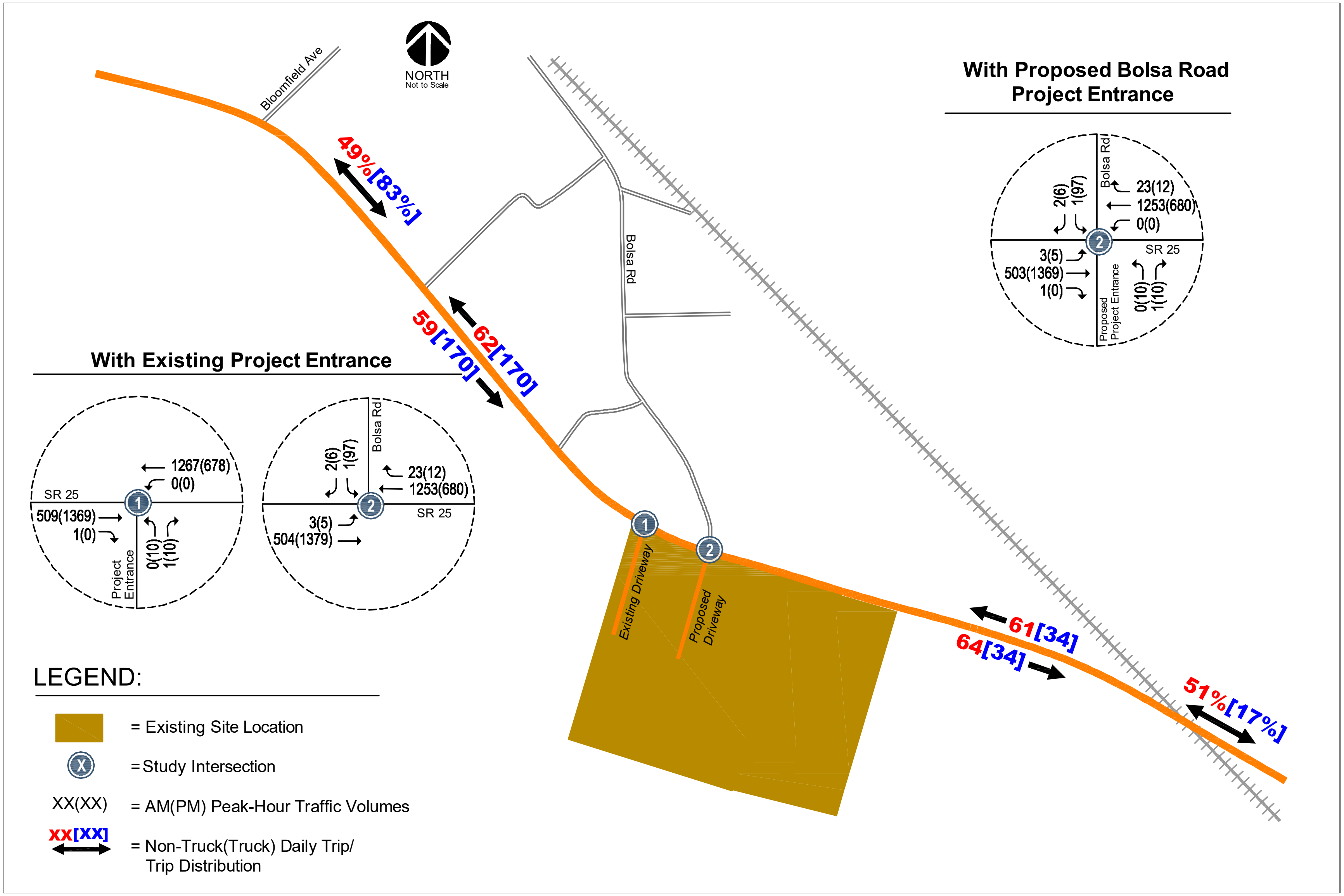
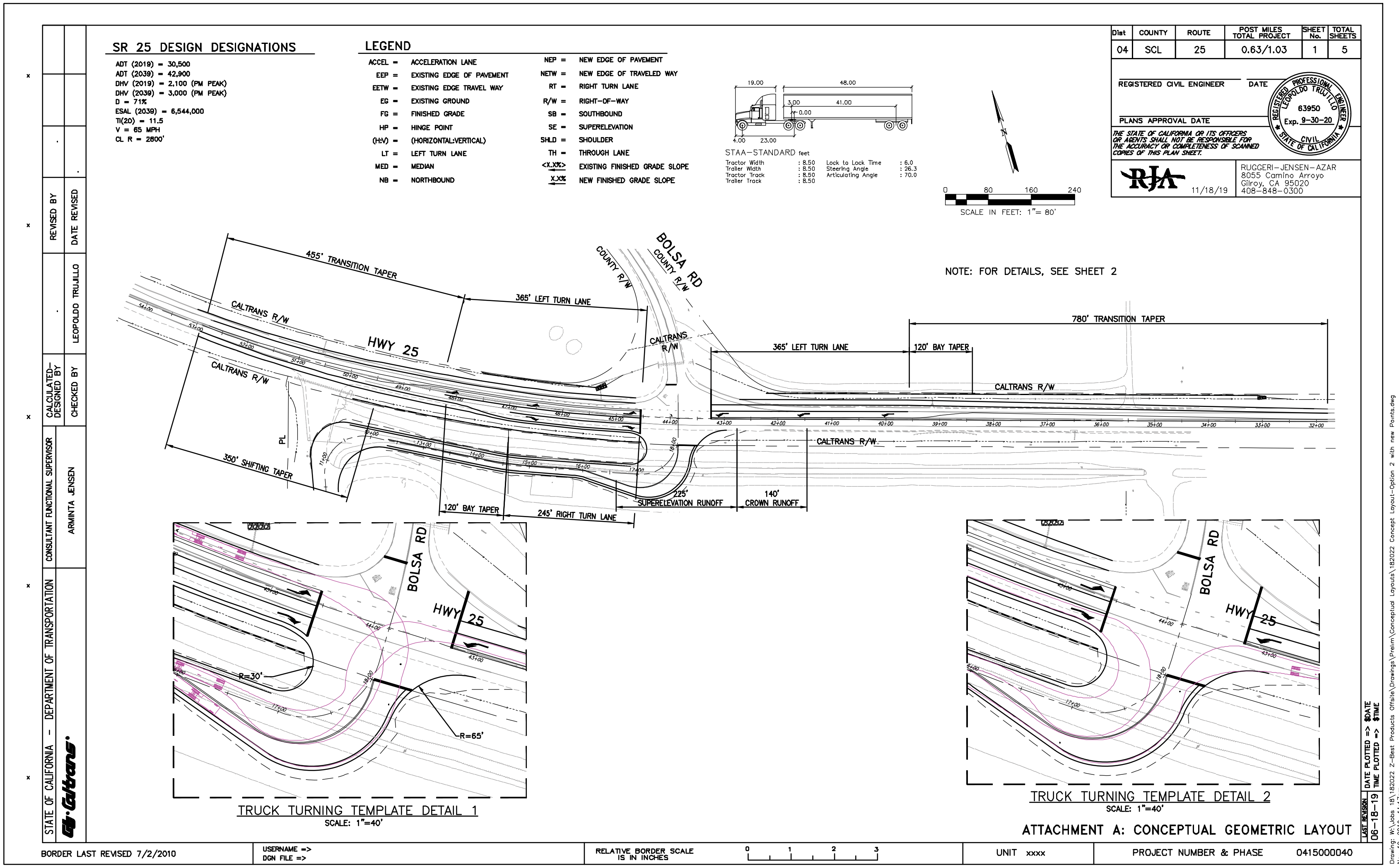


Figure 4
Conceptual Bolsa Road/Relocated Project Driveway Improvements



not be implemented. The proposed improvements include the addition of an eastbound deceleration lane into the project site, westbound left-turn lane into the project site, and acceleration lane to serve traffic exiting the project site. The proposed entrance improvements would not only improve truck access into the project site but would also result in improved highway segment operations by minimizing the disruption of through traffic along SR 25. A conceptual plan for the existing site entrance improvements is shown in Figure 5.

The site access improvements will be coordinated with Caltrans and they will determine whether the proposed site access improvements are adequate and meet Caltrans design standards.

Existing and Project Conditions Traffic Volumes

Existing plus project traffic volumes are comprised of the existing peak-hour traffic volumes and the net addition of the traffic estimated to be generated by the proposed facility expansion project.

The existing and projected peak-hour traffic volumes with the proposed facility expansion (project conditions) for each site access point alternative are shown on Figures 2 and 3, respectively.

Passenger Car Equivalent Trips

Because a significant portion of the traffic associated with the project would be truck traffic, a more conservative analysis was conducted for this study in which the truck trips were converted to passenger car equivalent (PCE) trips. This is founded on the observation that trucks impact traffic operations at intersections more significantly than passenger cars do. For this analysis, it is assumed that each truck trip is equivalent to 1.5 passenger car trips.

Intersection Level of Service Analysis

Level of Service is a qualitative description of operating conditions ranging from LOS A, or free-flow conditions with little or no delay, to LOS F, or jammed conditions with excessive delays. The study intersections were analyzed using TRAFFIX software, which is based on the *Highway Capacity Manual* (HCM) 2000 method for computing level of service at intersections. Two-way-stop controlled intersection levels of service are evaluated based on worst approach stop control delay time for all vehicles at the intersection.

Traffic conditions were analyzed for the weekday AM and PM peak hours. The weekday AM peak hour of traffic is generally between 7:00 AM and 9:00 AM, and the weekday PM peak hour is typically between 4:00 PM and 6:00 PM. It is during these periods that the most congested traffic conditions occur on a typical weekday. The level of service results are discussed below and summarized in Table 5. The level of service calculations are included in the Appendix.

Significant Impact Criteria

Each of the study facilities are located along SR 25. The California Department of Transportation (Caltrans) has jurisdiction of all State maintained facilities, including SR 25. Therefore, the study intersections were evaluated based on Caltrans significance criteria. The criteria described below apply to the weekday AM and PM peak hours.

Caltrans Definition of Significant Impacts

All roadway facilities studied are under the jurisdiction of Caltrans, and therefore, are required to meet the Caltrans Level of Service (LOS) standard. Caltrans level of service standard is LOS C or better. The Caltrans Guide for the Preparation of Traffic Impact Studies (Caltrans 2002) defines a significant impact to occur when:

Figure 5
Conceptual Existing Project Driveway Improvements

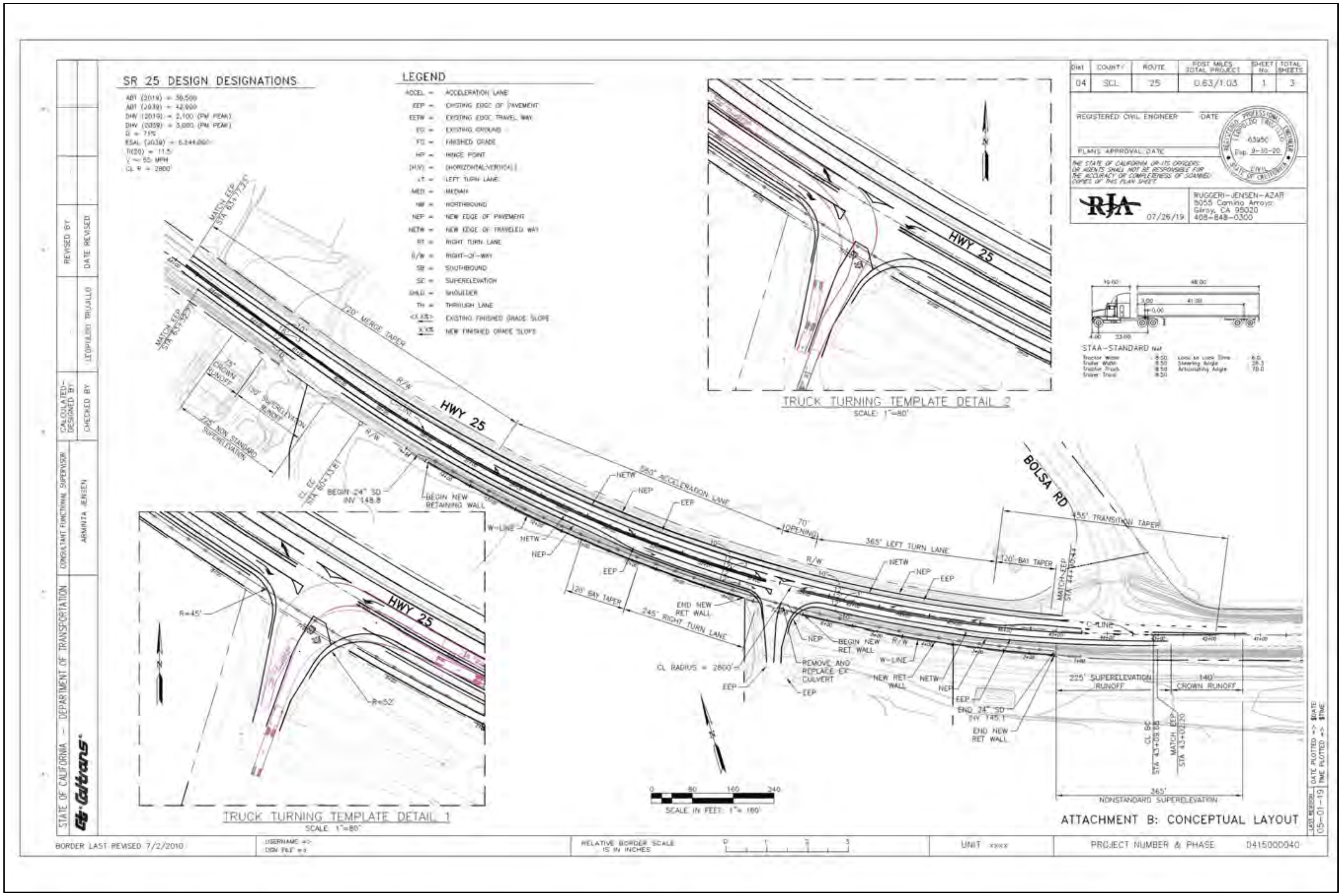


Table 5
Operations Analysis Result Summary

Intersection	LOS Standard	Peak Hour	Existing Warrant Met?	Existing Average Delay[1]	Existing Average LOS	Existing Worst Delay[2]	Existing Worst LOS	Existing + Project Warrant Met?	Existing + Project Average Delay[1]	Existing + Project Average LOS	Existing + Project Average Change	Existing + Project Worst Delay[2]	Existing + Project Worst LOS	Existing + Project Worst Change
Existing Project Entrance Alternative														
SR 25 and Existing Project Entrance	C	AM	No	0.2	A	**28.7**	**D**	No	0.0	A	-0.2	11.4	B	-17.3
		PM	No	0.9	A	**62.9**	**F**	No	0.5	A	-0.4	**54.2**	**F**	-8.7
SR 25 and Bolsa Road	C	AM	No	0.1	A	**30.3**	**D**	No	0.1	A	0.0	**30.1**	**D**	-0.2
		PM	**Yes**	22.1	C	**468.6**	**F**	**Yes**	21.7	C	-0.4	**458.0**	**F**	-10.6
Relocated Project Entrance to Bolsa Road Alternative														
SR 25 and Bolsa Road/Proposed Project Entrance	C	AM	--	--	--	--	--	No	0.1	A	--	**35.2**	**E**	--
(Stop-Controlled)		PM	--	--	--	--	--	**Yes**	**43.8**	**E**	--	**914.3**	**F**	--

Notes:
[1]Whole intersection weighted average control delay.
[2]The worst case delay is normally the time it would take a vehicle on the minor street of an unsignalized intersection to make a left-turn onto the major street.
Bold indicates unacceptable level of service or signal warrant met.

1. The addition of project traffic causes roadway (or intersection) operations to degrade from an acceptable level (LOS C or better) to an unacceptable level (LOS D or worse) or,
2. Project traffic is added to a roadway (or intersection) operating at an unacceptable level (LOS D or worse).

Existing Conditions

The results of the level of service analysis show that, measured against the Caltrans level of service standards, both the existing project entrance and Bolsa Road intersections with SR 25 currently operate at an unacceptable LOS F during the PM peak hour based on the worst approach delay. The worst-case approach is typically the minor street approach that is stop-controlled.

Project Conditions

Existing Project Entrance Alternative

The results of the level of service analysis show that when measured against the Caltrans level of service standards, the existing project entrance intersection with SR 25 would improve to LOS B during the AM peak hour and remain at LOS F under project conditions. The SR 25 and Bolsa Road intersection is projected to continue to operate at LOS D and LOS F conditions during the AM and PM peak hours, respectively, under project conditions. Each intersection would experience a slight reduction in delay on the worst approach during the peak hours with the project. The improvement in delay at each location is a result of the net reduction in trips due to the proposed expansion during the peak hours.

The proposed project would not result in the addition of traffic to the existing site access or SR 25 and Bolsa Road intersections during the peak hours, therefore, based on Caltrans impact criteria, the proposed project would not result in a significant project impact at the study intersections.

Relocated Project Access

The results of the level of service analysis show that the SR 25 and Bolsa Road intersection with stop-control on Bolsa Road and the relocated project entrance is projected to have worst-case approach operations of LOS E and F during the AM and PM peak hours, respectively, under project conditions.

Signal Warrant Analysis

The level of service analysis at the study intersections were supplemented with an assessment of the need for signalization of the intersections. The need for signalization of unsignalized intersections is assessed based on the Peak-Hour Volume Warrant (Warrant 3) described in the *California Manual on Uniform Traffic Control Devices for Streets and Highways (CA MUTCD)*, Part 4, Highway Traffic Signals, 2014. This method makes no evaluation of intersection level of service, but simply provides an indication whether vehicular peak hour traffic volumes are, or would be, sufficient to justify installation of a traffic signal. Intersections that meet the peak hour warrant are subject to further analysis before determining that a traffic signal is necessary. Additional analysis may include unsignalized level of service analysis and/or operational analysis such as evaluating vehicle queuing and delay. Other options such as traffic control devices, signage, or geometric changes may be preferable based on existing field conditions. The results of the signal warrant analysis are summarized in Table 5. The signal warrant sheets are included within the Appendix.

The results of the peak-hour volume warrants indicate that the peak-hour volumes at the existing project entrance intersection with SR 25 currently and are projected to fall below the threshold that warrant signalization with the proposed facility expansion. The peak hour volumes at the SR 25 and

Bolsa Road intersection currently meet and are projected to continue to meet the threshold for signalization during the PM peak hour with the relocation of the site access to Bolsa Road. However, a traffic signal at the new project access point at Bolsa Road is not recommended, or supported by Caltrans, since a traffic signal would adversely affect traffic operations along SR 25.

Intersection Operations (Queuing) Analysis

The operations analysis is based on vehicle queuing for left-turn movements at intersections. Vehicle queues obtained from TRAFFIX were utilized for this analysis. The basis of the analysis is as follows: (1) TRAFFIX is used to estimate the 95th percentile maximum number of queued vehicles during the peak hour for a particular movement; (2) the estimated maximum number of vehicles in the queue is translated into a queue length, assuming 25 feet per vehicle; and (3) the estimated maximum queue length is compared to the existing or planned available storage capacity for the movement. This analysis thus provides a basis for estimating future storage requirements at the selected locations.

Under project conditions, the queuing analysis results show that, the eastbound and westbound left-turn lanes at the relocated SR 25/Bolsa Road project access intersection would experience queue lengths of no more than one vehicle during the peak hours. The southbound (Project Entrance) approach would experience queue lengths of two vehicles, or 50 feet assuming an average vehicle length of 25 feet per vehicle. The northbound (Bolsa Road) approach currently experiences lengthy queues due to the large number of left-turns from Bolsa Road to SR 25 during the PM peak hour.

During the off-peak hours, as many as 52 trips (47 non-truck and 5 truck trips) are projected to access the project site from 4:00 AM to 5:00 AM. Approximately half of the 52 trips or 26 trips would access the site from the east. Assuming an even distribution of traffic arriving throughout the hour, this would equate to approximately one trip every two to three minutes or a queue of no more than one vehicle in the westbound left-turn lane.

Collision History

The collision history along SR 25 in the vicinity of the project entrance and Bolsa Road intersections with SR 25 was reviewed. A review of collision data received from Caltrans indicates a total of 29 collisions over a 3-year span along SR 25 between Bloomfield Road and the beginning of the highway divider (located approximately 1.5 miles east of the project site entrance). The number of collisions along this highway segment exceeds the statewide average for similar facilities. However, only two collisions occurred in the vicinity of the project entrance and Bolsa Road intersections with SR 25 over that same 3-year period.

Highway Segment Operations

The highway segments located immediately east and west of the project entrance were evaluated based on the *Highway Capacity Manual* (HCM) 2010 methodology and using the Highway Capacity Software (HCS). The results of the highway segment peak hour level of service analysis show that the segments along SR 25 currently operate at an unacceptable LOS E during the AM and PM peak hours.

According to the Caltrans definition of impact on highway segments, the addition of any traffic to a facility currently operating unacceptably would be considered an impact. The proposed project would result in a reduction of traffic volumes to and from the project site during the peak hours.

Therefore, the proposed project would not result in a significant project impact on highway segments of SR 25.

Proposed SR 25 Site Access Improvements

The operations and site access analysis shows that although the proposed project would not result in traffic impacts at the site access points and Bolsa Road intersections with SR 25, both the intersections and the study highway segments currently operate at unacceptable levels. The improvements at the existing site access point would improve traffic operations along SR 25 and the project site entrance.

The proposed relocation of the project access point to the SR 25/Bolsa Road intersection would provide a controlled access point to the project site from SR 25. Providing access to the project site from SR 25 via a controlled intersection would improve operations and safety for both project traffic and through traffic along SR 25, in particular since the majority of vehicular trips generated by the project site are large trucks. Along with the proposed relocated project access point, exclusive left-turn lanes along SR 25 which would not only increase intersection capacity but also minimize the disruption of through traffic along SR 25. Overall, the proposed site access improvements on SR 25 would improve traffic conditions at the project site access and along SR 25.

Each of the design requirements that would be applicable to the relocated project access point at the SR 25/Bolsa Road intersection are discussed below.

Highway Design Manual Standards

The Caltrans Highway Design Manual (HDM) makes the following recommendations regarding intersection design standards.

Sight Distance

A clear line of sight should be provided between the driver on the minor street (crossroad) and the approaching traffic (major street). At a minimum, adequate stopping sight distance should be provided at all unsignalized intersections. Corner sight distance and decision sight distance also should be provided when possible and/or applicable. In some cases, the cost of providing the required corner sight distance may be excessive. When restrictive conditions exist, the minimum value for corner sight distance shall be equal to the stopping sight distance. Decision sight distance is required at intersections where the State route turns or crosses another State route.

Based on the design speed along SR 25 (posted speed limit of 55 mph), the required stopping sight distance must be no less than 500 ft. (Table 201.1 of the HDM) and the minimum corner sight distance should be 605 ft.

The available sight distances on SR 25 at Bolsa Road would exceed both the minimum stopping and corner sight distances because SR 25 is relatively straight and has no driver view obstruction in the vicinity of the intersection

Acceleration Lanes

According to the HDM, at rural intersections with stop control on the local cross street, acceleration lanes for left and right turn onto the State facility should be considered.

Left-Turn Channelization

The HDM recommends left-turn lanes be provided at intersections to expedite the movement of through traffic, control the movement of turning traffic, increase intersection capacity, and improve safety. At a minimum, the left-turn lane should meet the following requirements:

Lane Width – The lane width for both single and double left-turn lanes on State highways shall be 12 ft. However, under certain circumstances, left-turn lane widths of 11 ft. or as narrow as 10 ft. may be used. Based on Caltrans design criteria, the left-turn lanes at the new intersection should be a minimum of 10 ft. wide.

Approach Taper – The approach taper provides space for a left-turn lane by moving traffic laterally to the right. In all situations where space is available (usually in rural and semi-rural areas on in urban areas with high traffic speeds and/or volumes), the standard left-turn channelization design in which all widening is to the right of approaching traffic and the deceleration lane begins at the end of the approach taper should be used. However, alternate designs with the deceleration lane beginning at the 2/3 point of the approach taper (so that part of the deceleration takes place in the through traffic lane) may be used in urban areas where constraints exist, speeds are moderate, and traffic volumes are relatively low. The required approach taper (Figure 405.2A) for the left-turn lanes on SR 25, based on a design speed of 55 mph and assuming the proposed left-turn lane would be 12 ft. wide, is 660 ft.

Deceleration Lane Length – Deceleration lane length are based on the roadway's design speed. It is desirable that deceleration take place entirely off the through traffic lanes. Based on Table 405.2B of the HDM, the required deceleration lane length for a 55-mph roadway is approximately 485 ft. (including bay taper). Bay tapers of 120 ft. are normally used on rural high-speed highways. As described above, alternate left-turn channelization designs allow the deceleration lane beginning at the 2/3 point of the approach taper, so part of the deceleration takes place in the through traffic lane. In cases where partial deceleration is permitted on the through lanes, designs speeds may be reduced 10 to 20 mph for a lower entry speed.

Storage Length – As a minimum, storage space for two passenger cars should be provided at 25 ft. per car within turn-pockets. However, if 10 percent (%) or more of the peak hour traffic is composed of large trucks, space for one passenger car and one truck should be provided.

Vehicular queue estimates for left-turns at the SR 25/Bolsa Road intersection show 95th percentile queue lengths of no more than one vehicle for left-turn movements along SR 25 during the peak hours. However, traffic volumes along SR 25 are composed of a significant amount of heavy trucks since it serves as the primary route to US 101 from a primarily agricultural area. Therefore, based on the estimated queue length calculations and Caltrans standards, a minimum of 75 ft. (one vehicle and one truck length) of queue storage capacity should be provided in the left-turn pockets along SR 25 at the intersection with Bolsa Road. Ultimately, Caltrans will decide whether the proposed intersection layouts are adequate and meets Caltrans design standards.

Supplemental Evaluation of Vehicle-Miles-Traveled (VMT)

Historically, transportation analysis has utilized delay and congestion on the roadway system as the primary metric for the identification of traffic impacts and potential roadway improvements to relieve traffic congestion that may result due to proposed/planned growth. However, the State of California has recognized the limitations of measuring and mitigating only vehicle delay at intersections and in 2013 passed Senate Bill (SB) 743, which requires jurisdictions to stop using congestion and delay metrics, such as Level of Service (LOS), as the measurement for CEQA transportation analysis. With the adoption of SB 743 legislation, public agencies will soon be required to base the determination of transportation impacts on VMT rather than level of service. The intent of this change is to shift the focus of transportation analysis under CEQA from vehicle delay and roadway auto capacity to a reduction in vehicle emissions, and the creation of robust multimodal networks that support integrated land uses.

An estimate of Vehicle-Miles-Traveled (VMT) was completed for the proposed facility expansion. VMT is typically calculated for common land uses such as residential, office, and industrial developments. However, the proposed project consists of an uncommon land use, a composting facility, that will primarily generate truck traffic for which evaluation tools such as a Transportation Demand Forecasting (TDF) model are not applicable for the estimation of VMT. Therefore, the estimates of VMT for the project were derived based on the anticipated number of employees and truck loads as well as origin/destination information provided by the applicant.

A comparison of VMT currently generated by the existing site operations versus the VMT that could be generated by the proposed expansion of site operations was completed. VMT is calculated as the number of vehicle trips multiplied by the length of the trips in miles. VMT per employee is a measure of the daily vehicle miles traveled divided by the number of employees of the project site.

As shown in Tables 6 and 7, the proposed expansion and adjustment of site operations will result in a decrease in VMT per employee and VMT per truck load, when compared to the VMT currently generated by the existing site operations.

Table 6
VMT per Employee Estimates

			Existing		Existing + Project	
Origin-Destination	**Distance (mi)**	**% Distribution[1]**	**Daily Trips[2]**	**Daily VMT**	**Daily Trips[2]**	**Daily VMT**
Hollister	11	51%	92	1012	127	1397
Los Banos	47	12%	22	1034	30	1410
Gilroy	5	26%	47	235	64	320
San Jose	35	6%	11	385	15	525
Morgan Hill	16	1%	2	32	2	32
Gustine	52	1%	2	104	2	104
Modesto	83	1%	2	166	2	166
Watsonville	21	1%	2	42	2	42
Santa Cruz	40	1%	2	80	2	80
Total			**182**	**3090**	**246**	**4076**
Daily VMT per Employee				**51.5**		**45.3**

[1] Source: Z-Best Products.

[2] Total daily trips as shown in the hourly trip generation table.

Table 7
VMT per Truck Load Estimates

		Existing				Existing + Project					Existing + Project (Peak 20-Day Season)[2]				
Origin-Destination	**Distance (mi)**	**Daily Loads[1]**	**Daily Trips**	**Daily VMT**	**Daily VMT per load**	**Daily Loads**	**Daily Trips**	**Daily VMT**	**Distribution**	**Daily VMT per load**	**Daily Loads**	**Daily Trips**	**Daily VMT**	**Distribution**	**Daily VMT per load**
Green Waste															
GreenWaste Recovery - San Jose	38	32.73	65.46	2487.4		89.73	179.46	6819.4			122.73	245.46	9327.4		
ZeroWaste Energy - San Jose	45	9.04	18.08	813.7		9.04	18.08	813.7			9.04	18.08	813.7		
Blue Line Transfer - South San Francisco	75	1.64	3.28	245.8		1.64	3.28	245.8			1.64	3.28	245.8		
Bay Counties SMART - Sunnyvale	48	3.99	7.97	382.7		3.99	7.97	382.7			3.99	7.97	382.7		
Sub-Total		47.39	94.79	**3929.5**	**82.9**	104.39	208.79	**8261.5**		**79.1**	137.39	274.79	**10769.5**		**78.4**
Finished Product (Mulch/Compost)															
100-mile Radius	50	20.75	41.50	**2074.8**	**100.0**	28.75	57.50	**2874.8**		**100.0**	33.75	67.50	**3374.8**		**100.0**
Landfill (Trash/ADC)															
Billy Wright Landfill - Los Banos	43	5.47	10.93	470.1		15.96	31.92	1372.5	30%		21.98	43.95	1890.0	30%	
Marina Landfill - Marina	29	8.06	16.13	467.7		23.54	47.09	1365.5	44%		32.42	64.84	1880.4	44%	
Newby Island Landfill - Milpitas	45	4.44	8.87	399.2		12.95	25.90	1165.7	24%		17.83	35.67	1605.1	24%	
John Smith Landfill - Hollister	17	0.20	0.41	6.9		0.59	1.18	20.1	1%		0.82	1.63	27.7	1%	
		18.17	36.33	**1343.8**	**74.0**	53.05	106.09	**3923.9**		**74.0**	73.05	146.09	**5403.2**		**74.0**
Total		86.31	172.62	**7348.1**	**85.1**	186.19	372.38	**15060.2**		**80.9**	244.19	488.38	**19547.6**		**80.1**

[1] Source: Z-Best Products. Average daily load estimated using total number of loads recorded in 2018.

[2] Peak leaf season in the fall and heavy volume in the spring. The increased tonnage during these 20 days would result in an additional 58 truck trips.

Potential SR 25 Widening and Realignment

Caltrans has identified operational problems during the peak commute hours along the SR 25 corridor and at the US 101/SR 25 interchange, which are due primarily to the capacity constraints of the highway and interchange. Thus, Caltrans has initiated the study for the widening and realignment of SR 25 that will include the segment along the project's frontage and realignment of Bolsa Road. In the vicinity of the project site, SR 25 consists of an undivided two-lane State highway with a posted speed limit of 55 miles per hour (mph) in both directions of travel.

In June 2016, Caltrans approved the Hollister to Gilroy State Route 25 Route Adoption project. In the Route Adoption study, Caltrans identifies two alternatives (plus a No Build alternative) to eventually replace 11.2 miles of the existing SR 25 two-lane highway with a four-lane expressway in San Benito and Santa Clara Counties. A route adoption would require San Benito and Santa Clara Counties to adopt a specific corridor for the future expressway into their General Plans, for the purpose of acquiring most or all parcels within the defined corridor area. The route adoption study extends from San Felipe Road (in Hollister) to the end of SR 25 at US 101 in Santa Clara County.

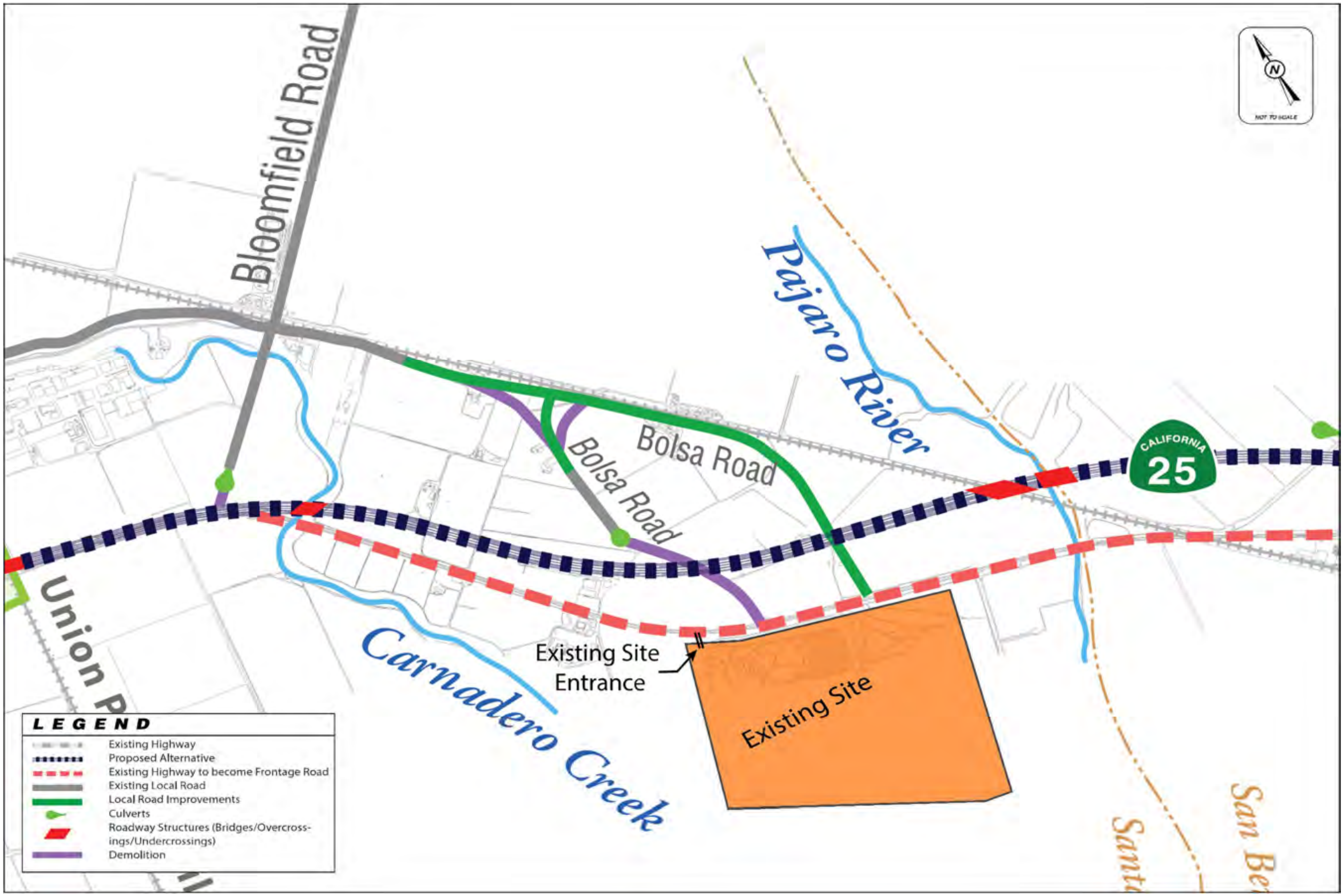
Both route adoption alternatives are 11.2 miles long and share the same alignment from US 101 to approximately ½ mile east of Shore Road. The project site entrance is located within this area. The proposed improvements would include the realignment of both SR 25 and Bolsa Road, which would result in a new intersection of Bolsa Road with the new realigned SR 25.

Although the actual SR 25 widening and realignment project has yet to be designed, approved, and funded, if constructed, it will affect project site access. The exact SR 25 realignment and location of the potential new intersection with Bolsa Road is not known at this time. However, the Route Adoption Alternatives 1 and 2 plans (prepared by Caltrans and shown on Figure 6) indicate the following:

- The realignment of SR 25 would begin east of Bloomfield Road and run north of and parallel to the existing SR 25 alignment from this point past Shore Road.
- The existing SR 25 would become a frontage road and would continue to provide direct access to the adjacent parcels/land uses, including the project site.
- The existing segment of Bolsa Road, between the existing SR 25 and north of the realigned SR 25 would be abandoned, eliminating the existing Bolsa Road/SR 25 intersection. The new Bolsa Road realignment would extend eastward adjacent to the existing Union Pacific Railroad tracks and intersect with both the realigned SR 25 and the existing SR 25 just east of the project site.

With the potential realignment of SR 25 and Bolsa Road, all project traffic bound for and originating from the Z-Best facility would utilize the new Bolsa Road intersection with the realigned SR 25.

Figure 6
Potential SR 25 Widening and Realignment



Conclusions

The proposed expansion of the existing facility operations on the site will include an increase in the number of employees from the current 58 employees (60 allowed by the use permit) to 80-85 employees (with a maximum of 90 employees allowed by the use permit). It is also anticipated that with the expanded operations, the facility would be able to serve an additional 100 trucks per day. However, based on the proposed new work shift times and all new truck trips being proposed to access the project site outside of the standard peak commute hours, the proposed expansion of the existing Z-Best facility operations would result in a decrease in the number of peak-hour trips generated by the project site when compared to existing conditions. Therefore, the proposed project would not result on impacts to any of the study facilities on SR 25.

The operations and site access analysis shows that although the proposed project would not result in traffic impacts at the study intersections and highway segments along SR 25, the existing project access point and SR 25/Bolsa Road intersection and the study highway segments currently operate at unacceptable levels. The proposed relocation of the project access point to the SR 25/Bolsa Road intersection would provide a controlled access point to the project site from SR 25. Providing access to the project site from SR 25 via a controlled intersection would improve operations and safety for both project traffic and through traffic along SR 25, in particular since the majority of vehicular trips generated by the project site are large trucks. Along with the proposed relocated project access point, exclusive left-turn lanes along SR 25 which would not only increase intersection capacity but also minimize the disruption of through traffic along SR 25. Overall, the proposed site access improvements on SR 25 would improve traffic conditions at the project site access and along SR 25.

Memorandum

Date: January 25, 2019

To: Valerie Negrete, County of Santa Clara

From: Robert Del Rio, T.E.

Subject: Response to Peer Review Comments on the Z-Best Compost Facility Application (File No. 6498-17P)

This memo is being provided to address comments provided as part of a peer review of the traffic operations study, *Z-Best Traffic Operations and Site Access Analysis*, dated February 7, 2017 and subsequent response to a California Department of Transportation (Caltrans) comments letter dated July 21, 2017 for the proposed expansion Z-Best Compost Facility Expansion. Per the request of the Environmental Consultant, a supplemental evaluation of Vehicle-Miles-Traveled also is provided.

Peer Review Comments

The peer review letter dated January 2, 2019 and prepared by Keith Higgins, consisted of a review of both the February 2017 operations memo and subsequent Caltrans response letter. The peer review listed a total of 24 comments. Comments 1 through 22 were in reference to the operations memo while comments 23 and 24 were in reference to the Caltrans response letter. It should be noted that adjustments were made to the proposed project subsequent to the completion of the February 2017 operations memo that resulted in a reduction of trips estimated to be generated by the proposed project. The peer review letter acknowledges the changes. However, many of the peer review comments are in reference to outdated information.

The following sections provide general discussions of the peer review comments.

SR 25/US 101 Peak Congestion Periods

The peer review comments state that peak traffic conditions along the SR 25/US 101 corridor occur earlier and for longer periods than the traditional peak commute hours of 7:00-9:00 AM and 4:00-6:00 PM. Traffic data collected as part of Caltran's Performance Measurement System (PeMS) indicates that traffic volumes are greatest between the hours of 5:00-8:00 AM and 3:00-7:00PM. Thus, based on the traffic data, the peak commute periods do in fact begin earlier and for longer periods of time.

However, Caltrans recommends that vehicle speeds also be considered when determining the peak congestion periods. The Caltrans PeMS data indicates that the actual peak congestion period, when vehicle speeds are slowest, occurs at 6:00 AM during the morning commute period and 5:00 PM during the evening commute period (see Figures 1 and 2). The data indicates that though traffic volumes begin to increase earlier, 5:00 AM and 3:00 PM, it is not until after traffic volumes have continued to increase that delay and congestion is experienced.

Therefore, based on the Caltrans PeMS data, it is during the 5:00-7:00 AM and 4:00-6:00 PM periods that the addition of additional traffic would result in the greatest impact on the SR 25/US 101 corridor.

Trip Estimates and Truck Activity

Several of the peer review comments referenced trip estimates for the proposed expansion that were presented in the operations memo. However, as noted in the subsequent Caltrans response letter, the operations plan for trucks on site as part of the proposed expansion was revised after the completion of the operations memo. The revision shifted all existing as well as the additional truck trips due to the proposed expansion to the evening and early morning hours between 8:00 PM and 4:00 AM. Table 1 presents the revised daily hourly trip estimates for the proposed expansion.

Figure 1
AM Peak Traffic Congestion (Caltrans PeMS)

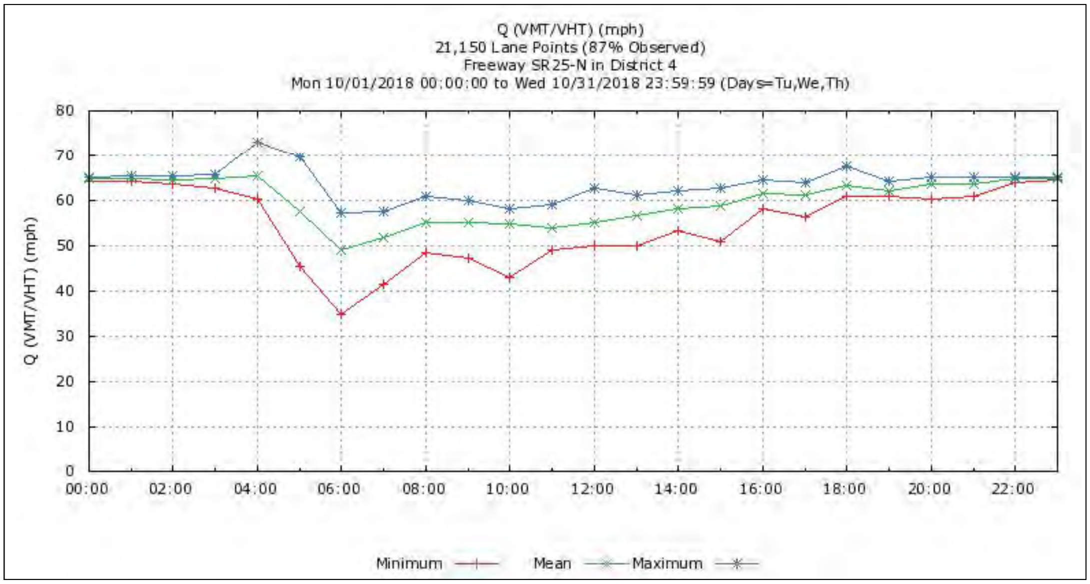


Figure 2
PM Peak Traffic Congestion (Caltrans PeMS)

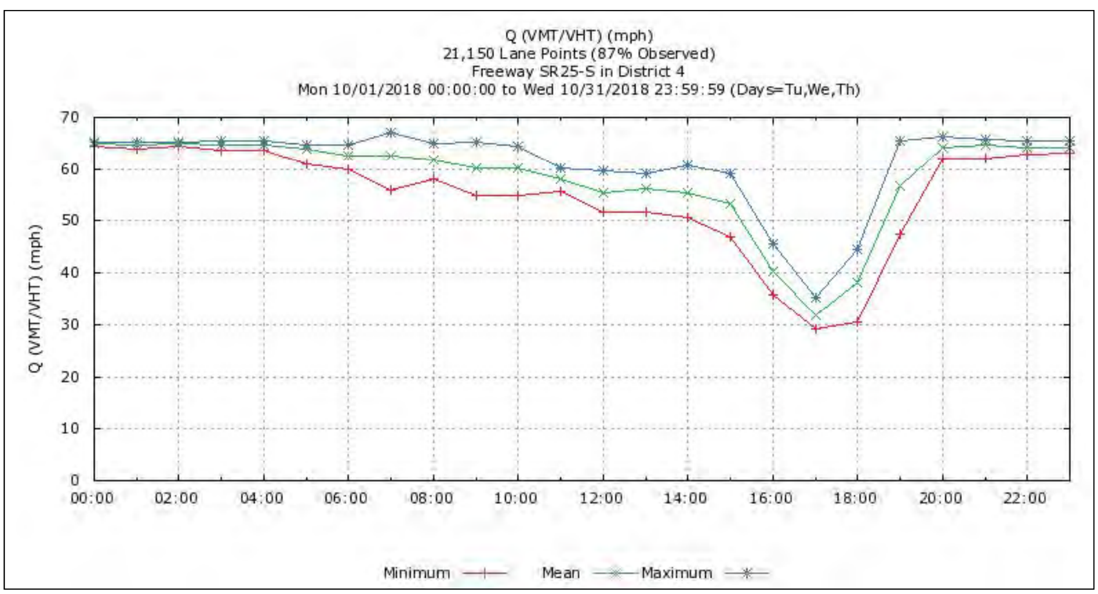


Table 1
Revised Hourly and Projected Site Generated Trips

Hours of Operation		Existing Conditions [1]: Non-Truck Trips (Based on Driveway Counts)	Truck Trips (Based on Driveway Counts)	Total	Total Site Trips: In	Out	Total	Proposed Conditions [2]: Non-Truck Trips: Additional Employee Trips	Existing Employee Trips/New Shift Times	Other Non-Truck Trips	Total Future Non-Truck Trips	Truck Trips: Additional Truck Trips	Existing Truck Trips/Off-Peak Hours Restriction	Total Future Truck Trips	Total	Total Site Trips: In	Out	Total	Net Additional Trips: In	Out	Total
12:00 AM	Arrivals	0	1	1	1	0	1			0	0	7	13	20	20	20	20	40	19	20	39
to 1:00 AM	Departures	0	0	0						0	0	7	13	20	20						
1:00 AM	Arrivals	0	0	0	0	1	1			0	0	7	13	20	20	20	20	40	20	19	39
to 2:00 AM	Departures	0	1	1						0	0	7	13	20	20						
2:00 AM	Arrivals	0	0	0	0	0	0			0	0	7	13	20	20	20	49	69	20	49	69
to 3:00 AM	Departures	0	0	0				10	19	0	29	7	13	20	49						
3:00 AM	Arrivals	0	3	3	3	5	8			0	0	7	13	20	20	20	20	40	17	15	32
to 4:00 AM	Departures	4	1	5						0	0	7	13	20	20						
4:00 AM	Arrivals	5	5	10	10	5	15	12	20	0	32			0	32	32	0	32	22	-5	17
to 5:00 AM	Departures	0	5	5						0	0			0	0						
5:00 AM	**Arrivals**	**2**	**5**	**7**	**7**	**3**	**10**			**0**	**0**			**0**	**0**	**0**	**0**	**0**	**-7**	**-3**	**-10**
to 6:00 AM	**Departures**	**0**	**3**	**3**						**0**	**0**			**0**	**0**						
6:00 AM	Arrivals	33	7	40	40	7	47			0	0			0	0	0	29	29	-40	22	-18
to 7:00 AM	Departures	0	7	7				10	19	0	29			0	29						
7:00 AM	Arrivals	4	6	10	10	11	21			0	0			0	0	0	0	0	-10	-11	-21
to 8:00 AM	Departures	3	8	11						0	0			0	0						
8:00 AM	Arrivals	6	6	12	12	5	17			1	1			0	1	1	1	2	-11	-4	-15
to 9:00 AM	Departures	3	2	5						1	1			0	1						
9:00 AM	Arrivals	6	13	19	19	20	39			6	6			0	6	6	7	13	-13	-13	-26
to 10:00 AM	Departures	7	13	20						7	7			0	7						
10:00 AM	Arrivals	9	7	16	16	23	39			9	9			0	9	9	11	20	-7	-12	-19
to 11:00 AM	Departures	11	12	23						11	11			0	11						
11:00 AM	Arrivals	4	8	12	12	16	28			4	4			0	4	4	6	10	-8	-10	-18
to 12:00 PM	Departures	6	10	16						6	6			0	6						
12:00 PM	Arrivals	4	10	14	14	15	29			4	4			0	4	4	5	9	-10	-10	-20
to 1:00 PM	Departures	5	10	15						5	5			0	5						
1:00 PM	Arrivals	3	12	15	15	13	28			3	3			0	3	3	4	7	-12	-9	-21
to 2:00 PM	Departures	4	9	13						4	4			0	4						
2:00 PM	Arrivals	3	8	11	11	10	21			2	2			0	2	2	1	3	-9	-9	-18
to 3:00 PM	Departures	3	7	10						1	1			0	1						
3:00 PM	Arrivals	3	5	8	8	13	21	10	19	0	29			0	29	29	32	61	21	19	40
to 4:00 PM	Departures	6	7	13				12	20	0	32			0	32						
4:00 PM	**Arrivals**	**5**	**5**	**10**	**10**	**27**	**37**			**0**	**0**			**0**	**0**	**0**	**0**	**0**	**-10**	**-27**	**-37**
to 5:00 PM	**Departures**	**22**	**5**	**27**						**0**	**0**			**0**	**0**						
5:00 PM	Arrivals	0	1	1	1	20	21			0	0			0	0	0	0	0	-1	-20	-21
to 6:00 PM	Departures	18	2	20						0	0			0	0						
6:00 PM	Arrivals	1	0	1	1	2	3			1	1			0	1	1	0	1	0	-2	-2
to 7:00 PM	Departures	1	1	2						0	0			0	0						
7:00 PM	Arrivals	0	0	0	0	0	0			0	0			0	0	0	0	0	0	0	0
to 8:00 PM	Departures	0	0	0						0	0			0	0						
8:00 PM	Arrivals	0	1	1	1	1	2			0	0	8	13	21	21	21	21	42	20	20	40
to 9:00 PM	Departures	0	1	1						0	0	8	13	21	21						
9:00 PM	Arrivals	0	0	0	0	0	0			0	0	7	13	20	20	20	20	40	20	20	40
to 10:00 PM	Departures	0	0	0						0	0	7	13	20	20						
10:00 PM	Arrivals	0	1	1	1	1	2	10	19	0	29	7	13	20	49	49	21	70	48	20	68
to 11:00 PM	Departures	1	0	1						1	1	7	13	20	21						
11:00 PM	Arrivals	0	0	0	0	0	0			0	0	7	13	20	20	20	20	40	20	20	40
to 12:00 AM	Departures	0	0	0						0	0	7	13	20	20						
TOTAL DAILY TRIPS:		**182**	**208**	**390**	**192**	**198**	**390**	**64**	**116**	**66**	**246**	**114**	**208**	**322**	**568**	**281**	**287**	**568**	**89**	**89**	**178**

Notes:
[1] Existing hourly project site traffic activity was estimated based on the existing 24-hour vehicle composition traffic counts conducted at the project site entrance in August 2015, in combination with information provided by Z-Best on their current number of employees, employee shift times, and hours of operation.
[2] Hourly site traffic projections associated with the proposed Z-Best facility operations expansion. These projections are based on the anticipated increase in the number of employees and number of trucks accessing the site daily, the proposed new employee shift times, and the restriction of all new truck traffic to access the site during the off-peak hours only (8:00PM - 4:00AM).

The hourly trip estimates show that the operations plan for the proposed expansion will result in a reduction in trips generated by the project site during the 5:00-7:00 AM and 4:00-6:00 PM peak congestion periods on the SR 25/US 101 corridor when compared to its current operations without the proposed expansion.

Furthermore, with the revised truck operations, the proposed expansion will result in no more than 40 trips during any one hour between the hours of 4:00 AM and 8:00 PM. The proposed expansion will result in 40 trips during the 3:00 to 4:00 PM period. Thus, the proposed expansion will add the greatest amount of traffic to the surrounding roadways outside of the identified peak congestion period of 4:00-6:00 PM.

Effects on Surrounding Roadways

As shown in Table 1 and described above, the project would add the greatest number of trips to surrounding roadways during the 3:00 to 4:00 PM period. However, the additional traffic due to the proposed expansion would be minimal when considering the distribution of those trips to surrounding roadways. Figure 3 indicates the distribution of project traffic to SR 25 during the 3:00 to 4:00 PM period. The distribution was developed based on origin/destination information for both employees and truck traffic provided by the applicant (see Tables 2 and 3). The origin/destination data indicates that project traffic would be split, approximately 50 percent, to SR 25 north and south of the project site.

The distribution of project trips results in the addition of no more than 11 trips (occurring during only the 3:00 to 4:00 PM period) to any segment of SR 25. Per the Highway Capacity Manual (HCM) 2010 and stated in the peer review memo, the capacity of a two-lane highway such as SR 25 is 1,700 passenger cars per hour in each direction. Therefore, the proposed expansion will result in the addition of traffic that is equivalent to less than one percent of the highway's capacity.

Similarly, the distribution of project trips will result in the addition of no more than six (6) trips during any one hour (occurring during only the 3:00 to 4:00 PM period) to the ramps at the US 101/SR 25 interchange. The addition of the minimal amount of project traffic to the US 101/SR 25 interchange intersections would not have a noticeable effect on intersection delay.

Again, the proposed expansion will result in a reduction in traffic volumes along SR 25 during the 5:00-7:00 AM and 4:00-6:00 PM peak congestion periods on the SR 25 corridor when compared to its current operations without the proposed expansion.

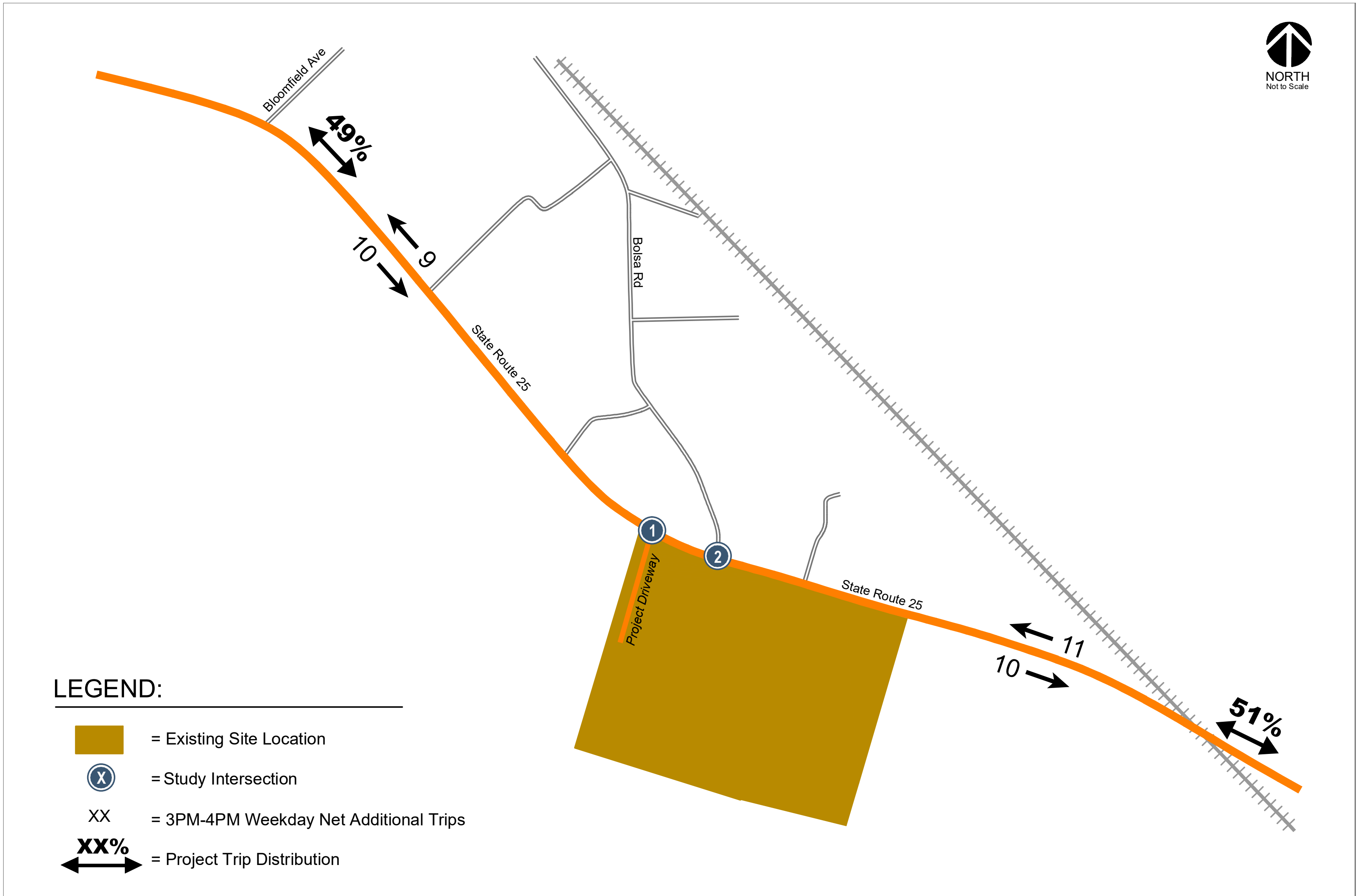
Supplemental Evaluation of Vehicle-Miles-Traveled (VMT)

At the request of the Environmental Consultant, an estimate of Vehicle-Miles-Traveled (VMT) was completed for the proposed facility expansion. VMT is typically calculated for common land uses such as residential, office, and industrial developments. However, the proposed project consists of an uncommon land use, a composting facility, that will primarily generate truck traffic for which evaluation tools such as a Transportation Demand Forecasting (TDF) model are not applicable for the estimation of VMT. Therefore, the estimates of VMT for the project were derived based on the anticipated number of employees and truck loads as well as origin/destination information provided by the applicant.

Historically, transportation analysis has utilized delay and congestion on the roadway system as the primary metric for the identification of traffic impacts and potential roadway improvements to relieve traffic congestion that may result due to proposed/planned growth. However, the State of California has recognized the limitations of measuring and mitigating only vehicle delay at intersections and in 2013 passed Senate Bill (SB) 743, which requires jurisdictions to stop using congestion and delay metrics, such as Level of Service (LOS), as the measurement for CEQA transportation analysis. With the adoption of SB 743 legislation, public agencies will soon be required to base the determination of transportation impacts on VMT rather than level of service. The intent of this change is to shift the focus of transportation analysis under CEQA from vehicle delay and roadway auto capacity to a reduction in vehicle emissions, and the creation of robust multimodal networks that support integrated land uses.

A comparison of VMT currently generated by the existing site operations versus the VMT that could be generated by the proposed expansion of site operations was completed. VMT is calculated as the number of vehicle trips multiplied by the length of the trips in miles. VMT per employee is a measure of the daily vehicle

Figure 3
Project Traffic Distribution



miles traveled divided by the number of employees of the project site.

As shown in Tables 2 and 3, the proposed expansion and adjustment of site operations will result in a decrease in VMT per employee and VMT per truck load, when compared to the VMT currently generated by the existing site operations.

Table 2
VMT per Employee Estimates

			Existing		Existing + Project	
Origin-Destination	Distance (mi)	% Distribution[1]	Daily Trips[2]	Daily VMT	Daily Trips[2]	Daily VMT
Hollister	11	51%	92	1012	127	1397
Los Banos	47	12%	22	1034	30	1410
Gilroy	5	26%	47	235	64	320
San Jose	35	6%	11	385	15	525
Morgan Hill	16	1%	2	32	2	32
Gustine	52	1%	2	104	2	104
Modesto	83	1%	2	166	2	166
Watsonville	21	1%	2	42	2	42
Santa Cruz	40	1%	2	80	2	80
Total			**182**	**3090**	**246**	**4076**
Daily VMT per Employee				**51.5**		**45.3**

[1] Source: Z-Best Products.
[2] Total daily trips as shown in the hourly trip generation table.

Table 3
VMT per Truck Load Estimates

		Existing				Existing + Project				
Origin-Destination	Distance (mi)	Daily Loads[1]	Daily Trips	Daily VMT	Daily VMT per load	Daily Loads	Daily Trips	Daily VMT	Distribution	Daily VMT per load
Green Waste										
GreenWaste Recovery - San Jose	38	32.73	65.46	2487.4		89.73	179.46	6819.4		
ZeroWaste Energy - San Jose	45	9.04	18.08	813.7		9.04	18.08	813.7		
Blue Line Transfer - South San Francisco	75	1.64	3.28	245.8		1.64	3.28	245.8		
Bay Counties SMART - Sunnyvale	48	3.99	7.97	382.7		3.99	7.97	382.7		
Sub-Total		47.39	94.79	**3929.5**	**82.9**	104.39	208.79	**8261.5**		**79.1**
Finished Product (Mulch/Compost)										
100-mile Radius	50	20.75	41.50	**2074.8**	**100.0**	28.75	57.50	**2874.8**		**100.0**
Landfill (Trash/ADC)										
Billy Wright Landfill - Los Banos	43	5.47	10.93	470.1		15.96	31.92	1372.5	30%	
Marina Landfill - Marina	29	8.06	16.13	467.7		23.54	47.09	1365.5	44%	
Newby Island Landfill - Milpitas	45	4.44	8.87	399.2		12.95	25.90	1165.7	24%	
John Smith Landfill - Hollister	17	0.20	0.41	6.9		0.59	1.18	20.1	1%	
		18.17	36.33	**1343.8**	**74.0**	53.05	106.09	**3923.9**		**74.0**
Total		86.31	172.62	**7348.1**	**85.1**	186.19	372.38	**15060.2**	**80.89**	**80.9**

[1] Source: Z-Best Products. Average daily load estimated using total number of loads recorded in 2018.

Site Access Point/SR 25 Improvements

Subsequent to the completion of the traffic operations analysis in 2017, safety/operational improvements at the project entrance on SR 25 were incorporated as part of the proposed expansion project. The proposed improvements include the addition of a southbound deceleration lane into the project site, northbound left-turn lane into the project site, and acceleration lane to serve traffic exiting the project site. The proposed entrance improvements would not only improve truck access into the project site but would also result in improved highway segment operations by minimizing the disruption of through traffic along SR 25. A plan for the entrance improvements (see Figure 4) has been developed by RJA and is under review. The proposed entrance improvements must be approved by Caltrans.

Summary

The intent of the traffic operations and site access analysis was to provide a focused evaluation of the current and projected operating conditions at the project's site access point(s) along SR 25. A full comprehensive traffic impact analysis was not completed for the proposed facility expansion for the following reasons:

- The proposed expansion and operations plan will result in a reduction in the number of trips currently generated by the project site during the periods of the greatest congestion on surrounding roadways.
- With the proposed expansion, the current site operations will be changed to eliminate truck traffic that is currently generated by the existing site operations during commute hours and restrict all future truck traffic with the proposed expansion to hours outside of the commute periods on surrounding roadways.
- With the exception of the project access point, the proposed facility expansion will result in the addition of no more than six (6) directional project trips to nearby intersections, including ramps at the SR 25 and US 101 interchange, during any one hour of the day.
- The proposed expansion will not result in the addition of hourly trips that equate to more than one percent of capacity of any surrounding highways or freeways.
- The proposed project has incorporated improvements at its existing access point along SR 25 that would not only improve truck access into the project site but would also result in improved highway segment operations by minimizing the disruption of through traffic along SR 25.
- The supplemental VMT evaluation indicates that the proposed expansion will not result in a significant increase in VMT when compared to the VMT currently generated by the existing site operations.

In addition, the Caltrans letter dated April 21, 2017 states the following in regards to SB 743 and VMT…*"Caltrans is focusing on transportation infrastructure that supports smart growth and efficient development to ensure alignment with State policies through the use of efficient development patterns, innovative travel demand reduction strategies, multimodal improvements, and VMT as the primary transportation impact metric.* ***For projects reviewed under the California Environmental Quality Act (CEQA), Caltrans uses VMT as the metric for evaluating transportation impacts and mitigation****."*

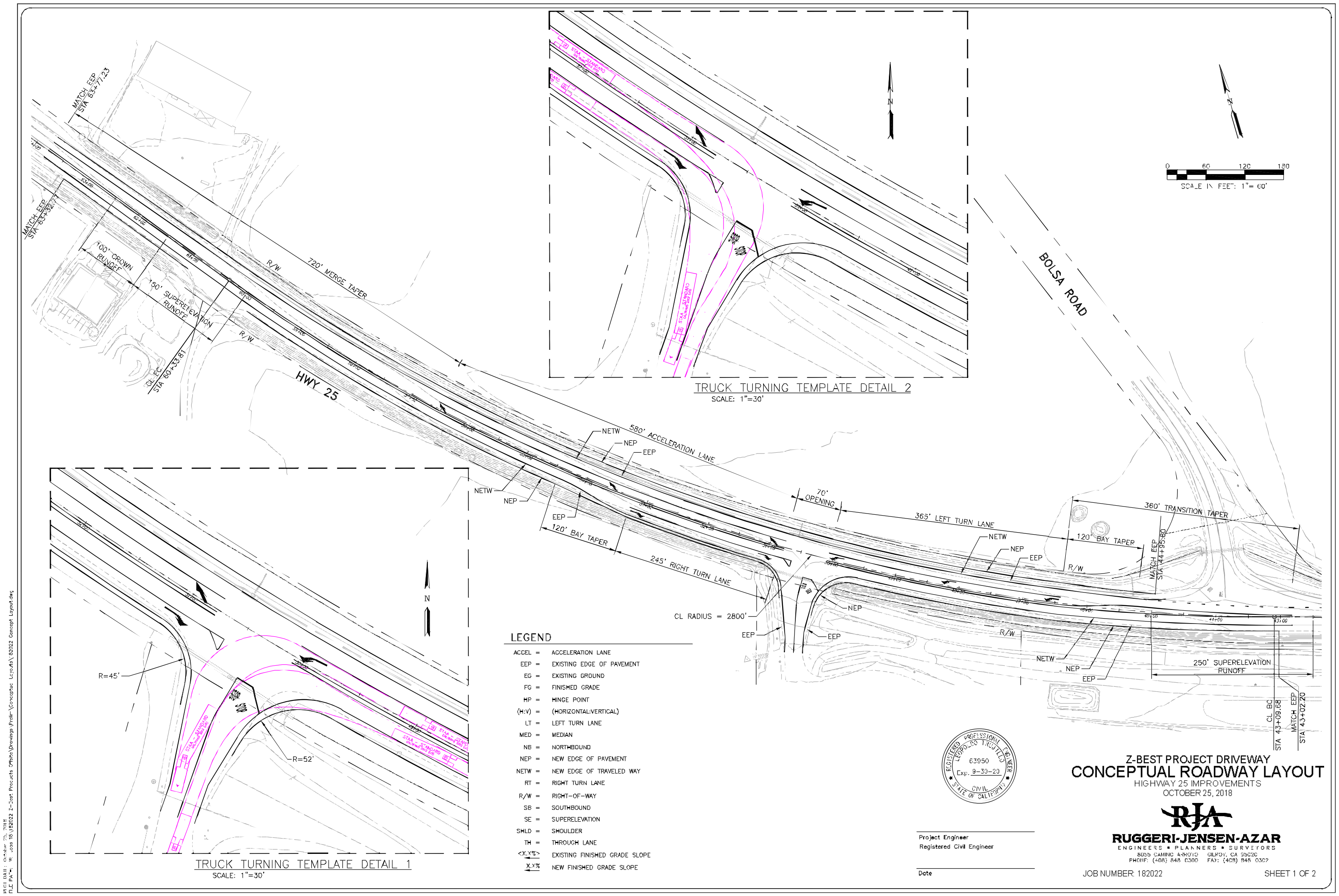
Furthermore, based on the Santa Clara Valley Transportation Authority (VTA), the congestion management agency of Santa Clara County, and the Caltrans transportation impact guidelines, a Transportation Impact Analysis is not required because:

1) Estimated peak hour trip generation is less than 50 project vehicles during the morning and evening peak hours,

2) Except at the driveways, fewer than 10 directional peak hour project trips will be added to nearby highways and intersections: and

3) The Caltrans Guide for Traffic Impact Studies states that a full traffic impact study may not be required for projects that generates less than 50 peak hour trips assigned to a State highway facility. The guidelines allow for a lesser level of analysis in some cases.

Figure 4
Ste Access Improvement Conceptual Plan



Keith Higgins
Traffic Engineer

January 2, 2019

Ron Sissem
EMC Planning Group
301 Lighthouse Avenue, Suite C
Monterey, CA 93940

Re: Z-Best Compost Facility Operations Analysis Peer Review Proposal, Santa Clara County, CA

Dear Ron,

Per your request, I am pleased to submit this peer review of the "Z-Best Compost Facility Traffic Operations and Site Access Analysis," State Route 25, Santa Clara County, California, prepared by Hexagon Transportation Consultants, Inc., February 7, 2017 (herein referred to as the "Operations Analysis"). Supplemental information was also reviewed, including the "Response to Transportation Comments on the Z-Best Compost Facility Application (File No. 6498-17P), Hexagon Transportation Consultants, Inc., July 21, 2017 (herein referred to as the "Response to Comments"). General comments are also provided for the "Aerated Static Pile Composting Preliminary Grading Plan, Drawing 11 – Highway Improvements," MH Engineering, 4//15/2018 (herein referred to as the "Conceptual Plan").

The following are my comments on the above-referenced Operations Analysis.

1. Pg. 2, Figure 1 - Z-Best Site Location – A project vicinity map would be helpful to indicate the project's location relative to US 101 to the west and San Benito County to the east. The easterly limit should include the SR 25 / Shore Road intersection. This will also encompass the recommended expanded study area discussed later in this comment letter.
2. Pg. 3, Figure 2 – Existing and Proposed Employee Work Shift Times – This figure should be updated to reflect the project changes described in the Supplemental Information.
3. Pg. 4, Proposed Facility Improvements and Scope of Study – Changes in shift hours will occur that generally move the arrival and departure times further from the traditional 7-9 am and 4-6 pm street peak hours of traffic. However, peak traffic conditions occur much earlier and for a longer time along SR 25. This is due to its regional function and because commuters leave Hollister as early as 5 am to avoid northbound US 101 traffic congestion and/or to arrive at employment centers in Silicon Valley before traditional work starting times. The study intersections should be analyzed during Project peak hour conditions.
4. It is recommended that the following additional locations be analyzed during Project peak hours.
    1. SR 25 / Southbound US 101 Ramps – This intersection experiences extreme congestion on the Southbound US 101 Off-Ramp that results in queue overflow onto the mainline southbound US 101 travel lanes.

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2. SR 25 / Northbound US 101 On-Ramp – This ramp is very short and has a minimal weave length. Project peak hour trips could represent an impact at this location.
3. SR 25 / Bloomfield Road – The southbound Bloomfield Road left turn movement has queues in the PM peak hour that extend to the Bloomfield Road / Bolsa Road intersection and can extend along eastbound Bolsa Road toward the City of Gilroy. These vehicles appear to be attempting to avoid the extremely long delay at the southbound US 101 Off-Ramp. The vehicles attempt to enter southbound SR 25 at this location because a median acceleration lane is provided. Although Bolsa Road has a direct connection with SR 25, more vehicles may avoid entering southbound SR 25 at Bolsa Road because a median acceleration lane is not provided. Many instead use the Bloomfield connection. The Operations Analysis indicates that a traffic signal is warranted at the SR 25 / Bolsa Road intersection. The study should estimate the amount of traffic that would be diverted from Bloomfield Road and possibly the Southbound US 101 Off-Ramp to take advantage of the protection of a left turn lane.
4. SR 25 road segments north and south of the Project. It appears that the Project could increase traffic by more than 1% during the Project peak hours, which is 17 vehicles in the peak direction using the VTA guideline of 1,700 vehicles per hour for each direction of travel. The project will result in an increase of 29 inbound and 29 outbound vehicles between 3 and 4 pm. Project traffic distribution apparently is 50% to and from the north and 50% to and from the south, which indicates that 15 project trips are added to northbound and southbound SR 25 during the project peak hour. Project truck traffic may be restricted to 8pm to 4am, so may not impact SR 25 during Project peak hours. This should be confirmed. As mentioned earlier in these comments, peak spreading occurs that could include the 3-4 pm hour. Caltrans criteria considers any additional traffic to a highway already operating at LOS D or worse to be a significant impact.

5. Pg. 4, Potential SR 25 Widening and Realignment - The scope of the study includes analyzing the existing highway network and the existing SR 25 after its conversion to a frontage road with the proposed SR 152 Trade Corridor. That project includes the US 101 / SR 25 interchange reconstruction, widening US 101 to 6 lanes and the realignment and widening of SR 25 to 4 lanes in Santa Clara County near Z-Best. It only has funding through the environmental phase. With the recent passage of San Benito County Measure G, the SR 25 Widening and Realignment portion in San Benito County has funding and is expected to be constructed by 2030.
6. Pg. 5, Study Scenarios –Cumulative and Cumulative Plus Project conditions should be analyzed as required by the VTA Traffic Impact Analysis Guidelines.
7. Pg. 7, Existing Trip Generation – Truck scale data is now 4 to 5 years old and needs to be updated.
8. Pg. 7, Existing Trip Generation – Study intersection traffic counts were collected in August 2015, which is over 3 years old. The count data should be updated.
9. Pg. 8, Table 3 – Hourly Existing and Projected Site-Generated Trips and Pg. 9, Project Trip Generation Estimates – Project trip generation should be reported in PCEs as well as number of vehicles.
10. Pg. 12 – Significant Impact Criteria – SR 25 is under Caltrans jurisdiction, so should be analyzed in accordance with Caltrans methodologies and criteria.

11. Pg. 12, Existing Conditions – The levels of service on SR 25 at the times of the Project peak impacts (i.e., 4-5 am and 3-4 pm) should be determined.
12. Pg. 12, Project Conditions – The Project apparently will have lower trip generation during the traditional 7-9 am and 4-6 pm peak periods than at present. However, the Project will add traffic during the 4-5 am and 3-4 pm hours. These time periods could also operate at LOS E or F. Project conditions should be analyzed at these times as well.
13. Pg. 13, Table 4 – Operations Analysis Results Summary – The table should be expanded to include the SR 25 intersections with the Southbound US 101 Off-Ramp and Bloomfield Road. Cumulative with and without the Project should also be included.
14. Pg. 14, Level of Service Analysis with Potential SR 25 Improvements – This scenario is helpful for planning the existing SR 25, which will become a frontage road. However, the analysis includes an evaluation of the Realigned SR 25 junction with the new Bolsa Road as an at-grade intersection. Based on the SR 152 Trade Corridor PSR-PDS, the SR 152 (i.e., SR 25) freeway will be on an elevated section with a bridge over Bolsa Road. Bolsa Road will gain access to the future SR 152 freeway via new connector road and ramps at the future SR 152 / SR 25 interchange, which will be located about 1.5 miles east of the Project. A conceptual plan of the most likely future highway network near the Project is included as **Attachment 1**. This should be accurately described.
15. Pg. 14, Signal Warrant Analysis – The second paragraph indicates that the SR 25 / Bolsa Road intersection currently meets peak hour signal warrants. The project is not expected to add traffic to this intersection between 4 pm and 6pm. However, the Project will add traffic to this intersection during other times during the afternoon, including the Project peak hour, which is from 3pm to 4pm. The Project's contribution at this time should be considered in determining a fair share contribution toward this signal.
16. Pg. 15, Intersection Operations (Queuing) Analysis – The queuing analysis should include the SR 25 intersections with the Project driveway and the existing Bolsa Road, which may exist for 20 years.
17. Pg. 15, Intersection Operations (Queuing) Analysis – The analysis should include warrants for left and right turn lanes at the Project driveway, Bolsa Road and Bloomfield Road during the Project peak hour as well as the traditional street peak hour.
18. Pg. 15, Intersection Operations (Queuing) Analysis – Geometric requirements for the Project driveway to accommodate Project peak hour traffic conditions with Cumulative growth should be recommended. Caltrans will ultimately have the permitting authority for driveway and channelization improvements. Deceleration and storage lengths will need to comply with the Caltrans Highway Design Manual.
19. Pg. 15, Highway Segment Operations – The segment analysis should be updated to reflect 2018 conditions.
20. Pg. 15, Highway Segment Operations – The impact of the Project during Project peak hours should be analyzed.
21. Pg. 18, Conclusions –The Project will increase traffic on SR 25 during the 4am to 5am and 3pm to 4pm Project peak hours. These should be analyzed to determine the impacts at those times.
22. Pg. 18, Conclusions – The proposed SR 25 improvements on a new alignment likely will not be in place for 20 years and should not be assumed to be in place to analyze impacts and mitigations.

23. The following comments are associated with the "Response to Comments" memo dated July 21, 2017.
    i. Current and proposed truck routes to and from the site - Project work shift changes will occur at hours that may experience congestion on SR 25. Project impacts at Project peak hours should be analyzed with current traffic data as discussed in the comments on the Operations Analysis.
    ii. Analysis of traffic operations with current conditions as opposed to the Bolsa Road realignment. Update the timeline for the Bolsa Road realignment. Bolsa Road likely will not be realigned as a part of the future highway improvements when they are built. The Project cannot rely on future highway improvements for mitigation or to determine the design of the mitigation.
    iii. Include the hours of 5am-9am and 3pm-8pm in the impact analysis in keeping with proposed employee hours and roadway conditions.
    iv. A travel demand analysis for vehicle miles traveled for the project. The San Benito County Express should be discussed in the Operations Analysis. Truck and auto vehicle-miles traveled should be estimated for the Project as well with credit for elimination of truck trips to landfills.
    v. An assessment of traffic impacts for both northbound and southbound left-turn access to and from SR 25. – The Project will increase traffic into and out of the Project during the Project peak hours. This needs to be analyzed for channelization design. The provision of this information will expedite the Encroachment Permit process with Caltrans for the channelization improvements.
    vi. A review of the feasibility and rationale for not having a deceleration lane along SR 25. – Channelization improvements are included as a part of the project description. The design will require Caltrans approval.
24. Conceptual Plan – The conceptual plan should be based on the Project peak hour traffic volumes. The updated Operations Analysis should confirm the design parameters for the northbound left turn lane, northbound median acceleration lane for left turns exiting the Project and a southbound right turn lane. The proximity of the Bolsa Road intersection may result in improvements extending through that intersection as well. Caltrans, Santa Clara County Roads and Airports and San Benito County are discussing ways to handle traffic at the SR 25 / Bolsa Road and SR 25 / Bloomfield Road intersections that may affect the design of the SR 25 / Project Driveway intersection. Project representatives will need to coordinate with these agencies regarding the design of channelization improvements at the Project driveway.

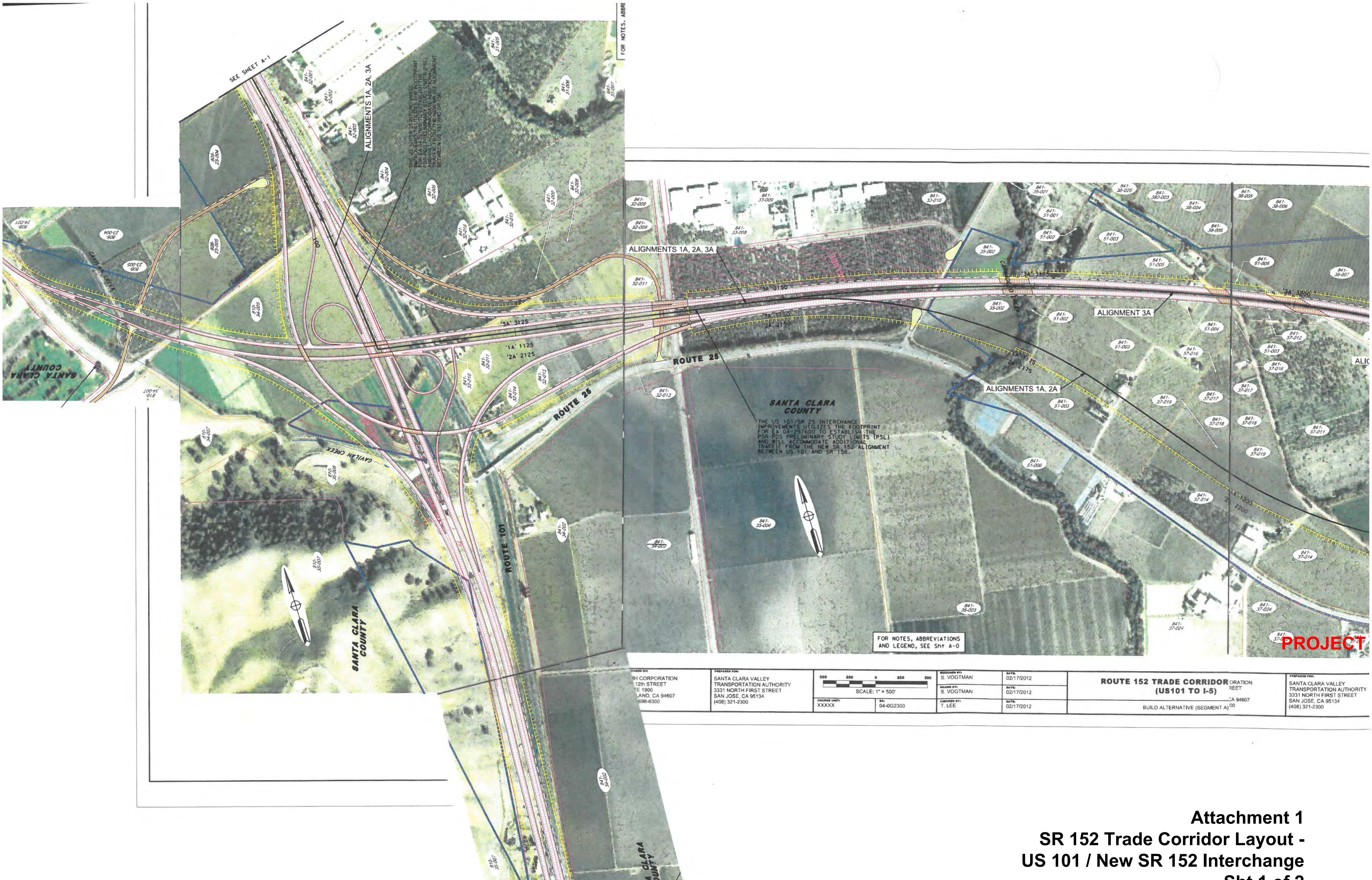
Please call me if you have any questions. Thank you for the opportunity to assist you.

Sincerely,

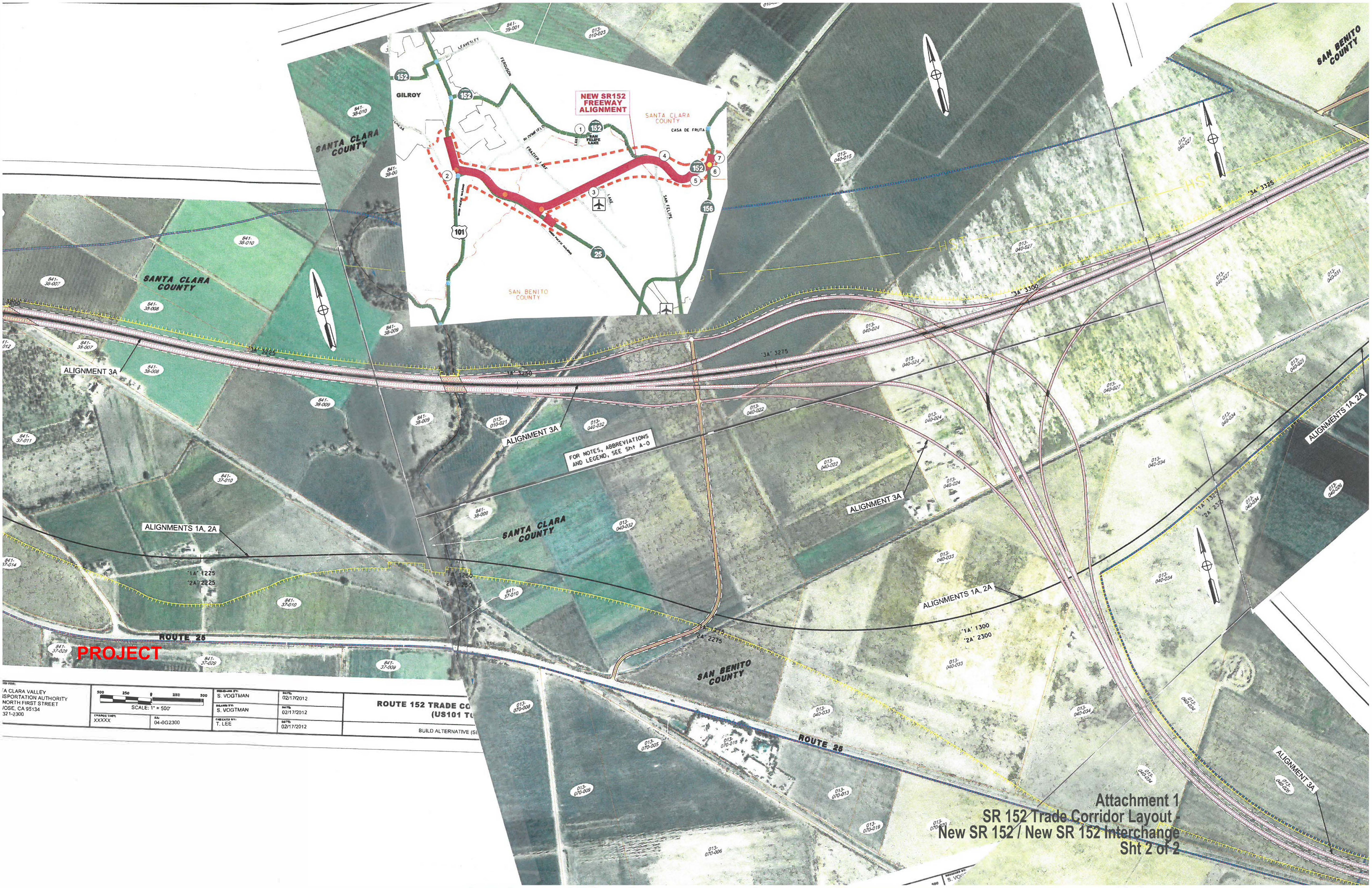
Keith Higgins

Keith Higgins, PE, TE

Attachments



Attachment 1
SR 152 Trade Corridor Layout -
US 101 / New SR 152 Interchange
Sht 1 of 2



Attachment 1
SR 152 Trade Corridor Layout -
New SR 152 / New SR 152 Interchange
Sht 2 of 2

HEXAGON TRANSPORTATION CONSULTANTS, INC.

Memorandum

Date: February 7, 2017

To: John Doyle, Z-Best Products

From: Robert Del Rio. T.E.

Subject: Z-Best Traffic Operations and Site Access Analysis

Introduction

Hexagon Transportation Consultants, Inc. has completed a traffic operations and site access analysis for the proposed improvements at the existing Z-Best Compost Facility located along State Route (SR) 25, south of the City of Gilroy in southern Santa Clara County, California. The proposed project consists of material processing improvements on the existing site to more efficiently process a larger volume of material. Access to the project site is currently provided via one stop-controlled full access entrance along the south side of SR 25 (for ease of reference, SR 25 will be referred to as an east/west roadway within this report).

The purpose of the traffic operations analysis is to determine the magnitude of project traffic currently on the adjacent roadway system and estimate the amount of additional traffic that would be added to the roadway system as a result of the proposed facility operations expansion (hereafter referred to as the proposed project). Existing traffic operational and/or safety constraints at the site access point and on the surrounding roadways and intersections also will be evaluated. The analysis of the transportation system is based on applicable local and regional standards.

Project Overview

Existing Facility

The Z-Best facility (project site) is located on the south side of SR 25 in south Santa Clara County. Access to the project site is provided via one existing entrance (hereafter referred to as project entrance), which intersects with SR 25. Currently, the facility is permitted to receive up to 1500 tons per day of feedstock material, inert material for facility maintenance, and additives used in finished products. Feedstock includes both green waste and municipal solid waste (MSW). Up to 2,500 tons per day of material may be received a maximum of 15 days per year and subset peak tonnages are set at 1,300 tons per day for green waste, 700 tons per day of MSW, and 500 tons per day of other material. The current hours of operation for the Z-Best facility are Monday through Friday 6 AM to 5 PM and Saturday 6 AM to 12 PM. The existing use permit allows the processing building to operate from 6 AM to 10 PM, the overall facility from 6 AM to 6 PM, and the windrow materials receiving, screening and turning (on-site) to be 24 hours a day. The facility is currently operated by 58 full-time employees (allowable maximum number of employees by current use permit is 60 employees) in five shift times (5 AM to 5 PM, 7 AM to 5 PM, 5 PM to 5 AM, 5 PM to 1:30 AM, and 6 AM to 5 PM), with the majority of the employees (30 employees) working between 5 AM and 5 PM. Access to the project site is currently provided via one existing entrance along SR 25 located approximately 600 feet (ft.) west of the Bolsa Road intersection with SR 25. The existing work shift times and number of employees per shift are summarized in Table 1.

The project site location is presented in Figure 1.

Figure 1
Z-Best Site Location

Table 1
Existing and Proposed Employee Work Shift Times

Hours of Operation	Existing Conditions [1]					Proposed Conditions [2]		
12:00 AM to 1:00 AM			SHIFT 3	SHIFT 4			SHIFT 2	SHIFT 3
1:00 AM to 2:00 AM				4				
2:00 AM to 3:00 AM							29	
3:00 AM to 4:00 AM								
4:00 AM to 5:00 AM	30 *					32 *		
5:00 AM to 6:00 AM	SHIFT 1		5		2 *	SHIFT 1		
6:00 AM to 7:00 AM		17 *			SHIFT 5			29
7:00 AM to 8:00 AM		SHIFT 2						
8:00 AM to 9:00 AM								
9:00 AM to 10:00 AM								
10:00 AM to 11:00 AM								
11:00 AM to 12:00 PM								
12:00 PM to 1:00 PM								
1:00 PM to 2:00 PM								
2:00 PM to 3:00 PM								
3:00 PM to 4:00 PM						32	29 *	
4:00 PM to 5:00 PM			5 *	4 *			SHIFT 2	
5:00 PM to 6:00 PM	30	17	SHIFT 3	SHIF 4	2			
6:00 PM to 7:00 PM								
7:00 PM to 8:00 PM								
8:00 PM to 9:00 PM								
9:00 PM to 10:00 PM								
10:00 PM to 11:00 PM								29 *
11:00 PM to 12:00 AM								SHIFT 3

Notes:
[1] Existing facility shift times and number of employees per shift (assumes employees will arrive at the site 15 minutes prior to the beginning of their work shifts and leave the site 15 minutes after completion of their work shift).
[2] Proposed facility shift times and assumed number of employees per shift (assumes employees will arrive at the site 15 minutes prior to the beginning of their work shifts and leave the site 15 minutes after completion of their work shift).
* Number of employees per work shift.

Proposed Facility Improvements

The proposed improvements (the project), involves replacing the current method of composting MSW with a more advanced, far more efficient method of composting. The current CTI composting system is proposed to be replaced with a “State of the Art” ECS composting method. With these proposed improvements, Z-Best will be able to compost more than double the amount of MSW feedstock within the same time period and within the same footprint on the site. Subsequently, Z-Best is proposing an increase in the daily feedstock tonnage limit from 1,500 tons per day to 2,750 tons per day. The additional feedstock tonnage is proposed to be received only at night during non-peak traffic hours. The number of employees also is proposed to increase from the current 58 employees (60 allowed by the use permit) to 80-85 employees (with a maximum of 90 employees allowed by the use permit). The proposed new work shift times would be the following: 5 AM to 3 PM, 4 PM to 2 AM, and 11 PM to 6 AM. The proposed work shift times and assumed number of employees per shift are summarized in Table 1.

It is anticipated that with the expanded operations, the facility would be able to serve an additional 57 trucks per day. All new truck trips are proposed to access the project site outside of the standard peak commute hours (7-9 AM and 4-6 PM). Truck traffic originating from and bound for the project site is currently restricted from using Bolsa Road. All new truck and vehicular traffic originating from and bound for the project site would continue to be restricted to the use of only SR 25 to SR 156 and US 101.

Scope of Study

This study estimates the additional traffic that would be generated with the proposed Zbest facility expansion and evaluates the effects of the additional traffic and possible roadway improvements at the project site entrance and along SR 25. Caltrans has initiated a study to eventually replace 11.2 miles of the existing SR 25 two-lane highway with a four-lane expressway in San Benito and Santa Clara Counties, including the segment along the project’s frontage. Therefore, the analysis includes and evaluation of project conditions with the potential future SR 25 improvements in place.

The analysis consists of the evaluation of current traffic operations at the study intersections and future traffic operations with the proposed project under both the existing and future roadway network. The traffic operations analyses at the study intersections consist of peak hour level of service analysis, signal warrant checks, and queuing analysis. The analysis includes an evaluation of traffic conditions during the AM (7:00-9:00 AM) and PM (4:00-6:00 PM) peak commute periods at the following two intersections:

SR 25 and Project Entrance
SR 25 and Bolsa Road

Each of the components of the intersection analyses are described in the following sections. Additionally, roadway segments along SR 25, east and west of the project site, also were evaluated to identify any existing deficiencies and to quantify the amount of additional traffic that is projected to be added by the proposed project.

Potential SR 25 Widening and Realignment

Caltrans has identified operational problems during the peak commute hours along the SR 25 corridor and at the US 101/SR 25 interchange, which are due primarily to the capacity constraints of the highway and interchange. Thus, Caltrans has initiated the study for the widening and realignment of SR 25 that will include the segment along the project’s frontage and realignment of Bolsa Road. In the vicinity of the project site, SR 25 consists of an undivided two-lane State highway with a posted speed limit of 55 miles per hour (mph) in both directions of travel.

In June 2016, Caltrans approved the Hollister to Gilroy State Route 25 Route Adoption project. In the Route Adoption study, Caltrans identifies two alternatives (plus a No Build alternative) to eventually replace 11.2 miles of the existing SR 25 two-lane highway with a four-lane expressway in San Benito and Santa Clara Counties. A route adoption would require San Benito and Santa Clara Counties to adopt a specific corridor for the future expressway into their General Plans, for the purpose of acquiring most or all parcels within the defined corridor area. The route adoption study extends from San Felipe Road (in Hollister) to the end of SR 25 at US 101 in Santa Clara County.

Both route adoption alternatives are 11.2 miles long and share the same alignment from US 101 to approximately ½ mile east of Shore Road. The project site entrance is located within this area. The proposed improvements would include the realignment of both SR 25 and Bolsa Road, which would result in new intersections of Bolsa Road with the new realigned SR 25 and the existing SR 25 east of the existing Bolsa Road/SR 25 intersection.

Although the actual SR 25 widening and realignment project has yet to be designed, approved, and funded, if constructed, it will affect project site access. The exact SR 25 realignment and location of the potential new intersection with Bolsa Road is not known at this time. However, the Route Adoption Alternatives 1 and 2 plans (prepared by Caltrans and shown on Figure 2) indicate the following:

- The realignment of SR 25 would begin east of Bloomfield Road and run north of and parallel to the existing SR 25 alignment from this point past Shore Road.
- The existing SR 25 would become a frontage road and would continue to provide direct access to the adjacent parcels/land uses, including the project site.
- The existing segment of Bolsa Road, between the existing SR 25 and north of the realigned SR 25 would be abandoned, eliminating the existing Bolsa Road/SR 25 intersection. The new Bolsa Road realignment would extend eastward adjacent to the existing Union Pacific Railroad tracks and intersect with both the realigned SR 25 and the existing SR 25 just east of the project site.

With the potential realignment of SR 25 and Bolsa Road, all project traffic bound for and originating from the Z-Best facility would utilize the new Bolsa Road intersection with the realigned SR 25.

Study Scenarios

This traffic study evaluates traffic conditions at the study intersections with both the existing roadway network and the planned SR 25 improvements. The study intersections were evaluated for the following study scenarios:

Existing Conditions: Existing conditions represent existing peak-hour traffic volumes on the existing roadway network. Existing peak hour traffic volumes at the project entrance and Bolsa Road intersections with SR 25 were obtained from new (August 2015) intersection turn movement counts.

Existing Plus Project Conditions: Existing Plus Project conditions represent existing peak-hour traffic volumes with the addition of the traffic estimated to be generated by the proposed facility expansion project. This scenario assumes no changes to the existing roadway network.

Existing Conditions with SR 25 Realignment: Existing conditions with SR 25 realignment represent reassigned existing traffic volumes at the project entrance and Bolsa Road intersections with the planned SR 25 improvements.

Project Conditions with SR 25 Realignment: Project conditions with SR 25 realignment represent reassigned existing plus project traffic volumes at the project entrance and Bolsa Road intersections with the planned SR 25 improvements.

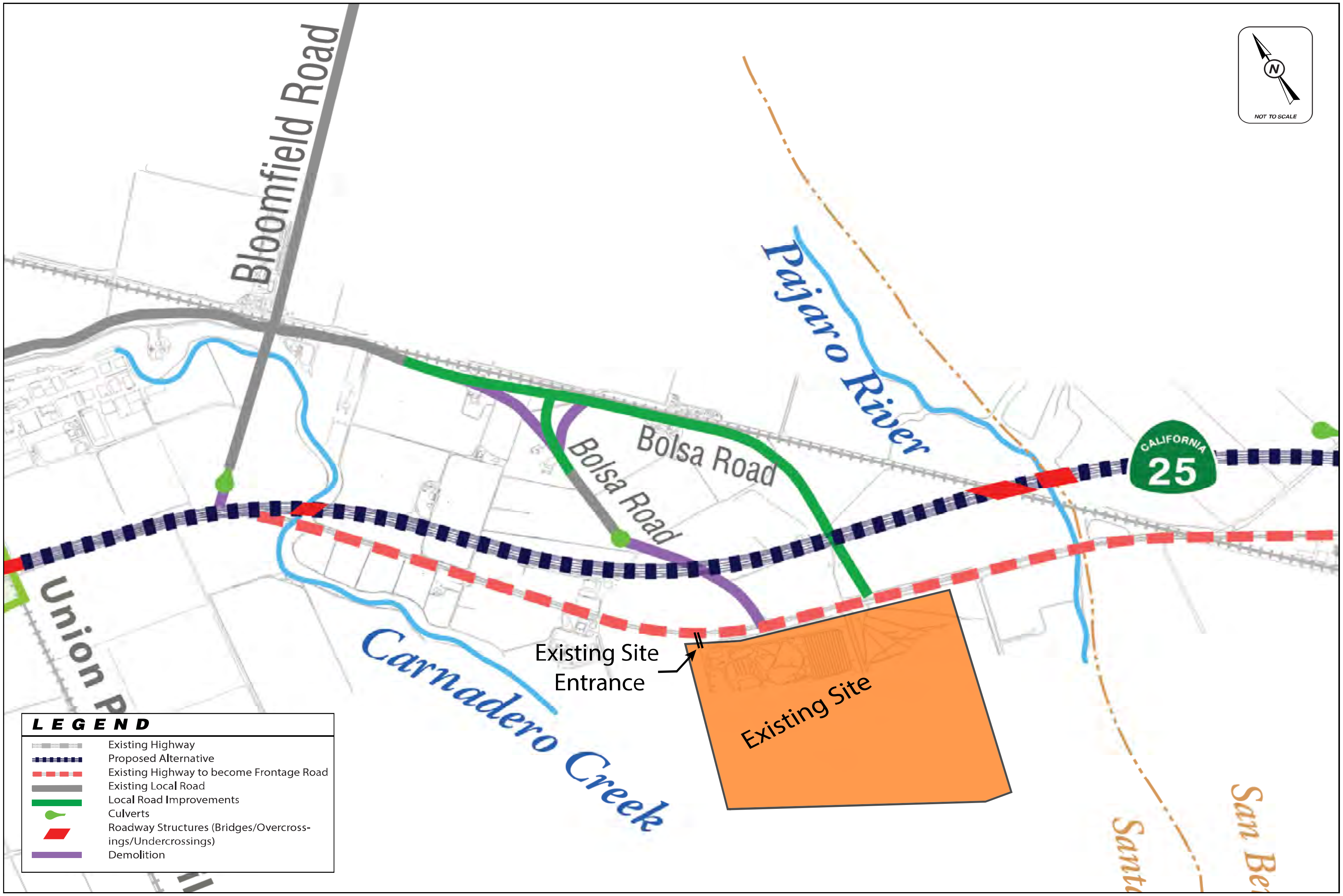


Figure 2
Potential SR 25 Widening and Realignment

Trip Generation, Distribution, and Assignment

Existing Trip Generation

Project trips currently utilizing the project entrance and on the surrounding roadway system were determined based upon truck scale data provided by Z-Best and existing count data collected at the project entrance.

The truck scale data provided by Z-Best includes the daily number of inbound and outbound trucks by hour that passed over the on-site scales during the period of October 2013 through September 2014, which, according to Z-Best staff, represent peak operations of the facility over the past two years. The existing count data was collected in August 2015 and consists of (1) peak-hour intersection turn-movement counts collected at the site's entrance during the AM peak period (7:00 to 9:00 am) and the PM peak period (4:00 to 6:00 pm) and (2) 24-hour vehicle composition video counts also collected at the site's entrance. The new 24-hour vehicle composition data were compared with the truck data provided by Z-Best to validate the truck scale data. The number of daily and peak hour trips to the site associated with all other non-truck traffic also were obtained from the new traffic counts. Other non-truck vehicular trips associated with the site include cars or smaller trucks driven by employees or vendors and parts and supply deliveries. Both the truck scale data provided by Z-Best and new count data are contained in the Appendix. The existing site trip generation data is summarized in Table 2.

Table 2
Existing Site-Generated Trips

	Daily			Peak Hours					
				AM			PM		
Type	In	Out	Total	In	Out	Total	In	Out	Total
Total Vehicle Trips									
Driveway Counts[1]	192	198	390	10	9	19	9	27	36
Heavy Truck Trips									
Truck Trips (Counts)[2]	104	105	209	6	8	14	5	5	10
Truck Trips (Scale Data)[3]	132	132	264	13	13	26	10	10	20

Notes:
AM = one peak-hour between 7:00 - 9:00 am
PM = one peak-hour between 4:00 - 6:00 pm
Daily = 24-hour total
[1] Based on peak hour intersection turn-movement and 24-hour daily counts completed at the project site entrance in August 2015.
[2] Based on vehicle composition obtained from 24-hour daily counts completed ar project site entrance in August 2015.
[3] Based on truck scale data provided by Z-Best (October 1st, 2013 to December 31st, 2013).

The count data collected at the site entrance indicates that the facility currently generates 390 daily vehicle trips with 19 trips occurring during the AM peak hour and 36 trips occurring during the PM peak hour.

Based on the vehicle composition data collected at the site entrance, approximately 209 daily truck trips are currently generated by the facility. The truck scale data indicated a peak of 264 daily truck trips. The number of truck trips obtained from the traffic counts is approximately 20% less than that indicated by the truck scale data. However, the truck scale data is reflective of a period of peak operations for the facility over the past two years.

Hourly site-generated trips, both truck and non-truck trips, were estimated by correlating the 24-hour count information collected at the site entrance with the current number of employees and their shift-times. Based on this information, all components of traffic currently accessing and leaving the project site throughout the day were estimated (see Table 3). It is estimated that approximately 210 truck trips and 180 non-truck trips (116

Table 3
Hourly Existing and Projected Site-Generated Trips

Hours of Operation		Existing Conditions[1]: Non-Truck Trips (Based on Driveway Counts)	Truck Trips (Based on Driveway Counts)	Total	Total Site Trips: In	Out	Total	Proposed Conditions[2]: Non-Truck Trips: Additional Employee Trips	Existing Employee Trips/New Shift Times	Other Non-Truck Trips	Total Future Non-Truck Trips	Truck Trips: Additional Truck Trips	Total Future Truck Trips	Total	Total Site Trips: In	Out	Total	Net Additiuonal Trips: In	Out	Total
12:00 AM	Arrivals	0	1	1	1	0	1			0	0	2	3	3	3	2	5	2	2	4
to 1:00 AM	Departures	0	0	0						0	0	2	2	2						
1:00 AM	Arrivals	0	0	0	0	1	1			0	0	2	2	2	2	3	5	2	2	4
to 2:00 AM	Departures	0	1	1						0	0	2	3	3						
2:00 AM	Arrivals	0	0	0	0	0	0			0	0	2	2	2	2	31	33	2	31	33
to 3:00 AM	Departures	0	0	0				10	19	0	29	2	2	31						
3:00 AM	Arrivals	0	3	3	3	5	8			0	0	3	6	6	6	4	10	3	-1	2
to 4:00 AM	Departures	4	1	5						0	0	3	4	4						
4:00 AM	Arrivals	5	5	10	10	5	15	12	20	0	32	3	8	40	40	8	48	30	3	33
to 5:00 AM	Departures	0	5	5						0	0	3	8	8						
5:00 AM	Arrivals	2	5	7	7	3	10			0	0	3	8	8	8	6	14	1	3	4
to 6:00 AM	Departures	0	3	3						0	0	3	6	6						
6:00 AM	Arrivals	33	7	40	40	7	47			0	0	3	10	10	10	39	49	-30	32	2
to 7:00 AM	Departures	0	7	7				10	19	0	29	3	10	39						
7:00 AM	**Arrivals**	**4**	**6**	**10**	**10**	**11**	**21**			**0**	**0**		**6**	**6**	**6**	**8**	**14**	**-4**	**-3**	**-7**
to 8:00 AM	**Departures**	**3**	**8**	**11**						**0**	**0**		**8**	**8**						
8:00 AM	Arrivals	6	6	12	12	5	17			1	1		6	7	7	3	10	-5	-2	-7
to 9:00 AM	Departures	3	2	5						1	1		2	3						
9:00 AM	Arrivals	6	13	19	19	20	39			6	6	3	16	22	22	23	45	3	3	6
to 10:00 AM	Departures	7	13	20						7	7	3	16	23						
10:00 AM	Arrivals	9	7	16	16	23	39			9	9	3	10	19	19	26	45	3	3	6
to 11:00 AM	Departures	11	12	23						11	11	3	15	26						
11:00 AM	Arrivals	4	8	12	12	16	28			4	4	3	11	15	15	19	34	3	3	6
to 12:00 PM	Departures	6	10	16						6	6	3	13	19						
12:00 PM	Arrivals	4	10	14	14	15	29			4	4	3	13	17	17	18	35	3	3	6
to 1:00 PM	Departures	5	10	15						5	5	3	13	18						
1:00 PM	Arrivals	3	12	15	15	13	28			3	3	3	15	18	18	16	34	3	3	6
to 2:00 PM	Departures	4	9	13						4	4	3	12	16						
2:00 PM	Arrivals	3	8	11	11	10	21			2	2	3	11	13	13	11	24	2	1	3
to 3:00 PM	Departures	3	7	10						1	1	3	10	11						
3:00 PM	Arrivals	3	5	8	8	13	21	10	19	0	29	3	8	37	37	42	79	29	29	58
to 4:00 PM	Departures	6	7	13				12	20	0	32	3	10	42						
4:00 PM	**Arrivals**	**5**	**5**	**10**	**10**	**27**	**37**			**0**	**0**		**5**	**5**	**5**	**5**	**10**	**-5**	**-22**	**-27**
to 5:00 PM	**Departures**	**22**	**5**	**27**						**0**	**0**		**5**	**5**						
5:00 PM	Arrivals	0	1	1	1	20	21			0	0		1	1	1	2	3	0	-18	-18
to 6:00 PM	Departures	18	2	20						0	0		2	2						
6:00 PM	Arrivals	1	0	1	1	2	3			1	1	3	3	4	4	4	8	3	2	5
to 7:00 PM	Departures	1	1	2						0	0	3	4	4						
7:00 PM	Arrivals	0	0	0	0	0	0			0	0	3	3	3	3	3	6	3	3	6
to 8:00 PM	Departures	0	0	0						0	0	3	3	3						
8:00 PM	Arrivals	0	1	1	1	1	2			0	0	3	4	4	4	4	8	3	3	6
to 9:00 PM	Departures	0	1	1						0	0	3	4	4						
9:00 PM	Arrivals	0	0	0	0	0	0			0	0	3	3	3	3	3	6	3	3	6
to 10:00 PM	Departures	0	0	0						0	0	3	3	3						
10:00 PM	Arrivals	0	1	1	1	1	2	10	19	0	29	3	4	33	33	4	37	32	3	35
to 11:00 PM	Departures	1	0	1						1	1	3	3	4						
11:00 PM	Arrivals	0	0	0	0	0	0			0	0	3	3	3	3	3	6	3	3	6
to 12:00 AM	Departures	0	0	0						0	0	3	3	3						
TOTAL DAILY TRIPS:		**182**	**208**	**390**	**192**	**198**	**390**	**64**	**116**	**66**	**246**	**114**	**322**	**568**	**281**	**287**	**568**	**89**	**89**	**178**

Notes:
[1] Existing hourly project site traffic activity was estimated based on the existing 24-hour vehicle composition traffic counts conducted at the project site entrance in August 2015, in combination with information provided by Z-Best on their current number of employees, employee shift times, and hours of operation.
[2] Hourly site traffic projections associated with the proposed Z-Best facility operations expansion. These projections are based on the anticipated increase in the number of employees and number of trucks accessing the site daily, the proposed new employee shift times, and the restriction of all new truck traffic to access the site during the off-peak hours only.

employee trips and 64 “other” trips), for a total of 390 total trips, are currently generated by the Z-Best Facility on an average weekday.

Project Trip Generation Estimates

The additional traffic associated with the expansion of the facility operations were estimated and assigned to the roadway network based on anticipated increase in the number of employees, employee work shift times, additional truck traffic, and assuming all new truck traffic would be generated outside of the standard peak commute hours.

The proposed expansion would increase the number of employees from the existing 58 employees to a maximum of 90 employees (although the applicant anticipates the plant to operate with no more than 85 employees). This represents an increase of 32 additional employees. The additional employees would result in the addition of 64 daily trips (32 inbound and 32 outbound trips) to the project site.

It is anticipated that with the expanded operations, the facility would be able to serve an additional 57 trucks per day, or 114 truck trips (57 inbound and 57 outbound) per day. With the applicant’s request to extend the receipt of materials to 24 hours a day, the new truck trips would access the site throughout the entire day, with the exception of the standard commute peak hours (or 20 hours a day). There is no proposed change to the truck trips currently generated by the existing site operations. Based on this assumption, the additional truck trips represent no more than 6 truck trips per hour.

The hourly trip generation estimates with the proposed facility expansion are summarized in Table 3. Employee trips were estimated based on the proposed work shift times (5 AM to 3 PM, 4 PM to 2 AM, and 11 PM to 6 AM) and assuming employees would arrive at the site within 15 minutes before the beginning of their shift time and leave the site within 15 minutes of the end of their shift time. The proposed new shift times were assumed to also apply to all current employees. With the proposed expansion, the Z-Best Facility is projected to generate a

total of 14 AM peak hour trips (6 inbound and 8 outbound trips) and 10 PM peak hour trips (5 inbound and 5 outbound). This represents a decrease of approximately 7 trips during the AM peak hour and 27 trips during the PM peak hour when compared to existing conditions. The projected decrease is due to the change in work shift times associated with the proposed expansion.

Trip Distribution and Assignment

The existing directional distribution of site-generated traffic was estimated based on the direction of arriving/departing traffic obtained from the turn-movement counts conducted at the project entrance. It should be noted that the directionality of trips obtained from the driveway counts is based on the total truck and auto trips. The existing directional distribution was applied to the future volume projections, with implementation of the proposed expansion, to assign new project traffic at the project entrance and to the roadway network.

Existing and Project Conditions Traffic Volumes

The existing and projected peak-hour traffic volumes with the proposed facility expansion (project conditions) at the study intersections are shown on Figure 3.

Other existing uses along SR 25 that would utilize the potential new realigned SR 25/Bolsa Road intersection for access include the Uesugi Farm site, located less than half a mile west of the project site, and sites located east of the project site. Existing traffic volumes associated with the project site and the other existing uses were reassigned to the potential new realigned SR 25/Bolsa Road intersection. However, since the amount of traffic that the other two existing uses currently generate is unknown, it was conservatively assumed, based on the size of their sites, that the Uesugi Farm site currently generates approximately half the peak-hour traffic that the project site generates, and the sites to the east currently generate approximately the same amount of peak-hour traffic as the project site. Existing and project conditions traffic volumes with the SR 25 realignment are presented on Figure 4.

Passenger Car Equivalent Trips

Because a significant portion of the traffic associated with the project would be truck traffic, a more conservative analysis was conducted for this study in which the truck trips were converted to passenger car equivalent (PCE)

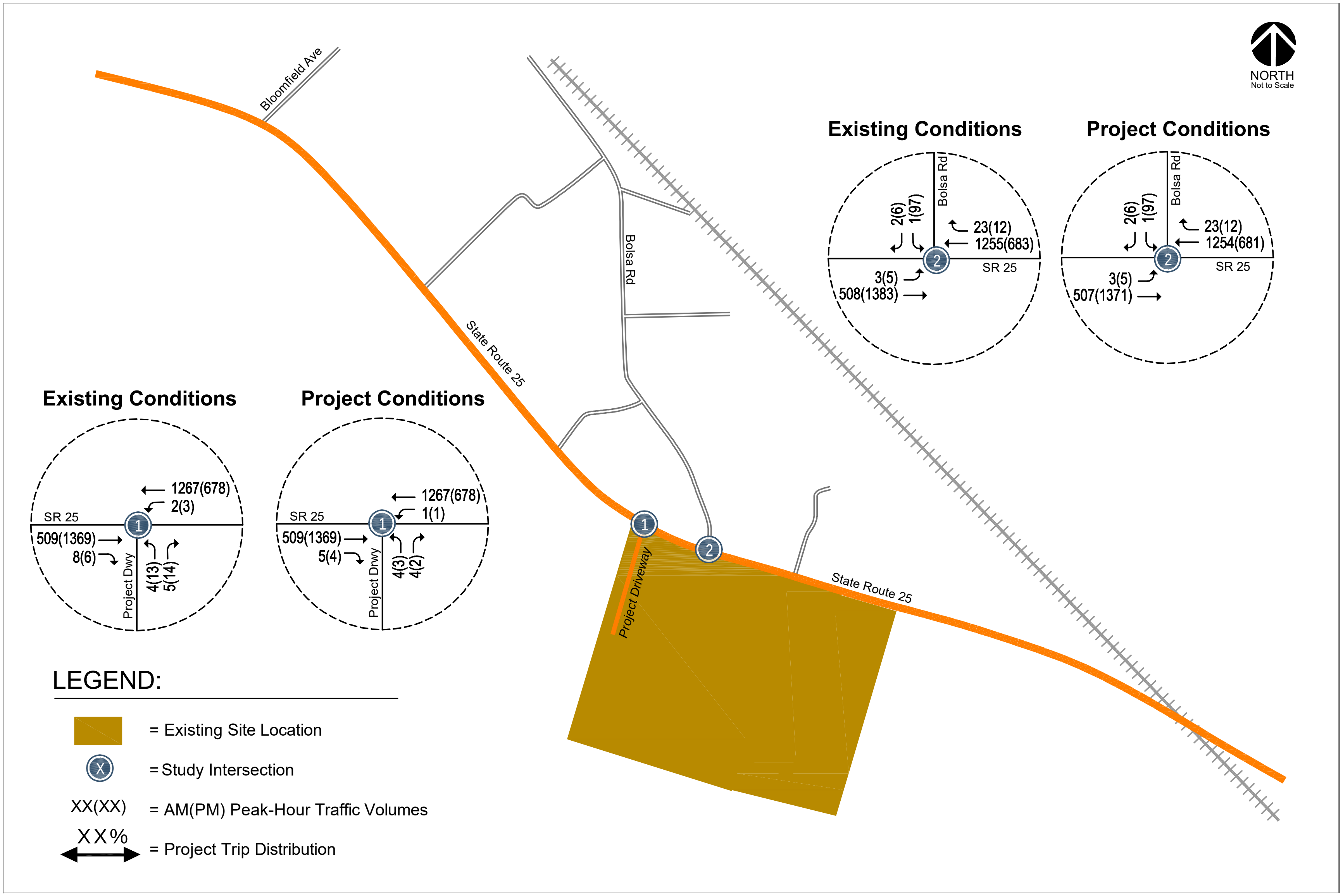


Figure 3
Existing and Project Conditions Traffic Volumes

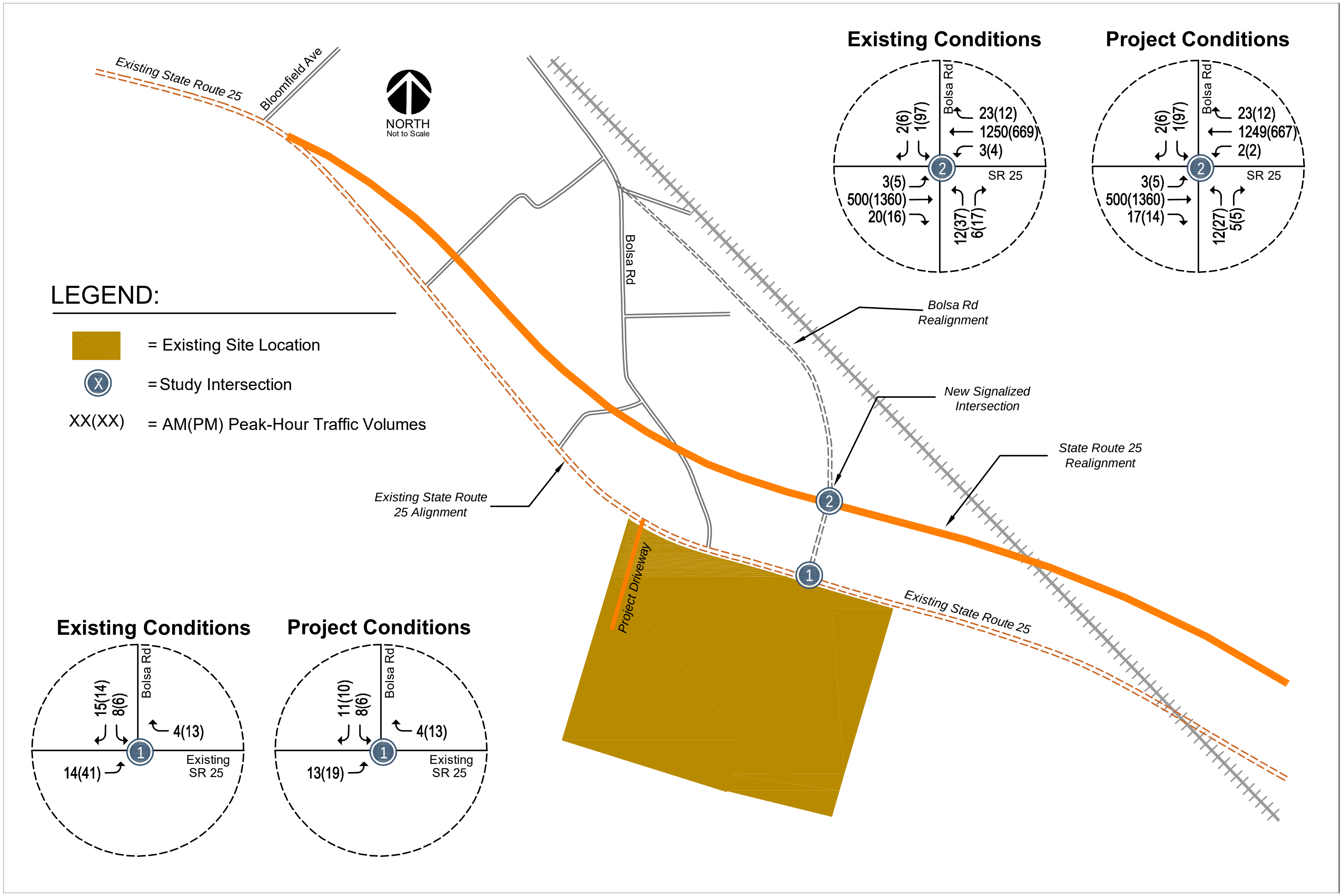


Figure 4
Existing and Project with SR 25 Realignment Conditions Traffic Volumes

trips. This is founded on the observation that trucks impact traffic operations at intersections more significantly than passenger cars do. For this analysis, it is assumed that each truck trip is equivalent to 1.5 passenger car trips. Applying the PCE factors to the estimated project truck trips, it was calculated that the existing facility operations currently generates a total of 28 PCE trips (13 inbound and 15 outbound) during the AM peak hour and 43 PCE trips (13 inbound and 30 outbound) during the PM peak hour. With the proposed project, the facility is estimated to generate a total of 21 PCE trips (9 inbound and 12 outbound) during the AM peak hour and 16 PCE trips (8 inbound and 8 outbound) during the PM peak hour. These are the project site traffic projections that were utilized for the evaluation of traffic operations at the study facilities.

Intersection Level of Service Analysis

Level of Service is a qualitative description of operating conditions ranging from LOS A, or free-flow conditions with little or no delay, to LOS F, or jammed conditions with excessive delays. The study intersections were analyzed using TRAFFIX software, which is based on the *Highway Capacity Manual* (HCM) 2000 method for computing level of service at intersections. Two-way-stop controlled intersection levels of service are evaluated based on worst approach stop control delay time for all vehicles at the intersection.

Traffic conditions were analyzed for the weekday AM and PM peak hours. The weekday AM peak hour of traffic is generally between 7:00 and 9:00 AM, and the weekday PM peak hour is typically between 4:00 and 6:00 PM. It is during these periods that the most congested traffic conditions occur on a typical weekday. The level of service results are discussed below and summarized in Table 4. The level of service calculations are included in the Appendix.

Significant Impact Criteria

All study facilities are located along SR 25. The California Department of Transportation (Caltrans) has jurisdiction of all State maintained facilities, including SR 25. Therefore, the study intersections were evaluated based on Caltrans significance criteria. The criteria described below apply to the weekday AM and PM peak hours.

Caltrans Definition of Significant Impacts

All roadway facilities studied are under the jurisdiction of Caltrans, and therefore, are required to meet the Caltrans Level of Service (LOS) standard. Caltrans level of service standard is LOS C or better. The Caltrans Guide for the Preparation of Traffic Impact Studies (Caltrans 2002) defines a significant impact to occur when:

1. The addition of project traffic causes roadway (or intersection) operations to degrade from an acceptable level (LOS C or better) to an unacceptable level (LOS D or worse) or,
2. Project traffic is added to a roadway (or intersection) operating at an unacceptable level (LOS D or worse).

Existing Conditions

The results of the level of service analysis show that, measured against the Caltrans level of service standards, both the project entrance and Bolsa Road intersections with SR 25 currently operate at an unacceptable LOS F during the PM peak hour based on the worst approach delay. The worst approach is typically the minor street approach that is stop-controlled.

Project Conditions

The results of the level of service analysis show that, with implementation of the proposed project, both the project entrance and Bolsa Road intersections with SR 25 are projected to experience a small improvement in the worst approach delay, although both intersections would continue to operate at an unacceptable LOS F during the PM peak hour. The proposed project would not add any additional traffic to either of the study intersections during the peak hours, therefore, based on Caltrans impact criteria, the proposed project would not result in a significant project impact at the study intersections.

Table 4
Operations Analysis Results Summary

			Existing					Existing Plus Project							
	LOS	Peak	Warrant	Average		Worst		Warrant	Average			Worst			
Location	Standard	Hour	Met?	Delay[1]	LOS	Delay[2]	LOS	Met?	Delay[1]	LOS	Change	Delay[2]	LOS	Change	
Existing Network															
SR 25 and Project Entrance	C	AM	No	0.2	A+	**28.7**	**D**	No	0.2	A+	0.0	**28.6**	**D**	-0.1	
		PM	No	0.9	A+	**60.2**	**F**	No	0.2	A+	-0.7	**48.0**	**E**	-12.2	
SR 25 and Bolsa Road	C	AM	No	0.1	A+	**30.3**	**D**	No	0.1	A+	0.0	**30.3**	**D**	0.0	
		PM	**Yes**	22.1	C-	**469.8**	**F**	**Yes**	21.5	C	-0.6	**453.5**	**F**	-16.3	
Existing Network with SR 25 Realignment															
New SR 25 and Bolsa Road (unsignalized)	C	AM	No	0.8	A+	**54.3**	**F**	No	0.7	A+	-0.1	**54.0**	**F**	-0.3	
		PM	**Yes**	**53.7**	**F**	**1016.1**	**F**	**Yes**	**44.6**	**E**	-9.1	**889.8**	**F**	-126.3	
New SR 25 and Bolsa Road (signalized)	C	AM	--	18.0	B-	--	--	--	18.0	B	0.0	--	--	--	
		PM	--	18.7	B-	--	--	--	18.7	B-	0.0	--	--	--	

Notes:
[1] Whole intersection weighted average control delay expressed in seconds per vehicle.
[2] The worst case delay is normally the time it would take a vehicle on the minor street of an unsignalized intersection to make a left-turn onto the major street, expressed in seconds per vehicle.
Bold indicates unacceptable level of service.

Level of Service Analysis with Potential SR 25 Improvements

These analysis scenarios assumed the potential realignment of SR 25 and Bolsa Road. The analysis focuses on the new potential intersection created by the realigned SR 25 and Bolsa Road, which would provide access to the project site and other existing uses along the existing SR 25. The project site entrance would be located along a frontage roadway (existing SR 25) with minimal through traffic, and therefore, would operate better than under existing conditions.

Existing Conditions with SR 25 Realignment

The results of the level of service analysis show that the new potential intersection of the realigned SR 25 and Bolsa Road would operate at an unacceptable LOS E and F during the AM and PM peak hours, respectively, with the reassignment of existing traffic as a result of the proposed SR 25 improvements and assuming the new intersection would continue to be stop-controlled on Bolsa Road.

Assuming the new Bolsa Road intersection with the realigned SR 25 is controlled by a traffic signal, the intersection is projected to operate at an acceptable LOS B during both the AM and PM peak hours.

The existing project site entrance along the existing SR 25 (new frontage road) would operate acceptably under this scenario.

Project Conditions with SR 25 Realignment

The results of the level of service analysis show that the new potential intersection of the realigned SR 25 and Bolsa Road would continue to operate at an unacceptable LOS E and F during the AM and PM peak hours, respectively, under project conditions with SR 25 realignment and assuming the new intersection would continue to be stop-controlled on Bolsa Road. However, the proposed project would result in an improvement in the intersections’ worst approach delay (associated with reduced number of employee peak-hour trips), therefore, based on Caltrans impact criteria, the proposed project would not result in a significant project impact at the intersection of the realigned SR 25/Bolsa Road.

Assuming the new Bolsa Road intersection with the realigned SR 25 is controlled by a traffic signal, the intersection is projected to operate at an acceptable LOS B during both the AM and PM peak hours under project plus SR 25 realignment conditions. Therefore, the proposed project would not result in a significant project impact at this intersection under these assumptions.

The existing project site entrance along the existing SR 25 (new frontage road) would operate acceptably under this scenario.

Signal Warrant Analysis

The level of service analysis at the study intersections were supplemented with an assessment of the need for signalization of the intersections. The need for signalization of unsignalized intersections is assessed based on the Peak-Hour Volume Warrant (Warrant 3) described in the *California Manual on Uniform Traffic Control Devices for Streets and Highways (CA MUTCD)*, Part 4, Highway Traffic Signals, 2014. This method makes no evaluation of intersection level of service, but simply provides an indication whether vehicular peak hour traffic volumes are, or would be, sufficient to justify installation of a traffic signal. Intersections that meet the peak hour warrant are subject to further analysis before determining that a traffic signal is necessary. Additional analysis may include unsignalized level of service analysis and/or operational analysis such as evaluating vehicle queuing and delay. Other options such as traffic control devices, signage, or geometric changes may be preferable based on existing field conditions.

The results of the peak-hour volume warrants indicate that the existing and project condition peak-hour volumes at the existing project entrance intersection with SR 25 fall below the threshold that warrant signalization. The peak hour volumes at the existing SR 25 and Bolsa Road intersection currently meet the threshold for signalization during the PM peak hour. Since the proposed project would not add additional peak-hour traffic to the intersection, it would not exacerbate the need for signalization of the intersection.

With the planned realignment of SR 25, the reassigned existing and project condition peak-hour traffic volumes at the new potential intersection of the realigned SR 25 and Bolsa Road would meet the threshold that warrants signalization during the PM peak hour. However, since the proposed project would not add additional peak-hour traffic to the intersection, it would not exacerbate the need for signalization of the intersection. Traffic volumes at the project entrance intersection with the existing SR 25 (frontage road) would fall below the threshold that warrants signalization under this scenario.

The results of the signal warrant analysis are summarized in Table 4. The signal warrant sheets are included within the Appendix.

Intersection Operations (Queuing) Analysis

The operations analysis is based on vehicle queuing for left-turn movements at intersections. Vehicle queues obtained from TRAFFIX were utilized for this analysis. The basis of the analysis is as follows: (1) TRAFFIX is used to estimate the 95th percentile maximum number of queued vehicles during the peak hour for a particular movement; (2) the estimated maximum number of vehicles in the queue is translated into a queue length, assuming 25 feet per vehicle; and (3) the estimated maximum queue length is compared to the existing or planned available storage capacity for the movement. This analysis thus provides a basis for estimating future storage requirements at the selected locations. The queue estimates for movements at the new potential intersection of the realigned SR 25 and Bolsa Road were evaluated under both existing and project conditions.

The queuing analysis results show that, under existing conditions and based on the reassigned peak-hour traffic volumes, both the eastbound and westbound left-turn approaches along the realigned SR 25 at Bolsa Road would experience queue lengths of no more than 1 vehicle during the peak hours. The southbound approach would experience a queue length of 4 vehicles, or 100 ft. assuming an average vehicle length of 25 ft. per vehicle, during the PM peak hour, while the northbound approach would experience a queue length of 2 vehicles, or 50 ft., during the PM peak hour. However, the projected queue would occur along Bolsa Road and would not result in a disruption of traffic flow on SR 25.

Under project conditions, all projected left-turn vehicle queues at the realigned SR 25 and Bolsa Road intersection would remain unchanged, with the exception of the northbound approach, which is projected to experience queue lengths of no more than 1 vehicle during the PM peak hour with implementation of the proposed project. Therefore, the proposed project would not negatively affect the projected peak-hour left-turn vehicular queues at the intersection of the realigned SR 25 and Bolsa Road.

During the off-peak hours, as many as 10 trips (8 non-truck and 2 truck trips) are projected to access the project site from the east on SR 25. These trips represent westbound left-turn movements at the new potential realigned SR 25/Bolsa Road intersection. Even if the westbound left-turn trips associated with the project site are conservatively assumed to be 10 trips during the PM peak-hour (instead of the projected 1 trip, during the worst of the two peak hours), the queue analysis results show that the projected westbound left-turn queue length along the realigned SR 25 at Bolsa Road would continue to be no more than 1 vehicle.

Collision History

The collision history along SR 25 in the vicinity of the project entrance and Bolsa Road intersections with SR 25 was reviewed. A review of collision data received from Caltrans indicates a total of 29 collisions over a 3-year span along SR 25 between Bloomfield Road and the beginning of the highway divider (located approximately 1.5 miles east of the project site entrance). The number of collisions along this highway segment exceeds the statewide average for similar facilities. However, only two collisions occurred in the vicinity of the project entrance and Bolsa Road intersections with SR 25 over that same 3-year period.

Highway Segment Operations

The highway segments located immediately east and west of the project entrance were evaluated based on the *Highway Capacity Manual* (HCM) 2010 methodology and using the Highway Capacity Software (HCS). The results of the highway segment peak hour level of service analysis show that the segments along SR 25 currently operate at an unacceptable LOS E during the AM and PM peak hours.

According to the Caltrans definition of impact on highway segments, the addition of any traffic to a facility currently operating unacceptably would be considered an impact. The proposed project is estimated to result in a decrease in traffic volume during the peak hours. Therefore, the proposed project would not result in a significant project impact on segments of SR 25.

Potential SR 25 Improvements

The operations and site access analysis shows that although the proposed project would not result in traffic impacts at the study intersections and highway segments, both the study intersections and the study highway segments currently operate at unacceptable levels. The proposed SR 25 improvements would improve traffic operations along the realigned SR 25, the new intersection of realigned SR 25/Bolsa Road, and the project site entrance. Converting the existing SR 25 to a frontage roadway would improve both traffic conditions and safety at the project entrance since the through traffic on the frontage road would be minimal. Additionally, the potential new intersection of the realigned SR 25/Bolsa Road would provide a controlled access point to the project site from SR 25. The peak hour intersection level of service and signal warrant analysis at the realigned SR 25/Bolsa Road intersection indicates that the intersection would have peak hour volumes that warrant the installation of traffic signal. Providing access to the project site from SR 25 via a signalized intersection would improve operations and safety for both project traffic and through traffic along SR 25, in particular since the majority of vehicular trips generated by the project site are large trucks. The potential new intersection also would include exclusive left-turn lanes along SR 25 that would not only increase intersection capacity but also would minimize the disruption of through traffic along SR 25. Overall, the potential SR 25 improvements would improve traffic conditions at the project site access and along SR 25.

Described below is the recommended intersection lane configuration at the potential new realigned SR 25/Bolsa Road intersection to provide adequate access to the project site and other existing uses along the new frontage road (existing SR 25).

Conceptual Layout of New SR 25 and Bolsa Road Intersection

A conceptual layout of the potential new Bolsa Road intersection with the realigned SR 25, intersection which would provide access to the project site, was prepared per Caltrans design standards. Each of the design requirements that would be applicable to the new access intersection are discussed below. Figure 5 provides a conceptual layout of the intersection per Caltrans requirements.

Highway Design Manual Standards

The Caltrans *Highway Design Manual* (HDM) makes the following recommendations regarding intersection design standards (Topic 405).

Sight Distance

A clear line of sight should be provided between the driver on the minor street (crossroad) and the approaching traffic (major street). At a minimum, adequate stopping sight distance should be provided at all unsignalized intersections. Corner sight distance and decision sight distance also should be provided when possible and/or applicable. In some cases, the cost of providing the required corner sight distance may be excessive. When restrictive conditions exist, the minimum value for corner sight distance shall be equal to the stopping sight distance. Decision sight distance is required at intersections where the State route turns or crosses another State route.

Based on the design speed along SR 25 (posted speed limit of 55 mph), the required stopping sight distance must be no less than 500 ft. (Table 201.1 of the HDM) and the minimum corner sight distance should be 605 ft. Since SR 25 is relatively straight in the vicinity of the new intersection location, more than 1,000 ft. of sight distance to the west and east on SR 25 from the new Bolsa Road could be provided.

Acceleration Lanes

According to the HDM, at rural intersections with stop control on the local cross road, acceleration lanes for left and right turn onto the State facility should be considered. Acceleration lanes would not be required if the new intersection is to be signalized.

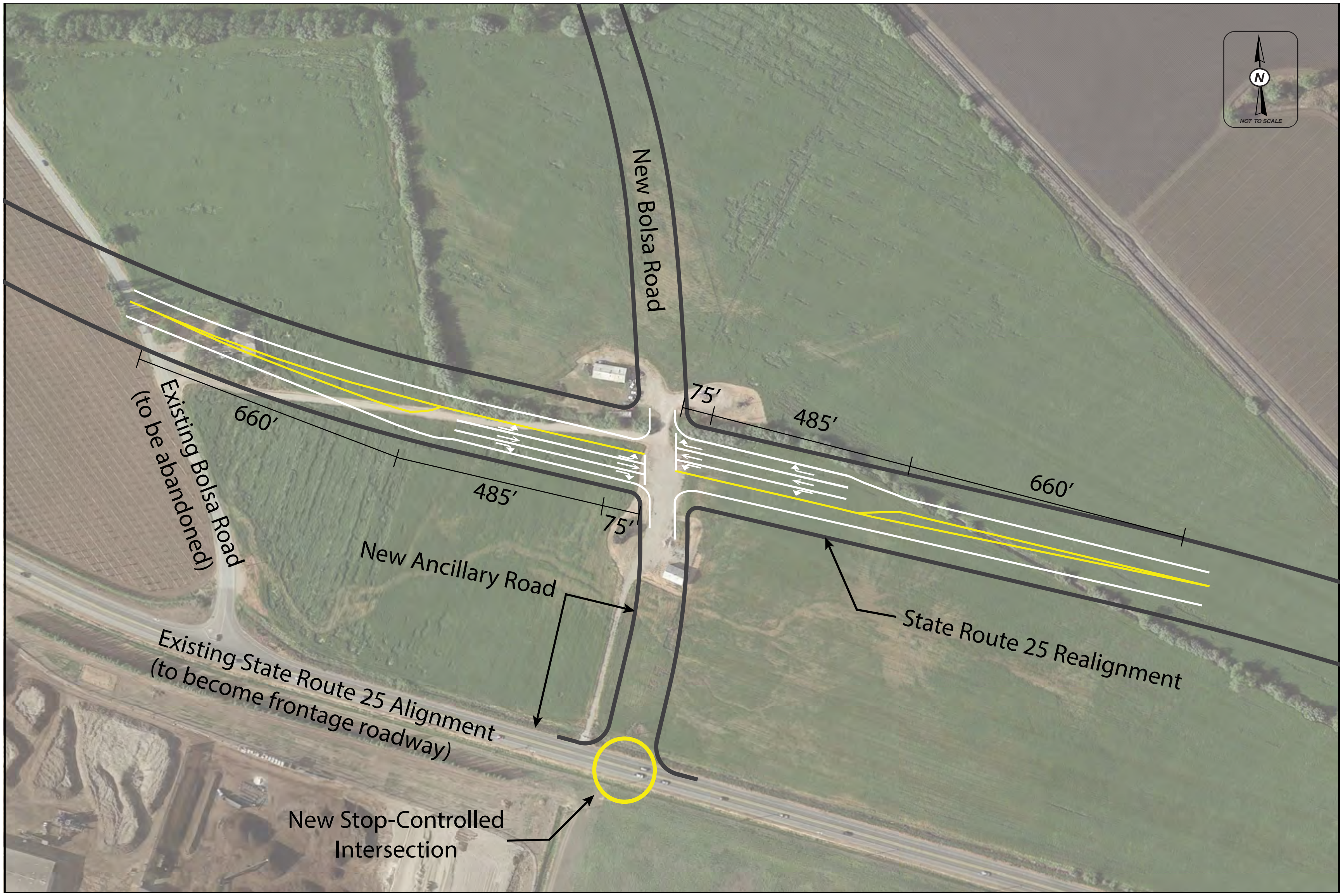


Figure 5
Conceptual Project Access along Realigned SR 25

Left-Turn Channelization

The HDM recommends left-turn lanes be provided at intersections to expedite the movement of through traffic, control the movement of turning traffic, increase intersection capacity, and improve safety. At a minimum, the left-turn lane should meet the following requirements:

Lane Width – The lane width for both single and double left-turn lanes on State highways shall be 12 ft. However, under certain circumstances, left-turn lane widths of 11 ft. or as narrow as 10 ft. may be used. Based on Caltrans design criteria, the left-turn lanes at the new intersection should be a minimum of 10 ft. wide.

Approach Taper – The approach taper provides space for a left-turn lane by moving traffic laterally to the right. In all situations where space is available (usually in rural and semi-rural areas on in urban areas with high traffic speeds and/or volumes), the standard left-turn channelization design in which all widening is to the right of approaching traffic and the deceleration lane begins at the end of the approach taper should be used. However, alternate designs with the deceleration lane beginning at the 2/3 point of the approach taper (so that part of the deceleration takes place in the through traffic lane) may be used in urban areas where constraints exist, speeds are moderate, and traffic volumes are relatively low. The required approach taper (Figure 405.2A) for the left-turn lanes on SR 25, based on a design speed of 55 mph and assuming the proposed left-turn lane would be 12 ft. wide, is 660 ft.

Deceleration Lane Length – Deceleration lane length are based on the roadway's design speed. It is desirable that deceleration take place entirely off the through traffic lanes. Based on Table 405.2B of the HDM, the required deceleration lane length for a 55 mph roadway is approximately 485 ft. (including bay taper). Bay tapers of 120 ft. are normally used on rural high-speed highways. As described above, alternate left-turn channelization designs allow the deceleration lane beginning at the 2/3 point of the approach taper, so part of the deceleration takes place in the through traffic lane. In cases where partial deceleration is permitted on the through lanes, designs speeds may be reduced 10 to 20 mph for a lower entry speed.

Storage Length – As a minimum, storage space for 2 passenger cars should be provided at 25 ft. per car within turn-pockets. However, if the peak hour traffic is 10 percent (%) or more, space for one passenger car and one truck should be provided.

Vehicular queue estimates for left-turns at the potential new intersection show 95th percentile queue lengths of no more than 1 vehicle for left-turn movements along SR 25 during the peak hours. However, traffic volumes along SR 25 are composed of a significant amount of heavy trucks since it serves as the primary route to US 101 from a primarily agricultural area. Therefore, based on the estimated queue length calculations and Caltrans standards, a minimum of 75 ft. (one vehicle and one truck length) of queue storage capacity should be provided in the left-turn pockets along the realigned SR 25 at the potential new intersection with Bolsa Road. Ultimately, Caltrans will decide whether the proposed improvements are adequate and meet Caltrans design standards.

Conclusions

The proposed expansion of the existing facility operations on the site will include an increase in the number of employees from the current 58 employees (60 allowed by the use permit) to 80-85 employees (with a maximum of 90 employees allowed by the use permit). It is also anticipated that with the expanded operations, the facility would be able to serve an additional 57 trucks per day. However, based on the proposed new work shift times and all new truck trips being proposed to access the project site outside of the standard peak commute hours, the proposed expansion of the existing Z-Best facility operations would result in a decrease in the number of peak-hour trips generated by the project site when compared to existing conditions. Therefore, the proposed project would not result on impacts to any of the study facilities on SR 25.

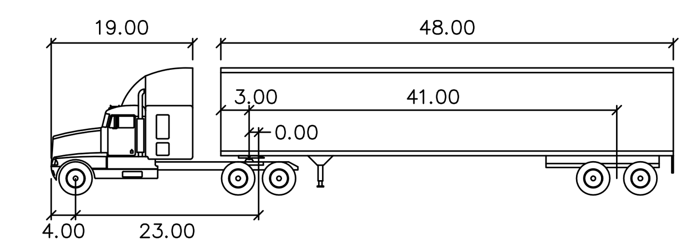
The operations and site access analysis shows that although the proposed project would not result in traffic impacts at the study intersections and highway segments along SR 25, both the study intersections and the study highway segments currently operate at unacceptable levels. The proposed SR 25 improvements would improve traffic operations along the realigned SR 25, the new intersection of realigned SR 25/Bolsa Road, and the project site entrance.

SR 25 DESIGN DESIGNATIONS

ADT (2019) = 30,500
ADT (2039) = 42,900
DHV (2019) = 2,100 (PM PEAK)
DHV (2039) = 3,000 (PM PEAK)
D = 71%
ESAL (2039) = 6,544,000
TI(20) = 11.5
V = 65 MPH
CL R = 2800'

LEGEND

ACCEL =	ACCELERATION LANE	NEP =	NEW EDGE OF PAVEMENT
EEP =	EXISTING EDGE OF PAVEMENT	NETW =	NEW EDGE OF TRAVELED WAY
EETW =	EXISTING EDGE TRAVEL WAY	RT =	RIGHT TURN LANE
EG =	EXISTING GROUND	R/W =	RIGHT-OF-WAY
FG =	FINISHED GRADE	SB =	SOUTHBOUND
HP =	HINGE POINT	SE =	SUPERELEVATION
(H:V) =	(HORIZONTAL:VERTICAL)	SHLD =	SHOULDER
LT =	LEFT TURN LANE	TH =	THROUGH LANE
MED =	MEDIAN	<X.X%>	EXISTING FINISHED GRADE SLOPE
NB =	NORTHBOUND	X.X%	NEW FINISHED GRADE SLOPE



STAA-STANDARD feet

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.3
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

0 80 160 240
SCALE IN FEET: 1"= 80'

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCL	25	0.63/1.03	1	4

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

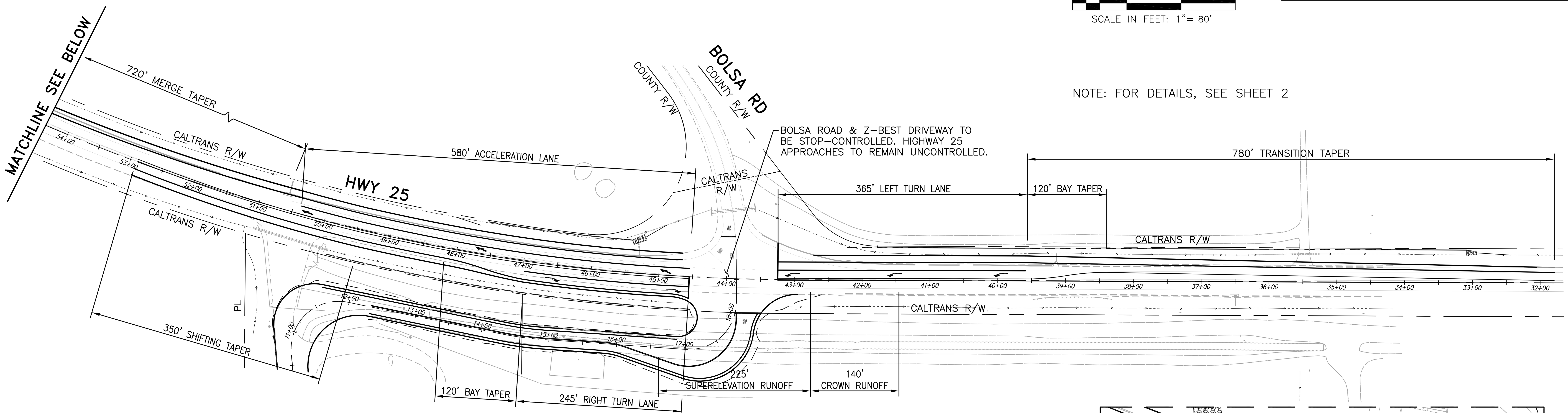
REGISTERED PROFESSIONAL ENGINEER LEOPOLDO TRUJILLO 63950 Exp. 9-30-20 CIVIL STATE OF CALIFORNIA

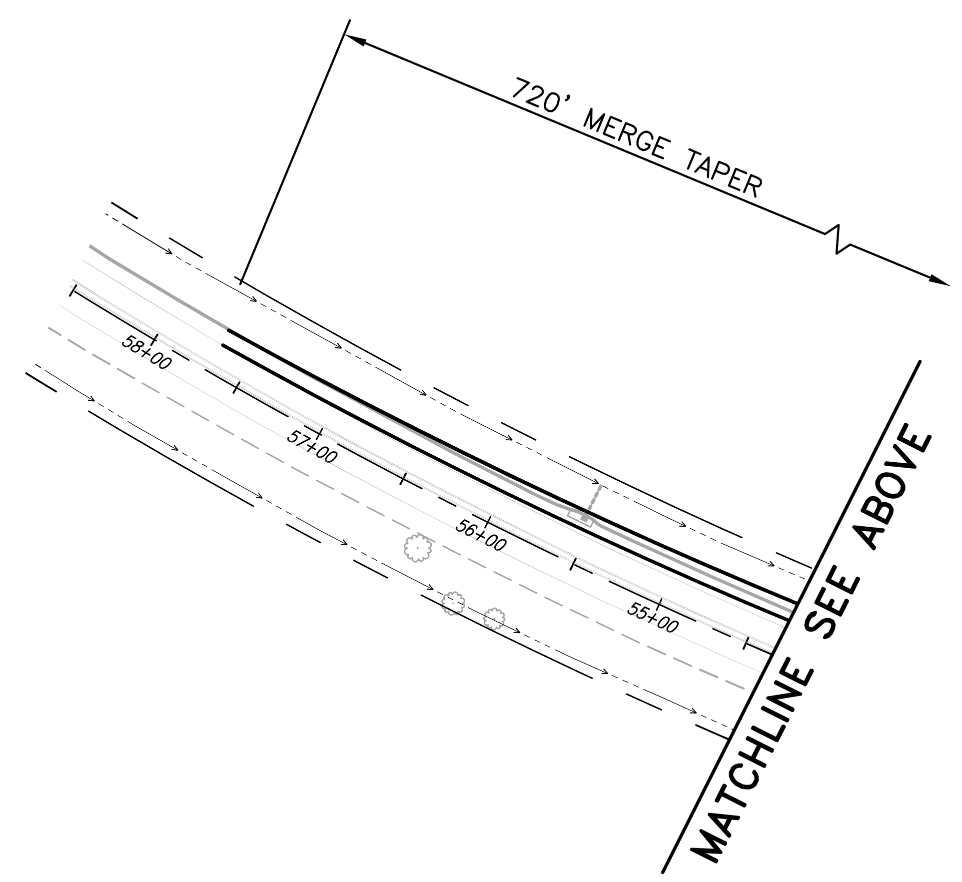
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

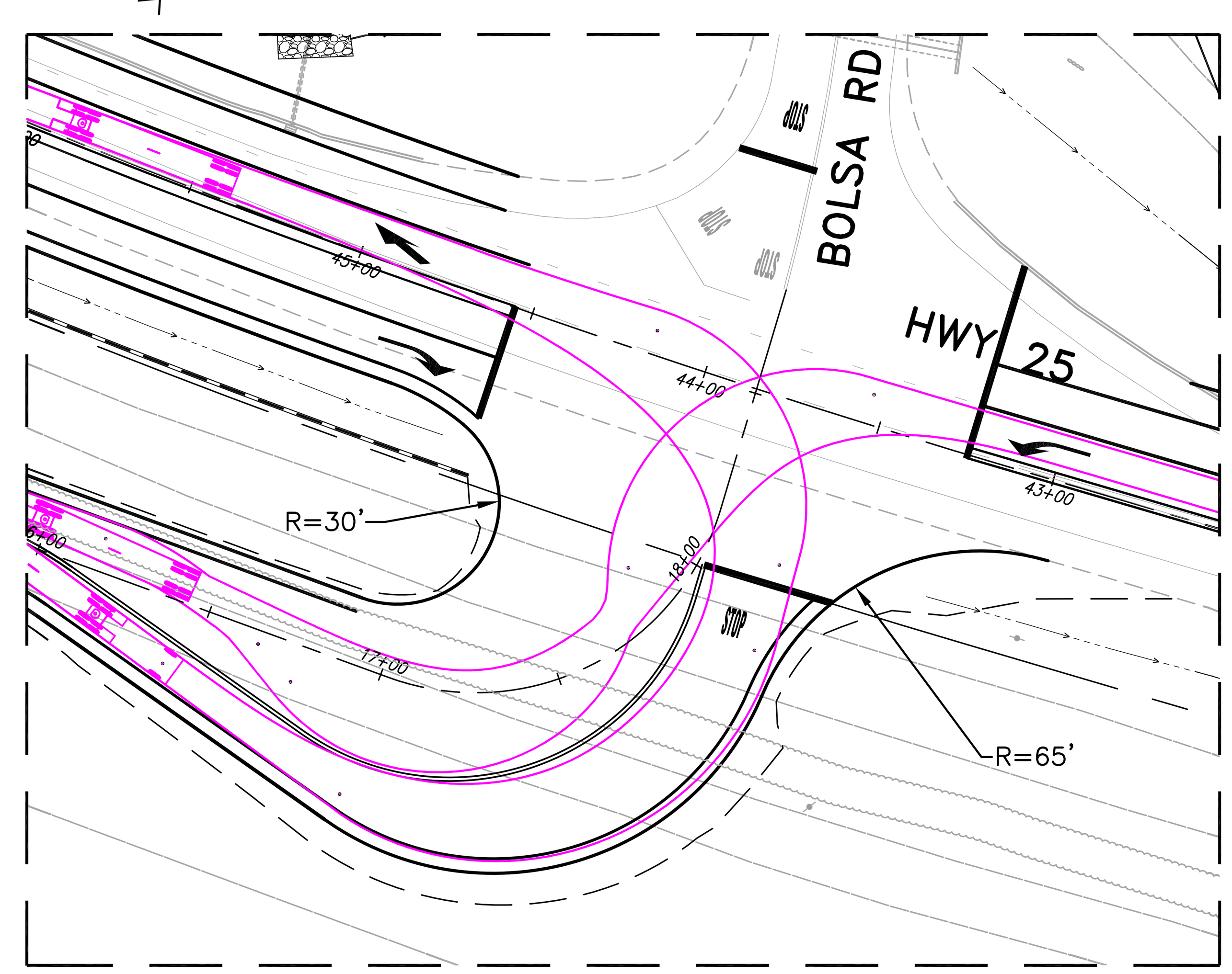
RJA 01/14/20

RUGGERI-JENSEN-AZAR
8055 Camino Arroyo
Gilroy, CA 95020
408-848-0300

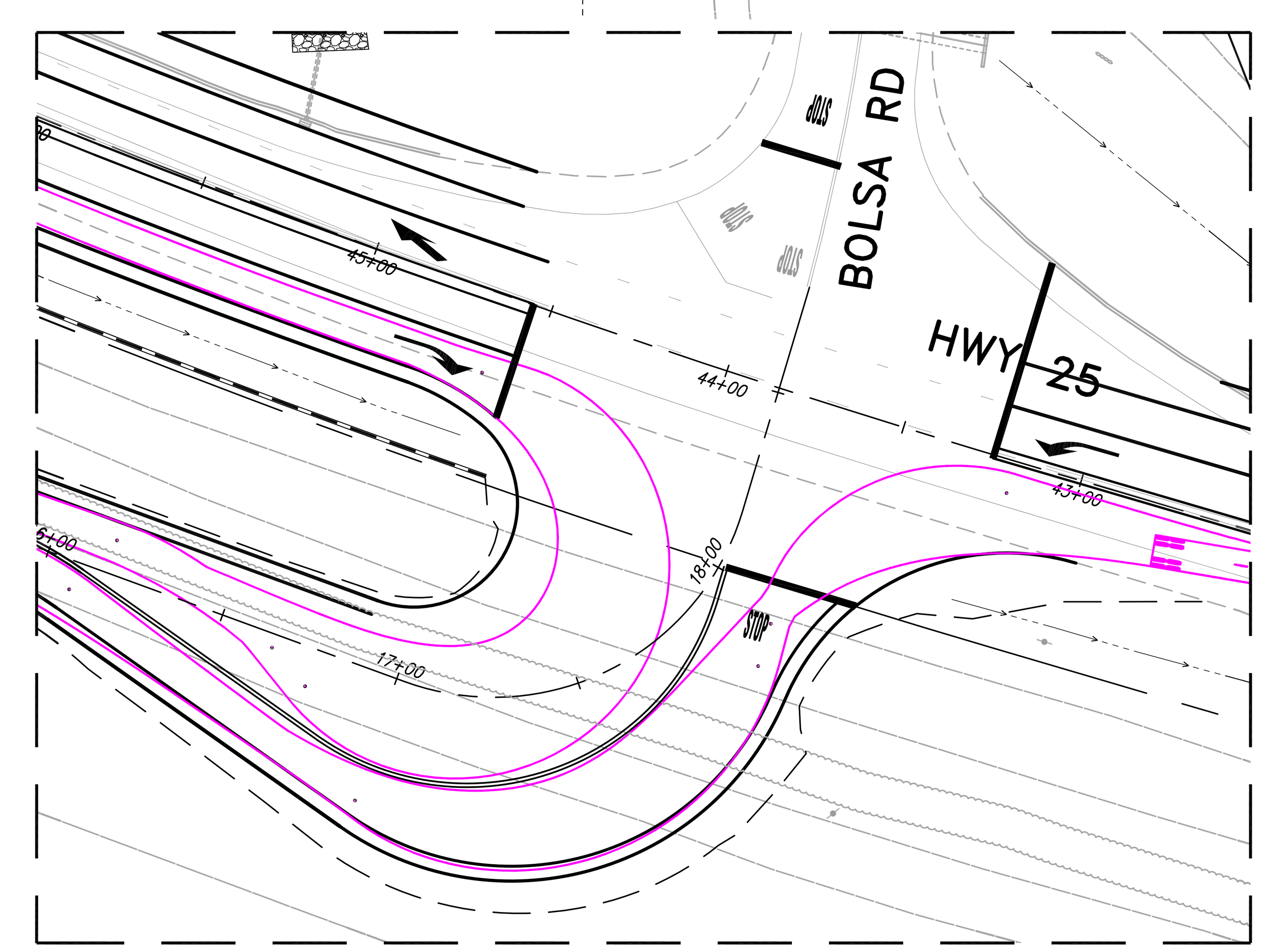
NOTE: FOR DETAILS, SEE SHEET 2







TRUCK TURNING TEMPLATE DETAIL 1
SCALE: 1"=40'



TRUCK TURNING TEMPLATE DETAIL 2
SCALE: 1"=40'

ATTACHMENT A: CONCEPTUAL GEOMETRIC LAYOUT

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

CONSULTANT FUNCTIONAL SUPERVISOR: ARMINTA JENSEN
CALCULATED-DESIGNED BY: LEOPOLDO TRUJILLO
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 06-18-19
DATE PLOTTED => $DATE
TIME PLOTTED => $TIME

Drawing: W:\Jobs 18\182022 Z-Best Products Offsite\Drawings\Prelim\Conceptual Layouts\182022 Concept Layout-Option 2 with new Points.dwg
Jan 14, 2020, 11:23am

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCL	25	0.63/1.03	2	4

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER LEOPOLDO TRUJILLO 63950 Exp. 9-30-20 CIVIL STATE OF CALIFORNIA

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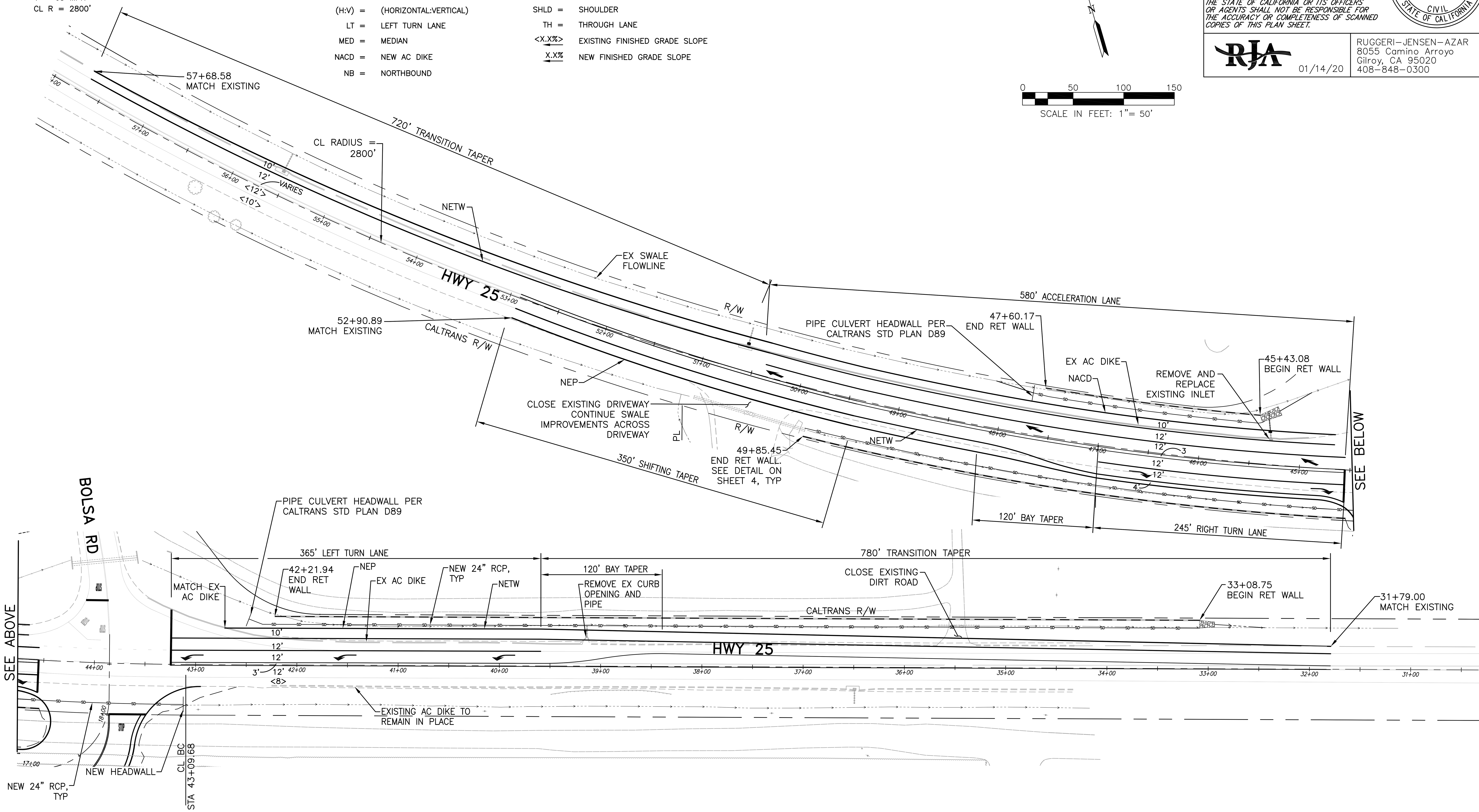
Gilroy, CA 95020
408-848-0300

SR 25 DESIGN DESIGNATIONS

ADT (2019) = 30,500
ADT (2039) = 42,900
DHV (2019) = 2,100 (PM PEAK)
DHV (2039) = 3,000 (PM PEAK)
D = 71%
ESAL (2039) = 6,544,000
TI(20) = 11.5
V = 65 MPH
CL R = 2800'

LEGEND

ACCEL =	ACCELERATION LANE	NEP =	NEW EDGE OF PAVEMENT
EEP =	EXISTING EDGE OF PAVEMENT	NETW =	NEW EDGE OF TRAVELED WAY
EETW =	EXISTING EDGE TRAVEL WAY	RT =	RIGHT TURN LANE
EG =	EXISTING GROUND	R/W =	RIGHT-OF-WAY
FG =	FINISHED GRADE	SB =	SOUTHBOUND
HP =	HINGE POINT	SE =	SUPERELEVATION
(H:V) =	(HORIZONTAL:VERTICAL)	SHLD =	SHOULDER
LT =	LEFT TURN LANE	TH =	THROUGH LANE
MED =	MEDIAN	<X.X%>	EXISTING FINISHED GRADE SLOPE
NACD =	NEW AC DIKE	X.X%	NEW FINISHED GRADE SLOPE
NB =	NORTHBOUND		



ATTACHMENT B: ROADWAY & DRAINAGE IMPROVEMENTS

STATE OF CALIFORNIA – DEPARTMENT OF TRANSPORTATION

Caltrans

CONSULTANT FUNCTIONAL SUPERVISOR: ARMINTA JENSEN

CALCULATED-DESIGNED BY: LEOPOLDO TRUJILLO

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REVISED BY

DATE REVISED

LAST REVISION 06-18-19

DATE PLOTTED => $DATE
TIME PLOTTED => $TIME

BORDER LAST REVISED 7/2/2010

USERNAME =>
DGN FILE =>

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT xxxx

PROJECT NUMBER & PHASE 0415000040

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Jan 14, 2020, 11:25am

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCL	25	0.63/1.03	3	4

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER LEOPOLDO TRUJILLO 63950 Exp. 9-30-20 CIVIL STATE OF CALIFORNIA

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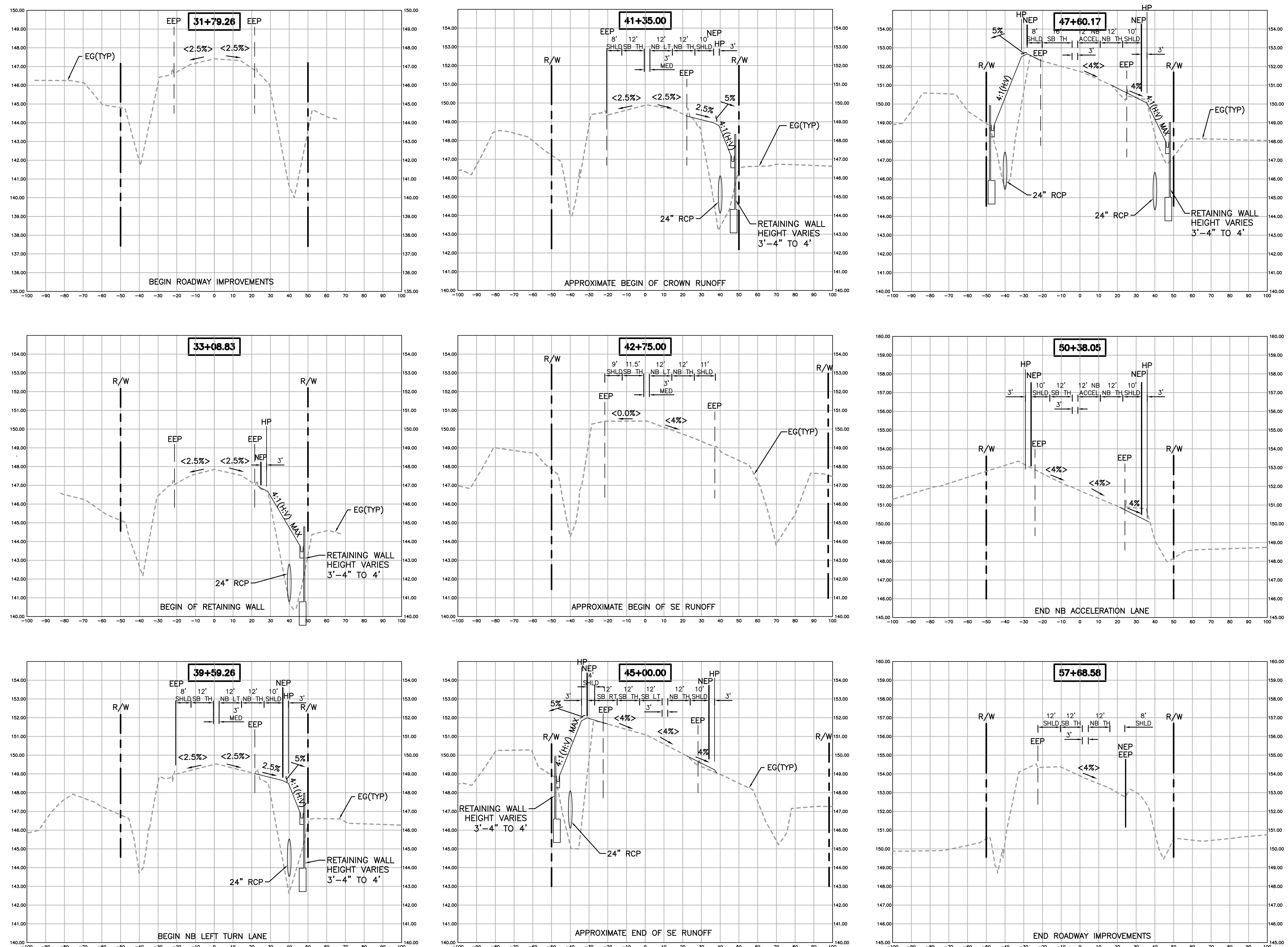

LEGEND

ACCEL	=	ACCELERATION LANE
EEP	=	EXISTING EDGE OF PAVEMENT
EETW	=	EXISTING EDGE OF TRAVEL WAY
EG	=	EXISTING GROUND
FG	=	FINISHED GRADE
HP	=	HINGE POINT
(H:V)	=	(HORIZONTAL:VERTICAL)
LT	=	LEFT TURN LANE
MED	=	MEDIAN
NB	=	NORTHBOUND
NEP	=	NEW EDGE OF PAVEMENT
NETW	=	NEW EDGE OF TRAVELED WAY
RT	=	RIGHT TURN LANE
R/W	=	RIGHT-OF-WAY
SB	=	SOUTHBOUND
SE	=	SUPERELEVATION
SHLD	=	SHOULDER
TH	=	THROUGH LANE
<X.X%>	=	EXISTING FINISHED GRADE SLOPE
X.X%	=	NEW FINISHED GRADE SLOPE

0 30 60 90

SCALE IN FEET: 1"= 30'

VERTICAL SCALE: 1" = 3'

ATTACHMENT C: CROSS SECTIONS

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

CONSULTANT FUNCTIONAL SUPERVISOR: ARMINTA JENSEN

CALCULATED-DESIGNED BY: LEOPOLDO TRUJILLO

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DATE REVISED

LAST REVISION 05-01-19

DATE PLOTTED => $DATE

TIME PLOTTED => $TIME

BORDER LAST REVISED 7/2/2010

USERNAME =>

DGN FILE =>

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT xxxx

PROJECT NUMBER & PHASE 0415000040

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Jan 14, 2020, 11:31am

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCL	25	0.63/1.03	4	4

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER LEOPOLDO TRUJILLO 63950 Exp. 9-30-20 CIVIL STATE OF CALIFORNIA

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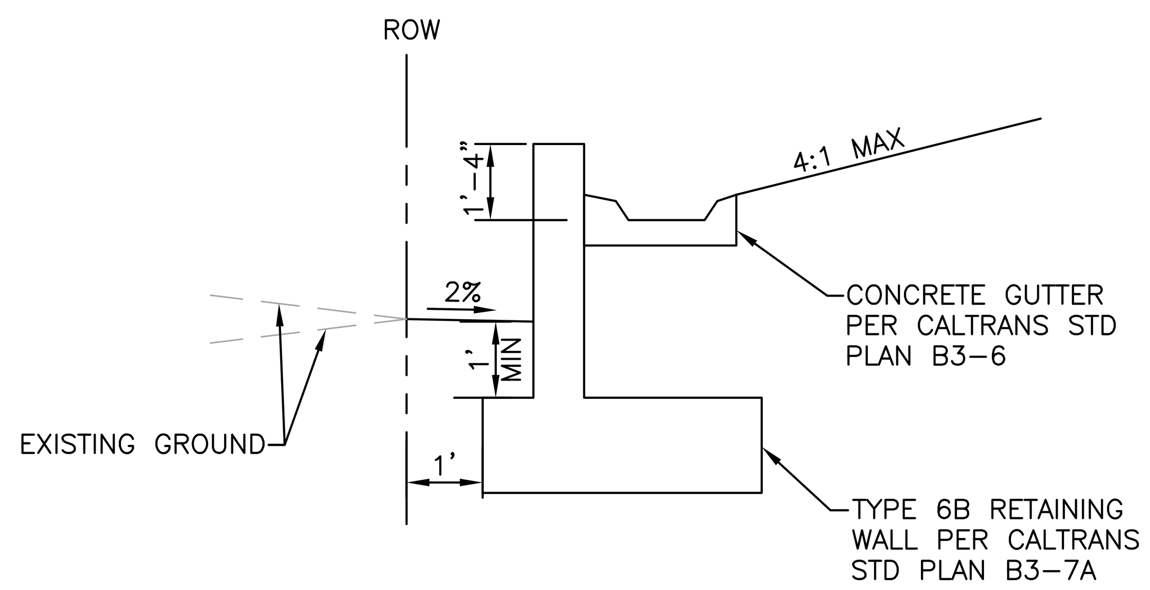
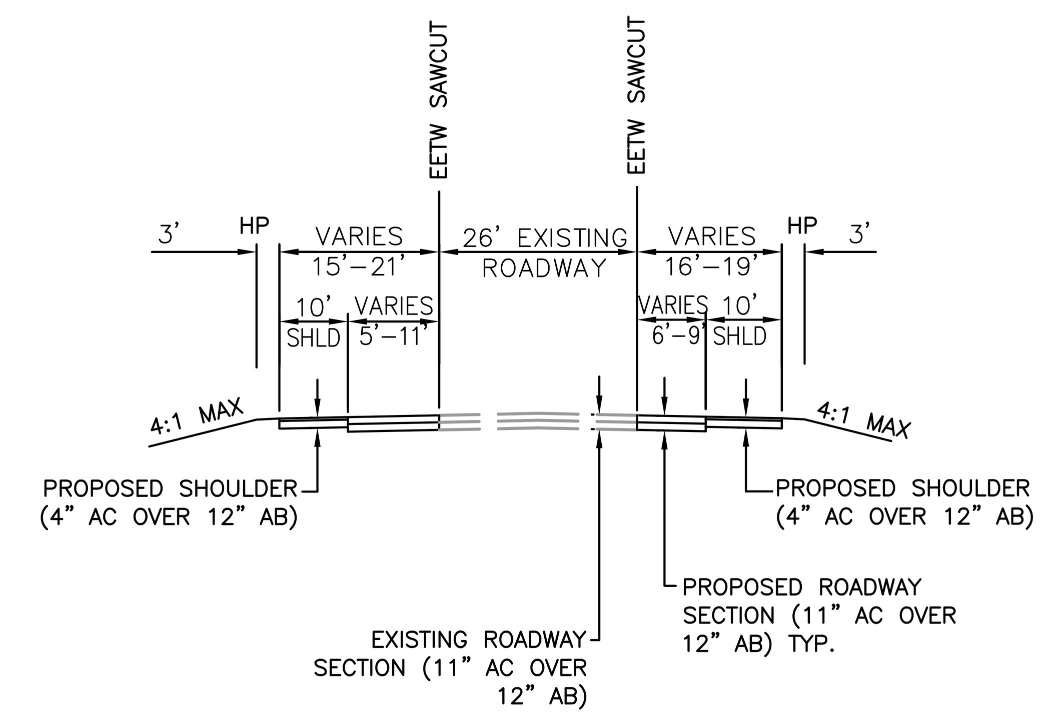


RETAINING WALL DETAIL

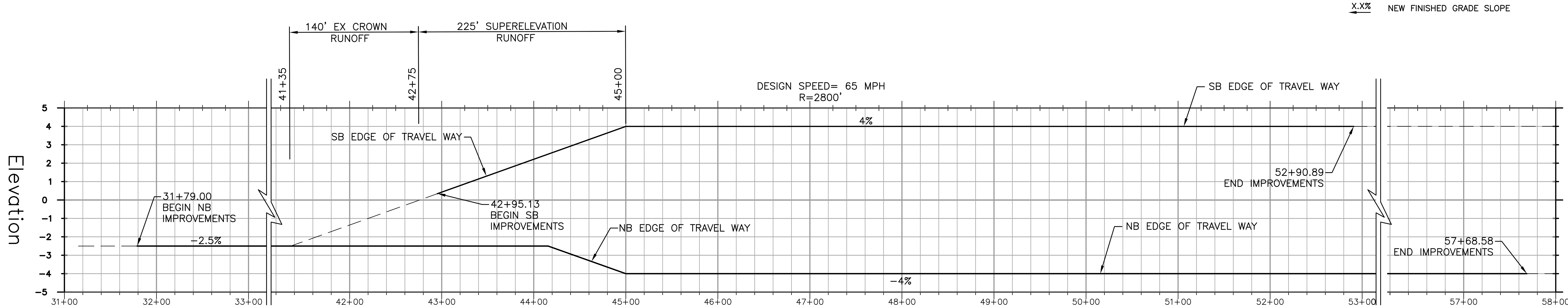


TYPICAL ROADWAY SECTION

LEGEND

ACCEL =	ACCELERATION LANE
EEP =	EXISTING EDGE OF PAVEMENT
EETW =	EXISTING EDGE OF TRAVEL WAY
EG =	EXISTING GROUND
FG =	FINISHED GRADE
HP =	HINGE POINT
(H:V) =	(HORIZONTAL:VERTICAL)
LT =	LEFT TURN LANE
MED =	MEDIAN
NB =	NORTHBOUND
NEP =	NEW EDGE OF PAVEMENT
NETW =	NEW EDGE OF TRAVELED WAY
RT =	RIGHT TURN LANE
R/W =	RIGHT-OF-WAY
SB =	SOUTHBOUND
SE =	SUPERELEVATION
SHLD =	SHOULDER
TH =	THROUGH LANE
<X.X%>	EXISTING FINISHED GRADE SLOPE
X.X%	NEW FINISHED GRADE SLOPE

0 30 60 90
SCALE IN FEET: 1"= 60'
VERTICAL SCALE: 1" = 6'



SUPERELEVATION DIAGRAM
HORIZONTAL SCALE: 1" = 60'
VERTICAL SCALE: 1" = 3'

ATTACHMENT D: SECTIONS & DETAILS

STATE OF CALIFORNIA – DEPARTMENT OF TRANSPORTATION
Caltrans

CONSULTANT FUNCTIONAL SUPERVISOR: ARMINTA JENSEN
CALCULATED-DESIGNED BY: LEOPOLDO TRUJILLO
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 05-01-19
DATE PLOTTED => $DATE
TIME PLOTTED => $TIME

BORDER LAST REVISED 7/2/2010
USERNAME =>
DGN FILE =>
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
UNIT xxxx
PROJECT NUMBER & PHASE 0415000040

Drawing: W:\Jobs 18\182022 Z-Best Products Offsite\Drawings\Prelim\Conceptual Layouts\182022 Concept Layout-Option 2 with new Points.dwg
Jan 14, 2020, 12:04pm

HEXAGON TRANSPORTATION CONSULTANTS, INC.

Memorandum

Date: August 11, 2020

To: John Doyle, Z-Best Products

From: Robert Del Rio. T.E.

Subject: Z-Best Supplemental VMT Clarification and Analysis

This memo is being provided to clarify and substantiate conclusions related to the VMT analyses that were provided within the *Operations and Site Access* Analysis dated January 30, 2020 for the proposed expansion of the Z-Best Compost Facility Expansion. Revisions and additional information are provided below at the request of County staff.

VMT for Non-Truck Trips

An estimate of Vehicle-Miles-Traveled (VMT) was completed for the proposed facility expansion as part of the traffic operations and site access analysis. Existing daily VMT estimates as shown in Table 6 of the report are based on vehicle composition data collected at the site entrance. Non-truck traffic includes traffic generated by employees and non-employees. Therefore, the title of the table is revised and shown below.

Table 1
VMT for Non-Truck Trips

			Existing		Existing + Project	
Origin-Destination	Distance (mi)	% Distribution[1]	Daily Trips[2]	Daily VMT	Daily Trips[2]	Daily VMT
Hollister	11	51%	92	1012	127	1397
Los Banos	47	12%	22	1034	30	1410
Gilroy	5	26%	47	235	64	320
San Jose	35	6%	11	385	15	525
Morgan Hill	16	1%	2	32	2	32
Gustine	52	1%	2	104	2	104
Modesto	83	1%	2	166	2	166
Watsonville	21	1%	2	42	2	42
Santa Cruz	40	1%	2	80	2	80
Total			**182**	**3090**	**246**	**4076**

[1] Source: Z-Best Products.
[2] Total daily trips as shown in the hourly trip generation table.

Employee-Only VMT

A supplemental estimate of VMT generated by only the employees of the proposed facility was completed using the same methodology as utilized for VMT estimates of non-truck traffic. The assumptions of the methodology include the following:

- Employee daily trips are two trips consisting of one inbound trip before the employee's shift and one outbound trip after the employee's shift
- Distance and distribution of trips are constant
- Linear growth of employee per employee origin. The total employee growth is approximately 55% (from the existing 58 employees to a proposed 90 employees) and each location would experience a 55% increase in employee.

The results of the analysis show that daily VMT per employee would not result in an increase from existing conditions as a result of the proposed expansion.

Table 2
VMT for Employees Only

			Existing		Existing + Project	
Origin-Destination	Distance (mi)	% Distribution[1]	Daily Trips[2]	Daily VMT	Daily Trips[2]	Daily VMT
Hollister	11	51%	58	639.8	90	992.731
Los Banos	47	12%	13	607.2	20	942.269
Gilroy	5	26%	29	145.8	45	226.241
San Jose	35	6%	6	208.6	9	323.69
Morgan Hill	16	1%	2	34.6	3	53.6276
Gustine	52	1%	2	112.3	3	174.29
Modesto	83	1%	2	179.3	3	278.193
Watsonville	21	1%	2	45.4	3	70.3862
Santa Cruz	40	1%	2	86.4	3	134.069
Total			**116**	**2059**	**180**	**3195**
Daily VMT per Employee				**35.5**		**35.5**

[1] Source: Z-Best Products.

[2] The facility has 58 employees under existing conditions (116 daily trips) and is proposed to have 90 employees (180 daily trips) with the proposed expansion.

Estimate of Baseline and Project Truck Trips

Table 7 of the operations report provides an estimate of VMT per truck load under existing and proposed conditions. Truck loads under existing conditions were estimated using on-site scale report data provided by Z-Best in 2018 and shown below in Table 3. Z-best is required to provide the scale report data to its designated LEA inspector on a monthly basis to show that the site operations are in compliance with allowable material types and daily limits defined in its Solid Waste Facility Permit.

Table 3
VMT per Truck Load Estimates

		Existing					Existing + Project						Existing + Project (Peak 20-Day Season)[3]				
Origin-Destination	Distance (mi)	Annual Loads (2018)[1]	Daily Loads	Daily Trips	Daily VMT	Daily VMT per load	Proposed Additional Loads[2]	Daily Loads	Daily Trips	Daily VMT	Distribution	Daily VMT per load	Proposed Additional Loads[2]	Daily Loads	Daily Trips	Daily VMT	Daily VMT per load
Green Waste																	
GreenWaste Recovery - San Jose	38	11,946	32.73	65.46	2487.4		57.0	89.73	179.46	6819.4			90.0	122.73	245.46	9327.4	
ZeroWaste Energy - San Jose	45	3,300	9.04	18.08	813.7			9.04	18.08	813.7				9.04	18.08	813.7	
Blue Line Transfer - South San Francisco	75	598	1.64	3.28	245.8			1.64	3.28	245.8				1.64	3.28	245.8	
Bay Counties SMART - Sunnyvale	48	1,455	3.99	7.97	382.7			3.99	7.97	382.7				3.99	7.97	382.7	
Sub-Total		17,299	47.39	94.79	**3929.5**	**82.9**	57.0	104.39	208.79	**8261.5**		**79.1**	90.0	137.39	274.79	**10769.5**	**78.4**
Finished Product (Mulch/Compost)																	
100-mile Radius	50	7,573	20.75	41.50	**2074.8**	**100.0**	8.0	28.75	57.50	**2874.8**		**100.0**	13.0	33.75	67.50	**3374.8**	**100.0**
Landfill (Trash/ADC)																	
Billy Wright Landfill - Los Banos	43	1,995	5.47	10.93	470.1		10.5	15.96	31.92	1372.5	30%		16.5	21.98	43.95	1890.0	
Marina Landfill - Marina	29	2,943	8.06	16.13	467.7		15.5	23.54	47.09	1365.5	44%		24.4	32.42	64.84	1880.4	
Newby Island Landfill - Milpitas	45	1,619	4.44	8.87	399.2		8.5	12.95	25.90	1165.7	24%		13.4	17.83	35.67	1605.1	
John Smith Landfill - Hollister	17	74	0.20	0.41	6.9		0.4	0.59	1.18	20.1	1%		0.6	0.82	1.63	27.7	
		6,631	18.17	36.33	**1343.8**	**74.0**	34.9	53.05	106.09	**3923.9**		**74.0**	54.9	73.05	146.09	**5403.2**	**74.0**
Total			86.31	172.62	**7348.1**	**85.1**	100	186.19	372.38	**15060.2**		**80.9**	158	244.19	488.38	**19547.6**	**80.1**
								Increase in Trucks	**Increase in Trips**					**Increase in Trucks**	**Increase in Trips**		
								100	**200**					**158**	**316**		

[1] Source: Z-Best Products. Total number of truck loads sent and received in 2018 as recorded by on-site scale reports.
[2] Additional truck loads compared to existing conditions.
[3] Peak leaf season in the fall and heavy volume in the spring. The increased tonnage during these 20 days would result in an additional 58 truck trips.

Average Existing Daily Truck Loads

The total number of truck loads sent or received to each origin/destination facility for the entire year were divided by 365 to estimate average daily truck loads.

Average Daily Truck Loads under Project Conditions (Non-Peak Season)

Based on estimates provided by Z-Best, the proposed expansion of the facility would result in an average increase of 100 daily trucks/loads (200 daily trips) during the non-peak season. Trucks loads are estimated to increase to/from the following origin/destination facilities and are shown in Table 3:

- An average increase of 57 daily loads (114 daily trips) received from GreenWaste Recovery San Jose.
- An average increase of 8 daily loads (16 daily trips) of finished products delivered to customers within a 100-mile radius.
- An average increase of 35 daily loads (70 daily trips) split in the same proportion to the four landfill facilities currently being served. This estimate is based on approximately 12,731 loads of additional trash/ADC generated per year with the proposed project.

Average Daily Truck Loads under Project Conditions (Peak Season)

Based on estimates provided by Z-Best, the proposed expansion of the facility would result in an average increase of 158 daily trucks loads (316 daily trips) during the peak 20-day season. Trucks loads are estimated to increase to/from the following origin/destination facilities and are shown in Table 3:

- An average increase of 90 daily loads (180 daily trips) received from GreenWaste Recovery San Jose. The estimated increase is 33 loads (66 trips) more than the estimate for the non-peak season.
- An average increase of 13 daily loads (26 daily trips) of finished products delivered within a 100-mile radius. The estimated increase is 5 loads (10 trips) more than the estimate for the non-peak season.
- An average increase of 55 daily loads (110 daily trips) split in the same proportion to the four landfill facilities currently being served. The estimated increase is 20 loads (40 trips) more than the estimate for the non-peak season.

APPENDIX H

DETENTION BASIN 1 AND 2 WATER BALANCE CALCULATIONS
Z-BEST COMPOST FACILITY WATER BALANCE
WATER BALANCE TECHNICAL MEMORANDUM

Golder Associates

CALCULATIONS

Date:	10/11/2016	**Made by:**	CMN
Project No.:	1651550	**Checked by:**	LMA
Site Name:	Z-Best Composting	**Reviewed by:**	RH
Subject	**DETENTION BASIN 1 AND 2 WATER BALANCE CALCULATIONS, REVISION 1**		

1.0 OBJECTIVE:

Evaluate detention basin storage needs for facility runoff and precipitation inflows with outflows including evaporation, dust control and compost operations at Z-Best Composting (Z-Best) Facility.

2.0 METHODOLOGY:

Model monthly inflows and outflows and resulting basin elevations based on stage-storage relationships for the existing Detention Basin 1 and proposed Detention Basin 2 (DB-1 and DB-2). If storage exceeds capacity, determine the minimum outflow volume of water that must be removed from the basins monthly. Inflows consist of direct precipitation into DB-1 and DB-2 and facility runoff. Outflows include DB-1 and DB-2 evaporation and use of water for compost moisture conditioning, dust control, and compost makeup water.

The Composting Order states that all detention basins shall be designed to maintain all run off from the working surfaces in addition to direct precipitation from a 25-year, 24-hour peak storm event (4.75 inches). Both the existing and proposed detention basins have been designed to hold a 100-year, 24-hour storm event (6.5 inches) which exceeds the requirements of the compost order. To be conservative, a water balance model was completed to show that DB-1 and the proposed DB-2 have sufficient capacity to manage all direct precipitation and stormwater runoff from an average annual year of precipitation (20.8 inches) and a 25-year return period wet year (37.4 inches).

3.0 ASSUMPTIONS/GIVENS:

Compost operations are conducted 7 days a week. Approximately 70 acres of Area 1 will drain to DB-1 and 26 acres of Area 2 will drain to DB-2.

3.1 Stage-Storage Relationship

The stage-storage relationships for Detention Basin 1 and 2 at the Z-Best Facility provide information relating the water elevation, surface area, and volume of the basins. These relationships were determined

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1000 Enterprise Way, Suite 190
Roseville, CA 95678
Tel: (916)786-2424 Fax: (916)786-2434 www.golder.com
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using the 2015 topographic map for the site and the design grades for the expansion area and detention basins. Tables 1 and 2 show the Detention Basin 1 and 2 stage-storage relationship data.

Table 1: Detention Basin 1 Stage-Storage Data

Elevation (ft)	Water Surface Area (sq ft)	Cumulative Water Volume (gal)	Cumulative Water Volume (Acre-ft)
139	274,324	9,138,789	28.0
138	262,958	7,149,598	21.9
137	251,722	5,244,095	16.1
136	240,615	3,421,322	10.5
135	229,637	1,680,326	5.2
134	224,197	--	0.0

The stage-storage relationship for Detention Basin 1 is shown below in a graph of storage volume versus both surface area and elevation, along with a linear trend line and R-squared value. Detention Basin 1 grades are based on limit of the basin from the 2015 topo with the assumed design geometry of 4:1 (Horizontal: Vertical) slopes and a depth of 5 feet consistent with the drainage study and flood plain analysis prepared by Edgar & Associates, Inc (August, 2008).

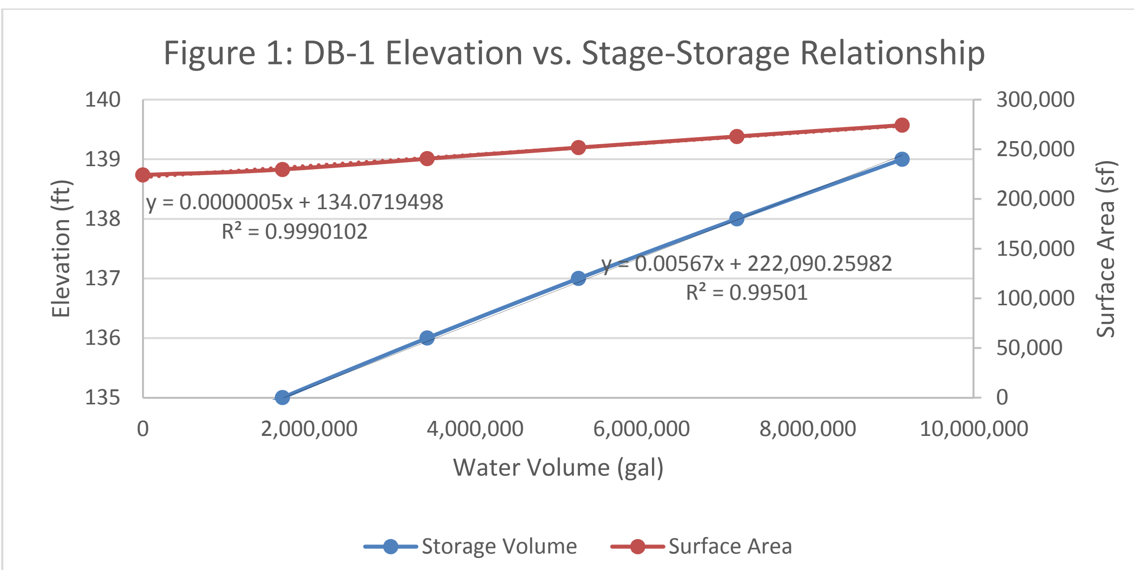
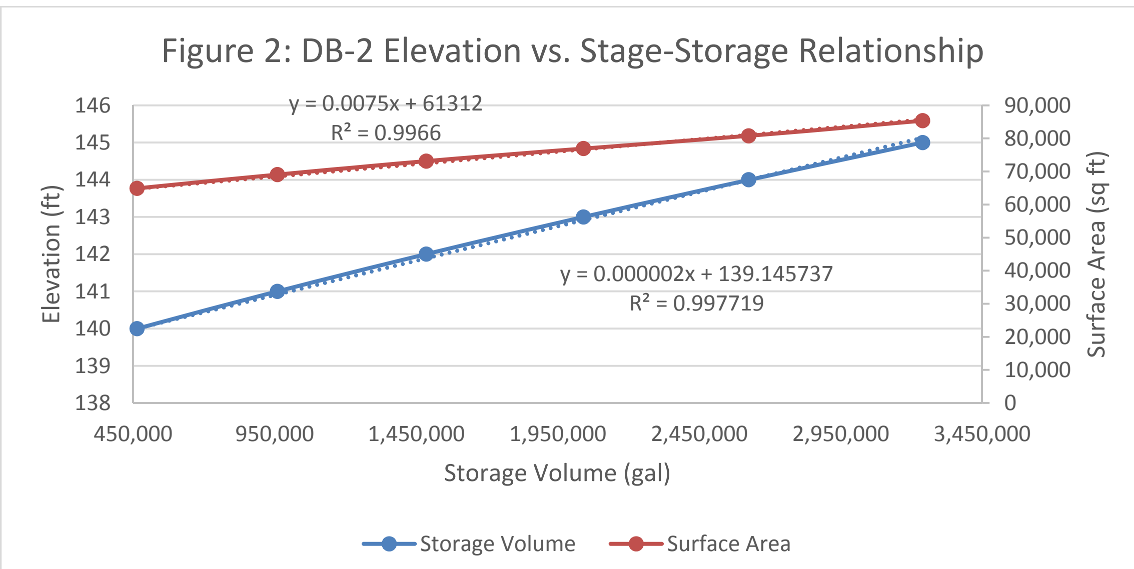


Table 2: Detention Basin 2 Stage-Storage Data

Elevation (ft)	Water Surface Area (sq ft)	Cumulative Water Volume (gal)	Cumulative Water Volume (Acre-ft)
145	85,340	3,240,686	9.9
144	80,764	2,625,747	8.0
143	76,949	2,041,855	6.3
142	73,111	1,486,304	4.6
141	69,051	960,006	2.9
140	64,880	464,194	1.4
139	60,515	0	0.0

The stage-storage relationship for Detention Basin 2 is shown below in a graph of storage volume versus both elevation and surface area, along with a linear trend line and R-squared value.



Curves were developed to present storage volume for the detention basins as a function of both elevation and surface area. The curves were fit with linear trend lines to calculate intermediate values of elevation, surface area, and volume. The R-squared value of each trend line are both less than 1/100th from 1, indicating a good fit for each trend line.

4.0 AVERAGE ANNUAL CONDITIONS

The average annual conditions over a period of several years were modeled to ensure outflows are greater than or equal to inflows. Each of the model inflows and outflows are described in detail in the following sections.

4.1 Inflows

Inflows for the average annual water balance model include direct precipitation in the detention basins and facility runoff as described below. It is assumed that no water used for the composting operations and dust control runs off the compost pad to the detention basins.

4.1.1 Direct Precipitation in Detention Basins

Monthly precipitation data was obtained from the Western Regional Climate Center (WRCC) website. Precipitation data was retrieved from records for Weather Station 043417 in Gilroy, CA. This station is located at 37° 0' 24 N and 121° 33' 48 W at elevation 190 feet approximately 8 miles northwest from the site. The data range retrieved is from May 1, 1957 to May 3, 2016. The mean annual precipitation for this range of data is 20.83 inches. The Isohyetal Map of Santa Clara County Mean Annual Precipitation, included in the Santa Clara County Hydrology Manual (October 2007), shows a mean annual precipitation for the site of approximately 21 inches. Therefore, we used the monthly precipitation data based on Gilroy Station 043417 with an annual mean precipitation of 20.83 inches.

Table 3: Monthly Precipitation

Months	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec	Annual Total
Average Precipitation (in)	4.70	3.74	3.24	1.40	0.39	0.10	0.05	0.05	0.32	0.90	2.21	3.72	20.83

To apply the monthly precipitation as an inflow to the water balance model, the area of DB-1 footprint (274,324 sq ft) and DB-2 footprint (85,340 sq ft) is multiplied by the amount of rainfall in the particular month and converted to gallons, according to the equation below. The basin is always subject to precipitation inflow, regardless of whether the other operational inflows are occurring.

$$P = \frac{R \times A}{12} \times 7.481\ gal/cf$$

Where:

P = monthly precipitation volume (gallons)

R = monthly rainfall from historical data (inches)

A = area of the Detention Basin footprint (ft^2)

Table 4: Monthly Direct Precipitation

Month	Detention Basin 1 (gal)	Detention Basin 2 (gal)
January	803,785	250,051
February	639,608	198,977
March	554,099	172,376
April	239,425	74,483
May	66,697	20,749
June	17,102	5,320
July	8,551	2,660
August	8,551	2,660
September	54,726	17,025
October	153,916	47,882
November	377,950	117,577
December	636,188	197,913
Totals	3,360,598	1,107,674

4.1.2 Facility Runoff

The facility pad runoff was calculated by multiplying the average monthly precipitation, the total area of the facility footprint (sq ft), and the percent runoff. The total area of the facility is approximately 105 acres. The average percent runoff of 0.72 was estimated based on calculated coefficients at similar sites. Table 5 and 6 shows the monthly Facility Runoff used for the water balance model.

Table 5: Facility Runoff Calculation – DB-1

Month	Total Area (sq ft)	Runoff Coefficient C	Precipitation (inches)	Total Facility[1] Precipitation (gallons)	Compost Pad[2] Runoff (gallons)
January	3,057,780	0.72	4.70	8,958,276	**6,449,959**
February	3,057,780	0.72	3.74	7,128,501	**5,132,520**
March	3,057,780	0.72	3.24	6,175,492	**4,446,355**
April	3,057,780	0.72	1.40	2,668,423	**1,921,264**
May	3,057,780	0.72	0.39	743,346	**535,209**
June	3,057,780	0.72	0.10	190,602	**137,233**
July	3,057,780	0.72	0.05	95,301	**68,617**
August	3,057,780	0.72	0.05	95,301	**68,617**
September	3,057,780	0.72	0.32	609,925	**439,146**
October	3,057,780	0.72	0.90	1,715,415	**1,235,098**
November	3,057,780	0.72	2.21	4,212,296	**3,032,853**
December	3,057,780	0.72	3.72	7,090,380	**5,105,074**
Totals	70.2 (acres)	--	20.83	39,683,257	**28,571,945**

Table 6: Facility Runoff Calculation – DB-2

Month	Total Area (sq ft)	Runoff Coefficient C	Precipitation (inches)	Total Facility[1] Precipitation (gallons)	Compost Pad[2] Runoff (gallons)
January	1,132,560	0.72	4.70	3,318,023	**2,388,977**
February	1,132,560	0.72	3.74	2,640,299	**1,901,016**
March	1,132,560	0.72	3.24	2,287,318	**1,646,869**
April	1,132,560	0.72	1.40	988,347	**711,610**
May	1,132,560	0.72	0.39	275,325	**198,234**
June	1,132,560	0.72	0.10	70,596	**50,829**
July	1,132,560	0.72	0.05	35,298	**25,415**
August	1,132,560	0.72	0.05	35,298	**25,415**
September	1,132,560	0.72	0.32	225,908	**162,654**
October	1,132,560	0.72	0.90	635,366	**457,464**
November	1,132,560	0.72	2.21	1,560,177	**1,123,327**
December	1,132,560	0.72	3.72	2,626,180	**1,890,850**
Totals	26.0 (acres)	--	20.83	14,698,137	**10,582,659**

Notes:
1. The total precipitation volume was calculated using the average annual precipitation data multiplied by the footprint of Areas 1 and 2.
2. The compost pad runoff volume was calculated by multiplying the total precipitation volume by the percent runoff.

4.2 Outflows

Outflows for the average annual water balance model include basin evaporation and water usage for dust control and compost moisture conditioning, as described below. It is assumed that all water required for the proposed aerated static piles will be taken from the 300,000-gallon leachate storage tank and that the aerated static pile system is fully contained.

4.2.1 Monthly Evaporation

Evapotranspiration (ETo) data was obtained from the CIMIS website from records for Weather Station 211 in Gilroy, California. ETo values are considered equal to evaporation from a large body of water, such as a basin or lake. Using ETo to estimate evaporation for DB-1 and DB-2 are considered conservative because ETo also takes into account plant uptake and there is no plant uptake in the basin. The data range retrieved is September 1, 2009 to June 10, 2016. The mean annual evaporation for this range of data is 49.56 inches.

Table 6: Average Monthly Evaporation

Months	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Evaporation (in.)	1.55	2.00	3.55	4.71	6.08	6.65	6.99	6.32	4.93	3.50	1.89	1.39	49.56

The monthly evaporation for the basins are calculated using the following equation:

$$E = \frac{R \times SA}{12} \times 7.481\, gal\ / cf$$

where:

E = monthly evaporation (gallons)

R = evaporation rate from historical data (inches)

SA = surface area of basin at the beginning of month (ft^2)

4.2.2 Water Usage for Compost Makeup Water

Based on information provided by Z-Best, the site currently uses 330,000 gallons of water per day Monday through Friday and an additional 165,000 gallons on Saturdays. Approximately half of the water is obtained from DB-1 and the remaining from the on-site wells. Typically, a max of 3,880,000 gallons of water is taken from the water wells if water is available. The water balance model assumes that approximately 22.2 million gallons per month of water is used for compost makeup water in Area 1 from DB-1. No compost make up water will be used in Area 2. Additional water that may be needed when the basins are dry comes from the on-site water wells.

4.2.3 Water Usage for Dust Control

The amount of water used for dust control each month is dependent upon the amount of water available after taking into account all of the inflows and outflows. For the purpose of this model, an additional estimated 2.7 million gallons of water per year is used from DB-1 for dust control and an additional estimated 9.8 million gallons of water per year will be used from DB-2 for dust control. In years of above average precipitation, more water will be taken from the basins than on-site water wells to maintain basin levels throughout the year.

4.3 Average Annual Year Water Balance Model

The model begins with the basins dry at an elevation of 134 feet for DB-1 and 139 feet for DB-2 (volume = 0 gallons) and 0% of capacity. During the first month, November of Year 1, the precipitation and facility runoff inflows are added to the basin volume and the evaporation and compost makeup water outflows are subtracted from the DB-1 and DB-2 volumes.

The volume of water at the end of the month is calculated by adding the inflows and subtracting the outflows. Using the stage-storage relationships, the change in elevation is calculated as a function of the change in volume. Adding this change in elevation to the initial elevation gives the final elevation. The percent capacity in the basin is calculated by dividing the final volume by the maximum volume. The final elevation and final volume for the basin will be used as the initial elevation and volume for the next month, and the model will repeat itself following the same steps.

4.4 Average Annual Year Water Balance Results

Based on the water balance model assumptions described in the previous sections, the outflows are greater than or equal to the inflows for an average annual precipitation year. During average annual precipitation conditions, the basin volumes typically fluctuate between approximately 0 and 4,900,000 gallons per year for DB-1 and between 0 and 1,900,000 gallons for DB-2. During average precipitation conditions, the basins are empty at the end of May and remain dry until January. The anticipated monthly volumes for the average annual precipitation water balance model for DB-1 and DB-2 are shown on Figures 3 and 4.

This water balance models a minimum annual water usage of approximately 28.0 million gallons or 86 acre-feet for DB-1 and an estimated 9.8 million gallons or 34.5 acre-feet for DB-2. This is consistent with the reported current water usage of between 80 and 100 acre-feet per year.

Figure 3: Detention Basin 1 Average Annual Precipitation Year Monthly Volumes

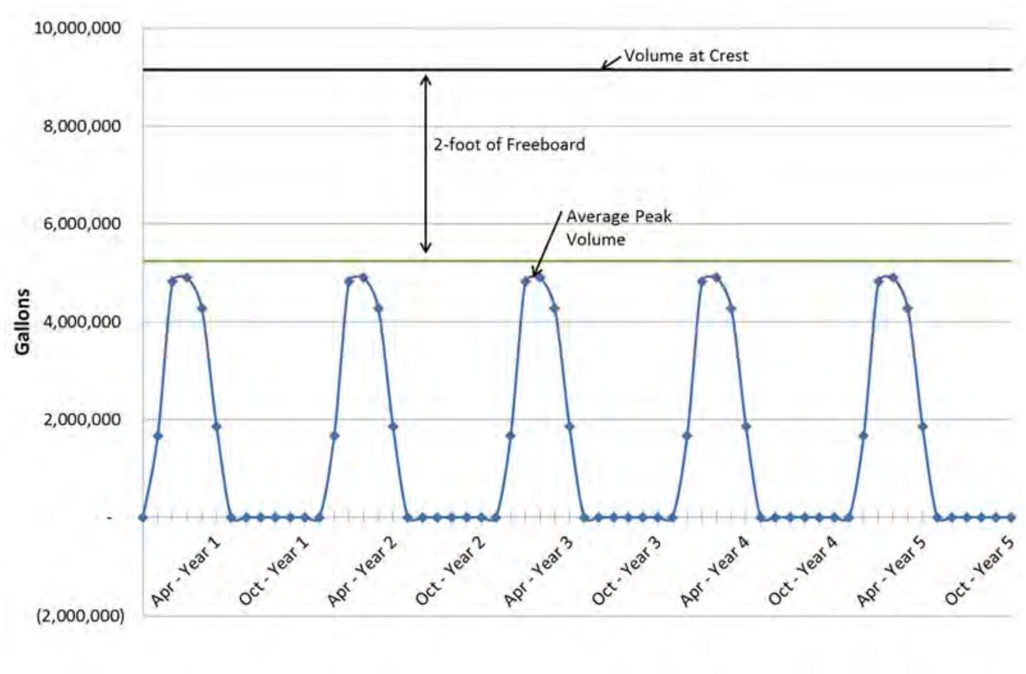
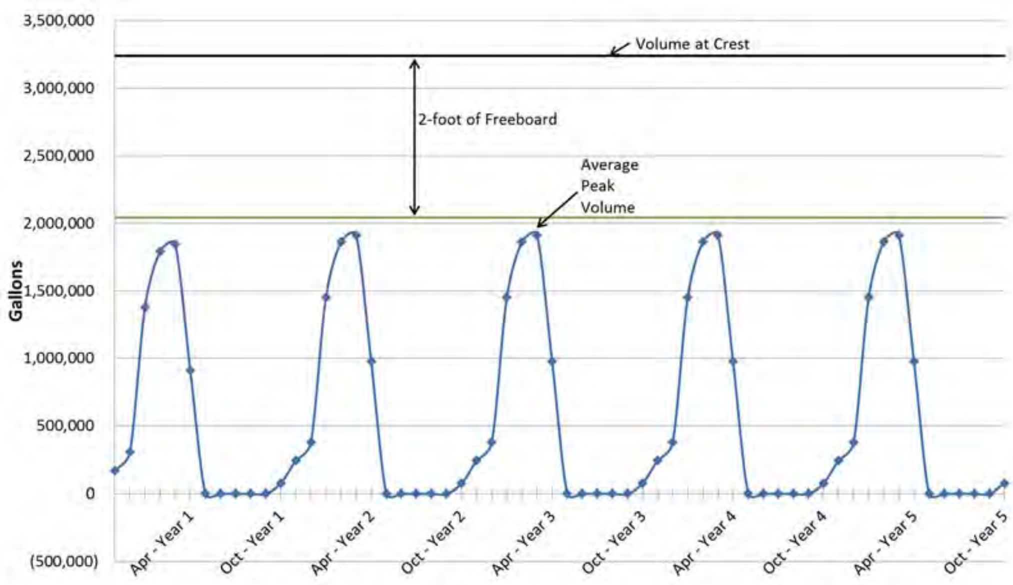


Figure 4: Detention Basin 2 Average Annual Precipitation Year Monthly Volumes



5.0 25-YEAR RETURN WET YEAR

A 25-year return wet year was modeled to ensure that the detention basin storage capacity meets or exceeds storage requirements under conservative conditions.

5.1 Inflows

Inflows for the 25-year return wet year water balance model include direct precipitation in DB-1 and DB-2 and facility runoff. Direct precipitation and facility runoff volumes were updated for the 25-year return wet year as described below.

5.1.1 Direct Precipitation

The 25-year wet year annual precipitation is estimated to be 37.37 inches based on the depth-duration-frequency information provided by the Department of Water Resources for the CIMIS Station 211 located in Gilroy, California. The average monthly precipitation from CIMIS was scaled up to equate to the 25-year wet year total annual precipitation as shown in Table 8.

Table 8: 25-Year Return Wet Year Average Monthly Precipitation

Month	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec	Annual Total
Precipitation (in)	8.43	6.71	5.81	2.51	0.70	0.18	0.09	0.57	1.61	3.96	6.67	9.77	37.37

The 25-year wet year monthly precipitation was added to the water balance model as an inflow in the same manner as described in Section 4.1.1 for the average annual precipitation.

5.1.2 Facility Runoff

The 25-year wet year monthly precipitation was used to calculate facility runoff as described in Section 4.1.2 for the average annual precipitation. The facility runoff for the 25-year return wet year is shown in Tables 9 and 10.

Table 9: 25-Year Return Wet Year Facility Runoff Calculation – DB-1

Month	Total Area (sq ft)	Runoff Coefficient C	25-yr Wet Year Precipitation (inches)	Total Precipitation (gallons)	Compost Pad Runoff (gallons)
January	3,057,780	0.72	8.43	16,086,777	**11,582,479**
February	3,057,780	0.72	6.71	12,789,369	**9,208,345**
March	3,057,780	0.72	5.81	11,093,014	**7,986,970**
April	3,057,780	0.72	2.51	4,803,161	**3,458,276**
May	3,057,780	0.72	0.70	1,334,211	**960,632**
June	3,057,780	0.72	0.18	343,083	**247,020**
July	3,057,780	0.72	0.09	171,541	**123,510**
August	3,057,780	0.72	0.09	171,541	**123,510**
September	3,057,780	0.72	0.57	1,105,489	**795,952**
October	3,057,780	0.72	1.61	3,087,746	**2,223,177**
November	3,057,780	0.72	3.96	7,566,884	**5,448,157**
December	3,057,780	0.72	6.67	12,732,188	**9,167,176**
Totals	70.2	--	37.37	71,285,006	**51,325,204**

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Table 10: 25-Year Return Wet Year Facility Runoff Calculation – DB-2

Month	Total Area (sq ft)	Runoff Coefficient C	25-yr Wet Year Precipitation (inches)	Total Facility[1] Precipitation (gallons)	Compost[2] Pad Runoff (gallons)
January	1,132,560	0.72	8.43	5,958,323	**4,289,992**
February	1,132,560	0.72	6.71	4,737,008	**3,410,646**
March	1,132,560	0.72	5.81	4,108,701	**2,958,265**
April	1,132,560	0.72	2.51	1,779,025	**1,280,898**
May	1,132,560	0.72	0.70	494,174	**355,805**
June	1,132,560	0.72	0.18	127,073	**91,493**
July	1,132,560	0.72	0.09	63,537	**45,746**
August	1,132,560	0.72	0.57	63,537	**45,746**
September	1,132,560	0.72	1.61	409,458	**294,810**
October	1,132,560	0.72	3.96	1,143,659	**823,435**
November	1,132,560	0.72	6.67	2,802,671	**2,017,923**
December	1,132,560	0.72	9.77	4,715,829	**3,395,397**
Totals	26.0 (Acres)	--	37.37	26,402,994	**19,010,156**

Notes:
1. The total precipitation volume was calculated using the scaled 25-year return wet year precipitation data multiplied by the footprint of Areas 1 and 2.
2. The compost pad runoff volume was calculated by multiplying the total precipitation volume by the percent runoff.

5.2 Outflows

Outflows for the 25-year return wet year water balance model include basin evaporation and water usage for dust control and compost makeup water in Area 1.

Monthly evaporation and compost makeup water volumes were assumed to be the same as those used in the average annual water balance model as detailed in Sections 4.2.1 and 4.2.2. Dust control outflows were updated for the 25-year return wet year as described below.

5.2.1 Water Usage for Dust Control

The amount of water used for dust control each month is dependent upon the amount of water available after taking into account all of the inflows and outflows. A minimum of approximately 23.2 million gallons of water (71 acre-ft) is required for dust control annually to maintain a minimum of two feet of freeboard in DB-1. A minimum of approximately 51.6 million gallons of water (158 acre-ft) is required for dust control annually to maintain a minimum of two feet of freeboard in DB-2.

5.3 25-Year Return Wet Year Water Balance Model and Results

During average precipitation conditions, the basins are empty at the end of May and June and remain dry until January. The 25-year return wet year inflows and outflows are managed to maintain 2 foot of freeboard in both basins. During years with above average precipitation, Z-Best will increase water usage from the detention basins and decrease water usage from the on-site water wells. In addition, the detention basins can be managed by selectively taking out water from one basin over the other.

The anticipated monthly volumes for the 25-year return wet year precipitation water balance model for DB-1 and DB-2 are shown in Figures 5 and 6.

Figure 5: DB-1 25-Year Return Wet Year Anticipated Monthly Volumes

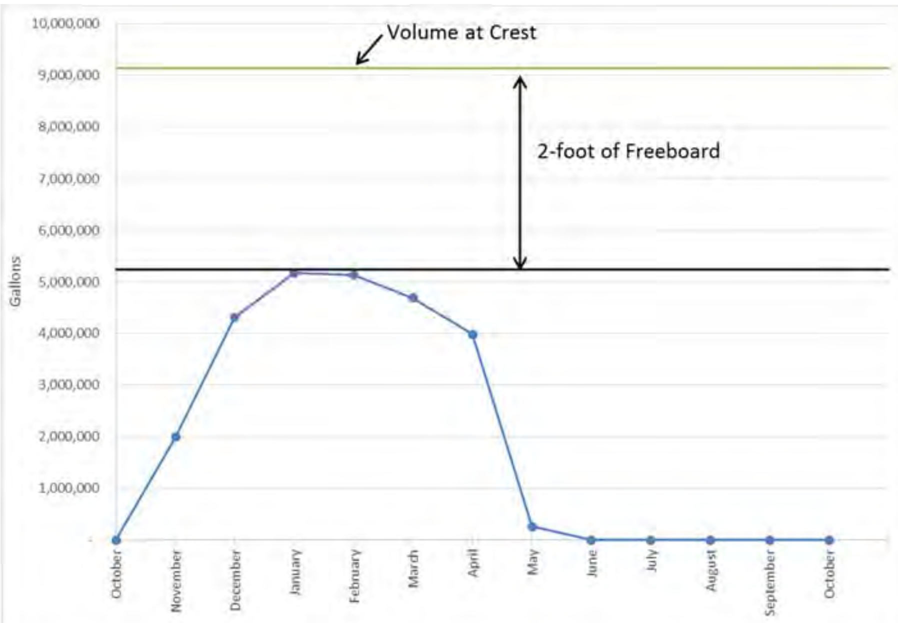
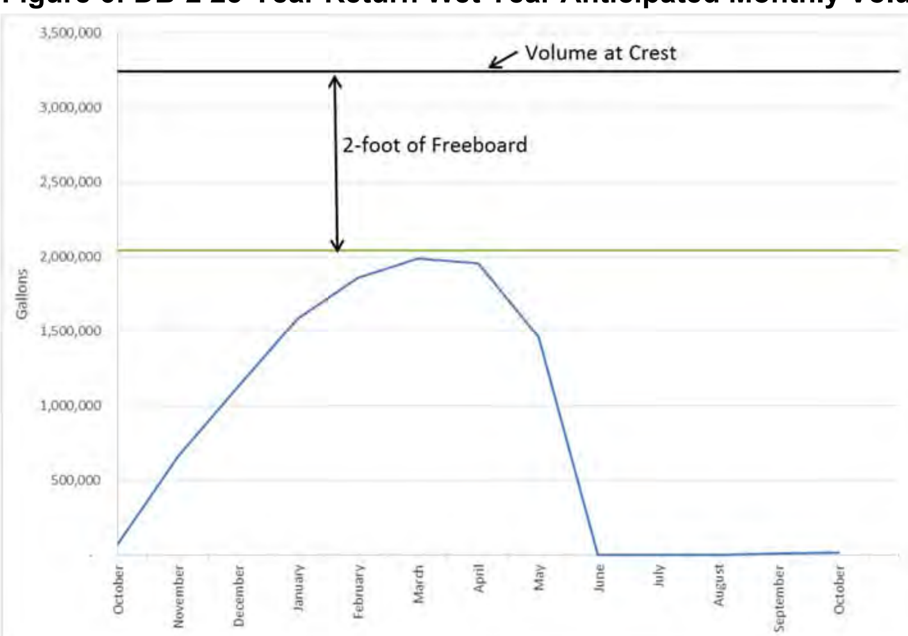


Figure 6: DB-2 25-Year Return Wet Year Anticipated Monthly Volumes



Detention Basin 1 Characteristics

Min Capacity (%)	Max Capacity (%)	Floor Elev (ft)	Minimum Surface Area (sf)	2-ft Freeboard from outlet (ft)	Volume at Freeboard (gal)	Elevation of Top of Pond (ft)	Maximum Surface Area (sf)	Total Volume (gal)
0%	100%	134	221,406	137.0	5,244,095	139	274,324	9,138,789

AVERAGE ANNUAL PRECIPITATION CONDITIONS INPUTS - DB-1

AVG CONDITIONS	Precipitation (inches)	Compost Pad Runoff (gallons)	Evaporation (inches)
January	4.70	6,449,959	1.55
February	3.74	5,132,520	2.00
March	3.24	4,446,355	3.55
April	1.40	1,921,264	4.71
May	0.39	535,209	6.08
June	0.10	137,233	6.65
July	0.05	68,617	6.99
August	0.05	68,617	6.32
September	0.32	439,146	4.93
October	0.90	1,235,098	3.50
November	2.21	3,032,853	1.89
December	3.72	5,105,074	1.39
Totals	20.8	28,571,945	49.6

25-YEAR RETURN WET YEAR PRECIPITATION CONDITIONS INPUTS - DB-1

25-YR WET YEAR CONDITIONS	Precipitation (inches)	Compost Pad Runoff (gallons)	Evaporation (inches)
January	8.43	11,582,479	1.55
February	6.71	9,208,345	2.00
March	5.81	7,986,970	3.55
April	2.51	3,458,276	4.71
May	0.70	960,632	6.08
June	0.18	247,020	6.65
July	0.09	123,510	6.99
August	0.09	123,510	6.32
September	0.57	795,952	4.93
October	1.61	2,223,177	3.50
November	3.96	5,448,157	1.89
December	6.67	9,167,176	1.39
Totals	37.4	51,325,204	49.6

		Initial Conditions			Inflows (Gal)			Outflows (Gal)				Final Conditions		
Year	Month	Starting Elevation (ft)	Starting Volume (Gal)	Starting Surface Area (ft^2)	Direct Precipitation	Compost Pad Runoff	Total Inflow	Evaporation	Dust Control	Compost Make Up Water	Total Outflow	Final Volume (gal)	Final Elev. (ft)	Final Capacity Used (%)
Year 1	November	134.00	-	221,406	377,950	3,032,853	3,410,803	260,874	-	3,149,929	3,410,803	-	134.00	0%
	December	134.00	-	221,406	636,188	5,105,074	5,741,261	191,859	-	3,880,000	4,071,859	1,669,402	134.83	32%
	January	134.83	1,669,402	230,032	803,785	6,449,959	7,253,744	222,279	-	3,880,000	4,102,279	4,820,867	136.41	92%
	February	136.41	4,820,867	246,317	639,608	5,132,520	5,772,128	307,116	1,500,000	3,880,000	5,687,116	4,905,879	136.45	94%
	March	136.45	4,905,879	246,756	554,099	4,446,355	5,000,453	546,103	1,200,000	3,880,000	5,626,103	4,280,229	136.14	82%
	April	136.14	4,280,229	243,523	239,425	1,921,264	2,160,690	715,055	-	3,880,000	4,595,055	1,845,864	134.92	35%
	May	134.92	1,845,864	230,944	66,697	535,209	601,906	601,906	-	1,845,864	2,447,770	-	134.00	0%
	June	134.00	-	221,406	17,102	137,233	154,335	154,335	-	-	154,335	-	134.00	0%
	July	134.00	-	221,406	8,551	68,617	77,167	77,167	-	-	77,167	-	134.00	0%
	August	134.00	-	221,406	8,551	68,617	77,167	77,167	-	-	77,167	-	134.00	0%
	September	134.00	-	221,406	54,726	439,146	493,872	493,872	-	-	493,872	-	134.00	0%
	October	134.00	-	221,406	153,916	1,235,098	1,389,015	483,099	-	905,916	1,389,015	-	134.00	0%
Year 2	November	134.00	-	221,406	377,950	3,032,853	3,410,803	260,874	-	3,149,929	3,410,803	-	134.00	0%
	December	134.00	-	221,406	636,188	5,105,074	5,741,261	191,859	-	3,880,000	4,071,859	1,669,402	134.83	32%
	January	134.83	1,669,402	230,032	803,785	6,449,959	7,253,744	222,279	-	3,880,000	4,102,279	4,820,867	136.41	92%
	February	136.41	4,820,867	246,317	639,608	5,132,520	5,772,128	307,116	1,500,000	3,880,000	5,687,116	4,905,879	136.45	94%
	March	136.45	4,905,879	246,756	554,099	4,446,355	5,000,453	546,103	1,200,000	3,880,000	5,626,103	4,280,229	136.14	82%
	April	136.14	4,280,229	243,523	239,425	1,921,264	2,160,690	715,055	-	3,880,000	4,595,055	1,845,864	134.92	35%
	May	134.92	1,845,864	230,944	66,697	535,209	601,906	601,906	-	1,845,864	2,447,770	-	134.00	0%
	June	134.00	-	221,406	17,102	137,233	154,335	154,335	-	-	154,335	-	134.00	0%
	July	134.00	-	221,406	8,551	68,617	77,167	77,167	-	-	77,167	-	134.00	0%
	August	134.00	-	221,406	8,551	68,617	77,167	77,167	-	-	77,167	-	134.00	0%
	September	134.00	-	221,406	54,726	439,146	493,872	493,872	-	-	493,872	-	134.00	0%
	October	134.00	-	221,406	153,916	1,235,098	1,389,015	483,099	-	905,916	1,389,015	-	134.00	0%

Z-Best Composting Facility Water Balance Model Results

		Initial Conditions			Inflows (Gal)			Outflows (Gal)				Final Conditions		
Year	Month	Starting Elevation (ft)	Starting Volume (Gal)	Starting Surface Area (ft^2)	Direct Precipitation	Compost Pad Runoff	Total Inflow	Evaporation	Dust Control	Compost Make Up Water	Total Outflow	Final Volume (gal)	Final Elev. (ft)	Final Capacity Used (%)
Year 3	November	134.00	-	221,406	377,950	3,032,853	3,410,803	260,874	-	3,149,929	3,410,803	-	134.00	0%
	December	134.00	-	221,406	636,188	5,105,074	5,741,261	191,859	-	3,880,000	4,071,859	1,669,402	134.83	32%
	January	134.83	1,669,402	230,032	803,785	6,449,959	7,253,744	222,279	-	3,880,000	4,102,279	4,820,867	136.41	92%
	February	136.41	4,820,867	246,317	639,608	5,132,520	5,772,128	307,116	1,500,000	3,880,000	5,687,116	4,905,879	136.45	94%
	March	136.45	4,905,879	246,756	554,099	4,446,355	5,000,453	546,103	1,200,000	3,880,000	5,626,103	4,280,229	136.14	82%
	April	136.14	4,280,229	243,523	239,425	1,921,264	2,160,690	715,055	-	3,880,000	4,595,055	1,845,864	134.92	35%
	May	134.92	1,845,864	230,944	66,697	535,209	601,906	601,906	-	1,845,864	2,447,770	-	134.00	0%
	June	134.00	-	221,406	17,102	137,233	154,335	154,335	-	-	154,335	-	134.00	0%
	July	134.00	-	221,406	8,551	68,617	77,167	77,167	-	-	77,167	-	134.00	0%
	August	134.00	-	221,406	8,551	68,617	77,167	77,167	-	-	77,167	-	134.00	0%
	September	134.00	-	221,406	54,726	439,146	493,872	493,872	-	-	493,872	-	134.00	0%
	October	134.00	-	221,406	153,916	1,235,098	1,389,015	483,099	-	905,916	1,389,015	-	134.00	0%
Year 4	November	134.00	-	221,406	377,950	3,032,853	3,410,803	260,874	-	3,149,929	3,410,803	-	134.00	0%
	December	134.00	-	221,406	636,188	5,105,074	5,741,261	191,859	-	3,880,000	4,071,859	1,669,402	134.83	32%
	January	134.83	1,669,402	230,032	803,785	6,449,959	7,253,744	222,279	-	3,880,000	4,102,279	4,820,867	136.41	92%
	February	136.41	4,820,867	246,317	639,608	5,132,520	5,772,128	307,116	1,500,000	3,880,000	5,687,116	4,905,879	136.45	94%
	March	136.45	4,905,879	246,756	554,099	4,446,355	5,000,453	546,103	1,200,000	3,880,000	5,626,103	4,280,229	136.14	82%
	April	136.14	4,280,229	243,523	239,425	1,921,264	2,160,690	715,055	-	3,880,000	4,595,055	1,845,864	134.92	35%
	May	134.92	1,845,864	230,944	66,697	535,209	601,906	601,906	-	1,845,864	2,447,770	-	134.00	0%
	June	134.00	-	221,406	17,102	137,233	154,335	154,335	-	-	154,335	-	134.00	0%
	July	134.00	-	221,406	8,551	68,617	77,167	77,167	-	-	77,167	-	134.00	0%
	August	134.00	-	221,406	8,551	68,617	77,167	77,167	-	-	77,167	-	134.00	0%
	September	134.00	-	221,406	54,726	439,146	493,872	493,872	-	-	493,872	-	134.00	0%
	October	134.00	-	221,406	153,916	1,235,098	1,389,015	483,099	-	905,916	1,389,015	-	134.00	0%
Year 5	November	134.00	-	221,406	377,950	3,032,853	3,410,803	260,874	-	3,149,929	3,410,803	-	134.00	0%
	December	134.00	-	221,406	636,188	5,105,074	5,741,261	191,859	-	3,880,000	4,071,859	1,669,402	134.83	32%
	January	134.83	1,669,402	230,032	803,785	6,449,959	7,253,744	222,279	-	3,880,000	4,102,279	4,820,867	136.41	92%
	February	136.41	4,820,867	246,317	639,608	5,132,520	5,772,128	307,116	1,500,000	3,880,000	5,687,116	4,905,879	136.45	94%
	March	136.45	4,905,879	246,756	554,099	4,446,355	5,000,453	546,103	1,200,000	3,880,000	5,626,103	4,280,229	136.14	82%
	April	136.14	4,280,229	243,523	239,425	1,921,264	2,160,690	715,055	-	3,880,000	4,595,055	1,845,864	134.92	35%
	May	134.92	1,845,864	230,944	66,697	535,209	601,906	601,906	-	1,845,864	2,447,770	-	134.00	0%
	June	134.00	-	221,406	17,102	137,233	154,335	154,335	-	-	154,335	-	134.00	0%
	July	134.00	-	221,406	8,551	68,617	77,167	77,167	-	-	77,167	-	134.00	0%
	August	134.00	-	221,406	8,551	68,617	77,167	77,167	-	-	77,167	-	134.00	0%
	September	134.00	-	221,406	54,726	439,146	493,872	493,872	-	-	493,872	-	134.00	0%
	October	134.00	-	221,406	153,916	1,235,098	1,389,015	483,099	-	905,916	1,389,015	-	134.00	0%
25-YR WET YEAR	November	134.00	-	221,406	678,060	5,448,157	6,126,217	260,874	-	3,880,000	4,140,874	1,985,343	134.99	38%
	December	134.99	1,985,343	231,665	1,141,350	9,167,176	10,308,526	200,749	3,900,000	3,880,000	7,980,749	4,313,120	136.16	82%
	January	136.16	4,313,120	243,693	1,442,029	11,582,479	13,024,508	235,480	8,050,000	3,880,000	12,165,480	5,172,148	136.59	99%
	February	136.59	5,172,148	248,132	1,147,487	9,208,345	10,355,832	309,379	6,200,000	3,880,000	10,389,379	5,138,601	136.57	98%
	March	136.57	5,138,601	247,959	994,079	7,986,970	8,981,050	548,764	5,000,000	3,880,000	9,428,764	4,690,887	136.35	89.5%
	April	136.35	4,690,887	245,645	429,540	3,458,276	3,887,816	721,286	-	3,880,000	4,601,286	3,977,417	135.99	76%
	May	135.99	3,977,417	241,958	119,658	960,632	1,080,290	917,113	-	3,880,000	4,797,113	260,594	134.13	5%
	June	134.13	260,594	222,753	30,681	247,020	277,701	277,701	-	260,594	538,295	-	134.00	0%
	July	134.00	-	221,406	15,341	123,510	138,851	138,851	-	-	138,851	-	134.00	0%
	August	134.00	-	221,406	15,341	123,510	138,851	138,851	-	-	138,851	-	134.00	0%
	September	134.00	-	221,406	98,181	795,952	894,133	680,480	-	213,653	894,133	-	134.00	0%
	October	134.00	-	221,406	276,133	2,223,177	2,499,310	483,099	-	2,016,211	2,499,310	-	134.00	0%

Golder Associates

Detention Basin 2 Characteristics

Min Capacity (%)	Max Capacity (%)	Floor Elev (ft)	Minimum Surface Area (sf)	2-ft Freeboard from outlet (ft)	Volume at Freeboard (gal)	Elevation of Top of Pond (ft)	Maximum Surface Area (sf)	Total Volume (gal)
0%	100%	139.00	60,515	143.0	2,041,855	145	85,340	3,240,686

AVERAGE ANNUAL PRECIPITATION CONDITIONS INPUTS -DB-2

AVG CONDITIONS	Precipitation (inches)	Compost Pad Runoff (gallons)	Evaporation (inches)
January	4.70	2,388,977	1.55
February	3.74	1,901,016	2.00
March	3.24	1,646,869	3.55
April	1.40	711,610	4.71
May	0.39	198,234	6.08
June	0.10	50,829	6.65
July	0.05	25,415	6.99
August	0.05	25,415	6.32
September	0.32	162,654	4.93
October	0.90	457,464	3.50
November	2.21	1,123,327	1.89
December	3.72	1,890,850	1.39
Totals	20.8	10,582,659	49.6

25-YEAR RETURN WET YEAR PRECIPITATION CONDITIONS INPUTS - DB-2

25-YR WET YEAR CONDITIONS	Precipitation (inches)	Compost Pad Runoff (gallons)	Evaporation (inches)
January	8.43	11,582,479	1.55
February	6.71	9,208,345	2.00
March	5.81	7,986,970	3.55
April	2.51	3,458,276	4.71
May	0.70	960,632	6.08
June	0.18	247,020	6.65
July	0.09	123,510	6.99
August	0.09	123,510	6.32
September	0.57	795,952	4.93
October	1.61	2,223,177	3.50
November	3.96	5,448,157	1.89
December	6.67	9,167,176	1.39
Totals	37.4	51,325,204	49.6

		Initial Conditions			Inflows (Gal)				Outflows (Gal)		Final Conditions		
Year	Month	Starting Elevation (ft)	Starting Volume (Gal)	Starting Surface Area (ft^2)	Direct Precipitation	Compost Pad Runoff	Total Inflow	Evaporation	Dust Control	Total Outflow	Final Volume (gal)	Final Elev. (ft)	Final Capacity Used (%)
Year 1	November	139.00	-	60,714	117,577	1,123,327	1,240,905	71,537	1,000,000	1,071,537	169,368	139.34	8%
	December	139.34	169,368	62,095	197,913	1,890,850	2,088,763	53,808	1,900,000	1,953,808	304,322	139.61	15%
	January	139.61	304,322	63,195	250,051	2,388,977	2,639,028	61,065	1,500,000	1,561,065	1,382,284	141.76	68%
	February	141.76	1,382,284	71,984	198,977	1,901,016	2,099,992	89,752	1,600,000	1,689,752	1,792,525	142.59	88%
	March	142.59	1,792,525	75,329	172,376	1,646,869	1,819,245	166,712	1,600,000	1,766,712	1,845,057	142.69	90%
	April	142.69	1,845,057	75,757	74,483	711,610	786,093	222,444	1,500,000	1,722,444	908,706	140.82	45%
	May	140.82	908,706	68,123	20,749	198,234	218,983	218,983	908,706	1,127,690	-	139.00	0%
	June	139.00	-	60,714	5,320	50,829	56,150	56,150	-	56,150	-	139.00	0%
	July	139.00	-	60,714	2,660	25,415	28,075	28,075	-	28,075	-	139.00	0%
	August	139.00	-	60,714	2,660	25,415	28,075	28,075	-	28,075	-	139.00	0%
	September	139.00	-	60,714	17,025	162,654	179,678	179,678	-	179,678	-	139.00	0%
	October	139.00	-	60,714	47,882	457,464	505,346	132,476	300,000	432,476	72,870	139.15	4%
Year 2	November	139.15	72,870	61,308	117,577	1,123,327	1,240,905	72,237	1,000,000	1,072,237	241,537	139.48	12%
	December	139.48	241,537	62,684	197,913	1,890,850	2,088,763	54,318	1,900,000	1,954,318	375,981	139.75	18%
	January	139.75	375,981	63,780	250,051	2,388,977	2,639,028	61,630	1,500,000	1,561,630	1,453,379	141.91	71%
	February	141.91	1,453,379	72,564	198,977	1,901,016	2,099,992	90,475	1,600,000	1,690,475	1,862,897	142.73	91%
	March	142.73	1,862,897	75,902	172,376	1,646,869	1,819,245	167,982	1,600,000	1,767,982	1,914,160	142.83	94%
	April	142.83	1,914,160	76,320	74,483	711,610	786,093	224,099	1,500,000	1,724,099	976,155	140.95	48%
	May	140.95	976,155	68,673	20,749	198,234	218,983	218,983	976,155	1,195,138	-	139.00	0%
	June	139.00	-	60,714	5,320	50,829	56,150	56,150	-	56,150	-	139.00	0%
	July	139.00	-	60,714	2,660	25,415	28,075	28,075	-	28,075	-	139.00	0%
	August	139.00	-	60,714	2,660	25,415	28,075	28,075	-	28,075	-	139.00	0%
	September	139.00	-	60,714	17,025	162,654	179,678	179,678	-	179,678	-	139.00	0%
	October	139.00	-	60,714	47,882	457,464	505,346	132,476	300,000	432,476	72,870	139.15	4%

Z-Best Composting Facility Water Balance Model Results

		Initial Conditions			Inflows (Gal)			Outflows (Gal)			Final Conditions		
Year	Month	Starting Elevation (ft)	Starting Volume (Gal)	Starting Surface Area (ft^2)	Direct Precipitation	Compost Pad Runoff	Total Inflow	Evaporation	Dust Control	Total Outflow	Final Volume (gal)	Final Elev. (ft)	Final Capacity Used (%)
Year 3	November	139.15	72,870	61,308	117,577	1,123,327	1,240,905	72,237	1,000,000	1,072,237	241,537	139.48	12%
	December	139.48	241,537	62,684	197,913	1,890,850	2,088,763	54,318	1,900,000	1,954,318	375,981	139.75	18%
	January	139.75	375,981	63,780	250,051	2,388,977	2,639,028	61,630	1,500,000	1,561,630	1,453,379	141.91	71%
	February	141.91	1,453,379	72,564	198,977	1,901,016	2,099,992	90,475	1,600,000	1,690,475	1,862,897	142.73	91%
	March	142.73	1,862,897	75,902	172,376	1,646,869	1,819,245	167,982	1,600,000	1,767,982	1,914,160	142.83	94%
	April	142.83	1,914,160	76,320	74,483	711,610	786,093	224,099	1,500,000	1,724,099	976,155	140.95	48%
	May	140.95	976,155	68,673	20,749	198,234	218,983	218,983	976,155	1,195,138	-	139.00	0%
	June	139.00	-	60,714	5,320	50,829	56,150	56,150	-	56,150	-	139.00	0%
	July	139.00	-	60,714	2,660	25,415	28,075	28,075	-	28,075	-	139.00	0%
	August	139.00	-	60,714	2,660	25,415	28,075	28,075	-	28,075	-	139.00	0%
	September	139.00	-	60,714	17,025	162,654	179,678	179,678	-	179,678	-	139.00	0%
	October	139.00	-	60,714	47,882	457,464	505,346	132,476	300,000	432,476	72,870	139.15	4%
Year 4	November	139.15	72,870	61,308	117,577	1,123,327	1,240,905	72,237	1,000,000	1,072,237	241,537	139.48	12%
	December	139.48	241,537	62,684	197,913	1,890,850	2,088,763	54,318	1,900,000	1,954,318	375,981	139.75	18%
	January	139.75	375,981	63,780	250,051	2,388,977	2,639,028	61,630	1,500,000	1,561,630	1,453,379	141.91	71%
	February	141.91	1,453,379	72,564	198,977	1,901,016	2,099,992	90,475	1,600,000	1,690,475	1,862,897	142.73	91%
	March	142.73	1,862,897	75,902	172,376	1,646,869	1,819,245	167,982	1,600,000	1,767,982	1,914,160	142.83	94%
	April	142.83	1,914,160	76,320	74,483	711,610	786,093	224,099	1,500,000	1,724,099	976,155	140.95	48%
	May	140.95	976,155	68,673	20,749	198,234	218,983	218,983	976,155	1,195,138	-	139.00	0%
	June	139.00	-	60,714	5,320	50,829	56,150	56,150	-	56,150	-	139.00	0%
	July	139.00	-	60,714	2,660	25,415	28,075	28,075	-	28,075	-	139.00	0%
	August	139.00	-	60,714	2,660	25,415	28,075	28,075	-	28,075	-	139.00	0%
	September	139.00	-	60,714	17,025	162,654	179,678	179,678	-	179,678	-	139.00	0%
	October	139.00	-	60,714	47,882	457,464	505,346	132,476	300,000	432,476	72,870	139.15	4%
Year 5	November	139.15	72,870	61,308	117,577	1,123,327	1,240,905	72,237	1,000,000	1,072,237	241,537	139.48	12%
	December	139.48	241,537	62,684	197,913	1,890,850	2,088,763	54,318	1,900,000	1,954,318	375,981	139.75	18%
	January	139.75	375,981	63,780	250,051	2,388,977	2,639,028	61,630	1,500,000	1,561,630	1,453,379	141.91	71%
	February	141.91	1,453,379	72,564	198,977	1,901,016	2,099,992	90,475	1,600,000	1,690,475	1,862,897	142.73	91%
	March	142.73	1,862,897	75,902	172,376	1,646,869	1,819,245	167,982	1,600,000	1,767,982	1,914,160	142.83	94%
	April	142.83	1,914,160	76,320	74,483	711,610	786,093	224,099	1,500,000	1,724,099	976,155	140.95	48%
	May	140.95	976,155	68,673	20,749	198,234	218,983	218,983	976,155	1,195,138	-	139.00	0%
	June	139.00	-	60,714	5,320	50,829	56,150	56,150	-	56,150	-	139.00	0%
	July	139.00	-	60,714	2,660	25,415	28,075	28,075	-	28,075	-	139.00	0%
	August	139.00	-	60,714	2,660	25,415	28,075	28,075	-	28,075	-	139.00	0%
	September	139.00	-	60,714	17,025	162,654	179,678	179,678	-	179,678	-	139.00	0%
	October	139.00	-	60,714	47,882	457,464	505,346	132,476	300,000	432,476	72,870	139.15	4%
25-YR WET YEAR	November	139.15	72,870	61,308	210,939	5,448,157	5,659,096	72,237	5,000,000	5,072,237	659,728	140.32	32%
	December	140.32	659,728	66,093	355,065	9,167,176	9,522,240	57,273	9,000,000	9,057,273	1,124,696	141.25	55%
	January	141.25	1,124,696	69,884	448,604	11,582,479	12,031,083	67,528	11,500,000	11,567,528	1,588,250	142.18	78%
	February	142.18	1,588,250	73,663	356,974	9,208,345	9,565,319	91,846	9,200,000	9,291,846	1,861,724	142.72	91%
	March	142.72	1,861,724	75,893	309,250	7,986,970	8,296,220	167,961	8,000,000	8,167,961	1,989,984	142.98	97.5%
	April	142.98	1,989,984	76,938	133,627	3,458,276	3,591,902	225,914	3,400,000	3,625,914	1,955,972	142.91	96%
	May	142.91	1,955,972	76,661	37,225	960,632	997,857	290,575	1,200,000	1,490,575	1,463,255	141.93	72%
	June	141.93	1,463,255	72,644	9,545	247,020	256,564	256,564	1,463,255	1,719,819	-	139.00	0%
	July	139.00	-	60,714	4,772	123,510	128,282	128,282	-	128,282	-	139.00	0%
	August	139.00	-	60,714	4,772	123,510	128,282	128,282	-	128,282	-	139.00	0%
	September	139.00	-	60,714	30,543	795,952	826,496	186,602	630,000	816,602	9,894	139.02	0%
	October	139.02	9,894	60,795	85,903	2,223,177	2,309,080	132,652	2,170,000	2,302,652	16,322	139.03	1%

Date:	March 26, 2019	**Made by:**	MAG
Project No.:	133-97640	**Checked by:**	LMA
Subject:	Z-Best Compost Facility Water Balance	**Reviewed by:**	RH
Project Short Title:	Z-Best Composting Tech Report		

1.0 OBJECTIVE:

Evaluate detention basin storage needs for facility runoff and precipitation inflows with outflows including evaporation, dust control and compost operations at Z-Best Composting (Z-Best) Facility. Determine the required groundwater usage for dust control and compost operations at Z-Best Composting (Z-Best) Facility

2.0 METHODOLOGY:

Model monthly inflows and outflows and resulting basin elevations based on stage-storage relationships for Detention Basin 1 and Detention Basin 2 (DB-1 and DB-2). Inflows consist of direct precipitation into DB-1 and DB-2 and facility runoff. Outflows include DB-1 and DB-2 evaporation and use of water for compost moisture conditioning and dust control. If compost operations water requirements exceed available water from DB-1 and DB-2, determine the volume of groundwater required to make-up the difference.

The State Water Resources Control Board Composting Order states that all detention basins shall be designed to maintain all runoff from the working surfaces in addition to direct precipitation from a 25-year, 24-hour peak storm event (4.75 inches). Both the detention basins have been designed to hold the runoff from a 100-year, 24-hour storm event (6.5 inches) which exceeds the requirements of the Composting Order. To be conservative, a water balance model was completed to show that DB-1 and DB-2 have sufficient capacity to manage all direct precipitation and stormwater runoff from an average annual year of precipitation (20.8 inches) and a 25-year return period wet year (37.4 inches).

3.0 ASSUMPTIONS/GIVENS:

Compost operations are conducted 5 day a week for the wood waste composting and 7 days a week for the proposed composting system by Engineered Compost Systems (ECS). Approximately 96 acres, including 70 acres of Area 1, the active compost area, will drain to DB-1 and 26 acres of Area 2, the finished compost area, will drain to DB-2. The runoff from Area 1 is assumed to contain pathogens that will limit its uses. The runoff from Area 2 is assumed to be "clean" and will have no limits on its uses.

For purposes of the water balance, the composting system is assumed to operate in a steady-state condition, i.e., the quantity of feedstock entering the system is equivalent to the quantity of finished compost removed from the system.

For purposes of the water balance, water used for dust control is assumed to be a 147,000 gallons per day for 245 days per year, based on site records. The amount of water available for dust control from DB-1 and DB-2 each month is dependent upon the amount of water available after taking into account all the inflows and other outflows. Groundwater will be used to make-up for any shortfalls between compost operations and dust control water requirements and the amount of water available from DB-1 and DB-2.

3.1 Stage-Storage Relationship

The stage-storage relationships for Detention Basins 1 and 2 at the Z-Best Compost Facility provide information relating the water elevation, surface area, and volume of the basins. These relationships were determined using the design grades for the proposed ECS composting area (western portion of Area 1) and Area 2. Tables 1 and 2 show Detention Basins 1 and 2 stage-storage relationship data.

Table 1: Detention Basin 1 Stage-Storage Data

Elevation (ft)	Water Surface Area (sq ft)	Cumulative Water Volume (gal)	Cumulative Water Volume (Acre-ft)
150.5	156,295	14,532,595	44.5
150	153,947	13,952,443	42.8
149	149,301	12,818,295	39.3
148.5	147,008	12,264,196	37.6
148	144,722	11,718,661	35.9
147	140,209	10,653,019	32.7
146	135,762	9,620,887	29.5
145	131,381	8,621,771	26.4
144	127,066	7,655,177	23.5
143	122,818	6,720,611	20.6
142	118,635	5,817,576	17.8
141	114,519	4,945,579	15.2
140	110,469	4,104,126	12.6
139	106,485	3,292,721	10.1
138	102,567	2,510,869	7.7
137	98,715	1,758,077	5.4
136	94,929	1,033,850	3.2
135	91,209	337,692	1.0
134.5	89,374	--	0.0

The stage-storage relationship for Detention Basin 1 is shown below in a graph of storage volume versus both surface area and elevation, along with a linear trend line and R-squared value. Detention Basin 1 grades are based on the design grades with side slope geometry of 3:1 (Horizontal: Vertical) and a depth of 16 feet consistent with the Aerated Static Pile Composting Preliminary Grading Plan drawings, prepared by Golder Associates (Golder 2018).

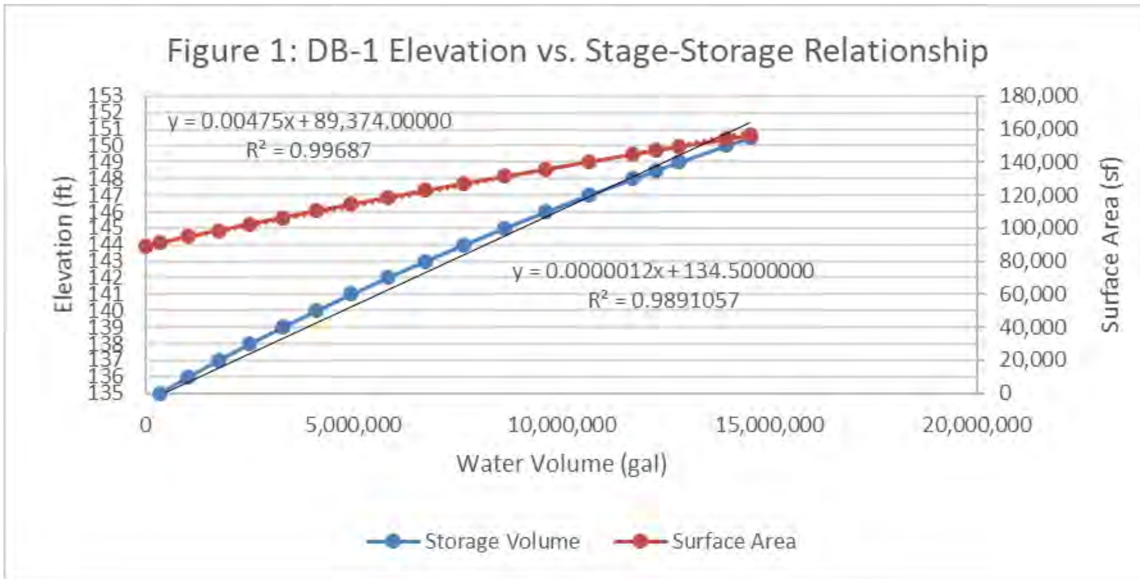
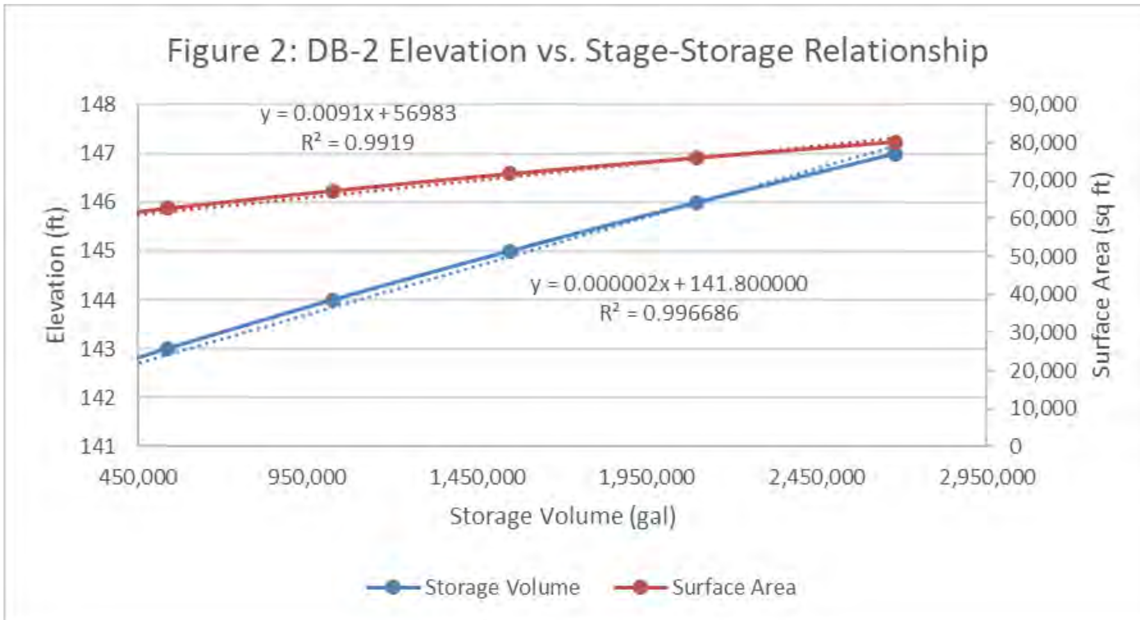


Table 2: Detention Basin 2 Stage-Storage Data

Elevation (ft)	Water Surface Area (sq ft)	Cumulative Water Volume (gal)	Cumulative Water Volume (Acre-ft)
149	88,226	3,944,915	12.1
148	84,677	3,298,256	10.1
147	80,203	2,681,604	8.2
146	76,032	2,097,284	6.4
145	71,822	1,544,309	4.7
144	67,345	1,023,825	3.1
143	62,723	537,370	1.6
142	57,968	85,984	0.3
141.8	56,983	--	0.0

The stage-storage relationship for Detention Basin 2 is shown below in a graph of storage volume versus both elevation and surface area, along with a linear trend line and R-squared value.



Curves were developed to present storage volume for the detention basins as a function of both elevation and surface area. The curves were fit with linear trend lines to calculate intermediate values of elevation, surface area, and volume. The R-squared value of each trend line are both less than 1/100th from 1, indicating a good fit for each trend line.

4.0 AVERAGE ANNUAL CONDITIONS

The average annual conditions over a period of several years were modeled to ensure outflows are greater than or equal to inflows, and that DB-1 and DB-2 had sufficient storage capacity. Each of the model inflows and outflows are described in detail in the following sections.

4.1 Inflows

Inflows for the average annual water balance model include direct precipitation to the detention basins and facility runoff as described below. It is assumed that the quantity of water used for the composting operations and dust control is the minimum required and, as a result, there is no runoff from the compost pad to the detention basins from the application of water for compost operations or dust control.

4.1.1 Direct Precipitation in Detention Basins

The Isohyetal Map of Santa Clara County Mean Annual Precipitation, included in the Santa Clara County Hydrology Manual (October 2007), shows a mean annual precipitation for the site of approximately 21 inches. Monthly precipitation data was obtained from the Western Regional Climate Center (WRCC) website. Precipitation data was also obtained from records for Weather Station 043417 in Gilroy, CA. This station is located at 37° 0' 24 N and 121° 33' 48 W at elevation 190 feet approximately 8 miles northwest from the site. The data range retrieved is from March 1, 1906 to June 10, 2016. The mean annual precipitation for this range of data is 20.83 inches. Therefore, with over 100 years of precipitation data, we used the monthly precipitation data based on Gilroy Station 043417 with an annual mean precipitation of 20.83 inches.

Table 3: Average Monthly Precipitation

	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec	Annual Total [1]
Average Precipitation (in)Precipitati on (in)	4.70	3.74	3.24	1.40	0.39	0.10	0.05	0.05	0.32	0.90	2.21	3.72	20.83

[1] Precipitation values may not add to 20.83 inches due to rounding.

To apply the monthly precipitation as an inflow to the water balance model, the area of DB-1 footprint (156,295 sq ft) and DB-2 footprint (88,226 sq ft) is multiplied by the amount of rainfall in the particular month and converted to gallons, according to the equation below. The basin is always subject to precipitation inflow, regardless of whether the other operational inflows are occurring.

$$P = \frac{R \times A}{12} \times 7.481\ gal/cf$$

Where:

P = monthly precipitation volume (gallons)

R = monthly rainfall from historical data (inches)

A = area of the Detention Basin footprint (ft^2)

Table 4: Average Monthly Direct Precipitation

Month	Detention Basin 1 (gal)	Detention Basin 2 (gal)
January	457,954	258,507
February	364,414	205,706
March	315,696	178,205
April	136,412	77,002
May	38,000	21,451
June	9,744	5,500
July	4,872	2,750
August	4,872	2,750
September	31,180	17,600
October	87,693	49,501
November	215,336	121,553
December	362,466	204,606
Totals	2,028,638	1,145,132

4.1.2 Compost Facility Runoff

The compost facility pad runoff was calculated by multiplying the average monthly precipitation, the total area of the compost facility footprint (sq ft), and the runoff coefficient. The total area of the facility is approximately 96 acres. The average runoff coefficient of 0.72 was estimated based on calculated coefficients at similar composting facilities. Table 5 and 6 shows the monthly compost facility runoff used for the water balance model.

Table 5: Compost Facility Runoff Calculation – DB-1

Month	Total Area (sq ft)	Runoff Coefficient C	Precipitation (inches)	Total Facility[1] Precipitation (gallons)	Compost Pad[2] Runoff (gallons)
January	3,057,780	0.72	4.70	8,958,276	6,449,959
February	3,057,780	0.72	3.74	7,128,501	5,132,520
March	3,057,780	0.72	3.24	6,175,492	4,446,355
April	3,057,780	0.72	1.40	2,668,423	1,921,264
May	3,057,780	0.72	0.39	743,346	535,209
June	3,057,780	0.72	0.10	190,602	137,233
July	3,057,780	0.72	0.05	95,301	68,617
August	3,057,780	0.72	0.05	95,301	68,617
September	3,057,780	0.72	0.32	609,925	439,146
October	3,057,780	0.72	0.90	1,715,415	1,235,098
November	3,057,780	0.72	2.21	4,212,296	3,032,853
December	3,057,780	0.72	3.72	7,090,380	5,105,074
Totals	70 acres	-	20.83 [3]	39,683,257	28,571,945

Notes:

[1] The total precipitation volume was calculated using the average annual precipitation data multiplied by the footprint of Area 1.

[2] The compost pad runoff volume was calculated by multiplying the total precipitation volume by the runoff coefficient.

[3] The monthly precipitation may not add to 20.83 inches due to rounding.

Table 6: Compost Facility Runoff Calculation – DB-2

Month	Total Area (sq ft)	Runoff Coefficient C	Precipitation (inches)	Total Facility[1] Precipitation (gallons)	Compost Pad Runoff[2] (gallons)
January	1,132,560	0.72	4.70	3,318,023	2,388,977
February	1,132,560	0.72	3.74	2,640,299	1,901,016
March	1,132,560	0.72	3.24	2,287,318	1,646,869
April	1,132,560	0.72	1.40	988,347	711,610
May	1,132,560	0.72	0.39	275,325	198,234
June	1,132,560	0.72	0.10	70,596	50,829
July	1,132,560	0.72	0.05	35,298	25,415
August	1,132,560	0.72	0.05	35,298	25,415
September	1,132,560	0.72	0.32	225,908	162,654
October	1,132,560	0.72	0.90	635,366	457,464
November	1,132,560	0.72	2.21	1,560,177	1,123,327
December	1,132,560	0.72	3.72	2,626,180	1,890,850
Totals	26 acres	-	20.83 [3]	14,698,137	10,582,659

Notes:

[1] The total precipitation volume was calculated using the average annual precipitation data multiplied by the footprint of Area 2.

[2] The compost pad runoff volume was calculated by multiplying the total precipitation volume by the runoff coefficient.

[3] Monthly precipitation may not add to 20.83 inches due to rounding.

4.2 Outflows

Outflows include basin evaporation and water usage for compost operations and dust control, as described below. The priorities for the source of water are shown in Table 7.

Table 7: Water Source Priorities

Usage	Source		
	Detention Basin 1	Detention Basin 2	Groundwater
Wood Waste Primary Composting	First Choice	Second Choice	Third Choice
Wood Waste Secondary Composting		First Choice	Second Choice
ECS Primary Composting	First Choice	Second Choice	Third Choice
ECS Secondary Composting		First Choice	Second Choice

4.2.1 Monthly Evaporation

Evapotranspiration (ETo) data was obtained from the CIMIS website from records for Station 211 in Gilroy, California. ETo values are considered equal to evaporation from a large body of water, such as a basin or lake. The data range retrieved is September 1, 2009 to June 10, 2016. The mean annual evaporation for this range of data is 49.56 inches.

Table 8: Average Monthly Evaporation

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Evaporation (in)	1.55	2.00	3.55	4.71	6.08	6.65	6.99	6.32	4.93	3.50	1.89	1.39	49.56

The monthly evaporation for the basins is calculated using the following equation:

$$E = \frac{R \times SA}{12} \times 7.481 gal / cf$$

where:

E = monthly evaporation (gallons)

R = evaporation rate from historical data (inches)

SA = surface area of basin at the beginning of month (ft^2)

4.2.2 Water Usage for Compost Operations

Based on information provided by Z-Best, the site will use 176,000 gallons of water per day Monday through Friday for the wood waste primary composting and 176,000 gallons per day Monday through Friday for wood waste secondary composting. Based on information provided by ECS, 20,000 gallons of water per day will be used for the ECS primary composting and 40,000 gallons per day for ECS secondary composting process. (These are average values and account for precipitation). Based on the water balance model calculation, approximately 24 million gallons per year of water will be used for compost operations from DB-1 and 10.6 million gallons from DB-2. Additional water that may be needed when the basins are dry will be obtained from the on-site groundwater wells.

4.2.3 Water Usage for Dust Control

For the purpose of this water balance model, the site will require approximately 36 million gallons of water per year for dust control, based on site records. The amount of water available for dust control each month is dependent upon the amount of water available after taking into account all the inflows and other outflows.

4.3 Average Annual Year Water Balance Model

The model begins with the basins dry at an elevation of 134.5 feet for DB-1 and 141.8 feet for DB-2 (volume = 0 gallons) and 0% of capacity. Starting the first month, July of Year 1, the precipitation and facility runoff inflows are added to the basin volume and the evaporation and compost operations outflows are subtracted from the DB-1 and DB-2 volumes.

The volume of water at the end of the month is calculated by adding the inflows and subtracting the outflows. Using the stage-storage relationships, the change in elevation is calculated as a function of the change in volume. Adding this change in elevation to the initial elevation gives the final elevation. The percent capacity in the basin is calculated by dividing the final volume by the maximum volume. The final elevation and final volume for the basin will be used as the initial elevation and volume for the next month, and the model will repeat itself following the same steps.

4.4 Average Annual Year Water Balance Results

Based on the water balance model assumptions described in the previous sections, the outflows are greater than or equal to the inflows for an average annual precipitation year. During average annual precipitation conditions, DB-1 and DB-2 remain dry at the end of each month due to the water usage required by the compost operations.

For the average annual precipitation year, compost usage water available from DB-1 is 24 million gallons or 73.7 acre-feet and an estimated 10.6 million gallons or 32.5 acre-feet from DB-2. For the average annual precipitation year, dust control water available from DB-1 is 4.6 million gallons (14.1 acre-ft).

5.0 25-YEAR RETURN WET YEAR

A 25-year return wet year was modeled to ensure that the detention basin storage capacity meets or exceeds storage requirements under conditions that are more conservative than the average precipitation year.

5.1 Inflows

Inflows for the 25-year return wet year water balance model include direct precipitation in DB-1 and DB-2 and compost facility runoff. Direct precipitation and facility runoff volumes were updated for the 25-year return wet year as described below.

5.1.1 Direct Precipitation

The 25-year wet year annual precipitation is estimated to be 37.37 inches based on the depth-duration-frequency information provided by the Department of Water Resources for the CIMIS Station 211 located in Gilroy, California. The average monthly precipitation from CIMIS was scaled up to equate to the 25-year wet year total annual precipitation as shown in Table 9.

Table 9: 25-Year Return Wet Year Average Monthly Precipitation

Month	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec	Annual Total
Precipitation (in)	8.44	6.71	5.82	2.51	0.70	0.18	0.09	0.09	0.57	1.61	3.96	6.67	37.37 [1]

[1] Monthly precipitation may not add to 37.37 inches due to rounding.

The 25-year wet year monthly precipitation was added to the water balance model as an inflow in the same manner as described in Section 4.1.1 for the average annual precipitation.

5.1.2 Compost Facility Runoff

The 25-year wet year monthly precipitation was used to calculate facility runoff as described in Section 4.1.2 for the average annual precipitation. The compost facility runoff for the 25-year return wet year is shown in Tables 10 and 11. With the greater runoff to DB-1 and DB-2, there is more water available from DB-1 and DB-2 for compost operations and dust control.

Table 10: 25-Year Return Wet Year Compost Facility Runoff Calculation – DB-1

Month	Total Area (sq ft)	Runoff Coefficient C	25-yr Wet Year Precipitation (inches)	Total Precipitation[1] (gallons)	Compost Pad Runoff[2] (gallons)
January	3,057,780	0.72	8.44	16,086,777	11,582,479
February	3,057,780	0.72	6.71	12,789,369	9,208,345
March	3,057,780	0.72	5.82	11,093,014	7,986,970
April	3,057,780	0.72	2.51	4,787,913	3,447,297
May	3,057,780	0.72	0.70	1,334,211	960,632
June	3,057,780	0.72	0.18	343,083	247,020
July	3,057,780	0.72	0.09	171,541	123,510
August	3,057,780	0.72	0.09	171,541	123,510
September	3,057,780	0.72	0.58	1,095,959	789,091
October	3,057,780	0.72	1.62	3,078,216	2,216,316
November	3,057,780	0.72	3.97	7,557,354	5,441,295
December	3,057,780	0.72	6.67	12,720,752	9,158,942
Totals	70 acres		37.37 [3]	71,229,731	51,285,407

Notes:

[1] The total precipitation volume was calculated using the scaled 25-year return wet year precipitation data multiplied by the footprint of Area 1.

[2] The compost pad runoff volume was calculated by multiplying the total precipitation volume by the runoff coefficient.

[3] Monthly precipitation may not add to 37.37 inches due to rounding

Table 11: 25-Year Return Wet Year Facility Runoff Calculation – DB-2

Month	Total Area (sq ft)	Runoff Coefficient C	25-yr Wet Year Precipitation (inches)	Total Facility[1] Precipitation (gallons)	Compost Pad Runoff[2] (gallons)
January	1,132,560	0.72	8.44	5,958,323	4,289,992
February	1,132,560	0.72	6.71	4,737,008	3,410,646
March	1,132,560	0.72	5.82	4,108,701	2,958,265
April	1,132,560	0.72	2.51	1,773,378	1,276,832
May	1,132,560	0.72	0.70	494,174	355,805
June	1,132,560	0.72	0.18	127,073	91,493
July	1,132,560	0.72	0.09	63,537	45,746
August	1,132,560	0.72	0.09	63,537	45,746
September	1,132,560	0.72	0.58	405,928	292,268
October	1,132,560	0.72	1.62	1,140,129	820,893
November	1,132,560	0.72	3.97	2,799,141	2,015,381
December	1,132,560	0.72	6.67	4,711,593	3,392,347
Totals	26 acres		37.37 [3]	26,382,521	18,995,415

Notes:

[1] The total precipitation volume was calculated using the scaled 25-year return wet year precipitation data multiplied by the footprint of Area 2.

[2] The compost pad runoff volume was calculated by multiplying the total precipitation volume by the runoff coefficient.

[3] Monthly precipitation may not add to 37.37 inches due to rounding.

5.2 Outflows

Outflows for the 25-year return wet year water balance model include basin evaporation and water usage for and compost operations and dust control.

Monthly evaporation was assumed to be the same as those used in the average annual water balance model as detailed in Sections 4.2.1. Compost makeup water volumes outflows were updated for the 25-year return wet year as described below. Dust control outflows were updated for the 25-year return wet year as described below.

5.2.1 Water Usage for Compost Operations

Based on information provided by Z-Best and ECS, the water usage rates are the same as those used in Section 4.2.2. Based on the water balance model calculation, approximately 33.6 million gallons per year of water would be used for compost operations from DB-1 and 19.8 million gallons from DB-2. Additional water that may be needed when the basins are dry will be obtained from the on-site groundwater wells.

5.2.2 Water Usage for Dust Control

The dust control water requirement was assumed to be the same as that used in the average annual water balance model as detailed in Sections 4.2.3.

The amount of water available for dust control each month is dependent upon the amount of water available after taking into account all the inflows and outflows. Based on this water balance model, 18.8 million gallons of water will be available from DB-1 for required dust control. No water will be available from DB-2 for dust control.

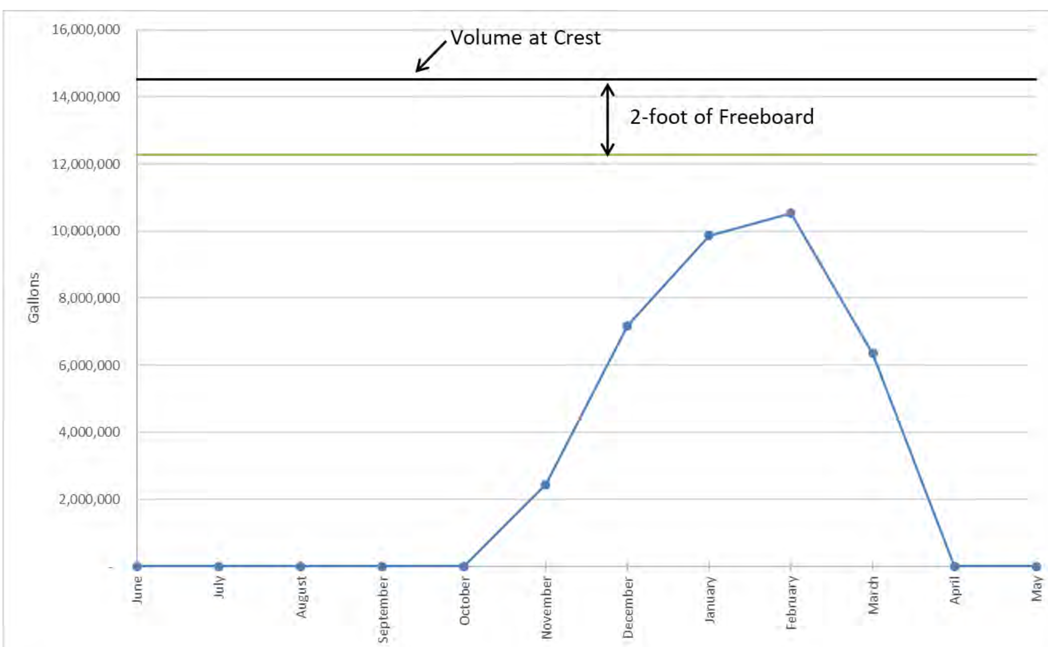
5.3 25-Year Return Wet Year Water Balance Model and Results

During average precipitation conditions, the basins are empty at the end of May and June and remain dry until January. During a 25-year return wet year, the amount of inflows exceed the amount of outflows such that the basins would potentially overflow. However, the basins are managed to maintain 2 foot of freeboard in both basins. During years with above average precipitation, water available from the detention basins will increase and groundwater usage from the on-site ground water wells will decrease.

For the 25-year return compost operations water available from DB-1 is 33.6 millions gallons (103.1 acre-ft) from and 19.8 millions gallons (60.8 acre-ft) from DB-2. For the 25-year return, dust control water available from DB-1 is 18.8 million gallons (57.7 acre-ft).

The anticipated monthly volumes for the 25-year return wet year precipitation water balance model for DB-1 is shown in Figure 3. The maximum storage in DB-1 is approximately 10.5 million gallons with a resulting freeboard of approximately 3.5 feet. Due to the water required by the compost operations, DB-2 remains dry at the end of each month.

Figure 3: DB-1 25-Year Return Wet Year Monthly Volumes



6.0 GROUNDWATER

6.1 Groundwater Usage

Groundwater from on-site wells is used for compost operations and dust control at Z-Best Compost Facility when no water is available from the onsite detention basins.

6.1.1 Water Usage for Compost Operations

The amount of groundwater used for compost operations is dependent upon the quantity of water required for composting operations and dust control, the amount of precipitation, and water available from DB-1, and DB-2. The required groundwater amount was estimated by calculating the required monthly water to sustain the primary and secondary composting operations with the information provide in section 4.2.2, and subtracting the monthly volumes used from DB-1 and DB-2.

Table 12 shows monthly required groundwater usage for an average annual precipitation year and Table 13 shows the monthly required volumes for a 25-year return wet year.

Table 12: Annual Average Precipitation Year Groundwater Usage

Month	Primary Composting (gallons)	Secondary Composting (gallons)	Total Compost Operations (gallons)
January	-	2,519,578	2,519,578
February	-	2,604,327	2,604,327
March	-	3,413,037	3,413,037
April	2,588,752	4,362,706	6,951,459
May	4,257,551	5,108,302	9,365,853
June	4,384,000	4,984,000	9,368,000
July	4,492,000	5,112,000	9,604,000
August	4,492,000	5,112,000	9,604,000
September	4,188,360	4,978,880	9,167,240
October	3,364,219	4,729,369	8,093,588
November	1,241,117	3,806,260	5,047,377
December	-	3,065,923	3,065,923
Total	29,007,999	49,796,383	78,804,381

Table 13: 25-Year Return Wet Year Groundwater Usage

Month	Primary Composting (gallons)	Secondary Composting (gallons)	Total Compost Operations (gallons)
January	-	412,857	598,857
February	-	931,342	1,099,342
March	-	1,959,737	2,145,737
April	-	3,736,323	3,916,323
May	-	4,933,681	5,921,400
June	4,384,000	4,984,000	12,488,000
July	4,492,000	5,112,000	12,877,000
August	4,492,000	5,112,000	12,877,000
September	3,813,569	4,835,240	11,768,809
October	2,313,334	4,326,614	9,765,948
November	-	2,817,678	4,452,351
December	-	1,401,951	1,587,951
Total	19,494,903	40,563,423	79,498,717

6.1.2 Water Usage for Dust Control

The amount of groundwater used for dust control is dependent upon the quantity of water required for composting operations and dust control, and the amount of water available from DB-1, and DB 2. The required groundwater amount was estimated by calculating the required monthly water required for the primary and secondary composting operations with the information provide in section 4.2.2 and 4.2.3, and subtracting the monthly volumes used from DB-1.

Table 14 shows monthly required groundwater usage for dust control for an average annual precipitation year and a 25-year return wet year.

Table 14: Dust Control Yearly Groundwater Usage

Month	Average Annual Precipitation Year (gallons)	25-year Return Wet Year (gallons)
January	757,449	-
February	1,634,500	-
March	3,014,746	-
April	3,087,000	-
May	3,234,000	801,719
June	2,940,000	2,940,000
July	3,087,000	3,087,000
August	3,087,000	3,087,000
September	2,940,000	2,940,000
October	2,940,000	2,940,000
November	2,793,000	1,454,673
December	1,894,908	-
Total	31,409,602	17,250,392

7.0 SUMMARY

The table below summarizes water usage requirements and sources at the Z-Best Compost Facility.

Table 14: Water Usage and Source Summary

		Source		
	Requirement	**DB-1**	**DB-2**	**Groundwater**
Average Annual Precipitation				
Primary Composting	53,060,000	24,052,000	0	29,008,000
Secondary Composting	60,360,000	0	10,564,000	49,796,000
Dust Control	36,015,000	4,605,000	0	31,410,000
25-year Wet Year				
Primary Composting	53,060,000	33,565,000	0	19,495,000
Secondary Composting	60,360,000	0	19,797,000	40,563,000
Dust Control	36,015,000	18,765,000	0	17,250,000

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TECHNICAL MEMORANDUM

DATE June 7, 2019 **Project No.** 13397640

TO John Doyle
Z-Best Products

CC

FROM Richard Haughey

RE: WATER BALANCE, Z-BEST COMPOST FACILITY

Z-Best Products is an existing compost facility located in Gilroy, California. Currently, there are two primary compost operations at the facility, green waste open windrow composting and municipal solid waste/food waste composting. The green waste composting is conducted using turned open windrows. The municipal solid waste/food waste composting is conducted using a Compost Technology, Inc. (CTI) aerated in-vessel composting system. Z-Best is proposing to replace the CTI composting system with an aerated static pile composting system utilizing technology developed by Engineered Compost Systems (ECS).

Compost facilities in California are regulated by the State Water Resources Control Board (SWRCB) in addition to other regulatory agencies. The SWRCB adopted General Waste Discharge Requirements for Compost Operations (Compost Order) in Order No. WQ 2015-0121-DWQ on August 4, 2015. Among other requirements, the Compost Order requires:

- Drainage facilities to be designed to handle the peak discharge from a 25-year, 24-hour storm event
- Stormwater runoff to be managed to prevent discharge

To provide a conservative design, Golder designed proposed Detention Basin 1 and existing Detention Basin 2 to be able to contain the peak discharge from a 100-year, 24-hour storm event.

Golder prepared a water balance ("Z-Best Compost Facility Water Balance," March 26, 2019) for the proposed ECS project at the Z-Best Compost Facility to evaluate stormwater quantities and to determine that the capacities of proposed Detention Basin 1 and existing Detention Basin 2 were sufficient to prevent discharge. The water balance considered precipitation, stormwater runoff, evaporation, moisture conditioning required for the compost operation, and dust control. The water balance was performed for both an average precipitation year and a 25-year wet year. (The greatest detention basin storage capacity would be needed during the 25-year wet year.) As part of the water balance, the quantity of groundwater needed to supplement water requirements that could not be provided by precipitation was also determined.

The water balance determined that both Detention Basin 1 and Detention Basin 2 would empty by the end of June and remain dry until January during a 25-year wet year. Additionally, it was determined that both detention basins had sufficient capacity to meet the maximum estimated stormwater storage requirement while providing two or more feet of freeboard.

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Based on records maintained at the Z-Best Compost Facility, approximately 89,800 gallons per day of groundwater is used at the site. This equates to approximately 32,664,000 gallons per year.

The water balance determined that approximately 81,206,000 gallons of groundwater would be required to supplement water requirements during an average precipitation year and approximately 77,308,000 gallons would be required during the 25-year wet year. The results are summarized below.

		Source		
	Requirement	DB-1 [1]	DB-2 [2]	Groundwater [3]
Average Annual Precipitation				
Primary Composting [4]	53,060,000	24,052,000		29,008,000
Secondary Composting [4]	60,360,000		10,564,000	49,796.000
Dust Control	36,015,000	4,605,000		31,410,000
				81,206,000
25-year Wet Year				
Primary Composting [4]	53,060,000	33,565,000		19,495,000
Secondary Composting [4]	60,360,000		19,797,000	40,563,000
Dust Control	36,015,000	18,765,000		17,250,000
				77,308,000

[1] Detention Basin 1 (DB-1) water is suitable for primary composting and dust control.
[2] Detention Basin 2 (DB-2) water is suitable for secondary composting and dust control, if available.
[3] Groundwater is suitable for primary composting, secondary composting, and dust control.
[4] Includes both green waste open windrow composting and ECS composting.

Richard Haughey
Associate

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