Clover Flat Landfill, Inc.
CEQA Project Description

for the proposed transition to the:

Clover Flat Resource Recovery Park

Prepared by:

May 26, 2011

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List of Acronyms

AB 32	California Global Warming Solutions Act of 2006
AB 939	California Integrated Waste Management Act of 1989
ADC	alternative daily cover
BAAQMD	Bay Area Air Quality Management District
CalRecycle	California Department of Resources, Recycling and Recovery
CARB	California Air Resources Board
CEQA	California Environmental Quality Act
C&D	construction and demolition
CFL	Clover Flat Landfill
CFL, Inc.	Clover Flat Landfill, Inc.
CFRRP	Clover Flat Resource Recovery Park
CO_2	carbon dioxide
CYD	cubic yards
dBA	decibel
EPR	extended producer responsibility
GHG	greenhouse gases
JTD	Joint Technical Document
kW	kilo-watt
LEA	Local Enforcement Agency
LFG	landfill gas
$MMTCO_2e$	metric tons of carbon dioxide equivalents
MRF	Material Recovery Facility
MSW	municipal solid waste
MW	mega-watt
PPD	pounds per person per day
RPS	Renewable Portfolio Standard
RWQCB	Regional Water Quality Control Board
SWFP	Solid Waste Facility Permit
TPD	Tons per Day

TPY	Tons per Year
UP	Use Permit
UVDS	Upper Valley Disposal Services
UVR	Upper Valley Recycling
UVWMA	Upper Valley Waste Management Authority
VPD	vehicles per day
VPY	vehicles per year
WDRs	Waste Discharge Requirements

USE PERMIT APPLICATION SUMMARY

File: Use Permit Modification #P09-0051

Project Name: Clover Flat Resource Recovery Park

Project Justification: Transition the Clover Flat Landfill project that addressed AB 939 with recycling programs and safe landfill disposal, to the Clover Flat Resource Recovery Park project, which will address AB 32 by permitting new programs to reduce and avoid greenhouse gas emissions.

Project Applicant: Clover Flat Landfill, Inc.
1285 Whitehall Lane
St. Helena, California 94574
(707) 942-1412

Property Owner: Vista Corporation
1285 Whitehall Lane
St. Helena, California 94574
(707) 942-1412

Property Profile: 4380 Clover Flat Road, Calistoga, California, 94515
Assessor Parcel # 020-120-020

Parcel Size:	179.97	acres - no change
Permitted Area:	78.0	acres - increase 1.01 acres
Disposal Area:	44.0	acres - no change

The Solid Waste Facility Permit area is proposed to increase by 1.01 acres to 79.01 acres to include recycling activities at the gate entrance area to necessitate a Solid Waste Facility Permit Revision to #28-AA-0002.
The permitted tonnage of 600 tons per day will remain the same.

Hours of Operations: The hours of operations will remain the same**.**
Tuesday to Saturday 9am to 4 pm – Sunday 9am to 3 pm.

Landfill Profile: The landfill capacity is proposed to decrease from 5.1 million cubic yards to 4.9 million cubic yards with the same disposal footprint of 44.0 acres and a maximum height of 1,000 feet above mean sea level, with the proposed extension of the closure date from 2021 to 2044 with increased compaction with an average annual disposal rate of 50,000 tons per year.

Traffic Profile: The permitted traffic volume of 275 roundtrip vehicles per day will remain the same.

PROJECT BACKGROUND AND OVERVIEW

The Clover Flat Landfill (CFL) is the name of the current project and is located in upper Napa County, at 4380 Silverado Trail, about three miles east of Calistoga, California. CFL lies in a steep canyon in the mountains of east Napa Valley. CFL is operated by Clover Flat Landfill, Inc. (CFL, Inc.) on lands owned by the Vista Corporation. The landfill serves the upper Napa Valley, and the cities of Calistoga, St. Helena, and Yountville, and has been accepting municipal solid waste since 1963. The properties within one-mile of the landfill are designated as "Agricultural, Watershed, and Open Space" and "Agricultural Reserve" by the Napa County Conservation, Development & Planning Department.

CFL is a Class III municipal solid waste disposal site operating under Napa County Use Permit No. U-438889, and Waste Discharge Requirements adopted in November 1991 by the Regional Waste Quality Control Board, San Francisco Bay Region. The Facility also operates under Solid Waste Facility Permit (SWFP) No. 28-AA-0002, issued by the Napa County Executive Office, acting as the Local Enforcement Agency (LEA), for the state Department of Recycling, Resources, and Recovery (CalRecycle). The SWFP allows maximum receipt of 600 tons per day (TPD) of material and 275 round trip vehicles per day (VPD). The operating hours are Tuesday to Saturday, 9am to 4 pm, and Sunday from 9 am to 3 pm. The Facility is closed to the public on Mondays and legal holidays.

CFL is a Class III municipal solid waste disposal site. The permitted refuse area occupies 44 acres of a 78-acre permitted facility on a 179.97-acre parcel. The developed disposal area is approximately 36 acres. The final elevation will be 1,000-feet above mean sea level. Based upon the site development plan, the landfill has a permitted capacity of about 5.1 million cubic yards (CY) of material. CFL has an active landfill gas collection system with a flare, which is currently being converted over into a renewable energy project.

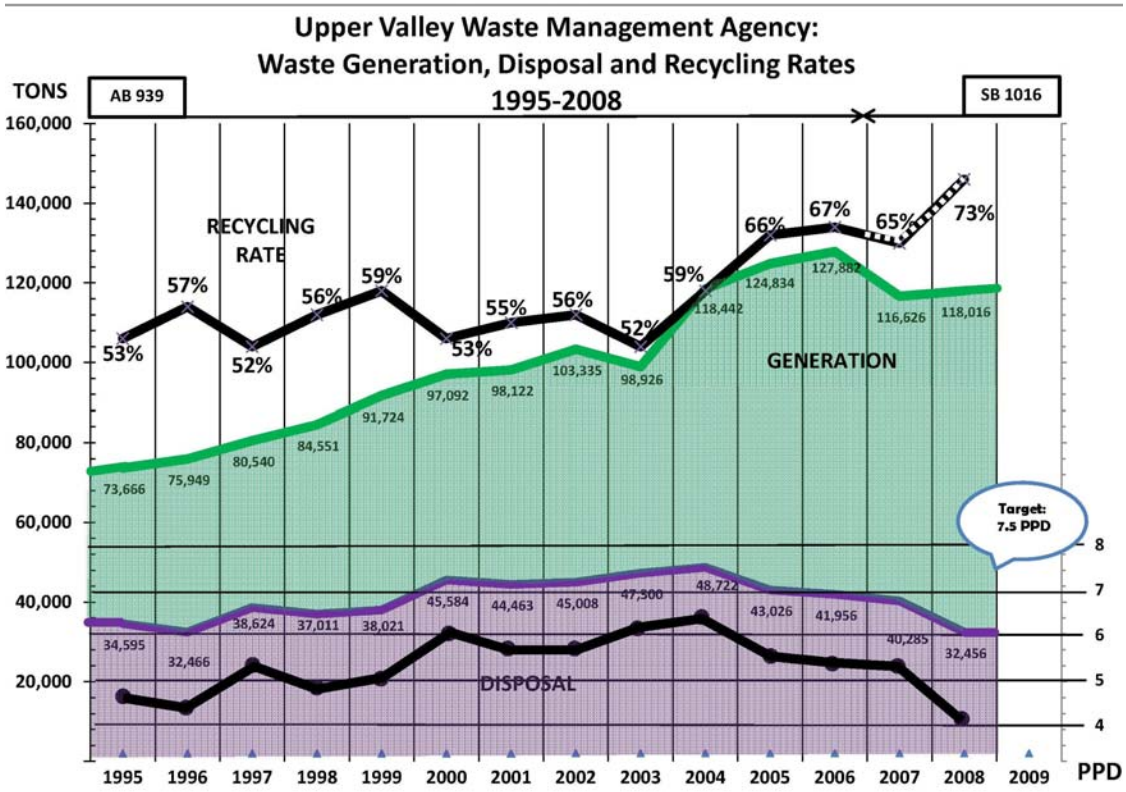
CFL is operated according to the Joint Technical Document (JTD) dated December 2005, which was the basis to issue the 5-Year Permit Review on April 3, 2006 for SWFP No. 28-AA-0002, and subsequent amendments. The landfill has an estimated closure date of 2021. The next 5-Year Permit Review due date is May 24, 2011, in which an application has been submitted where there is a commitment to apply for a SWFP Revision after the CEQA document is certified. Significant physical changes to the CFL are not proposed as part of this Use Permit application, as there will be no changes to the following major categories:

- **No changes in the tonnage amount or waste types.**
- **No changes in traffic counts.**
- **No changes in operating hours.**
- **No changes in disposal footprint or height of the landfill.**

CFL was re-engineered in the early 1990's to address the California Integrated Waste Management Act of 1989, known as AB 939. CFL has revised the SWFP to recycle more at the landfill. CFL added a landfill gas collection system in April 2004 consisting of 18 collection wells and a flare to burn the landfill gas. Another 5 landfill gas collection wells were added in 2010 to convey landfill gas to the landfill gas energy generation facility that will be installed in 2011 as allowed by the recent minor modification to the Use Permit. A research project to allow the composting of food waste was allowed by an Enforcement Agency Notification in 2010. The current recycling and composting operations, as modified over the years, have provided programs and diversion tonnages in collaboration with the Upper Valley Waste Management Authority (UVWMA) that have complied with and exceeded the AB 939 mandates.

The recycling goals of AB 939 have been achieved at the local level as the UVWMA reached a state verified landfill diversion rate of 53% in 2000, and has maintained AB 939 compliance over the last decade, as shown in Figure 1. In 2007, the AB 939 landfill diversion rate system transitioned into an SB 1016 disposal accounting system to determine recycling compliance by pounds per person per day (PPD) instead of a landfill diversion or recycling rate. CalRecycle does not convert the new SB 1016 disposal target into an AB 939 diversion rate anymore. However, the equivalent landfill diversion rate was calculated by Edgar & Associates, Inc. The disposal target rate is 7.5 PPD relies upon a waste generation rate of 15 PPD, where the UVWMA achieved and disposed of only 4.1 PPD in 2008 leaving 10.9 PPD of diversion tonnage, where 10.9 PPD of diversion divided by 15 PPD of generation, translates to a 73% calculated recycling rate.

Figure 1 - UVWMA Waste Generation, Disposal and Recycling Rates



CFL, Inc. installed a new management team in 2009 and a new vision of how the landfill facility can serve the community for years to come, having reached the state-mandated AB 939 recycling goals. Working with UVWMA, a mixed construction and demolition processing facility was installed in 2008. Looking beyond the AB 939 recycling mandates and into greenhouse gas reduction strategies, there are legislative discussions taking place that suggest that the recycling goals will increase beyond the mandated 50% rate towards 75% by 2020, as state government and many jurisdictions are adopting polices to make "zero waste" happen. CFL, Inc. is committed to continued work with the UVWMA on additional programs in order to address future challenges.

The AB 32 Scoping Plan adopted by the California Air Resources Board (CARB) to reduce greenhouse gas emissions will be mandating commercial recycling by July 1, 2012, which could include restaurants and multi-family residences. The AB 32 Scoping Plan and recently signed legislation will also increase the renewable energy standards from 20% in 2020 to 33% by 2020, calling for new sources of renewable green energy, from sources like landfill gas and woody biomass.

With new mandates and emerging legislation, CFL plans to become the ***Clover Flat Resource Recovery Park,*** shifting the focus from just being a landfill with recycling into a resource recovery park which has a multitude of recycling and composting operations, and has already instituted AB 32 early action items to collect landfill gas and convert it to energy. The ***Clover Flat Resource Recovery Park*** is the new project name that will also have the ability to produce renewable energy from woody biomass and be able to supply landscape materials and commodities derived from recyclable material back to the community for sustainable business practices.

The Use Permit (UP) will need to be modified and the SWFP will need to be revised in 2011, to address a series of proposed changes, which are part of this UP Application package, to obtain the necessary entitlements:

- Extend the estimated closure date of the Landfill to from 2021 to 2044, due to increased recycling, increased compaction, the use of synthetic tarps as alternative daily cover, and using an average annual disposal rate of 50,000 tons per year.
- Decrease the landfill capacity from 5.1 million cubic yards to 4.9 million cubic yards in a discrete location only to allow the existing concrete operations pad to remain in place with a new Final Fill Plan for that specific area.
- Expand the gate operations area and the Recycling Operations area from 1.4 acres to 2.1 acres, increasing the permitted boundary of the SWFP by 1.01 acres.
- Apply for a Grading Permit for the proposed gate operations area which includes 70,000 cubic yards of cut material, and to create the proposed 2.1 acre Recycling Operations area.
- Add a 1 mega-watt biomass conversion facility that uses clean processed wood waste in a gasification unit.

- Increase in-vessel food waste composting operations and food waste transfer and processing operations.
- Increase the storage of recyclable materials.
- Add a series of commodity bunkers for wood chips, compost, top soil blends, aggregate materials, and landscape materials for the general public to purchase recyclable materials.
- Add a residential food waste drop-off at Recycling Operations area.
- Allow new inert alternative daily cover (ADC) material.

The following Site Maps are provided for the Clover Flat Landfill as shown in Figure 2 below:

Site Map 1	Current Operation Site Map
Site Map 2A	Site Map for proposed CUP Modification
Site Map 2B	New Final Fill Plan with Operations with proposed CUP Modification
Site Map 3A	Proposed Recycling Area Site Plan
Site Map 3B	Recycling Area Grading Plan
Site Map 4	Emissions Sources Site Plan

Figure 2 – Aerial Map of the Clover Flat Landfill Parcels
Assessor Parcel # 020-120-020 (Red Bold boundary)

From AB 939 to AB 32

The operator and Use Permit applicant, Clover Flat Landfill, Inc., is now poised to transform CFL into the ***Clover Flat Resource Recovery Park*** to meet the measures of AB 32, the California Global Warming Solutions Act of 2006. The Clover Flat Landfill project proposes to become the ***Clover Flat Resource Recovery Park*** (CFRRP) project with the UP Application submitted in November 2009. Clover Flat Landfill, Inc. will remain as the operator and the Use Permit applicant. Additional information to the UP Application was submitted in August 2010 and March 2011. Subsequent meetings were held in December 2010 and March 2011 to review the UP Application packages.

AB 32 resulted in the adoption of the AB 32 Scoping Plan in 2008 that included a series of measures adopted by the California Air Resources Board for High Recycling/Zero Waste, which will affect the solid waste and recycling sector and local government. The other major measures of AB 32 include the Renewable Portfolio Standard (RPS), the Low Carbon Fuel Standard, mandated Commercial Recycling, Anaerobic Digestion, the increased use of Compost, and Extended Producer Responsibility (EPR). Mandated commercial recycling will require additional processing capacity at recycling facilities. Strategic Directive No. 6 being implemented by the new state oversight agency, CalRecycle, requires that 50% of the organic material be diverted from landfills by 2020. The organic feedstock can be processed into compost feedstock to increase compost use or be used as feedstock for anaerobic digestion facilities.

The UP application for the CFRRP project will require a new CEQA document and a SWFP Revision by the LEA to be concurred with by CalRecycle, which should occur in late 2011 or early 2012. The implementation of the proposed processing programs proposed at CFRRP will also need to be presented to the UVWMA. The design of the CFRRP is being based on the adopted measures of the adopted AB 32 Scoping Plan and the Next Chapters as shown in Figure 3 below. AB 32 has defined plans and programs for 2020, with a vision of 2050 that sets a goal to have an 80% reduction of greenhouse gas compared to the 1990 base year. The CFRRP project accommodates the AB 32 Scoping Plan measures of 2020 and looks forward towards 2044 when the landfill will be at capacity, where the programs will continue on.

Figure 3 – AB32 Implementation Timeline From the California Air Resources Board Home Page for AB 32 Implementation

Napa County Community Review Draft Climate Action Framework

CFL, Inc. and UVDS committed to voluntarily estimate their combined greenhouse gas (GHG) emissions inventory for the Calendar Year 2006 as a means to understand their GHG impacts. A summary of the GHG inventory for 2006 baseline operations shows that there are 4.5 times more avoided GHG emissions attributed to recycling than generated with the collection, processing and disposal of materials. A total of 1,556.2 metric tons of GHGs were emitted from the UVDS fleet and electricity use on a companywide basis, and 2,737 metric tons of GHGs were emitted from fugitive methane emissions from the landfill. The avoided indirect emissions due to recycling and composting add up to 19,386 metric tons not being generated. A copy of the GHG Inventory Management Plan is provided in Appendix A.

The Community Review Napa County draft Climate Action Framework, dated December 2009, was circulated for review which included Six Goals and 53 Actions for GHG Reductions**.** CFL, Inc. provided comments supporting the major goals, including the following;

- Reduce Consumption and Solid Waste.
- Improve the energy supply by switching from fossil fuels to renewable.
- Achieve overall waste diversion of 75% to 90% by 2020.
- Conserve Agriculture, Natural Resources, and Urban Forest.

UVDS has produced high-quality, organic-certified compost from agricultural "waste" in the Upper Valley since the early 1990's. UVDS also has collected and processed green waste for use as compost feedstock, and mulches for erosion control. UVDS plans to expand their collection program for commercial and residential food waste to produce compost. The use of compost has shown to decrease water usage by up to 30% on certain crops, and has positive carbon sequestration attributes. The UVDS programs are not part of the Project in the UP application.

- CFL, Inc. and UVDS supports conserving agriculture, and the strategy for agricultural wastes to be used to increase soil health and increase yields, and has participated in many research studies over the years on the value of compost.
- CFL, Inc. and UVDS have established the local facility to process all residential green waste, and plan to expand the program for residential food waste.
- CFL, Inc. and UVDS are exploring the feasibility of anaerobic digesters.

This Project is poised to implement the following programs at the CFRRP that are part of the UP Application that are recommended actions items in the Climate Action Plan:

- This project plans to expand the commercial food waste composting at the CFRRP.
- This project plans to generate renewable energy at the CFRRP.

AB 32 Scoping Plan – High Recycling/Zero Waste

CARB has adopted over 100 measures to reduce GHGs with high recycling, that are aimed at reducing methane emissions at landfills, increasing waste diversion, composting and other beneficial uses of organic materials, and mandating commercial recycling as California moves toward zero waste. As clearly stated in the AB 32 Scoping Plan, California has a long track record of reducing GHG emissions by turning waste into resources, exemplified by the statewide waste diversion rate from landfills of 64 percent (which exceeds the current 50 percent mandate) resulting from recovery of recyclable materials. Re-introducing recyclables with intrinsic energy value back into the manufacturing process reduces GHG emissions from multiple phases of product production including extraction of raw materials, pre-processing and manufacturing. Additionally, by recovering organic materials from the waste stream, and having a vibrant composting and organic materials industry, there is an opportunity to further reduce GHG emissions through the indirect benefits associated with the reduced need for water and fertilizer for California's Agricultural sector.

The AB 32 Scoping Plan anticipated reducing GHG emissions from the Recycling and Waste Sector as noted in Table 1 below:

Table 1
Recycling and Waste Sector Recommendation - Landfill Methane Capture and High Recycling/Zero Waste
(MMTCO2E in 2020)

Measure No.	Measure Description	MMTCO2E Reductions
RW-1	Landfill Methane Control (Discrete Early Action)	1
RW-2	Additional Reductions in Landfill Methane • Increase the Efficiency of Landfill Methane Capture	TBD
RW-3	High Recycling/Zero Waste • Mandatory Commercial Recycling • Increase Production and Markets for Organics Products • Anaerobic Digestion • Extended Producer Responsibility • Environmentally Preferable Purchasing	 5 2 2 TBD TBD
	Total	10

With the AB 32 Measure RW-1, CFL, Inc. has already instituted the discrete early action items to collect landfill gas and is in the process of converting it into renewable energy with the installation of the landfill gas energy generation facility recently approved with a minor modification to the Use Permit.

AB 32 Recycling Plan

The CFRRP project proposes to provide mandated commercial recycling processing services and process organic feedstocks for the Upper Napa Valley, as required in the AB 32 Scoping Plan, and generate renewable energy.

- Mandated Commercial Recycling: Five million metric tons of CO_2 equivalent reductions are required by 2020. This project recognizes the current mixed commercial recycling processing of the bulkier dry waste and recyclables at the Material Recovery Facility, which will continue as part of the CFRRP.
- Compost Use: The use of compost is to reduce 2 million metric tons of CO_2 equivalent reductions by 2020. CFL has already started a research commercial food waste in-vessel composting with plans to expand it further as part of the CFRRP.
- Renewable Energy: The use of renewable energy from 20% to 33% by 2020 is mandated to reduce 21.2 million metric tons of CO_2 equivalent reductions by 2020. CFRRP will become energy self-sufficient by adding a 1 mega-watt biomass gasification unit, after having already converting the landfill gas flare into a landfill gas energy generation facility to generate 848 kilo-watt.

The following AB 32 Recycling Plan components are part of this UP Application package for the CFRRP project:

- Extend the estimated closure date of the Landfill to from 2021 to 2044, due to increased recycling, increased compaction, the use of synthetic tarps as alternative daily cover, and using an average annual disposal rate of 50,000 tons per year.
- Add a 1 mega-watt biomass conversion facility that uses clean processed wood waste in a gasification unit.
- Increase in-vessel food waste composting operations and food waste transfer and processing operations.
- Increase the storage of recyclable materials.
- Add a series of commodity bunkers for wood chips, compost, top soil blends, aggregate materials, and landscape materials for the general public to purchase recyclable materials.
- Add a residential food waste drop-off at Recycling Operations area.

Tonnage Amounts and Sources:

No increase in permitted tonnages.
The current SWFP permits allows 600 TPD of material across the scales, and the tons are not proposed to increase.

No increase in permitted vehicles.
The material will be delivered in vehicles, where up to 275 round-trip vehicles per day are permitted, and traffic is not proposed to increase.

The sources of waste and material should not be a new environmental assessment issue since the Facility is already entitled to receive 600 TPD and 275 VPD, where the tons and traffic have already been permitted, and the delivery of the waste and materials occur off of the Silverado Trail. The sources of disposal tonnage are a contractual issue between the UVWMA and CFL,

Inc. Importation of waste has been discussed and negotiated with UVWMA over the years in terms of the contract. Up to two transfer trailers per day of processed wood chips may be delivered from Bay Area facilities. See Table 2 below for a comparison of the capacity between the existing CFL project and the proposed CFRRP project.

Table 2 - Comparison of existing CFL Project and the proposed CFRRP Project

Characteristics	Existing CFL Project	Proposed CFRRP Project
Compliance with State Mandates	Compliance with AB 939 to maintain the 50% landfill diversion mandate on and after 2000, with operational modifications to get to 2012.	Ability to also address AB 32 goals from 2012 to 2044 to expand mandated commercial recycling capacity, expand food waste processing for composting and add on-site renewable energy from biomass.
Planning Horizon	An AB 939 planning horizon of 22 years from 1990 to 2012, with landfill closure in 2021.	An AB 32 planning horizon of 32 years from 2012 to 2044.
SWFP Operator/ UP Applicant	Clover Flat Landfill, Inc.	
Service Area	UVWMA and surrounding communities	
Permitted TPD	Remains the same at 600 TPD peak, no increase	
Permitted Vehicles Per Day	Remains the same at 275 round trip vehicles per day, no increase	
Hours of Operations	Remains the same Tues. – Sat. 9am to 4 pm and Sun. 9 am to 3 pm. No changes	
Total Permitted Landfill Capacity	5.1 million cubic yards of landfill capacity	4.9 million cubic yards of landfill capacity – Decrease due to use of the existing concrete pad on CFL
Landfill footprint and height	No increase in footprint or height – Same 44 acres and not to exceed 1,000 feet in above mean sea level.	
Landfill closure	2021	2044 Increase compaction and average annual disposal of 50,000 tons per year
Diversion Programs	• Recycling Drop-off Center • Material Recovery Facility • Green Waste Processing • Concrete/Inert Processing • Metal Processing • Food waste compost research operations	• Recycling Drop-off Center • Material Recovery Facility to continue to accommodate mixed dry commercial recyclables • Green Waste Processing • Concrete/Inert Processing • Metal Processing • Food waste compost and transfer operations • Residential food waste drop-off program • Recycled material bunker sales
Energy Production	Landfill gas to energy generation facility of approximately 848 kilo-watts.	Biomass Conversion Facility in a gasification unit – 1 mega-watt.

PROJECT DESCRIPTION

The proposed project would be named the ***Clover Flat Resource Recovery Park*** and consist of the following distinct operational area:

- ***Gate Operations*** will be relocated and include the following activity:
    - Figure 2A shows the proposed Recycling Operations area of 2.1 acres.
    - Figure 3A shows the Gate Operations
    - Figure 3B shows the proposed Grading of the Recycling Operations area
    - Relocation of the gate house and scale operations
    - The permitted tons will remain the same at 600 TPD.
    - The permitted traffic will remain the same at 275 round-trip VPD.
    - The waste types will remain the same.
    - The operating hours will remain the same.
    - The scalehouse will manage the receipt of waste and materials within the current entitlements of 600 TPD and 275 VPD, which will remain past 2021 to 2044.
    - Expand the gate operations area and the Recycling Operations area from 1.4 acres to 2.1 acres, increasing the permitted boundary of the Solid Waste Facility Permit by 1.01 acres.
    - Apply for a Grading Permit for the proposed gate operations which includes 70,000 cubic yards (CYD) of cut material and to create the proposed 2.1-acre Recycling Operations area.

- ***Landfill Operations*** would include the following activity:
    - The disposal footprint off 44 acres and the height of the landfill at 1,000 feet above mean sea level will remain the same.
    - Extend the closure date from 2021 to 2044, due to increased recycling, increased compaction and the use of synthetic tarps as alternative daily cover, and using a fill rate of 50,000 tons per year as the average annual volume.
    - Decrease the landfill capacity from 5.1 million CYD to 4.9 million CYD in a discrete location only to allow the existing concrete operations pad to remain in place with a new Final Fill Plan for that specific area.
    - Figure 2B shows the location of the proposed biomass gasification unit pad area which decreases the landfill capacity, and also shows the proposed final fill of the landfill in the specific area.
    - Allow new inert ADC material types.

- ***Recycling Operations*** would be expanded with the following activity:
    - Figure 3A shows the Gate Operations
    - Figure 3B shows the proposed Grading of the Recycling Operations area
    - Relocate the existing canopied mixed recyclables processing line to the Gate Operations area and designate it as the Material Recovery Facility.

- Continue to process mixed dry commercial recyclables on the Material Recovery Facility to address the upcoming mandated commercial recycling regulations.
- Add a residential food waste drop-off at Recycling Operations area.
- Expand in-vessel food waste composting and food waste transfer and processing operations.
- Increase the storage of recyclable materials.

- Add a series of commodity bunkers for wood chips, compost, top soil blends, aggregate materials, and landscape materials for the general public to purchase recycled materials.

- ***Renewable Energy Facilities*** would include the following:
  - Figure 2B shows the location of the proposed biomass gasification unit pad area
  - Add a Biomass Conversion Facility that plans to use 40 TPD of clean processed wood waste in a gasification unit to produce 1 mega-watt of renewable energy for on-site use and off-site sales.

PERMITS REQUIRED

The following permits as listed in Table 3 below will be required for the proposed project.

Table 3
Required Permits for the proposed Project

Agency	Permit
Napa County Conservation, Development & Planning Department.	• Use Permit Modification • Use Permit for an Exception to the Conservation Regulations will be required for slopes greater 30 percent • Grading Plan
Napa County Solid Waste Local Enforcement Agency	• Solid Waste Facility Permit Revision including o Preliminary Closure Plan o Material Recovery Facility o Composting o Transfer
California Department of Resources, Recycling and Recovery (CalRecycle)	• Solid Waste Facility Permit concurrence
Regional Water Quality Control Board	• Stormwater Pollution Prevention Plan update
Bay Area Air Quality Management Air District	• Authority to Construct the biomass conversion facility • Permit to Operate biomass conversion facility • Permit to Operate update for the relocation and additional tonnages for Material Recovery Facility

GATE OPERATIONS

The waste amounts, traffic counts and operating hours will remain the same and no changes are being proposed as part of this project. The scale house will continue to manage the receipt of waste and materials within the current entitlements of 600 TPD and 275 round-trip vehicles per day (VPD), as allowed by the current SWFP and is proposed to be the same in the SWFP Revision. **The operator will no longer accept traffic after 275 VPD has crossed the scale.**

Tons and traffic vary with seasons and economic cycles, and it would be an exhaustive exercise to analyze all potential scenarios of waste types and traffic. Table 4 presents the major operations expected during peak activity. The peak traffic distribution by activity in Table 4 below was presented for the purposes of calculating the air emissions impacts and presents a worst case scenario in terms of traffic counts to determine a peak corresponding mobile emissions amounts.

Table 4
Clover Flat Resource Recovery Park - Peak Traffic and Annual Traffic Count Estimates for the purpose of estimating daily and annual emissions from mobile sources

Resource Recovery Park Activity	Peak Daily Activity Tons/Traffic TPD Vehicles per Day (VPD)	Average Daily Activity Tons/Traffic TPD Vehicles per Day (VPD)	Annual Activity 310 days per year Tons per Year (TPY) Vehicles per Year (VPY)
Inbound Landfill operations	**200 TPD**	**160 TPD**	**50,000 TPY**
6 tons per Collection/Recycling Truck with 16.4 miles average distance	20 trucks for 120 TPD	18 trucks for 108 TPD	5,580 VPY
0.8 tons per Self-Haul with 25.70 miles average distance	100 vehicles for 80 TPD	65 vehicles for 52 TPD	20,150 VPY
Total Landfill Traffic	120 VPD	83 VPD	25,730 VPY
Inbound Material Recovery Facility adding commercial recyclables	**300 TPD**	**200 TPD**	**62,000 TPY**
5 tons per Collection/Recycling Truck with 16.4 miles average distance	40 trucks for 200 TPD	30 trucks for 150 TPD	9,300 VPY
1 ton per Self-Haul with 25.70 miles average distance	100 vehicles for 100 TPD	50 vehicles for 50 TPD	15,500 VPY
Total Mixed Recyclables Processing Facility Traffic	140 VPD	80 VPD	24,800 VPY
Inbound Source-separated Recycling Drop-off operations	**100 TPD**	**60 TPD**	**18,600 TPY**
6.7 tons per Collection/Recycling Truck with 16.4 miles average distance	15 trucks for 100 TPD	12 trucks for 60 TPD	3,720 VPY
Total Landfill, Mixed Recyclables Processing, Recycling, as permitted under current SWFP	**Inbound 600 TPD SWFP peak**	**Inbound 420 TPD average annual**	**Inbound 130,600 TPY**
	275 VPD SWFP peak	**175 VPD average annual**	**54,250 VPY**

Please refer to Appendix B, "Analysis of Air Quality and Public Health Risks – Clover Flat Resource Recovery Project" that determined the air emissions from the expected daily and annual traffic that includes the landfill activity, the Material Recovery Facility, and source-separated recycling drop-off activity. Even with a worst case scenario present, the mobile air emissions are not a significant source according to the proposed BAAQMD Thresholds of Significance.

Whereas, tons and traffic vary with seasons and economic cycles, the expected scenario for each major activity is based upon historical data and the design capacity the recycling equipment. The future landfill operations tonnages are based upon a historical peak disposal filling rate of 50,000 tons per year, as experienced in 2004 (as shown in Figure 1), with a peak daily flow of 200 TPD, and an average daily flow of 160 TPD. It is anticipated that the future growth in the population to 2044, and the cycles of boom and bust construction activity, will be accommodated by increased recycling activity, instead of landfilling. The traffic counts for 2009 were reviewed for self-haul, collection vehicles and transfer trucks and the traffic count estimates for the worst case air emissions project scenario and were totaled from Table 4 and placed in Table 5 below.

The average traffic count in 2009 was 115 VPD with a peak of 194 VPD occurring on April 14, 2009. There are over 81 VPD of peak traffic count available to accommodate the traffic from dropping of residential food waste, delivering wood chips, transferring food waste, and back-hauling materials and commodities. Employees' traffic count will be 16 VPD peak now and into the future, and are not counted towards the SWFP permitted traffic volume following LEA practices in the County.

Table 5
Historical and Project Traffic Count Estimates

	2009 Traffic Counts	**Typical Project Traffic Estimates Worst Case Air Emissions**
Self-Haul	168 VPD peak day 86 VPD average	200 VPD peak 115 VPD average
Collection Trucks	30 VPD peak day 14 VPD ave	75 VPD peak 30 VPD average
Transfer Trucks	10 VPD peak day 1 VPD ave	
Total Traffic	194 VPD peak on 4/14/09 115 VPD average	275 VPD peak

The Material Recovery Facility has a design capacity of 300 TPD with an average annual capacity of 200 TPD as presented in Table 4, where additional tons are expected during the next construction cycle and the increase in bulky commercial recycling. The mixed dry commercial recyclables from the larger warehouse operations and larger commercial establishments are

now processed at the current and re-located Material Recovery Facility. The expected recycling rate at the Material Recovery Facility (MRF) will continue to be 70%, where up to 60 TPD from the MRF would go into the landfill for disposal as presented in Table 4 and Table 6.

The Material Recovery Facility will still process mixed C&D and self-haul loads rich in C&D. With the mandated commercial recycling regulations coming forth where programs will need to be in place by July 1, 2012, under the AB 32 Scoping Plan, it has been the practice of the MRF to process more than just mixed C&D and self-haul materials. Single-stream material from residential and commercial sources with less than 10% residual will continue to go to the Upper Valley Recycling operations on Whitehall Lane – and is not part of this project. The bulkier heavier commercial waste from commercial sources will continue to be processed at the MRF. The MRF will accommodate mixed commercial recyclables that has up to 30% residuals which is not appropriate for Recycling Centers that need to stay under 10% residuals. A more detailed description of the MRF operations in provided in the Recycling Operations section.

The source-separated Recycling Drop-off operations plan to receive 100 TPD peak (with an average annual of 60 TPD) of clean concrete and asphalt, wood waste, green waste, metal, and food waste as presented in Table 4 and Table 6.

CFL was a historical landfill-based operation with recycling activity. The anticipated Facility Recycling Rate for the CFRRP Project could be as high as 55% as shown in Table 6 below, accommodating an average annual of 130,600 tons per year of material from 2011 to 2044,

Table 6 – Anticipated CFRRP Project Recycling Rate

	Average TPD	Recycling Tons/ Disposal Tons	Facility Recycling Rate
Landfill operations	100 TPD direct 60 TPD residual from the MRF	0 TPD Recycling/ 100 TPD Disposal	0%
Material Recovery Facility adding dry commercial recyclables	200 TPD	140 TPD Recycling/ 60 TPD Disposal	70%
Source-separated Recycling Drop-off operations	60 TPD	59 TPD Recycling/ 1 TPD Disposal	99%
Total CFRRP	420 TPD	199 TPD Recycling/ 161 TPD Disposal	55%

The UVWMA landfill diversion rate has been in the mid-60% range (and up to 74% in 2008), which includes a series of programs not located at CFL, such as the UVR Recycling Center and the UVDS Compost Facility on Whitehall Lane in St. Helena, which are not part of this Project. The UVWMA landfill diversion rate includes back-hauling by some commercial businesses, source reduction, and a series of other programs managed by the UVWMA. Those programs will continue, and be expanded, to assist in reaching an overall diversion rate of 90% by 2020 as proposed by the Community Review Napa County Draft Climate Action Framework.

Delivery of Wood Chips:

The proposed biomass conversion facility using gasification technologies plans to use 40 TPD of wood chips or 15,000 tons per year. Wood chips will be generated on-site from incoming vehicles delivery source-separated lumber and brush, or recovered from mixed C&D loads, and will also be imported from Bay Area facilities. The Material Recovery Facility could process an average of 200 TPD during peak construction seasons with has typically 30% recoverable wood material, providing 60 TPD of wood chips to fuel the biomass conversion facility. At 100 TPD of incoming mixed C&D, about 30 TPD of wood waste could be recovered and processed into wood chips. Currently, about 12 TPD of wood is recovered. With the anticipated economic recovery and the rebound of the construction industry coupled with a movement towards being LEED certified, wood waste amount should increase. A C&D Ordinance directing wood waste to certified processing facilities in the Napa Valley would also increase the supply of wood wastes. With agricultural burning being curtailed in the Valley, additional agricultural woody biomass should also become available over the Project term.

To account for seasonal low peaks and down construction cycles, the amount of wood recovered from the processing line and delivered from source-separate loads is assumed to be a conservative low amount of about 10 TPD. The other 30 TPD of pre-processed wood chips will need to be imported from off-site sources from Bay Area facilities in a transfer trailer which could amount to an average of 1.5 loads per day.

The current permits allow up to 600 TPD and 275 vehicles per day. To ensure a sustainable supply of wood chips, 1.5 transfer trailers per average day carrying 20 tons of wood chips may be needed on a seasonal or intermittent basis. The 1.5 trip per day, and the 30 TPD, will count towards the current permit limits of 275 VPD. It would be typical that the empty transfer trailer would back haul compost or mulches to markets. The wood chips may be processed at out-of-county wood waste processing operations scattered around the Bay Area. It is typical that transfer trailers haul wood chips from the Bay Area to Central Valley biomass-to-energy facilities. The acceptance of wood chips at the CFRRP would significant reduce the transfer trailer traffic and transportation emissions in the Bay Area.

Traffic Impacts:

The current SWFP allows 275 round-trip vehicles per day, and Project is not proposing an increase in the traffic volume. The operator will no longer accept traffic after 275 VPD has crossed the scale. The green waste processing program, the food waste composting program, and any sales of materials, will be part of the 275 vehicles per day. Typically the sales of material are back-hauled from CFL after a customer has used the Facility. The anticipated vehicle trips to purchase materials are already included in the traffic counts. In the name of economic efficiencies and standard industry practice, contractors and gardeners that drop off their wastes and materials, typically back haul recycled materials and soil amendments in the same vehicle at the same trip, where back hauls would not count as an additional trip. In the

cases where a customer is coming solely to purchase products, that vehicle will be included in the permitted traffic counts of 275 vehicles per day.

Vehicle Emissions after 2021:

Although there is no anticipated increase in vehicular traffic proposed, the extension of the landfill closure date from 2021 to 2044 will result in vehicle emissions being generated over a longer period of time (23 years). The expected annual emissions over this time period from vehicle emissions and their health impacts were evaluated. CFL, Inc. retained Air Permitting Specialists which produced the report *"Analysis of Air Quality and Public Health Risks – Clover Flat Resource Recovery Project*", dated July 2010; a copy is provided in Appendix B.

The peak daily traffic and the annual expected traffic estimates from Table 4 were used to determine the mobile vehicles emissions.

This air quality analysis focused on two main issues:

- Air quality impacts associated with traffic in terms of daily and annual emissions.
- Estimate of public health risks in terms of residential cancer risk.

The result of the analysis indicates that daily and annual emissions would be below the thresholds of significance as set forth by the Bay Area Air Quality Management District (BAAQMD). Specifically, the emissions associated with the traffic vary between 0.27 to 9.5 lbs/day, depending on the air pollutant, and between 0.03 to 1.02 tons/year, depending on the air pollutant. These emission rates are well below the BAAQMD thresholds of significance[1].

Grading of Recycling Center Expansion:

The proposed grading for the expanded Recycling Operations pad area will cut 70,000 CYD of material, and no fill material, to create the 2.1 acre operations area. The proposed grading will follow the best management practices to reduce erosion and sedimentation. Installation and maintenance of erosion control measures during grading will be the responsibility of the contractor. The grading details are shown on Site Map 2A for proposed CUP Modification. Site Map 3B – Recycling Area Grading Plan, will be conducted for the prevention of significant erosion and siltation entering the storm drain system, natural drainage courses, and/or intruding upon adjacent roadways and properties. Slopes shall not be greater than 1.5:1. Grading is limited to the entrance facilities and not exposed to the scenic view sheds of the Silverado Trail.

The proposed grading will follow the best management practices, and will be guided by the following principles:

[1] BAAQMD Draft Air Quality Guidelines, BAAQMD September 2009.

Preservation of existing vegetation shall occur to the maximum extent practicable. Exposed slopes shall be protected by using erosion prevention measures to the maximum extent practicable, such as establishing 70% vegetation coverage, hydroseeding, straw mulch, geotextiles, plastic covers, blankets or mats. Whenever it is not possible to utilize erosion prevention measures, exposed slopes shall employ sediment control devices, such as fiber rolls and silt fences. Fiber rolls and silt fences shall be trenched and keyed into the soil and installed on contour. Silt fences shall be installed approximately two to five feet from toe of slope. Soil and material stockpiles shall be properly protected to minimize sediment and pollutant transport from the construction site. The existing drainage facilities will be protected from sedimentation during all phases of construction, where the toe of the fill will be over 100 feet from the natural watercourse

Permits: Expanding the gate operations area and the Recycling Operations area from 1.4 acres to 2.1 acres will increasing the permitted boundary of the SWFP by 1.01 acres. This area will only be used for recycling operations, and not landfill disposal. The following state and local permits will be required:

- Use Permit Modification from the Napa County Conservation Development and Planning.
- Use Permit for an Exception to the Conservation Regulations will be required for slopes greater 30 percent.
- Grading Permit from the Napa County Conservation Development and Planning.
- Storm Water Pollution Prevention Plan update to the Regional Water Quality Control Board.
- SWFP Revision from the Napa County Executive Office, acting as the LEA to the California Department of Resources, Recycling and Recovery (CalRecycle)

Tree Survey: Expanding the gate operations area and the Recycling Operations area from 1.4 acres to 2.1 acres will require a Grading Permit and the removal of 362 native trees of 6 inches in diameter or greater. The Plant, Wildlife, and Tree Survey for Clover Flat Recycling Facility Expansion was prepared by Questa Engineering Corporation in July, 2010 and amended March 29, 2011, and is provided in Appendix C. As summarized in Table 4 on page 13 of the referenced Survey, and detailed in Attachment A of the Survey, some 362 native trees 6 inches in diameter (DBH) or greater would be removed in association with the recovery/recycling pad area expansion. These are primarily various species of Oak trees and Douglas Fir trees, but also include some California Bay, Big Leaf Maple, and Madrone.

The recommended mitigation measures from page 13 of the reference survey in Appendix C states the following; “Because of the over-stocked nature of the site’s oak woodland forest, tree replacement should not be based only on a count of the larger trees to be removed, A reasonable mitigation plan would involve replanting with about 300 trees (at an approximately 12-foot spacing) per acre, if the replacement planting were to occur at this site in an area with similar soils and aspect. Planting more densely than this in this area would be wasteful. The proposed 300 replacement or mitigation trees for the 2.1 acre site (+/-150 trees/acre) planting density will allow for some natural mortality at this dry site. In time, natural thinning will cull the weaker trees and improve spacing. The mitigation goal would be to end up with about 60 to

80 trees per acre at early maturity, depending on species, with a planned mortality of about 50 to 60% over a period of time. If the site were to be irrigated, for 3 to 5 years during the plant establishment period, a lower initial planting density could be utilized. Plant survival in an irrigated and managed site is typically 75% after 5 years."

"Tree replacement would include Blue Oak, Black Oak, Coast Live Oak, Douglas Fir, Foothill Pine, and perhaps a few California Bay trees. Although Madrone is a native tree, and was included in the tree inventory, it should not be included in the mitigation planting plan. Madrone is a pioneer species that develops on disturbed sites. It is relatively short-lived and prone to a new disease (Madrone Canker). If planted, in time it will be eliminated by the native Oaks and Fir."

The report was amended on March 29, 2011 to include the 3 areas at CFL where the Tree Mitigation Plan would occur. Figure 1 in the amended report provided in Appendix C shows 2.1 acres of tree plantings. Figure 2 provides the details of the Tree Mitigation Plan:

- Area 1 - North Upper Area – 110 plantings over 0.55 acres
- Area 2 - Upper Viewing Area – 110 plantings over 0.55 acres
- Area 3 - Upper Caretaker Area – 130 plantings over 1.0 acres

Figure 3 in Appendix C provides the Planting Notes and a profile of the typical planting details.

Geotechnical Information: The Shaw Group prepared the Joint Technical Document (JTD) in 2005 for the CFL as part of the permitting documents required for the SWFP Revision at the time. A Geotechnical Analysis and Slope Stability Analysis were required to be part of the JTD and were included in Appendix G of the JTD. Previous engineering analysis indicated that excavation slopes can be as steep as 1.25:1 (horizontal: vertical). The slope of 1.5:1 (horizontal: vertical) is now being proposed by EBA Engineers for the proposed grading, which is a 67% slope. The slopes will be greater than 30%, and a Use Permit for an Exception to the Conservation Regulations will be required. The average slope over three rise/run cross section is about 60%, adding in the drainage bench midway up the cut where the average run is 140 feet, and the average rise is 83 feet.

The JTD also requires that the Regional and Site Geology be discussed. As started on page 18 of the JTD, the bedrock underlying the site consists of the Sonoma Volcanic comprised predominantly of tuffaceous rocks with relatively minor amounts of interbedded siliceous rocks, claystone, and siltstone. Following review of the record and investigation at the site, serpentine rock was not observed in the cut area and is not expected in this geologic environment.

Stockpile on Cut Material: The 70,000 CYD of cut material will be stored on the property and used as intermediate and daily cover material, as part of on-going operations. It is typical of landfill operations to have stockpiles of fill material as a result of landfill construction activities, where the soil is incorporated into daily operations over the years. The previous CEQA documents have already entitled large excavations and cuts as part of the CFL development that utilizes the spoils of the construction activity into the daily activities. The ability for the

operator to provide adequate access and operational areas while stockpiling material is a state minimum standard that the LEA provides monthly oversight. The short-term aesthetics impacts of stockpile storage were addressed in the previous EIR.

It is problematic to estimate where the 70,000 CYD will been placed today, as the landfill is a dynamic construction project. The operator realizes that the material may need to be double-handled and will be stored for seasonal purposes. The fill material from the Recycling Pad extension will be placed within the permitted boundary of the landfill and will not be placed in the upper pad area outside of the permitted landfill boundary. The operator will prepare a wet weather operations plan every year on or before October 15, 2010, and place the plan into the operating record and will indicated where the fill material will be stored on an annual basis and provide an estimated 2-year fill plan, to be updated every year.

LANDFILL OPERATIONS

The disposal footprint of the landfill will remain the same as well as the height. Due to increased recycling, increased compaction and the use of synthetic tarps as ADC, the closure date of the landfill will be extended from 2021 to 2044 based on an average annual fill rate of 50,000 tons per year. The landfill capacity will decrease from 5.1 million CYD to 4.9 million CYD to allow the existing concrete operations pad currently being used for the MRF operations to remain in place. A new Final Fill Plan as shown on Figure 2B has been prepared for the decreased capacity for that specific area, and the Project proposes to allow new inert ADC material types.

Closure in 2044:

The remaining permitted landfill capacity of 3,335,000 CYD was calculated on August 7, 2009, based upon a July 1, 2009 topographic map. Keeping the existing concrete operations pad to remain in place in a discrete area will notch out 170,000 CYD of permitted landfill capacity. Figure 2B provides the proposed Final Fill Plan, keeping the concrete operations pad that is proposed to be used for the biomass gasification unit when the MRF is relocated down to the proposed Recycling Operations area. With increased compaction and the decrease in use of soil as daily cover, and based upon a historical landfill filling rate of up to 50,000 tons per year, the landfill's estimated closure date is 2044, where the current SWFP had an estimated closure date of 2021.

Using the compaction rate of 1,300 pounds per cubic yard and a soil to cover ratio of 5:08:1, as recently calculated by Neal Bolton of Blue Ridge Services with EBA Engineers, the site life expectancy is 2044, at an average annual fill rate of 50,000 tons per year, as shown in Table 7 below. The applicant agrees that the preliminary Closure and Postclosure Maintenance Plan will be to be amended with a revised SWFP Application slated for later in 2011.

Landfill Emissions after 2021:

Although there is no anticipated increase in tonnage proposed, the extension of the landfill closure date from 2021 to 2044 will result in landfill gas emissions being generated over a longer period of time (23 years). Clover Flat retained Air Permitting Specialists which produced the report *"Analysis of Air Quality and Public Health Risks – Clover Flat Resource Recovery Project*", dated July 2010; a copy is provided in Appendix B.

Lifetime cancer risks at off-site homes associated with exposure to toxic air contaminants is estimated to be between 1 to 2 cancers/million. This estimate is based on peak landfill gas (LFG) generation rate in 2044. If emissions were averaged over 70 years, then the average LFG generation rate and emissions of toxic air contaminant (TACs) would be well below the peak levels. This in turn leads to lower health risks. The results indicate the maximum cancer risk is approximately 1 in a million at the nearest homes located to the southwest. Under current BAAQMD CEQA Guidelines, a project is deemed to have significant impact if cancer risk exceeds

10 cancers per million. Given the extremely low levels of health risk associated with this facility, a more detailed risk analysis is not warranted.

Table 7 – Site Life Calculations

Calendar Year	MSW Tons Disposed	MSW CY Disposed	Soil Disposal (Cover Materials, See Notes)	Total CY Disposed	Remaining Capacity 3,162,264 CY on July 1, 2009
7/1/2009					3,162,264
2010	50,000	76,923	12,654	89,577	3,072,687
2011	50,000	76,923	12,654	89,577	2,983,110
2012	50,000	76,923	12,654	89,577	2,893,533
2013	50,000	76,923	12,654	89,577	2,803,956
2014	50,000	76,923	12,654	89,577	2,714,379
2015	50,000	76,923	12,654	89,577	2,624,802
2016	50,000	76,923	12,654	89,577	2,535,226
2017	50,000	76,923	12,654	89,577	2,445,649
2018	50,000	76,923	12,654	89,577	2,356,072
2019	50,000	76,923	12,654	89,577	2,266,495
2020	50,000	76,923	12,654	89,577	2,176,918
2021	50,000	76,923	12,654	89,577	2,087,341
2022	50,000	76,923	12,654	89,577	1,997,764
2023	50,000	76,923	12,654	89,577	1,908,187
2024	50,000	76,923	12,654	89,577	1,818,610
2025	50,000	76,923	12,654	89,577	1,729,033
2026	50,000	76,923	12,654	89,577	1,639,456
2027	50,000	76,923	12,654	89,577	1,549,879
2028	50,000	76,923	12,654	89,577	1,460,302
2029	50,000	76,923	12,654	89,577	1,370,726
2030	50,000	76,923	12,654	89,577	1,281,149
2031	50,000	76,923	12,654	89,577	1,191,572
2032	50,000	76,923	12,654	89,577	1,101,995
2033	50,000	76,923	12,654	89,577	1,012,418
2034	50,000	76,923	12,654	89,577	922,841
2035	50,000	76,923	12,654	89,577	833,264
2036	50,000	76,923	12,654	89,577	743,687
2037	50,000	76,923	12,654	89,577	654,110
2038	50,000	76,923	12,654	89,577	564,533
2039	50,000	76,923	12,654	89,577	474,956
2040	50,000	76,923	12,654	89,577	385,379
2041	50,000	76,923	12,654	89,577	295,802
2042	50,000	76,923	12,654	89,577	206,226
2043	50,000	76,923	12,654	89,577	116,649
2044	50,000	76,923	12,654	89,577	27,072
2045	50,000	76,923	12,654	89,577	(62,505)

- Waste compaction rate estimated at 1,300 lbs/cy
- Waste to soil cover ratio estimated at 5.08 : 1

Allow New ADC Material

The SWFP for CFL currently allows the following types of ADC materials in accordance with state minimum standards and LEA specifications, where further evaluation of the impacts are not necessary:

- Concrete
- Asphalt
- Mulch
- Green material
- Biosolids
- Sludge

The applicant is working with the LEA on using diatomaceous earth as an ADC material. Diatomaceous earth is a type of industrial sludge that will need to comply with LEA specification B.2 from the SWFP, and is not part of this Project.

The applicant has requested the ability to use re-processed glass chards. Re-processed glass chards generated from single-stream recycling practices are back-hauled to the facility and used as ADC. Since this type of ADC is not pre-approved by the state with state minimum standards, the applicant proposes a demonstration project to include re-processed glass as ADC. The ADC demonstration process will follow current CalRecycle Title 27 regulations and would focus on dust control. The JTD will need to be amended for new ADC types. This ADC will consist of clean glass shards re-processed in San Leandro to remove contamination and fines. The uses of this ADC material shall only occur during periods of low wind to minimize dust generation, and will be routinely sprayed with water to retain a level of moisture. This ADC will not be exposed for more than 7 days, and will only be used on the slopes of cells that will be covered by additional MSW within a week.

Crystalline silica is the naturally occurring form of silicon dioxide and can cause serious lung disease. Dust from glass is an amorphous rather than crystalline material and does not have the same health impacts as crystalline silica. The broken glass may have the potential to generate some dust, but it is not coming from a facility where glass is ground or crushed. It is simply the fraction of glass material that is small enough to pass a one-inch screen. The fine material from broken or ground glass is considered by the Occupational Safety and Health Administration as a nuisance dust and treated as such. Moisture application is used to prevent airborne dust and loads would be covered for transport.

RECYCLING OPERATIONS

Recycling operations would be expanded by adding more bulky commercial waste to the existing canopied MRF, adding in-vessel food waste composting and food waste transfer and processing operations, increasing the storage of recyclable materials, and adding a series of commodity bunkers for wood chips, compost, top soil blends, aggregate materials, and landscape materials for the general public to purchase recycled materials.

Relocation of the Material Recovery Facility:

The current entrance, facilities and Recycling Center occupy 1.4 acres on an asphalt concrete pad area. The Recycling Center is being proposed to be expanded to 2.1 acres and increase the SWFP area by 1.01 acres with the proposed re-location of the Material Recovery Facility from the landfill to the Recycling Center area.

The applicant has aggressively diverted mixed C&D and self haul materials at the MRF since autumn of 2008. It was anticipated that over 6,800 metric tons of GHGs would be avoided each year with the operations of the facility as provided in Appendix C – Greenhouse Gas Emissions Reductions – "Construction and Demolition Material Recovery Study", Edgar & Associates, Inc. – September 2007. Phase 1 of the Mixed C&D Processing Facility consisted of a processing line that is extremely durable and portable, and was developed with moderate costs with the construction of a concrete pad on the intermediate cover of CFL. The processing line was selected with the goal of installing, modifying, and eventually moving the processing line as part of Phase 2 of this operation. The processing line has the capability of handling 25 tons per hour of material, and for a 12 hour operating day, the capacity is 300 TPD. For a typical 8 hour shift, the capacity is 200 TPD. This processing line has proven to be durable with low maintenance, and has disc screens on the front-end to produce an ADC material from C&D fines that meets state specifications. Dry mixed commercial recyclables have been increasingly processed over time.

The Material Recovery Facility will still process mixed C&D and self-haul loads rich in C&D. With the mandated commercial recycling regulations coming forth where programs will need to be in place by July 1, 2012, under the AB 32 Scoping Plan, it has been the practice of the MRF to process more than just mixed C&D and self-haul materials. Single-stream material from residential and commercial sources with less than 10% residual will continue to go to the Upper Valley Recycling operations on Whitehall Lane – and is not part of this project. The bulkier heavier commercial waste from commercial sources will continue to be processed at the MRF. The MRF will accommodate mixed commercial recyclables that has up to 30% residuals which is not appropriate for Recycling Centers that need to stay under 10% residuals. The MRF's recycling rate will continue to achieve a 70% diversion rate, and continue to process the same types of mixed recyclables from C&D, self-haul, and commercial sources. The following materials will not be processed at the MRF: residential MSW from the curbside cart, wet commercial MSW from bins, food waste or restaurants wastes, liquids, and sludges. This is not a mixed MSW MRF, but a mixed recyclable MRF that will recovery 70% of the material, leaving 30% residual with incidental amounts of putrescibles.

The MRF will continue to accept the same mixed recyclable materials, and will continued to be canopied with the relocation, but will not be housed in a building. The MRF will be located on an asphalt-concrete pad when relocated at the Recycling Operations Center and will be tucked closer to the cut slope to offer a level of protection from the winds (See Figure 3A). The winds travel up and down the draw from the northeast to the southwest, where the scalehouse is to the east.

The traffic routes to the MRF are shown in Figure 3A. After being weighed at the scalehouse, the vehicles are directed to the MRF areas following the directional signage. The vehicles will be backed up to the tipping pad to deposit their loads. Self-haul vehicle vehicles (car, light duty trucks) would exit without being re-weighed. Customers with an account with CFL, typically have their tare weight for their vehicles. In those cases, the vehicles would exit without being re-weighed. Users that are large enough to be weighed, and do not have an accounts, will need to be re-weighed prior to exiting, and they would be informed by the scalehouse.

Add Residential Food Waste Drop-off Program:

The drop-off residential food waste programs in an interim measure until a residential co-collected organics program can be deployed someday. Wheeled carts will be placed in the Recycling Center Drop-off area and be checked daily, and transported every 48 hours to the food waste composting programs on top of CFL, for the inclusion of this feedstock into the composting program. The amount of food waste will be incidental and is presented as a convenience to the residents of the Upper Valley that may wish to have their food waste composted. The wheeled carts may fill up daily, and may generate 10 to 20 tons of food waste per year.

The anticipated vehicle trips to purchase materials are already included in the traffic counts. The rule of thumb is that the users of the Facility are contractors and gardeners that drop off their wastes and materials, and back haul the recycled materials and soil amendments in the same vehicle at the same trip, where back hauls would not count as an additional trip. In the cases where a customer is coming solely to purchase products, that vehicle will be counted against the permitted traffic counts of 275 vehicles per day.

Add In-Vessel Food Waste Composting and Food Waste Transfer Operations

The CRPPP project will allow food waste composting on-site and the transfer of food waste from the proposed bunkers or in the vessel from CRPPP to a permitted compost facility. The CFRRP proposes to add a containerized in-vessel food waste composting system, using modified 40-cubic yard or 50-cubic yard corrosion-resistant containers to convert source-separated food wastes into valuable compost products, with up to 60 containers or 2,500 CYD of material, or a peak of 13,000 tons per year. Using containerized composting eliminates buildings, large concrete surfaces and storm water basins since the food waste is containerized. Source-separated food wastes from local restaurants, from zero-waste special events, and the

residential food waste drop-off program will be delivered to one of two concrete bunkers on top of the intermediate cover on the landfill deck. The intermediate cover will be compacted soil of at least 1 foot, sloped at 1% for positive drainage, and will be maintained to prevent ponding due to settlement.

Should on-site composting not be economically feasible due to the smaller scale, as an option, the food waste composting may occur at an off-site permitted compost facility, and the food waste would be transferred from the bunkers or in the full vessels to a permitted compost facility. The amount of food and green waste that could be transferred off-site to a permitted facility could be 13,000 tons per year, or up to 42 TPD day, or 2 transfer trailer vehicles per day.

There will be a public drop-off of food waste at the Recycling Center that will be stored up to 24 hours prior to being transferred to the compost operations. Food waste will also arrive at the site via commercial packer trucks. The food waste will be stored in the bunkers for a period not to exceed 24 hours, and if stored overnight will be covered with a synthetic tarp. Each bunker will be approximately 20 feet by 20 feet and hold up to 75 CYD of food waste. The food waste will be mixed with processed green waste and some finished compost, and then loaded into the food waste composting vessel. The food waste/green waste mixture will be composted in the enclosed compost vessel for a maximum time of 30 days. Following removal from the compost vessel the material will be stored at the CFL. Two scenarios are currently envisioned:

- **Scenario 1**: The material would be stored for up to 14 days for curing and then be trucked to a permitted compost facility for further processing into soil amendments.
- **Scenario 2**: The material would be stored for only two days and then be trucked to a permitted compost facility for further processing into soil amendments.

Therefore, emissions estimates for VOCs and ammonia are provided for the 24-hour period before incorporation into the composting system, the 30-day active in-vessel compost period and both 14-day and 2-day storage periods following removal from the compost vessel.

Tonnage Throughput
The proposal is to begin with a minimum capacity of 800 CYD and potentially increase this to 2,500 CYD of in-vessel composting volume. If a density of 1,000 lbs. per cubic yard for the food waste/green waste mixture is assumed, with a retention time of 30 days, the result would be a minimum throughput of 14 TPD and a maximum of 42 TPD.

Food Waste Composting Vessels
There are many in-vessel compost systems available of the containerized, modular version envisioned for the CFL. The vessels are specifically designed to prevent leakage of liquid or gases. The anticipated mixture of feedstocks is 40% to 50% food waste, mixed with green waste and finished compost. The composting vessels are sealed with gaskets and pull-down latches to achieve an airtight seal. The specific compost vessel type will be a modified metal roll-off bin.

The base of the compost vessel is sealed where liquids are neither generated nor will leak. Moisture control is optimized where the compost retains the moisture without the generation of free liquids, where leachate will not be generated. Air is blown into the base of the vessel and exits the top. Space is left at the top of the feedstock in each vessel for the placement of a biofilter consisting of finished compost on top of the material. Prior to exiting the vessel, the emitted gas passes through the biofilter. Aeration will be provided by blowers that will be powered either through grid-provided power (PG&E) or power generated on-site by the proposed LFG energy system, the biomass gasification system, or a combination of those sources. Emissions from the on-site power sources are provided elsewhere in this document.

Biofilter Performance

The use of finished compost material as a biofilter has been shown to reduce the amount of VOCs and ammonia in compost off-gas. A study by the California Integrated Waste Management Board (CIWMB, 2007) found that such a biofilter layer on a compost windrow reduced VOC emissions by 82% the first week and 75% over two weeks. Engineered Compost Systems, Inc. documented VOC destruction by a biofilter of 99% in results presented at the BioCycle 2010 West Coast Conference.

Emission Factors – Food Waste Composting

The most relevant available data for food waste composting is from a study conducted at a NorCal Waste Systems, Inc. compost facility in Vacaville, CA (Card & Schmidt, 2006). The study included emissions monitoring for a combination of food and green waste (about 50/50) that was composted in an Ag Bag (a commercial large-scale, in-vessel composting system) using forced aeration. Emissions are generated during: 1) the 24 hours of food waste storage prior to composting, 2) the active in-vessel composting period, and 3) the storage period before off-site shipment to a permitted compost facility (2 to 14–day storage time) following removal from the compost vessel.

Food Waste Feedstock Storage:

Food waste will be mixed with green waste and incorporated into the composting process within 24 hours. In the study conducted at the Norcal Waste Systems, Inc. compost facility in Vacaville, CA (Card & Schmidt, 2006) emissions were measured from a mixed food waste/green waste feedstock pile over a period of two days. The study results show VOC emissions of 0.09 lbs/ton and ammonia emissions of 0.00043 lbs/ton of feedstock material over the two-day period.

Using one day of storage rather than two, assuming storage for 365 days per year, and applying the emission factors to the maximum anticipated throughput tonnage of 42 TPD results in annual emissions of:

- 0.34 tons/year of VOCs
- 0.0016 tons/year of NH3

Active In-Vessel Composting Phase

A conservative 30-day period of active composting is assumed for emission estimates. Emissions of 3.06 lbs/ton of VOCs and 0.05 lbs./ton of ammonia (NH_3) were calculated to have been generated over a 30-day period of active in-vessel composting during the study in Vacaville. The assumed reduction in emissions from the biofilter is 75%. Applying the biofilter destruction rate to the emissions generated, the fugitive emissions are calculated to be 1.61 lbs./ton for VOCs and 0.026 lbs./ton for NH_3.

Applying these emission factors to the maximum daily throughput of 42 TPD over 365 days results in annual emissions of:

- 0.20 tons/year of VOCs
- 0.0032 tons/year of NH3

Post-Compost Material Storage

During the NorCal study, following removal from the aerated Ag Bag, it is estimated that 33.6 lbs/ton of VOCs and 0.67 lbs/ton of NH_3 were generated over the following 30 days (Card & Schmidt, 2006). Tonnages are based on as-received tonnages prior to composting; therefore, no material loss during composting is considered. Simulations were conducted by the study authors based on the data that showed that 2% of VOC emissions and 18% of NH_3 emissions were generated during the first two days following removal from the Ag Bag, and 63% of VOCs and 91% of NH3 were generated during the first two weeks of curing.

Two scenarios are being considered, one where compost product is removed from the CFL within two days following removal from the compost vessel and, alternatively, where the material would be stored for up to 14 days. Emissions for these two scenarios are:

Emissions from two days of storage at CFL:

- 5.5 tons/year of VOCs
- 0.92 tons/year of NH3

Emissions from two weeks of storage at CFL:

- 162 tons/year of VOCs
- 4.6 tons/year of NH3

Emissions from composting are summarized in Table 8 below.

References Cited for Food Waste Composting Emissions

Emissions Testing of Volatile Organic Compounds from Greenwaste Composting at the Modesto Compost Facility in the San Joaquin Valley, CIWMB, 2007.

Jepson Prairie Organic Compost Facility, Air Emission Source Test: Emissions Evaluation of Complete Compost Cycle VOC and Ammonia Emissions, T.R. Card, C.E. Schmidt, 2006.

Organic Material Composting and Drying Focusing on Greenwaste Composting: Air Emissions Data Review (Card & Schmidt, 2008)

Table 8 – Annual Emissions from Food Waste Composting

Compost Phase	VOC Emissions (tons/year)	NH_3 Emissions (tons/year)
Feedstock storage (1 day)	0.34	0.0016
In-Vessel Composting (30 days)	0.20	0.0032
Compost Storage (2 days)	5.5	0.92
Compost Storage (14 days)	162.5	4.6
Total – Two Days Storage	6.04	0.925
Total – Two Weeks Storage	168.54	4.65

Increase the Storage of Recyclable Materials and Commodities

The current landfill operations have limited storage capacity, and with increased recycling, increased storage will be needed. The maximum reasonable volume was determined based upon peak seasonal flows of source-separated materials during the peak construction season, and the amount of recovered material from the MRF. The location of the storage materials will be placed on top of the compacted intermediate cover of the CFL, and may be moved quarterly or annually to adjust to the filling of the landfill and the construction schedule of future landfill phases. After the relocation of the MRF, the concrete pad will stay in place and will store wood chips and other recyclables and bins. The amount of storage for each type of recyclable material and commodity is provided in Table 9 below.

The facility produces a series of construction and landscape products from the recovered recyclables. These materials will be offered to contractors and the general public to be used in the County for green construction projects. With the emerging LEED-certified construction practices, these materials recycled from waste by-products will allow contractors to construct LEED-certified buildings using local green materials for sustainable business practices. The recovered concrete, rock, and inert material is processed into an aggregate base rock that can be used in roads, foundations, and as structural fill material. The recovered wood waste is processed into wood chips for use as biomass fuel to produce renewable energy, or to be used as ground cover for erosion control. The recovered green waste is processed into a mulch that can also be used for erosion control or compost feedstock, which is delivered to a compost facility to produce custom compost and soil blends. These materials will be back-hauled by facility customers to be used as a ground cover and fertilizer replacement.

Should there be independent trips be just for commodity sales, those trips would be allowed and would count against the permitted 275 vehicles per day. The realistic assumption is present below, where the users of CFL will have access to commodities for sale. The Facility is used by licensed contractors that typically back haul material whenever possible and is presented as a convenience to the residents of the Upper Valley that may request local compost and mulches. Typically, bulk and volume sales will occur with the current system where UVDS deliver loads of composts and mulches to the customer. The amount of retails sales from on-site users hopefully increases to over 1,000 tons per year.

The maximum storage time allowed by California Code of Regulation Title 27 is listed per commodity type, as enforced by the Napa County LEA, on behalf of CalRecycle.

State standards allow the LEA to approve an alternative method of compliance. These provisions are not intended to allow the LEA to change the particular standard, but are intended to allow the LEA flexibility to approve, in advance, an alternative method of meeting the existing standard. For facilities that require a full SWFP, such as the CFL, the LEA may choose to include the approved method as a term and condition of the SWFP, and may increase or decrees the amount of materials that may be stored.

The maximum reasonable volume was determined based upon peak seasonal flows of source-separated materials during the peak construction season, and the amount of recovered material from the MRF. The location of the storage materials will be placed on top of the compacted intermediate cover of the CFL, and may be moved quarterly or annually to adjust to the filling of the landfill and the construction schedule of future landfill phases. The intermediate cover will be compacted soil of at least 1 foot, sloped at 1% for positive drainage, and will be maintained to prevent ponding due to settlement.

The amount of potential emissions for each material type was calculated is listed below for each material type.

Clean Green Material:

Amount: The storage volume of clean green material from the existing source-separation program and the recovery of green material from the mixed waste processing facility will increase up to 6,000 CYD for a 30-day holding period as allowed under Title 27 regulations under the direction of the County LEA. The current permit allows up to 1,500 CYD for up to 21 days. The green material is chipped and ground, and then screened. The fines are further composted by mixing with the food waste to balance out the C: N ratio, creates porosity, and is used as an inoculate for the research food waste composting program underway. The overs are the larger woody pieces that are used for biomass fuel or mulch for erosion control on-site. Some of the compost and mulch will be placed in bunkers for retail sales for users of the Facility.

ADC: Clean green waste will not be used for ADC, and the recordkeeping practices have been recently updated to reflect the other types of ADC used on-site. Contaminated green waste, and overs that do not qualify as clean biomass, would continue to be used as ADC as allowed by the SWFP and Title 14 state minimum standards, with the updated recordkeeping procedures. Contaminated green waste would include screened overs with plastics or other inert contaminates, and would not include any fines.

Finished Compost: Green waste used in the research food waste program will undergo a composting process with the food waste, where finished compost is produced on site.

Table 9 – Storage of Recyclables and Commodities
(may be adjusted by the LEA following Title 27 standards)

Material	Location See Site Map	Storage time	Maximum Storage Volume	End Use
Clean Green Material	CFL Intermediate Cover stockpile	30 days	6,000 cubic yards	Fines shipped off-site, some material mixed with food waste composting on-site, overs used for biomass; some mulch used on-site for erosion control, or contaminated wood chips used for ADC.
Clean Concrete, Rock and Asphalt	CFL Intermediate Cover stockpile	180 days	10,000 cubic yards	On-site use for roads and tipping pad
Clean/Recovered Wood	CFL Intermediate Cover stockpile	60 days	5,000 cubic yards	Shipped off-site to a biomass plant or used on-site at biomass gasification unit
Metals	CFL Intermediate Cover stockpile	180 days	5,000 cubic yards	Shipped off-site for recycling
Food Waste Storage	2 Bunkers on top of CFL intermediate cover	Rolling 24 hours	150 cubic yards	Composted in on-site vessels; may be shipped off-site for composting
Food and Green Waste in Compost Containers	20 to 63 containers on top of landfill intermediate cover	30 days	2,500 cubic yard	Composted on-site
Food waste compost curing	CFL Intermediate Cover stockpile	48 hours	500 cubic yards	Shipped off-site to UVDS for blending
Commodity Sales (wood chips, compost, compost blends, top soils, aggregate base rock)	6 Bunkers on top of CFL intermediate cover	Continual being stocked	450 cubic yards	Back-hauled by customers, typically contractors and gardeners that use the facility
Broken Glass - 1" minus screen fines (still needs to be approved by the LEA)	Placed on landfill and used as daily cover	7 days max exposed before being covered with waste	350 cubic yards	Incorporated into the landfill as alternative daily cover material

Project volumes purchased by customers: Mulch and compost will be available for customers using the facility, where after tipping their waste material, the customers may back-haul mulch and composter materials from the dedicated bunkers on-site. The program is presented as a convenience to the residents of the Upper Valley that may request local compost and mulches. Typically, bulk and volume sales will occur with the current system where UVDS deliver loads of composts and mulches to the customer. The amount of retails sales from on-site users hopefully increases to over 1,000 tons per year.

Greenwaste has the potential to generate emissions during the typical 14-day storage time. Current entitlements allow a 21-day storage time for 1,500 CYD. There is very little data on which to base estimates of VOC emissions from green waste storage. The studies upon which these estimates are based are described below.

- A study conducted by the California Integrated Waste Management Board in Modesto, CA (CIWMB, 2007) also looked at VOCs from green waste composting, but not specifically at green waste storage or any other emission types. Emissions were sampled when the compost phase began. Nonetheless, this data is also used in the estimate of green waste storage due to the lack of available data. This study found that 81% of VOC emissions occurred during the first two weeks of composting, which is not this case will only be storage until processed. A later analysis revised the CIWMB results upward from 0.9 to 1.54 (Card & Schmidt, 2008). The NorCal study included 12 measurements, a relatively small sample size compared to the CIWMB data set of 36 measurements.

  Applying the data from the CIWMB study the VOCs generated by the maximum storage of 6,000 CYD of green waste with a storage time of 14 days is 33 tons per year. Current entitlements allow a 21-day storage time for 1,500 CYD, where the average pile size will be 3,000 CYD. Applying the data from the CIWMB study the VOCs generated by the storage of 3,000 CYD of green waste with a storage time of 14 days is 16 tons per year, where the baseline would be 8 tons per year for the current storage piles.

The incremental increased emissions estimate of VOCs from storing additional clean green material above baseline is 8 tons VOCs per year.

Clean Concrete, Rock and Asphalt:
There is a small potential for these materials to generate dust if they are dry and weather conditions are windy. In this case, moisture application will be used as a dust control measure.

Clean/Recovered Wood:
Dust can be generated during grinding of waste wood to create wood chips for transport to biomass energy facilities. Moisture application is applied as needed to control dust.

Metals:
There is no potential for metal material to generate emissions. However, dust may be generated during the processing of C&D waste from which the metals may be derived. Moisture application is used as needed to prevent dust generation from C&D fines.

Commodity Sales Products:
These materials consist of wood chips, compost, compost blends, top soils, and aggregate base rock. The compost materials will be well-stabilized and won't generate additional biologically-mediated emissions. The only emissions anticipated are potential dust generation, which would be controlled through moisture application.

RENEWABLE ENERGY FACILITY OPERATIONS

CFL proposes to add a biomass conversion facility that uses clean processed wood waste in a gasification unit at the location where the MRF is now located. Site Map 5A shows the Elevation View of the Biomass Gasification Unit, and Site Map 5B shows the Plan View of the Biomass Gasification Unit. The proposed layout shows a vertical bucket feed conveyor. CFL may use a variation of the in-feed conveyor that is an inclined food conveyor at a 45 degree angle from the operations pad to conversion chamber. A minimum of 2 days of feedstock, or 80 tons of wood chips, or 400 CYD, is required to be next to the feed conveyor, where the remaining wood chip may be stored elsewhere on the landfill intermediate cover.

Biomass Gasification Unit

Fuel Types

The Biomass Gasification Unit will be design to handle 40 TPD of biomass feedstock and will be operating 24 hours per day, 7 days per week, with about 6 planned maintenance days per year. The following biomass material types will be used: (1) Wood, wood chips, and wood waste; (2) Agricultural crop residuals; (3) Bark, lawn, yard, and garden clipping; (4) Leaves, silivicultural residue, and tree and brush pruning. The primary fuel type will be wood chips from on-site wood grinding operations. Agricultural crop residuals from vineyard wastes and biomass waste from quarantined materials such as Sudden Oak Death could be treated at the biomass gasification unit.

Fuel Storage

A minimum of 2 days of feedstock, or 80 tons of wood chips, or 400 CYD, is required to be next to the feed conveyor, where the remaining wood chips may be stored elsewhere on the landfill cover. The size of the pile will not exceed 15 feet in height, and will have a minimum of 20 feet fire lane around the perimeter of the pile. Figure 5 provides the proposed Site Plan for the Biomass Gasification Operations with the wood chip storage piles shows 2 piles with 5,000 CYD of storage capacity.

Fuel Sources

Most of the wood chips will be generated on-site from incoming vehicles delivery source-separated lumber and brush, or recovered from mixed C&D loads. The MRF could process an average of 200 TPD during peak construction seasons with has typically 30% recoverable wood material, providing 60 TPD of wood chips to fuel the biomass conversion facility. At 100 TPD of incoming mixed C&D, about 30 TPD of wood waste could be recovered and processed into wood chips. To account for seasonal low peaks and down construction cycles, the amount of wood recovered from the processing line and delivered from source-separate loads is assumed to be about 20 TPD. The other 20 TPD will need to be imported from off-site sources in a transfer trailer

To ensure a sustainable supply of wood chips, 1.5 transfer trailers per day carrying 30 tons of wood chips per day may be needed on a seasonally or intermittent basis. The wood chips may

be processed at out-of-county wood waste processing operations scattered around the Bay Area. It is typical that transfer trailers haul wood chips from the Bay Area wood waste processing operations to Central Valley biomass-to-energy facilities. The Clover Flat facility offers a closer and convenient operation that will reduce overall vehicle emissions.

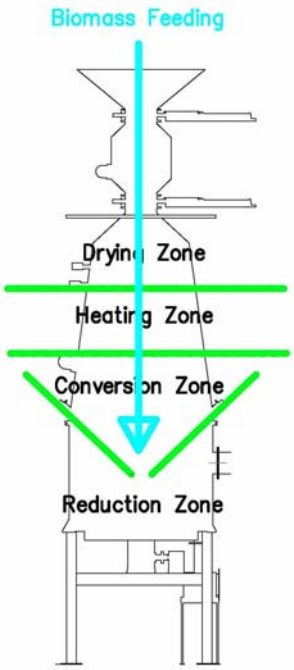
In the future, additional agricultural wastes will be generated from "no-burn" days and policies. Agricultural wastes, such as vineyards and orchards, may be processed into wood chips to generate another 20 TPD locally where importation may not be needed.

Aesthetics

The current MRF is 27 feet tall with the canopied along the processing line. The location is not located in a sensitive ridge line identified in the 1990 EIR for the original landfill CEQA analysis. The proposed Biomass Gasification Unit will be located on the same pad area after relocation of the MRF. The Unit will peak out at 41 feet as shown on Figure 5. Most of the mass of the unit will be less than 20 feet, such as the massing of the MRF, which is 27 feet tall. The in-feed conveyor and the biomass feed into the chamber will be 41 feet in an area of less than 25 feet by 25 feet. The in-feed conveyor and the chamber will be painted a neutral earth tone color that would blend into the color of the landfill cover material. There is no proposed lattice or landscaping at this location, since the Unit is coated below the sensitive ridge lines indentified in the 1990 EIR.

Biomass Conversion Operations

The applicant proposes to add biomass conversion operations on the concrete pad where the current Material Processing Facility is located on the landfill deck as shown on Figure 2 - Site Plan, to produce electricity out of the clean processed wood waste materials that is currently recovered and planning to be recovered. The concrete pad will remain in place and all the equipment will be new including one front-end loader to manage the wood chips. The applicant proposes to utilize 40 TPD of clean wood chips processed on-site from the wood recovery operations to generate approximately 1 MW of electricity. The biomass conversion facility will only receive clean processed wood chips, and will obtain the necessary air permits from the BAAQMD. The lumber that is recovered and processed into biomass wood chips is currently being hauled to the Central Valley (to Woodland, Tracy, Rocklin or Andersen), to be combusted at biomass-to-energy facilities. Additional wood chips may be delivered by transfer trailers. The electricity is considered renewable power and is sold to the utilities for their achievement of the state mandate of utilizing 20% renewable energy by 2010. Current state policy and future laws could increase the amount of renewable energy used in California to 33% by 2020.



The applicant proposes to use technologies that convert biomass into a synthetic natural gas (syngas) through the process of thermo-chemical conversion in a gasification unit. This syngas

is then used to fuel a specially modified natural gas genset that provides renewable electricity and heat. The biomass gasification process is a thermo-chemical one that 'cooks' biomass in an oxygen starved environment. By depriving the fuel of sufficient oxygen the biomass does not burn, but rather gives off a hydrogen rich syngas. As the biomass gives off the syngas, it is transformed into bio-char and ash of approximately 1-5% of the volume of biomass fuel. The syngas is then captured, cleaned and cooled before being sent as fuel to the Genset. The gensets are provided by a variety of nationally known vendors such as Cummins, Caterpillar, or GE. This ensures that there are readily available spare parts and maintenance technicians available locally. The bio-char has demonstrated ability to sequester carbon in solid form for upward of 1,000 years if applied as a soil amendment.

A conveyor fed hopper provides the most flexible solution to deliver biomass wood chips into the unit into the fuel hopper. Once in the hopper, the system uses a robust platform and fuel metering sensors to continuously feed the conversion unit in small batches as needed.

The biomass conversion chamber as shown in the adjacent figure is essentially a chemical reactor where various complex thermo-chemical processes take place. As it flows through the reactor, the biomass gets dried, heated, converted into gas and reduced into bio-char and ash. Although there is a considerable overlap, each process can be considered to be occupying a separate zone, in which fundamentally different chemical and thermal reactions take place. The fuel must pass through all of these zones to be completely converted. The downdraft conversion unit, employed by the technology, is under vacuum drawn by a high-pressure blower ("negative air"). The essential characteristic of the downdraft design is that the tars given off in the heating zone are drawn through the conversion zone, where they will be broken down or oxidized. When this happens, the energy they contain is usefully recovered and the mixture of gases in the exit stream is relatively clean. Expected total gas contaminant concentration prior to filtration is up to 100 times less than is often seen in updraft and fluid bed systems.

Gas cleansing

After the syngas has been extracted from the conversion chamber it is cooled and cleaned by a series of scrubbers and filters. First the gas passes through a venturi scrubber, which is known to remove particulate in the submicrometer range. The gas is then passed through a series of four filters. The first is a coarse filter to coalesce residual liquids. The second is a rejuvenating active sawdust filter, the third is a similar passive filter, and the fourth is a fabric bag filter. The filter media are sawdust and biomass chips so instead of using expensive synthetic filters that need to be thrown away, the used filter media can be simply placed into the fuel hopper and consumed.

Power Generation

The power units are based on a spark-ignited engine genset. Depending on the model chosen, the engines are capable of providing up to 1 mega-watt (net) operating on syngas. The applicant will customize to allow syngas carburetion for this engine and provide standard paralleling switchgear for electrical output with up to 1 mega-watt.

The applicant plans to utilize a CAT 3516 or the Cummins 1710 as the most attractive engine options. These engines also have unique features of better fuel economy, better emissions, durability, and extended oil and filter change period. Both CAT and Cummins engines have been designed to combine compact size, low emission levels and excellent performance characteristics of high-speed technology with the medium speed benefits of water-cooled exhaust valve seats, steel-crown pistons & combustion control. A Bay Area Air Management Quality District Permit to Operate will be obtained. The San Joaquin Valley Air Pollution Control District has issued a Permit to operate for similar biomass conversion unit.

Emission Estimates

An **Authority to Construct** was granted by the San Joaquin Valley Air Pollution Control District (SJVAPCD) for a project to produce syngas from biomass feed stocks (SJVAPCD, 2009). The emissions estimates in this document are based on the permit limits placed on the engine by the SJVSPCD. Those limits are shown in Table 10:

Table 10 – SJVAPCD Permit Limits for Biogasification Energy Production

Constituent	SJVAPCD Permit Limit
NOx	9 ppmv @ 15% O2
Sox	0.03 g/hp-hr
PM-10	0.05 g/hp-hr
CO	75 ppmv @ 15% O2
VOC	25 ppmv @ 15% O2

The following parameters are used in the estimate of emissions are provided in Table 11:

Table 11 – Parameter Values used in Calculations

Parameter	Value	Source
Power Generation	1 MW	Applicant
Syngas Heat Content	131 Btu/scf	ATC – Application Review
Syngas F-Factor	7,648 dscf/MMBtu	ATC – Application Review
Engine Efficiency	30%	Typical for IC Engine
Thermal Energy Required	273 MMBtu/day	Calculated
Syngas Flow to Engine	2,083,861 scf/day	Calculated

Constituent limits given in terms of ppmv are converted grams per day using the calculations shown below.

EF-NOx = (9/10^6)*(7,648 $dscf_{out}$/MMBTU)*(131 MMBtu/MMscf)*(2.083861 MMscf/day)*(46 lb/lb-mole)*(1 lb-mole/379.5 scf)*(453.6 g/lb)*((20.9/(20.9 – 15))

EF-NOx = 3,660 g/day

EF-CO = (75/10^6)*(7,648 $dscf_{out}$/MMBTU)*(131 MMBtu/MMscf)*(2.083861 MMscf/day)*(28 lb/lb-mole)*(1 lb-mole/379.5 scf)*(453.6 g/lb)*((20.9/(20.9 – 15))

EF-CO = 18,564 g/day

EF-VOC = (25/10^6)*(7,648 $dscf_{out}$/MMBTU)*(131 MMBtu/MMscf)*(2.083861 MMscf/day)*(16 lb/lb-mole)*(1 lb-mole/379.5 scf)*(453.6 g/lb)*((20.9/(20.9 – 15))

EF-VOC = 3,536 g/day

Constituent limits in units of grams per brake horsepower-hour (g/bhp-hr) are converted to g/MW-hr using the conversion of 1,341 g/bhp-hr = 1 g/Mw-hr (CARB Fleet Emission Calculator), and further converted to grams per day.

EF-Sox = 966 g/day
EF-PM10 = 1,609 g/day

No permit limit was established by the SJVAPCD for formaldehyde. Formaldehyde emissions are estimated using an emission factor provided by Jenbacher, a subsidiary of General Electric that manufactures engine-generator systems. The same emissions factor is used for the syngas system as for the landfill gas engine-generator set.
EF-Formaldehyde = 0.2 g/hp-hr = 6,437 g/day

Criteria Pollutant Emissions
Annual criteria pollutant emissions are shown in Table 12. The annual emissions provided assume that the engine-generator set operates 24 hours per day, 365 days per year, generating 1 MW of power.

Table 12 – Annual Criteria Pollutant Emissions – SynGas Engine

Constituent	Annual Emissions Lbs./year
Volatile Organic Compounds	2,846
Carbon Monoxide	14,941
NOx	2,946
PM10	1,295
SOx	777
Formaldehyde	5,181

The engine-generator system will be shut down from time to time for maintenance or repair. In this case, the gasifier would either be shut down and the wood chip fuel alternatively managed, or the syngas would be routed to the flare that burns landfill gas.

Bio-char & Ash Handling
Bio-char & ash is removed from the conversion chamber using pumped slurry. Scrubbed particulate is combined with the bio-char stream. A closed water loop is used for cooling as well as to provide a seal to the bottom of the gasifier. Water slurry level is maintained in a tank and pumped to an automated filter. The automated filter is typical for river sludge treatment and separates the solids from the recirculated water. The char byproduct, also called biochar, is separated out using a special mechanical separator for resale as a soil amendment, sequestering carbon in the ground in solid form for up to 1,000 years. Water leaving the filter is passed through a final stationary filter prior to heat exchange. The scrubbing water is absorbing heat from the product gas and must be cooled in a cooling tower prior to returning to the closed-loop scrubber.

GREENHOUSE GAS ANALYSIS

Clover Flat Landfill, Inc. is committed to voluntarily estimate their combined GHG emissions inventory for the Calendar Year 2006 as a means to understand their GHG impacts. A summary of the GHG inventory for 2006 baseline operations shows that there are 4.5 times more avoided GHG emissions attributed to recycling than generated with the collection, processing and disposal of materials. A total of 1,556.2 metric tons of GHGs were emitted from CFL and UVDS fleets and electricity use on a companywide basis, and 2,737 metric tons of GHGs were emitted from fugitive methane emissions from the landfill. The avoided indirect emissions due to recycling and composting add up to 19,386 metric tons not being generated. A copy of the GHG Inventory Management Plan is provided in Appendix A

Greenhouse Gas Reductions attributed to the Biomass Conversion Facility
As noted in the Table 13, the greenhouse gas emissions are significantly reduced with less hauling and converting energy from biogenic "carbon-neutral" sources such as wood chips, instead of using anthropogenic energy from fossil fuel sources. Approximately 151 metric tons of greenhouse gases can be reduced by utilizing 40 tons of biomass fuel from local sources as shown in the Table 13 below.

Greenhouse Gas Emissions
GHG emissions generated by the project are principally methane generation from decomposing landfilled waste. However, GHGs are also generated by the fuel combusted on-site and from indirect emissions generated elsewhere from the provision of electricity for use on-site.

As previously described, the project is to increase the life of the landfill from a current closure date of 2021 to an anticipated closure date of 2044, which will prolong the generation of project emissions. Therefore, emissions from landfill operations and emissions of landfill methane would remain largely the same until 2021.

A GHG estimate for facility operations has not been conducted for the current year, but an estimate of GHGs for the CFL was previously done using 2006 data as a baseline, following the California Climate Action Registry General Reporting Protocol. Emissions for facility operation, excluding landfill methane, for the 2006 calendar year were 494 metric tons carbon dioxide equivalent emissions ($MTCO_2$-e). Current emissions are estimated at 600 $MTCO_2e$.

An engine generator system is proposed to generate electricity from landfill gas. The pass-through emissions of methane is estimated at 2%, which is the same as the pass through emissions for the landfill gas flare. Therefore, these emissions are included in the estimate of emissions from the landfill gas flare.

Table 13 – Current Baseline and Proposed Operation for Biomass Wood Chips

	Current System – Baseline	Proposed Biomass Gasification Unit
Fuel Type	Processed clean wood chips from on-site facilities, or nearby facilities, that remove treated wood waste and other contaminants.	
Fuel Supply	40 TPD of clean wood chips from on-site Facility with source-separated wood waste and agricultural wastes, wood waste recovered from the on-site MRF, and overs from the green material processing operations; or up to 30 TPD of wood ships imported from Bay Area facilities.	
Technology	Large biomass energy facilities from the mid-1980s are in California's Central Valley that utilizes upgraded steam-turbine cycles with 20% efficiency.	On-Site gasification technologies with 30% efficiency.
Permits	Local air district permit and land use entitlements.	Local air district permit and land use entitlements. San Joaquin Valley APCD has issued Permit to Operate for a similar biomass gasification unit in Merced County.
Haul	40 TPD, or 2 trips, about 90 miles to a large Central Valley biomass energy facility.	40 TPD on-site or local sources. Reduced 2 transfer trailers of traffic per day through Napa County to the Central Valley
GHG emissions from hauling	0.36 metric tons per trip, or 151.2 metric tons per year.	Reduce GHG emission by 151.2 metric tons per year.
Residual	Biomass ash from 7% to 10% of feedstock that can be used for land application.	Bio-Char from 1% to 5% of feedstock that offers long-term soil sequestration of carbon.

LANDFILL GAS METHANE EMISSIONS

The USEPA LandGem model is used to estimate methane emissions from waste decomposition. The project emissions are the increase in emissions beyond the year 2021 when, under the project scenario, the facility is able to continue landfilling waste until 2047. Therefore, maximum methane emissions from the landfill occur in the year 2047and the first year that project emissions are generated is 2023.

A landfill gas collection system is in place at CFL. Landfill gas is assumed to be collected at an efficiency of 75% and combusted at a flare with an assumed destruction efficiency of 98%. Of the remaining 25% of landfill methane, 10% is assumed to be oxidized in the soil cover and the remainder is emitted directly to the atmosphere. Results are shown for selected years in Table 14.

Table 14 – Project Landfill Methane Emissions in $MTCO_2e$ for Selected Years

Year	Total Project Landfill Methane Generated	Landfill Methane Recovered	Fugitive Methane Emissions	Landfill Flare Pass Through (2%)	Total Landfill Methane Emissions
2023	2,502	1,877	563	28	591
2030	17,474	13,106	3,932	197	4,129
2040	32,750	24,563	7,369	368	7,737
2048	41,256	30,942	9,283	464	9,747
2050	38,084	28,563	8,569	428	8,997
2060	25,528	19,146	5,744	287	6,031
2070	17,112	12,834	3,850	193	4,043
2080	11,471	8,603	2,581	129	2,710
2090	7,689	5,767	1,730	87	1,817
2100	5,154	3,866	1,160	58	1,218

Note: 2048 is the peak year for emissions. 2047 is the last year waste would be landfilled.

OVERALL CRITERIA POLLUTANT EMISSIONS

Overall criteria pollutant emissions for the project activities described above are presented in Table 15.

Table 15 – Project Emissions for Criteria Pollutants

Process	VOCs (tons/year)	NOx (tons/year)	PM (tons/year)	Sox (tons/year)	Formaldehyde (tons/year)
Incremental Clean Green Storage	8	-	-	-	-
In-Vessel Composting (2-day storage)	6	-	-	-	-
Biomass Gasification	1.4	1.5	0.6	0.39	2.6
Vehicles	0.05	0.8	0.03	-	-

UTILTIES

Assessor Parcel # 020-120-020 is the location of the CFRRP Project. The proposed domestic sewage system will be located on this parcel. The utilities will follow existing easements on this parcel off-site following current easements.

Water Supply

CFL will have a total of 16 employees under current conditions and may increase to 20 employees over time. The number of users of the facility that would need to access to the water would be limited to inspectors, vendors, and maintenance personnel, that could add up to 2 to 4 users per day. The number of users will not exceed 25 on a peak day. However, they are not employees, personnel, residents or users of the water supply systems, as the typical trip last under 20 minutes to delivery waste and materials.

The Use Permit Application Package included the Water Supply Information, as requested, where the 10 gpm private water well was discussed, with a 10,000 gallon storage capacity. The Water Available Analysis – Phase 1 Study was also included where the existing use and the proposed use of 1.8 million gallons were noted.

Domestic Sewage System

The City of Calistoga does not serve CFL. The existing sewage systems are antiquated and were installed in the early-1960's for the current scalehouse and the mid-1970 for the current office across the parking lot. There are no records of the design or the permitting from their installation from over 30 to 40 years ago. Portable toilets are located on-site for the employees at the landfill operation and the MRF. The general public has access to the portable toilets in case of need.

The current operating practice of the antiquated sewer system entails that each tank is pumped approximately twice per year. CFL plans to properly abandon these systems when the Recycling Center is expanded to with the new scalehouse office. The liquids capacity of the proposed septic tank will be 1,500 gallon to accommodate up to 20 employees, while keeping portable toilets at the landfill operations and next to the mixed waste processing facility.

CFL does plan to permit a new scalehouse and office that is 12 feet wide and up to 60 feet long to house personnel. The applicant proposes to grade and install the new scalehouse/office within 2 to 3 years of the adoption of the proposed Conditional Use Permit, and will abandon the current systems at that time.

A Preliminary Wastewater System Feasibility Report was prepared by REB Engineering for a new system at CFL. A copy of the report dated March 22, 2011 is provided in Appendix F. The current parcel has been identified as the location of the septage system, as shown in the Report.

NOISE

The expected should levels due to electrical generation equipment was analyzed for the Clover Flat Landfill minor modification to add the landfill gas energy generation facility in 2010. An 848 kW rate Genset will be added as part of the landfill gas collection system to create green energy from the landfill gas that was previously flared. The flare will remain as back-up for maintenance.

A Sound Level Study for the Clover Flat Landfill expansion was prepared by Sound Solutions Acoustical Consulting Services in November 15, 2010, and in attached as Appendix E. The conclusion above is based upon a number of assumptions about the proposed equipment where the Genset with the gas conditioner will have a specified cumulative duration of 51 dBA for 30 minutes. The Napa County limits are 75 dBA for 30 minutes. It is expected to be valid if the equipment meets the following specifications:

1. Any gas conditioner installed shall produce a sound level of no more that 85 dBA at a distance of one meter from any face of the unit.

2. Any microturbine installed shall be Model MT250 by Ingersoll Rand.

3. Any genset installed shall be Model JGC 316 GS-L.L by General Electric, completely enclosed in a steel container provided by the manufacturer. The container shall include sound attenuators along air intake and air outlet paths.

4. An exhaust silencer (not provided by the genset manufacturer) shall be added to the Genset. The silencer shall provide an insertion loss of a least 30 dB at all significant frequency components of the exhaust sound. Example: Critical Muffler by Nelson.

5. With the container and exhaust silencer installed, the genset sound level in any direction around the container shall not exceed 65 dBA at a distance of 10 meters from the nearest container face.

Given the equipment specifications listed, the Noise Study concluded that the sound levels produced by the proposed equipment are expected to comply with the Napa County Noise Ordinance limits at the property lines of the Clover Flat Facility.

The CFRRP project includes the biomass gasification unit with the addition of electrical generation equipment. Phoenix Energy conducted sound readings on their operating biomass gasification unit in Merced County with readings of 51 to 53 dBA at locations 10 meters from the unit. A copy of the readings is provided in Appendix E. Phoenix Energy will be using a Caterpillar G3516 TA electrical generation equipment where their sound reading from the manufactures specification is also provided in Appendix E where the free filed mechanical and exhaust noise is 81.3 dBA to 91.6 dBA at 50 feet from the engine, not enclosed. The Caterpillar G3516 TA will not be open to the air, but will also be completely enclosed, and will meet the specifications listed above for the Genset.