July 30, 2014 Project No. 1301525

Mr. Phil Graham, Organics and Landfill Manager
Recology Yuba-Sutter/Feather River Organics
3001 North Levee Road
Marysville, CA 95901

RE: AMENDED COMPOST AREA LEACHATE COLLECTION WORK PLAN FOR FEATHER RIVER ORGANICS, RECOLOGY YUBA-SUTTER FACILITY, MARYSVILLE, CALIFORNIA

Dear Mr. Graham:

Golder Associates Inc. (Golder) is submitting this amendment to our January 31, 2014 Compost Area Leachate Collection Water Work Plan to address the management of compost leachate for the Feather River Organics (FRO) compost operations at the Recology Yuba Sutter (RYS) site. As described below, this work plan reflects and includes the conceptual design and schedule for upgrading the compost area leachate collection system to accommodate a 3.16-inch storm event as recommended by Brown and Caldwell (letter dated July 28, 2014, Attachment 1).

1.0 COMPOST AREA LEACHATE COLLECTION IMPROVEMENTS

Brown and Caldwell (July 28, 2014) evaluated three options for managing compost leachate for a 3.16-inch storm event, which corresponds to a 25-year, 24-hr storm event per California Department of Water Resources data. These options included: 1) storage of compost leachate; 2) discharge of compost leachate to the Marysville sewer system; and 3) a combination of storage and discharge to the City of Marysville (City) sewer system. Brown and Caldwell indicate that a potential restriction on discharge is the capacity of the sewer line, which the capacity has not been formally determined by the City. Therefore, Brown and Caldwell recommended Option No. 3 with the currently City-approved 65,000 gallon per day discharge rate.

Golder's hydrology calculations indicate that the total run-off from the approximately 11.4-acres of current compost operations is approximately 183,000 gallons for a 3.16-inch storm. Allowing for 65,000 gallons to be pumped to the City's sewer system, approximately 118,000 gallons of compost leachate will need to be temporarily stored, which can be accommodated by six (6) 21,000 gallon Baker tanks.

Figure 1 shows the proposed improvements to manage the compost leachate from a 3.16-inch storm. These generally include:

- Adding 3 Baker tanks to the 3 Baker tanks currently in use at FRO
- Extending a 4-inch pipeline along the north end of the compost facility to the sewer system discharge point near the RYS truck maintenance facility
- Adding a larger concrete vault in the Hog Farm area to convey compost leachate to the Baker tanks
- Adding two additional five horsepower pumps in the concrete vault
- Upsizing the existing pumps in the southern compost leachate collection vaults to convey larger leachate flows

Additional improvements to the electrical infrastructure may be required to operate the proposed pumps. Vacuum lysimeters will be installed within the upper 2 feet of the soil subgrade below each Baker tank to

Golder Associates Inc.
1000 Enterprise Way, Suite 190
Roseville, CA 95678 USA
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Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

allow monitoring of the unsaturated zone on a quarterly basis. Attachment 2 includes Golder's hydrology calculations that support the above proposed compost water improvements.

2.0 SCHEDULE

The following schedule is proposed for the finalizing the design and constructing the upgraded storm water improvements:

- Complete Final Design – Week of August 11, 2014
- Start Construction – Week of August 18, 2014
- Complete the Improvements – October 1, 2014

3.0 SUMMARY

This submittal summarizes the proposed upgrades to the existing compost area leachate collection system to increase the capacity to accommodate FRO composting operations through a combination of on-site storage and discharge to the sewer system as recommended by Brown and Caldwell. Please call if you have any questions or need additional information.

Sincerely,

GOLDER ASSOCIATES INC.

Joel Kelsey
Project Engineer

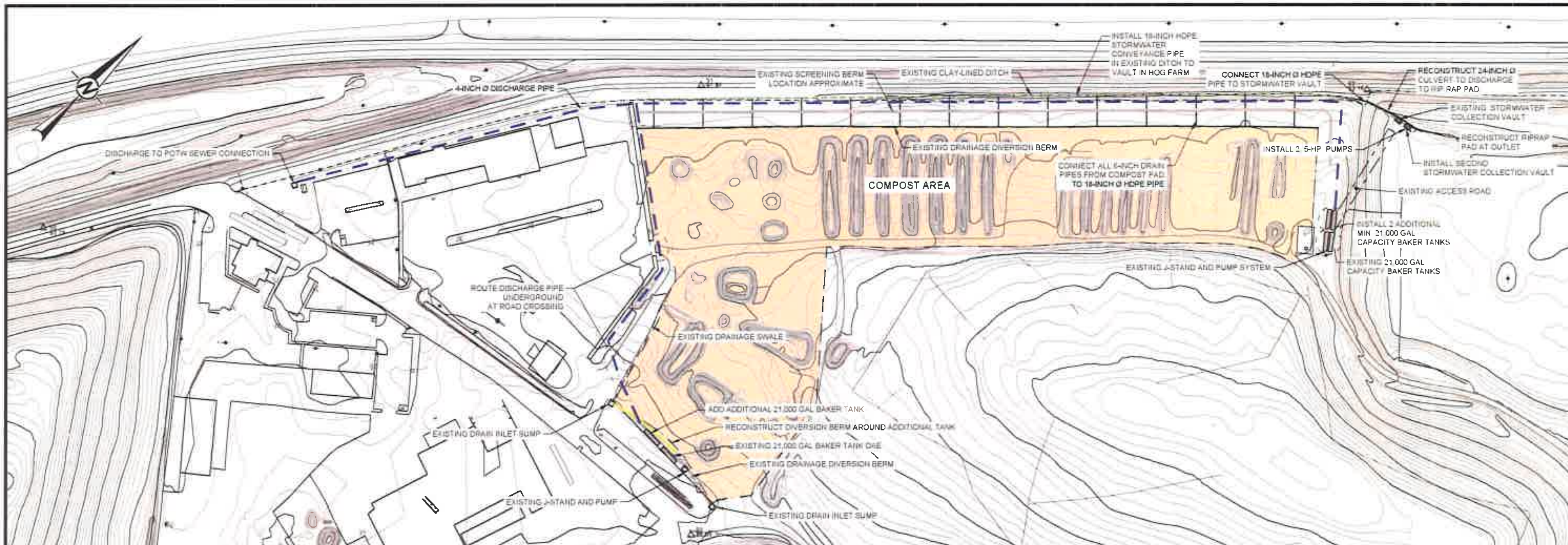
REGISTERED PROFESSIONAL ENGINEER
KENNETH G. HASKELL
No. C053290
Exp. 6/30/15
CIVIL
STATE OF CALIFORNIA

Kenneth G. Haskell, P.E.
Principal / Practice Leader

Attachments: Attachment 1 – July 28, 2014 Brown and Caldwell Letter
Attachment 2 – Golder's Hydrology Calculations

cc: Drew Lehman - Recology
Jordan Norris – Recology
Ron Crites – Brown and Caldwell

FIGURE



GENERAL NOTES

1. TOPOGRAPHY PROVIDED BY AERIAL DATA INC. DATE OF TOPOGRAPHY APRIL 30, 2012
2. EACH BAKER TANK WILL BE UNDERLAIN BY A SOILMOISTURE EQUIPMENT CORP. MODEL 1920F1L36 SOIL WATER SAMPLER (OR EQUIVALENT)

LEGEND

- 4 - INCH Ø HDPE PIPE
- 18 - INCH Ø HDPE PIPE
- 21,000 GALLON BAKER TANK WITH SOIL WATER SAMPLER ("VACUUM LYSIMETER") (NOTE 2)

REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RVW

PROJECT

COMPOST PAD IMPROVEMENTS
RECOLOGY YUBA SUTTER

TITLE

CONCEPTUAL STORMWATER COLLECTION PLAN

Golder Associates

PROJECT No.		1301535	FILE No.	RYS-CP1-F1
DESIGN	JTK	7-28-2014	SCALE	AS SHOWN
CADD	CMN	7-28-2014	FIGURE	
CHECK	JTK	7-28-2014		1
REVIEW	KGH	7-30-2014		

ATTACHMENT 1
BROWN AND CALDWELL LETTER
DATED JULY 28, 2014

1590 Drew Avenue, Suite 210
Davis, CA 95618

T: 530.747.0650
F: 530.297.7148

July 28, 2014

Brown AND Caldwell

Mr. Drew Lehman
Director Environment & Planning
Recology
50 California Street, 24th Floor
San Francisco, California 94111-9796 1017-146499

Subject: Feather River Organics Stormwater Disposal Evaluation

Dear Mr. Lehman:

Brown and Caldwell (BC) is pleased to submit this stormwater disposal evaluation for Feather River Organics (FRO) at the Marysville site. This letter report provides background, a review of options, and recommendations for implementation.

Background

The California Regional Water Quality Control Board (Regional Water Board) regulates the Recology Yuba Sutter (RYS) landfill (including the Feather River Organics Compost facility) under Waste Discharge Requirements (WDRs) Order RS-2003-0093 and Cleanup and Abatement Order (CAO) RS-2013-0704 issued on August 29, 2013.

The FRO compost facility is approximately 16 acres in size, but the composting operations are limited to an area of 11.4 acres.

Pursuant to discussions with staff of the Regional Water Board, Recology is evaluating proposals to implement a system at the site that would be capable of handling compost water during the 25-year, 24-hour storm event.

Based on calculations provided by Golder Associates (Folder) using the Regional Water Board recommended DWR database, the 25-yr, 24-hr storm will produce 183,000 gallons per day (gpd) of runoff from the FRO composting operations. The purpose of this report is to recommend the best practicable solution for managing this runoff to achieve the Regional Water Board's stated goal of managing for the 25-yr, 24-hr event.

Review of Options

There are three options for managing the runoff:

1. Store the entire 183,000 gallons on site,
2. Discharge all of the compost stormwater to the City of Marysville sewer system on an ongoing basis throughout a storm event, or
3. Store a portion and discharge the remainder to the Marysville sewer system.

Option 1 – Storage

Golder has evaluated storage in either lined ponds or in free-standing Baker tanks. With respect to the use of tanks, to retain the 183,000 gallons from a 25-yr storm (DWR database) would require 10 Baker tanks of 20,000 gallons each. The stored water would need to be pumped from the tanks into the water truck and used as makeup water during non-rainy days and/or trucked to an onsite sewer manhole at the RYS site for discharge into the City of Marysville treatment system.

At present there are three Baker tanks on site at RYS collecting stormwater runoff in two different locations. One is located at the entrance to the FRO compost operation, and the remaining two are near the flare on the northeast portion of the site.

Option 2 – Management of FRO Discharge to Marysville Sewer System

The City of Marysville owns and operates a wastewater collection, treatment and disposal system. Wastewater is collected in the City of Marysville using a conventional gravity sewer system with pumping stations to lift the wastewater to the treatment plant.

The treatment plant (located on Bizz Johnson Road) is a secondary treatment plant featuring gravity primary clarifiers and tricking filters. The effluent is applied to rapid infiltration basins located near the Yuba and Feather Rivers.

The treatment plant is rated at 1.7 million gallons per day (mgd). Current dry weather flows average 1.3 mgd and peak wet-weather flows are up to 3 mgd. Future flows from the Marysville collection system will be pumped to the larger (5 mgd +) Linda County Water District system. A connecting pipeline has been designed and will be constructed in the next 2 to 3 years.

Under Option 2, compost runoff from FRO would be piped from the concrete vault and the free standing Baker tanks to an existing manhole onsite that is connected to the city sewer system. Compost runoff would be mixed with municipal wastewater and passed through three of the City's existing pumping stations to reach the treatment plant.

The limitation on the flow of compost runoff that the sewer system could accept has been determined by the City to be the sewer system itself, not the treatment plant. This is based on an analysis by David Lamon at the City of Marysville. The sewer system of East Marysville would need to be evaluated according to David Lamon, to determine the exact flow rate of compost area runoff that could be accepted into the system during a rain event (see Attachment 1).

Option 3 – Storage and Discharge

The third option is to store and discharge at the same time. By collecting, storing, and piping a portion of the runoff to the sewer throughout the course of a rain event, the net amount of on-site storage volume is reduced. After the storm recedes the stored water in Baker tanks would be pumped into the sewer at a fixed rate.

Using the City's previously approved 65,000 gpd flowrate for sewer discharge during storms; the net on-site storage required would be reduced to 118,000 gallons, which could be accommodated using six (6) Baker tanks during the rainy season.

Recommendations for Implementation

Our recommended option is the simultaneous Storage and Discharge option #3. To implement this option the existing 3 (three) Baker tanks would be increased to 6 (six). Four tanks would accommodate the northern portion of the composting area and two tanks would be used on the southern portion.

A 4-inch HDPE pipeline would be connected from the vault and Baker tanks to the sewer manhole in the northwest portion of the RYS site. Pumps and appurtenances would be added to accommodate the expected flows.

Very truly yours,

Brown and Caldwell

Ronald W. Crites

Ronald W. Crites
Project Manager

REGISTERED PROFESSIONAL ENGINEER
RONALD W. CRITES
No. C21532
Exp. 09-30-15
CIVIL
STATE OF CALIFORNIA

RWC:iu

Attachment:

- Attachment 1:
  David Lamon, City of Marysville (personal communication, June 23, 2014)

From: David Lamon [mailto:dlamon@marysville.ca.us]
Sent: Wednesday, July 23, 2014 11:00 AM
To: skendall@recology.com; 'PGraham@recology.com'
Subject: Composting Runoff

I reviewed the possibility of the City accepting storm water runoff from the Recology composting area. We looked at both the water quality and potential quantity. There did not appear to be any issues with the water quality in terms of our ability to treat the runoff. The primary issue, as I indicated in our meeting, is the ability of the City system and treatment facility to treat an increased flow during a storm event.

We normally have an increase in influent flows at our plant as the result of a storm event due to inflow and infiltration into our system. We try to keep our I&I increased flow to 10-15% of dry weather flows. With a 100-year storm, the 24 hour rainfall would be 4.66". Over the 15 acre site, this would total 1.9 million gallons in a 24 hour period (MGD). The city's current dry weather flow is around 1.3 MGD. The only way we can accommodate such an increase in inflow to our system is to meter the runoff over an extended period of time.

Reviewing the rainfall information (http://www.co.sutter.ca.us/pdf/pw/design_standards/DS8_Section_5_Storm_Drainage_Revision.pdf), it appears that the 100-year storm total rainfall peaks around 4-8 days duration. Extending the discharge to around 15 days, the storage capacity peaks around day 5 of the storm records. Very roughly, we came up with the following:

1. Using an estimated outflow rate of 0.75 acre-feet (AF) per day, the 100 year rainfall totals (per day) show a peak detention requirement around day 5 at about 7.6 AF. With a continued outflow of 0.75 AF per day, the detained storm water would discharge in another 10 days, for a total design flow period of 15 days.
2. Looking at the outflow of 0.75 AF per day, this would translate to 0.38 cfs. Our lines in East Marysville are generally 8" with an average slope of around 0.3%. Flow capacity would calculate at 0.67 cfs. This indicates that the added flow would be about 60% of the pipe capacity. If existing flows exceed 0.27 cfs (40% of capacity), then the outflow from the detention basin would have to be reduced (extended over a longer period) or adjusted during the day to avoid peak domestic flows.

This should give you some rough numbers to use in looking at your options. In order for the City to accept flows under the conditions outlined, we would have to model our flows in East Marysville to determine if the final proposed flow rate from Recology and the point of connection could be handled without exceeding our pipeline capacities.

Please let me know if we can provide any additional information.

David Lamon, PE
City Services Director
City of Marysville
530-749-3902

ATTACHMENT 2
HYDROLOGY CALCULATIONS

Client	Recology	**Subject**	FRO Compost Pad		
Project	Yuba Sutter/FRO		Drainage	**Prepared By** JTK	**Date** 7/30/14
				Reviewed By KGH	**Date** 7/30/14
				Approved By KGH	**Date** 7/30/14

Objective

Design an improved surface water collection system for the Feather River Organics (FRO) composting facility at the Recology Yuba Sutter (RYS) facility in Marysville, California to contain runoff for a 3.16-inch, 24-hour storm event with 65,000 gallons per day being disposed of to the publically owned treatment works (POTW) connection located near the entrance of the RYS facility.

Design Criteria and Assumptions

Runoff collected in Hog Farm vaults is pumped to 4, 21,000-gallon Baker tanks (Tank Storage 1). Runoff collected from either sump on the southern compost area is pumped to a 2, 21,000 Baker tanks (Tank Storage 2). Water collected at both tank storage locations will be pumped to the POTW via pumps with flow meters.

1. The EPA SWMM method was used to model the compost site runoff using Autodesk's Storm and Sanitary Analysis (SSA) software.
2. Approximately 40 percent of the area is covered by compost piles on the compost pad.
3. Evaluate the SCS Type I distribution for a 3.16-inch storm with a duration of 24-hours.
4. The compost pad will be regraded to a 3-percent grade to the northwest.

Calculations

Subbasin Delineations

Subbasins were delineated based on existing major features at the site that would divide runoff and based on continued regrading being performed at the site.

Curve Numbers

Curve numbers were estimated based on compost piles or compost products that are stored on the site. Weighted curve numbers were assigned based on areas of storage piles and the working surface. The composting operation pad consists of a low-permeability, clayey soil intermixed with either an aggregate base or crushed, recycled concrete to create a relatively low-permeability working surface. These soils are assumed to be a soil group "C" type. The soils types for the Curve numbers are summarized on table 1 below.

Client Recology	**Subject** FRO Compost Pad	**Prepared By** JTK	**Date** 7/30/14
Project Yuba Sutter/FRO	Drainage	**Reviewed By** KGH	**Date** 7/30/14
		Approved By KGH	**Date** 7/30/14

Table 1 – Runoff Curve Numbers

Area I.D.	Area (%)	Surface Type	Soil Group	Individual Curve Number	Weighted Curve Number (CN)
Sub-01	60	Compacted Low-permeability soil surface	C	87	52.6
	40	Compost Pile	N/A	1	
Sub-02	60	Compacted Low-permeability soil surface	C	87	52.6
	40	Compost Pile	N/A	1	
Sub-03	60	Compacted Low-permeability soil surface	C	87	52.6
	40	Compost Pile	N/A	1	
Sub-04	60	Compacted Low-permeability soil surface	C	87	52.6
	40	Compost Pile	N/A	1	
Sub-06	60	Compacted Low-permeability soil surface	C	87	52.6
	40	Compost Pile	N/A	1	

Time of Concentration

The time of concentration for each subbasin was calculated within the SSA model using the EPA SWMM method as follows:

$$Tc = (0.94 * (L^{0.6}) * (n^{0.6})) / ((i^{0.4}) * (S^{0.3}))$$

Where:

Tc = Time of Concentration (min)
L = Flow Length (ft)
n = Manning's Roughness
i = Rainfall Intensity (in/hr)
S = Slope (ft/ft)

The SSA output files include the time of concentration calculations and are provided with this calculation attachment.

Rainfall Depths

A SCS Type I, 3.16-inch storm, 24-hour storm was modeled to estimate runoff for the compost pad and product storage areas. Table 2 shows estimated runoff depths for each area and total volume calculations based on the area of each subbasin

Client Recology	**Subject** FRO Compost Pad		
Project Yuba Sutter/FRO	Drainage	**Prepared By** JTK	**Date** 7/30/14
		Reviewed By KGH	**Date** 7/30/14
		Approved By KGH	**Date** 7/30/14

Table 2 – Runoff Volume Calculations

Description	Area (sf)	Runoff Depth for a 3.16-inch, 24-hour type I SCS storm (in.)	Runoff Volume (Gal.)
Sub-01	125,246	0.59	46,067
Sub-02	98,349	0.59	36,174
Sub-03	109,045	0.59	40,108
Sub-04	94,162	0.60	35,221
Sub-06	67,889	0.60	25,394
		Total Area Runoff =	**182,964**

As shown in Table 2 above, approximately 183,000 gallons of runoff will need to be managed for a 24-hour period for the design storm event. Allowing for 65,000 gallons of discharge to the POTW equals a total of approximately 118,000 gallons that will need to be stored for short-term duration. To store 118,000 gallons, a total of 6 Baker tanks will be required. The site already maintains three (3), 21,000 gallon capacity Baker tanks on site therefore, three (3) additional tanks with the same capacity will be required.

Conclusions

Golder modeled the system and concluded that the following improvements will need to be implemented for the site to be able to manage runoff for the design storm event:

1. Add a total of three (3) additional, 21,000 gallon capacity Baker tanks
2. Add a second vault within the Hog Farm and include two additional, 5-hp pumps
3. Add 4-inch diameter pipes from each tanks storage area that route water to the POTW
4. Include pump controls at each tank storage area with flow meters which will allow FRO to discharge 65,000 gpd maximum.
5. Connect each 6-inch diameter pipe from the northwestern berm to an 18-inch diameter pipe routed in the existing ditch. Connect the 18-inch diameter pipe to the existing vault at the Hog Farm.
6. Reroute the existing 24-inch diameter corrugate metal pipe from discharging into the existing Hog Farm vault to the relocated riprap pad (This pipe will only carry stormwater runoff from areas other than the compost pad

Autodesk® Storm and Sanitary Analysis 2014 - Version 8.1.46 (Build 1)

****
Project Description
****

File Name .... Discharge POTW 3pt16event r2.SPF

****
Analysis Options
****

Flow Units .... cfs
Subbasin Hydrograph Method. EPA SWMM
Infiltration Method .... SCS Curve Number
Link Routing Method .... Hydrodynamic
Storage Node Exfiltration.. None
Starting Date OCT-20-2013 00:00:00
Ending Date OCT-22-2013 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:05:00
Wet Time Step 00:05:00
Dry Time Step 01:00:00
Routing Time Step .... 2.00 sec

****
Element Count
****

Number of rain gages 1
Number of subbasins 5
Number of nodes 15
Number of links 15
Number of pollutants 0
Number of land uses 0

****
Subbasin Summary
****

Subbasin ID	Total Area ft²	Equiv. Width ft	Imperv. Area %	Average Slope %	Raingage
Sub-01	125246.39	311.60	0.00	3.0000	-
Sub-02	98348.50	308.48	0.00	3.0000	-
Sub-03	109044.70	321.23	0.00	3.0000	-
Sub-04	94161.79	500.00	0.00	3.0000	-
Sub-06	67889.08	500.00	0.00	3.0000	-

****
Node Summary
****

Node	Element	Invert	Maximum	Ponded	External

ID	Type	Elevation ft	Elev. ft	Area ft²	Inflow
Jun-01	JUNCTION	92.00	94.00	0.00	
Jun-02	JUNCTION	91.00	93.00	0.00	
Jun-03	JUNCTION	89.00	91.00	0.00	
Jun-07	JUNCTION	87.00	200.00	0.00	
Outlet_HF	JUNCTION	88.34	91.34	0.00	
Out-01	OUTFALL	78.00	85.00	0.00	
Out-04	OUTFALL	0.00	7.00	0.00	
Out-POTW1	OUTFALL	92.00	100.50	0.00	
Out-POTW2	OUTFALL	92.00	100.00	0.00	
2_Tanks_South	STORAGE	100.00	108.00	0.00	
4-baker_tanks_HF	STORAGE	92.00	100.50	0.00	
Jensen_Tank1_exist	STORAGE	79.00	86.00	0.00	
Jensen_Vault2	STORAGE	76.00	83.00	0.00	
SE_Sump	STORAGE	80.00	86.00	0.00	
SW_Sump	STORAGE	80.00	86.00	0.00	

****
Link Summary
****

Link ID	From Node	To Node	Element Type	Length ft	Slope %	Manning's Roughness
Link-04	Jun-01	Jun-02	CONDUIT	446.1	0.2242	0.0150
Link-05	Jun-02	Jun-03	CONDUIT	395.3	0.5060	0.0150
Link-09	Jun-03	Outlet_HF	CONDUIT	540.0	0.1213	0.0150
Link-11	Outlet_HF	Jensen_Tank1_exist	CONDUIT	40.0	6.4875	0.0240
Link-14	Jensen_Tank1_exist	Jensen_Vault2	CONDUIT	20.0	10.0000	0.0240
pipe_Vault-to-tank	4-baker_tanks_HF	Jun-07	CONDUIT	260.7	6.1364	0.0150
Pump-08	Jensen_Vault2	Jun-07	TYPE3 PUMP			
Pump-10	Jensen_Vault2	Jun-07	TYPE3 PUMP			
Pump-Exist	Jensen_Tank1_exist	Jun-07	TYPE3 PUMP			
SE_Sump_Pump	SE_Sump	2_Tanks_South	TYPE3 PUMP			
SW_Sump_Pump	SW_Sump	2_Tanks_South	TYPE3 PUMP			
Orifice-01	Jensen_Vault2	Out-01	ORIFICE			
Orifice-02	Jensen_Vault2	Out-04	ORIFICE			
Weir-01	2_Tanks_South	Out-POTW2	WEIR			
Weir-02	4-baker_tanks_HF	Out-POTW1	WEIR			

****
Cross Section Summary
****

Link ID	Shape	Depth/ Diameter ft	Width ft	No. of Barrels	Cross Sectional Area ft²	Full Flow Hydraulic Radius	Design Flow Capacity

```
      ft           cfs

------------------------------------------------------------------------------------
----------------------
  Link-04          CIRCULAR          1.50          1.50          1          1.77
      0.38         4.31
  Link-05          CIRCULAR          1.50          1.50          1          1.77
      0.38         6.48
  Link-09          CIRCULAR          2.00          2.00          1          3.14
      0.50         6.83
  Link-11          CIRCULAR          2.00          2.00          1          3.14
      0.50        31.21
  Link-14          CIRCULAR          2.00          2.00          1          3.14
      0.50        38.75
  pipe_Vault-to-tank FORCE_MAIN        0.50          0.50          1          0.20
        0.13          2.50

  **************************        Volume         Depth
  Runoff Quantity Continuity       acre-ft        inches
  **************************     ---------       -------
  Total Precipitation ......         2.991         3.160
  Evaporation Loss .........         0.000         0.000
  Infiltration Loss ........         2.392         2.527
  Surface Runoff ...........         0.563         0.595
  Final Surface Storage ....         0.036         0.038
  Continuity Error (%) .....        -0.001

  **************************        Volume        Volume
  Flow Routing Continuity          acre-ft      Mgallons
  **************************     ---------     ---------
  Dry Weather Inflow .......         0.000         0.000
  Wet Weather Inflow .......         0.563         0.184
  Groundwater Inflow .......         0.000         0.000
  RDII Inflow ..............         0.000         0.000
  External Inflow ..........         0.000         0.000
  External Outflow .........         0.186         0.061
  Surface Flooding .........         0.000         0.000
  Evaporation Loss .........         0.000         0.000
  Initial Stored Volume ....         0.000         0.000
  Final Stored Volume ......         0.372         0.121
  Continuity Error (%) .....         0.784

  ******************************************
  Composite Curve Number Computations Report
  ******************************************

  ------------------
  Subbasin Sub-01
  ------------------

                                                              Area           Soil
  Soil/Surface Description                                   (ft²)          Group
   CN

------------------------------------------------------------------------------------
----
  COMPACT_CLAYEY-LOAM_SOIL(ACCESS_ROAD)                    71269.67            -
87.00
  COMPOST_PILE                                             47513.14            -
 1.00
  Composite Area & Weighted CN                            118782.81
```

52.60

Subbasin Sub-02

```
                                                              Area          Soil
Soil/Surface Description                                      (ft²)         Group
 CN
----------------------------------------------------------------------------------------
----
COMPACT_CLAYEY-LOAM_SOIL(ACCESS_ROAD)                       54911.12          -
87.00
 -                                                          36607.41          -
 1.00
Composite Area & Weighted CN                                91518.54
52.60
```

Subbasin Sub-03

```
                                                              Area          Soil
Soil/Surface Description                                      (ft²)         Group
 CN
----------------------------------------------------------------------------------------
----
COMPACT_CLAYEY-LOAM_SOIL(ACCESS_ROAD)                       61224.20          -
87.00
 -                                                          40816.12          -
 1.00
Composite Area & Weighted CN                               102040.33
52.60
```

Subbasin Sub-04

```
                                                              Area          Soil
Soil/Surface Description                                      (ft²)         Group
 CN
----------------------------------------------------------------------------------------
----
Dirt roads                                                  58583.48          C
87.00
 -                                                          39055.65          -
 1.00
Composite Area & Weighted CN                                97639.13
52.60
```

Subbasin Sub-06

```
                                                              Area          Soil
Soil/Surface Description                                      (ft²)         Group
 CN
----------------------------------------------------------------------------------------
----
Dirt roads                                                  41220.57          C
87.00
 -                                                          27480.41          -
 1.00
```

```
  Composite Area & Weighted CN                                     68700.99
52.60


  ****************************************************
  EPA SWMM Time of Concentration Computations Report
  ****************************************************

          Tc = (0.94 * (L^0.6) * (n^0.6)) / ((i^0.4) * (S^0.3))

          Where:

          Tc = Time of Concentration (min)
          L  = Flow Length (ft)
          n  = Manning's Roughness
          i  = Rainfall Intensity (in/hr)
          S  = Slope (ft/ft)

  ------------------
  Subbasin Sub-01
  ------------------

          Flow length (ft):                                 401.96
          Pervious Manning's Roughness:                    0.10000
          Impervious Manning's Roughness:                  0.01500
          Pervious Rainfall Intensity (in/hr):             0.13167
          Impervious Rainfall Intensity (in/hr):           0.13167
          Slope (%):                                       3.00000
          Computed TOC (minutes):                            55.58

  ------------------
  Subbasin Sub-02
  ------------------

          Flow length (ft):                                 318.83
          Pervious Manning's Roughness:                    0.10000
          Impervious Manning's Roughness:                  0.01500
          Pervious Rainfall Intensity (in/hr):             0.13167
          Impervious Rainfall Intensity (in/hr):           0.13167
          Slope (%):                                       3.00000
          Computed TOC (minutes):                            48.36

  ------------------
  Subbasin Sub-03
  ------------------

          Flow length (ft):                                 339.47
          Pervious Manning's Roughness:                    0.10000
          Impervious Manning's Roughness:                  0.01500
          Pervious Rainfall Intensity (in/hr):             0.13167
          Impervious Rainfall Intensity (in/hr):           0.13167
          Slope (%):                                       3.00000
          Computed TOC (minutes):                            50.22

  ------------------
  Subbasin Sub-04
  ------------------

          Flow length (ft):                                 188.33
          Pervious Manning's Roughness:                    0.10000
          Impervious Manning's Roughness:                  0.01500
          Pervious Rainfall Intensity (in/hr):             0.13167
          Impervious Rainfall Intensity (in/hr):           0.13167
```

```
        Slope (%):                                       3.00000
        Computed TOC (minutes):                            35.26

  ------------------
  Subbasin Sub-06
  ------------------

        Flow length (ft):                                135.78
        Pervious Manning's Roughness:                    0.10000
        Impervious Manning's Roughness:                  0.01500
        Pervious Rainfall Intensity (in/hr):             0.13167
        Impervious Rainfall Intensity (in/hr):           0.13167
        Slope (%):                                       3.00000
        Computed TOC (minutes):                            28.98

  ***********************
  Subbasin Runoff Summary
  ***********************


----------------------------------------------------------------------------------
--------------------
  Subbasin               Total      Total      Total      Total      Total      Peak
Runoff       Time of
  ID                  Rainfall     Runon      Evap.     Infil.     Runoff     Runoff
Coefficient  Concentration
                            in         in         in         in         in        cfs
       days  hh:mm:ss
----------------------------------------------------------------------------------
--------------------
  Sub-01                  3.16       0.00       0.00       2.53       0.59       0.22
 0.186    0  00:55:34
  Sub-02                  3.16       0.00       0.00       2.53       0.59       0.19
 0.188    0  00:48:21
  Sub-03                  3.16       0.00       0.00       2.53       0.59       0.20
 0.187    0  00:50:13
  Sub-04                  3.16       0.00       0.00       2.53       0.60       0.22
 0.190    0  00:35:15
  Sub-06                  3.16       0.00       0.00       2.51       0.60       0.18
 0.191    0  00:28:58
----------------------------------------------------------------------------------
--------------------


  ******************
  Node Depth Summary
  ******************


----------------------------------------------------------------------------------
-----
  Node            Average    Maximum    Maximum    Time of Max      Total      Total
Retention
  ID                Depth      Depth        HGL     Occurrence    Flooded       Time
  Time
                 Attained   Attained   Attained                    Volume    Flooded

                       ft         ft         ft    days   hh:mm   acre-in    minutes
hh:mm:ss
```

Jun-01	0.05	0.22	92.22	0	10:54	0	0	0:00:00
Jun-02	0.05	0.25	91.25	0	10:54	0	0	0:00:00
Jun-03	0.13	0.55	89.55	0	10:59	0	0	0:00:00
Jun-07	11.10	37.07	124.07	0	11:05	0	0	0:00:00
Outlet_HF	0.04	0.20	88.54	0	11:01	0	0	0:00:00
Out-01	0.00	0.00	78.00	0	00:00	0	0	0:00:00
Out-04	0.00	0.00	0.00	0	00:00	0	0	0:00:00
Out-POTW1	0.00	0.00	92.00	0	00:00	0	0	0:00:00
Out-POTW2	0.00	0.00	92.00	0	00:00	0	0	0:00:00
2_Tanks_South	5.52	7.50	107.50	0	20:18	0	0	0:00:00
4-baker_tanks_HF	5.63	8.00	100.00	0	18:57	0	0	0:00:00
Jensen_Tank1_exist	1.68	4.16	83.16	0	11:05	0	0	0:00:00
Jensen_Vault2	1.39	2.00	78.00	0	11:34	0	0	0:00:00
SE_Sump	1.16	5.13	85.13	0	10:57	0	0	0:00:00
SW_Sump	1.02	2.04	82.04	0	10:22	0	0	0:00:00

****
Node Flow Summary
****

Node ID	Element Type	Maximum Lateral Inflow cfs	Peak Inflow cfs	Time of Peak Inflow Occurrence days	Time of Peak Inflow Occurrence hh:mm	Maximum Flooding Overflow cfs	Time of Peak Flooding Occurrence days	Time of Peak Flooding Occurrence hh:mm
Jun-01	JUNCTION	0.20	0.20	0	10:48	0.00		
Jun-02	JUNCTION	0.19	0.39	0	10:49	0.00		
Jun-03	JUNCTION	0.22	0.61	0	10:54	0.00		
Jun-07	JUNCTION	0.00	0.99	0	11:05	0.00		
Outlet_HF	JUNCTION	0.00	0.61	0	11:00	0.00		
Out-01	OUTFALL	0.00	0.00	0	00:00	0.00		
Out-04	OUTFALL	0.00	0.00	0	00:00	0.00		
Out-POTW1	OUTFALL	0.00	0.99	0	18:57	0.00		
Out-POTW2	OUTFALL	0.00	0.36	0	20:18	0.00		
2_Tanks_South	STORAGE	0.00	0.38	0	10:41	0.00		
4-baker_tanks_HF	STORAGE	0.00	0.99	0	11:05	0.00		
Jensen_Tank1_exist	STORAGE	0.00	0.61	0	11:01	0.00		
Jensen_Vault2	STORAGE	0.00	0.44	0	11:05	0.00		

SE_Sump	STORAGE	0.22	0.22	0	10:30	0.00
SW_Sump	STORAGE	0.18	0.18	0	10:24	0.00

****
Storage Node Summary
****

Storage Node ID	Maximum Ponded Volume 1000 ft³	Maximum Ponded Volume (%)	Time of Max Ponded Volume days hh:mm	Average Ponded Volume 1000 ft³	Average Ponded Volume (%)	Maximum Storage Node Outflow cfs	Maximum Exfiltration Rate cfm	Time of Max. Exfiltration Rate hh:mm:ss	Total Exfiltrated Volume 1000 ft³
2_Tanks_South	4.958	94	0 20:18	3.651	69	0.36	0.00	0:00:00	0.000
4-baker_tanks_HF	10.572	94	0 18:57	7.434	66	0.99	0.00	0:00:00	0.000
Jensen_Tank1_exist	0.367	55	0 11:05	0.137	21	0.65	0.00	0:00:00	0.000
Jensen_Vault2	0.683	29	0 11:34	0.474	20	0.82	0.00	0:00:00	0.000
SE_Sump	0.026	85	0 10:57	0.006	19	0.20	0.00	0:00:00	0.000
SW_Sump	0.010	34	0 10:22	0.005	17	0.19	0.00	0:00:00	0.000

****
Outfall Loading Summary
****

Outfall Node ID	Flow Frequency (%)	Average Flow cfs	Peak Inflow cfs
Out-01	0.00	0.00	0.00
Out-04	0.00	0.00	0.00
Out-POTW1	13.64	0.21	0.99
Out-POTW2	9.79	0.19	0.36
System	5.86	0.40	1.33

****
Link Flow Summary
****

Link ID	Element Type	Time of Peak Flow	Maximum Velocity	Length Factor	Peak Flow during	Design	Ratio of	Ratio of	Total	Reported

```
Flow    Maximum    Maximum          Time  Condition
                                    Occurrence  Attained            Analysis
Capacity   /Design       Flow  Surcharged
                                    days hh:mm    ft/sec                 cfs
cfs       Flow      Depth     minutes

---------------------------------------------------------------------------------------
---------------------------------------------
  Link-04                   CONDUIT      0  10:54      1.14     1.00         0.20
4.31      0.05       0.16              0  Calculated
  Link-05                   CONDUIT      0  10:54      1.17     1.00         0.39
6.48      0.06       0.27              0  Calculated
  Link-09                   CONDUIT      0  11:00      1.52     1.00         0.61
6.83      0.09       0.19              0  Calculated
  Link-11                   CONDUIT      0  11:01      3.82     1.00         0.61
31.21      0.02       0.10             0  Calculated
  Link-14                   CONDUIT      0  11:05      4.01     1.00         0.44
38.75      0.01       0.08             0  Calculated
  pipe_Vault-to-tank        CONDUIT      0  11:05      6.54     1.00         0.99
2.50      0.39       0.72              0  Calculated
  Pump-08                   PUMP         0  11:27                            0.82
       0.85                       128
  Pump-10                   PUMP         0  00:00                            0.00
       0.00                         0
  Pump-Exist                PUMP         0  10:26                            0.21
       1.00                       887
  SE_Sump_Pump              PUMP         0  10:50                            0.20
       0.94                       451
  SW_Sump_Pump              PUMP         0  10:06                            0.19
       0.91                       329
  Orifice-01                ORIFICE      0  00:00                            0.00
                 0.00
  Orifice-02                ORIFICE      0  00:00                            0.00
                 0.00
  Weir-01                   WEIR         0  20:18                            0.36
                 0.00
  Weir-02                   WEIR         0  18:57                            0.99
                 0.01
```

```
***************************
Flow Classification Summary
***************************
```

Link	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
	--- Fraction of Time in Flow Class ----								
Link-04	0.63	0.02	0.00	0.35	0.00	0.00	0.00	0.16	0.0000
Link-05	0.59	0.04	0.00	0.37	0.00	0.00	0.00	0.10	0.0000
Link-09	0.21	0.38	0.00	0.41	0.00	0.00	0.00	0.17	0.0000
Link-11	0.21	0.00	0.00	0.00	0.00	0.00	0.79	0.68	0.0000
Link-14	0.73	0.00	0.00	0.00	0.00	0.00	0.27	0.55	0.0000
pipe_Vault-to-tank	0.22	0.48	0.00	0.00	0.00	0.30	0.00	0.22	0.0013

```
*************************
Highest Continuity Errors
*************************
Node Jun-07 (1.73%)
```

```
*****************************
Time-Step Critical Elements
*****************************
None

**********************************
Highest Flow Instability Indexes
**********************************
Link Pump-Exist (2)
Link pipe_Vault-to-tank (2)


**************************
Routing Time Step Summary
**************************
Minimum Time Step           :      2.00 sec
Average Time Step           :      2.00 sec
Maximum Time Step           :      2.00 sec
Percent in Steady State     :      0.00
Average Iterations per Step :      2.11



  WARNING 108 : Surcharge elevation defined for Junction Jun-07 is below junction
maximum elevation. Assumed surcharge elevation equal to maximum elevation.
  WARNING 110 : Initial water surface elevation defined for Storage Node
Jensen_Vault2 is below storage node invert elevation.
              Assumed initial water surface elevation equal to invert elevation.

  Analysis began on:  Mon Jul 28 13:06:51 2014
  Analysis ended on:  Mon Jul 28 13:06:54 2014
  Total elapsed time: 00:00:03
```

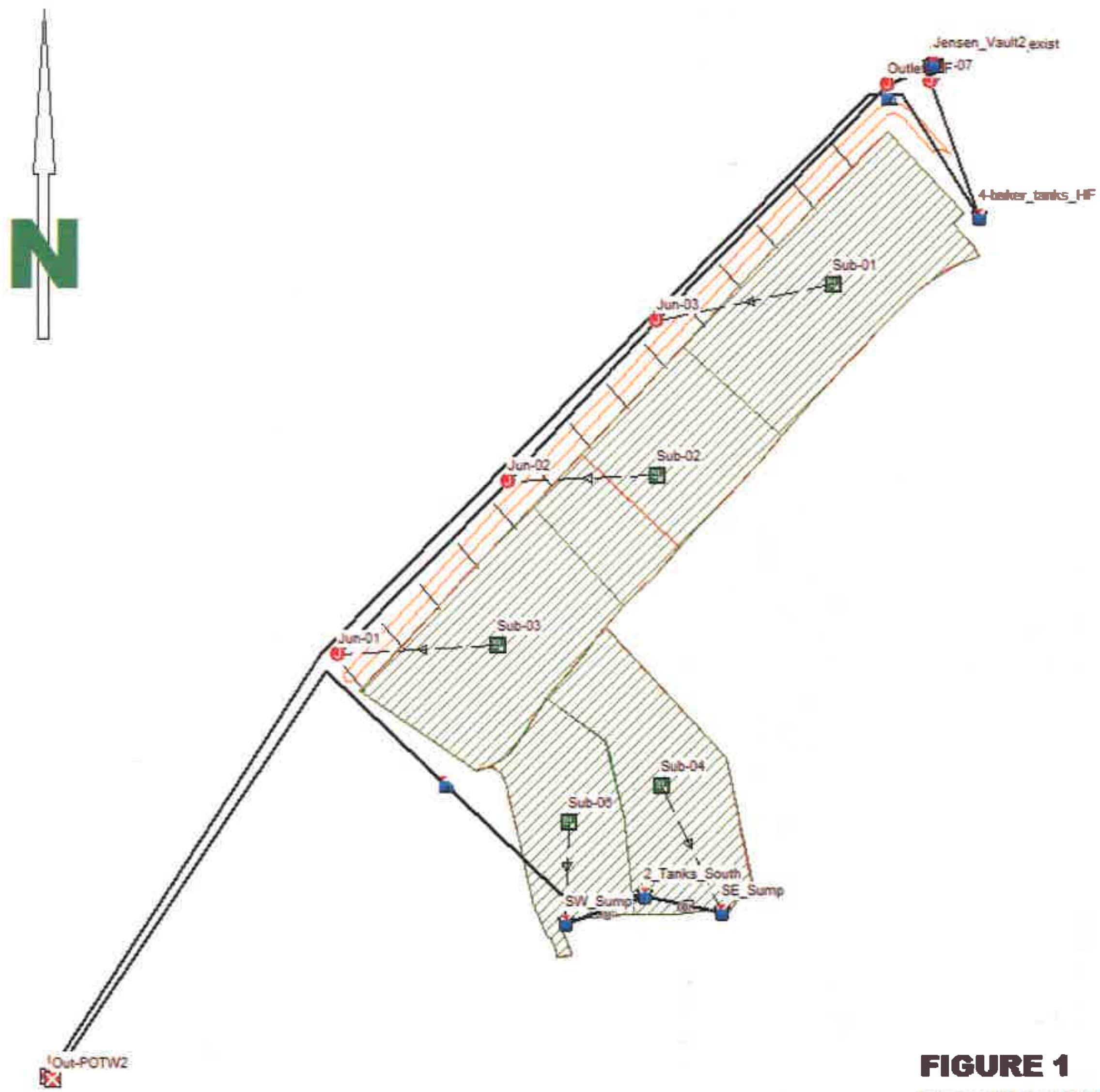


FIGURE 1
FEATHER RIVER ORGANICS
SUB-BASIN DRAINAGE MAP