4. Collection

This chapter presents an assessment of the existing waste and recycling collection systems in the Town of Apple Valley and the City of Victorville. This assessment has two objectives:

- Identify strategies to improve solid waste and recycling collection practices; and
- Identify potential to separately collect food waste and landscape waste.

An important element of the residential recycling system in Victorville and Apple Valley is the collection program for source separated recyclables, collected at the curb in wheeled carts (carts) once per week. All other materials are collected from waste carts in a separate curbside collection program. Organic waste, including food waste and landscape waste, is collected along with other waste from residences and from non-residential sources, except where generators such as landscape contractors and residents collect it separately and transport it to the Victorville Landfill (Landfill) or the California Bio-Mass Facility (CA Bio-Mass) near Victorville. Separate collection of organic waste from generators would represent a potential recycling element that is not included in the current system for either community. Waste collection from non-residential sources is collected in a separate system, due to the need for various-sized containers to meet these generators' needs. This chapter presents three topics:

- An assessment of the collection system the contractor has implemented;
- An assessment of customer service management; and
- Conclusions and recommendations to advance recycling activities, including potential revisions to the franchise agreement, potential revisions to other aspects of the collection system, and the potential for separate collection of food waste and landscape waste.

4.1 Contracted Collection System

Burrtec Waste Industries, Inc., a private company, holds the franchise agreement for the collection of waste and recyclables for both Victorville and Apple Valley. The Burr family started the collection company in 1955, and it continues to be owned and operated by the Burr family, with Cole Burr currently serving as president of the company. The franchise arrangements between the City of Victorville and the Town of Apple Valley are with Victorville Disposal, Inc. and AVCO Disposal, Inc., respectively, each of which is owned by Burrtec Waste Industries, Inc., referred to as "Burrtec" throughout this section unless otherwise noted.

The trucks and crews that service these two jurisdictions are based at a yard located at 17080 Stoddard Wells Road in Victorville, located between the Victorville Landfill and the Victor Valley MRF.

The first step in this assessment involved a GBB Team representative making site visits in Apple Valley and Victorville between November 16 and November 19, 2008, specifically to view collections of waste and recyclables in these two jurisdictions. The GBB Team representative rode with the contractor's route supervisors; met with the contractor's collection crews at roll call; made site visits to the Landfill, MRF, and a Victorville school which collects recyclables; interviewed Burrtec representatives from

Apple Valley, Victorville, Burrtec, Engineered Compost Systems, and the Mojave Desert & Mountain Joint Powers Authority; as well as rode through Helendale, Silver Lakes, Oro Grande, and Phelan.

4.1.1 Description of Franchised Collection Services

Apple Valley and Victorville each entered into franchise agreements with Burrtec in 1995 to take waste from commercial and residential customers in these jurisdictions to the Victorville Landfill. The Victorville Landfill is owned by San Bernardino County and, since July 2001, has been operated by Burrtec.[1] The franchise contract also provides for Burrtec to collect recyclables and transport them to the Victor Valley Materials Recovery Facility (MRF) where they are processed and shipped to end-users.

Photo 4-1: Same day collection of waste and recycling carts

The collection services include once-per-week collection of waste and recycling from residential customers using Automatic Side Loaders (ASLs). Blue 60-gallon carts are used for the collection of aluminum and tin cans, glass bottles and jars, plastic bottles, jars, tubs and trays, including rigid polymer types 1 through 7, and all types of dry, clean paper. Green 95-gallon carts are used for the collection of waste which includes animal waste, bathroom waste, tissues, diapers, food waste, yard waste, garden and tree trimmings, grass clippings, weeds, dirty, soiled and wet paper products, plastic bags, expanded plastic, and other non-recyclable discarded items.

Photo 4-2: ASL collecting a blue recycling cart.

As Photo 4-1 shows, waste and recycling residential collections are both on the same day. All routes are collected using ASLs using one crew member (a driver) to collect the routes, as shown in Photo 4-2.

Commercial and multi-family collection containers include carts, front-load boxes, (known as bins), roll-off boxes and self-contained compactors. The service times and configuration of containers vary depending upon the need of the customer and the space limitations. There may be apartment buildings, as an example, using a bin for waste, another bin for recycling, while another building uses a blue cart for recycling. Other customers may use roll-off boxes for construction and demolition waste, 40-cubic-yard boxes for OCC, and bins for waste.

[1] This contract is for all of San Bernardino County's solid waste disposal facilities which includes active and closed landfills, community collection centers, and transfer stations. (Source: Burrtec website: http://www.burrtec.com/2_bur_landfill.php)

Photo 4-3: OCC and waste compactors

Photo 4-3 show one commercial customer in the Town of Apple Valley with a compactor for waste and another for OCC, and Photo 4-4 illustrates various front-load box sizes on their way to customers.

Burrtec also collects bulky items by appointment. Residents call directly to Burrtec's Team representatives who then make an appointment for the collection of such items as mattresses, furniture, stoves, and refrigerators. Each resident can schedule two such collections a year with up to five items placed out for each of those collections. Burrtec employees separate materials set out by recyclable and non-recyclable. Mattresses are transported to the Burrtec yard and then set off to the side for a mattress reclaimer to collect. Other recyclable materials also are transported to the Burrtec yard. Refrigeration-type appliances have Freon extracted from them, if necessary, and along with other metal recyclable items, are sent to scrap dealers. Non-recyclable materials collected are transported to the Landfill.

Photo 4-4: Bin delivery vehicle

Photo 4-5 shows mattresses at the Burrtec yard stored in an overseas container to protect them from the weather until the company reclaiming mattresses can collect them. Photo 4-6 shows the excess mattresses that are stacked waiting to be transported. Photo 4-7 shows a bulky collection vehicle with mattresses and a freezer on board. The collection vehicle is backed up to Burrtec's Rear-load waste truck and has fed the latter's compactor unit with broken furniture to be taken to the Landfill.

Photo 4-5: Mattresses to Be Recycled

Photo 4-6: Excess Mattresses

Photo 4-7: Bulky Waste Truck Unloading into Rear-load Truck

Burrtec also provides a collection service called Commercial Select: commercial accounts with bins or boxes of loads of waste that Burrtec deems to be rich with recyclable material. Burrtec collects these containers on routes specially designed just for these customers and takes them to the Victor Valley MRF.

Commercial Select customers can be a one-time collection. However, typically, they all are regular customers whose waste loads have been collected over time and the driver and route supervisor or City inspector recommend them because of the consistent content of the waste. However, when the content of a Commercial Select container is primarily waste material, contains food waste, or is especially grimy, then the driver and route supervisor will no longer have it collected as Commercial Select but will have it collected on a route that is destined for the Landfill.

Beyond route waste and recyclable collection using carts, Burrtec provides collection service to residents of the two jurisdictions using bins. Photo 4-8 shows an inventory of Burrtec bins ready to be delivered to customers. Photo 4-9 shows Burrtec carts being pulled from the inventory to deliver to a customer. Photo 4-10 shows Burrtec's cart wash rack to sanitize carts before being delivered.

Photo 4-8: Bin Inventory

Photo 4-9: Carts

Photo 4-10: Cart Wash Rack

Table 4-1 summarizes the collection services for waste and recycling that Burrtec provides to the jurisdictions.

Table 4-1 – Burrtec Collection Services

Service Type	Service Frequency, Collections/Week	Service Container Type / Size	Service Collection Vehicle Type
Residential Curbside Recycling	1	Cart: 60 gallon	Automatic Side Loader (ASL)
Residential Waste	1	Cart: 95 and 35 gallon	ASL
Commercial Waste	1 or more	Bin (Front-load box): 1.5, 2, 3, 4 cubic yard (cy)	Front-end Loader
Commercial Waste	1 or more	Cart: 95 gallon	ASL
Commercial Recycling	1 or more	Cart and/or Bin: 95 and 60 gallon and 1.5, 2, 3, 4, cy	ASL and Front-end Loader
Multi Family Dwelling	1 or more	Cart and/or Bin: 95 and 60 gallon and 1.5, 2, 3, 4, cy	Front-end Loader and ASL
Roll-off & Compactor Waste and Recycling	Varies	10, 20, 30, 40 cy	Roll-off Truck
Commercial Select Loads	1 or more	Roll-off boxes and Bins	Roll-off Truck and Front-end Loader
Bulky Waste	Varies	Not Containerized	Trailers, Flat Beds, and Box Trucks

Beyond service collection activity, under the franchise arrangement between Burrtec and the Town of Apple Valley, Burrtec provides a customer call center and the billing activities for the Town's customers while the City of Victorville keeps these operations in-house with the exception of having all residential calls roll over to Burrtec each Friday. Burrtec tracks the calls and has the ability to report to the jurisdiction the number and type of calls received, as well as the result of any work done based on a call. Burrtec also provides an additional service to the Town of Apple Valley by having one of its sales representatives develop interest in recycling by potential customers. The Burrtec representative is not stationed in the High Desert area but periodically drives in from the Burrtec facility in Fontana.

4.1.2 Crews and Equipment

Photo 4-11: Roll call

GBB went to the Burrtec yard at 4:30 a.m. on Monday, November 17, to be at the roll call for the drivers of the bin collection routes. As with the residential collection that begins at 6 a.m., many of the drivers came to work early to talk and eat with fellow employees. There appeared to be a sense of camaraderie and good fellowship among the crews whose members appeared to be longstanding employees making a career in solid waste. The route supervisor gave a safety talk at each roll call, commercial and residential, and provided information on Burrtec activities. Drivers took the work order slips left for them by the Burrtec customer service operations the day before and went through their route sheets adding and deleting collection customers as necessary as shown in Photo 4-11. The drivers then went to the yard and began a pre-trip inspection, as best they could in total darkness, and warmed up their trucks, as illustrated in Photo 4-12.

Photo 4-12: Burrtec drivers inspected the collection vehicles as best they could in the dark before leaving onto the collection route (photo taken in emerging daylight)

The route supervisor, and all of Burrtec's officials, allowed the GBB representative total freedom to walk around its yard operations and discuss work activities with anyone and everyone. There was no appearance of hesitation on Burrtec employees' part about this access. Employees appeared to welcome the informal discussions with the GBB Team representative and seemed to discuss freely their thoughts on the operations with which they are involved. No negative comments were made by them regarding Burrtec or the jurisdictions.

The most common concern of these drivers, however, was the amount of soil and gravel they find in the residential carts, both waste and recycling. Many recounted how they can often tell by the tension in the hydraulic controls that operate the gripper, which grabs around the cart before lifting and dumping it, if the cart has significant dirt and gravel in it because of the weight such material will add to these collections. At that point, the drivers say they do not pick up the cart, but get out and visually check the contents; if dirt and gravel are found, they tag and notify the route

supervisor. Unfortunately, these drivers say, there can be significant dirt and gravel in the cart but not enough weight to cause the same level of tension in the controls that would warn the driver of the contents. The drivers would like to see more education to the customers to instruct them to not place dirt and gravel into carts.

Photo 4-13: Drivers Complain of Dirt and Gravel in Carts

Although there are occasional cul-de-sacs, stretches of neighborhood roads, and small neighborhoods that have houses with green lawns, bushes, and small trees, the majority of places viewed had dirt yards decorated with rocks of various colors. Residents evidently clean their yards and dump dirt and gravel from these cleaning activities into the waste carts. Photo 4-13 illustrates these kinds of yards.

At the time of GBB's visit to the site, Burrtec had the following types and quantity of trucks operational:

- Front loaders for commercial bin collections (Quantity – 22),
- ASLs for residential waste and recycling cart collections (Quantity – 34),
- Roll-off trucks for box collections (Quantity – 10),
- Rear-load waste truck for yard use only (Quantity – 1),
- Box trucks to deliver carts (Quantity – 7), and
- Trucks and trailers to collect bulky material which are illustrated in Photos 4-14 to 4-18 (Quantity not identified).

The trucks appeared well maintained and clean.

Photo 4-14: Front-end Loader

Photo 4-15: Box Truck

Photo 4-16: Roll-off Truck

Photo 4-17: Automatic Side Loader (ASL)

4.1.3 Collection Route Data

In 2008, Burrtec route supervisors began to keep recycling and waste collection statistics on a per-route basis. Burrtec provided collection statistic data for one week for each community to GBB, and from that data, the following summary tables have been created. Tables 4-2 and 4-3 compare the residential waste collection in Apple Valley and Victorville. Apple Valley has approximately 19,517 residential accounts for waste and recycling collection, including multi-family units with green carts for waste and blue carts for recycling. Apple Valley also has approximately 639 commercial box waste accounts, 80 commercial-recycling-only accounts, and 146 Commercial Select accounts.

The City of Victorville has approximately 26,136 residential accounts for waste and recycling collection, including multi-family units with green carts for waste and blue carts for recycling. The City also has approximately 1,445 front-loader bin accounts, that include 1,254 waste-only accounts, 191 Commercial Select accounts, and 495 Commercial Recycle Route accounts that also have waste or Commercial Select service. Among the bin accounts are approximately 65 apartment complexes with 10 or more units, with the number of units ranging from 10 to 400.

Also, Victorville has 80 "Commercial Can" accounts that use the green/blue carts for waste and recycling collection, although a few of these accounts are "Recycle Only" accounts, with waste collection provided by the bin service. The City has approximately 58 roll-off compactor box customers.

Crews for each are operating approximately 10 hours a day. AVCO's (Town of Apple Valley residents) are spread over a greater distance than those by Victorville Disposal, thereby accounting for the fact that AVCO collected from nearly 300 less units per day than their counterparts in Victorville. The amount of waste collected per customer, on average, ranges from nearly 32 to 46 lbs in Apple Valley and 39 to 45 in Victorville.

Table 4-2 - Apple Valley Residential Waste

Waste	Monday	Tuesday	Wed.	Thursday	Friday	*Total*
Trucks Operating	6	6	6	6	6	***30***
Total Tons	92.24	70.54	68.29	82.27	83.48	***396.8***
Avg. Tons Per Truck	15.37	11.76	11.38	13.71	13.91	***13.23***
Total Customers	4,225	4,425	4,054	3,574	3,731	***20,009***
Avg. Customers Per Truck	704	738	676	596	622	***667***
Avg. Lbs. Per Customers	43.66	31.88	33.69	46.04	44.75	**39.7**
Times Each Truck Unloaded	2	2	2	2	2	***60***
No. of 3rd Loads	0	0	0	0	0	***0***
Total Hours Per Day	58.25	59.75	59.75	56	58.5	***292.3***
Avg. Hours Per Truck	9.71	9.96	9.96	9.33	9.75	***9.7***

Note: Collection Statistics for Week of November 3 through 7, 2008

Table 4-3 - Victorville Residential Waste

	Monday	Tuesday	Wed.	Thursday	Friday	Total
Trucks & Routes	6	6	6	6	6	**30**
Total Tons	119.14	127.04	119.86	135.94	112.03	**614.01**
Avg. Tons Per Truck	19.86	21.17	19.98	22.66	18.67	**20.5**
Total Customers	5,663	5,804	5,713	6,025	5,780	**28,985**
Avg. Customers Per Truck	944	967	952	1,004	963	**966**
Avg. Lbs. Per Customer	42.08	43.78	41.96	45.13	38.76	**42.4**
Times Each Truck Unloaded	2	2	2	2	2	**60**
No. of 3rd Loads	1	2	0	2	0	**5**
Total Hours	59	56.5	59.75	71.75	60.25	**307.3**
Avg. Hours Per Day Per Truck	9.83	9.42	9.96	11.96	10.04	**10.2**

Note: Collection Statistics for Week of November 17 through 21, 2008

Tables 4-4 and 4-5 compare the residential recycling collection in Apple Valley and Victorville. AVCO's average quantity of recyclables per set-out collected is 12.5 pounds compared with waste collected per customer of nearly 40 pounds per customer. Victorville Disposal collects an average of 8.7 pounds of recyclables per customer, a third less than AVCO, compared with 42.4 pounds of waste per week.

Data points provided are for a week during a month known, in general, for heavy waste generation and may not be a true representation of annual average quantities. Recyclable quantities also may be slightly higher in the months of November and December than at other times of the year. Quantities of recyclables over the entire FY2008 for AVCO-serviced (Apple Valley) households represented 22 percent of their total waste set out and 18 percent for Victorville. Households pay for the privilege to set their carts at the curb approximately four times a month but actually only do so when the cart is full or nearly full, thereby creating average quantities presented in Tables 4-4 and 4-5.

Table 4-4 - Apple Valley Residential Recycling Collection Data

AVCO: Residential Recycling	Monday	Tuesday	Wed.	Thur.	Friday	*Total*
Trucks & Routes	4	3	4	4	4	***19***
Total Tons	31.95	22.67	25.49	25.25	22.19	***127.6***
Avg. Tons Per Truck	7.99	7.56	6.37	6.31	5.55	***6.71***
Total Customers	4,324	4,454	4,170	3,681	3,784	***20,413***
Avg. Customers Per Truck	1,081	1,485	1,043	920	946	***1,074***
Avg. Lbs. Per Customer	14.78	10.18	12.23	13.72	11.73	***12.5***
First Unloading	4	3	4	4	4	***19***
Second Unloading	4	3	2	1	1	***11***
Total Hours	41.50	41.50	40.00	38.75	42.75	***204.5***
Avg. Hours/Day/Truck	10.38	13.83	10.00	9.69	10.69	***10.8***

Note: Collection Statistics for Week of November 17 through 21, 2008

Table 4-5 - Victorville Residential Recycling Collection Data

	Monday	Tuesday	Wed.	Thur.	Friday	*Total*
Trucks & Routes	4	4	4	5	4	***21***
Total Tons	23.52	24.3	23.21	33.31	22.12	***126.5***
Avg. Tons Per Truck	5.88	6.08	5.80	6.66	5.53	***6.0***
Total Customers	5,677	5,809	5,704	6,023	5,778	***28,991***
Avg. Customers Per Truck	1,419	1,452	1,426	1,205	1,445	***1,381***
Avg. Lbs. Per Customer	8.29	8.37	8.14	11.06	7.66	***8.7***
First Load	4	4	4	5	4	***21***
Second Load	0	0	0	0	0	***0***
Total Hours	40.25	40.50	38.75	53.75	42.00	***215.3***
Avg. Hours/Day/Truck	10.06	10.13	9.69	10.75	10.50	***10.3***

Note: Collection Statistics for Week of November 17 through 21, 2008

The experience of collection trucks servicing more residences for recycling than for waste, common across the country, also appears to be borne out by comparing the number of average customers per truck (per day). AVCO's waste routes average 667 customers per truck but it average 1,074 recycling customers per truck, due to three factors: 1) variation in lb per set-out, with higher quantities requiring a longer amount of time to perform the pick-up, 2) variation in set-out rate, with higher rates causing the vehicle to stop at more households along the route, and 3) distance between houses, with greater distances requiring more time to traverse the route. It is estimated that the variation in set-out rate is the most significant factor in the disparity in the number of households served for waste and for recycling.

Victorville's spread between the two types of collection is less, however, with 966 customers for waste compared to 1,381 for recycling, yet Victorville's quantities per set-out are a third less than those collected by AVCO. A set-out analysis should be performed to better identify set-out rates and frequency, participation rates, and average household quantities on each route. Factors such as the size and subscription frequency of the local newspaper, and other consumption patterns affect quantities of recycling, an assessment of which is beyond the scope of this study.

4.2 Customer Service Centers

Customers of waste collection services will call customer service operators for any number of reasons, all of which demand immediate answers, such as holiday schedules, missed collection, what to do with certain recyclables, and billing questions, to name a few.

4.2.1 Town of Apple Valley

The franchise contracts between Burrtec and the two jurisdictions under review differ significantly when it comes to customer service operations. Apple Valley has Burrtec handle all customer service inquiries and billing. By having Burrtec handle its calls, Apple Valley does not need to maintain a customer call center, however, the Town does not hear directly from its residents about service deficiencies . The contractor, in other words, is a filter between Apple Valley and its residents that could reduce the

immediacy of any service problems and possibly reduce awareness of a recurrent nature of any problems.

4.2.2 City of Victorville

During 2008, Victorville changed its organizational structure and has moved the responsibility of its solid waste customer service operations away from solely being housed within the Finance Department to splitting its activities among the Office of the City Clerk and the Finance Department with enforcement now in the Public Works Department. Chart 4-1 shows the prior organizational structure, and Chart 4-2 illustrates the current organization.

The revised organization is designed to consolidate residential customer service for water and solid waste into one location rather than have two separate call centers as it had previously. The structure separates solid waste operations from customer service and interestingly separates commercial customer service from residential.

4.2.2.1 Commercial Customer Service Center

The billing coordinator of the prior organizational structure stayed in the Finance Department and handles all commercial customer service calls. When discussing the work performed by this individual, it was indicated that she has full knowledge of the City's commercial customers, knows the routes of their collection and calls Burrtec workers directly to understand the reality of the customer's situation. Her experience with billing and commercial accounts is so complete that she can quickly review monthly figures and ascertain whether there has been an operational or a billing discrepancy. Yet, this employee's knowledge and customer service work is not tracked by any kind of database that can be used as a reference by others. The corporate memory stays with the individual.

Chart 4.1: Victorville's Prior Solid Waste Organizational Structure

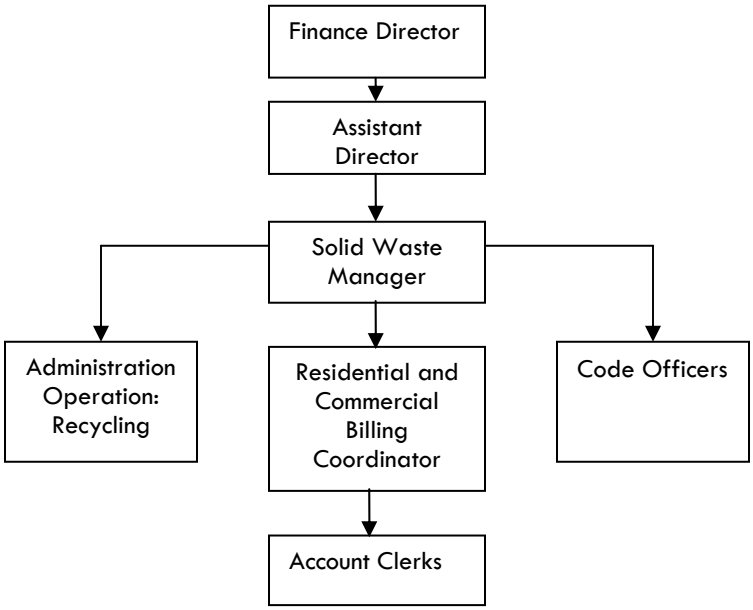
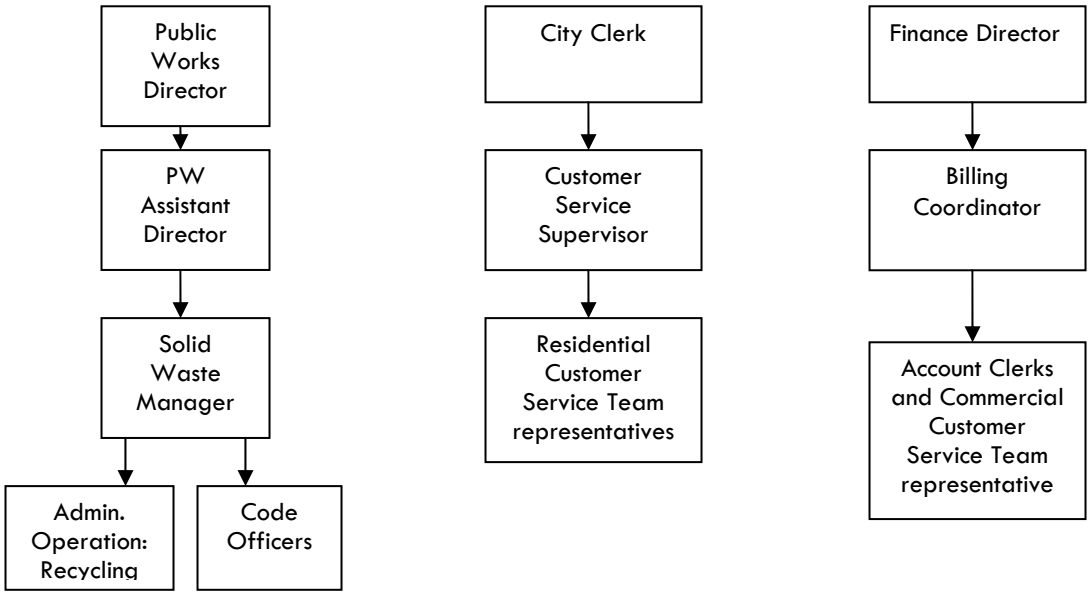


Chart 4.2: Victorville's Current Solid Waste Organizational Structure



Off-the-shelf customer service software packages can track calls by type of call, by the route the customer is serviced, and other possible queries that can produce reports to provide the manager of the collection system insight into how services can be improved. The City should consider implementing such a database system for tracking customer service calls and information regarding the telephone response and the response by the commercial collection system. To the extent that residents offer their support and cooperation in relation to the satisfaction obtained from the City with the collection program, tracking these calls and responses to understand customer satisfaction levels can be helpful in understanding the "people" aspect of recycling system success levels.

4.2.2.2 Residential Customer Service Call Center

Residential solid waste accounts have been handled under the Office of the City Clerk by 14 customer service team representatives and a supervisor working Monday through Thursday from 7:30 a.m. to 5:30 p.m. On Fridays, the calls have been transferred to the Burrtec customer service crew. The Burrtec customer service individuals told GBB that they can handle the additional workload on Fridays with its current customer service staff (prior to January 2009). Victorville's customer service operations use a People Soft CIS package which has the ability to track calls by categories and to run queries. This, however, has not been set up for solid waste calls. In fact, the City could not tell GBB how many calls for residential solid waste were coming into the system. Similarly, the City cannot tally up the type of sanitation calls it gets, such as whether a customer is calling about recycling or waste services, for missed waste collections, or for advice on how to recycle more. If a complaint comes in and a request for a remedy is sent to Burrtec, the City's system is not set up to close the work order or to create a customer history.

In January 2009, calls received by Victorville's customer service group that relate to residential solid waste service issues began to be transferred to Burrtec. Calls related to account status – new account, stop service, balance due, payments, and other - are still handled by the City Clerk's customer service representatives since the City's representatives have access to account information and Burrtec does not. An

understanding of customer satisfaction levels with the residential waste and recycling collection system can be helpful in any assessment of factors contributing to the level of participation and cooperation in the recycling collection system, as mentioned above regarding commercial collection customer satisfaction. Similar to the recommendation made above regarding commercial customer service response tracking, the GBB Team recommends that Apple Valley and Victorville require Burrtec to implement such tracking capability, presumably not later than with the next rebid of the contract.

In November 2008, the City was late on its billing to customers because of problems with integrating water accounts with the billing software implemented within the last 12 months. Sanitation sends out commercial invoices each month and residential invoices every month with little to no problems.

The bulk of the City's customer call center's activities appear to be directed toward water customers. The Customer call center pointed out the educational material stand that is stocked with printed brochures provided by the City about services the City offers and recycling in general. One idea expressed by City staff was to have a digital display providing such information in the lobby where citizens pay their bills, as shown in Photos 4-18 through 4-21. However, due to the temporary nature of the impact that a digital display would provide, Victorville could benefit by continuing its practice of providing printed materials that residents can take home with them and refer to them at later dates.

Photo 4-18: Victorville's Customer Service Area

Photo 4-19: Possible Location on Wall of Digital Display of Solid Waste Information

Photo 4-20 Victorville's Customer Service Team representatives

Victorville's customer service operators have access to a binder of information about waste, but it is unclear how often it is used by these personnel and how well trained they are on waste issues. Having such information available to them through their customer service program and having those categories of calls tracked would help the customer, the customer call center representative, and the manager of the operations. With the January 2009 revision sending waste collection service calls to Burrtec, the same need applies, although GBB is not aware of Burrtec's customer service representatives' knowledge of Victorville's waste and recycling collection programs. It is recommended that Burrtec review the training provided to customer service personnel and

Photo 4-21 Victorville's Solid Waste Education Stand in City Lobby

ensure it is meeting the City's needs.

A summary tabulation of call center data, as generated by the People Software used by Victorville, was provided, including wait time experienced by customers calling into the residential customer call center from September 1 to November 21, 2008. The average wait time was 12.5 minutes. A call center industry benchmark is that a high percentage of calls need to be answered within 20 seconds[2] Further, if the wait is to last longer than 40 seconds, the customer service team representative should check with the caller (within 30 seconds) to ensure that the caller is willing to wait longer than 40 seconds. This information, regarding practices for checking with customers having to wait, was not available to GBB, yet a nearly 13-minute average wait time over nearly three months suggests that the number of customer call center employees is inadequate. The City of Victorville should develop tracking properties in its customer service software or have Burrtec perform the work of customer service and billing.

4.3 Victorville Landfill

Burrtec operates the Victorville Landfill for the County of San Bernardino, and residents and commercial haulers can use the facility seven days a week. Incoming loads are reviewed by a spotter to assess the recyclability of each load. Loads of mostly waste are sent to the disposal area of the Landfill and these loads comprise the majority of total quantities delivered to the Landfill on a daily basis. However, loads with higher levels of recyclable materials are directed to an area near the disposal area but designated for recycling, for unloading, sorting, storage, and loading for transportation to markets through the County Disposal Site Diversion Program (CDSDP).

Photo 4-22: Burrtec employees hand-sort recycle rich loads being dropped at the active face of the Victor Valley Landfill

[2] Source of benchmark: Benchmark Portal, a call center auditing methodology, developed by Purdue University, West Lafayette, Indiana.

Unloading in the designated recycling area is directed by the Burrtec operator, in accordance with material types in each load. Loads containing just one recyclable material (clean loads), including construction wood scraps and wood products, landscape and tree trimming materials, other inert material, scrap metal, cardboard, carpet and pad, tires, and any other recyclable materials as determined by Burrtec, are unloaded into the stockpile for the respective material.

Loads that contain several materials are unloaded in the recycling area and sorted by site labor, with site labor placing the materials according to type in stockpiles or bins, as illustrated in Photo 4-22. Waste that will later be disposed of in the Landfill also is placed in a stockpile or in bins. Hardfill (brick and block) also is separated and stored for grinding into gravel, and metal is segregated and sent to a scrap yard. Wood waste is brought to the wood stockpile, Photo 4-23, situated (during November 2008) on the peak overlooking the active face where it is stored until a grinding contractor brings a mobile grinding unit and grinds the wood for marketing as boiler fuel.

Prohibited waste is removed from the recycling area and processed in accordance with the load check program. If stored overnight, waste stockpiles or bins are covered with a tarp or other cover to prevent vectors from having access to them.

Certain materials, such as wood and others, after having larger pieces manually removed, are processed in a grinder and/or screen to extract fines. Fines are disposed of in the Landfill, however, they may be considered in the future as alternate daily cover (ADC), after a demonstration project as required by Title 27, Section 20690, with approval by LEA and concurrence by CIWMB. Upon approval, Burrtec will stockpile ADC material produced and use it when it is available in sufficient quantity.

Wood and landscape materials are stockpiled together. Burrtec may segregate these materials into a number of separate piles, for up to 21 days, in preparation of grinding to produce a specific product for either on-site of off-site beneficial use. Residue from wood grinding, that may contain stumps, soil, rocks, steel, and other contaminants not suitable for processing with the mobile grinder, may be stockpiled prior to further processing. Additional processing of the residue may include manual sorting, screening, and regrinding. Waste remaining is stockpiled until is is transported to the Landfill for disposal.

Inert materials such as concrete rubble, brick, asphalt, landclearing soils, and other similar materials are stockpiled for use as ADC or other on-site or off-site uses. For recycling measurement and tracking, the inert stockpile is relocated each month or as determined necessary by the operator to facilitate accurate tracking. Burrtec screens these materials to remove fines, as previously discussed, and stockpiles the larger material for additional crushing. Mobile crushing equipment is brought in once the stockpile reaches an estimated 5,000 tons.

Large pieces of scrap metal removed are stockpiled on the ground for storage; smaller pieces are placed into bins for storage. Metal is shipped using roll-off bins, dump trucks, or walking floor type or other suitable semi-trailers. Corrugated is stored in bins. Carpet and pad is stockpiled and is later loaded into semi-trailers or bins for shipment. Other materials, including tires, mixed recyclables, and other recyclable material, is stored and later transported in bins.

The Landfill has no area for customers to drop off recyclable grades of paper (other than corrugated), glass and plastic containers, HHW, or to leave materials for reuse. Customers must travel to the MRF to recycle these other materials (except for HHW). Also, neither the Landfill nor the MRF has a reuse center where books, clothing, and other items can be left. For self-haul customers, traveling to multiple locations is therefore required to recycle these eligible materials and for any reuse opportunities. This situation is a deterrent to recycling; many customers will weigh the cost in time and fuel, and decide to dispose these materials as waste at the Landfill. It must be expected that a certain amount of recycling and reuse will not be conducted. If a full-service facility were available, it would be expected that most, or even all, of the recyclables brought by self-haul customers would be recovered for recycling.

Photo 4-23: Green and Wood Waste dropped separately at the Victor Valley Landfill and is ground for beneficial use.

It is recommended that the facility at the Landfill for bringing loads rich in recyclables as well as source separated materials, be expanded to a single full service capability, a "Drop-off Center", to include waste, recycling, a reuse facility, and a HHW Facility. The MRF is permitted to receive waste as well as recyclables. It is recommended that the JPA implement a full-service drop-off facility at the MRF if the County is not able to implement a facility within a time period that meets Apple Valley and Victorville's needs.

4.4 Unincorporated Areas

The unincorporated areas surrounding Apple Valley and Victorville are also under franchise arrangements with San Bernardino County; however, unlike Apple Valley and Victorville, services provided are not uniform.

4.4.1 Phelan Transfer Station

Phelan, for instance, is an unincorporated area serviced by CR&R Waste and Recycling Services (CR&R) that provides waste and recycling services to residential and business customers on a voluntary subscription basis. Residents in Phelan are not required to have curbside services. These residents can elect to take their waste directly to the County (Phelan) transfer station and their recyclables either to the transfer station or to the recycling drop-off facility that is located near the transfer station.

4.4.1.1 Waste Types Accepted

The facility accepts only non-hazardous solid wastes from commercial, residential, and other self-haul wastes from the Phelan area. The major portion of waste received at the station is residential waste. Smaller quantities of commercial and construction/demolition wastes also are accepted. Residential waste received includes non-bulky materials, including yard waste, and bulky materials such as discarded home appliances, wood, vehicle parts and tires, and home remodeling debris.

Commercial wastes include many of the same materials as residential wastes, although, by observation, it includes higher proportions of paper, cardboard, metals and packaging materials. See Chapter 5 for details on composition of waste delivered to the Phelan transfer station.

Construction and demolition debris wastes include building materials, packaging and rubble resulting from construction, remodeling, repair and demolition operations on pavements, houses, commercial building and other structures. Due to potential damage and/or jamming of the compactor or loading pit, CR&R (the operator) does not typically accept demolition wastes as described below:

- Large loads of inert materials that the operator determines cannot be handled on site. These materials would typically be hauled to a regional landfill;

- Demolition debris transported on vehicles having more than three axles. Vehicles with more than three axles are required to be transported directly to a regional landfill by the customer;

- Demolition debris materials whose length exceeds four feet, unless it is recyclable material to be utilized in the CDSDP; and

  Demolition debris containing materials whose individual piece, size, or mass exceeds two cubic feet. These shall be transported directly to a regional landfill by the customer unless it is determined by the site operator that it is recyclable material to be utilized in the CDSDP and can be adequately handled on-site.

Source-separated recyclables such as wood, yard waste, scrap metal, tires, paper and cardboard are accepted. The on-site load checker identifies loads with potential recyclable materials as they arrive. If recyclables are found in the load, customers are asked to separate the recyclables on the tipping floor, or they are sent directly to the existing recyclable/bulky item storage area. Materials separated on the tipping floor are later moved to the recyclable/bulky item area by transfer station employees.

4.4.1.2 Recycling and Recyclable Material Handling

Recycling activities consist of a combination of customers separating their loads as they unload and active manual separation by employees. Customers are requested to separate their materials into a number of categories including, but not limited to: wood, yard waste, scrap metal, tires, cardboard, paper and waste. Designated areas are provided in the unloading area for customers to place their separated materials. These areas consist of either stockpile areas or bins for specific materials types, either on the lower tipping floor or conveniently placed along the loading area.

Customers place separated materials directly into the appropriate stockpile or bin. Employees transport materials to the recyclable material storage area. Separate stockpile areas or bins are provided outside the building for wood and landscaping materials, scrap metal, tires, cardboard and inert material. Customers with larger loads or loads that are pre-sorted are sent directly to the recyclable material storage area to unload at the stockpile or bin.

Commercial hauler loads that are rich in recyclable materials may either be unloaded on the building floor or at the recyclable material storage area at the appropriate bin or stockpile, as directed by a transfer station employee. Once unloaded, employees

manually separate the loads, taking each of the separated materials to the appropriate stockpile or bin.

When loads containing a high degree of recyclable materials are unloaded at the outside stockpile or at recyclable material storage area, employees sort through loads to remove unwanted non-recyclable materials. These non-recyclables are temporarily placed nearby and later transferred to the building floor by the wheeled loader or hand cart to be combined with other waste for disposal.

Separated materials may be shipped off site for further processing in a variety of manners. Wood and landscaping waste is loaded into a transport trailer and taken to the Victorville Landfill for processing. Cardboard removed from the waste stream is either stored in several bins or in a secure stockpile that will prevent the wind from blowing the materials away from the stockpile. Once a truckload volume has been stored, it will be shipped to a MRF for baling. Cardboard may be shipped in roll-off bins or placed back on the building floor, processed through the compactor and loaded into a transport for shipment off site.

Scrap metal separated by customers or employees is placed into a stockpile or in a bin prior to shipment off site to a metal recycler. Inert materials, such as incidental landscaping soil, rock, broken concrete, and asphalt, are stockpiled until a truckload volume has been stored, then shipped to the Victorville Landfill for beneficial reuse. Other materials may be removed from the waste stream when determined feasible by the operator. These materials are either placed in a stockpile or stored in bins and shipped off site for further processing.

4.4.1.3 Victor Valley Material Recovery Facility (MRF) Buy Back Facility

The MRF, discussed in detail in Chapter 6, operates a buy-back facility to which residents may deliver materials. The MRF purchased 1,369 tons of buy-back material in 2008. Cardboard (OCC) comprised 87 percent by weight, followed by newspaper, glass and PET bottles, and aluminum cans, each at minor quantities.

The MRF also accepts drop-off items in “Recycle Alley”, adjacent to the parking lot, along the east wall. About 13 tons per month was dropped-off during the first quarter of 2009. About 45 percent of that volume was CRTs (cathode ray tube devices, especially televisions and computer monitors). Scrap metal comprised another 25 percent, followed by newspaper, mixed recyclables, cardboard, mixed rigid plastic, glass and plastic bags.

4.4.2 Subscription Collection Service

Among those residents who subscribe to CR&R's waste and recycling services, according to CR&R's operational manager Brian Spears, participation in the recycling program is good. If provision of recycling service to residents in the unincorporated areas were made mandatory by the County, participation and quantities collected would increase. To further examine this scenario, however, more detailed data would need to be collected in order to accurately gauge the number of residents who currently have the service and are participating in the recycling program and the number of residents who do not have recycling services provided by CR&R.

4.5 Recycling Options

In 2008 and 2009, the Victorville area, as is the rest of the country, is going through an economic recession. Driving through the area, one becomes immediately aware of home foreclosures with the City of Victorville's homeowners experiencing 2,895 notices of defaults during the period of January through October 2008, while the Town of Apple Valley had 1,290 during that same period. The City's single-family construction permits have fallen to 1998 levels, diminishing the number of local construction jobs available. See Table 4-6.

Table 4-6 - City of Victorville's Single-family Construction Permit Activity

City of Victorville
Construction Activity (1998-2008)

Total Single-family Residences		
Year	**Permits**	**Value**
1998	176	$21,725,896
1999	315	$38,061,018
2000	345	$44,061,018
2001	641	$102,732,467
2002	986	$162,736,629
2003	2,102	$358,131,375
2004	2,699	$478,940,771
2005	2,263	$405,191,347
2006	3,039	$585,344,117
2007	1,090	$229,124,280
2008	170	$12,436,100
Total	13,826	$2,438,485,018

Source: City of Victorville Planning Department

As in most other parts of the U.S., the Victor Valley area appears to have lost some jobs. During this period of elevated incidences of home foreclosures, drastically fluctuating fuel prices, and job insecurity, questions may arise regarding whether residents will agree to pay for additional recycling collection services at the curb. Potential strategies described in this subsection to increase recycling must be sensitive to cost so as to enhance their potential to receive support and implementation. Fortunately, some strategies for greater recovery also would have a minimal impact on costs for the residential collection system, and they are identified here.

4.5.1 Commercial Food Waste

Restaurants appear to have grown in number in the Victorville in recent years. The commuter population may frequent these food establishments more than residents that live and work locally, perhaps because of the smaller amount of time and energy families have to expend toward preparing meals after their extended evening commute. Restaurants that prepare food, as opposed to just heating food that has been prepared off site, represent a source of organic material (food waste) that can be separated from other waste, and composted or processed in another beneficial process.

Burrtec has begun to evaluate the possible venture into collecting food waste from such commercial establishments elsewhere in its collection market. The company has begun a pilot project at one of its locations to compost green waste and food waste. It also has been evaluating a research project utilizing On-Site Power.

Food waste suppliers would include retail supermarkets that, in Victorville, have significant amounts of fresh produce as well as fish and meat. Restaurants are another generator of this material. The United States Penitentiary located northwest of the Victorville houses approximately 1,000 prisoners. Prisons have food waste and the labor available to perform in-house food composting operations as they do in the Nashville, Tennessee area. Schools also produce food items, but generally their kitchen staffs do not prepare and cook meals, thereby limiting the amount of kitchen food scraps. However, food students discard can be collected and delivered to a compost operation. Larger churches with kitchens and fellowship halls also are a source of food waste.

Commercial entities can collect food waste in the kitchen and service areas and containerize it in carts, if space is a premium, or bins if there is ample room. Photos 4-24 and 4-25 and Photos 4-26 and 4-27 show a bin in a Seattle shopping center and cart collection in a highly trafficked and tourist area of San Francisco, respectively.

Photos 4-24 and 4-25 of a compost bin located at a Seattle-area shopping center with eating establishments capturing food waste for composting.

Photos 4-26 and 4-27 were taken in San Francisco's busy tourist area, Union Square, where commercial food waste, waste, and recycling carts are set out for daily collection.

Apple Valley and Victorville could consider delivering food waste to compost processing options that are presented in a summary form in this subsection.

4.5.1.1 Engineered Compost Systems (ECS)

Photos 4-28 and 4-29 show the infrastructure being put together by ECS for Burrtec's pilot compost program.

Burrtec has enlisted the assistance of Engineered Compost Systems (ECS) to initiate a pilot project for a high-rate compost process. ECS began in 2000 to tailor existing compost technologies with client needs to produce practical compost operations. The GBB Team met with Richard Crockett of Burrtec and Jeff Gorom and Charles Krauter of ECS at the Burrtec MRF and Transfer station in Fontana. In November 2008, the ECS team was in the process of setting up the infrastructure for the compost pilot program (Photos 4-28 and 4-29). The pilot compost project commenced operation in early 2009. This pilot program is a covered, negative-aerated static pile system. The piping shown in the pictures is to provide negative-only aeration to specific areas. The material composted will be covered with a material that does not absorb water. The cover is reported to cling to the compost because of the negative aeration that also acts as an exhaust pulling the odors into a biofilter stripping the foul smell away from emissions.

The Burrtec pilot project is essentially a small version of the facility that ECS built for Silver Springs Organics, LLC, a private firm that processes all of the City of Olympia, Washington's food and yard waste (Photo 4-30). Olympia is a compact city, covering less than 19 square miles, and has a population of approximately 45,000. The Silver Spring Organics' operation is receiving 30,000 tons per year of separated food waste from the City's collection system. In 2008, the facility completed its first year of commercial operation. The facility's current capacity is 60,000 tons per year and is expected to double that capacity in phase II of its development to its permit limit of 120,000 tons per year. The facility expects to increase quantities received to 90,000 tpy, or 50 percent greater than 2008 quantities, although revisions to the collection program were not provided.

Silver Springs Organics LLC reports that the waste received from Olympia is exceptionally clean. Also, the company has a customer base, such as Washington DOT, for finished products. The company processes feedstock for 45 days to stabilize it although it is still hot, an indication that the compost is not fully matured at that point. The company sells compost after it has been processed for 45 days, and thus far, the company has been successful in marketing all compost made at the facility.

Photo 4-30: Silver Spring Organics, LLC processes 60,000 tons per year of food and yard waste. Source of the photo: http://www.silverspringsorganics.com/

4.5.1.2 California Bio-Mass Facility

Since April 2000, California Bio-Mass, Inc. (CA Bio-Mass) has owned and operated a composting facility at a site provided by the Victor Valley Wastewater Reclamation Authority (VVWRA), under a long-term site lease between CA Bio-Mass and VVWRA. The site is located on Shay Road, approximately 5 miles north of the City of Victorville. The 50-acre facility is adjacent to and west of the Mojave River channel. The surrounding land use is dominated by the VVWRA wastewater treatment facility. The nearest residences to the project site are approximately one half mile east, across the Mojave River and to the south, on the east side of Shay Road. Most of the surrounding land uses are vacant, non-agricultural land, zoned for low density residential uses.

Five permits and approvals govern the design and operation of the composting facility:

- Conditional Use Permit, City of Victorville, CUP 58-99, Resolution No. P-99-191, Issued December 1999.
- Initial Study/Mitigated Negative Declaration, Victor Valley Water Reclamation Authority, (State Clearinghouse #99111005), November 1, 1999.
- Revised Initial Study/Negative Declaration, California Integrated Waste Management Board, (State Clearinghouse #1999111005), April 11, 2000.
- Solid Waste Facility Permit, San Bernardino County Public Health Department, Environmental Health Services/California Integrated Waste Management Board, SWIS #36-AA-0403, May 1, 2000.
- Waste Discharge Requirements, Lahontan Regional Water Quality Control Board, WDID No. 6B369912001, Board Order No. R6V-2000-65A1 Issued, June 13, 2002.
- Permits to Operate, Mojave Desert Air Pollution Control District. (Plant #109076, exempt from Reg. 2-1-113.7).

The Facility is operated 24 hours per day, six days per week, Monday through Saturday; it is open to the public from 7:00 am to 4:30 pm on each of those days. Two categories of materials are received at the facility: solid waste (feedstock for the compost operation) and liquid additives. The majority of material received is permitted solid waste, including green waste, wood waste, manure, wallboard, paper, pre- and post-consumer food material, fishery waste, agricultural waste, and construction and demolition (C&D) debris. The Facility is permitted to process a total of 135,000 tons per year, or approximately 700 tons per day of these materials and the Facility currently receives approximately 60,000 tons per year. In 2009, the Facility charges $30 per ton for solid waste except food waste, $34 per ton for food waste, with surcharges applied for contamination levels above certain norms.

Various liquid wastes received include beer, soda, syrup, milk, grease trap wastes, shampoo wastes, other liquid food wastes and other miscellaneous liquids. Generators deliver approximately 20,000 gallons per day of liquid waste additives.

Operations conducted at the Facility consist of seven distinct processing steps: receiving, load checking, processing, composting, screening, monitoring, and curing.

All vehicles delivering feedstock, additives and amendments are weighed at the scale for billing purposes. Delivered materials also are inspected. A sign at the entrance to the Facility includes the name of the facility and the operator, Facility hours of operation, a phone number where the operator can be reached in case of an

emergency, a list of accepted materials, and a schedule of fees for delivering materials.

All delivered materials are subject to a random load check inspection. Load checking at the Facility is conducted by spotters, pickers, and equipment operators on a random basis, after the vehicle clears the scale. Spotters primarily direct traffic into position to unload, but also have the opportunity to survey loads before and during the unloading process. Most loads of solid waste materials are directed to the grinding area for unloading and processing, although loads not requiring grinding are directed to unload in the composting area. After a vehicle is allowed to tip its load, and prior to grinding, pickers remove materials not acceptable for composting. Not only do these activities reduce contamination, they also reduce the potential for damage to grinding and other equipment.

Loader operators perform another visual load check prior to processing to ensure that foreign material that may damage any equipment is not loaded into the grinder. Wheeled bucket loaders feed the material into one of two grinders. Materials destined for composting will be transported from the grinders to the composting area by the bucket loaders. Additive liquids or water are added to the newly formed windrows to achieve the desired moisture content. The Facility uses a combination of static pile and windrow method for composting. Windrows are initially formed and later turned during processing using the loaders.

Once material has completed the composting process, windrows are broken down and delivered to the screening plant. Some of the material is screened to provide a consistent particle size for end markets. Screened material is delivered to the curing and storage area.

Potential markets for compost in California are substantial. Actual markets are influenced by a number of factors including transportation costs, application costs, education, supply, and the success of a given commodity in a given year, as some growers will add compost only in good years, when commodity prices are high.

California *Bio-Mass*, Inc. has developed markets in multiple regions for the marketing of compost. Markets in the areas of the Inland Empire, High Desert, and Las Vegas have been increasing their use of landscape related compost products. Landscape related applications of compost consist of top dressing, pre-plant amendments, and other soil amendments. Market areas of the Southern San Joaquin Valley, Lancaster/Palmdale and other areas of concentrated agricultural activities have been significant users of compost. These markets continue to expand as the beneficial use of this product becomes evident to the agricultural community.

4.5.1.3 On-Site Power - Anaerobic Digestion

Burrtec President Cole Burr told GBB that Burrtec had been evaluating a project called On-Site Power. The University of California in Davis is affiliated with On-Site Power, an experimental anaerobic digestion technology system, known as the “Biogas Energy Project.” There is no operating commercial facility at this time.

The experimental facility processes eight tons a day of solid and liquid food, green and animal waste. The UC Davis pilot plant is shown in Photo 4-31. The bio-digestion process uses microorganisms (likely mesophilic bacteria) to convert organic material into a biogas, a combination of carbon dioxide and methane. This can be further processed into value-added products such as electricity and biofuel.

Photo 4-31: UC Davis Biogas Energy Project

In previous conversations between GBB and the operators of On-Site Power, the latter have estimated that a commercial operation of their system would have a capital cost (minus the property) of $4 million for every 100 tons per day processed, or $40,000 per daily ton of processing capacity. Anaerobic digestion has large-scale experience processing wastewater treatment system sludge in the U.S. and Europe, and processing other primarily homogeneous waste streams such as animal waste in Europe.

Several issues must be addressed to demonstrate commercial viability of anaerobic digestion, although a discussion of those issues is beyond the scope of this study. Based on information presented by On-Site Power on its website, the UC Davis project could possibly be characterized as demonstration scale. Demonstration scale refers to using commercial-scale equipment and processes. This approach, when successful in proving technology, offers a much higher potential for further scale-up to successful commercial scale operations than does development at smaller, laboratory-oriented, scale facilities. The CA Greenhouse Gas Scoping Plan incentives should be considered during assessment of this technology.

4.5.1.4 Recommendations

It is recommended that Apple Valley and Victorville monitor the progress of these projects and assess their effectiveness at the end of each project or at the end of each phase if the projects continue in their development. Scale-up of the collection service to most or all commercial food waste generators is recommended when a composting operation(s) proves the technology employed is capable of operating at the larger quantities expected with the scale-up, and when reliable markets for the product are available.

4.5.2 Commercial Yard Waste

A portion of yard waste collected from commercial generators is placed along with waste in the cart, bin, or box used by the generator in the same manner as food waste. However, as in most communities, the majority of yard waste is generated by commercial generators and is collected by landscape contractors. These contractors typically deliver loads of segregated yard waste, including prunings, limbs, and other plant waste, to the Landfill. If the load contains yard waste or wood waste, it is

directed to an area away from the fill area, where it is beneficially recovered. See Subsection 4.3.

Yard waste collected by these contractors could be delivered to CA Bio-Mass for composting. With the current Landfill tip fee of $40 per ton and the CA Bio-Mass fee at $30 per ton, an incentive exists for generators to use the CA Bio-Mass facility. The fact that substantial quantities of yard waste and wood waste is delivered to the Victorville Landfill suggests that either 1) a portion of generators are collecting material from sources so close to the Victorville Landfill that the convenience factor is greater than the financial incentive to use CA Bio-Mass, or 2) certain generators are now aware of the CA Bio-Mass facility. Budgets submitted by San Bernardino County staff for FY2010 include tip fee increases for the Victorville Landfill of approximately $10 per ton. Adoption of these tip fees would increase the incentive to use CA Bio-Mass. Awareness building also should be continued within the education and information programs. Beyond that, enacting a ban on yard waste from the Landfill would be the next step.

4.5.3 Residential Yard Waste and Food Waste

Yard waste set out for waste collection in Victorville and Apple Valley was estimated to be approximately 26 percent of post-recycling quantities delivered to the Victorville Landfill. Greater detail is presented in Section 5, Waste Composition. Yard waste observed during the drive-through of neighborhoods was primarily prunings from trees. These prunings were not placed for collection with waste but were taken to the Victorville Landfill where they were segregated, stored, and ground up and used as mulch or marketed as boiler fuel.

If yard waste collection is implemented in the near future, the yard waste could be taken to CA Bio-Mass for composting. However, to optimize quantities of organic material collected from residential generators, food waste should also be included in the collection. Like collection and composting of food waste from the Commercial Sector, implementing a co-collection of yard waste and food waste from the residential sector would depend on a reliable composting facility. Due to the substantial quantities of food waste and yard waste generated by residences in Apple Valley and Victorville, it is recommended that a collection system for food waste and yard waste be considered for implementation once a reliable composting operation is available. Also, it is recommended that implementation begin with a pilot program consisting of one or two full routes for these materials. A coordinated data collection program is needed to document costs and participation data. These data can then be analyzed to determine the feasibility of expansion of the pilot to full scale.

4.5.4 Wet-Dry Collection

Wet-dry collection is a collection approach for maximizing quantities of a material eligible for recycling and composting. This concept includes two or three collections, depending on the recycling program. Table 4-7 presents the two options.

Table 4-7 – Wet-Dry Collection Options

No. Carts	Description	Dry Recyclables and Waste	Yard Waste Food Waste Other Wet Organics	Waste (To Landfill)
Two	All Dry materials delivered to MRF, Compostable materials to a compost facility (all wet materials and yard waste)	X	X	
Three	Eligible Dry Recyclable materials delivered to MRF, Compostable materials to a compost facility (wet) and non-recyclable dry materials placed in a third collection cart	X	X	X

Food waste and other organics, excluding yard waste, comprise approximately 51 percent of the post-recycling waste stream. Greater details are provided in Chapter 5.

Restaurants are a good example of high-volume generators of food waste. While keeping its traditional bins for collection of recyclables and waste, the Four Seasons Hotel in Philadelphia, Pennsylvania, has added a third collection for food waste. In 2007, the Four Seasons collected more than 100 tons of food waste. The food waste was placed into 35-gallon carts and then transported by pickup truck to a compost operation outside of Philadelphia.

The Region of Peel, Ontario, Canada, consisting of approximately 300,000 one- to six-unit homes (Cities of Brampton and Mississauga, and the Town of Caledon), began a source-separated food waste and soiled paper collection program in 2007. The soiled paper includes paper contaminated by fluids and/or food waste. Initial program results indicated that approximately 23 pounds of food waste and soiled paper per household per month (annual average) was set out in 13-gallon Norseman Green Bins (12 in. L X 11 in. W X 27 in. H.). See Exhibit 4-1. Rear-load compaction trucks are used for collection on all routes. Some routes are run using single-compartment vehicles and some dual with a 60/40 split. This latter type of vehicle collects dry recyclables simultaneous with the food waste and soiled paper. Collection routes service 800 and 1,000 households per customers per day. The organic material is delivered to two composting facilities serving the region.[3]

[3] Source for Philadelphia Four Seasons program and Region of Peel program: "Source Separated Organics Collection," BioCycle, January 2009, pp. 23-28.

Exhibit 4-1 - Norseman Green Bin

Source: Norseman, Inc.

In the Peel program, residents may line the small cart with approved compostable bags, newspaper, or paper bags. Residents are responsible for cleaning the carts. The Region of Peel program has not added yard waste to the collection program, leaving yard waste for the waste collection container. Yard waste could be added, although the small, specialized container used in this program would have to be replaced with a larger container, perhaps 48-gallon, 64-gallon, or larger.

Implementing a yard waste and food waste/solid paper combined collection could be part of a two-collection program only after a composting system is available to take this material and a pre-processing system is implemented. This pre-processing system would receive loads of waste that contained recyclable materials, and provide for manual and automated methods to separate recyclable and non-recyclable materials. A detailed discussion of a conceptual design pre-processing system is presented in Chapter 7 of this report. Such a pre-processing system would allow the "dry" collection to complement the above described food waste and yard waste, or "wet" collection, thereby constituting a two-part collection.

Without the pre-processing system to separate recyclables from the dry stream, a third collection would be required for the recyclables, resulting in a "wet-dry" system with three collections: (1) Dry recyclables, (2) food waste/other organics, and (3) waste.

4.5.5 Radio Frequency Identification (RFID) System

RFID is the term applied to any device that carries a passive radio transponder device. The RFID unit is powered by an interrogating unit that emits a standard radio signal. Thus, the RFID unit requires no battery. The RFID unit receives the signal, typically at a frequency between 120 kHz and 140 kHz. The electronic components within the unit modify the signal to make it unique to the RFID unit and then send or "reflect" this unique signal back to the reader. The interrogating unit or reader receives the unique signal.

The signal emitted carries a coded number which serves to identify the device to which the RFID unit is attached. Signals can be read within a line of sight or even beyond, although the line of sight limitation is the most common use. The RFID unit is referred to as a tag.

The radio frequency reader device passes along the received signal to an electronic data storage device for storage of signal data. If a geographic positioning system (GPS) device is added to the storage device, geographic locational coordinates for the RFID tag are added to the data set. The storage device can be equipped to store data sets received for later manual download using a portable storage device (such as a stick drive) or download via a wired or wireless connection to a computer that will process the data. The storage device can alternatively be equipped for transmission of data sets recorded using a satellite-based system or cellular telephone system. This latter system will provide real-time data to the operator regarding location of each RFID tagged piece of equipment and to management.

RFID tags have a wide range of use, from logging toll charges to vehicles on highways, to identifying cattle, to identifying waste and recycling carts, and numerous other asset-monitoring applications. An example of an RFID tag on a recycling cart is shown in Photo 4-32. Each RFID tag has a unique multi-digit number associated with it, programmed by the tag manufacturer.

Photo 4-32: Sample RFID Tag

For waste and recycling collection systems, an RFID tag should be permanently attached to the cart in a location that would not be susceptible to abrasion or other damage in use by the customer or collection crew. The tags can be molded into the cart or attached with a rivet. In quantity, RFID tags cost less than $5.00 each. A reader device, to be mounted on the side of the collection truck that would be in sight of the cart during pick-up, has a cost of approximately $200. A data storage device, to be mounted inside the cab, would have a cost of approximately $600 to $700 each.

Several other costs would be incurred to implement RFID tags. For a collection system that already has carts in place, labor to install the tags at the curb and, at the same time, log the customer address associated with the RFID tag/cart combination would be required. Passes over multiple weeks of collection would likely be required to complete implementation, based on not every household setting out its cart each week of collection.

The collection system operator would have to implement computer software, and possibly hardware, in the form of a computer dedicated to the tracking and data system. One way to implement this is in conjunction with new billing and customer service software. If a system is implemented where a billing and customer service system is already in place, an assessment of the software's capability to add fields for the RFID information would be needed. The system operator also would need to add IT support and an operator of the RFID data collection. The system operator could be a technician, as long as qualified database administration capability is available elsewhere in the system (City/Town government) or on a contract basis.

More sophisticated equipment, including on-board computing systems, costing as much as $5,000, are available; however, those are not needed for residential or commercial routes that are static. This higher level of equipment can be useful for collection routes that are custom designed on a daily basis, such as for collection of scheduled bulky materials bins, or where it is desired to generate billing information

from collections such as commercial bin customers, especially for out of schedule collections.

4.5.6 Textile Collection

Although textiles are a small percentage of the waste stream, they can be separately collected at minimal expense. One workable approach is for the collection contractor provides the resident a distinctive thirty-three gallon bag to place the resident's textiles for recycling. The contractor would collect these full bags and leave an empty one for the resident. The full bags would be placed in the compactor with the rest of the recyclables. The recyclable material would be unloaded onto the tip area and sent up the conveyer belt. The highly visible and uniform color and size of bags of textiles would be noticed and removed by pre-sorters from the conveyor belt. Separated textiles would be aggregated, sent to a facility for further separation, and then sent to re-use or recycling markets. The frequency of the set-out would be low enough that it would not significantly hinder the time of the collection route but would add a new recycling service to customers.

The scope of this study was limited to identifying collection approaches; however, it is understood, that, like other materials targeted for recovery, markets for textiles are equally essential to an effective collection system to make textile recycling work. The JPA has pursued markets in the past without being able to engage one or more long-term markets for textiles. The JPA should continue to monitor markets for this material and consider adding textiles when markets are available.

4.6 Recommendations

<u>Franchise Contracts for Collection</u>

1. Have Burrtec conduct a set-out rate study for residential recyclables to identify the levels of participation and opportunities for improvement in Apple Valley and Victorville.

2. Burrtec should promote to its commercial accounts placing additional recyclable materials (more than OCC) in any and all bins, except in the case where such initiatives would be detrimental to the generator/collector's revenue. See Chapter 1 for more on this.

3. Address residents' habits to reduce the incidence of dirt and gravel in waste carts.

<u>Customer Service</u>

1. Victorville's residential solid waste customers' waiting time on the phone is too long. Either more customer service people are needed to answer the phones, or the work should be contracted out to Burrtec, similar to the arrangement in Apple Valley.

2. Victorville should consider implementing a database system for tracking customer service calls and information regarding the telephone response and the response by the commercial collection system.

3. For all calls handled by Burrtec, it is recommended that Burrtec implement customer service response tracking and report information to Apple Valley and Victorville. This would apply to residential collection programs in Apple Valley and Victorville and commercial collection in Apple Valley. Also, it is recommended that Burrtec review training practices for customer service personnel and make revisions that meet Victorville and Apple Valley's needs.

Unincorporated Areas

1. It is recommended that the County, as a step towards increasing recycling participation, match drop-off center hours to that of the transfer station to which waste is delivered, especially on Saturday.

2. It is recommended that the County consider moving any off-site, recycling drop-off facilities to the transfer station.

Recycling Options

1. It is recommended that Apple Valley and Victorville monitor the progress of the ECS and the CA Bio-Mass compost facilities' food waste pilot projects and the on-site anaerobic digestion project, and assess their effectiveness at the end of each project or at the end of each phase if the projects continue in their development. Scale-up of the collection service to most or all commercial food waste generators in Apple Valley and Victorville is recommended when a composting operation(s) demonstrates that the respective technology is capable of operating at quantities expected with the scale-up, and reliable markets for the product are available.

2. Consideration of anaerobic digestion also should include a close assessment of this technology, as it is commercially untested on solid waste in the U.S.

3. It is recommended that Apple Valley and Victorville take advantage of incentive tip fee levels for delivering commercially generated yard waste to a compost facility, provide education and information to promote this practice, and consider a landfill ban on yard waste as needed to ensure that commercially generated yard waste is not disposed of in the Landfill but, instead, is recycled through composting.

4. Due to the substantial quantities of food waste and yard waste generated by residences in Apple Valley or Victorville, it is recommended that a collection system for food waste and yard waste be considered for implementation once a reliable composting operation is available, as described in recommendation no. 1. It is recommended that implementation begin with a pilot program that would consist of one or two recycling routes to obtain technical feasibility (of the material to feed into the compost operation), costs, and participation data.

5. The JPA should continue to monitor markets for textiles and consider adding textiles when markets are available.

It is recommended that the County implement a single full-service drop-off location to include waste, recycling, a reuse facility, and an HHW Facility at the Landfill. The JPA should implement a full-service drop-off facility at the MRF if the County is not able to implement a facility within a time period that meets Apple Valley and Victorville's needs.