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Water Resources Planning and Management

Date: November 8, 2012
From: Gary Fiske
To: Hossein Parandvash
Cc: Lorna Stickel, Tom Chesnutt
Re: Water and sewer expenditures for large commercial/industrial customers

The Portland City Council requested that this Water Conservation Rate Study include an evaluation of possible rate structure(s) to promote economic development among large commercial/industrial customers. As part of that assessment, it is important to examine the relative importance of expenditures for water and sewer service as a component of overall production expenditures. That is the purpose of this memorandum.

While essential inputs to production for nearly all commercial and industrial businesses, water and sewer services are not often a major focus for cost control. Concern generally focuses on reliability and quality of service rather than cost. There are two reasons for this:

- First, unreliable or poor quality water and sewer service can be hugely disruptive to production processes and may necessitate added investment to build in service redundancy or even be a cause for relocation.
- Second, at least in the United States, water and sewer service costs historically have been low to modest. While water and sewer costs over the past two decades have escalated faster than general inflation, they remain a small share of total production cost for most industries.

This memorandum provides estimates of water and sewer cost as a share of total production cost for industries represented by some of PWB's largest commercial, industrial, and institutional (CII) customers. The estimates are from 2010 IMPLAN input-output data for Multnomah County, Oregon.

IMPLAN is an input-output (I-O) modeling system developed and maintained by the Minnesota IMPLAN Group (MIG). It is widely used by public and private entities to conduct regional economic impact analysis. IMPLAN I-O models use regional data sets prepared by MIG. An IMPLAN data set consists of the following elements:

- Industry Make and Use Tables
- Regional Data on
 - Imports and Exports
 - Industry Output
 - Employment
 - Value Added (i.e. payments to land, labor, and capital)
 - Final Demands

Industry Make and Use tables show the commodity outputs *made* by each industry in the model and the commodity inputs *used* by each industry to produce these outputs. The use table essentially provides

the list of ingredients – such as water and sewer utility services -- that go into the production process. In IMPLAN, an industry may draw on up to 440 separate commodity inputs. The basic data used by MIG to develop regional production functions come from the national I-O accounts maintained by U.S. Bureau of Economic Analysis (BEA). The national I-O accounts are updated by BEA every five years. The last major update was completed in 2007.

PWB provided a list of large CII customers. Data was compiled on the 13 sectors that include these customers. Table 1 shows the customers and the sectors to which the customers were assigned.

Table 1. Large CII Customers and Associated IMPAN Sectors

Sectors	PWB Customers
<i>Heavy Manufacturing</i> Semiconductor and related device manufacturing Aircraft parts manufacturing Ship building and repairing	Siltronic Corporation Precision Castparts Corporation Vigor Industrial, LLC
<i>Food Processing</i> Fluid milk and butter manufacturing Ice cream and frozen dessert manufacturing Frozen food manufacturing Fats and oils refining and blending Seasoning and dressing manufacturing	Darigold, Inc Sunshine Dairy Foods, Inc Ajinomoto Frozen Foods USA, Inc Ventura Foods, LLC
<i>Beverages & Ice</i> Soft drink and ice manufacturing Coffee and tea manufacturing Breweries	Koldkist Beverage Ice Portland Bottling Company Coca Cola USA DS Waters of America Portland Bottling Company Pyramid Breweries Widmer Brewing Company
<i>Accommodation Services</i> Hotels and motels	Doubletree Hotel Benson Hotel Sheraton Portland Airport
<i>Health Care</i> Hospitals	Emanuel Hospital Providence Medical Center U.S. Vets Hospital Center Portland Hospital Service Corporation Good Samaritan Hospital Legacy Health System

Table 2 summarizes the results. More detailed sector-specific results are included in Appendix A. For each sector, the table shows the percentage of total production costs that water and sewer costs

comprise in Multnomah County. For comparison purposes, the table also shows the fraction of production costs that is associated with the top five production cost components.

Table 2. Water and Sewer Service as Fraction of Sector-Specific Production Costs

Sector	Water & Sewer as % of Purchased Commodities^a	Water & Sewer Rank Among All Purchased Commodities	Top 5 Purchased Commodities^a Total %
Semiconductors mfg	0.076%	99 th out of 166	49.7%
Aircraft parts mfg	0.069%	85 th out of 139	41.3%
Ship building and repairing	0.106%	82 nd out of 153	29.3%
Fluid milk and butter mfg	0.147%	50 th out of 136	69.3%
Ice cream/frozen dessert mfg	0.110%	68 th out of 117	41.4%
Frozen food mfg	0.142%	55 th out of 127	40.8%
Fats/oils refining/ blending mfg	0.088%	43 rd out of 102	79.7%
Seasoning and dressing mfg	0.218%	59 th out of 109	40.6%
Soft drink and ice mfg	0.086%	64 th out of 130	65.6%
Coffee and tea mfg	0.075%	57 th out of 81	61.9%
Breweries	0.104%	55 th out of 119	61.4%
Hotels and motels	1.048%	24 th out of 249	37.7%
Hospitals	0.288%	50 th out of 249	45.3%
^a Purchased commodities include payments for all goods and services used in production other than labor.			

It is important to emphasize that these results are not based on actual cost or production data for individual PWB customers, but rather represent regionalized estimates for industry groupings as compiled by MIG. Thus, they should only be considered as indicative of the importance of water and sewer services relative to total production cost for these customers.

Conclusions

Based on the above data, the following conclusions are drawn:

- Water & sewer services are not a major production expense for the sectors examined.
- With the exception of the hotel sector, expenditures on water and sewer services constitute well under half a percent of total expenditures on purchased commodities.

- Costs for water & sewer services are unlikely to be major determinants of overall production cost or profitability for the sectors examined. They are therefore not likely to have important impacts on strategic decisions relating to investment, expansion, relocation, or the like.
- The expenditure percentages for specific CII customers will, of course, vary from the IMPLAN reported county sector averages. This can be due to normal variation across customers and over time and/or to differences in how the figures are calculated. Thus, for example, the percentage of commodity costs represented by water/sewer expenditures, as reported by one of the brewers listed, is higher than that contained in the IMPLAN data set for Multnomah County and, while still low, is considered by the owners to be a significant expense and one that as it rises reduces the ability to hire new employees and affects profits and decision making.

Appendix A

Heavy Manufacturing

IMPLAN Sector:	Semiconductor and related device manufacturing
Water and Sewer Service as % of:	
Purchased commodities ^a	0.076%
Total production value ^b	0.046%
Cost rank among all purchased commodities:	99 th out of 166 purchased commodities
Percentile^c:	60%
PWB Customer(s) in this Sector:	Siltronic Corporation
^a Purchased inputs other than labor. ^b Total value of production including payments to labor and capital. ^c Percent of purchased inputs other than labor with higher share of total purchased commodities.	

IMPLAN Sector:	Other aircraft parts and auxiliary equipment manufacturing
Water and Sewer Service as % of:	
Purchased commodities ^a	0.069%
Total production value ^b	0.039%
Cost rank among all purchased commodities:	85 th out of 139 purchased commodities
Percentile^c:	61%
PWB Customer(s) in this Sector:	Precision Castparts Corporation
^a Purchased inputs other than labor. ^b Total value of production including payments to labor and capital. ^c Percent of purchased inputs other than labor with higher share of total purchased commodities.	

IMPLAN Sector:	Ship building and repairing
Water and Sewer Service as % of:	
Purchased commodities ^a	0.106%
Total production value ^b	0.059%
Cost rank among all purchased commodities:	82 nd out of 153 purchased commodities
Percentile^c:	54%
PWB Customer(s) in this Sector:	Vigor Industrial, LLC
^a Purchased inputs other than labor. ^b Total value of production including payments to labor and capital. ^c Percent of purchased inputs other than labor with higher share of total purchased commodities.	

Food Processing

IMPLAN Sector:	Fluid milk and butter manufacturing
Water and Sewer Service as % of:	
Purchased commodities ^a	0.147%
Total production value ^b	0.121%
Cost rank among all purchased commodities:	50 th out of 136 purchased commodities
Percentile^c:	37%
PWB Customer(s) in this Sector:	Darigold, Inc; Sunshine Dairy Foods, Inc
^a Purchased inputs other than labor.	
^b Total value of production including payments to labor and capital.	
^c Percent of purchased inputs other than labor with higher share of total purchased commodities.	

IMPLAN Sector:	Ice cream and frozen dessert manufacturing
Water and Sewer Service as % of:	
Purchased commodities ^a	0.110%
Total production value ^b	0.085%
Cost rank among all purchased commodities:	68 th out of 117 purchased commodities
Percentile^c:	58%
PWB Customer(s) in this Sector:	Darigold, Inc; Sunshine Dairy Foods, Inc
^a Purchased inputs other than labor.	
^b Total value of production including payments to labor and capital.	
^c Percent of purchased inputs other than labor with higher share of total purchased commodities.	

IMPLAN Sector:	Frozen food manufacturing
Water and Sewer Service as % of:	
Purchased commodities ^a	0.142%
Total production value ^b	0.113%
Cost rank among all purchased commodities:	55 th out of 127 purchased commodities
Percentile^c:	43%
PWB Customer(s) in this Sector:	Ajinomoto Frozen Foods USA, Inc
^a Purchased inputs other than labor.	
^b Total value of production including payments to labor and capital.	
^c Percent of purchased inputs other than labor with higher share of total purchased commodities.	

IMPLAN Sector:	Fats and oils refining and blending
Water and Sewer Service as % of:	
Purchased commodities ^a	0.088%
Total production value ^b	0.080%
Cost rank among all purchased commodities:	43rd out of 102 purchased commodities
Percentile^c:	42%
PWB Customer(s) in this Sector:	Ventura Foods, LLC
^a Purchased inputs other than labor.	
^b Total value of production including payments to labor and capital.	
^c Percent of purchased inputs other than labor with higher share of total purchased commodities.	

IMPLAN Sector:	Seasoning and dressing manufacturing
Water and Sewer Service as % of:	
Purchased commodities ^a	0.218%
Total production value ^b	0.185%
Cost rank among all purchased commodities:	59th out of 109 purchased commodities
Percentile^c:	54%
PWB Customer(s) in this Sector:	Ventura Foods, LLC
^a Purchased inputs other than labor.	
^b Total value of production including payments to labor and capital.	
^c Percent of purchased inputs other than labor with higher share of total purchased commodities.	

Beverages & Ice

IMPLAN Sector:	Soft drink and ice manufacturing
Water and Sewer Service as % of:	
Purchased commodities ^a	0.086%
Total production value ^b	0.075%
Cost rank among all purchased commodities:	64th out of 130 purchased commodities
Percentile^c:	49%
PWB Customer(s) in this Sector:	Koldkist Beverage Ice, Portland Bottling Company, Coca Cola USA, DS Waters of America
^a Purchased inputs other than labor.	
^b Total value of production including payments to labor and capital.	
^c Percent of purchased inputs other than labor with higher share of total purchased commodities.	

IMPLAN Sector:	Coffee and tea manufacturing
Water and Sewer Service as % of:	
Purchased commodities ^a	0.075%
Total production value ^b	0.064%
Cost rank among all purchased commodities:	57th out of 81 purchased commodities
Percentile^c:	70%
PWB Customer(s) in this Sector:	Portland Bottling Company
^a Purchased inputs other than labor. ^b Total value of production including payments to labor and capital. ^c Percent of purchased inputs other than labor with higher share of total purchased commodities.	

IMPLAN Sector:	Breweries
Water and Sewer Service as % of:	
Purchased commodities ^a	0.104%
Total production value ^b	0.068%
Cost rank among all purchased commodities:	55th out of 119 purchased commodities
Percentile^c:	46%
PWB Customer(s) in this Sector:	Pyramid Breweries, Widmer Brewing Company
^a Purchased inputs other than labor. ^b Total value of production including payments to labor and capital. ^c Percent of purchased inputs other than labor with higher share of total purchased commodities.	

Hospitality

IMPLAN Sector:	Hotels and motels, including casino hotels
Water and Sewer Service as % of:	
Purchased commodities ^a	1.048%
Total production value ^b	0.457%
Cost rank among all purchased commodities:	24th out of 249 purchased commodities
Percentile^c:	10%
PWB Customer(s) in this Sector:	Doubletree Hotel, Benson Hotel, Sheraton Portland Airport
^a Purchased inputs other than labor. ^b Total value of production including payments to labor and capital. ^c Percent of purchased inputs other than labor with higher share of total purchased commodities.	

Health Care

IMPLAN Sector:	Private hospitals
Water and Sewer Service as % of:	
Purchased commodities ^a	0.288%
Total production value ^b	0.124%
Cost rank among all purchased commodities:	50th out of 249 purchased commodities
Percentile^c:	20%
PWB Customer(s) in this Sector:	Emanuel Hospital, Providence Medical Center, Good Samaritan Hospital, U.S. Vets Hospital Center, Portland Hospital Service Corporation, Legacy Health System
^a Purchased inputs other than labor. ^b Total value of production including payments to labor and capital. ^c Percent of purchased inputs other than labor with higher share of total purchased commodities.	