

# Volume 3: Technical Appendices



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Port of Portland — Portland Business Alliance

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### Project Funders:

Commercial Real Estate Economic Coalition (CREEC)  
Clackamas County  
City of Gresham  
City of Hillsboro  
City of Portland  
City of Sherwood  
City of Wilsonville  
Howard S. Wright  
National Electrical Contractors Association – Oregon-Columbia Chapter  
Oregon State Building & Construction Trades Council  
Portland General Electric  
Plumbing & Mechanical Contractors Association  
Sheet Metal & Air Conditioning Contractors National Association  
Three Oaks Development Company  
Westside Economic Alliance

*The Project is being funded in part through funds provided by the State of Oregon, acting by and through the Business Oregon (an Oregon state agency).*

*The site information contained in this report is based on publicly available data sources and is not intended to replace independent due diligence for transaction purposes. Prospective purchasers, tenants, and others shall perform and rely solely upon, their own independent due diligence with respect to the Property.*

## REGIONAL INDUSTRIAL SITE READINESS PROJECT

Prepared by Group Mackenzie, Ash Creek Associates, Inc., and Johnson Reid

Volume 3 is one of four documents for the Regional Industrial Site Readiness Project. This volume presents the technical appendices that support Volumes 1 and 2. Volume 1 presents the complete Project analysis and findings. Volume 2 presents site specific details and results of the Project. The Project Executive Summary is the fourth document.

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			SITE CHARACTERISTICS																				INFRASTRUCTURE			TRANSPORTATION			AVAILABILITY/OWNERSHIP														
Site ID	Preliminary Tier	State Certified	Traded Sector Industry	Owner/Site	Location	County	Gross Acres	Wetlands (RLIS)	Wetland Acreage (Jurisdictions)*	Flood 96 Acres (RLIS)	FEMA Flood AC (RLIS)	Floodplain AC (Jurisdictions)*	Streams AC (RLIS)	Stream AC (Jurisdictions)*	7-25% Slope Acres (RLIS)	10-35% Slope Acres (Jurisdiction)(RLIS)	All Constraints (RLIS)	All Constraints (Jurisdictions)*	% Constraints (RLIS)	% Constraints (Jurisdictions)*	Net Developable Acreage (RLIS)	Net Developable Acreage (Market Knowledge)*	Use Restriction	Brownfield	Annexation Required	Number of Taxlots	Number of Owners	Sewer Score	Water Score	Storm Score	Surrounding System Quality	Access to Interstate Highway	Access to Freight Route (Roadway)	Access to Freight System (All Modes)	Currently for Sale/Lease	Willing to Transact	Private Ownership	Investor	Public	User	Site ID	Notes	
1	1	YES	C, D, H	RIVERGATE (PORT)	PORTLAND	Multnomah	51.25	0.00		0.21	43.20	0	0.00		0.02	0	43.24	0	84.36%	0.00%	8.02	43.15				5		A	B	A	A	B	A	A	L				YES		1	Lease only	
11	1		D, H	PORTLAND INTERNATIONAL CENTER - EAST (PORT)	PORTLAND	Multnomah	43.50	0.34		0.00	0.00		0.79		1.19		2.32		5.33%		41.18					2		A	A	A	A	C	A	B	L				YES		11	Lease only	
21	1		A, B, D, F, H, I	LSI EAST (PORT)	GRESHAM	Multnomah	115.98	0.00		0.00	0.00		0.00		0.96		0.96		0.83%		115.01					6		A	A	A	A	B	A	B		YES			YES		21	Delineation # 11-0203; no jurisdictional wetlands on site	
32	1		F	ELIGSEN RALPH H & SHIRLEY L	WILSONVILLE	Clackamas	32.34	0.00		0.00	0.00		0.00		0.00		0.00		0.00%		32.34					1		A	A	A	A	C	B	B	S		YES				32	Price constrained: currently not at industrial price; No further wetland investigation warranted - per DSL	
44	1		D, F	INTEL CORPORATION	HILLSBORO	Washington	31.39	0.00	0.00	0.00	0.00	0	0.00		1.28	0	1.28	0	4.08%	0.00%	30.11	31.39				3		B	B	A	A	A	A	B	S					YES	44	Irregular site shape; can not get square/rectangle net developable 25 acres; No further wetland investigation warranted - per DSL	
46	1	YES	D, F	DEV. SERVICES OF AMERICA (WESTMARK SITE)	HILLSBORO	Washington	30.02	0.00	0.00	0.00	0.00	0	0.00		1.02	0	1.02	0	3.40%	0.00%	29.00	30.02				1		A	B	A	A	A	A	B	S		YES				46	Delineation # 07-0165: valid for 5 years. New delineation required in March 2012; No further investigation warranted - per DSL	
48	1	YES	A, F	WAFFORD DEWAYNE (BAKER/BINDEWALD SITE)	HILLSBORO	Washington	50.78	0.00	1.48	0.00	0.54	0.05	0.78		8.86	0.47	9.40	3.84	18.51%	7.56%	41.38	46.94				1		A	B	A	A	A	A	A	S		YES				48	Delineation # 08-0396; Wetland acreage provided by DSL; No further wetland investigation warranted - per DSL	
49	1	YES	A, F	NIKE FOUNDATION	HILLSBORO	Washington	73.88	0.98	0.98	0.00	6.84	13.75	1.13		0.35	0.04	7.16	14.02	9.69%	18.98%	66.72	59.86				1		A	B	A	A	A	A	A	S			YES			49	Wetland acreage provided by City of Hillsboro; Wetland delineation expires April 2012; No further wetland investigation warranted - per DSL	
57	1	YES	D, F	MERIX CORPORATION	FOREST GROVE	Washington	34.25	0.66		0.00	0.00		0.00		0.30		0.83		2.42%		33.42					1		A	A	A	A	A	B	C	S					YES	57	Delineation # 06-0248; no further site investigation warranted - per DSL	
9	2		D, H,	NE MARINE DR & 33rd AVE (PORT)	PORTLAND	Multnomah	66.74	4.61	0.60	1.86	16.48	18	1.56		11.25	0	26.84	4.04	40.22%	6.05%	39.89	62.70				1		A	A	A	C	C	A	B	L				YES		9	Lease only; requires transportation improvements; Located in managed floodplain; Net developable assumes wetland mitigation	
13	2		D, H	ICDC LLC	PORTLAND	Multnomah	28.11	0.00		0.00	0.00		0.00		5.24	1.59	5.24	1.59	18.63%	5.66%	22.87	26.52				3		C	A	A	A	C	B	B	L				YES		NO	13	Local Wetland Inventory does not exist; Site lacks wetland delineation; 100% hydric soils on site and on site wetlands are expected by DSL; Based on wetland findings site may fall below 25 net developable acres
22	2		A, B, D, F, H	LSI WEST (PORT)	GRESHAM	Multnomah	87.69	0.00	3.70	0.00	0.00		0.67	0.67	23.77	15.45	24.40	19.85	27.82%	22.64%	63.29	67.84				3		A	A	A	A	B	A	B		YES **			YES		22	Multi year farming leases on property require buy out resulting in Tier 2; No longer a brownfield; Net developable acres is only south of sloped hill; Delineation # 11-0203; Wetland acreage provided by DSL; Per DSL, approximately 1 acre of wetland exists in net developable area on south portion of the site; No further site investigation warranted - per DSL	
29	2		C, D, H	CLACKAMAS COUNTY DEVELOPMENT	CLACKAMAS	Clackamas	61.93	0.00		1.85	6.71		3.82		26.47		32.32	21.93	52.20%	35.41%	29.60	40.00	A			11		B	B	B	B	B	B	C	S/L				YES		29	Can mitigate brownfield within 6 months (completed phase 2 assessment); Development Agency estimates net developable 40 acres; Tier 2 because wetlands analysis and mitigation plan requires more than 180 days and not shovel ready within 180; No further wetland investigation warranted - per DSL	
38	2		D	BILES FAMILY LLC	SHERWOOD	Washington	39.60	0.00		0.00	0.00		0.00		8.72		8.72		22.01%		30.89			YES		1		C	A	B	B	B	B	B	S		YES				38	No further wetland investigation warranted - per DSL	
40	2		D	PACIFIC REALTY ASSOCIATES LP	TUALATIN	Washington	26.80	0.00		0.00	0.00		0.00		2.95	0	3.04	0	11.34%	0.00%	23.76	26.80				1		A	A	A	B	B	A	A	S/L			YES			40	Needs intersection improvements. Permit timing > 6 months; No further wetland investigation warranted - per DSL	
50	2	YES	A, F	KEITH BERGER / HERBERT MOORE / BOYLES TRUST	HILLSBORO	Washington	72.40	0.00	0.07	0.00	7.16	5.78	0.00	1.88	0.86	0	8.02	6.26	11.08%	8.65%	64.38	66.14				5	3	B	B	A	B	B	B	B	S		YES				50	Known SNRO on site; Required extension of Huffman Rd for site access is greater than 6 month timeline; Wetland delineation reoccurred 11/09; Wetland acreage provided by DSL; No further wetland investigation warranted - per DSL; North portion of Moore parcel is included as part of this site; 2 property owners	
52	2	YES	A, F	BERGER PROPERTIES / HERBERT MOORE	HILLSBORO	Washington	52.00	0.00	0.00	0.00	0.00	0	0.00		0.00	0	0.00	0	0.00%	0.00%	52.00	48.10				2	2	A	A	A	B	C	B	B	S		YES				52	Gross acreage includes area designated for Huffman Rd extension and net developable acreage does not; Required extension of Huffman Rd for site access is greater than 6 month timeline; Southern portion of Moore parcel is included as part of this site; 3 property owners	
54	2		D, F	5305 NW 253RD AVENUE LLC	HILLSBORO	Washington	38.49	0.75	1.01	0.00	8.34	7.25	0.00		2.47	0	9.08	9.9	23.59%	25.72%	29.41	28.59		YES		1		C	B	B	C	C	B	B		N/A	YES				54	Willingness to transact is unknown	
55	2		B, D, F	SPOKANE HUMANE SOCIETY	HILLSBORO	Washington	45.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0	0.00%	0.00%	45.49	45.49		YES		1		C	A	C	C	C	B	B		YES	YES				55	Known SNRO on site; Multiple owners own this parcel but listed as 1 LLC; could be aggregated with site 56 for a 116 acre site	
56	2		A, F	EAST EVERGREEN SITE	HILLSBORO	Washington	71.11	0.00	5.16	0.88	0.00	0.00	0.00		0.44	0	1.32	7.26	1.86%	10.21%	69.79	71.11		YES		9	7	C	A	B	A	C	B	C	S	YES	YES				56	Floodplain and SNRO on site; Net developable acres assumes mitigated floodplain and SNRO; 9 parcels/7 property owners; 6 parcels/4 owners currently for sale; Remaining owners have in past expressed willingness to transact; could be aggregate with site 55 for a 116 acre site	
62	2		D, F	ROCK CREEK SITE	HAPPY VALLEY	Clackamas	40.83	0.00		0.00	0.00		0.00		6.65		6.65		16.29%		34.18					5																	



Site ID	Preliminary Tier	State Certified	Traded-Sector Industry	Owner/Site	Location	County	Gross Acres	Wetlands (RLIS)	Wetland Acreage (Jurisdictions)*	Flood 96 Acres (RLIS)	FEMA Flood AC (RLIS)	Floodplain AC (Jurisdictions)*	Streams AC (RLIS)	Stream AC (Jurisdictions)*	7-25% Slope Acres (RLIS)	10-25% Slope Acres (Jurisdiction RLIS)*	All Constraints (RLIS)	All Constraints (Jurisdictions)*	% Constraints (RLIS)	% Constraints (Jurisdictions)*	Net Developable Acreage (RLIS)	Net Developable Acreage (Market Knowledge)*	Use Restriction	Brownfield	Annexation Required	Number of Taxlots	Number of Owners	Sewer Score	Water Score	Storm Score	Surrounding System Quality	Access to Interstate Highway	Access to Freight Route (Roadway)	Access to Freight System (All Modes)	Currently for Sale/Lease	Willing to Transact	Private Ownership	Investor	Public	User	Site ID	Notes		
35	3		C, D	TONQUIN INDUSTRIAL AREA	TUALATIN	Washington	49.70	0.83	0.50	0.00	0.00		0.15		9.18		9.73	9.40	19.58%	18.91%	39.97	40.30			YES	8	7	B	C	B	B	B	B	A	A		YES				YES	35	Property owners have expressed willingness to aggregate - per City of Tualatin	
36	3		B, C, D	TIGARD SAND & GRAVEL SITE	TUALATIN	Washington	296.88	9.33		0.00	0.00		1.02		163.71		168.78		56.85%		128.10			YES	15	3	C	C	B	C	B	A	A	A		NO				YES	36	Tigard Sand & Gravel owns 12 parcels; active gravel operation		
37	3		D	ORR FAMILY FARM LLC	SHERWOOD	Washington	96.26	4.20		0.00	0.00		0.00		49.60		53.42		55.50%		42.84			YES	1		C	A	B	C	B	B	A	A		NO	YES					37	Annexation required; Owner not willing to transact	
47	3		D, F	CRANFORD JULIAN F & SHARON D	HILLSBORO	Washington	28.51	0.44	0.44	0.55	2.32	0.52	0.00	0.50	5.63	0.47	7.93	1.22	27.82%	4.28%	20.57	27.29				1		C	B	B	A	A	A	A		NO	YES					47	Combination of hydric and partially hydric soils present; On site wetland investigation warranted - per DSL	
59	3		C, D, H	COFFEE CREEK INDUSTRIAL AREA - site 2	WILSONVILLE	Washington	46.37	0.00	0.00	0.00	0.00	0.00	0.00		0.10		0.10	0	0.22%		46.27			YES	12	8	B	B	A	B	B	B	C	B		NO	YES					59	8 property owners; ability to aggregate has not been discussed	
60	3		C, D, H	COFFEE CREEK INDUSTRIAL AREA - site 3	WILSONVILLE	Washington	29.65	0.00	0.00	0.00	0.00	0.00	0.00		2.60		2.60	0	8.77%		27.05			X	YES	10	7	B	A	A	B	B	B	C	C		NO	YES					60	7 property owners; No expressed willingness to aggregate; Site includes parcels that are split by County lines; Potential underground storage tank on site but exact location is unclear (Metro database); UST could be also located in parcel 61 to the north
61	3		C, D, H	COFFEE CREEK INDUSTRIAL AREA - site 4	WILSONVILLE	Washington	48.56	0.00	0.00	0.00	0.00	0.00	0.00				0.00	0	0.00%		48.56			YES	12	8	B	A	A	B	B	B	B	C	C		NO	YES					61	8 property owners; No expressed willingness to aggregate
64	3		D	WOODFOLD-MARCO MFG INC (East Oak St)	FOREST GROVE	Washington	25.46	0.00		0.00	0.00		0.00		0.00		0.00		0.00%		25.46				2	2	B	B	B	A	C	A	C		NO	YES					64	2 parcels; 2 property owners		
65	3		D	WOODFOLD-MARCO MFG INC (West Oak St)	FOREST GROVE	Washington	53.93	0.02		0.00	0.00		0.00		0.00		0.02		0.04%		53.91				5		B	B	C	A	C	A	C		NO	YES					65			
100	3		A, B, D, F	HOLZMEYER RICHARD HENRY ET AL	FOREST GROVE	Washington	111.37	0.00		0.00	0.00		0.00		11.63		11.25		10.10%		100.12			YES	1		C	--	B	A	C	C	B		N/A	YES					100	Outside UGB; Water service information was not available at the time of this analysis		
101	3		A, B, F	VANROSE FARMS and VANDERZANDEN	HILLSBORO	Washington	270.5	18.45		9.08	27.34	22.85	12.14		29.99	23.41	35.77	45.67	13.22%	16.88%	234.73	224.83		YES	2	2	C	B	B	B	C	B	B		YES	YES					101	Outside UGB; Parcels were aggregated into1 site per City of Hillsboro; On site wetland investigation is warranted per DSL		
104	3		A, B, F	HILLSBORO URBAN RESERVES (Aggregate)	HILLSBORO	Washington	320	0.00	0.00	0.00	14.96	9.24	0.00		4.54	1.36	19.50	10.60	6.09%	3.31%	300.50	309.40		YES	9	8	C	B	B	C	C	C	B	B		YES	YES					104	Outside UGB; Property owners have expressed willingness to aggregate and transact - per City of Hillsboro; On site wetland investigation is warranted - per DSL	
109	3		A, D, H	MORSE BROS INC	TUALATIN	Washington	85.31	3.98		0.00	0.00		0.00		21.26		23.59		27.65%		61.73			C	YES	7		C	C	B	C	C	C	B		NO				YES	109	Outside UGB		

\* These columns indicate that environmental constraint information was provided by jurisdictions, Port of Portland, or Group Mackenzie knowledge and are not from Metro RLIS data. These columns supplement the previous RLIS columns. Net developable acreage (market knowledge) supplements the net developable acreage (RLIS) column.

\*\* Indicates a seller is willing to transact but not within in tier 1 timeframe of 180 days.

TRADED-SECTOR INDUSTRY:

A: Regionally to nationally scaled clean-tech manufacturer

B: Globally scaled clean technology campus

C: Heavy industrial/manufacturing

D: General manufacturing

E: Food processing

F: High-tech manufacturing or campus industrial

G: Regional (multi-state) distribution center

H: Warehouse/distribution

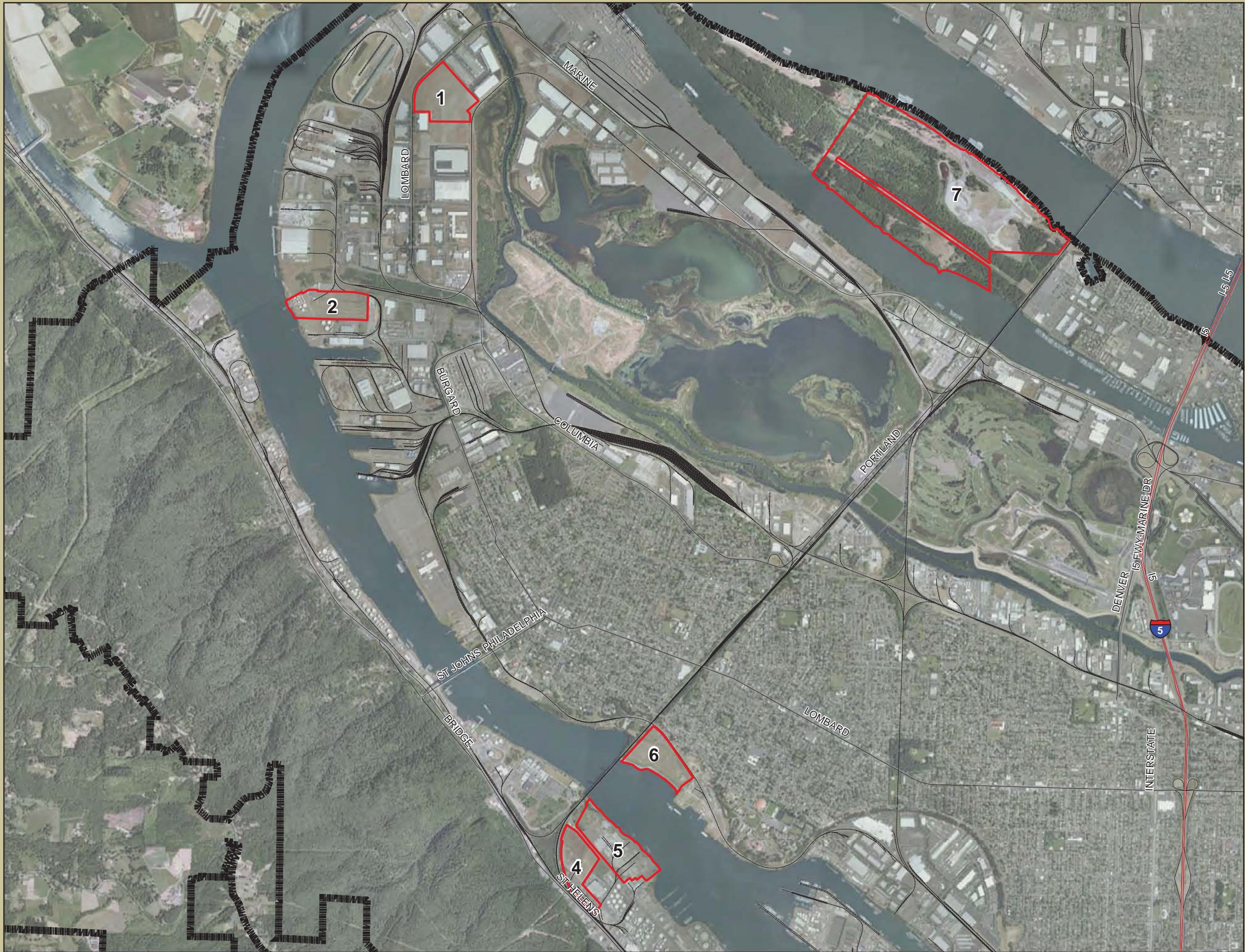
I: Portland regional distribution center

J: Call center/business services

K: Data centers

L: Rural/frontier industrial

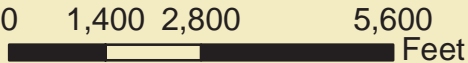




# Regional Industrial Inventory Project

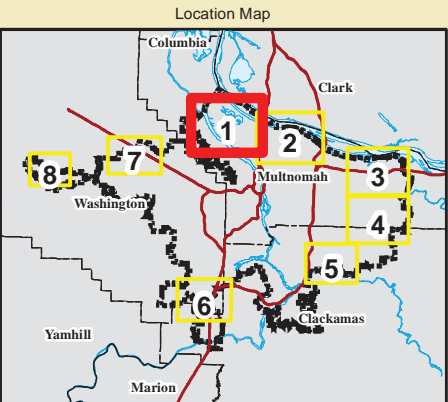
Map 1  
North Portland

- Potential Industrial Site
- Urban Growth Boundary



Source Data  
Metro RLIS Lite Base Data, August 2011

Geographic Projection Information  
NAD 83 HARN, Oregon North  
Lambert Conformal Conic



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Regional Industrial  
Inventory Project

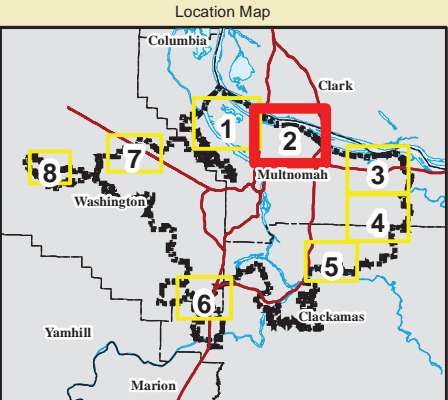
Map 2  
Portland International Airport

- Potential Industrial Site
- Urban Growth Boundary

0 1,400 2,800 5,600 Feet

Source Data  
Metro RLIS Lite Base Data, August 2011

Geographic Projection Information  
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Lambert Conformal Conic



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Regional Industrial  
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Map 3  
East Multnomah County

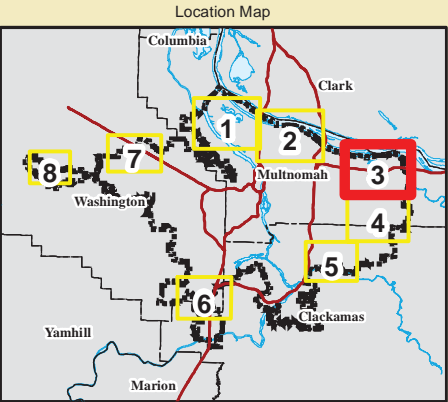
Potential Industrial Site

Urban Growth Boundary



Source Data  
Metro RLIS Lite Base Data, August 2011

Geographic Projection Information  
NAD 83 HARN, Oregon North  
Lambert Conformal Conic

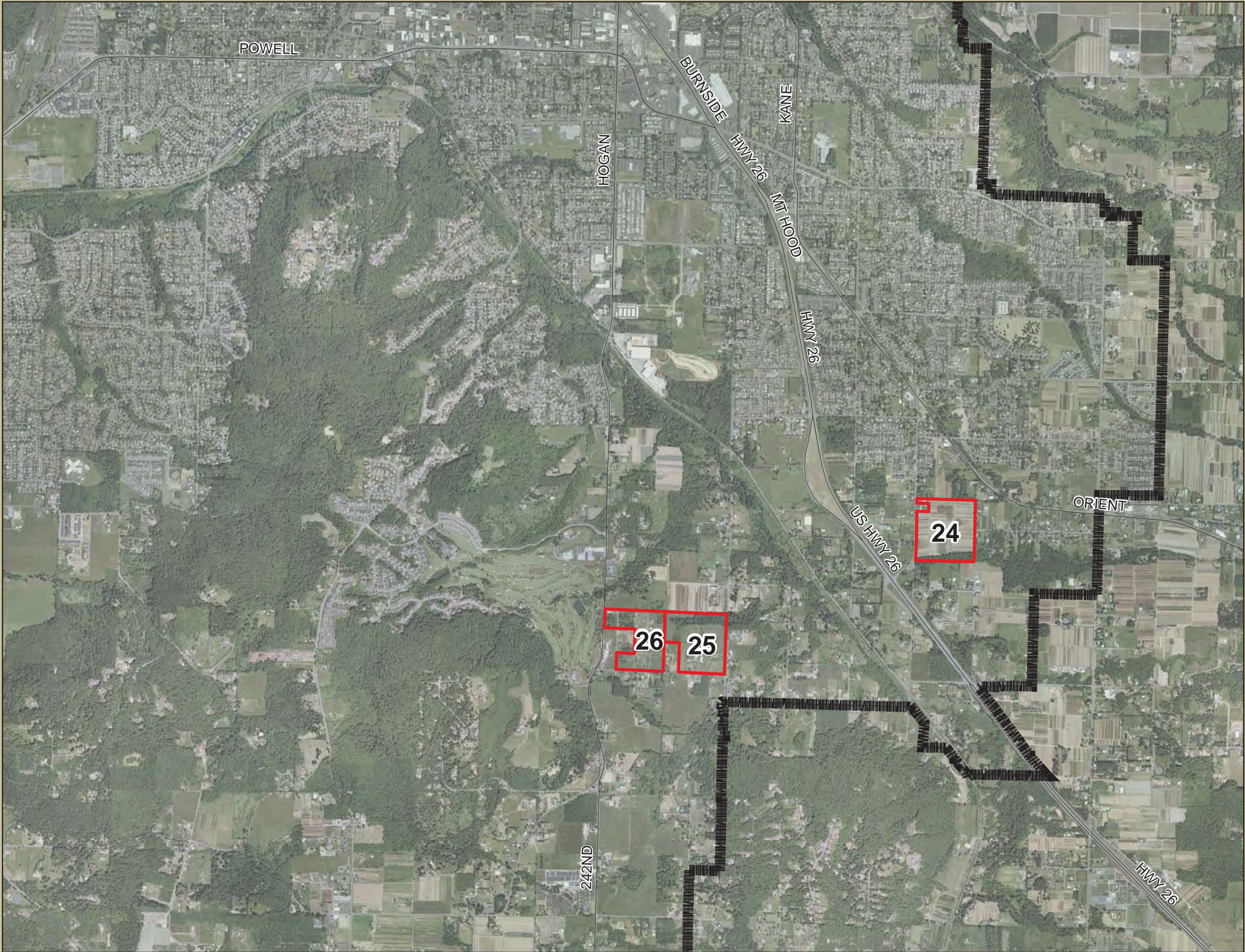


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
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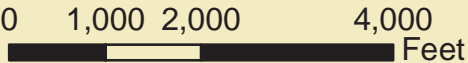




Regional Industrial  
Inventory Project

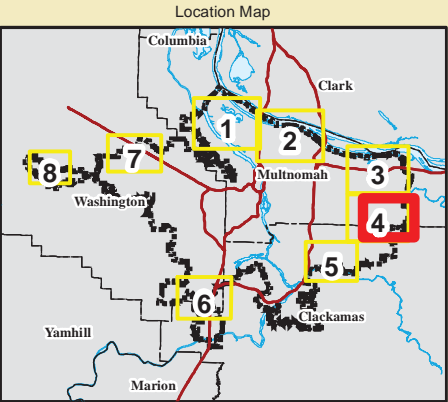
Map 4  
E Gresham

-  Potential Industrial Site
-  Urban Growth Boundary



Source Data  
Metro RLIS Lite Base Data, August 2011

Geographic Projection Information  
NAD 83 HARN, Oregon North  
Lambert Conformal Conic



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
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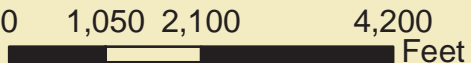




**Regional Industrial  
Inventory Project**

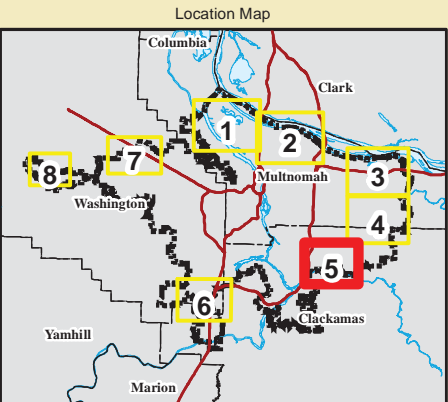
**Map 5  
Clackamas County**

-  Potential Industrial Site
-  Urban Growth Boundary



**Source Data**  
Metro RLIS Lite Base Data, August 2011

**Geographic Projection Information**  
NAD 83 HARN, Oregon North  
Lambert Conformal Conic

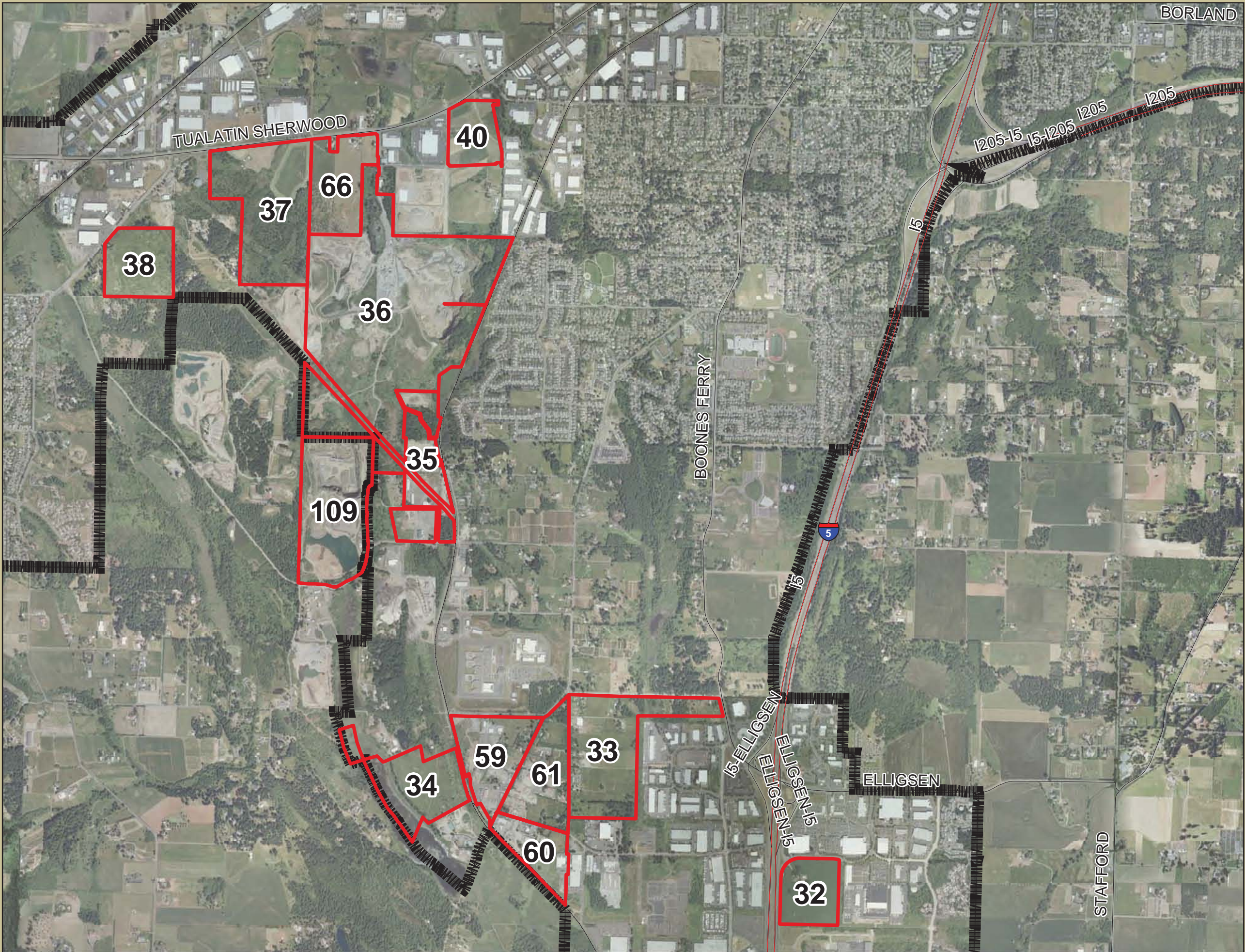


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File: SiteReview\_10.27.2011.mxd  
Map Created by: GF  
Project No: 2110160

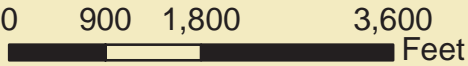




**Regional Industrial  
Inventory Project**

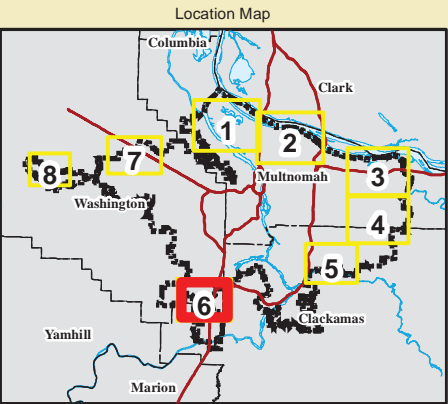
**Map 6**  
**Tualatin, Sherwood &  
Wilsonville**

-  Potential Industrial Site
-  Urban Growth Boundary



**Source Data**  
Metro RLIS Lite Base Data, August 2011

**Geographic Projection Information**  
NAD 83 HARN, Oregon North  
Lambert Conformal Conic



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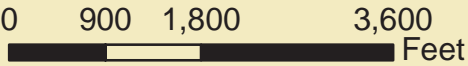
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Inventory Project

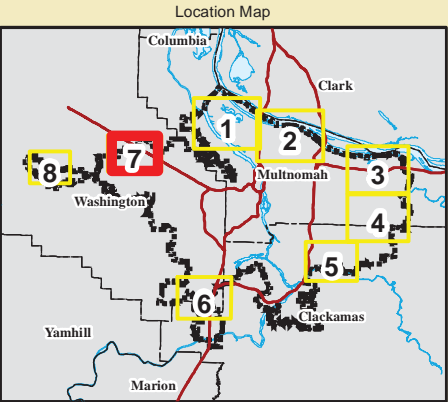
Map 7  
Hillsboro

- Potential Industrial Site
- Urban Growth Boundary



Source Data  
Metro RLIS Lite Base Data, August 2011

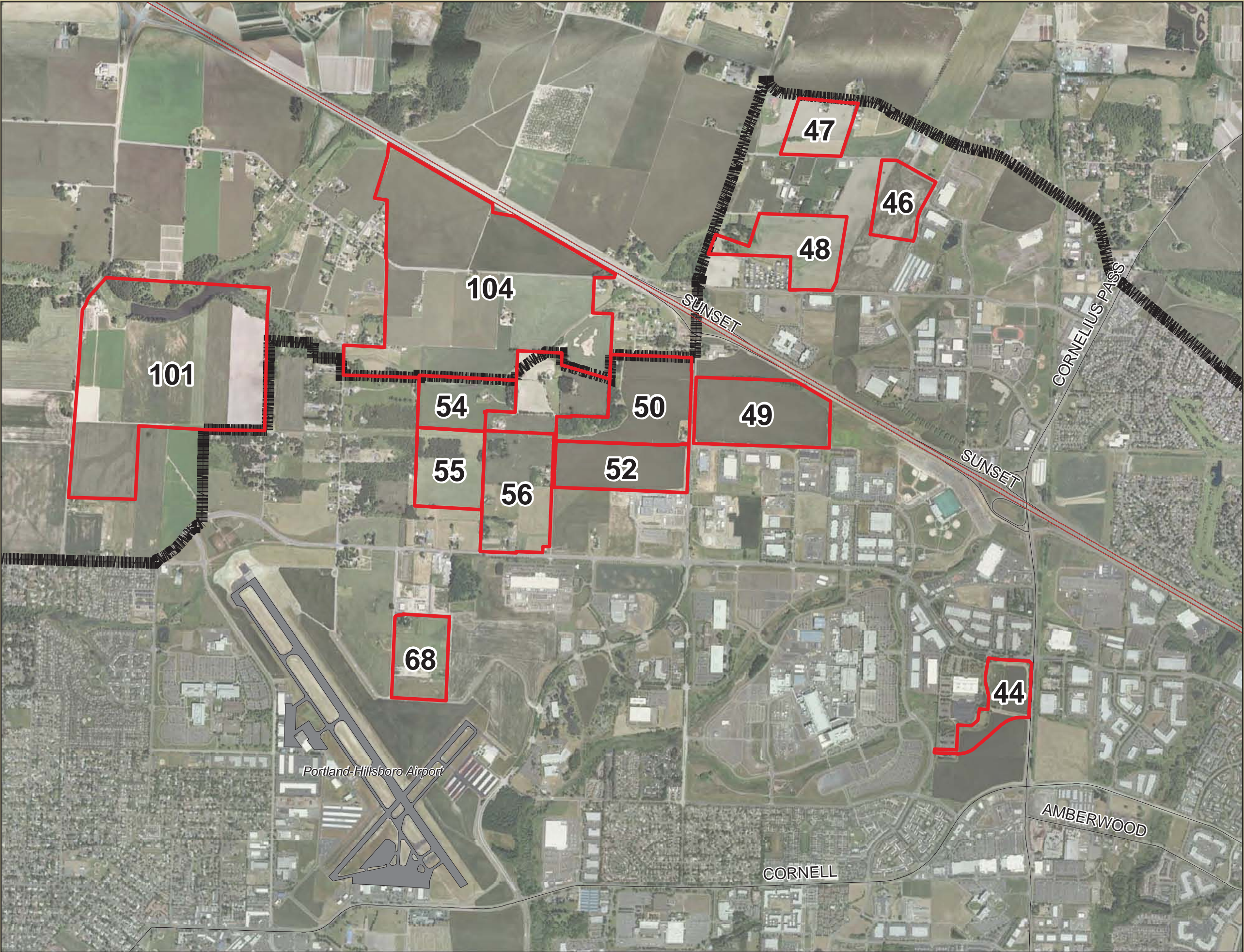
Geographic Projection Information  
NAD 83 HARN, Oregon North  
Lambert Conformal Conic



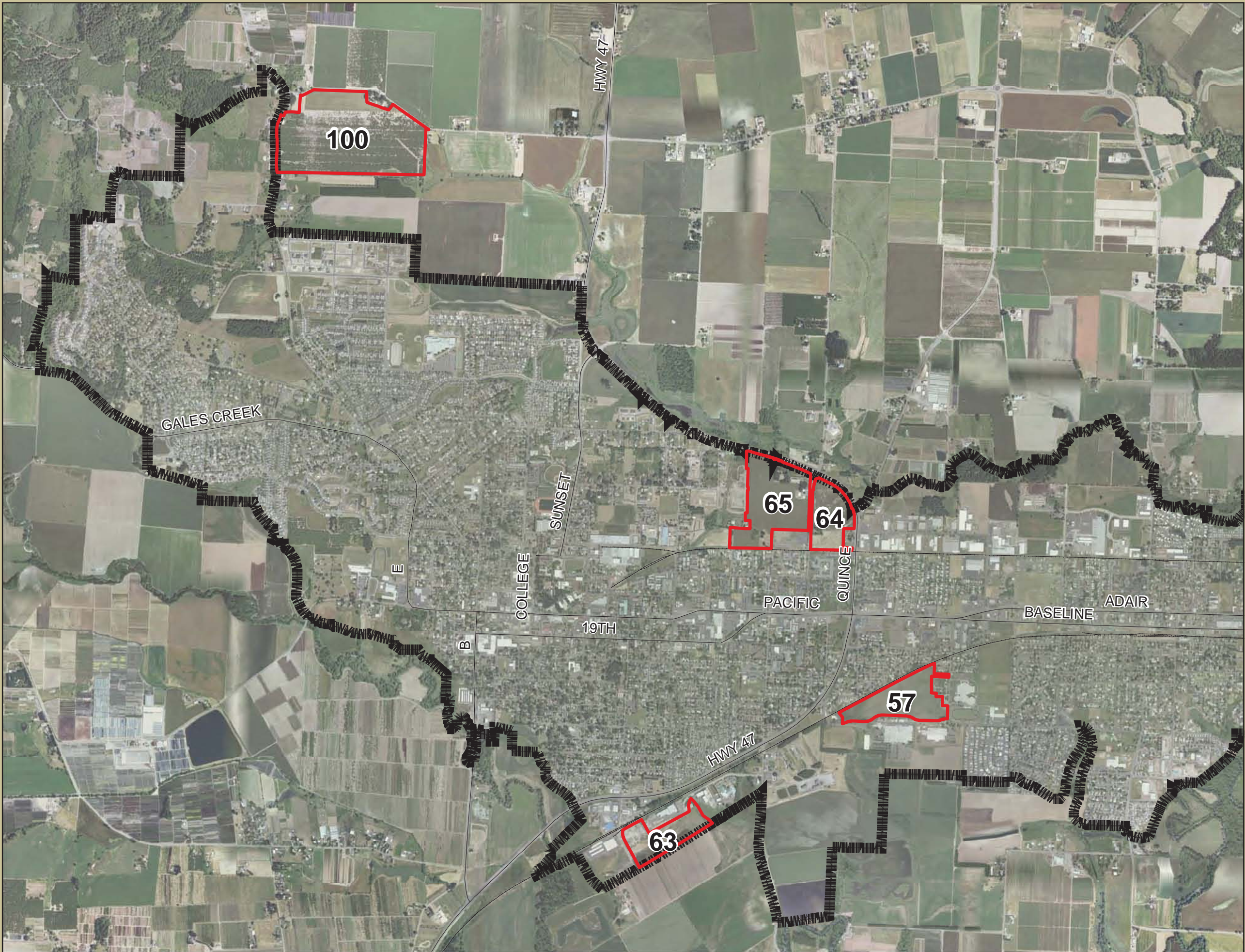
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


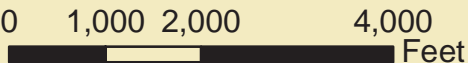




Regional Industrial  
Inventory Project

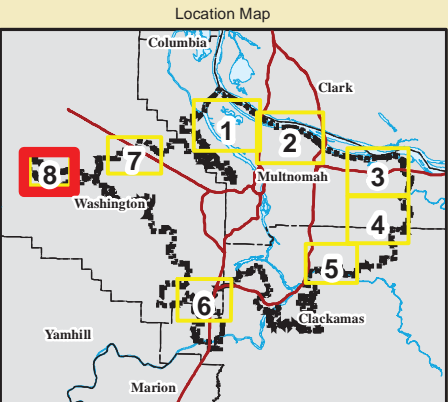
Map 8  
Forest Grove

-  Potential Industrial Site
-  Urban Growth Boundary



Source Data  
Metro RLIS Lite Base Data, August 2011

Geographic Projection Information  
NAD 83 HARN, Oregon North  
Lambert Conformal Conic



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Phase 1 Tiering Matrix									
	25 net developable acres	Use Restriction	Brownfield Remediation	Annexation Required	Sewer, Water, & Storm	System Mobility	Currently for Sale or Lease		Willingness to Transact
Tier 1	Within 6 months	No	No or Within 6 months (Score of A)	No	A or B	A or B	Yes	OR	Yes
Tier 2	Within 7-30 months	Yes or No	Within 7-30 months (Score of B)	Yes	A, B or C	A, B or C	Yes	OR	Yes or Unknown
Tier 3	>30 months	Yes or No	>30 months (Score of C)	Yes	A, B or C	A, B or C	Yes or No	OR	Yes or No or Unknown

Site readiness and time to market are the determining factors used to develop tiers of sites.

**Tier 1** sites are shovel ready, or can be shovel ready within 180 days (6 months) and require minimal to no additional costs or time to deliver a site. It is anticipated that no or minimal infrastructure or remediation is necessary along with due diligence and entitlements, could be provided/obtained within this time period. The site has no use restriction, and is currently on the market for sale or lease or the ownership is willing to transact.

**Tier 2** sites require additional time, between 7-30 months, and costs to deliver a shovel ready site. These sites may have a use restriction e.g. marine or aviation only as determined by the Port of Portland. They may have deficiency issues with regards to infrastructure, may require brownfield remediation and may also require annexation and additional entitlements that are assumed to take beyond 6 months time. These sites are currently on the market for sale or lease, or the ownership is willing to transact or this information is not available.

**Tier 3** sites require the most time, over 30 months, and costs to deliver a shovel ready site. In addition to the criterion for Tier 2, these sites may or may not be currently for sale or lease or willingness to transact could be yes or no, or is not available.

INFRASTRUCTURE AND TRANSPORTATION RATING METHODOLOGY

INFRASTRUCTURE

Sewer	A	≥ 8" main located adjacent to or stubbed to site or within ~200ft of site. No downstream pipe/treatment capacity issues.
	B	≥ 6-8" main located within ~ 1000ft, with no downstream deficiencies. Possible pump station needed.
	C	No nearby pipe and/or significant lift station and force main needed. Downstream deficiencies may be present.
Water	A	≥ 12" main adjacent or within ~200ft, preferred loop system existing. No low-pressure issues.
	B	≥ 8" adjacent, or ≥ 12" main within ~ 1000ft. No pump station or pressure/treatment deficiencies.
	C	No nearby pipe and/or system deficiencies present.
Storm	A	≥ 12" public main adjacent or within ~200ft, or ability to discharge to managed surface waters. No capacity issues.
	B	≥ 12" main within ~ 500ft; possible outfall to nearby regulated surface channel or wetland.
	C	No adjacent public storm or no available discharge point to surface water.

TRANSPORTATION

Surrounding System Quality	A	Local Access <u>and</u> Transportation System Mobility are <b>Good</b>
	B	Local Access is <b>Good</b> <u>and</u> Transportation System Mobility is <b>Poor -OR- Local Access is Poor and Transportation System Mobility is Good</b>
	C	Local Access <u>and</u> Transportation System Mobility are <b>Poor</b>
<p><b>Defined by 2 metrics:</b> <i>Local Access</i> – Defined as the immediate (proximate) transportation system. Factors to consider: Direct roadway connection to the transportation system Extent of frontage and offsite improvements necessary to connect to the proximate transportation system Values:     <b>Good</b> –     Property has direct connection and no offsite improvements are necessary.               <b>Poor</b> –     Property does not have a direct connection and/or significant improvements are necessary to gain local access.</p> <p><i>Transportation System Mobility</i> – Defined as the mobility on the existing freight transportation system. This includes mobility on the adjacent higher-order roadways and intersections. This does not include mobility on the mainline interstate highways as it is assumed all motor vehicle freight generally has to traverse these roadways and is not critical to individual property valuation. Values:     <b>Good</b> –     Mobility of adjacent system has a PM peak hour v/c ratio ≤ 0.99 (an approximate LOS F or better).               <b>Poor</b> –     Mobility of adjacent system has a PM peak hour v/c ratio &gt; 0.99 (an approximate LOS F or worse).</p>		
Access to Interstate Highway	A	< 1.0 Miles to Interstate Highway
	B	1.0 - 5.0 Miles to Interstate Highway
	C	> 5.0 Miles to Interstate Highway
Access to Freight Route (Roadway)	A	< 0.5 Miles to Freight Route
	B	0.5 - 2.0 Miles to Freight Route
	C	> 2.0 Miles to Freight Route
Access to Freight System (All Modes)	A	Reasonable Access to 3 Freight Modes
	B	Reasonable Access to 2 Freight Modes
	C	Reasonable Access to 1 Freight Modes





PROFILE			A	B	C	D	E	F	G	H	I	J
CRITERIA			Regionally to Nationally Scaled Clean-Tech Manufacturer	Globally Scaled Clean Technology Campus	Heavy Industrial / Manufacturing	General Manufacturing	Food Processing	High-Tech Manufacturing or Campus Industrial	Regional (multi-state) Distribution Center	Warehouse / Distribution	Call Center / Business Services	Rural / Frontier Industrial
1	GENERAL REQUIREMENTS		Use is permitted outright, located in UGB or equivalent and outside flood plain; and site (NCDA) does not contain contaminants, wetlands, protected species, or cultural resources or has mitigation plan(s) that can be implemented in 180 days or less.									
2	PHYSICAL SITE	Competitive Acreage*	50	100	25	10	20	25	200	25	3	5
3	Competitive Slope:	Maximum Slope	0 to 5%	0 to 5%	0 to 5%	0 to 5%	0 to 5%	0 to 7%	0 to 5%	0 to 5%	0 to 12%	0 to 5%
4	WORKFORCE	People	150,000	750,000	30,000	30,000	20,000	60,000	75,000	20,000	25,000	1,000
5	TRANSPORTATION	ADT/Acre	50 to 75 (per acre)	50 to 75 (per acre)	42 to 58 (per acre)	76 to 106 (per acre)	75 to 100 (per acre)	50 to 75 (per acre)	64 to 86 (per acre)	65 to 86 (per acre)	144 to 192 (per acre)	5 to 10 (per acre)
6	MILES TO INTERSTATE OR OTHER PRINCIPLE ARTERIAL:	Miles	w/ in 10	w/ in 10	w/ in 10	w/ in 20	w/ in 30	w/ in 15	w/ in 5 (only interstate or equivalent)	w/ in 5 (only interstate or equivalent)	N/A	N/A
7	RAILROAD ACCESS:	Dependency	Preferred	Preferred	Preferred	Preferred	Preferred	Not Required	Preferred	Preferred	Not Required	N/A
8	PROXIMITY TO MARINE PORT:	Dependency	Preferred	Preferred	Preferred	Preferred	Preferred	Not Required	Preferred	Preferred	Not Required	N/A
9	PROXIMITY TO AIRPORT-REGIONAL(Commercial):	Dependency	Competitive	Required	Preferred	Preferred	Preferred	Competitive	Preferred	Preferred	Preferred	N/A
		Distance (Miles)	w/ in 60	w/ in 30	w/ in 60	w/ in 60	w/ in 60	w/ in 30	w/ in 60	w/ in 60	w/ in 60	N/A
10	PROXIMITY TO AIRPORT-INTERNATIONAL:	Dependency	Preferred	Competitive	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	N/A
		Distance (Miles)	w/ in 100	w/ in 100	w/ in 300	w/ in 300	w/ in 300	w/ in 100	w/ in 300	w/ in 300	w/ in 300	N/A
11	UTILITIES											
	WATER:	Min. Line Size (Inches/Dmtr)	10	10	8"	8"	10"	10"	4"	4"	4"	4"
		Min. Fire Line Size (Inches/Dmtr)	10"	10"	10"	10"	10"	10"	10"	10"	8"	6" (or alternative source)
		High Pressure Water Demand Dependency	Preferred	Preferred	Preferred	Not Required	Preferred	Preferred	Not Required	Not Required	Not Required	Not Required
		Flow (GPD)	250,000	1 MGD	36,100	17,000	24,900	65,300	11,700	11,700	4,600	750
12	SEWER:	Min. Service Line Size (Inches/Dmtr)	10"	10"	8"	8"	10"	10"	4"	4"	4"	4' (or on-site source)
		Flow (GPD)	250,000	1 MGD	32,500	15,300	100,000	58,800	11,700	11,700	4,600	750
13	NATURAL GAS:	Preferred Min. Service Line Size (Inches/Dmtr)	6"	6"	6"	4"	6"	6"	2"	2"	2"	N/A
		On Site	Competitive	Competitive	Competitive	Competitive	Preferred	Competitive	Preferred	Preferred	Preferred	Preferred
14	ELECTRICITY:	Minimum Service Demand	2 MW	10 MW	1 MW	.25 MW	.25 MW	.25 MW	1 MW	.25 MW	0.15 MW	.1 MW
		Close Proximity to Substation	Competitive	Competitive	Competitive	Preferred	Not Required	Competitive	Not Required	Not Required	Preferred	Not Required
		Secondary System Dependency	Preferred	Competitive	Required	Not Required	Not Required	Required	Not Required	Not Required	Required	Not Required
15	TELECOMMUNICATIONS:	Major Communications Dependency	Required	Required	Preferred	Preferred	Preferred	Required	Preferred	Preferred	Required	Preferred
		Route Diversity Dependency	Preferred	Preferred	Not Required	Not Required	Not Required	Required	Not Required	Not Required	Required	Not Required
		Fiber Optic Dependency	Preferred	Preferred	Preferred	Preferred	Preferred	Required	Preferred	Preferred	Required	Not Required
16	SPECIAL CONSIDERATIONS		Acreage allotment includes expansion space (often an exercisable option). Very high utility volumes in one or more areas common. Sensitive to nearby uses.	Demanding criteria-driven site selection. High material and visitor throughput. Major Commercial Airport a must. Redundency in trip routes and utilities vital. Surrounding Environmentalals (vibration, noise, etc). Buffering and expansion space necessary. Sensitive to encroachment activities of nearby uses (residential, institutional, commercial).	Adequate distance from sensitive land uses (residential, parks, large retail centers) necessary. High throughput of materials. Large yard spaces and/or buffering required. Often transportation related requiring marine/rail links.	Adequate distance from sensitive land uses (residential, parks) necessary.	May require high volume/supply of water and sanitary sewer treatment. Often needs substantial storage/yard space for input storage. Ons site water pre-treatment needed in many instances.	Surrounding environment of great concern (vibration, noise, air quality, etc.). Increased setbacks may be required and/or on-site utility service areas. Avoid sites close to wastewater treatment plants, landfills, sewage lagoons, and other such land uses. May require high volume/supply of water and sanitary sewer treatment.	Transportation routing and proximity to/from major highways is crucial. Expansion options required. Truck Staging requirements mandatory. Does not like to site or have routing issues between site and interstate that have rail crossings, school zones, airport runways, or drawbridges.	Transportation infrastructure such as roads and bridges to/from major highways is most competitive factor.	Relatively higher parking ratios may be necessary. Will be very sensitive to labor force considerations and the location of other similar centers in the region.	Located in more remote locations in the state. Usually without direct access (within 50 miles) of Interstate or City of more than 50,000 people.

Group Mackenzie; Business Oregon

Terms:

More Critical

↑

Less Critical

**'Required'** factors are seen as mandatory in a vast majority of cases and have become industry standards

**'Competitive'** significantly increases marketability and is *highly recommended by OBD*. May also be linked to financing in order to enhance the potential reuse of the asset in case of default.

**'Preferred'** increases the feasibility of the subject property and its future reuse. Other factors may, however, prove more critical

\* Competitive Acreage: Acreage that would meet the site selection requirements of the majority of industries in this sector.

\*\*Total Site: Building footprint, including buffers, setbacks, parking, mitigation, and expansion space



## MEMORANDUM

---

**DATE:** September 30, 2011

**TO:** Mark Clemons  
GROUP MACKENZIE

**FROM:** Jerry Johnson  
JOHNSON REID LLC

**SUBJECT:** Redevelopment Site Identification and Key Analytical and Policy Issues

---

This memorandum addresses the methodological approach used to identify prospective industrial redevelopment sites, reviews preliminary results, and discusses key analytical and policy issues.

While the primary focus of Group Mackenzie's analysis is on vacant large lot industrial sites available within the Portland metropolitan area, the impact that redevelopment can play in accommodating large lot industrial demand is also of interest. The following are key considerations with respect to redevelopment that should be understood from a policy perspective:

- What is the inventory of industrial sites that could be considered as likely and/or potential redevelopment sites?
- Within what time frame can these sites be expected to be available to serve the market?
- What is the net industrial capacity associated with these sites?

## METHODOLOGY

As a general rule, redevelopment is considered plausible when the residual land value under the highest and best use development scenario is equal to or greater than the estimated current value of the property, including improvements. The inventory of sites with potential to redevelop was derived using a methodological approach that compared assumed land values for industrial uses to the value of the property and improvements under the existing use. A land value of \$6 per square foot was assumed to represent an average land value for industrial uses, while Real Market Value (RMV) from County Assessor's records was used as a proxy for the value of land and improvements of individual properties.

If the assumed market value of the land is greater to or equal to the market value of the property, it is assumed to represent a rational development or redevelopment opportunity. While development and/or redevelopment is considered viable in these instances, it does not necessarily mean that it will be redeveloped. There are a number of additional factors that impact redevelopment, and we assume that only a portion of opportunities identified as viable will be realized within the study horizon.

Some of the factors which can stall or preclude redevelopment are:

- **Measures of market value.** Within the analysis, Real Market Value (RMV) based on county assessor records is used as a proxy for the market value of the property. In our experience, this



measure tends to undervalue assets. As a result, it has the effect of indicating a higher likelihood of redevelopment, leading to an over-statement of redevelopment potential.

- **Owner disposition.** This factor includes a broad range of variables, including the property owner's interest in redevelopment, level of capitalization, investment objectives, risk sensitivity, availability and terms of credit, perception of return, etc.
- **Current lease structure.** The property's current lease structure and term may either preclude major improvements or reduce the potential for realizing a return on enhancements or improvements. An example of this is often found in retail leases, which have relatively long terms with extension options.
- **Leaseholder disposition.** The leaseholder's disposition is also a contributing factor to improvements, as the leaseholder's willingness to bear the burden of increased rents associated with improvements is critical. In addition to the current leaseholder, the general market for space and the disposition of potential lessees is also an important factor impacting the viability of improving a property.
- **Regulatory environment** – The ability to successfully complete an improvement also relies upon the local regulatory environment, including building and zoning code applications.
- **Holding costs** – A property owner's basis and tax position in a property may impact the likelihood of redevelopment. Owners without major return requirements are more likely to hold properties, as are owners with property tax relief such as those taking advantage of programs such as farm tax deferrals on property taxes.
- **Specialized improvements** – Industrial uses often have highly specialized improvements, which may have a high value but limited ability to be re-purposed. Work should be done to test the development economics associated with repurposing sites for highly dissimilar uses, or the capacity associated with these sites should be appropriately discounted.\
- **Site Characteristics** – While sites may have a low improvement value, this may reflect issues that have impact the ability to develop the sites. These include issues such as environmental contamination and/or wetlands, which can sharply increase development costs and/or the timing of any development.

The methodology screens for sites of an appropriate size and zoning categorization, and then develops a ratio of current RMV per square foot divided by the assumed industrial land value (\$6 per square foot). Sites with a ratio close to 1.2 or below are considered to have redevelopment potential, in that the estimated value of land and improvements is 120% or less of the assumed underlying land value for alternative industrial uses.

## OUTPUT

The methodology generated an initial list of 93 sites, each of which is summarized in the following table.



Tract ID	Owner	Site Address	City	Total RMV	GIS Acres	RMV/SF	RMV/Underlying Land Value
153E08D -01700	PORTLAND GENERAL ELECTRIC CO	3490 W POWELL LOOP	GRESHAM	\$0	36.34	\$0.00	0.00
1N1E28A -00300	UNION PACIFIC RAILROAD CO		PORTLAND	\$0	78.31	\$0.00	0.00
1N1E21 -00100	UNION PACIFIC RAILROAD CO		PORTLAND	\$0	67.28	\$0.00	0.00
1N1E20 -01300	PORTLAND TERMINAL R R CO &> BU		PORTLAND	\$0	82.93	\$0.00	0.00
2N1W34 -00300	PORTLAND GENERAL ELECTRIC CO	12500 NW MARINA WAY	PORTLAND	\$0	63.11	\$0.00	0.00
2N1E30 -01400	BURLINGTON NORTHERN RAILROAD H	14420-14440 WI/ N BYBEE LAKE RD	PORTLAND	\$0	36.38	\$0.00	0.00
2N1W36 -00400	UNION PACIFIC RAILROAD CO	9003 N COLUMBIA BLVD	PORTLAND	\$0	54.43	\$0.00	0.00
22E31 00600	PORTLAND GEN ELEC CO	NO SITUS	OREGON CITY	\$0	28.72	\$0.00	0.00
25129A001600	PORTLAND GENERAL		SHERWOOD	\$0	43.13	\$0.00	0.00
1N1E18D -00200	PORTLAND SHIPYARD LLC	5555 WI/ N CHANNEL AVE	PORTLAND	\$100	56.01	\$0.00	0.00
1N1E07 -00100	MC CORMICK & BAXTER CREOSOTING	6900 N EDGEWATER ST	PORTLAND	\$170	42.39	\$0.00	0.00
1N3340000401	JACOBSMUHLEN MEATS INC	1395 NW SUSBAUER RD	CORNELLUS	\$230	31.16	\$0.00	0.00
1N1E27 -00100	CLEAR CHANNEL OUTDOOR INC	SWC/ GREELY & N INTERSTATE AVE	PORTLAND	\$7,700	40.22	\$0.00	0.00
1N3E23 -00900	PORT OF PORTLAND	TROUTDALE AIRPORT	TROUTDALE	\$23,010	77.18	\$0.01	0.00
152E21A -00300	OREGON STATE OF (HWY COMM>		PORTLAND	\$21,270	68.69	\$0.01	0.00
251200002000	SIX CORNERS LAND INVESTMENT	20015 SW PACIFIC HWY	SHERWOOD	\$30,320	51.46	\$0.01	0.00
1N2E07 -00100	PORT OF PORTLAND(LEASED	5330 WI/ NE COURIER CT	PORTLAND	\$308,860	386.26	\$0.02	0.00
1N1W13 -01200	COOKIN NORMAL &	7200 WI/ NW FRONT AVE	PORTLAND	\$101,190	79.27	\$0.03	0.00
25129D000300	LANGER FAMILY LLC	14958 SW TUALATIN SHERWOOD RD	SHERWOOD	\$76,580	56.48	\$0.03	0.01
151E14A -00500	CLEAR CHANNEL OUTDOOR INC	5411 E/ SE MCLOUGHLIN BLVD	PORTLAND	\$88,420	53.61	\$0.04	0.01
152060001000	HILLSBORO CITY OF		HILLSBORO	\$175,770	89.74	\$0.04	0.01
251138000600	CLEAN WATER SERVICES	16060 SW 85TH AVE	TIGARD	\$154,050	50.61	\$0.07	0.01
1N2280001550	PORT OF PORTLAND THE	3115 NE CORNELL RD	HILLSBORO	\$1,365,330	422.36	\$0.07	0.01
22E10 00601	STATE OF OREGON	NO SITUS	CLACKAMAS	\$706,552	121.09	\$0.13	0.02
2N1W35D -00300	LAMPROS STEEL INC	9040 WI/ N BURGARD WAY	PORTLAND	\$155,290	25.21	\$0.14	0.02
251288000102	GALBREATH WILLIAM A	19925 SW CIOLE RD	SHERWOOD	\$172,180	27.19	\$0.15	0.02
25122D000550	WALGRAEVE GARY &	11345 SW HERMAN RD	TUALATIN	\$358,620	54.96	\$0.15	0.02
1N1W02 -00100	PORT OF PORTLAND(LEASED	TERMINAL 4	PORTLAND	\$597,360	88.03	\$0.16	0.03
1N2150000300	CRANFORD JULIAN F & SHARON D	23320 NW WEST UNION RD	HILLSBORO	\$201,100	28.51	\$0.16	0.03
15305C000100	CLEAN WATER SERVICES		FOREST GROVE	\$1,082,030	131.62	\$0.19	0.03
1N1E10 -00200	GILBERT FAMILY LLC ET AL	1001 W/ N SCHMEER RD	PORTLAND	\$531,870	64.51	\$0.19	0.03
1N2210003100	BERGER KEITH A & REBECCA LEE	5455 NW BIRCH AVE	HILLSBORO	\$362,020	42.22	\$0.20	0.03
1N1E11B -00903	FAZIO ANTHONY A &	8433 NE 13TH AVE	PORTLAND	\$334,720	34.96	\$0.22	0.04
1N3E34C -00500	ISI LOGIC MANUFACTURING	22318 NE GUSAN ST	GRESHAM	\$762,910	74.93	\$0.23	0.04
31W14C 00103	MEADOWESTVACO PACKAGING SYS LLC	NO SITUS	WILSONVILLE	\$325,610	26.23	\$0.28	0.05
1N1E02C -00300	PORTLAND CITY OF(BUREAU OF	10040 NE 6TH DR	PORTLAND	\$387,790	28.87	\$0.31	0.05
25129A000100	UNITED STATES OF AMERICA	20555 SW GERDA LN	SHERWOOD	\$636,900	45.76	\$0.32	0.05
1N3E23 -00800	PORT OF PORTLAND(LEASED	1000-1260 NW PERIMETER WAY	TROUTDALE	\$461,720	32.63	\$0.32	0.05
1N2E08 -00300	PORT OF PORTLAND(LEASED	NE AIRPORT WAY, A	PORTLAND	\$7,813,160	480.55	\$0.37	0.06
23E06C 08001	WEAVER RUSSELL J & KATHLEEN D	NO SITUS	CLACKAMAS	\$607,532	34.20	\$0.41	0.07
25127B000300	WAGER EDWARD J	12075 SW TUALATIN SHERWOOD RD	TUALATIN	\$595,490	32.15	\$0.43	0.07
1N1E12D -00100	BROADMOOR INC	3509 WI/ NE COLUMBIA BLVD	PORTLAND	\$2,793,200	139.37	\$0.46	0.08
21E36 01700	PORTLAND GEN ELEC CO	NO SITUS	WEST LUNN	\$1,178,985	48.98	\$0.55	0.09
151E11D -00200	TILBURY CEMENT CO	4035 SE 22ND AVE	PORTLAND	\$1,123,380	44.82	\$0.58	0.10
1N2E06 -00300	PORT OF PORTLAND(LEASED	4756 NE MARINE DR	PORTLAND	\$9,867,110	346.42	\$0.65	0.11
151090001100	MAXTEK	3025 SW ZWORYKIN AVE	BEAVERTON	\$3,584,620	124.13	\$0.66	0.11
1N3E33 -01300	LINDE INC	21015 WI/ SE STARK ST	GRESHAM	\$5,710,320	137.48	\$0.95	0.16
1N1E05 -00400	PORTLAND CITY OF	N PORTLAND RD	PORTLAND	\$1,889,680	41.29	\$1.05	0.18
2N1W35B -01500	TIME OIL CO	10350 WI/ N TIME OIL RD	PORTLAND	\$1,614,930	32.90	\$1.13	0.19
1N1E04A -00400	THE PORT OF PORTLAND	10799 N EXPO RD	PORTLAND	\$5,482,970	97.40	\$1.29	0.22
2N1W24 -01200	PORT OF PORTLAND(LEASED	8235 WI/ N MARINE DR	PORTLAND	\$7,156,740	120.22	\$1.37	0.23
2N1E30 -00900	PORT OF PORTLAND(LEASED	6347 N MARINE DR	PORTLAND	\$2,439,320	40.66	\$1.38	0.23
25124B001007	JEWELL ATTACHMENTS LLC	18101 SW BOONES FERRY RD	TIGARD	\$1,706,600	27.95	\$1.40	0.23
2N1W26 -00800	SHAWCOR PIPE PROTECTION LLC	14400 WI/ N RIVERGATE BLVD	PORTLAND	\$9,258,060	147.14	\$1.44	0.24
1N2230001200	UNITED STATES OF AMERICA	21255 NW EVERGREEN PKWY	HILLSBORO	\$3,016,000	46.30	\$1.50	0.25
153050000800	WHITE OAK RIVER INC	4114 HEATHER ST	FOREST GROVE	\$2,063,450	25.84	\$1.83	0.31
1N3E22D -00102	WEYHRIE ENTERPRISES LLC	1459 NW SUNDIAL RD	TROUTDALE	\$2,324,840	28.37	\$1.88	0.31
22E10 00602	STATE OF OREGON	NO SITUS	CLACKAMAS	\$5,271,878	64.11	\$1.89	0.31
2N1W35D -00700	UNION BANK OF CALIFORNIA	12005 WI/ N BURGARD ST	PORTLAND	\$2,252,280	25.30	\$2.04	0.34
25121A002100	GRIMM'S FUEL CO	18400 SW PACIFIC HWY	TUALATIN	\$2,767,800	28.47	\$2.23	0.37
22E04D 00700	GREAT AMERICAN TV&R CO INC	9415 SE LAWNFIELD RD	CLACKAMAS	\$4,586,572	42.41	\$2.48	0.41
153E05BC -04000	MULTNOMAH COUNTY	1400 SE 182ND AVE	PORTLAND	\$2,758,990	25.21	\$2.51	0.42
1N1E01 -00400	PORT OF PORTLAND	2432 NE MARINE DR	PORTLAND	\$8,251,930	66.74	\$2.84	0.47
2N1W36 -00200	METRO		PORTLAND	\$42,008,480	330.28	\$2.92	0.49
1N1E06 -00200	COLUMBIA STEEL CASTING CO INC	10425 WI/ N BLOSS AVE	PORTLAND	\$9,817,660	75.81	\$2.97	0.50
1N3E23 -00100	PORT OF PORTLAND	E SIDE/ NW SUNDIAL RD	TROUTDALE	\$26,743,370	201.26	\$3.05	0.51
151080000504	TUALATIN HILLS PARK &	15655 SW MILLIKAN WAY	BEAVERTON	\$27,058,240	193.10	\$3.22	0.54
152070000200	HILLSBORO CITY OF	2500 SW HILLSBORO HWY	HILLSBORO	\$22,926,260	162.26	\$3.24	0.54
1N3E22 -00504	FORT JAMES CORPORATION	22329 NE MARINE DR	FAIRVIEW	\$5,488,100	36.12	\$3.49	0.58
1N1E17 -00301	US BARGE LLC	5555 WI/ N CHANNEL AVE	PORTLAND	\$10,341,130	64.41	\$3.69	0.61
2N1W35B -00300	PORT OF PORTLAND(LEASED	13333 WI/ N RIVERGATE BLVD	PORTLAND	\$5,141,790	31.80	\$3.71	0.62
1N3E34D -00600	SEMICONDUCTOR COMPONENTS	23400 WI/ NE GUSAN ST	GRESHAM	\$4,210,670	25.91	\$3.73	0.62
1N3E30D -01300	NEW ALBERTSON'S INC	17505 WI/ NE SAN RAFAEL ST	PORTLAND	\$5,747,740	34.19	\$3.86	0.64
1N1E12 -00200	PORT OF PORTLAND	7000 WI/ NE AIRPORT WAY	PORTLAND	\$23,204,200	132.54	\$4.02	0.67
1N3E26B -01200	MULTNOMAH COUNTY	1400-1700 W HIST COLUMBIA RIVER HWY	TROUTDALE	\$4,511,990	25.26	\$4.10	0.68
31W14D 01903	RITE AID STORE #80	29555 SW BOONES FERRY RD	WILSONVILLE	\$5,337,990	29.80	\$4.11	0.69
1N2E07 -00200	PORT OF PORTLAND	7000 WI/ NE AIRPORT WAY	PORTLAND	\$19,283,060	103.63	\$4.27	0.71
1N3E29A -00900	BOYD FUTURE ASSOCIATES LLC	19730 WI/ NE SANDY RD	PORTLAND	\$5,161,250	27.68	\$4.28	0.71
1N1E01 -00100	PORT OF PORTLAND	10150 NE 33RD DR	PORTLAND	\$36,424,200	193.59	\$4.32	0.72
1N2270000104	INTEL CORPORATION	2501 NW 229TH AVE	HILLSBORO	\$21,692,450	111.71	\$4.46	0.74
153E14C -01600	MUTUAL MATERIALS COMPANY	2300 SE HOGAN RD	GRESHAM	\$17,009,850	86.37	\$4.52	0.75
1N133BC01300	BEAVERTON SCHOOL DIST #48J	13845 NW SCIENCE PARK DR	PORTLAND	\$8,393,080	38.29	\$5.03	0.84
2N1W36C -00700	WMR LLC	11920 WI/ N BURGARD ST	PORTLAND	\$6,875,390	29.27	\$5.39	0.90
1N2E09 -00400	PORT OF PORTLAND		PORTLAND	\$30,426,330	128.95	\$5.42	0.90
2N1W26 -00501	PORT OF PORTLAND(LEASED	14005 WI/ N LOMBARD ST	PORTLAND	\$6,724,650	27.62	\$5.59	0.93
1N2220001000	HILLSBORO CITY OF	4450 NW 229TH AVE	HILLSBORO	\$7,055,870	28.36	\$5.71	0.95
22E16A 00100	SAFeway CANADA HOLDINGS INC	16800 SE EVELYN ST	CLACKAMAS	\$11,399,900	45.60	\$5.74	0.96
1N2E15B -00200	PORT OF PORTLAND	10201 WI/ NE AIRPORT WAY	PORTLAND	\$12,286,450	45.53	\$6.20	1.03
22E08D000101	JMP INC	8000 SE ROOTS RD	PORTLAND	\$11,507,541	42.24	\$6.25	1.04
2N1E30 -00600	PORT OF PORTLAND	6399 WI/ N MARINE DR	PORTLAND	\$17,094,710	60.48	\$6.49	1.08
2N1W35D -01200	WMR LLC	11920 N BURGARD ST	PORTLAND	\$8,340,630	28.92	\$6.62	1.10
1N2270000100	INTEL CORPORATION	3100 NE SHUTE RD	HILLSBORO	\$13,519,070	44.79	\$6.93	1.15
25127A000200	PACIFIC REALTY ASSOCIATES LP	20800 SW 115TH AVE	TUALATIN	\$8,576,910	27.24	\$7.23	1.20





The list included a number of sites that were owned by utilities, railroads or public entities. The Port of Portland alone accounted for 20 of the 93 sites identified in the initial screen. When these are excluded, the methodology yields a total of 41 sites with an indicated potential for redevelopment.

Tract ID	Owner	Site Address	City	Total RMV	GIS Acres	RMV/SF	RMV/Underlying Land Value
1N1E06 -00200	COLUMBIA STEEL CASTING CO INC	10425 WI/ N BLOSS AVE	PORTLAND	\$9,817,660	75.81	\$2.97	0.50
1N1E10 -00200	GILBERT FAMILY LLC ET AL	1001 W/ N SCHMEER RD	PORTLAND	\$531,870	64.51	\$0.19	0.03
1N1E11B -00903	FAZIO ANTHONY A &	8433 NE 13TH AVE	PORTLAND	\$334,720	34.96	\$0.22	0.04
1N1E12D -00100	BROADMOOR INC	3509 WI/ NE COLUMBIA BLVD	PORTLAND	\$2,793,200	139.37	\$0.46	0.08
1N1E17 -00301	US BARGE LLC	5555 WI/ N CHANNEL AVE	PORTLAND	\$10,341,130	64.41	\$3.69	0.61
1N1W13 -01200	COOKIN NORMA L &	7200 WI/ NW FRONT AVE	PORTLAND	\$101,190	79.27	\$0.03	0.00
1N2150000300	CRANFORD JULIAN F & SHARON D	23320 NW WEST UNION RD	HILLSBORO	\$201,100	28.51	\$0.16	0.03
1N2210003100	BERGER KEITH A & REBECCA LEE	5455 NW BIRCH AVE	HILLSBORO	\$362,020	42.22	\$0.20	0.03
1N2270000100	INTEL CORPORATION	3100 NE SHUTE RD	HILLSBORO	\$13,519,070	44.79	\$6.93	1.15
1N2270000104	INTEL CORPORATION	2501 NW 229TH AVE	HILLSBORO	\$21,692,450	111.71	\$4.46	0.74
1N3E22 -00504	FORT JAMES CORPORATION	22329 NE MARINE DR	FAIRVIEW	\$5,488,100	36.12	\$3.49	0.58
1N3E22D -00102	WEYHRICH ENTERPRISES LLC	1459 NW SUNDIAL RD	TROUTDALE	\$2,324,840	28.37	\$1.88	0.31
1N3E29A -00900	BOYD FUTURE ASSOCIATES LLC	19730 WI/ NE SANDY RD	PORTLAND	\$5,161,250	27.68	\$4.28	0.71
1N3E30D -01300	NEW ALBERTSON'S INC	17505 WI/ NE SAN RAFAEL ST	PORTLAND	\$5,747,740	34.19	\$3.86	0.64
1N3E33 -01300	LINDE INC	21015 WI/ SE STARK ST	GRESHAM	\$5,710,320	137.48	\$0.95	0.16
1N3E34C -00500	LSI LOGIC MANUFACTURING	22318 NE GLISAN ST	GRESHAM	\$762,910	74.93	\$0.23	0.04
1N3E34D -00600	SEMICONDUCTOR COMPONENTS	23400 WI/ NE GLISAN ST	GRESHAM	\$4,210,670	25.91	\$3.73	0.62
1S1090001100	MAXTEK	3025 SW ZWORYKIN AVE	BEAVERTON	\$3,584,620	124.13	\$0.66	0.11
1S1E11D -00200	TILBURY CEMENT CO	4035 SE 22ND AVE	PORTLAND	\$1,123,380	44.82	\$0.58	0.10
1S1E14A -00500	CLEAR CHANNEL OUTDOOR INC	5411 E/ SE MCLOUGHLIN BLVD	PORTLAND	\$88,420	53.61	\$0.04	0.01
1S3050000800	WHITE OAK RIVER INC	4114 HEATHER ST	FOREST GROVE	\$2,063,450	25.84	\$1.83	0.31
1S3E14C -01600	MUTUAL MATERIALS COMPANY	2300 SE HOGAN RD	GRESHAM	\$17,009,850	86.37	\$4.52	0.75
22E04D 00700	GREAT AMERICAN TV&R CO INC	9415 SE LAWNFIELD RD	CLACKAMAS	\$4,586,572	42.41	\$2.48	0.41
22E08DD00101	JMP INC	8000 SE ROOTS RD	PORTLAND	\$11,507,541	42.24	\$6.25	1.04
22E16A 00100	SAFEWAY CANADA HOLDINGS INC	16800 SE EVELYN ST	CLACKAMAS	\$11,399,900	45.60	\$5.74	0.96
23E06C 08001	WEAVER RUSSELL J & KATHLEEN D	NO SITUS	CLACKAMAS	\$607,532	34.20	\$0.41	0.07
2N1W26 -00800	SHAWCOR PIPE PROTECTION LLC	14400 WI/ N RIVERGATE BLVD	PORTLAND	\$9,258,060	147.14	\$1.44	0.24
2N1W35B -01500	TIME OIL CO	10350 WI/ N TIME OIL RD	PORTLAND	\$1,614,930	32.90	\$1.13	0.19
2N1W35D -00300	LAMPROS STEEL INC	9040 WI/ N BURGARD WAY	PORTLAND	\$155,290	25.21	\$0.14	0.02
2N1W35D -00700	UNION BANK OF CALIFORNIA	12005 WI/ N BURGARD ST	PORTLAND	\$2,252,280	25.30	\$2.04	0.34
2N1W35D -01200	WMMR LLC	11920 N BURGARD ST	PORTLAND	\$8,340,630	28.92	\$6.62	1.10
2N1W36C -00700	WMMR LLC	11920 WI/ N BURGARD RD	PORTLAND	\$6,875,390	29.27	\$5.39	0.90
2S121A002100	GRIMM'S FUEL CO	18400 SW PACIFIC HWY	TUALATIN	\$2,767,800	28.47	\$2.23	0.37
2S122D000550	WALGRAEVE GARY &	11345 SW HERMAN RD	TUALATIN	\$358,620	54.96	\$0.15	0.02
2S124B001007	JEWELL ATTACHMENTS LLC	18101 SW BOONES FERRY RD	TIGARD	\$1,706,600	27.95	\$1.40	0.23
2S127A000200	PACIFIC REALTY ASSOCIATES LP	20800 SW 115TH AVE	TUALATIN	\$8,576,910	27.24	\$7.23	1.20
2S127B000300	WAGER EDWARD J	12075 SW TUALATIN SHERWOOD RD	TUALATIN	\$595,490	32.15	\$0.43	0.07
2S128B000102	GALBREATH WILLIAM A	19925 SW CIPOLE RD	SHERWOOD	\$172,180	27.19	\$0.15	0.02
2S129D000300	LANGER FAMILY LLC	14958 SW TUALATIN SHERWOOD RD	SHERWOOD	\$76,580	56.48	\$0.03	0.01
31W14C 00103	MEADWESTVACO PACKAGING SYS LLC	NO SITUS	WILSONVILLE	\$325,610	26.23	\$0.28	0.05
31W14D 01903	RITE AID STORE #80	29555 SW BOONES FERRY RD	WILSONVILLE	\$5,337,990	29.80	\$4.11	0.69

The analysis was done at a GIS level for the entire region, and does not factor in a broader range of factors that can impact the likelihood of redevelopment. These include the assumption that gross acreage is equivalent to net acreage, which we know to be untrue in many instances.

This redevelopment analysis was completed as part of a larger vacant industrial lands analysis, which analyzed parcels throughout the Portland metropolitan region. The list above includes parcels that were also identified through the vacant land analysis, and in some instances, there is overlap between the two datasets. A portion of the sites in the table above are included in the 57 site dataset that is a part of the tiering inventory; some of the sites above are land banked by users and are included in the "User Designated" inventory table and may be further developed by the current user/owner; and some of the sites above are physically constrained and are included in the Appendix of this report. When these sites are excluded, the redevelopment methodology yields a total of 25 sites with an indicated potential for redevelopment.



## **POLICY IMPLICATIONS**

While we can use a methodological approach to identify prospective redevelopment sites, a considerable amount of further analysis would be required to clarify their impact on the market. Many of the issues impacting the redevelopment likelihood and capacity outlined earlier in this memorandum would take considerable time to identify at the specific site level. Additional screening for issues such as environmental contamination and wetlands is likely possible at the GIS level.

If redevelopment can be assumed at some time on at least a portion of these sites, it may add to the region's capacity to accommodate large lot industrial users. It is important to note that any capacity increase associated with redevelopment would need to factor in the net impact, deducting the current capacity served by the site. In other words, if redevelopment accommodates an 800 person firm but displaces current uses with 200 employees, the net increase in capacity would be 600 employees.

In many instances, marginal development patterns are at a lower density than historical patterns, and redevelopment in these cases may yield a decrease in effective employment capacity.

The time line of when sites could be expected to be available is also important. From an economic development perspective, the key variable is the number of readily available sites in the market at any one time. Sites such as the Broadmoor Golf Course, while potentially available at some time in the future, cannot be assumed as part of the short-term inventory. In addition, sites with environmental clean-up costs may never be able to be economically developed as industrial land without public intervention.

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# Regional Industrial Lands

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## Utility Infrastructure and On-Site Development

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Prepared: May 31, 2012  
By: Brent Nielsen, P.E.

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### **SITES INCLUDED:**

SITE 2 – TIME OIL COMPANY (PORTLAND)

SITE 13 – ICDC LLC (PORTLAND)

SITES 15/16 – BT PROPERTY LLC (UPS)/MICHAEL CEREGHINO (GRESHAM)

SITE 19 – TRIP PHASE 2 (TROUTDALE)

SITE 24 – JEAN JOHNSON (GRESHAM)

SITE 29 – CLACKAMAS COUNTY DEVELOPMENT (CLACKAMAS)

SITE 33 – COFFEE CREEK INDUSTRIAL AREA (WILSONVILLE)

SITE 37 – ORR FAMILY FARM LLC (SHERWOOD)

SITES 55/56 – SPOKANE HUMANE SOCIETY/EAST EVERGREEN (HILLSBORO)

SITE 62 – ROCK CREEK (HAPPY VALLEY)

SITE 104 – HILLSBORO URBAN RESERVES (AGGREGATE) (HILLSBORO)



**SITE 2**  
**TIME OIL COMPANY (PORTLAND), MAP 1*****Public Water System***

The site is in the City of Portland Water Bureau service area and is currently served by 24" mains located along the southern and eastern site frontages. Portland Water Bureau maintenance records were not reviewed, but no specific deficiencies are known for this system.

- Proposed improvements: extend service lateral directly to the site, assumed at the south side of the site.

***Public Sewer System***

The site is currently served by the City of Portland with a 12" CSP main located along the south frontage of the site and a 15" CSP main (Rivergate Interceptor) located along the east property line. Portland BES maintenance records indicate that both pipes are in good condition adjacent to the site boundaries.

- Proposed improvements: extend service lateral directly to the site, assumed at the south side of the site.

***Public Storm System***

The site is located along the Willamette River; however, private outfalls to the river are unlikely to be approved, particularly for new construction. Therefore, the site is required to discharge to a public storm main. The nearest storm facility is a City of Portland 24" main located in N Burgard Way, which discharges directly to the river.

- Proposed improvements: extend 1200' of 18" storm main from the south side of the site (existing tank farm area) to the N Burgard Way public main.
- It is anticipated that surface water quality facilities will be located in the floodplain cut zones, which will be approximately 5-6 feet below adjacent grades. Depending on the depth of the connection to the N Burgard Way public main, the onsite storm design may need to incorporate a pump system to reach the public gravity line.

***Building Pad Surcharge***

It is anticipated that the building pad areas on site will require surcharging to minimize the potential for total and differential settlement. The building pads cover approximately 580,000 square feet, which would be surcharged in 3 stages, with each stage covering approximately 193,000 square feet and about 8 feet thick. The surcharge process is expected to take approximately 21 months.

The surcharge process could be expedited by using a thicker soil berm or covering the entire surcharge area in one berm rather than in stages. However, the costs for importing and processing additional berm soil would significantly increase compared to the current staged proposal.

***Steep Slope Mitigation***

The site does not have steep slopes, so no slope mitigation is necessary.

***Floodplain Cut/Fill Balance***

The Time Oil site is located within both the 100-year and 1996 floodplain boundaries for the Willamette River (to the west) and Columbia Slough (to the east). Per City requirements, buildings within the Metro Flood Management Area need to be constructed at least 1 foot above flood elevation, which would require filling a substantial portion of the site. Fill materials placed within the flood zone need to be balanced with an equal volume of cut within the flood zone. No specific regulations refer to associated yard

storage and parking areas, but these areas should generally be raised to within 18" and 6" of the 1996 flood elevation. Based on GIS and historical data, the 1996 flood elevation is approximately 32.0 feet (NAVD 1988 datum). In order raise the building pad areas to elevation 33 ft, the yard areas to 30.5 ft, and the parking areas to 31.5 feet, the site requires approximately 74,500 cy of fill to be placed in the floodplain.

The balanced floodplain cut is proposed to be taken from the existing tank farm areas at the south and northwest edges of the site, as well as an area along the eastern edge of the property, which covers approximately 9 acres. In order to balance the expected 74,500 cy of fill, the cut zones should be lowered to approximate elevation 24.8 ft.

**SITE 13**  
**ICDC LLC (PORTLAND), MAP 3*****Public Water System***

The site is currently served by the City of Portland with an existing 12" water main located at the southwest corner of the site in NE Cameron Blvd.

- Proposed improvements: Construct an approximate 100-ft 8-inch service lateral to directly serve the site.

***Public Sewer System***

The site is currently served by the City of Portland with an existing 15" sewer gravity main located at the southwest corner of the site in NE Cameron Blvd.

- Proposed improvements: Construct an approximate 100-ft 8-inch service lateral to directly serve the site.

***Public Storm System***

The site is currently served by the City of Portland by an existing 36" storm drain line located at the southwest corner of the site in NE Cameron Blvd.

- Proposed improvements: Construct an approximate 100-ft 15-inch service lateral to directly serve the site.

***Building Pad Surcharge***

It is anticipated that the building pad areas on site will require surcharging to minimize the potential for total and differential settlement. A substantial portion of the west half of the site (the ICDC-owned property) has already been surcharged through ongoing efforts by the property owner, but the east portion (owned by Entercom) has not been prepared. Approximately 475,000 sf of building pad area remains to be surcharged, which is proposed to be accomplished in 4 stages each 8 feet thick and covering approximately 118,750 sf. It is estimated that the surcharge process to prepare the east portion of the site will take approximately 24 months.

The surcharge process could be expedited by using a thicker soil berm or covering the entire surcharge area in one berm rather than in stages. However, the costs for importing and processing additional berm soil would significantly increase compared to the current staged proposal.

***Steep Slope Mitigation***

The site does not have steep slopes, so no slope mitigation is necessary.

***Floodplain Cut/Fill Balance***

The ICDC/Entercom site is located within the Multnomah County Drainage District managed floodplain and is protected from Columbia River floods by the Marine Drive levee along the north side of the site. Construction within the MCDD managed floodplain requires coordination with MCDD to verify that the proposed development will not exceed the capacity of the district's facilities, but no additional floodplain requirements are expected to impact the site.



**SITES 15/16****BT PROPERTY LLC (UPS)/MICHAEL CEREGHINO (GRESHAM), MAP 3*****Public Water System***

The site is currently served by the City of Gresham by an existing 10" water main located to the north in NE Riverside Pkwy, and a 15" water main located along the west property line.

- Proposed improvements: Construct an approximate 100-ft 12-inch lateral to directly serve the site.

***Public Sewer System***

The site is currently served by the City of Gresham by an existing 10" sewer gravity main located to the north in NE Riverside Pkwy, a 15" sewer main stubbed to the southwest corner of the site in NE Portal Way, and a 12" sewer main at the northeast corner in NE Interlachen Ln. Existing 30" to 48" trunk lines run south to north along the east edge of the site, but direct service to these sewers is not available.

- Proposed improvements: Construct an approximate 100-ft 12-inch lateral to directly serve the site.

***Public Storm System***

The site is currently served by City of Gresham storm drains located at the site boundary.

- Proposed improvements: No public storm system improvements are necessary.

***Building Pad Surcharge***

It is anticipated that the building pad areas on site will require surcharging to minimize the potential for total and differential settlement. Approximately 1,010,000 sf of building pad area requires surcharging, which is proposed to be accomplished in 5 stages each 8 feet thick and covering approximately 207,000 sf. It is estimated that the surcharge process to prepare the east portion of the site will take approximately 36 months.

The surcharge process could be expedited by using a thicker soil berm or covering the entire surcharge area in one berm rather than in stages. However, the costs for importing and processing additional berm soil would significantly increase compared to the current staged proposal.

***Steep Slope Mitigation***

The site does not have steep slopes, so no slope mitigation is necessary.

***Floodplain Cut/Fill Balance***

The ICDC/Entercom site is located within the Multnomah County Drainage District managed floodplain and is protected from Columbia River floods by the Marine Drive levee along the north side of the site. Construction within the MCDD managed floodplain requires coordination with MCDD to verify that the proposed development will not exceed the capacity of the district's facilities, but no additional floodplain requirements are expected to impact the site.



**SITE 19**  
**TRIP PHASE 2 (TROUTDALE), MAP 3*****Public Water System***

The site is currently served by the City of Troutdale water system by a 12" main located within Swigert Way along the northern edge of the site.

- Proposed improvements: Construct an approximate 100-ft 8-inch lateral to directly serve the site.

***Public Sewer System***

The site is located within the City of Troutdale sewer service boundary, and the northern portion of the site could be served by an existing public lift station and force main located within Swigert Way. The southern portion of the site would require sewer service extension within Graham Road.

- Proposed improvements: Construct approximately 1500-ft of 8-inch diameter sewer main within Graham Road.
- Improvements Timeline: Sewer improvements are anticipated to take approximately 6 months for design and permitting, plus 6 months for construction.

***Public Storm System***

The site is located within the City of Troutdale drainage system and is expected to be served by municipal piped systems which drain to an existing drainage creek west of the site. The site is located within the Sandy Drainage Improvement Company managed floodplain. Therefore, it is anticipated that the site improvements will not require on-site detention facilities and that stormwater runoff will be directed to the SDIC-managed drainage system.

- Proposed improvements: Construct approximately 1,700 feet of 15" storm mains within Swigert Way and Graham Road.
- Improvements Timeline: Storm system improvements are anticipated to take approximately 8 months for design and permitting, plus 12 months for construction.

***Building Pad Surcharge***

It is anticipated that the building pad area on site will require surcharging to minimize the potential for total and differential settlement. Approximately 1,020,000 sf of building pad area requires surcharging, which is proposed to be accomplished in 6 stages each 8 feet thick and covering approximately 189,600 sf. It is estimated that the surcharge process to prepare the building pad area of the site will take approximately 39 months.

The surcharge process could be expedited by using a thicker soil berm or covering the entire surcharge area in one berm rather than in stages. However, the costs for importing and processing additional berm soil would significantly increase compared to the current staged proposal.

***Wetland Fill***

The site contains substantial areas of wetlands which would be filled to establish the building pad and parking areas across the site. Based on comments from Port of Portland staff, contaminated soils within the existing wetlands would need to be excavated and replaced before filling could occur. The costs associated with excavation and disposal of the contaminated soils are described and accounted for in the environmental clean-up portion of this study; however, the site fill earthwork is included in this section. Based



on information provided by the Port of Portland, the contaminated soil replacement is expected to cost approximately \$1.09 million.

Additionally, the site grades would need to be raised several feet in order to eliminate depressions and prevent site inundation from surrounding wetlands. According to Port of Portland cost estimates prepared in other site development studies, this fill is expected to cost approximately \$3.66 million to raise the site grades. The total cost associated with raising the site grades within the wetland areas is approximately \$4.75 million. This work is expected to take approximately 9 months for design and permitting, plus about 24 months for construction. The permitting timeline presented here is for a grading permit and does not include environmental remediation permitting, which is described separately in this study.

***Floodplain Cut/Fill Balance***

The ICDC/Entercom site is located within the Sandy Improvement Drainage Company managed floodplain and is protected from Columbia River floods by a US Army Corps of Engineers levee located north of the site. Construction within the SIDC managed floodplain requires coordination with SIDC to verify that the proposed development will not exceed the capacity of the drainage company's facilities, but no additional floodplain requirements are expected to impact the site.



**SITE 24**  
**JEAN JOHNSON (GRESHAM), MAP 4*****Public Water System***

The site is within the City of Gresham service boundary but is not currently served by municipal water mains. Based on review of the Springwater Community Master Plan (2005) and comments received from City of Gresham staff, the site could be served by extending existing mains from the Southeast Service Level.

- Proposed improvements: Construct approximately 7,940 feet of 12" to 18" diameter water mains from the existing Southeast Service Level boundary to the site.
- Improvements Timeline: Water improvements are anticipated to take approximately 12 months for design and permitting, plus 24 months for construction.

***Public Sewer System***

The site is in the Gresham service district but is not currently served by municipal sewer mains. Based on review of the Springwater Community Master Plan (2005) and comments from City of Gresham staff, the site is expected to be served by extending the Telford Road Interceptor sewer system.

- Proposed improvements: Construct approximately 7,600 feet of 12" to 21" diameter gravity sewer pipes along Telford Road and crossing Hwy 26.
- Improvements Timeline: Sewer improvements are anticipated to take approximately 12 months for design and permitting, plus 24 months for construction.

***Public Storm System***

The site is located along the north edge of an unnamed tributary of Johnson Creek, and it is expected that the proposed site development would follow existing ground slopes and drain to the south edge of the site. Based on review of the Springwater Community Master Plan (2005) and comments from City of Gresham staff, the City anticipates the need for a regional detention pond facility to be located in the southwest corner of the site. It is expected that this facility would discharge directly to the creek.

- Proposed improvements: Construct an approximately 18.8-acre regional detention pond facility, as well as approximately 2,350 feet of water quality treatment swales located in the public frontage roadways.
- Improvements Timeline: Storm system improvements are anticipated to take approximately 12 months for design and permitting, plus 12 months for construction.

***Utility Expansion Notes***

The Springwater area of Gresham is generally not served by existing public utility services. Based on comments from City of Gresham staff, it is expected that services will be extended as development occurs within the Springwater area, which means that the first sites to develop in the area will bear a higher start-up cost than subsequent sites.

The Jean Johnson site is located relatively far from the edge of the Gresham utility service boundaries and would require significant infrastructure extensions in order to serve the site. While the costs to extend the public utilities would be high, service expansions of this nature would avail direct utility service to many acres of nearby developable land along the utility corridor(s). This report does not attempt to quantify this associated benefit, but it should be noted that the expansion of the public services to this proposed site could spur a substantial amount of local development.



***Building Pad Surcharge***

It is anticipated that this site will not require building pad surcharging.

***Steep Slope Mitigation***

The site slopes from approximate elevation 480 ft at the north edge to about elevation 430 ft at the south edge. The site will require grading to mitigate and flatten the slopes to accommodate building pads and truck maneuvering areas. It is assumed that up to about 2 percent slope can be accommodated around buildings, and up to 7 percent can be accommodated in vehicular areas. Approximately 28,500 cy of earthwork is expected to mitigate steeply sloped areas.

***Floodplain Cut/Fill Balance***

This site is not located within a 100-year floodplain.



**SITE 29****CLACKAMAS COUNTY DEVELOPMENT (CLACKAMAS), MAP 5*****Public Water System***

The site is currently served by Clackamas County Service District #1 by an existing main located to the north in SE Capps Rd.

- Proposed improvements: Construct an approximate 100-ft 8-inch lateral to directly serve the site.

***Public Sewer System***

The site is currently served by the Clackamas County Service District #1 by an existing 10" main located to the north in SE Capps Rd, with an existing public pump station located on site.

- Proposed improvements: No sewer improvements are necessary for this site.

***Public Storm System***

The site currently has 2 detention ponds constructed at the southeast corner of the site which discharge directly to the Clackamas River and can be used for the proposed development.

Alternatively, the site is also served by Clackamas County Service District #1 by a 42" storm main located in SE Capps Rd; however, a pump station would be needed to utilize this system.

- Proposed improvements: No public storm system improvements are necessary to use the existing detention ponds and Clackamas River outfall.

***Building Pad Surcharge***

It is anticipated that this site will not require building pad surcharging.

***Steep Slope Mitigation***

The site is bordered to the north and east by steep cut slopes from prior mining/quarry uses on the site, which will require slope mitigation in order to establish the proposed building pads and associated site development. It is expected that about 28,300 cy of earthwork is required to mitigate the steep slopes on site.

***Floodplain Cut/Fill Balance***

This site is not located within a 100-year floodplain.



## SITE 33 COFFEE CREEK INDUSTRIAL AREA (WILSONVILLE), MAP 6

### ***Public Water System***

The site is within the City of Wilsonville service boundary and is served by existing 18" water mains along the west and north edges of the site. Based on review of the *Coffee Creek Industrial Area Infrastructure Analysis* (2011), the water system serving this site should be looped to provide sufficient flow and pressure to the site development.

- Proposed improvements: Construct approximately 2,600 feet of 12" diameter water mains through the site to develop a looped system.
- Improvements Timeline: Water improvements are anticipated to take approximately 6 months for design and permitting, plus 15 months for construction.

### ***Public Sewer System***

The site is within the City of Wilsonville service district, and an existing 18" sewer main is located near the southwest corner of the site. Based on review of the *Coffee Creek Industrial Area Infrastructure Analysis* (2011), the United Disposal Interceptor trunk line downstream of the site is generally sized to handle the expected capacity at build-out of the Coffee Creek area. However, there is a section of 14" pipe near the connection with the Edwards Trunk line that is expected to be under-sized for the fully developed build-out flows.

While the downstream deficiency is identified for full build-out of the Coffee Creek area, the downstream improvements may not be necessary to serve the study site depending on the relative development timing for this site. If the site develops early relative to the rest of the Coffee Creek area, then the sewer interceptor pipe upgrade may not be needed to provide sufficient service. However, if the majority of the Coffee Creek area is built up before this site, then the sewer line is likely to need the upgrade in order to provide adequate capacity. This study assumes that the site will be developed early in the regional build-out process, so the costs for the downstream sewer improvement are not included in this analysis.

- Proposed improvements: Construct approximately 2,600 feet of 15" diameter gravity sewer pipes through the site.
- Improvements Timeline: Sewer improvements are anticipated to take approximately 6 months for design and permitting, plus 15 months for construction.

### ***Public Storm System***

The site is located within the Basalt Creek watershed, which eventually discharges to the Coffee Creek Wetlands area located in the southwest portion of the Coffee Creek Plan Area. However, no public storm piping or conveyance systems currently serve the study site. Based on review of the *Coffee Creek Industrial Area Infrastructure Analysis* (2011), the proposed storm system for the Coffee Creek area includes a central regional detention facility which would be located along the eastern edge of the study site. The infrastructure analysis of this site suggests that about half of the detention facility described in the City's master planning documents would be needed in order to adequately serve the site development.

- Proposed improvements: Construct approximately 5,200 feet of 15" to 18" storm drain piping within Garden Acres Road and Kinsman Road, and construct an approximate 3.5-acre regional detention facility along the east edge of Kinsman Road.

- **Improvements Timeline:** Storm system improvements are anticipated to take approximately 6 months for design and permitting, plus 15 months for construction.

***Building Pad Surcharge***

It is anticipated that this site will not require building pad surcharging.

***Steep Slope Mitigation***

The site does not have steep slopes, so no slope mitigation is necessary.

***Floodplain Cut/Fill Balance***

This site is not located within a 100-year floodplain.



**SITE 37**  
**ORR FAMILY FARM LLC (SHERWOOD), MAP 6*****Public Water System***

The site is currently served by the City of Sherwood water system along Tualatin-Sherwood Road, but water service would need to be extended in SW 124<sup>th</sup> Street along the east side of the site.

- Proposed improvements: Construct approximately 1,150 feet of 12" water main to the southeast corner of the site boundary.
- Improvements Timeline: Water improvements are anticipated to take approximately 6 months for design and permitting, plus 12 months for construction.

***Public Sewer System***

The site is in the City of Sherwood service boundary but is not currently served by municipal service. Clean Water Services owns the public trunk mains that collect flows from the city's system. Based on review of sanitary sewer master plans prepared by the City of Sherwood and Clean Water Services, the site and the surrounding Area 48 industrial lands could be served through extension of public service lines located west of the site along Tualatin-Sherwood Road.

The downstream trunk lines are currently under-sized to accommodate full build-out of Area 48. According to comments from city staff, these lines are currently in various stages of design and construction. The full scope of downstream improvements may not be needed to serve the Orr Family site, if the site development occurs early relative to the rest of the Area 48 build-out. However, if other Area 48 development occurs, the downstream improvements are likely to be required to handle the increased sewer flows.

- Service Extension Improvements: Construct approximately 3,500 feet of 15" sewer main from the Area 48 Trunk line in Tualatin-Sherwood Road.
- Extension Improvements Timeline: Sewer improvements are anticipated to take approximately 12 months for design and permitting, plus 24 months for construction.
- Downstream Service Upgrades:
  - Improve approximately 3,000 feet of existing Area 48 Trunk pipe, from 8"-10" pipe upgraded to 15" pipe.
  - Improve approximately 1,350 feet of existing Rock Creek Trunk pipe, from 18" pipe upgraded to 24" pipe.
  - Improve approximately 6,530 feet of existing Onion Flat Trunk pipe, from 18" pipe upgraded to 24" pipe.
- Downstream Upgrades Timeline: Sewer upgrades are anticipated to take approximately 24 months for design and permitting, plus 36 months for construction. A portion of this design and construction work is currently underway.

***Public Storm System***

The site is currently served by City of Sherwood storm mains located within Tualatin-Sherwood Road along the north side of the site. The proposed development will require stormwater detention to discharge to this public facility due to anticipated downstream capacity limitations in the Hedges Creek watershed.

- Proposed improvements: Construct approximately 1.7 acres of detention pond facilities along the north edge of the site.
- Improvements Timeline: Storm system improvements are anticipated to take

approximately 6 months for design and permitting, plus 9 months for construction.

***Building Pad Surcharge***

It is anticipated that this site will not require building pad surcharging.

***Steep Slope Mitigation***

The southern portion of the site would require earthwork to mitigate steeply sloped areas to establish building pads and parking areas. It is anticipated that the south and west boundaries in particular will require cut slopes and grading to mitigate steep areas. It is assumed that up to about 2 percent slope can be accommodated around buildings, and up to 7 percent can be accommodated in vehicular areas. Approximately 50,900 cy of earthwork is expected to mitigate steeply sloped areas.

***Floodplain Cut/Fill Balance***

This site is not located within a 100-year floodplain.



**SITE 37-A  
ORR FAMILY FARM – SOUTH LOT (SHERWOOD), MAP 6*****Public Water System***

The site is currently served by the City of Sherwood water system along Tualatin-Sherwood Road, but water service would need to be extended to Blake Road at the southeast corner of the site, along the SW 124<sup>th</sup> Street alignment.

- Proposed improvements: Construct approximately 1,850 feet of 12" water main to Blake Road at the southeast corner of the site.
- Improvements Timeline: Water improvements are anticipated to take approximately 6 months for design and permitting, plus 12 months for construction.

***Public Sewer System***

The site is in the City of Sherwood service boundary but is not currently served by municipal service. Clean Water Services owns the public trunk mains that collect flows from the city's system. Based on review of sanitary sewer master plans prepared by the City of Sherwood and Clean Water Services, the site and the surrounding Area 48 industrial lands could be served through extension of public service lines located west of the site along Tualatin-Sherwood Road.

The downstream trunk lines are currently under-sized to accommodate full build-out of Area 48. According to comments from city staff, these lines are currently in various stages of design and construction. The full scope of downstream improvements may not be needed to serve the Orr Family site, if the site development occurs early relative to the rest of the Area 48 build-out. However, if other Area 48 development occurs, the downstream improvements are likely to be required to handle the increased sewer flows.

- Service Extension Improvements: Construct approximately 5,600 feet of 15" sewer main from the Area 48 Trunk line in Tualatin-Sherwood Road through the north Orr Family site. Construct approximately 750 feet of 12" sewer main from the boundary of the south Orr Family site to the south edge of the power line easement.
- Extension Improvements Timeline: Sewer improvements are anticipated to take approximately 12 months for design and permitting, plus 24 months for construction.
- Downstream Service Upgrades:
  - Improve approximately 3,000 feet of existing Area 48 Trunk pipe, from 8"-10" pipe upgraded to 15" pipe.
  - Improve approximately 1,350 feet of existing Rock Creek Trunk pipe, from 18" pipe upgraded to 24" pipe.
  - Improve approximately 6,530 feet of existing Onion Flat Trunk pipe, from 18" pipe upgraded to 24" pipe.
- Downstream Upgrades Timeline: Sewer upgrades are anticipated to take approximately 24 months for design and permitting, plus 36 months for construction. A portion of this design and construction work is currently underway.

***Public Storm System***

The site is currently served by City of Sherwood storm mains located within Tualatin-Sherwood Road along the north side of the site. The proposed development will require stormwater detention to discharge to this public facility due to anticipated downstream capacity limitations in the Hedges Creek watershed.

- Proposed improvements: Construct approximately 2.0 acres of detention pond and

water quality facilities located near the existing wetlands.

- Improvements Timeline: Storm system improvements are anticipated to take approximately 6 months for design and permitting, plus 9 months for construction.

#### ***Building Pad Surcharge***

It is anticipated that this site will not require building pad surcharging.

#### ***Steep Slope Mitigation***

The site has several steep slopes, hills, and valleys that cross the site. The site has a low area around the existing wetland, but otherwise generally slopes down to the north. Due to the irregular hills and steep slopes, the site will require significant grading and retaining structures to establish building pads and truck maneuvering areas. It is expected that the final site configuration will involve cutting the building pads and parking lots in a series of benches following the existing slope. It is assumed that up to about 2 percent slope can be accommodated around buildings, and up to 7 percent can be accommodated in vehicular areas. Approximately 262,400 cy of earthwork grading, and about 6,000 sf of retaining walls are expected to mitigate the steeply sloped areas. Additionally, approximately 7,100 cf of embankment fill is required to construct Blake Road across the north edge of the existing wetland area.

#### ***Floodplain Cut/Fill Balance***

This site is not located within a 100-year floodplain.



**SITES 55/56****SPOKANE HUMANE SOCIETY/EAST EVERGREEN (HILLSBORO), MAP 7*****Public Water System***

The site is currently served by the City of Hillsboro water system by an 18" main within Evergreen Road, but water service would need to be extended to the east and west sides of the site within 253<sup>rd</sup> Ave and 264<sup>th</sup> Ave. It is not expected that the future water main loop is needed for the section of the future Huffman Road along the north edge of the site.

- Proposed improvements: Construct approximately 4,300 feet of 18" water main to the north extent of the site.
- Improvements Timeline: Water improvements are anticipated to take approximately 12 months for design and permitting, plus 15 months for construction.

***Public Sewer System***

The site is currently within the City of Hillsboro sewer service boundary, and an existing 10" main located within Evergreen Road along the south edge of the site. Due to the depth of the sewer pipe and site topography, gravity sewer service can only be extended to about the mid-point of the site.

Beyond this boundary, sewer service would need to be pumped to a nearby trunk line, or a gravity trunk line would need to be extended along the creek alignment to the north. Either sewer improvement option should be sized to accommodate future build-out of the nearby properties that would contribute to sewer flows draining to the new facility.

- Proposed improvements:
  - Construct approximately 2,100 feet of 18" diameter gravity main within 264<sup>th</sup> Avenue.
  - Construct an approximately 2.8-MGD public lift station located near the northeast corner of the site, sized to serve this site and future development at nearby properties within the sewershed.
  - Construct approximately 2,200 feet of 12" public force main within 253<sup>rd</sup> Avenue to the existing Clean Water Services main in Evergreen Road near the southeast corner of the site.
- Improvements Timeline: Sewer improvements are anticipated to take approximately 12 months for design and permitting, plus 15 months for construction.

***Public Storm System***

The site is not currently served by public storm mains, except by a City of Hillsboro located near the southeast corner of the site. This pipe is not anticipated to be deep enough nor have capacity for gravity drainage from the entire developed site. Except for a portion of the site near the southeast corner, the storm drainage from the site is expected to drain the north into the adjacent wetland and creek waterways. Public facilities associated with this site include storm mains located in 253<sup>rd</sup> Avenue and 264<sup>th</sup> Avenue.

- Proposed improvements: Construct approximately 6,250 feet of 12" to 15" diameter storm drain pipe within 253<sup>rd</sup> Avenue and 264<sup>th</sup> Avenue.
- Improvements Timeline: Storm system improvements are anticipated to take approximately 6 months for design and permitting, plus 12 months for construction.

***Building Pad Surcharge***

It is anticipated that this site will not require building pad surcharging.

***Steep Slope Mitigation***

The site is generally gentle-sloped, but a small area in the east portion of the site exceeds the suggested slope limits and would require earthwork grading to mitigate sloped areas in proposed building pads and parking areas. It is assumed that up to about 2 percent slope can be accommodated around buildings, and up to 7 percent can be accommodated in vehicular areas. Approximately 10,800 cy of earthwork is expected to mitigate steeply sloped areas.

***Floodplain Cut/Fill Balance***

This site is not located within a 100-year floodplain.



**SITE 62  
ROCK CREEK (HAPPY VALLEY), MAP 5*****Public Water System***

The site is within the Sunrise Water Authority service boundary but is not currently served by public mains. Based on GIS information received from SWA, the site could be served by extending existing mains along Highway 212, southwest of the site.

- Proposed improvements: Construct approximately 500 feet of 24" water pipe along Highway 212 to the site, plus about 1,500 feet of 18" water pipe along 162<sup>nd</sup> Avenue to the northwest boundary of the site.
- Improvements Timeline: Water improvements are anticipated to take approximately 9 months for design and permitting, plus 9 months for construction.

***Public Sewer System***

The site is Clackamas County Service District No. 1 service boundary, within the Rock Creek drainage basin. Public sewer service is not currently available at the site. Based on the CCSD sanitary sewer master plan (2009), the site is expected to be served by extending service from the Clackamas Interceptor to the Rock Creek area.

The downstream Clackamas Interceptor is currently under-sized to accommodate full build-out of the Rock Creek area. The primary trigger for this project is development in the Rock Creek basin resulting in 5,700 EDUs added to the system (this site contributes approximately 30 EDUs). If this site is developed prior to the build-out of the Rock Creek area, the interceptor pipe may not need to be upgraded to serve this site. However, if this site is developed during or in conjunction with significant development within the Rock Creek sewer basin, then the Clackamas Interceptor upgrades would be necessary to serve the site.

- Service Extension Improvements:
  - Construct approximately 4,000 feet of 36" diameter Clackamas Interceptor pipe within Highway 212.
  - Construct approximately 2,500 feet of 15" to 18" diameter local service lines within Highway 212 and 162<sup>nd</sup> Avenue
- Extension Improvements Timeline: Sewer improvements are anticipated to take approximately 12 months for design and permitting, plus 18 months for construction.
- Downstream Service Upgrades:
  - Improve approximately 16,800 feet of 36" gravity sewer and 12,500 feet of 30" force main interceptor, with improvements to the Clackamas Pump Station.
- Downstream Upgrades Cost and Timeline: The Clackamas Interceptor upgrades are anticipated to cost approximately \$33.7 million and take approximately 5 to 10 years for design and construction.

***Public Storm System***

The site is not currently served by public storm facilities. It is expected that transportation improvements to 162<sup>nd</sup> Avenue and Highway 212 will trigger storm facility improvements, which would discharge into Rock Creek near the southwest corner of the site.

- Proposed improvements: Construct approximately 2,400 feet of 15" storm pipe within 162<sup>nd</sup> Avenue and Highway 212.
- Improvements Timeline: Storm system improvements are anticipated to take approximately 6 months for design and permitting, plus 6 months for construction.

***Building Pad Surcharge***

It is anticipated that this site will not require building pad surcharging.

***Steep Slope Mitigation***

The site generally slopes down toward the southwest corner of the site at grades from approximately 10 percent to 20 percent. The site will require significant grading and retaining structures to establish building pads and truck maneuvering areas. It is expected that the final site configuration will involve cutting the building pads and parking lots in a series of benches following the existing slope. It is assumed that up to about 2 percent slope can be accommodated around buildings, and up to 7 percent can be accommodated in vehicular areas. Approximately 273,800 cy of earthwork grading, and about 20,000 sf of retaining walls are expected to mitigate the steeply sloped areas.

***Floodplain Cut/Fill Balance***

This site is not located within a 100-year floodplain.



**SITE 104****HILLSBORO URBAN RESERVES (AGGREGATE) (HILLSBORO), MAP 7*****General Utility Service Note***

The site is currently not within a municipal utility service district since it resides outside the Metro urban growth boundary. It is expected that the UGB boundary will be moved to include this site, and that the site will be served by the City of Hillsboro at that time.

***Public Water System***

Based on information from City of Hillsboro water department staff, the site is expected to be served from the existing water transmission lines within Evergreen Road, with two legs of a looped system expected to be built along 253<sup>rd</sup> Avenue and 264<sup>th</sup> Avenue.

- Proposed improvements:
  - Construct approximately 5,800 feet of 18" water main within 253<sup>rd</sup> Avenue.
  - Construct approximately 6,100 feet of 18" water main within 264<sup>th</sup> Avenue.
  - Construct approximately 3,200 feet of 18" water main within Meek Road.
- Improvements Timeline: Water improvements are anticipated to take approximately 12 months for design and permitting, plus 24 months for construction.

***Public Sewer System***

The site is expected to be served by City of Hillsboro and Clean Water Services sewer facilities within Huffman Street east of the site. Since the site lies beyond the gravity service boundary for the Huffman trunk line, it is expected that the sewer flows would be conveyed through gravity lines to a new public lift station located south of the site. The flows would be pumped from the lift station to the existing sewer trunk lines.

- Proposed improvements:
  - Construct approximately 7,900 feet of 15" to 18" diameter gravity mains within 253<sup>rd</sup> Avenue, 264<sup>th</sup> Avenue, and Meek Road.
  - Construct an approximately 3.0-MGD public lift station located near the southwest corner of the site, sized to serve this site and future development at nearby properties within the sewershed.
  - Construct approximately 5,200 feet of 18" public force main within Huffman Street Clean Water Services trunk line at the intersection of Huffman Street and Brookwood Parkway east of the site.
- Improvements Timeline: Sewer improvements are anticipated to take approximately 12 months for design and permitting, plus 24 months for construction.

***Public Storm System***

The site is not currently served by public storm mains. There is a broad ridge running southwest-to-northeast through the middle of the site, which separates the drainage basins of Storey Creek to the north and Waible Creek to the south. It is expected that the storm drainage system at the site will include piping within the new roadways to direct runoff to these creeks, with regional detention facilities installed to meet Clean Water Services requirements.

- Proposed improvements:
  - Construct approximately 15,100 feet of 18" to 24" diameter storm piping within 253<sup>rd</sup> Avenue, 264<sup>th</sup> Avenue, and Meek Road.
  - Construct four regional detention ponds near the creek outfall locations, totaling approximately 48 ac-feet of storage.
- Improvements Timeline: Storm system improvements are anticipated to take approximately 12 months for design and permitting, plus 24 months for construction.

***Building Pad Surcharge***

It is anticipated that this site will not require building pad surcharging.

***Steep Slope Mitigation***

The site is generally gentle-sloped and is not expected to require slope mitigation to establish building pad and parking areas.

***Floodplain Cut/Fill Balance***

This site is not located within a 100-year floodplain.



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# Regional Industrial Lands

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## Transportation Infrastructure

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Revision Date: June 21, 2012

By: Chris Clemow, P.E., P.T.O.E.

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### **SITES INCLUDED:**

SITE 2 – TIME OIL COMPANY (PORTLAND), MAP 1

SITE 13 – ICDC LLC (PORTLAND), MAP 3

SITES 15/16 – BT PROPERTY LLC (UPS)/MICHAEL CEREGHINO (GRESHAM), MAP 3

SITE 19 – TRIP PHASE 2 (TROUTDALE), MAP 3

SITE 24 – JEAN JOHNSON (GRESHAM), MAP 4

SITE 29 – CLACKAMAS COUNTY DEVELOPMENT (CLACKAMAS), MAP 5

SITE 33 – COFFEE CREEK INDUSTRIAL AREA (WILSONVILLE), MAP 6

SITE 37 – ORR FAMILY FARM LLC (SHERWOOD), MAP 6

SITES 55/56 – SPOKANE HUMANE SOCIETY/EAST EVERGREEN (HILLSBORO), MAP 7

SITE 62 – ROCK CREEK (HAPPY VALLEY), MAP 5

SITE 104 – HILLSBORO URBAN RESERVES (AGGREGATE) (HILLSBORO), MAP 7

## SITE 2

### TIME OIL COMPANY (PORTLAND), MAP 1

Site 2 access to the north is via N Lombard Street and N Rivergate Boulevard and from the south is via N Burgard Street and N Time Oil Road. Access to the site from the north includes three at-grade railroad spur crossings, suggesting a risk of occasional blockage.

N Time Oil Road is privately-owned and maintained by a consortium of land owners. The road does not meet public standards, does not have shoulders and has a series of speed bumps limiting truck mobility. The N Time Oil Road/Burgard Street intersection is stop-controlled with sight distance concerns related to curves and elevation change. The existing access to the Time Oil site via Time Oil Road has a sharp skew, making it too tight a turn for trucks to access from the north. Improved truck access could be accommodated via Time Oil Road by reconstructing the intersection so it has a less severe angle.

The City of Portland Transportation System Plan (TSP) does not identify the need for any transportation infrastructure improvements in the immediate project area. Information provided by PBOT staff indicates Time Oil site development will not require public street improvements to Rivergate or Burgard, unless land use review is required triggering a transportation analysis (not likely) or if there is a land division process triggering the need to address public right-of-way access. It should be noted the private owners of Time Oil Road could require improvements independent of City requirements.

In the previously prepared July 2007 Working Harbor Reinvestment Strategy: Transportation Infrastructure Analysis, \$6-\$9M was identified to improve Time Oil Road to public standards and transfer jurisdiction to the City. Based on discussions with Port staff, it was agreed \$1M of these improvements would be assessed to the Time Oil property.

Based on the conceptual site plan, anticipated transportation infrastructure improvements necessary to serve immediate subject property development are limited to site access improvements. The \$1M of Time Oil Road improvements would be assessed to the development and constructed by others as a separate project.

#### TIER 3 TO TIER 1 IMPROVEMENTS

##### **Improvements and Estimated Cost**

The following transportation infrastructure improvements are minimally necessary to: 1) provide acceptable/good property access to the public roadway system, and 2) mitigate off-site transportation impacts.

1. Realign site access/intersection to fix skew
  - Cost: ≈\$80k
2. Time Oil Road improvement assessment
  - Cost: ≈\$1M

##### **Improvement Timeline: Zero to Site Ready**

Frontage and direct property access improvements are anticipated to be constructed concurrent with property development. If done in advance, anticipate 3 months for design and permitting and 3 months for construction.



**SITE 13**  
**ICDC LLC (PORTLAND), MAP 3**

Site 13 has direct access to NE Cameron Boulevard along the entire southern property boundary. Cameron provides access to NE Airport Way via NE 166<sup>th</sup> Avenue and to NE 158<sup>th</sup> Avenue which extends between NE Marine Drive and NE Sandy Boulevard (OR30).

The City of Portland Transportation System Plan (TSP) does not identify the need for any transportation infrastructure improvements in the immediate project area.

Based on the conceptual site plan, anticipated transportation infrastructure improvements necessary to serve immediate subject property development are limited to frontage roadway (NE Cameron Boulevard) improvements and direct property access improvements.

**TIER 2 TO TIER 1 IMPROVEMENTS****Improvements and Estimated Cost**

No off-site transportation infrastructure improvements are necessary.

**Improvement Timeline: Zero to Site Ready**

Frontage and direct property access improvements are anticipated to be constructed concurrent with property development. If done in advance, anticipate 6 months for design and permitting and 8 months for construction.

**SITES 15/16****BT PROPERTY LLC (UPS)/MICHAEL CEREGHINO (GRESHAM), MAP 3**

Taken together, Sites 15 and 16 have direct access to NE Riverside Drive to the north and NE Portal Way at the southeast corner. Access to NE Interlachen Lane to the northeast can also occur but is not anticipated as the roadway is not necessarily intended to support industrial traffic. It is anticipated direct access will be NE Riverside Drive and NE Portal Way.

The City of Gresham Transportation System Plan (TSP) identifies a roadway connection between Portal and Riverside (i.e., Portal extending to intersect with Riverside). It is anticipated this public roadway connection will need to be provided if Sites 15 and 16 are developed independently or with smaller individual industrial uses. However, if the properties are developed by a single large user, connectivity may only need to be provided via internal development circulation.

Based on discussion with agency staff, near term property development can occur without the need to construct significant off-site transportation infrastructure improvements. Again, if Sites 15 and 16 are developed independently developed or have smaller uses, a public roadway (industrial collector) will need to be constructed between Portal and Riverside. If developed by a single large user the public connection may not be necessary.

Based on the conceptual site plan, anticipated transportation infrastructure improvements necessary to serve immediate subject property development are limited to direct property access improvements.

**TIER 3 TO TIER 1 IMPROVEMENTS****Improvements and Estimated Cost**

An industrial collector roadway will need to be constructed between Portal and Riverside if properties are independently developed. If developed by a single large user, it is not anticipated that any off-site transportation infrastructure improvements are necessary.

**Improvement Timeline: Zero to Site Ready**

Frontage and direct property access improvements are anticipated to be constructed concurrent with property development. If done in advance, anticipate 6 months for design and permitting and 8 months for construction.



## SITE 19

### TRIP PHASE 2 (TROUTDALE), MAP 3

Site 19 (Trip Phase 2) is bound by Graham Road to the south, Swigert Way to the north and east, and Sundial Road to the east. Direct access to Sundial may be restricted and access will be to Swigert Way and Graham Road.

The Troutdale Transportation System Plan (TSP) did not identify any transportation System Plan improvements for TRIP Phase 2. In Phase 1, the following transportation improvements were made:

- Widen Sundial Road to 3 lanes from Marine Drive to Graham Road
- Construct a traffic signal at the Marine Drive/Sundial Road intersection

Based on the conceptual site plan and discussions with City and Port staff, anticipated transportation infrastructure improvements necessary to serve immediate subject property development are limited to direct property access improvements and the following:

- Construct extension of Swigert Way to Graham Road. Based on Port estimates, \$825,000 of the total \$2.37M project cost will be assessed to this property.
- Reconstruct Graham Road and complete ½ street improvements (overlay, bike lane, sidewalk and other frontage improvements) on Graham Road along property frontage. The Port of Portland is also pursuing grant funding to reconstruct Graham Road, including structural roadway improvements, to accommodate truck traffic from Sundial Road to Frontage Road. Based on Port estimates, \$3.5M of the total \$10.09M project cost will be assessed to this property for these improvements.
- Construct possible traffic signal at the Swigert Way/Graham Road intersection of the Swigert Way/Sundial Road intersection. If signalization is required, the cost is estimated at \$500,000.
- Development may also be required to participate in the widening of Sundial Road. A portion of these improvement costs will be required for property development by the Port, but are not required for subdivision by the City of Troutdale.

#### TIER 3 TO TIER 1 IMPROVEMENTS

##### **Improvements and Estimated Cost**

The following transportation infrastructure improvements are minimally necessary to: 1) provide acceptable/good property access to the public roadway system, and 2) mitigate off-site transportation impacts.

1. Construct extension of Swigert Way to Graham Road
  - Cost: ≈\$825K
2. Construct ½ street improvements on Graham Road along property frontage and total roadway improvement assessment
  - Cost: ≈\$3.5M
3. Construct traffic signal at the Sundial Road/Graham Road intersection
  - Cost: ≈\$500k

##### **Improvement Timeline: Zero to Site Ready**

Frontage and direct property access improvements are anticipated to be constructed concurrent with property development. If done in advance, anticipate 12 months for design and permitting and 24 months for construction.

## SITE 24

### JEAN JOHNSON (GRESHAM), MAP 4

Site 24 is bound by SE 267<sup>th</sup> Avenue/Anderson Road to the west. SE Carl Street extends to the property boundary on the east. It is anticipated direct access will be oriented to SE 267<sup>th</sup> Avenue/Anderson Road which connects directly to US26 to the south.

The most recent relevant transportation planning documents include the Springwater Transportation System Plan (TSP) and the US26: Access to the Springwater Community Interchange Area Management Plan (IAMP). Both documents identify the need for long range infrastructure improvements; however, none are programmed or funded. More specifically, the IAMP identifies two grade separated US26 overcrossings; one connecting SE Orient Drive to SE Rugg Road including a US26 interchange. Based on the IAMP Figure 14 schematic roadway alignment, the proposed collector roadway impacts the northeast corner of the subject property. It is important to note this layout is schematic and it not likely to affect a near-term development application.

Based on discussion with agency staff, near term property development can occur without the need to construct significant off-site transportation infrastructure improvements. However, the SE 267<sup>th</sup> Avenue/Anderson Road (minor roadway) connection to US26 is anticipated to operate poorly until improvements are constructed. While immediate property development can occur without off-site improvements, it is agency intent for all properties in the IAMP-benefitted area to monetarily participate in funding of long-range improvements via a yet-to-be determined assessment structure.

Based on the conceptual site plan, anticipated transportation infrastructure improvements necessary to serve immediate subject property development are limited to direct property access improvements and the following:

- Possible short-term US26/ SE 267<sup>th</sup> Avenue/Anderson Road improvements such as a southbound right-turn lane.

#### TIER 3 TO TIER 1 IMPROVEMENTS

##### **Improvements and Estimated Cost**

The following transportation infrastructure improvements are minimally necessary to: 1) provide acceptable/good property access to the public roadway system, and 2) mitigate off-site transportation impacts.

1. Possible short-term US26/ SE 267<sup>th</sup> Avenue/Anderson Road improvements such as a southbound right-turn lane.
  - Cost: ≈\$250k
2. Potential, proportional assessment of IAMP-identified improvements
  - Cost: unknown

##### **Improvement Timeline: Zero to Site Ready**

Frontage and direct property access improvements are anticipated to be constructed concurrent with property development. If done in advance, anticipate 6 months for design and permitting and 8 months for construction.



**SITE 29****CLACKAMAS COUNTY DEVELOPMENT (CLACKAMAS), MAP 5**

Site 29 has direct access to SE Capps Road to the north and SE Wilde Road to the east; however, access to Wilde Road is limited by topography. Direct property access can be oriented to SE Capps Road which connects to OR212 via SE 120<sup>th</sup> Avenue, SE Jennifer Street and SE 122<sup>nd</sup> Avenue.

Near term property development can occur with minimal need to construct off-site transportation infrastructure improvements. However, OR212 mobility will generally be poor until planned and programmed Sunrise Corridor improvements are constructed. These improvements include construction of a new east-west roadway (Sunrise corridor) north of the existing OR212 alignment. The Sunrise Jobs and Transportation Act (JTA) Project is constructing a smaller phase of the larger Sunrise Corridor project by 2014. These improvements will address the existing congestion and safety problems in the OR212/224 corridor by constructing a new road from I-205 to 122<sup>nd</sup> Avenue and some local roadway connections serving the Lawnfield Industrial District.

Based on the conceptual site plan, anticipated transportation infrastructure improvements necessary to serve immediate subject property development are limited to direct property access improvements and the following:

- Construct ½ Capps Road improvements from eastern property edge to 122<sup>nd</sup> Avenue.

**TIER 2 TO TIER 1 IMPROVEMENTS****Improvements and Estimated Cost**

The following transportation infrastructure improvements are minimally necessary to: 1) provide acceptable/good property access to the public roadway system, and 2) mitigate off-site transportation impacts.

1. Construct ½ Capps Road improvements from eastern property edge to 122<sup>nd</sup> Avenue
  - Cost:  $\approx 950 \text{ LF} @ \$1,400/\text{LF} \times \frac{1}{2} \text{ Roadway} = \$665\text{k}$

**Improvement Timeline: Zero to Site Ready**

Direct property access roadway improvements are anticipated to be constructed concurrent with property development. If done in advance, anticipate 6 months for design and permitting and 8 months for construction.

### SITE 33 COFFEE CREEK INDUSTRIAL AREA (WILSONVILLE), MAP 6

Site 33 is bound by SW Day Road to the north and SW Garden Acres Road to the west. The property has direct access to both roadways. A portion of the property also extends to SW Boones Ferry Road; however, direct access to this roadway may be limited/restricted to the individual property at the southwest corner of the Boones Ferry Road/Day Road intersection.

The Wilsonville Transportation System Plan (TSP) identifies a several recently constructed transportation infrastructure improvements including the widening of Day Road to 3 lanes from Grahams Ferry to Boones Ferry and constructing traffic signals at both ends. The Coffee Creek Industrial Master Plan also identifies two new roadways to be constructed in the project area including: Kinsman Road – a north-south roadway on the east side of the property extending south from Day Road, and; Java Road – an east-west roadway extending between Garden Acres and Kinsman.

Because the proposed development contemplates aggregated properties, roadway connectivity shown in the TSP and the Coffee Creek Industrial Master Plan is assumed to include the need to construct Kinsman as a public roadway and the connectivity provided by Java will be accomplished via internal development circulation. It should be noted a portion of Kinsman Road improvements can be incorporated into property development and are not necessarily in addition to site development costs.

Based on the conceptual site plan, anticipated transportation infrastructure improvements necessary to serve immediate subject property development are limited to direct property access improvements and the following:

- Construct  $\frac{1}{2}$  street improvements on Garden Acres Road along property frontage
- Construct  $\frac{2}{3}$  street improvements on Kinsman Road along property frontage

#### TIER 3 TO TIER 1 IMPROVEMENTS

##### **Improvements and Estimated Cost**

The following transportation infrastructure improvements are minimally necessary to: 1) provide acceptable/good property access to the public roadway system, and 2) mitigate off-site transportation impacts.

1. Construct  $\frac{1}{2}$  street improvements on Garden Acres Road along property frontage
  - Cost:  $\approx 2,400\text{LF} @ \$1,400/\text{LF} \times \frac{1}{2}\text{Roadway} = \$1.68\text{M}$
2. Construct  $\frac{2}{3}$  street improvements on Kinsman Road along property frontage
  - Cost:  $\approx 2,400\text{LF} @ \$1,400/\text{LF} \times \frac{2}{3}\text{Roadway} = \$2.24\text{M}$  (can be part of site development)

##### **Improvement Timeline: Zero to Site Ready**

Frontage and direct property access improvements are anticipated to be constructed concurrent with property development. If done in advance, anticipate 6 months for design and permitting and 12 months for construction.

**SITE 37**  
**ORR FAMILY FARM LLC (SHERWOOD), MAP 6**

Site 37 is bound by SW Tualatin-Sherwood Road to the north. It is anticipated direct access property will be to this roadway at the SW Cipole Road intersection and to the future extension of SW 124<sup>th</sup> Avenue to the east.

The 2005 City of Sherwood Transportation System Plan (TSP) indicates the subject property is outside of the Urban Growth Boundary (UGB); therefore, no long-range transportation infrastructure was identified to serve the property. The 2010 Tonquin Employment Area Concept Plan identifies SW 124<sup>th</sup> Avenue as being the primary north-south arterial roadway connection extending between US99W and SW Tualatin-Sherwood Road. It is anticipated 124<sup>th</sup> will be extended south of Tualatin-Sherwood Road to serve the subject property and properties further to the south. The Tonquin Employment Area Concept Plan also identifies an east-west collector roadway (referred to as the Internal Connector (SW Blake Road Extension)) being constructed to provide connectivity

With property development, it is anticipated primary development access will be to the north (Tualatin-Sherwood Road at Cipole) and on (124<sup>th</sup>). Based on City access spacing requirements, access on 124<sup>th</sup> (an arterial roadway) has to be at least 600' from T-S Road. It should be noted that even with good direct property access, overall Tualatin-Sherwood Road and US99W corridor mobility is poor.

Based on the conceptual site plan, property development is anticipated to occur in two phases and require the following transportation infrastructure improvements in addition to direct property access improvements:

**North Phase** – assumed to be developed by a single industrial user

- Construct  $\frac{2}{3}$  street improvements on SW 124<sup>th</sup> Avenue along east property frontage between Tualatin-Sherwood Road and the southern development edge (1,150 feet)
- Construct SW Tualatin-Sherwood Road/SW 124<sup>th</sup> Avenue intersection improvements
- Construct SW Tualatin-Sherwood Road/SW Cipole Road intersection improvements

**South Phase** – assumed to be developed as an industrial business park

- Construct  $\frac{2}{3}$  street improvements on SW 124<sup>th</sup> Avenue along east property frontage between the North Phase development edge and the east-west Internal Connector (SW Blake Road Extension) (600 feet)
- Construct full street improvements on the east-west Internal Connector (SW Blake Road Extension) between the SW 124<sup>th</sup> Avenue extension and the west property line (1,700 feet).



## TIER 3 TO TIER 1 IMPROVEMENTS

### Improvements and Estimated Cost

The following transportation infrastructure improvements are minimally necessary to: 1) provide acceptable/good property access to the public roadway system, and 2) mitigate off-site transportation impacts.

#### North Phase

1. Construct  $\frac{2}{3}$  street improvements on SW 124<sup>th</sup> Avenue along east property frontage between Tualatin-Sherwood Road and the southern edge of the North Phase development.
  - Cost:  $\approx 1,150\text{LF} @ \$1,400/\text{LF} \times \frac{2}{3}\text{Roadway} = \$1.08\text{M}$
2. Construct SW Tualatin-Sherwood Road/SW 124<sup>th</sup> Avenue intersection improvements
  - Cost:  $\approx \$200\text{k}$
3. Construct SW Tualatin-Sherwood Road/SW Cipole Road intersection improvements
  - Cost:  $\approx \$200\text{k}$

#### South Phase

4. Construct  $\frac{2}{3}$  street improvements on SW 124<sup>th</sup> Avenue along east property frontage between the North Phase development edge and the east-west Internal Connector (SW Blake Road Extension)
  - Cost:  $\approx 600\text{LF} @ \$1,400/\text{LF} \times \frac{2}{3}\text{Roadway} = \$560\text{k}$
5. Construct full street improvements on the east-west Internal Connector (SW Blake Road Extension) between the SW 124<sup>th</sup> Avenue extension and the west property line
  - Cost:  $\approx 1,700\text{LF} @ \$1,400/\text{LF} = \$2.38\text{M}$

### Improvement Timeline: Zero to Site Ready

Frontage and direct property access improvements are anticipated to be constructed concurrent with property development. If done in advance, anticipate 12 months for design and permitting and 12 months for construction.

**SITES 55/56****SPOKANE HUMANE SOCIETY/EAST EVERGREEN (HILLSBORO), MAP 7**

Taken separately, Site 55 (Spokane Humane Society property) does not have direct access to a public roadway and Site 56 (East Evergreen Site) has direct access to NW Evergreen Road and to NW Mier-Jurgen Road (an unimproved roadway).

The Hillsboro Transportation System Plan (TSP) identifies a number of transportation infrastructure improvements necessary to serve the area in the plan year, including:

- Widen Evergreen Road to 5 lanes – Current being constructed by Washington County
- Extend Huffman Street west of Brookwood Parkway (Shute Road) to 253<sup>rd</sup> Avenue
- Extend 253<sup>rd</sup> Avenue to the north and adding a southbound right-turn lane.

It should be noted future roadway alignments are not specifically defined or programmed. Rather, the TSP generally contemplates the extension of roadways in the area to meet future development needs.

The conceptual site plan prepared by Group Mackenzie contemplates the extension of 253<sup>rd</sup> and 264<sup>th</sup> Avenues to the north and Huffman Street between 253<sup>rd</sup> and 264<sup>th</sup> Avenues. Discussions with City staff have further clarified the transportation infrastructure improvements necessary to serve immediate subject property development including:

- Construct  $\frac{2}{3}$  street improvements on 253<sup>rd</sup> along property frontage.
- Construct  $\frac{2}{3}$  street improvements on 264<sup>th</sup> along property frontage. It is assumed 264<sup>th</sup> between the south property edge and Evergreen will be constructed by others.
- Construct  $\frac{2}{3}$  street improvements on Huffman along property frontage.
- Construct traffic signal at the Evergreen/264<sup>th</sup> intersection
- Construct traffic signal at the Evergreen/Site access intersection. (Intersection is located near the western property edge at Evergreen)

**TIER 2 TO TIER 1 IMPROVEMENTS****Improvements and Estimated Cost**

The following transportation infrastructure improvements are minimally necessary to: 1) provide acceptable/good property access to the public roadway system, and 2) mitigate off-site transportation impacts.

1. Construct  $\frac{2}{3}$  street improvements on 253<sup>rd</sup> along property frontage.
  - Cost:  $\approx 2,300\text{LF} @ \$1,400/\text{LF} \times \frac{2}{3}\text{Roadway} = \$2.15\text{M}$
2. Construct  $\frac{2}{3}$  street improvements on 264<sup>th</sup> along property frontage
  - Cost:  $\approx 1,400\text{LF} @ \$1,400/\text{LF} \times \frac{2}{3}\text{Roadway} = \$1.31\text{M}$
3. Construct  $\frac{2}{3}$  street improvements on Huffman along property frontage
  - Cost:  $\approx 2,800\text{LF} @ \$1,400/\text{LF} \times \frac{2}{3}\text{Roadway} = \$2.61\text{M}$
4. Construct traffic signal at the Evergreen/264<sup>th</sup> intersection
  - Cost:  $\approx \$500\text{k}$
5. Construct traffic signal at the Evergreen/Site access intersection
  - Cost:  $\approx \$500\text{k}$

**Improvement Timeline: Zero to Site Ready**

Frontage and direct property access improvements are anticipated to be constructed concurrent with property development. If done in advance, anticipate 9 months for design and permitting and 18 months for construction.

**SITE 62**  
**ROCK CREEK (HAPPY VALLEY), MAP 5**

Site 62 (Rock Creek) directly fronts OR212 (Clackamas Highway); however, direct access will be limited to other roadways. This includes an east-west collector to the north, 162<sup>nd</sup> Avenue to the west, and a north-south collector to the east. If this sites develops without adjacent property development occurring, all access will be to 162<sup>nd</sup> Avenue.

The Sunrise Corridor planning effort (presented in Figure 8-7 of the Happy Valley Transportation System Plan (TSP)) identifies a number of transportation infrastructure improvements significantly impacting the subject property. Because these improvements are long-range and unfunded, property development is assumed to be generally consistent with roadway alignments presented in TSP Figure 8-3. It should be further noted, because the proposed development contemplates aggregated properties, local street connectivity shown in the TSP is not necessary. Resulting anticipated improvements include:

- Construct ½ street improvements on 162<sup>nd</sup> along property frontage
- Construct an east-west collector roadway for the width of the property (internal)
- Construct a north-south collector mid-property (internal)
- Construct ½ street improvements (north-south collector) on eastern property edge
- Construct OR212/162<sup>nd</sup> Avenue intersection improvements (including traffic signal)

The subject property is anticipated to have good access to adjacent north/south collector roadways; however, overall OR212 corridor mobility is poor and will remain so until major TSP-identified improvements are constructed.

**TIER 2 TO TIER 1 IMPROVEMENTS****Improvements and Estimated Cost**

The following transportation infrastructure improvements are minimally necessary to: 1) provide acceptable/good property access to the public roadway system, and 2) mitigate off-site transportation impacts. Based on the conceptual site plan, the following improvements include:

1. Dedicate property necessary to accommodate widening of OR212 to 5 lanes
2. Construct ½ street improvements on 162<sup>nd</sup> Avenue along property frontage
  - Cost:  $\approx 1,000\text{LF} @ \$1,400/\text{LF} \times \frac{1}{2}\text{Roadway} = \$700\text{k}$
3. Construct a ½ street improvement (north-south collector) on eastern property edge
  - Cost:  $\approx 400\text{LF} @ \$1,400/\text{LF} \times \frac{1}{2}\text{Roadway} = \$280\text{k}$
4. Construct OR212/162<sup>nd</sup> Avenue intersection improvements (including traffic signal)
  - Cost:  $\approx \$500\text{k}$

**Improvement Timeline: Zero to Site Ready**

Frontage and direct property access improvements are anticipated to be constructed concurrent with property development. If done in advance, anticipate 9 months for design and permitting and 18 months for construction



**SITE 104****HILLSBORO URBAN RESERVES (AGGREGATE) (HILLSBORO), MAP 7**

The site has direct access to NW Meek Road which will require improvement to urban standards. The property has recently been brought into the Urban Growth Boundary (UGB) but is located outside of the Hillsboro City limits.

It should be noted any future roadway alignments are not specifically defined or programmed in the City of Hillsboro Transportation System Plan (TSP). Rather, the roadway alignments have been identified via recent long-term transportation infrastructure planning efforts occurring in the immediate area.

Discussions with City staff have further clarified the transportation infrastructure improvements necessary to serve immediate subject property development including:

- Construct full-width street improvements on 253<sup>rd</sup> from Meek to south property line.
- Construct full-width street improvements on 264<sup>th</sup> from Meek to south property line. (It should be noted the conceptual site plan shows the roadway alignment adjacent the west property line; however, full-width improvements are assumed).
- Improve/reconstruct Meek from east property edge to 264<sup>th</sup> Avenue
- Construct shoulder improvements on Meek from 264<sup>th</sup> to Jackson School
- Construct 264<sup>th</sup>/Sewell intersection improvements and connection
- Long-term plans also contemplate realigning Meek to intersect with Brookwood north of OR26. This realignment will require a grade separated overcrossing and is believed necessary to accommodate future year traffic volumes. This improvement is not assumed to be necessary to serve Site 104.

**TIER 3 TO TIER 1 IMPROVEMENTS****Improvements and Estimated Cost**

The following transportation infrastructure improvements are minimally necessary to: 1) provide acceptable/good property access to the public roadway system, and 2) mitigate off-site transportation impacts.

1. Construct full-width street improvements on 253<sup>rd</sup> from Meek to south property line
  - Cost:  $\approx 1,800 @ \$1,400/LF = \$2.52M$
2. Construct full-width street improvements on 264<sup>th</sup> from Meek to south property line
  - Cost:  $\approx 2,100 @ \$1,400/LF = \$2.94M$
3. Improve/reconstruct Meek from east property edge to 264<sup>th</sup> Avenue
  - Cost:  $\approx 4,500 LF @ \$1,400/LF = \$6.3M$
4. Construct shoulder improvements on Meek from 264<sup>th</sup> to Jackson School
  - Cost:  $\approx \$250k$
5. Construct 264<sup>th</sup>/Sewell intersection improvements and connection
  - Cost:  $\approx \$300k$

**Improvement Timeline: Zero to Site Ready**

Extensive transportation infrastructure improvements will need to be constructed to facilitate property development, including additional agency planning and programming efforts. If done in advance, anticipate 18 months for design and permitting and 24 months for construction.

Site # & Name <sup>1</sup>		Estimated Wetland Acreage	Permits Needed/Timeframe <sup>2</sup>	Cost of Mitigation <sup>3</sup>	Comments
13	ICDC LLC & Entercom	<p>ICDC: Approx. 8 ac. Entercom: Approx. 0.9 ac.</p> <hr/> <p>Approx. 1.4 ac. impact with conceptual site plan (0.2 ac. @ Entercom; 1.2 ac. @ ICDC)</p>	<p>DSL: 120 days</p> <p>USACE: 150 days</p>	<p>Site not currently served by any wetland mitigation bank. Permittee-provided on- or off-site mitigation will be necessary.</p>	<p>ICDC: Majority of site filled under permit 11059-FP. Per on-site determination WD11-0076, unfilled areas have wetland condition. Delineation needed.</p> <p>Entercom: Wetland acreage based on Natl. Wetland Inventory mapping (0.7 ac. wetland) and photo-signature of potential wetland condition (0.2 acres). Delineation needed.</p>
29	Clackamas Co. Development	<p>DSL jurisdictional wetlands = 0.42 ac. plus Carli Creek and Clackamas River = 2.16 ac. Potential federally jurisdictional wetland area is 1.76 ac.<sup>4</sup></p> <hr/> <p>Approx. 1.76 ac. impact assumed per County staff input</p>	<p>No DSL permit need anticipated by County.</p> <p>USACE: 270 days (assuming Corps asserts federal jurisdiction on non-state-jurisdictional wetlands)</p>	<p>\$308,000</p> <p>Site currently served by Foster Creek Mitigation Bank.</p>	<p>Wetland acreage based on approved delineation #12-0001. Exact extent of federal jurisdiction will need to be determined at time of permit application.</p> <p>Personal communication with County staff on 1/19/12 indicated that all DSL-jurisdictional wetlands, Carli Creek and Clackamas River would be avoided as part of site development.</p>
55/56	Spoke Humane Society/E. Evergreen	<p>Approx. 28 ac. plus tributary McKay Cr.</p> <hr/> <p>Approx. 28 ac. impact with conceptual site plan</p>	<p>DSL: 120 days</p> <p>USACE: 270 days</p>	<p>\$4.9 million</p> <p>Site currently served by Tualatin Valley Mitigation Bank</p>	<p>Wetland acreage based on delineation 08-0257 for tax lots 2000, 2001, 2002, 2003, and 2100 and best professional estimate for remainder.<sup>5</sup> Delineation needed.</p>

Site # & Name <sup>1</sup>		Estimated Wetland Acreage	Permits Needed/Timeframe <sup>2</sup>	Cost of Mitigation <sup>3</sup>	Comments
62	Rock Creek	Approx. 0.75 ac. <hr/> Approx. 0.5 ac. impact with conceptual site plan	DSL: 120 days  USACE: 45 days (assuming expedited Nationwide Permit #39 will apply)	\$88,000  Site currently served by Foster Creek Mitigation Bank.	Wetland area mapped in Happy Valley Local Wetland Inventory, 2008. No mapped hydric soils. Needs delineation.
2	Time Oil	No wetland areas evident.	NA	NA	No wetland areas identified on Natl. Wetland Inventory or "Portland Natural Resource Inventory Update March 2009". No photo-signatures evident.
24	Jean Johnson	Approx. 6 ac. plus Johnson Cr. tributary <hr/> Approx. 4.5 ac. impact with conceptual site plan	DSL: 120 days  USACE: 270 days	\$788,000  Site currently served by Foster Creek Mitigation Bank	Wetland area assumed to coincide with the mapped hydric soil area along south edge of site. Needs delineation.
15/16	UPS/Cereghino	Cereghino: approx. 4 ac. wetland; 3 ac. open water  UPS: approx. 16 ac. wetland; 0.5 ac. open water <hr/> Approx. 18.5 ac. impact with conceptual site plan	DSL: 120 days  USACE: 150 days	Site not currently served by any wetland mitigation bank. Permittee-provided on- or off-site mitigation will be necessary.	Cereghino: Wetland determination prepared by Pacific Habitat Services for City of Gresham, August 2011 (not DSL-concurred). Needs delineation.  UPS: Estimated 1/3 wetland (16 ac.) based on photo-signature of a mosaic condition. Needs delineation.



Site # & Name <sup>1</sup>		Estimated Wetland Acreage	Permits Needed/Timeframe <sup>2</sup>	Cost of Mitigation <sup>3</sup>	Comments
19	TRIP-Port of Portland	17.38 ac. wetland plus Salmon Creek and ditches <hr/> 17.38 ac. impact with conceptual site plan	DSL: 120 days  USACE: 150 days	Site not currently served by any wetland mitigation bank. Permittee-provided on- or off-site mitigation will be necessary.	Wetland acreage based on delineation WD09-0114.
33	Coffee Creek #1	Approx. 0.75 ac. wetland and 0.25 ac. wetland mitigation site. <hr/> Approx. 0.75 ac. impact with conceptual site plan	DSL: 120 days  USACE: 150 days	\$46,000  Site currently served by Mud Slough Mitigation Bank	Wetland acreage based on Metro RLIS. Delineation needed.  DSL # 25201-RF and Delineation 02-0393 (for mitigation area) – outside of the conceptual site plan footprint.
37	Orr Family Trust: North	Approx. 3 acres <hr/> Approx. 3 ac. impact with conceptual site plan	DSL: 120 days  USACE: 150 days	\$525,000  Site currently served by Tualatin Valley Mitigation Bank	Wetland acreage based on photo-signature of potential wetland condition (3 acres). Delineation needed.
37	Orr Family Trust: South	Approx. 4.2 acres <hr/> Approx. 0.2 ac. impact with conceptual site plan	DSL: 40 days  USACE: 45 days	\$12,000  Site currently served by Mud Slough Bank	Wetland acreage based on Natl. Wetland Inventory mapping (4.2 ac. wetland). Delineation needed.
104	Hillsboro Urban Reserves	Approx. 34 ac. plus Waible Creek and several tributary drainages <hr/>	DSL: 120 days  USACE: 270 days	\$5.1 million  Site currently served by Tualatin Valley Mitigation	Wetland acreage based on best professional judgment. <sup>5</sup> Delineation needed.

Site # & Name <sup>1</sup>		Estimated Wetland Acreage	Permits Needed/Timeframe <sup>2</sup>	Cost of Mitigation <sup>3</sup>	Comments
		Approx. 29 ac. impact with conceptual site plan		Bank	

**Footnotes:**

**1**Sites are as identified by Group MacKenzie, January 18, 2012.

**2** Standard DSL Individual Permit timeframe is 120 days. For wetland fills less than or equal to 0.2 acres, a state General Permit is available with permit timeframe of 40 days. Permit timeframes for federal process as follows: 45 days if Nationwide Permit # 39 is applicable (wetland impact 0.5 ac. or less for industrial development); 150 days for Individual Permit where Endangered Species Act (ESA) consultation is unlikely; 270 days for Individual Permit where ESA consultation appears likely. ESA consultation identified as likely for sites containing streams that are proximal to salmonid-bearing waters. Time measured from day of application submittal and assumes complete application submittal.

**3**Cost based on cost of credits at Foster Creek Mitigation Bank (\$175,000 per credit), Tualatin Valley Mitigation Bank (\$175,000 per credit), or Mud slough Mitigation Bank (\$61,000 per credit up to 1.5 credits; \$57,000 per credit greater than 1.5 credits). Banks will need to be contacted to verify if sufficient credits are available at time of permitting. Cost based on estimated wetland impact area as derived from conceptual site plans provided by Group Mackenzie.

**4** Assumes Army Corps of Engineers would not assert federal jurisdiction on constructed sediment basins totaling 4.5 acres.

**5**Methodology for best professional judgment: Ratio of delineated wetland area to mapped hydric soil area (50%) was calculated for delineations conducted on adjacent site with same mapped hydric soil unit. Used when no delineation or determination information, or local wetland inventory (or equivalent) was available.

# Portland General Electric



## *Industrial Lands Inventory Phase 2*

*Electric Power  
Service*

*February 24, 2012*





# Project Grading Scale for Electrical Power Service

## 1 = Easy

- Nominal total project cost; less than \$5 M
- Existing infrastructure readily available to meet demand
- Marginal upgrades required to deliver service directly to the site
- Immediate access to transmission and distribution feeders

## 2 = Medium

- Generally between \$5 M and \$10 M total project cost
- Access to 13kV feeders less than a mile away
- Minimal upgrades required to meet customer demands in less than 12 months

## 3 = Hard

- \$10 M or greater total project cost
- Complex in nature
- City zoning issues or access to permits
- Access to transmission difficult or more than a mile away

**Note:** Cost encompasses total capital cost for a project in the specified region for electrical service up the meter only. Additional cost will be required beyond the point of delivery. Cost breakdown between customer and utility is not defined. Information provided is based on general assumptions (general purpose service as oppose to dedicated and/or alternate service per a customer's specific request) and is subject to change. Information in this presentation should not be used or distributed for purposes outside the scope of the Industrial Lands Project.

# Proposed Service for ICDC/Entercom Site

## 48.5 Acres, Portland

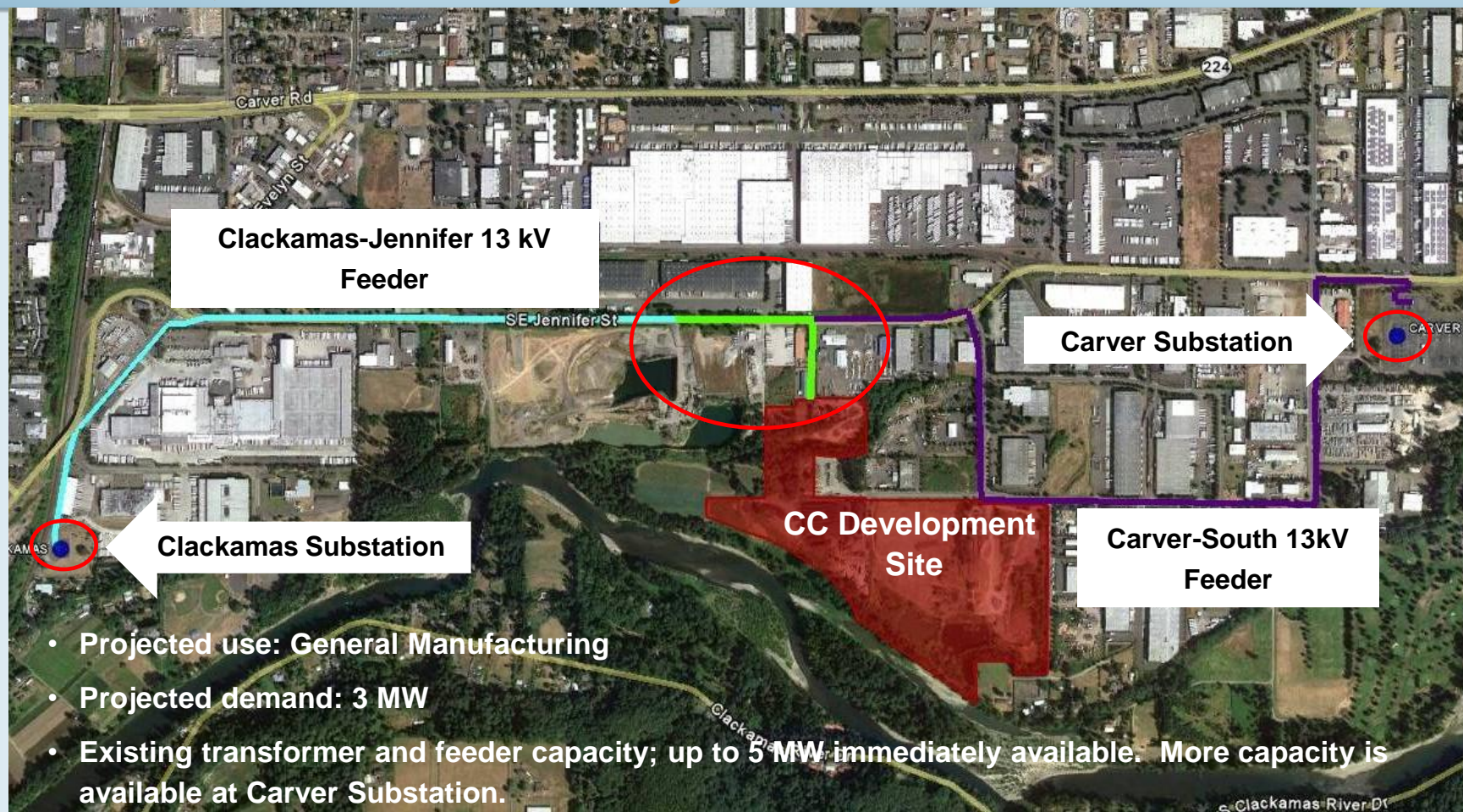


- Projected use: Warehouse/ Distribution
- Projected demand: 1.5 MW
- Currently served by Hemlock Substation
- Existing transformer capacity up to 3 MW
- Existing feeder capacity up to 2 MW
- A tap line from the existing Hemlock-Mason 13kV feeder will provide preferred service to the site
- Project grade = 1



# Proposed Service for CC Development Site

## 40 Acres, Clackamas County



- Currently served by Clackamas Substation
- Feeder upgrades are required to serve the site . A portion of the Carver-South 13 kV feeder will need to be converted to the Clackamas-Jennifer 13 kV feeder (shown in green).
- Project grade = 2



# Proposed Service for Evergreen Site

## 116 acres, Hillsboro

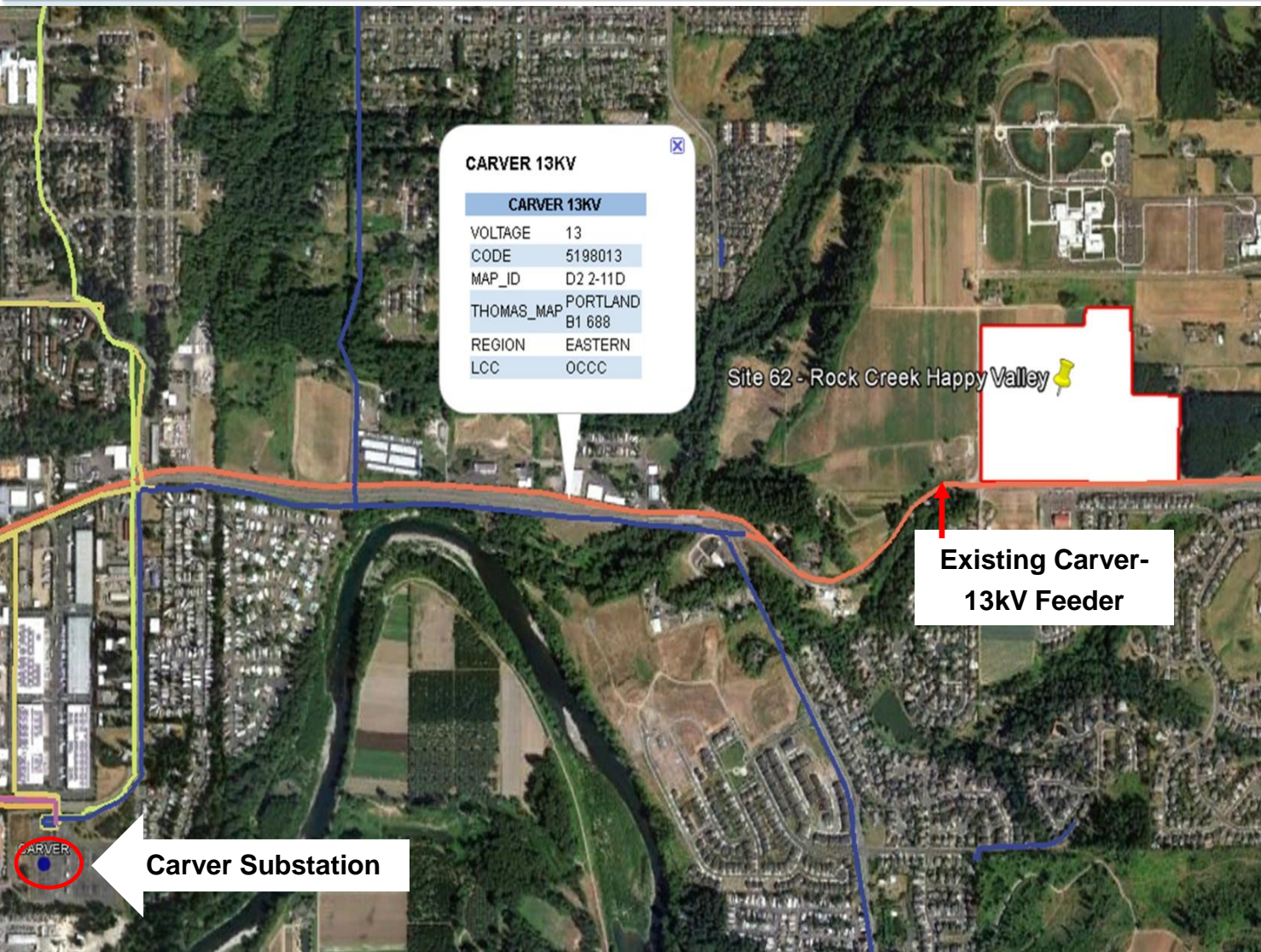


- Projected use:  
Globally scaled clean tech campus
- Projected demand:  
20 MW
- Site will be served by the future Shute Substation
- Will be served by the future Shute Substation at 35kV distribution voltage
- Projected to have two 115 kV transmission sources
- Project grade = 3



# Proposed Service for Rock Creek Site

## 34 Acres, Happy Valley



- Projected use: High Tech Manufacturing or Campus Industrial
- Projected demand: 4 MW
- Currently served by Carver Substation
- Existing transformer capacity up to 7 MW
- Existing feeder capacity up to 4 MW
- A tap line from the existing Carver-13 13kV feeder will provide preferred service to the site
- Project grade = 1



# Proposed Service for Time Oil Company Site

## 25 Acres, Portland



- Projected use: Heavy industrial/ Manufacturing with Strategic Marine
- Projected demand: 8-12 MW
- Currently served by Rivergate South Substation
- Existing transformer capacity up to 10 MW
- Existing feeder capacity up to 6 MW
- In order to reach 12 MW of estimated load, the substation transformer will need to be upgraded
- Project grade = 2



# Proposed Service for Jean Johnson Site

## 33.8 Acres, Gresham



- Projected use: High tech Manufacturing or Campus Industrial
- Projected demand: 4 MW
- Currently served by Hogan North Substation; approx. 2 miles NE of the property
- Existing transformer capacity up to 11 MW
- Existing feeder capacity up to 1 MW
- Hogan North-Salquist 13 kV feeder mainline will be reconfigured to provide preferred service to the property.
- Project grade = 2



# Proposed Service for UPS & Cereghino Sites

## 75 Acres Total (50/25 Acre Split), Portland

- Projected use: General Manufacturing
- Projected demand: 5-10 MW
- Currently served by Hemlock Substation
- Existing transformer capacity up to 3 MW
- Existing Hemlock-Mason 13kV feeder capacity up 2 MW
- In order to reach 10 MW of estimated load, transformer and feeder upgrades are required
- Project grade = 3





# Proposed Service for TRIP Site

## 80 Acres, Troutdale

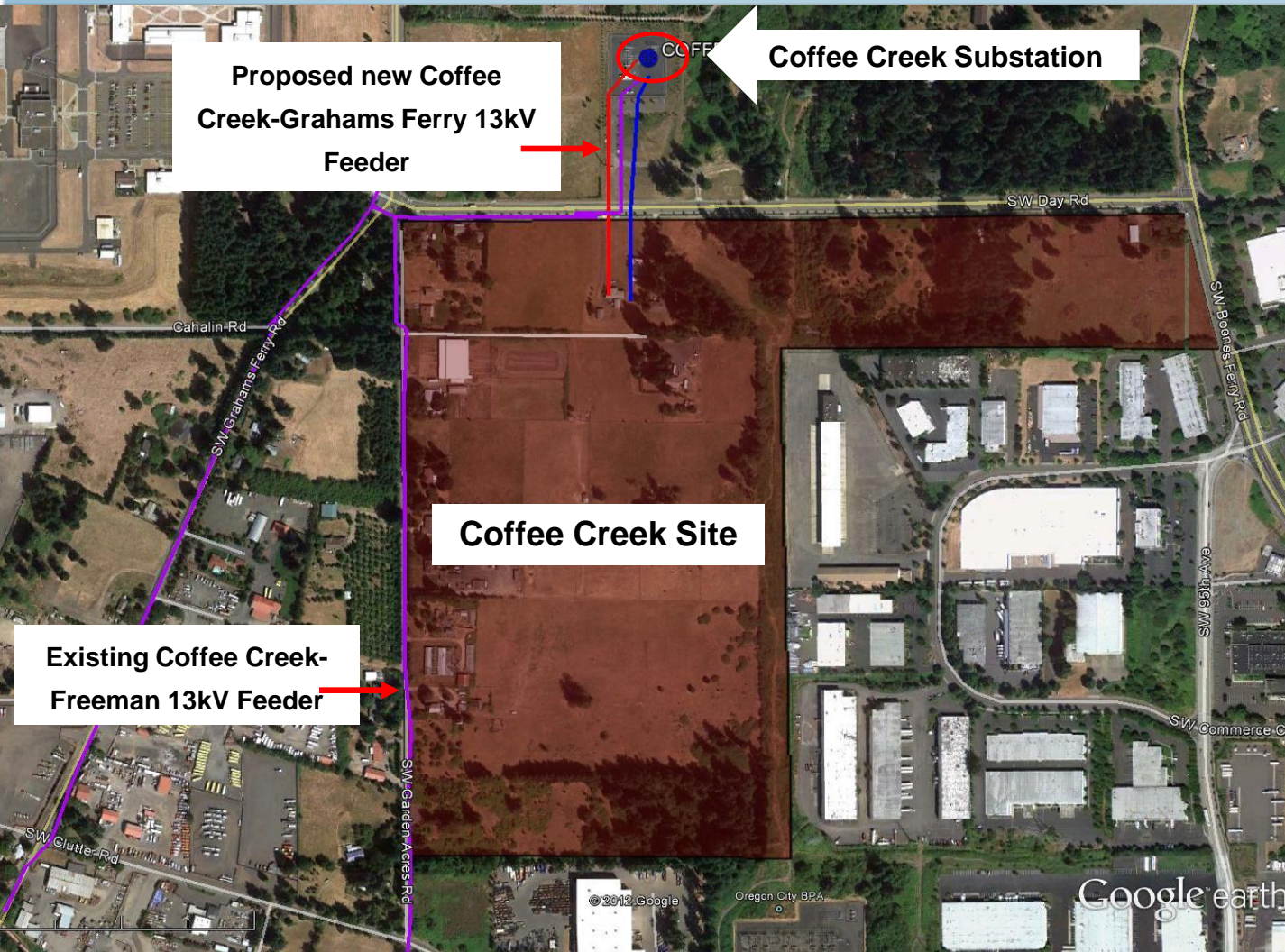


- Projected use:  
Portland Regional Distribution Center
- Projected demand: 3 MW
- Currently served by Blue Lake Substation
- Existing transformer capacity up to 5 MW
- Existing feeder capacity up to 7 MW
- The Blue Lake-Toyo Tanso 13kV feeder will be extended to provide preferred service to the property.
- Project grade = 1



# Proposed Service for Coffee Creek Site 1

## 80.34 Acres, Wilsonville

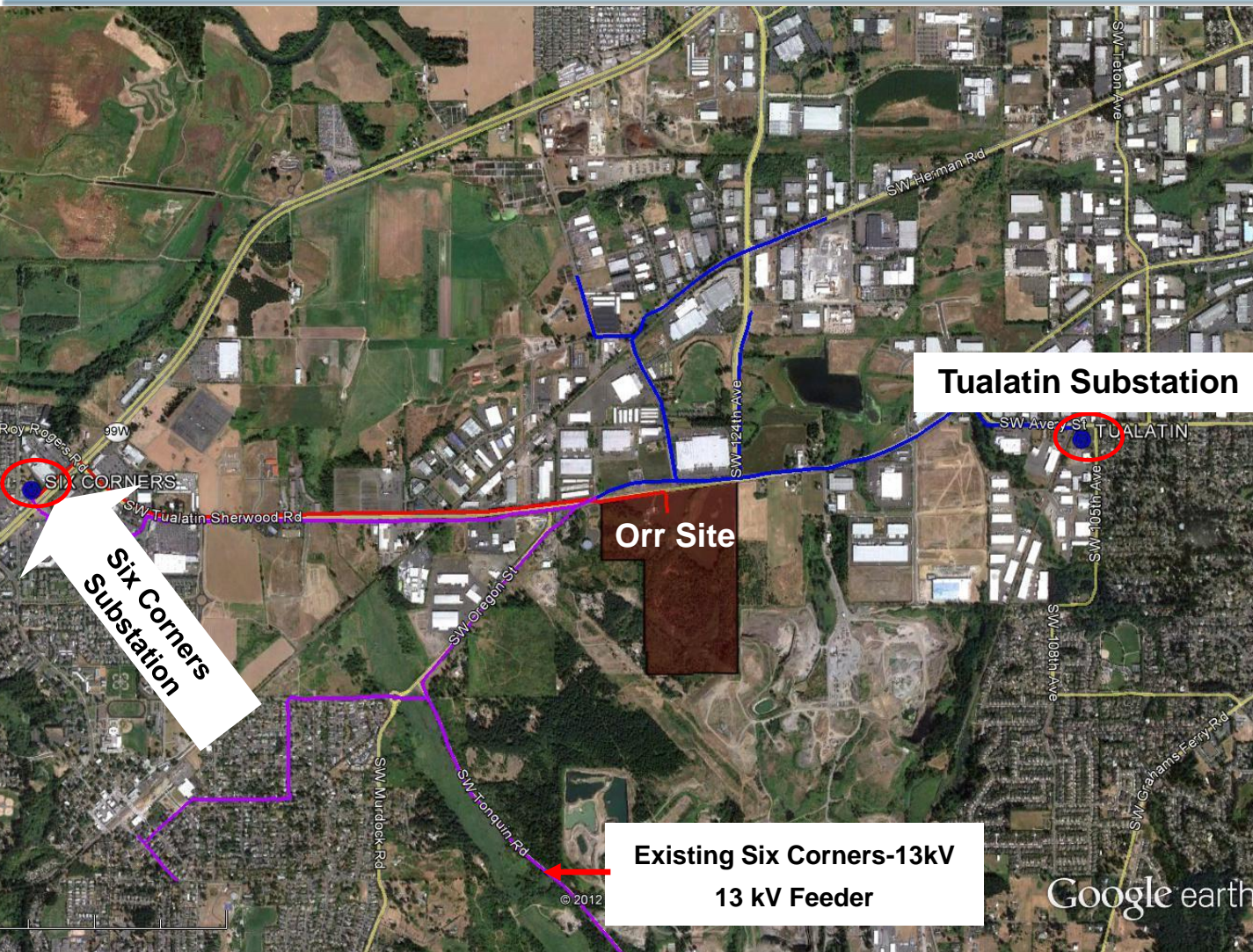


- Projected use: General Manufacturing for Singles User and Business Park
- Projected demand: 6 MW
- Currently served by Coffee Creek Substation; almost on site
- Existing transformer capacity up to 12.5 MW
- Existing feeder capacity up to 5 MW
- To meet demand a new 13kV feeder will be constructed from an existing transformer at Coffee Creek Substation
- Project score = 2



# Proposed Service for Orr Family Farm

## 42.8 Acres, Sherwood/Tualatin

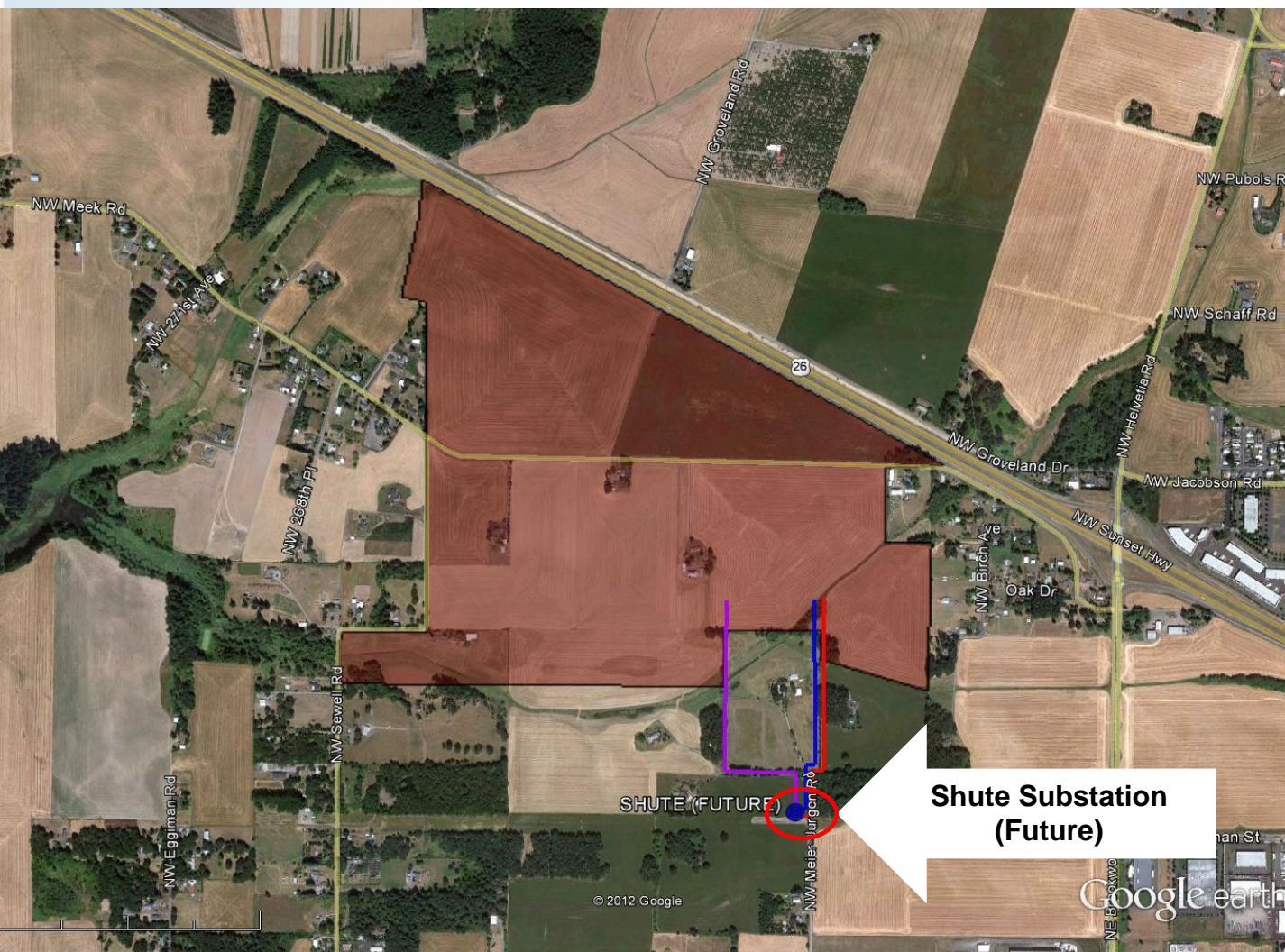


- Projected use: General Manufacturing
- Projected demand: 3 MW
- Currently served by Six Corners Substation
- Existing transformer capacity up to 3 MW
- Existing feeder capacity up to 4.5 MW
- To meet demand a proposed new feeder from Six Corners Substation would be constructed; shown in red to the site
- Project grade = 2



# Proposed Service for Hillsboro Urban Reserves

## 309.2 Acres, Hillsboro



- Projected use:  
Regionally/  
nationally scaled  
clean tech  
manufacturer;  
globally scaled clean  
tech campus
- Projected demand:  
35 MW
- Will be served by the  
future Shute  
Substation at 35kV  
distribution voltage
- The proposed three  
feeders from Shute  
Substation are  
shown in red, blue,  
and purple
- Project grade = 3



## Contact Us

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*Evaluation of Environmental Conditions  
At Candidate Industrial Sites  
Regional Industrial Inventory Project  
Portland Metropolitan Area, Oregon*

Prepared for:  
Group Mackenzie

August 2, 2012  
1901-00





Ash Creek Associates, Inc.  
Environmental and Geotechnical Consultants

***Evaluation of Environmental Conditions  
At Candidate Industrial Sites  
Regional Industrial Inventory Project  
Portland Metropolitan Area, Oregon***

Prepared for:  
Group Mackenzie

August 2, 2012  
1901-00



*Chris W. Breemer* Expires 8/31/2012

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Chris Breemer, R.G.  
Principal, Ash Creek Associates

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3.2 Review DEQ Facility Profiler .....	2
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4.0 SITE SUMMARIES .....	4
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## **Appendices**

A	Regional Industrial Inventory Maps
B	Site 2: Time Oil Site Summary
C	Site 13: ICDC LLC and Entercom Site Summary
D	Site 15/16: UPS and Cereghino Site Summary
E	Site 19: Port of Portland TRIP Site Summary
F	Site 24: Jean Johnson Site Summary
G	Site 29: Clackamas County Development Site Summary
H	Site 33: Coffee Creek Site Summary
I	Site 37: Orr Family Farm Site Summary
J	Site 55/56: East Evergreen Site Summary
K	Site 62: Rock Creek Site Summary
L	Site 104: Hillsboro Urban Reserves Site Summary





---

## **1.0 Project Understanding**

Ash Creek Associates, Inc. (Ash Creek) prepared this assessment of environmental conditions at prospective industrial development sites on behalf of Group Mackenzie for a coalition of organizations, including the Oregon Business Development Department, the Portland Business Alliance, Metro, the Port of Portland, and the Oregon Chapter of NAIOP. This report evaluates for the potential that hazardous substances (including petroleum hydrocarbons) may be present at 11 properties in the Portland metropolitan area. As appropriate for each property, conceptual costs for environmental assessment and remediation are presented. The properties are each at least 25 acres in area and are candidates for industrial development.

The properties were selected for evaluation by the Project Management Team, based on a detailed study of prospective industrial development sites in the Portland metropolitan area. Maps showing the locations and boundaries of the sites are included in Appendix A. Group Mackenzie prepared conceptual site development plans for each of the sites and these were used by Ash Creek as part of the assessment.

Where potential impacts by hazardous substances were identified, Ash Creek developed conceptual cost estimates for assessment and remediation. The cost estimates and schedules are conceptual in nature because: (1) they are based on a limited review of publicly available files; (2) Ash Creek staff did not enter the subject properties or interview property owners; and (3) collection and analysis of environmental media (soil, sediment, groundwater, air) was not performed. The information presented herein, along with a number of factors, will be considered by Group Mackenzie to assess overall development costs for the prospective development sites.

The Project was funded in part with Oregon State Lottery Funds administered by the Oregon Business Development Department. The Port of Portland, the Portland Business Alliance, the State of Oregon, the project funding partners, or their consultants make no representations or warranties, express or implied, concerning the properties described herein, or the accuracy, adequacy, or completeness of the information contained in this report. Prospective purchasers, tenants, and others shall perform, and rely solely upon, their own independent due diligence with respect to the properties.

## **2.0 Scope of Services**

Ash Creek was provided with a list of prospective development sites. Ash Creek completed the following scope of services for each candidate site:

1. Obtained and reviewed historical aerial photographs.
2. Reviewed the Oregon Department of Environmental Quality (DEQ) Facility Profiler and the Environmental Cleanup and Site Information (ECSI) online databases of sites with known or suspected use or releases of hazardous substances.

- 
3. Performed a site reconnaissance to observe current conditions and to obtain photographs of the subject properties and surrounding facilities of interest.
  4. For properties that are listed in the DEQ Facility Profiler or ECSI databases due to releases of hazardous substances (confirmed or suspected), Ash Creek obtained and reviewed readily available relevant files.
  5. In cases where hazardous substances are suspected or confirmed, Ash Creek developed a cost estimate and schedule for anticipated environmental assessment and remediation activities.

## **3.0 Methods**

### **3.1 Review of Historical Aerial Photographs**

Ash Creek obtained historical aerial photographs of each site from the University of Oregon or local government. Photographs were requested for 10-year intervals; however, due to limitations of the aerial photography collections, the interval between aerial photographs varies. Photographs were generally available for the period between the 1930s and present. Each photograph was reviewed for historical land uses and activities at the target properties and adjacent properties to assess the potential for environmental impacts from the depicted activities/land uses. In general, the resolution of the aerial photography is only sufficient to identify large-scale land uses and activities. For example, features such as small aboveground storage tanks (ASTs), commonly used for the storage of gasoline and diesel, and individual chemical drums, are generally not visible on aerial photographs.

### **3.2 Review DEQ Facility Profiler**

DEQ maintains an online geo-referenced database of confirmed and suspected contaminated properties in Oregon – the “Facility Profiler”. Ash Creek identified each of the subject properties in the Facility Profiler system to determine if DEQ has records of hazardous materials storage or releases at the subject properties or at nearby properties. Listings that indicate conditions that could pose a risk to the subject properties were further evaluated through a review of DEQ files (see Section 3.4).

### **3.3 Site Reconnaissance**

An Ash Creek representative visited and photographed each site and visually assessed the properties for conditions or activities that may indicate that hazardous substances have impacted the sites. The site reconnaissance was performed from public rights of way. Ash Creek representatives did not knowingly enter private property or interview site owners or occupants.

---

### 3.4 File Review

Ash Creek reviewed files maintained by DEQ for facilities/properties that could pose a risk to the target properties. Files were selected for review based on information presented in the DEQ Facility Profiler system. For relatively simple DEQ listings (for example, residential heating oil tank releases), the file review was performed using online DEQ databases (i.e., the ECSI and the Leaking Underground Storage Tank [LUST] databases). For more complex listings, hard copies of pertinent files were reviewed.

### 3.5 Conceptual Assessment and Remediation Cost Estimate

Ash Creek developed assessment and remediation cost estimates for each property where hazardous substance contamination is suspected or confirmed. The cost estimates are based on the background information obtained during the activities described in Sections 3.1 through 3.4. Assessment cost estimates are based on DEQ and U.S. Environmental Protection Agency (EPA) guidance for remedial investigations, and our experience in the region.

The scope and cost for remediation of contaminated properties in Oregon is normally determined through a risk-based decision making process. Under this process, site-specific cleanup standards are established for an impacted property, based on a thorough evaluation of current and reasonably likely future land and water uses. Generally, cleanup standards are more stringent (and remediation costs are higher) at sites in residential areas, where children or infants may be exposed to hazardous substances, relative to sites in industrial areas, which are normally occupied by adults for a more limited duration.

Unless stated otherwise, Ash Creek made the following assumptions when developing remediation cost estimates for each target property:

1. Groundwater will not be used for any beneficial purpose, because it is assumed that all of the site are currently served by municipal supplies or will be served in the future;
2. Land use will be consistent with traded sector development in an industrial or office configuration;
3. Disturbed portions of the target properties will be covered with buildings, asphalt-concrete, concrete, and small landscaped areas following future development;
4. Given assumptions 1 through 3, the sites will be devoid of ecologically valuable habitat; therefore, ecological receptors will not be exposed to hazardous substances at the site; and
5. Remediation will be performed consistent with DEQ requirements and by using a presumptive remedy<sup>1</sup> that is likely to be effective and is reasonable in cost.

---

<sup>1</sup> U.S. EPA, Presumptive Remedies – Policies and Procedures. Presumptive Remedies: Policy and Procedures

<http://www.epa.gov/superfund/policy/remedy/presump/pol.htm>



---

If these assumptions are incorrect, assessment and remediation costs could vary significantly from the estimates presented herein.

## **4.0 Site Summaries**

Information about historical land uses and hazardous substance conditions at each target property, photographs, and supporting information, is compiled in Appendices B through L. A summary of information about hazardous substance impacts and potential investigation/remediation costs for each site is included in Section 5.

## **5.0 Summary**

The following table summarizes site conditions, conceptual assessment and remediation costs, and timeframes for assessment and remediation at each site.

**Table I – Summary of Property Conditions**

Site	Site Name	Possible Hazardous Substance Impacts	Range of Investigation and Remediation Costs <sup>2</sup>	Remediation Permitting and Timeframe
2	Time Oil Company	Soil and groundwater contamination resulted from petroleum storage and handling, waste oil storage, and wood treatment chemical (PCP) blending operations. Soil and/or groundwater contamination are assumed to impact the entire site.	\$754,000 <sup>3</sup>	3-6 months
13	ICDC LLC and Entercom	Virtually the entire property was used for agricultural purposes between at least 1935 and present. Residual pesticides may be present in soil. Investigation of the magnitude and extent of pesticide impacts will be necessary prior to site development.	\$15,000	3 months

---

<sup>2</sup> A range of costs is presented when the magnitude and extent of impacts, if any, is unclear. Refer to Appendices B through L for cost assumptions and details.

<sup>3</sup> The estimated remediation costs do not include long-term costs for extraction and treatment of contaminated groundwater.

Site	Site Name	Possible Hazardous Substance Impacts	Range of Investigation and Remediation Costs <sup>2</sup>	Remediation Permitting and Timeframe
15/16	UPS and Cereghino	Virtually the entire property was used for agricultural purposes between at least 1935 and present. Residual pesticides may be present in soil. Investigation of the magnitude and extent of pesticide impacts will be necessary prior to site development.	\$15,000	3-6 months
19	Port of Portland TRIP	The property is included on the National Priority List (NPL; Superfund) due to releases from a Reynolds/Alcoa aluminum processing facility that historically operated at the site. Extensive remediation has been performed, resulting in the removal of the majority of hazardous substances from the site. Residual impacts remain in soil and groundwater at the site. Impacted soil, which is present on approximately 16 acres of the site, must be removed from the site or covered with clean fill. Future development must be performed in accordance with the Consent Order for the site.	\$3,025,000	3-6 months
24	Jean Johnson	Virtually the entire property was used for agricultural purposes between at least 1936 and present. Residual pesticides may be present in soil. Investigation of the magnitude and extent of pesticide impacts will be necessary prior to site development.	\$15,000	3-6 months
29	Clackamas County Development	The property was used for residential, agricultural, aggregate mining, equipment maintenance, composting, and other purposes between at least 1938 and present. Oil-range hydrocarbons and other hazardous substances are present in small areas of soil. The impacted soil, which appears to occupy less than 1 percent of the total site area, should be remediated prior to or during site development.	\$25,000	3 months



Site	Site Name	Possible Hazardous Substance Impacts	Range of Investigation and Remediation Costs <sup>2</sup>	Remediation Permitting and Timeframe
33	Coffee Creek	Virtually the entire property was used for agriculture purposes between at least 1936 and present. Residual pesticides may be present in soil. Residential/farm ASTs and/or underground storage tanks (USTs), used for storing gasoline, diesel, or heating oil, may be present at the site. Investigation of the magnitude and extent of pesticide and petroleum impacts, if any, may be necessary prior to site development. If ASTs/USTs are present, they should be decommissioned and remediated (if releases have occurred) prior to development.	\$35,000 to \$155,00	3-6 months
37	Orr Family Farm	Approximately 20 percent of the property was used for agriculture purposes between at least 1936 and present. Residual pesticides may be present in soil. Residential/farm ASTs and/or USTs, used for storing gasoline, diesel, or heating oil, may be present at the site. Investigation of the magnitude and extent of pesticide and petroleum impacts, if any, may be necessary prior to site development. If ASTs/USTs are present, they should be decommissioned and remediated (if releases have occurred) prior to development.	\$25,000 to \$45,000	3-6 months



Site	Site Name	Possible Hazardous Substance Impacts	Range of Investigation and Remediation Costs <sup>2</sup>	Remediation Permitting and Timeframe
55/56	East Evergreen	Virtually the entire property was used for agriculture purposes between at least 1936 and present. Residual pesticides may be present in soil. Residential/farm ASTs and/or USTs, used for storing gasoline, diesel, or heating oil, may be present at the site. Investigation of the magnitude and extent of pesticide and petroleum impacts, if any, may be necessary prior to site development. If ASTs/USTs are present, they should be decommissioned and remediated (if releases have occurred) prior to development.	\$30,000 to \$120,000	3-6 months
62	Rock Creek	Virtually the entire property was used for agriculture purposes between at least 1936 and present. Residual pesticides may be present in soil. A heating oil UST was possibly decommissioned at the site in 2002. Residential/farm ASTs and/or USTs, used for storing gasoline, diesel, or heating oil, may be present at the site. Investigation of the magnitude and extent of pesticide and petroleum impacts, if any, may be necessary prior to site development. If ASTs/USTs are present, they should be decommissioned and remediated (if releases have occurred) prior to development.	\$30,000 to \$120,000	3-6 months
104	Hillsboro Urban Reserves	Virtually the entire property was used for agriculture purposes between at least 1936 and present. Residual pesticides may be present in soil. Residential/farm ASTs and/or USTs, used for storing gasoline, diesel, or heating oil, may be present at the site. Investigation of the magnitude and extent of pesticide and petroleum impacts, if any, may be necessary prior to site development. If ASTs/USTs are present, they should be decommissioned and remediated (if releases have occurred) prior to development.	\$30,000 to \$120,000	3-6 months



## ***Appendix A***

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### **Regional Industrial Inventory Maps**

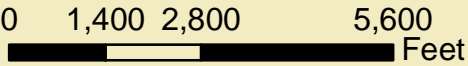


Regional Industrial  
Inventory Project  
October 27, 2011

Map 1  
North Portland

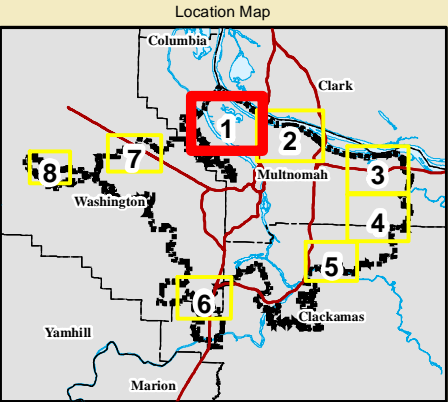
Potential Industrial Site

Urban Growth Boundary



Source Data  
Metro RLIS Lite Base Data, August 2011

Geographic Projection Information  
NAD 83 HARN, Oregon North  
Lambert Conformal Conic



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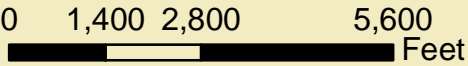
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Regional Industrial  
Inventory Project  
October 27, 2011

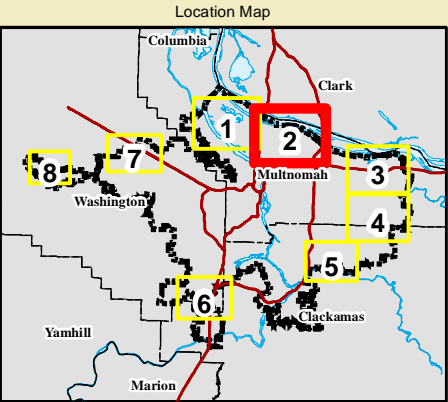
Map 2  
Portland International Airport

- Potential Industrial Site
- Urban Growth Boundary



Source Data  
Metro RLIS Lite Base Data, August 2011

Geographic Projection Information  
NAD 83 HARN, Oregon North  
Lambert Conformal Conic



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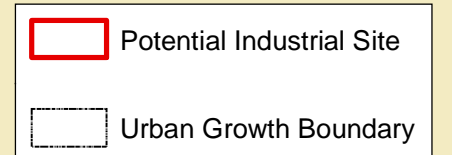
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Project No: 2110160



Regional Industrial  
Inventory Project  
October 27, 2011

Map 3  
East Multnomah County



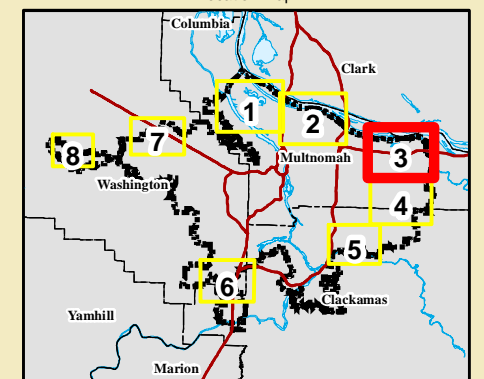
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Feet

Source Data  
Metro RLIS Lite Base Data, August 2011

Geographic Projection Information  
NAD 83 HARN, Oregon North  
Lambert Conformal Conic



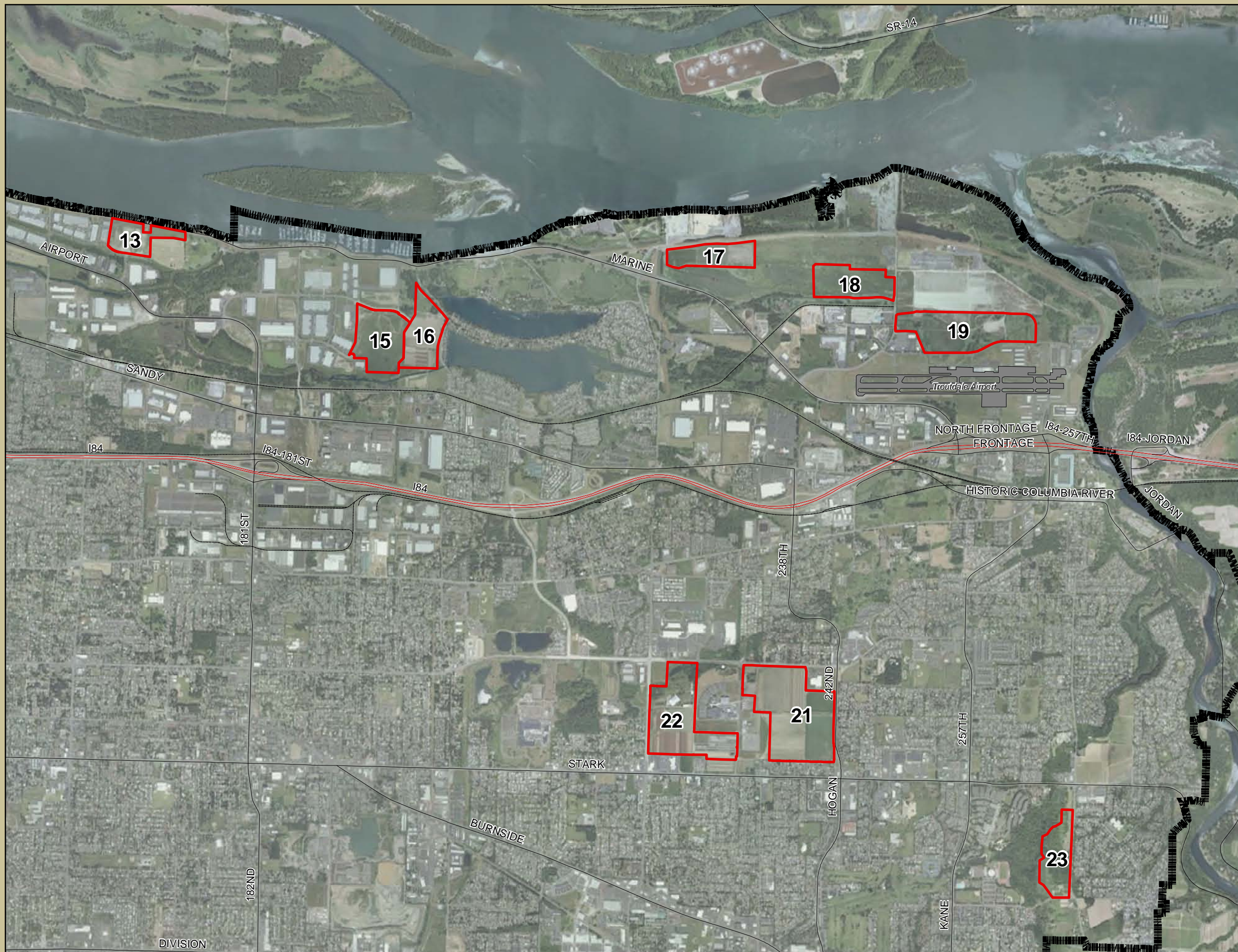
Location Map



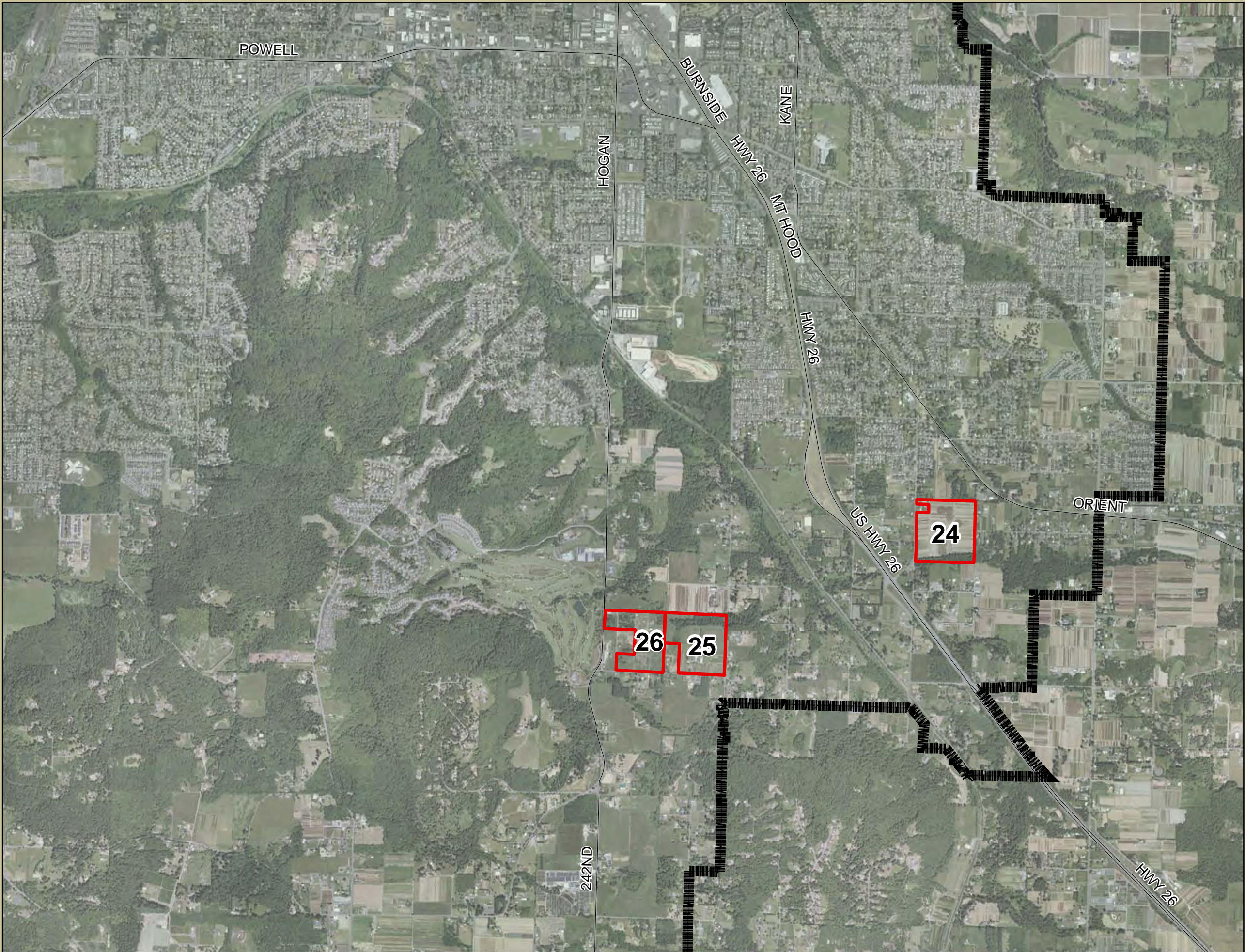
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Map Created by: GF  
Project No: 2110160





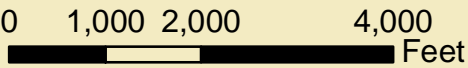




Regional Industrial  
Inventory Project  
October 27, 2011

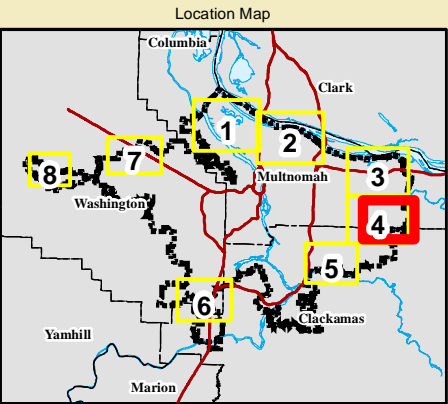
Map 4  
E Gresham

-  Potential Industrial Site
-  Urban Growth Boundary



Source Data  
Metro RLIS Lite Base Data, August 2011

Geographic Projection Information  
NAD 83 HARN, Oregon North  
Lambert Conformal Conic



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Project No: 2110160

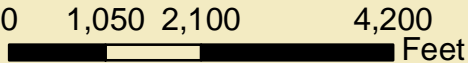




**Regional Industrial  
Inventory Project  
October 27, 2011**

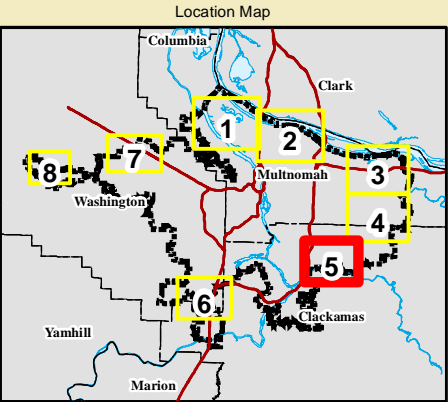
**Map 5  
Clackamas County**

- Potential Industrial Site
- Urban Growth Boundary



**Source Data**  
Metro RLIS Lite Base Data, August 2011

**Geographic Projection Information**  
NAD 83 HARN, Oregon North  
Lambert Conformal Conic

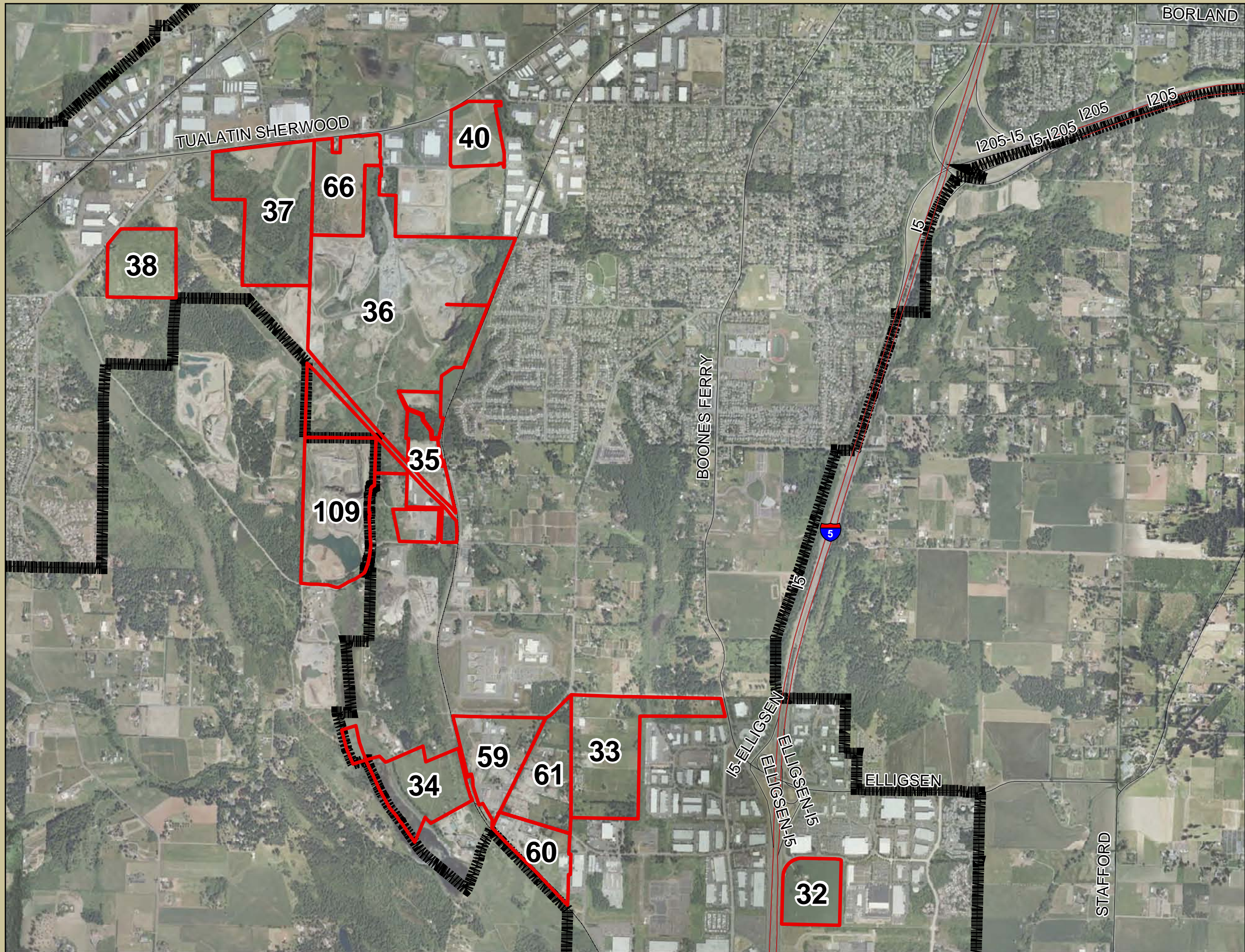


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Date: 10/27/11  
File: SiteReview\_10.27.2011.mxd  
Map Created by: GF  
Project No: 2110160





**Regional Industrial  
Inventory Project  
October 27, 2011**

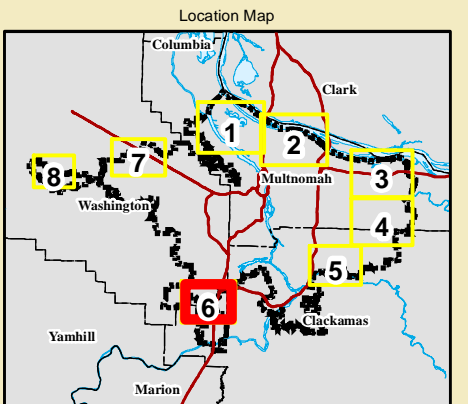
**Map 6  
Tualatin, Sherwood &  
Wilsonville**

-  Potential Industrial Site
-  Urban Growth Boundary



**Source Data**  
Metro RLIS Lite Base Data, August 2011

**Geographic Projection Information**  
NAD 83 HARN, Oregon North  
Lambert Conformal Conic



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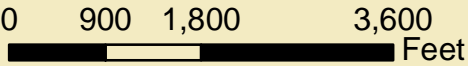
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File: SiteReview\_10.27.2011.mxd | Project No: 2110160



Regional Industrial  
Inventory Project  
October 27, 2011

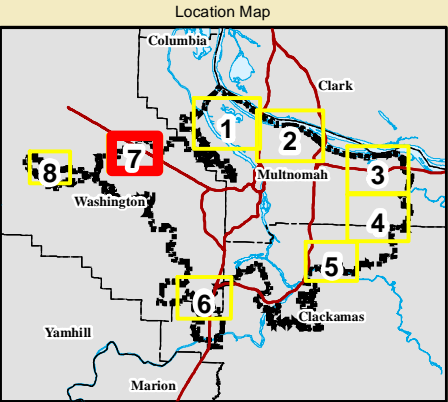
Map 7  
Hillsboro

-  Potential Industrial Site
-  Urban Growth Boundary



Source Data  
Metro RLIS Lite Base Data, August 2011

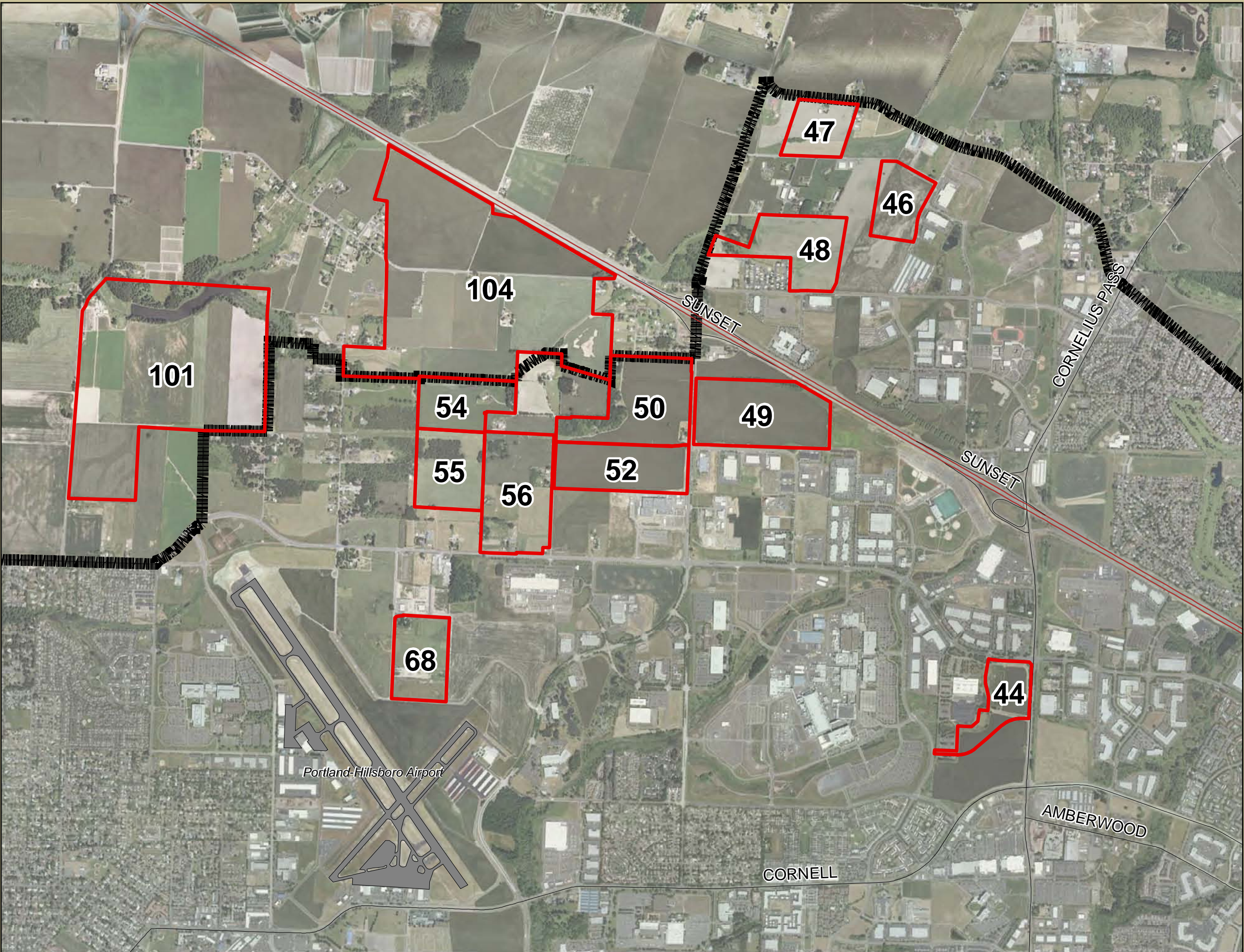
Geographic Projection Information  
NAD 83 HARN, Oregon North  
Lambert Conformal Conic



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
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File: SiteReview\_10.27.2011.mxd | Project No: 2110160

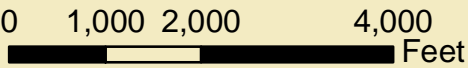




Regional Industrial  
Inventory Project  
October 27, 2011

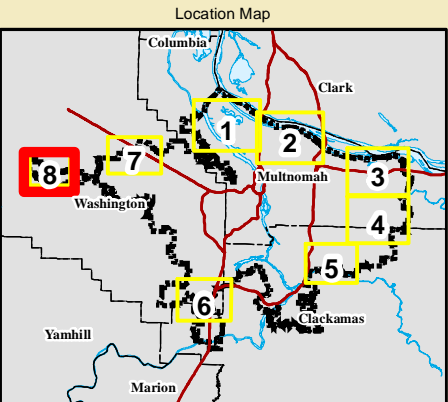
Map 8  
Forest Grove

-  Potential Industrial Site
-  Urban Growth Boundary



Source Data  
Metro RLIS Lite Base Data, August 2011

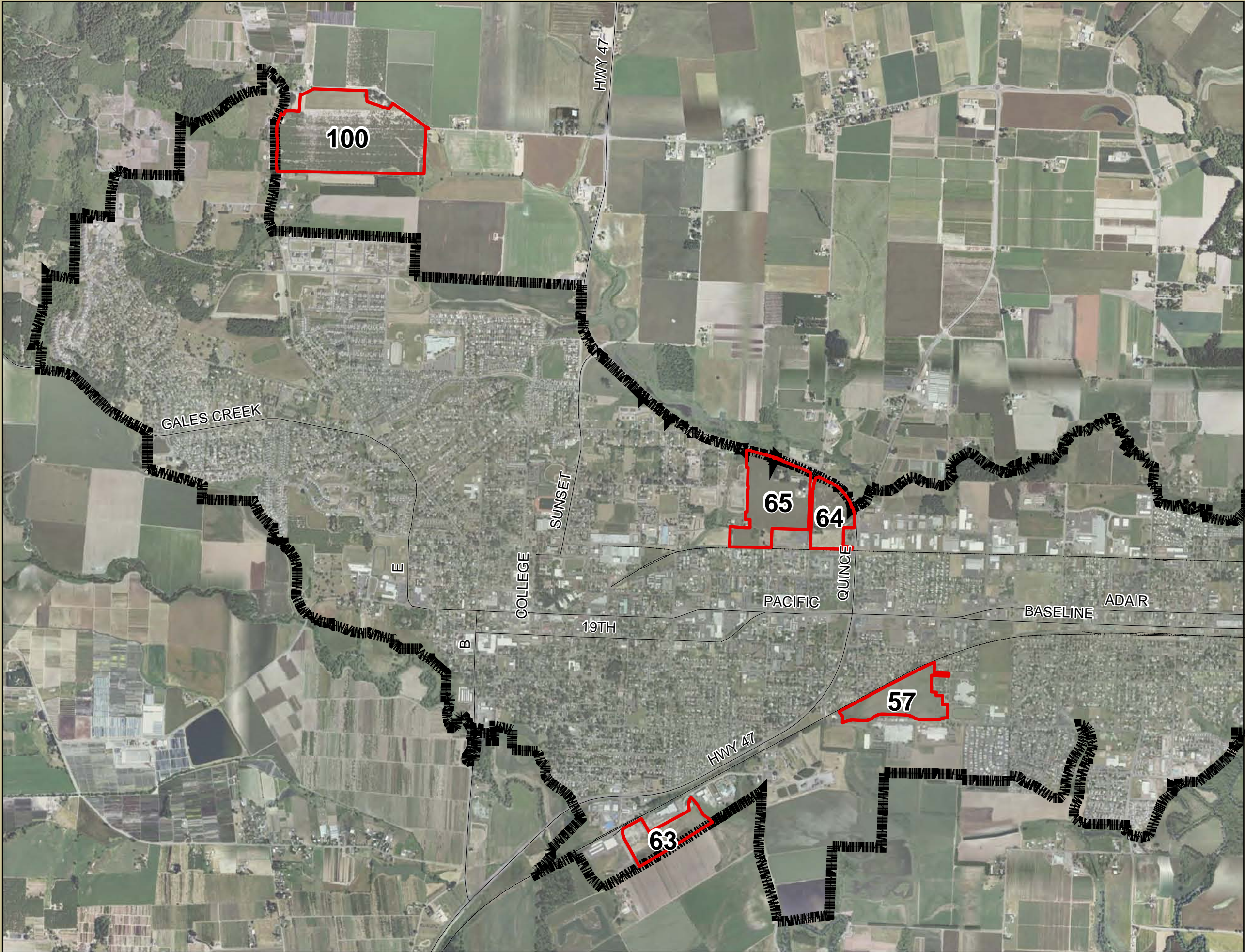
Geographic Projection Information  
NAD 83 HARN, Oregon North  
Lambert Conformal Conic



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Date: 10/27/11  
File: SiteReview\_10.27.2011.mxd  
Map Created by: GF  
Project No: 2110160





## ***Appendix B***

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### **Site 2: Time Oil Site Summary**



## ***Appendix B —Site 2: Time Oil Site Summary***

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### ***Attachments***

- A      Aerial Photographs
- B      Photograph Log
- C      Conceptual Redevelopment Drawing



## **Appendix B —Site 2: Time Oil Site Summary**

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This Appendix presents a summary of information about environmental conditions at site 2.

### **1.0 Aerial Photography Review**

A summary of historical activities at the site, based on a review of aerial photography, is presented below. Copies of aerial photography are included in Attachment A.

1936 – The 1936 historical aerial photograph suggests that the site was recently disturbed (likely filled).

1944 – The Main Terminal Tank Farm is present in the northwest portion of the site, along with the dock structure. The remainder of the site and the property to the south and east has been developed for the Oregon Shipbuilding Corporation shipyard (the “shipyard”). The shipyard portion of the site appears to be a storage area and includes a series of railroad spurs and roads. The majority of the property to the north remains undeveloped, although what appears to be an electrical transmission tower is present.

1948 – The site appears generally unchanged, except that the shipyard appears to be unused. A dock structure south of the site is now present. It is difficult to determine, but it appears that the railroad spurs have been removed.

1956 – Above-ground storage tanks (ASTs) have been constructed on the Bell Terminal Tank Farm. The property immediately east of the Bell Terminal Tank Farm appears to include a small landfill. A second electrical transmission tower is present north of the site.

1964 – Additional ASTs have been added to the Main Terminal Tank Farm and the Bell Terminal Tank Farm. The landfill on the property immediately east of the Bell Terminal Tank Farm appears to be absent.

1970 – The ASTs used by Crosby & Overton in the 1980s have been constructed. The shipyard-era roads on the eastern portion of the site are darker (e.g., wet or oiled). There appears to be ponded water northeast of the Bell Terminal Tank Farm.

1980 – The Aviation Gasoline Storage Area ASTs have been constructed. An additional AST has been added to each of the Main Terminal and Bell Terminal tank farms. A building is present north of the site along with a third electrical transmission tower. The Premier Edible Oils (PEO) tank farm has been constructed west of the Bell Terminal Tank Farm.

1990 – No significant changes are visible at the site. A ship is berthed at the on-site dock and rail cars are present on the spur adjacent to the warehouse.





## **Appendix B —Site 2: Time Oil Site Summary**

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1998 – The ASTs used by Crosby & Overton in the 1980s have been removed. The soil stockpile adjacent to the PCP mixing area has been constructed. A ship is berthed at the on-site dock. Vegetation has been removed from the eastern portion of the site.

2005 – No significant changes are visible at the site. The PEO tank farm has been removed.

### **2.0 Review of DEQ Facility Profiler**

The Time Oil Company (TOC) site is identified in the DEQ Facility Profiler as being listed on the confirmed release list (CRL) and assigned DEQ Environmental Cleanup and Site Information (ECSI) number 170.

The site was operated as a petroleum products storage terminal from the 1940s through 2001. Other historical activities at the site included (1) pentachlorophenol (PCP) product formulation and storage (Koppers Co.) from 1967 to 1982; and (2) waste oil storage by Crosby and Overton in the 1980s. Remedial Investigation (RI) activities have been ongoing since 1995. Soil and groundwater contamination resulted from petroleum storage and handling, waste oil storage, and PCP blending operations. Contaminants of Interest (COI) at the site include total petroleum hydrocarbons (TPH), polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), metals, and PCP. Several phases of soil remediation were performed between 1995 and 2011. Groundwater remediation, consisting of a pump-and-treat system, was implemented in 2000 and continues to operate. The on-site above-ground storage tanks (ASTs) were demolished and removed in 2009. TOC is currently preparing a Source Control Evaluation (SCE) and Risk Assessment Work Plan.

### **3.0 Site Reconnaissance**

The site was observed on January 31, 2012 from public rights of way adjacent to the site. The majority of the site is undeveloped (i.e., vegetated) and generally vacant with exception of a few buildings. A photograph log is included in Attachment B.

### **4.0 File Review**

Ash Creek reviewed publicly available files to further evaluate the potential for contamination at the site.

TOC has divided the Site into three parcels for their work toward regulatory closure:

1. East Property (21 acres) – No structures are present on the East Property, but this area was historically part of the shipyard during World War II. This area and a portion of the Central Property received a DEQ no further action (NFA) determination in 2003. The NFA determination is contingent upon continued use of the site for industrial purposes, which limit suitable habitat for



## ***Appendix B —Site 2: Time Oil Site Summary***

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sensitive ecological receptors. An equitable servitude and deed restriction was recorded on the property.

2. Central Property (13.5 acres) - Includes the former Bell Terminal, the undeveloped western portion of the East Property located directly north of the Bell Terminal, and the former Aviation Gasoline Storage Area; and
3. West Property (17.5 acres) - Includes the former Main Terminal, the former PCP mixing area, and remaining property to the west of the central property.

**Tank Farm Areas.** A surface soil removal action was conducted in 2011 to reduce on-site contaminant concentrations, in support of the forthcoming risk assessment. Residual concentrations of TPH (up to 20,000 milligrams per kilogram [mg/kg]) and PAHs remain on-site. Concentrations of TPH, above the DEQ Clean Fill Criteria (100 mg/kg), are present from the ground surface to the full depths explored. The highest relative concentrations were detected at the capillary fringe in each tank farm. There is the potential that petroleum constituents are present in soil below 10 feet below ground surface (bgs) at concentrations that exceed screening levels for vapor intrusion. Lead concentrations that exceed the DEQ Clean Fill Criteria (17 mg/kg) are present across the tank farms.

**East Property.** Although the East Property has received an NFA, the determination was based on the cleanup standards at the time of work (e.g., 1 mg/kg industrial cleanup standard for PAHs). There are likely locations that contain contaminants at concentrations that exceed current DEQ Risk-Based Concentrations (RBCs), requiring that soil be managed as part of property redevelopment.

**PCP Formulation Area.** Soil remediation activities removed PCP-impacted soil in the former warehouse and mixing area, but residual soil with PCP is present below approximately 13 feet. Few dioxin/furan soil samples have historically been collected, but the available data suggest that dioxins/furans may be present in soil at concentrations that exceed DEQ RBCs. A groundwater treatment system was installed in 2000 to limit further migration of PCP-impacted groundwater in the upper and lower water-bearing zones. Redevelopment of this area will require proper management of impacted soil and groundwater, if encountered (i.e., dewatering). Any redevelopment will also need to accommodate the continued operation of the groundwater treatment system and the presence of monitoring wells on the property. If the configuration of the groundwater treatment/monitoring system is not compatible with development plans, modification of the treatment/monitoring system will be required.

**Former Crosby & Overton Leasehold.** Historical releases from the ASTs and overall poor housekeeping led to contamination on this former leasehold. Soil remediation activities have been completed, but residual contamination remains (under approximately 1.5 feet of backfill). Residual contamination is likely present in some locations at concentrations that exceed current RBCs, requiring that soil be properly managed during property redevelopment.





## **Appendix B —Site 2: Time Oil Site Summary**

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**Subsurface Physical Obstacles.** During the summer and fall of 2009, the remaining ASTs, two loading racks, and associated aboveground piping were removed from the site. Some underground piping was also removed, but a large portion of the underground piping remains in place. Following is a summary of these utilities from the *Tank Farm Demolition Completion Report*:

- A network of at least three buried Transite® asbestos-containing pipelines connect the former Main Terminal and former Bell Terminal Tank Farm Areas. The Transite® pipelines are believed to be about 3 feet bgs.
- A buried natural gas pipeline apparently runs from the Main Gate to the approximate northwest corner of the former Bell Terminal Tank Farm, and then east.
- Underground product piping (coated with non-asbestos-containing insulation) that historically connected the former boiler unit with former Tanks 14501 and 15005 (located in the northwest corner of the Main Terminal Tank Farm) was capped and left in place.
- Three 8-inch-diameter underground product pipelines extending from the southeast corner of the former Main Terminal to the northwest corner of the former Bell Terminal were capped (using a welding torch) and left in place.
- A 10-inch-diameter underground product pipeline extending west from the central portion of the former Bell Terminal was capped and left in place.

### **5.0 Summary of Environmental Conditions**

The Facility has a long industrial history, with environmental impacts related to petroleum storage and transfer, PCP formulation activities, and tenant areas (i.e., Crosby & Overton). Although surface soil removal actions have been completed to ready the Facility for a risk assessment, there is likely residual contamination (at concentrations above DEQ RBCs and clean fill criteria) that will require management during redevelopment (e.g., dewatering, special soil handling, potential off-site disposal, etc.). Due to residual volatile constituents in soil, the potential for vapor intrusion issues should also be considered during development (e.g., passive building venting or targeted soil gas sampling). Based on the limited file review, the active groundwater treatment system at the site appears to effectively mitigate the potential for PCP migration to the Willamette River. To maintain source control, and prevent migration of impacted groundwater to the adjacent Portland Harbor Superfund Site, the groundwater treatment system must be maintained and active in the foreseeable future.

The aboveground tank farm equipment has been removed but a number of pipelines were left in place (including buried Transite® asbestos-containing pipelines).



## **Appendix B —Site 2: Time Oil Site Summary**

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### **6.0 Conceptual Assessment and Remediation Cost Estimate and Schedule**

Extensive assessment and remediation efforts have been completed at the Site. Those efforts have included the following:

- Excavation of 1,500 cubic yards of soil from the east parcel;
- Excavation of 6,400 cubic yards of soil and multiple phases of in situ chemical oxidation (ISCO) injection in the former PCP mixing area;
- Excavation of 300 cubic yards of soil from the former Crosby & Overton tank area;
- Excavation of 7,000 cubic yards of soil from targets areas of the Site in 2011; and
- As of February 2010, approximately 80 million gallons of groundwater have been treated and discharged to the sanitary sewer (approximately 6 million gallons annually).

Although environmental remediation efforts have been conducted, impacted soil remains on-site and must be managed as part of property redevelopment. The potential for vapor intrusion also must be addressed during the redevelopment process (through sampling and analysis of soil vapor and/or through installation of vapor mitigation systems at building locations).

The following estimate of assessment and remediation costs includes: (1) costs accrued to date, and (2) anticipated future costs.

#### **6.1 Future Costs**

The following estimate of future costs was prepared using the following conceptual redevelopment model. A preliminary drawing prepared by Group Mackenzie is included in Attachment C.

- Metal manufacturing/process operation that utilizes water, rail, and truck modes of transportation.
- Three buildings and lay down yard areas. Rail service to the northern-most building.
- Land-based crane system that would be used to off load from a vessel (e.g., barge or ship) at the dock.
- Balanced cut and fill in order to bring the land surface to an elevation of 31 feet NAVD88 and the building pads to an elevation of 32 feet (one foot above the flood plain). The proposed soil cut areas presented on the conceptual design include light petroleum contamination.

The additional tasks and associated costs required to address hazardous substance impacts for the conceptual redevelopment scenario are summarized below.





## **Appendix B —Site 2: Time Oil Site Summary**

**Groundwater Treatment System.** The groundwater treatment system must remain in operation as a source control measure to prevent migration of impacted groundwater to the Willamette River. However, the costs for operation and maintenance of the system and discharge of extracted water to the City of Portland sanitary sewer (\$3,720,000<sup>1</sup>) are not included in this remediation cost estimate because these costs are not required to make the site development-ready (the objective of this project). Rather, this cost will be part of ongoing maintenance and would likely be subject to negotiation between present and future property owners.

**Capping Contaminated Soil.** Impacted soil will be excavated from cut areas and placed in portions of the site scheduled for filling (i.e. underneath building footprints and other operations areas). DEQ requires a Solid Waste Letter of Authorization (SWLA) prior to the removal and permanent placement of impacted soil at the site. It will be necessary to install a cap over the impacted soil. We assume that the cap will consist of asphalt or cement concrete pavement (including building foundations), clean soil, or a combination of these materials. The cap will be protective of human health by preventing direct contact with the soil and by preventing movement of the soil. A Soil Management Plan (SMP) will be necessary to address risks associated with construction worker exposure and to address long-term requirements for inspection and maintenance of the caps (e.g., annual inspections, sealing observed cracks, etc.). Alternatively, clean soil could be imported to the site and used to raise selected areas above the flood plain elevation, reducing the risk of construction worker exposure to impacted media.

**Increased Depth of Soil Cut.** It may be necessary to increase the depth of the soil cut at removal areas to accommodate placement of a cover layer of clean imported soil in those areas. The increased cut depth can be accommodated in the cut and fill balance. The clean imported soil may be required to provide suitable habitat material for wetland features.

**Decommissioning and Modification of Well Network.** Eighty-five groundwater monitoring well wells are located at the site. It is likely possible to decommission some of the wells to accommodate development plans, however a portion of the well network must be maintained. It may also be necessary to move some wells to accommodate construction activities. Costs associated with these costs are included in Table 1.

Table 1 – Assessment and Remediation Costs for Site 2

Cost	Description
\$10,000	SWLA for placement of lightly petroleum contaminated soil under cap
\$25,000	Soil gas investigation for soil placed under building footprints (as necessary based on DEQ request as part of SWLA negotiation)

<sup>1</sup> Present value, based on 3% annual discount rate; assumes \$350,000 per year for 15 years.



## ***Appendix B —Site 2: Time Oil Site Summary***

\$10,000	Preparation of SMP
No Cost <sup>2</sup>	Installation of cap
\$74,000 <sup>1</sup>	Annual cap inspection and O&M (assumes \$5,000 per year for 20 years)
No Cost <sup>3</sup>	Dewatering during construction.
\$300,000 <sup>4</sup>	Placement of habitat cap in former tank farms deep cut areas (as necessary).
\$250,000	Abandonment/modification of 85 flush-mount and above-grade groundwater monitoring well monuments and wells.
\$85,000	Environmental oversight during cut and fill activities from contaminated areas (assumes 40 days of oversight)
<b>\$754,000</b>	<b>Total *</b>

\* Does not include handling and disposal of historical pipelines that were left in place (including buried Transite® asbestos-containing pipelines) as part of site demolition.

### **6.2 Other Costs**

The summary of assessment and remediation costs was developed based on a limited review of publicly available files and is limited to costs required to address impacts at upland portions of the site during redevelopment. The groundwater treatment system operates at the upland portion of the site, and thus, the costs for operating that system are included in this estimate. However, it is reasonably likely that the groundwater treatment system would not be required, or could be reduced in scope, were it not for the need to prevent migration of impacted groundwater to the Willamette River.

A preliminary review of river bottom bathymetry adjacent to the Site suggests that the river is approximately 40 feet deep. Consequently, we assume that the depth is sufficient for marine vessel access to the dock and no costs for dredging are included. The Port of Portland (Port) plans to provide estimated costs (i.e., permitting, construction, water quality monitoring, and habitat mitigation) associated with removal of the existing dock and construction of a new dock.

The site is adjacent to the Portland Harbor Superfund Site and is considered a potential contributor to contamination in the Portland Harbor. As a result, owners and operators of the site (future, current and/or former) may be assessed some share of the costs for conducting the remedial investigation and implementing a remedy in the Portland Harbor. The remedy for the Portland Harbor Superfund Site has not

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<sup>2</sup> Costs for installation of a cap are not included, based on the assumption that a cap, consisting of cement- or asphalt-concrete will be installed during development, regardless of the presence of impacted soil.

<sup>3</sup> Dewatering costs are not included because the scope of dewatering is unknown and it is assumed that the existing groundwater extraction system and permits can be used for dewatering.

<sup>4</sup> Costs for habitat fill assume one foot of clean import.





## ***Appendix B —Site 2: Time Oil Site Summary***

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been selected and the allocation for investigation/remediation costs is ongoing; therefore, it is not possible to estimate what amount of those costs, if any, will be apportioned to owners/operators of the site.

### **6.3 Schedule and Permitting**

Groundwater remediation is ongoing at the site and is expected to continue for approximately 15 years. The groundwater remediation activities should have little to no effect on a development schedule for the site because those activities can continue during and after development.

The most significant remediation effort that will be required for development of the site will be the soil handling and placement under the cap. We anticipate the schedule to negotiate the SWLA with DEQ could occur in approximately three to six months. The placement of the cap and other handling of impacted soil would be performed during overall redevelopment of the Site and these efforts are not included in the schedule.



## ***Attachment A***

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### **Aerial Photographs**

































## ***Attachment B***



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### **Photograph Log**

## ATTACHMENT B PHOTOGRAPH LOG

**Project Name:** Regional Industrial Inventory Project - Site 2  
**Project Number:** 1901-00

**Client:** Group MacKenzie  
**Location:** Portland, Oregon



<b>Photo No:</b> 1	
<b>Photo Date:</b> Jan. 31, 2012	
<b>Orientation:</b> South	
<b>Description:</b>  Field at site, viewed from North Time Oil Road. View to the south.	
<b>Photo No:</b> 2	
<b>Photo Date:</b> Jan. 31, 2012	
<b>Orientation:</b> West	
<b>Description:</b>  Field at site, along with several on-site structures, viewed from North Time Oil Road. View to the west.	



## ATTACHMENT B PHOTOGRAPH LOG

**Project Name:** Regional Industrial Inventory Project - Site 2  
**Project Number:** 1901-00


**Client:** Group MacKenzie  
**Location:** Portland, Oregon

<b>Photo No:</b> 3	
<b>Photo Date:</b> Jan. 31, 2012	
<b>Orientation:</b> Southwest	
<b>Description:</b>  Field at site, viewed from North Time Oil Road. View to the southwest.	
<b>Photo No:</b> 4	
<b>Photo Date:</b> Jan. 31, 2012	
<b>Orientation:</b> Southeast	
<b>Description:</b>  Field at site, viewed from North Time Oil Road. View to the southeast.	

## ATTACHMENT B PHOTOGRAPH LOG

**Project Name:** Regional Industrial Inventory Project - Site 2  
**Project Number:** 1901-00

**Client:** Group MacKenzie  
**Location:** Portland, Oregon

<b>Photo No:</b> 5	
<b>Photo Date:</b> Jan. 31, 2012	
<b>Orientation:</b> East	
<b>Description:</b>  Field at site, viewed from North Time Oil Road. View to the east.	



## ***Attachment C***

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### **Conceptual Redevelopment Drawing**







## ***Appendix C***

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### **Site 13: ICDC LLC and Entercom Site Summary**

# Appendix C —Site 13: ICDC LLC and Entercom Site Summary

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## Attachments

- A      Aerial Photographs
- B      Photograph Log





## ***Appendix C —Site 13: ICDC LLC and Entercom Site Summary***

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This Appendix presents a summary of information about environmental conditions at site 13.

### ***1.0 Aerial Photography Review***

A summary of historical activities at the site, based on a review of aerial photography, is presented below. Copies of aerial photography are included in Attachment A.

1935 – The site is used for agricultural purposes, with the exception of a small area at the south side of the site. A stream channel or irrigation ditch, oriented in a west-east alignment, appears to bisect the site. A roadway is parallel to the north side of the site. A forested area is south of the site.

1948 – The site and surrounding areas appear generally unchanged, with the exception that the forested area at the southern portion of the site has been cleared and is in agricultural use.

1956 – No significant changes are visible at the site or at surrounding areas.

1964 – No significant changes are visible at the site or at surrounding areas.

1970 – No significant changes are visible at the site or at surrounding areas..

1980 – No significant changes are visible at the site or at surrounding areas.

1990 – No significant changes are visible at the site. Land west of the site has been cleared and graded.

1998 – No significant changes are visible at the site, although it is unclear if the site remains in agricultural uses. Several large buildings and parking areas have been constructed west and south of the site. NE Cameron Road and NE Airport Way have also been built west and south of the site.

2005 – No significant changes are visible at the site. Land southeast of the site has been graded. Several large buildings and parking areas have been constructed southwest of the site, near NE Airport Way.

### ***2.0 Review of DEQ Facility Profiler***

No regulatory listings for facilities that appear to pose a significant environmental risk were identified for properties at or adjacent to the site.



## ***Appendix C —Site 13: ICDC LLC and Entercom Site Summary***

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### **3.0 Site Reconnaissance**

The site was observed on January 17, 2012 from public rights of way. The site was undeveloped and fallow at the time of the site reconnaissance. No buildings are present at the site. Irrigation systems were not in place during the site reconnaissance; therefore, it is unclear if water is supplied to the site by an on- or off-site well or other source(s). A photograph log is included in Attachment B.

### **4.0 File Review**

A file review was not performed for the site because the site is not included in DEQ's listings of properties with documented or suspected hazardous substance impacts.

### **5.0 Summary of Environmental Conditions**

Aerial photography indicates that the site has been in agricultural use since at least 1936. Crops apparently consisted of grasses and cover crops until sometime before 1998. The exact types of crops grown at the site are unclear based on the review of aerial photography. It is unclear if agricultural uses are ongoing. Pesticides and herbicides (pesticides) that were commonly applied to crops in Oregon include inorganic, organochlorine, and organophosphate compounds. The pesticide residues most often detected in Oregon soil are lead, arsenic, cadmium, and mercury (inorganic compounds); and DDT, dieldrin, and toxaphene (organic compounds). Studies have shown that pesticides may accumulate on agricultural lands at concentrations that exceed acceptable risk levels. Analytical data are unavailable to confirm whether residual pesticides are present in soil at the site.

An assessment for residual pesticide concentrations in soil should be performed prior to site development. The information obtained during the assessment can be used to determine whether the site is impacted, and if so, to plan for soil management and for protection of worker health and the environment during future development activities.

Assuming the site is developed for industrial purposes, the majority of the site is likely to be covered with asphalt-concrete or concrete surfaces, preventing human and ecological exposure to pesticides in soil. Under this scenario, assuming moderate levels of pesticide impacts, remediation to address pesticides in soil is not likely to be necessary. If redevelopment plans include the construction or alteration of wetlands, ponds, or other significant natural habitat within areas formerly used for agriculture and impacted by pesticides, pesticide concentrations are high, or significant human/ecological exposure is expected, additional pesticide remediation may be necessary.





## ***Appendix C —Site 13: ICDC LLC and Entercom Site Summary***

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### ***6.0 Conceptual Remediation Cost Estimate***

Based on the assumptions listed above, the estimated cost for an assessment of residual pesticide concentrations in soil is approximately \$15,000. A remediation cost estimate was not prepared for pesticides in soil because asphalt-concrete, concrete pavement, and building foundations will presumably be installed during industrial development of the site, preventing human and ecological exposure to pesticides in soil and removing the need for other remediation efforts. If pesticide-impacted soil is removed from the site during earthwork activities, additional handling/disposal costs may be incurred.

No permitting is required to perform an assessment of pesticide conditions at the site. A pesticide assessment can be completed in less than three months. The pesticide assessment should be performed prior to initiating site preparation/development activities because the assessment data should be used to inform decisions regarding worker health and safety and soil management.



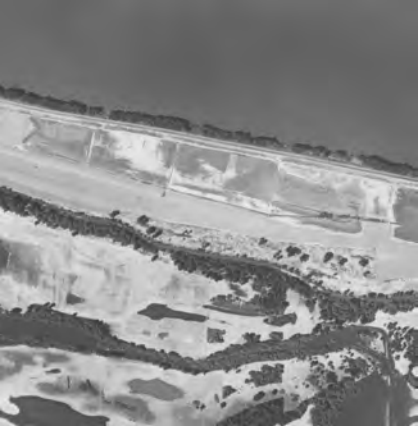
## ***Attachment A***

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### **Aerial Photographs**





























## ***Attachment B***

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### **Photograph Log**

## ATTACHMENT B PHOTOGRAPH LOG

**Project Name:** Regional Industrial Inventory Project - Site 13  
**Project Number:** 1901-00



**Client:** Group MacKenzie  
**Location:** Troutdale, Oregon

<b>Photo No:</b> 1	
<b>Photo Date:</b> Jan. 17, 2012	
<b>Orientation:</b> East	
<b>Description:</b> Field at site, viewed from off-site property adjacent and west of the site. View to the east.	
<b>Photo No:</b> 2	
<b>Photo Date:</b> Jan. 17, 2012	
<b>Orientation:</b> East	
<b>Description:</b> Field at site, viewed from off-site property adjacent and west of the site. View to the east.	

## ATTACHMENT B PHOTOGRAPH LOG

**Project Name:** Regional Industrial Inventory Project - Site 13  
**Project Number:** 1901-00

**Client:** Group MacKenzie  
**Location:** Troutdale, Oregon



<b>Photo No:</b> 3	
<b>Photo Date:</b> Jan. 17, 2012	
<b>Orientation:</b> North	
<b>Description:</b>  Field at site, viewed from intersection of NE 166 <sup>th</sup> Avenue and NE Cameron Boulevard. View to the north.	
<b>Photo No:</b> 4	
<b>Photo Date:</b> Jan. 17, 2012	
<b>Orientation:</b> Southeast	
<b>Description:</b>  Field at site, viewed from off-site property adjacent and west of the site. View to the east.	



## ATTACHMENT B PHOTOGRAPH LOG

**Project Name:** Regional Industrial Inventory Project - Site 13  
**Project Number:** 1901-00

**Client:** Group MacKenzie  
**Location:** Troutdale, Oregon

<b>Photo No:</b> 5	
<b>Photo Date:</b> Jan. 17, 2012	
<b>Orientation:</b> South	
<b>Description:</b>  Field at site, viewed from NE Marine Drive. View to the south.	
<b>Photo No:</b> 6	
<b>Photo Date:</b> Jan. 17, 2012	
<b>Orientation:</b> South	
<b>Description:</b>  Field at site, viewed from NE Marine Drive. View to the south.	

## ***Appendix D***

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### **Site 15/16: UPS and Cereghino Site Summary**

# Appendix D — Site 15/16: UPS and Cereghino Site Summary

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## Appendices

- A Aerial Photographs
- B Photograph Log





## **Appendix D — Site 15/16: UPS and Cereghino Site Summary**

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This Appendix presents a summary of environmental conditions at sites 15 and 16. Site numbers 15 and 16 are contiguous and were evaluated as a single property.

### **1.0 Aerial Photography Review**

A summary of historical activities at the site, based on a review of aerial photography, is presented below. Copies of aerial photography are included in Attachment A.

1935 – The site appears to be used for agricultural purposes.

1948 – The site appears flooded. Non-inundated areas appear to be used for agricultural purposes.

1956 – The site appears to be used for agricultural purposes.

1964 – No significant changes are visible.

1970 – No significant changes are visible.

1980 – No significant changes are visible.

1990 – No significant changes are visible.

1998 – No significant changes are visible.

2005 – No significant changes are visible.

### **2.0 Review of DEQ Facility Profiler**

No regulatory listings for facilities that appear to pose a significant environmental risk were identified for properties at or adjacent to the site.

### **3.0 Site Reconnaissance**

The site was observed on December 7, 2011 from public rights of way. The site is currently in agricultural use. Crops appear to consist of vegetables (pumpkins and lettuce, during the site reconnaissance) and grasses. A drainage channel from Fairview Lake is located adjacent to the south side of the site. A shed, used for storing irrigation piping, and possibly other materials, is present at the northeast corner of the Site.



## ***Appendix D — Site 15/16: UPS and Cereghino Site Summary***

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A polyethylene storage tank is adjacent to the south side of the shed. The use of the tank is unclear, but may include fertilizer mixing. A photograph log is included in Attachment B.

### ***4.0 File Review***

A file review was not performed for the site because the site is not included in DEQ's listings of properties with documented or suspected hazardous substance impacts.

### ***5.0 Summary of Environmental Conditions***

Aerial photography indicates that the site has been in agricultural use since at least 1935. The exact types of crops grown at the site are unclear based on the review of aerial photography. Pesticides and herbicides (pesticides) that were commonly applied to crops in Oregon include inorganic, organochlorines, and organophosphate compounds. The pesticide residues most often detected in Oregon soil are lead, arsenic, cadmium, and mercury (inorganic compounds); and DDT, dieldrin, and toxaphene (organic compounds). Studies have shown that pesticides may accumulate on agricultural lands at concentrations that exceed acceptable risk levels. Analytical data are unavailable to confirm whether residual pesticides are present in soil at the site.

An assessment of residual pesticide concentrations in soil should be performed prior to site development. This assessment should be conducted site-wide, including at locations near the polyethylene tank. The information obtained during the assessment can be used to determine whether the site is impacted, and if so, to plan for proper soil management and for protection of worker health and the environment. The cost for an assessment<sup>1</sup> of residual pesticide concentrations in soil is in the range of \$15,000.

Assuming the site is developed for industrial purposes, the majority of the site is likely to be covered with asphalt-concrete or concrete surfaces, preventing human and ecological exposure to contaminants in soil via direct contact. Under this scenario, assuming moderate levels of pesticide impacts, remediation to address pesticides in soil is not likely to be necessary. If redevelopment plans include the construction or alteration of wetlands, ponds, or other significant natural habitat within areas formerly used for agriculture and impacted by pesticides, pesticide concentrations are high, or significant human/ecological exposure is expected, additional pesticide remediation may be necessary.

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<sup>1</sup> Assessment costs are estimated based on guidance provided in, *Guidance for Evaluating Residual Pesticides on Lands Formerly Used for Agricultural Production*, Oregon Department of Environmental Quality, 2006.



## ***Appendix D — Site 15/16: UPS and Cereghino Site Summary***

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### ***6.0 Conceptual Assessment and Remediation Cost Estimate***

Based on the assumptions listed above, the estimated cost for an assessment of residual pesticide concentrations in soil is approximately \$15,000. A remediation cost estimate was not prepared for pesticides in soil because asphalt-concrete, concrete pavement, and building foundations will presumably be installed during industrial development of the site, preventing human and ecological exposure to pesticides in soil and removing the need for other remediation efforts. If pesticide-impacted soil is removed from the site during earthwork activities, additional handling/disposal costs may be incurred.

No permitting is required to perform an assessment of pesticide conditions at the site. A pesticide assessment can be completed in less than three to six months. The pesticide assessment should be performed prior to initiating site preparation/development activities because the assessment data should be used to inform decisions regarding worker health and safety and soil management.





## ***Attachment A***

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### **Aerial Photographs**









1956

















## ***Attachment B***

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### **Photograph Log**



## ATTACHMENT B PHOTOGRAPH LOG

**Project Name:** Regional Industrial Inventory Project - Site 15/16  
**Project Number:** 1901-00

**Client:** Group MacKenzie  
**Location:** Gresham, Oregon

<b>Photo No:</b> 1	
<b>Photo Date:</b> Dec. 7, 2011	
<b>Orientation:</b> North	
<b>Description:</b>  Agricultural area viewed from NE Portal Way. A buried natural gas pipeline marker is visible in the foreground.	
<b>Photo No:</b> 2	
<b>Photo Date:</b> Dec. 7, 2011	
<b>Orientation:</b> East	
<b>Description:</b>  Agricultural area viewed from NE Portal Way.	



## ATTACHMENT B PHOTOGRAPH LOG

**Project Name:** Regional Industrial Inventory Project - Site 15/16  
**Project Number:** 1901-00



**Client:** Group MacKenzie  
**Location:** Gresham, Oregon

<b>Photo No:</b> 3	
<b>Photo Date:</b> Dec. 7, 2011	
<b>Orientation:</b> Southwest	
<b>Description:</b> Cabbage field viewed from NE Interlachen Lane.	
<b>Photo No:</b> 4	
<b>Photo Date:</b> Dec. 7, 2011	
<b>Orientation:</b> South	
<b>Description:</b> Cabbage field viewed from NE Interlachen Lane.	

## ATTACHMENT B PHOTOGRAPH LOG

**Project Name:** Regional Industrial Inventory Project - Site 15/16  
**Project Number:** 1901-00

**Client:** Group MacKenzie  
**Location:** Gresham, Oregon

<b>Photo No:</b> 5	
<b>Photo Date:</b> Dec. 7, 2011	
<b>Orientation:</b> East	
<b>Description:</b> Pumpkin field viewed from NE Riverside Parkway.	
<b>Photo No:</b> 6	
<b>Photo Date:</b> Dec. 7, 2011	
<b>Orientation:</b> Southwest	
<b>Description:</b> Irrigation shed and water tank near NE Interlachen Lane.	

## ***Appendix E***

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### **Site 19: Port of Portland TRIP Site Summary**



# **Appendix E —Site 19: Port of Portland TRIP Site Summary**

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## **Attachments**

- A      Aerial Photographs
- B      Photograph Log



## ***Appendix E —Site 19: Port of Portland TRIP Site Summary***

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This Appendix presents a summary of information about environmental conditions at site 19, which is a portion of the Port of Portland (Port) Troutdale Reynolds Industrial Property (TRIP). Site 19 consists of two parcels (Lots 7 and 8).

### ***1.0 Aerial Photography Review***

A summary of historical activities at the site, based on a review of aerial photography, is presented below. Copies of aerial photography are included in Attachment A.

1935 – The site is used for agricultural purposes. A stream channel crosses the central portion of the site. A few small buildings, possibly dwellings, are present at the west side of the site.

1948 – The central portion of the site, known as the South Wetland, appears flooded. The buildings at the west side of the site have been removed. Some ground disturbance has occurred at the central-east portion of the site in the vicinity of the area subsequently referred to as the South Landfill. The Reynolds/Alcoa facility (the facility) has been constructed north of the Site. The Troutdale Airport has been constructed south of the site.

1955 – No significant changes are visible.

1961 – The facility has expanded to include a small area at the northern portion of the site. No significant changes are visible.

1970 – Expansion of the facility is visible at the north side of the site. A roadway has been constructed in a west-east alignment across much of the site. A drainage channel has been constructed at the site, in a northwest-southeast alignment, near the facility.

1980 – A large building, part of the Reynolds/Alcoa facility has been constructed at the north portion of the site.

1990 – A cryolite pond, part of the Reynolds/Alcoa facility, is visible at the north portion of the site. Several large buildings have been constructed west and southwest of the site.

1998 – Additional commercial development is visible west, southwest, and southeast of the site.

2005 – The Reynolds/Alcoa facility has been removed and the site has been graded.



## **Appendix E —Site 19: Port of Portland TRIP Site Summary**

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### **2.0 Review of DEQ Facility Profiler**

The site is identified in the DEQ Facility Profiler database as a National Priority List (NPL, or Superfund) facility due to releases of hazardous substances that occurred as a result of historical aluminum processing activities. The Facility profiler indicates that the site has been the subject of remediation and assessment activities for many years; therefore the volume of files maintained for the site by DEQ is extensive. The historical use of the site, and investigation and remediation activities are summarized in Section 5.

### **3.0 Site Reconnaissance**

The site was observed on December 27, 2011 from public rights of way. The site is currently undeveloped and generally vacant. A natural gas pipeline valve structure is present at the south side of the site near NW Graham Road. It appears that the buried natural gas pipeline traverses a portion of the site. A drainage ditch, which generally runs in a west-east alignment, is present at the central portion of the site. The property north of the site (also part of the former Reynolds/Alcoa facility) is occupied by a Federal Express distribution center. The Troutdale airport is present south of the site. Vacant parcels are present west and east of the site. A photograph log is included in Attachment B.

### **4.0 File Review**

Ash Creek has performed extensive environmental services at the site on behalf of the current property owner, the Port. Ash Creek reviewed internal files and files maintained by the Port to prepare the following summary of environmental conditions (Section 5) and the conceptual cost estimate for assessment and remediation (Section 6).

### **5.0 Summary of Environmental Conditions**

The site is located in Troutdale and Fairview, Oregon, north of the Troutdale Airport and southwest of the confluence of the Columbia and Sandy Rivers. The former Reynolds/Alcoa facility consists of approximately 693 acres; however, the portion of the facility that is the subject of this report (Lots 7 and 8) is approximately 54 acres. Topography at the site is generally flat, with some minor relief toward the north and northeast. The majority of former Reynolds/Alcoa facilities were located north of the site.

The Facility was originally developed as an aluminum reduction plant for the U.S. government in 1941 to support wartime production of aluminum. The plant operated at varying production capacities through 1991, when operations were temporarily curtailed. Plant operations were restarted in 1998, but were curtailed again in 2000 after Alcoa acquired the Facility. The facility was closed permanently in July 2002.





## ***Appendix E —Site 19: Port of Portland TRIP Site Summary***

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Facility operations (including past waste disposal, spills, leaks, and other releases) caused soil and groundwater contamination at TRIP. The historical releases included process and non-process wastes and residues. Process wastes were primarily associated with the former aluminum reduction plant (located north of Parcels 7 and 8). Non-process wastes included demolition debris, scrap equipment, and construction materials. Contaminants that were associated with these wastes included fluoride, cyanide, antimony, arsenic, beryllium, chromium, lead, nickel, polynuclear aromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPH), volatile organic compounds (VOCs), and polychlorinated biphenyls (PCBs). The site was placed on the EPA National Priorities List (Superfund) in 1994 and investigation and sampling activities at the site began that same year. A significant number of removal and remedial actions independent of and prior to the plant demolition process were completed. These actions (resulting in the removal of more than 230,000 tons of material) were conducted prior to July 2002, when the closure of the facility was announced. The demolition of the facility occurred between 2003 and 2005, and resulted in the removal of 116,000 tons of additional material from the facility. The material removed was the major source of contamination to the underlying groundwater zones and its removal significantly reduced the potential for contaminant migration.

Groundwater remediation, consisting of a pump-and-treat system, was initiated in 2004 and is ongoing. The EPA issued a Record of Decision (ROD) in 2006, which sets forth the requirements for future groundwater remediation, soil and groundwater management, and groundwater use restrictions. A consent decree to implement the ROD was executed by the United States and Reynolds Metals Company in 2008. An Easement and Equitable Servitude (EES), which was applied to the property in 2007, also sets forth requirements for future activities at the site. The EES specifically includes a requirement to comply with a contaminated media management plan (CMMP) that was prepared for the site. The Port acquired TRIP in 2007.

In summary, as of approximately 2005, a number of removal actions had been completed at the Facility. Those actions removed the bulk of impacted soil; however, soil containing low to moderate concentrations of contaminants remains at the site and elevated concentrations of some contaminants (particularly fluoride) remain in groundwater at the facility. A groundwater pump-and-treat remediation system is operating at the facility; however, none of the extraction wells are included in the boundaries of the subject site. The pump-and-treat system is expected to operate for at least eight more years. Other remediation required at the site in the future includes capping of impacted soil in the South Wetlands. In addition to the remediation efforts listed above, long-term management of contaminated media is required at the site.



## ***Appendix E —Site 19: Port of Portland TRIP Site Summary***

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### **6.0 Conceptual Assessment and Remediation Cost Estimate and Schedule**

Extensive assessment and remediation efforts have been completed at the facility. Those efforts have included the removal of approximately 350,000 tons of impacted soil, treatment of groundwater, and removal of the former aluminum processing facilities. Most of these activities occurred outside of the boundaries of the subject site. The following estimate of assessment and remediation costs is limited to projected future costs. The historical costs incurred by the Port, Reynolds/Alcoa, and other parties are not included in the cost estimate.

Future environmental assessment/remediation tasks for the site include: (1) removal of contaminated organic soil from the South Wetlands, (2) removal or modification of several groundwater monitoring wells; and (3) possibly, treatment of water extracted during dewatering efforts. Each of these tasks and estimated costs are described below.

**Removal of Contaminated Organic Soil.** Several types of hazardous constituents have been detected in surface soil at the South Wetlands. These constituents include fluoride, polychlorinated biphenyls, polycyclic aromatic hydrocarbons, and some metals. These constituents pose some risk to human health; therefore, prior to development and occupational use of the South Wetlands, the wetlands must be covered with at least one foot of clean fill. The costs for placement of a one-foot-thick layer of clean fill are not included in this estimate of environmental assessment/remediation costs because placement of structural fill will be required to raise the site grade above the flood level, regardless of the presence of contamination in soil.

Shallow soil in the South Wetlands is highly organic; therefore, it is likely that the shallow soil material will not provide suitable load-bearing properties for future development. To prepare that area for placement of structural fill, we assume that it will be necessary to remove the upper one foot of impacted organic-rich soil. Assuming that the soil is classified as non-hazardous special waste, it can be disposed of at a RCRA Subtitle D facility, such as the Waste Management Hillsboro Landfill. The Port has estimated that approximately 40,000 cubic yards of impacted soil will need to be removed from the South Wetland. Assuming the material weighs approximately 1.5 tons per cubic yard, and loading, transport, and disposal cost \$50/ton, the total costs for removing the impacted soil from the South Wetlands will be approximately \$3 million.

Alternatively, excavated impacted soil from the South Wetlands can be reused at the site; however, the re-use of that material is subject to significant restrictions such as the finished elevations (may not exceed 18 feet NGVD) and the requirement for at least one foot of clean cover. Therefore, it may not be feasible to re-use that material on-site under many development scenarios and we assume it will be removed from the site.



## **Appendix E —Site 19: Port of Portland TRIP Site Summary**

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**Decommissioning/Modification of Monitoring Wells.** Several groundwater monitoring well are located at the site. It is likely possible to decommission some of the wells to accommodate development plans, however, it may be necessary to maintain a portion of the well network. It may also be necessary to move some wells to accommodate construction activities.

**Dewatering.** If dewatering is necessary during development, it may be necessary to treat the water prior to discharge. Costs for future treatment and discharge of water are not included in this remediation cost estimate because the magnitude of required dewatering, if any, is unclear.

**Groundwater Remediation.** Groundwater remediation is ongoing at the facility; however, none of the groundwater remediation infrastructure is present at the subject site and there is no requirement to remediate groundwater at the site. Therefore, future costs for groundwater remediation at the greater TRIP property are not allocated to the subject site.

The following table summarizes the range of historical and projected assessment and remediation costs for Site 19.

**Table I – Assessment and Remediation Costs for Site 19**

<b>Estimated Cost</b>	<b>Activity</b>
\$3,000,000	Projected costs for removal and off-site disposal of impacted surface sediment from the South Wetlands.
\$25,000	Decommission/modify groundwater monitoring wells at site.
<b>\$3,025,000</b>	<b>Total</b>

### **6.1 Schedule and Permitting**

The most significant remediation effort that will be required for development of the site will be the removal of impacted organic-rich soil from the South Wetlands and placement of at least one-foot of clean fill over the excavated area. The removal of impacted soil and placement of clean fill must be conducted prior to or upon initiation of the development activities. We anticipate that the impacted soil can be removed and fill emplaced in approximately three to six months.

Because a Consent Order and contaminated media management plan have been established for the site, remediation-specific permitting, with the exception of a landfill disposal permit, is not required to remove impacted media from the South Wetlands and to place clean fill in that area. However, it will be necessary to coordinate with DEQ prior to and during that work. Other non-remediation permits will be required, such as wetland mitigation and grading permits.





## ***Attachment A***

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### **Aerial Photographs**

























## ***Attachment B***

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### **Photograph Log**



## ATTACHMENT B PHOTOGRAPH LOG

**Project Name:** Regional Industrial Inventory Project - Site 19  
**Project Number:** 1901-00

**Client:** Group MacKenzie  
**Location:** Troutdale, Oregon



<b>Photo No:</b> 1	
<b>Photo Date:</b> Dec. 27, 2011	
<b>Orientation:</b> Northwest	
<b>Description:</b>  Field viewed from NW Graham Road.	
<b>Photo No:</b> 2	
<b>Photo Date:</b> Dec. 27, 2011	
<b>Orientation:</b> East	
<b>Description:</b>  Field and drainage channels viewed from NW Sundial Road.	



## ATTACHMENT B PHOTOGRAPH LOG

**Project Name:** Regional Industrial Inventory Project - Site 19  
**Project Number:** 1901-00



**Client:** Group MacKenzie  
**Location:** Troutdale, Oregon

<b>Photo No:</b> 3	
<b>Photo Date:</b> Dec. 27, 2011	
<b>Orientation:</b> Southeast	
<b>Description:</b> Field viewed from NW Swigert Way.	
<b>Photo No:</b> 4	
<b>Photo Date:</b> Dec. 27, 2011	
<b>Orientation:</b> Southwest	
<b>Description:</b> Job trailer, viewed from NW Swigert Way.	

## ATTACHMENT B PHOTOGRAPH LOG

**Project Name:** Regional Industrial Inventory Project - Site 19  
**Project Number:** 1901-00

**Client:** Group MacKenzie  
**Location:** Troutdale, Oregon

<b>Photo No:</b> 5	
<b>Photo Date:</b> Dec. 27, 2011	
<b>Orientation:</b> North	
<b>Description:</b>  Field viewed from NW Graham Road. A natural gas pipeline valve is located in the fenced area.	
<b>Photo No:</b> 6	
<b>Photo Date:</b> Dec. 27, 2011	
<b>Orientation:</b> Northeast	
<b>Description:</b>  Field viewed from NW Graham Road.	

## ***Appendix F***

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### **Site 24: Jean Johnson Site Summary**



## ***Appendix F — Site 24: Jean Johnson Site Summary***

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### **Attachments**

- A      Aerial Photographs
- B      Photograph Log



## **Appendix F — Site 24: Jean Johnson Site Summary**

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This Appendix presents a summary of information about environmental conditions at site 24.

### **1.0 Aerial Photography Review**

A summary of historical activities at the site, based on a review of aerial photography, is presented below. Copies of aerial photography are included in Attachment A.

1936 – The northern and western portions of the site are in agricultural use. The land appears to be used for cover crops. It appears that forest has been recently cleared from the southern portion of the site. The eastern portion of the site remains forested. An off-site dwelling and at least one small accessory structure are visible near the northwest corner of the site, adjacent to SE 267<sup>th</sup> Ave. A number of other residential structures are visible in the vicinity of the site. A railroad track appears to occupy the current Orient Road alignment.

1948 – The site appears generally unchanged, with the exception that the southern portion of the site has been converted to agricultural uses. Significant changes are not visible at surrounding properties. Orient Road has been constructed.

1956 – No significant changes are visible at the site. Some forest has been cleared from areas east and south of the site.

1964 – No significant changes are visible. Additional residential structures have been constructed near the site.

1970 – Forested areas have been removed from the east side of the site and that area has been converted to agricultural use. No other significant changes are visible.

1980 – No significant changes are visible at the site. Dense residential development is visible north of the site.

1990 – Agricultural uses at the site appear to consist of nursery stock, rather than cover crops. Increasing residential development is visible north of the site.

1998 – No significant changes are visible at the site. Increasing residential development is visible north of the site.

2005 – No significant changes are visible at the site.



## **Appendix F — Site 24: Jean Johnson Site Summary**

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### **2.0 Review of DEQ Facility Profiler**

No regulatory listings for facilities that appear to pose a significant environmental risk were identified for properties at or adjacent to the site.

### **3.0 Site Reconnaissance**

The site was observed on December 7, 2011 from nearby public rights of way. The site is currently in agricultural use, specifically for raising nursery stock. No buildings are present at the site. Irrigation systems were not in place during the site reconnaissance; therefore, it is unclear if water is supplied to the site by an on- or off-site well or other source(s). A photograph log is included in Attachment B.

### **4.0 File Review**

A file review was not performed for the site because the site is not included in DEQ's listings of properties with documented or suspected hazardous substance impacts.

### **5.0 Summary of Environmental Conditions**

Aerial photography indicates that the site has been in agricultural use since at least 1936. Crops apparently consisted of grasses and cover crops until sometime before 1990. Subsequently, the site was used for growing nursery stock. The exact types of crops grown at the site are unclear based on the review of aerial photography. Pesticides and herbicides (pesticides) that were commonly applied to crops in Oregon include inorganic, organochlorines, and organophosphate compounds. The pesticide residues most often detected in Oregon soil are lead, arsenic, cadmium, and mercury (inorganic compounds); and DDT, dieldrin, and toxaphene (organic compounds). Studies have shown that pesticides may accumulate on agricultural lands at concentrations that exceed acceptable risk levels. Analytical data are unavailable to confirm whether residual pesticides are present in soil at the site.

An assessment for residual pesticide concentrations in soil should be performed prior to site development. The information obtained during the assessment can be used to determine whether the site is impacted, and if so, to plan for soil management and for protection of worker health and the environment during future development activities.

Assuming the site is developed for industrial purposes, the majority of the site is likely to be covered with asphalt-concrete or concrete surfaces, preventing human and ecological exposure to pesticides in soil. Under this scenario, assuming moderate levels of pesticide impacts, remediation to address pesticides in soil is not likely to be necessary. If redevelopment plans include the construction or alteration of wetlands,





## **Appendix F — Site 24: Jean Johnson Site Summary**

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ponds, or other significant natural habitat within areas formerly used for agriculture and impacted by pesticides, pesticide concentrations are high, or significant human/ecological exposure is expected, additional pesticide remediation may be necessary.

### **6.0 Conceptual Remediation Cost Estimate**

Based on the assumptions listed above, the costs for an assessment of residual pesticide concentrations in soil is approximately \$15,000. A remediation cost estimate was not prepared for pesticides in soil because asphalt-concrete, concrete pavement, and building foundations will presumably be installed during industrial development of the site, preventing human and ecological exposure to pesticides in soil and removing the need for other remediation efforts. If pesticide-impacted soil is removed from the site during earthwork activities, additional handling/disposal costs may be incurred.

No permitting is required to perform an assessment of pesticide conditions at the site. A pesticide assessment can be completed in three to six months. The pesticide assessment should be performed prior to initiating site preparation/development activities because the assessment data should be used to inform decisions regarding worker health and safety and soil management.



## ***Attachment A***

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### **Aerial Photographs**





























## ***Attachment B***

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### **Photograph Log**



## ATTACHMENT B PHOTOGRAPH LOG

**Project Name:** Regional Industrial Inventory Project - Site 24  
**Project Number:** 1901-00



**Client:** Group MacKenzie  
**Location:** Gresham, Oregon

<b>Photo No:</b> 1	
<b>Photo Date:</b> Dec. 27, 2011	
<b>Orientation:</b> Northeast	
<b>Description:</b> Agricultural area viewed from SE 267 <sup>th</sup> Avenue.	
<b>Photo No:</b> 2	
<b>Photo Date:</b> Dec. 27, 2011	
<b>Orientation:</b> East	
<b>Description:</b> Agricultural area viewed from SE 267 <sup>th</sup> Avenue.	

## ATTACHMENT B PHOTOGRAPH LOG

**Project Name:** Regional Industrial Inventory Project - Site 24  
**Project Number:** 1901-00



**Client:** Group MacKenzie  
**Location:** Gresham, Oregon

<b>Photo No:</b> 3	
<b>Photo Date:</b> Dec. 27, 2011	
<b>Orientation:</b> Southeast	
<b>Description:</b> Agricultural area viewed from SE 267 <sup>th</sup> Avenue.	
<b>Photo No:</b> 4	
<b>Photo Date:</b> Dec. 27, 2011	
<b>Orientation:</b> East	
<b>Description:</b> Agricultural area viewed from SE 267 <sup>th</sup> Avenue.	

## ATTACHMENT B PHOTOGRAPH LOG

**Project Name:** Regional Industrial Inventory Project - Site 24  
**Project Number:** 1901-00

**Client:** Group MacKenzie  
**Location:** Gresham, Oregon

<b>Photo No:</b> 5	
<b>Photo Date:</b> Dec. 27, 2011	
<b>Orientation:</b> Southeast	
<b>Description:</b> Agricultural area viewed from SE 267 <sup>th</sup> Avenue.	
<b>Photo No:</b> 6	
<b>Photo Date:</b> Dec. 27, 2011	
<b>Orientation:</b> Northeast	
<b>Description:</b> Agricultural area viewed from SE 267 <sup>th</sup> Avenue.	



## ***Appendix G***

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### **Site 29: Clackamas County Development Site Summary**

# **Appendix G —Site 29: Clackamas County Development Site Summary**

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## **Attachments**

- A      Aerial Photographs
- B      Photograph Log



## ***Appendix G —Site 29: Clackamas County Development Site Summary***

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This Appendix presents a summary of information about environmental conditions at site 29. The site is irregular in shape and consists of 12 tax lots. When necessary, the following discussion of environmental conditions at the site refers to tax lots based on the last four digits of their Clackamas County identification (e.g., tax lot 1200).

### ***1.0 Aerial Photography Review***

A summary of historical activities at the site, based on a review of aerial photography, is presented below. This review is based on aerial photography included in *Phase I Environmental Site Assessment (ESA), Emmert Site, 12000 SE Capps Road, 11436 SE Capps Road, 16590 SE 114<sup>th</sup> Avenue, Clackamas, Oregon* (Kleinfelder, 2009). The photography was used with the permission of Clackamas Business and Economic Development Services, the user of the Phase I ESA. Copies of aerial photography are included in Attachment A.

1938 – The majority of the site is in agricultural use; however, a small area at the northwestern portion of the site is forested. Crops appear to consist of cover crops. A few small structures are visible at the central portion of the site. Surrounding land is generally in agricultural use or forested.

1948 – The site appears generally unchanged.

1956 – No significant changes are visible at the site, with the exception that a small structure has been constructed near the northern and northwest boundaries of the site.

1964 – It appears that a small structure was demolished and a medium-size building was constructed at the central portion of the site

1974 – No significant changes are visible at the site, with the exception that a small structure has been constructed near the northeast boundary of the site, a medium-size building was constructed at the north portion of the site, and two medium-size structures were constructed near the north boundary of the site.

1979 – Several ponds and a commercial/industrial facility have been constructed off-site, near the northwest boundary of the site. A couple of small structures are visible at the southwest portion of the site.

1983 – An aggregate mining and processing business is operating adjacent to the southeast portion of the site. Stockpiled gravel is present at the easternmost site parcels.

1989 – The aggregate mining operations have expanded to include additional portions of the site. Some of the on-site borrow pits are flooded.





## ***Appendix G —Site 29: Clackamas County Development Site Summary***

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1996 – Agricultural land at the southwest portion of the site has been converted to industrial uses. A number of stockpiles of material are visible. Much of the aggregate-mining area has been graded and appears unused. Several off-site commercial/industrial buildings have been constructed near the north and east sides of the site.

2004 – Gravel mining and processing is no longer occurring at the site. Much of the former aggregate mining/processing area is covered with immature vegetation. Additional commercial/industrial development has occurred off-site, near the north and east boundaries of the site.

### ***2.0 Review of DEQ Facility Profiler***

The Site is included in several Facility Profiler listings, including:

- Emmert Industrial Corporation - 11811 SE Hwy 212;
- Clackamas Compost Products – 11620 SE Capps Road;
- Capps Road Business Park – 12000 SE Capps Road; and
- Coles, John – 12075 SE Vernon Street.

Nearby facilities included in the Facility Profiler database for releases of hazardous substances include:

- Surgichrome, Inc. - 16569 SE 115th Ave; and
- Precision Roof Trusses - 11550 SE Jennifer Street.

The risks and impacts that these listed facilities pose to the subject site were evaluated during Phase I and II ESAs that were conducted at the site in 2009 and 2010, respectively. These documents are discussed in Section 4.

### ***3.0 Site Reconnaissance***

The site was observed on March 5, 2012 from nearby public rights of way. Due to the large size of the site and the limited access at the perimeter of the site, it was difficult or impossible to view some portions of the property. The site is currently vacant, with the exception of: (1) the Clackamas Compost Products facility, which uses the southwest portion of the site for storing, processing, and blending of compost products; and (2) a vacant single-family dwelling, which was most recently used as an office building. The southeastern portion of the site, which was historically used for aggregate mining and processing, is flat and covered in many areas by immature vegetation. Some unused heavy equipment is present at the north-central portion of the site, adjacent to SE Capps Road. A photograph log is included in Attachment B.



# ***Appendix G —Site 29: Clackamas County Development Site Summary***

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## **4.0 File Review**

Phase I and II ESAs, prepared in 2009 and 2010, respectively, were reviewed to evaluate environmental conditions at the site.

### **4.1 Phase I ESA**

Kleinfelder, Inc. performed a phase I ESA at the site in 2009. Kleinfelder identified the following recognized environmental conditions (RECs) or potential RECs:

- A 275-gallon oil UST was reportedly decommissioned at the site (Clackamas Sand and Gravel parcel 2202) in 1986. The method of decommissioning (i.e. removal or in-place) was not reported and confirmation analytical data were unavailable to Kleinfelder.
- An open, uncovered truck maintenance facility, operated by DB Trucking, was observed at the site (tax lot 1200) in 2009. Oil staining was visible on a concrete slab in the maintenance area. The truck maintenance area was identified as a potential REC due to the potential for spills and leakage of hazardous substances to impact soil at the margins of the slab.
- A “hobby type maintenance shop” was also identified at tax lot 1200. This facility was identified as a potential REC due to the observed use of hazardous substances, and staining observed on the floor.
- An exterior maintenance area, operated by Clackamas Compost Products (tax lot 1800), was identified as a potential REC due to the use and possible spillage of hazardous substances.
- Reportedly, 10 to 15 feet of fill was placed at the site to reclaim former aggregate mining areas. Information about the source and quality of the fill was reportedly unavailable. Kleinfelder did not identify the fill as an REC; however, they did report that it was considered a possible “environmental concern”.
- A metal plating facility, Surgichrome, Inc., historically operated adjacent to the north boundary of the site tax lot 1500. Hazardous substances have been released at the Surgichrome property, and impacted groundwater has been detected (primarily chromium). The Oregon Department of Environmental Quality (DEQ) is currently implementing remediation and monitoring at the facility.

### **4.2 Phase II ESA**

Kleinfelder performed a Phase II ESA in 2010 to further evaluate the conditions identified during the Phase I ESA. Assessment activities completed by Kleinfelder included collection of 20 soil samples from surface soil and test pits for laboratory analyses. Lab data were compared to DEQ Risk-Based Concentrations (RBCs) for selected exposure scenarios. Kleinfelder’s findings, are summarized below:



## ***Appendix G —Site 29: Clackamas County Development Site Summary***

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- Oil, polycyclic aromatic hydrocarbons (PAHs), and metals were detected in soil near the DB Trucking maintenance area (tax lot 1200). PAH concentrations exceeded RBCs for commercial/industrial exposure to soil.
- Soil samples collected from the septic drain field and the “hobby type maintenance shop” area, at tax lot 1200 contained several hazardous substances, but the concentrations did not exceed commercial/industrial RBCs.
- Lube oil, PAHs, VOCs, and metals were detected in soil collected at the Clackamas Compost Products maintenance area (tax lot 1800). The concentration of oil exceeded the RBC for commercial exposure.
- Samples of fill from the former Clackamas Sand and Gravel properties (tax lots 1900, 2100, 2101, 2200, 2301, and 2500) did not contain hazardous substances at concentrations that exceed commercial/industrial RBCs.
- Soil samples collected near abandoned heavy equipment at tax lot 2200 contained lube oil, PAHs, and metals at concentrations that exceed commercial/industrial RBCs.

Kleinfelder recommended excavation and disposal of a limited quantity of impacted soils (estimated at 81 cubic yards) before or during redevelopment. Alternative soil management options for these soils include: 1) capping with minimum of 3 feet of clean soil hardscape, or buildings; 2) disposal at a regulated landfill; or 3) treating onsite. Kleinfelder concluded that if the impacted soil is not removed prior to site development, the construction contractor and subcontractors that come in contact with or disturb the soil will need hazardous material awareness training.

### ***5.0 Summary of Environmental Conditions***

Information obtained during Phase I and II ESAs indicate that the site is impacted by hazardous substances (primarily oil and related compounds) at several distinct areas of the site. Groundwater impacts have not been identified, with the exception of impacts related to the off-site Surgichrome facility. Surgichrome impacts are being addressed by DEQ.

Assuming the site is developed for industrial purposes, the majority of the site is likely to be covered with asphalt-concrete or concrete surfaces, preventing human and ecological exposure to hazardous substances in soil. Under this scenario, the impacted soil could likely be left in-place and covered with an appropriate cap (i.e., asphalt or cement concrete). If redevelopment plans include the construction or alteration of wetlands, ponds, or other significant natural habitat within impacted areas, remediation may be required.

Despite the option to leave contaminated media on-site, development may be simplified and overall costs reduced, if the contaminated soil is removed from the site prior to development. Under this preferred





## ***Appendix G —Site 29: Clackamas County Development Site Summary***

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alternative, contaminant-specific development plans and specially trained development personnel would not be required. Furthermore, the need for future management of impacted soil would be removed.

### ***6.0 Conceptual Remediation Cost Estimate***

Based on the assumptions listed above, additional assessment is not required. The costs for removal and off-site disposal of impacted soil (assume 120 tons) would likely be in the range of \$25,000, including a small amount of post-removal soil sampling and analysis. Remediation, including sampling and analysis can be completed in less than three months. The remediation can be performed prior to or during redevelopment activities. Regardless of the timing of that work, properly trained personnel should be used to implement the work. No permitting is required to perform the listed remediation activities at the site.



## ***Attachment A***

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### **Aerial Photographs**



1938





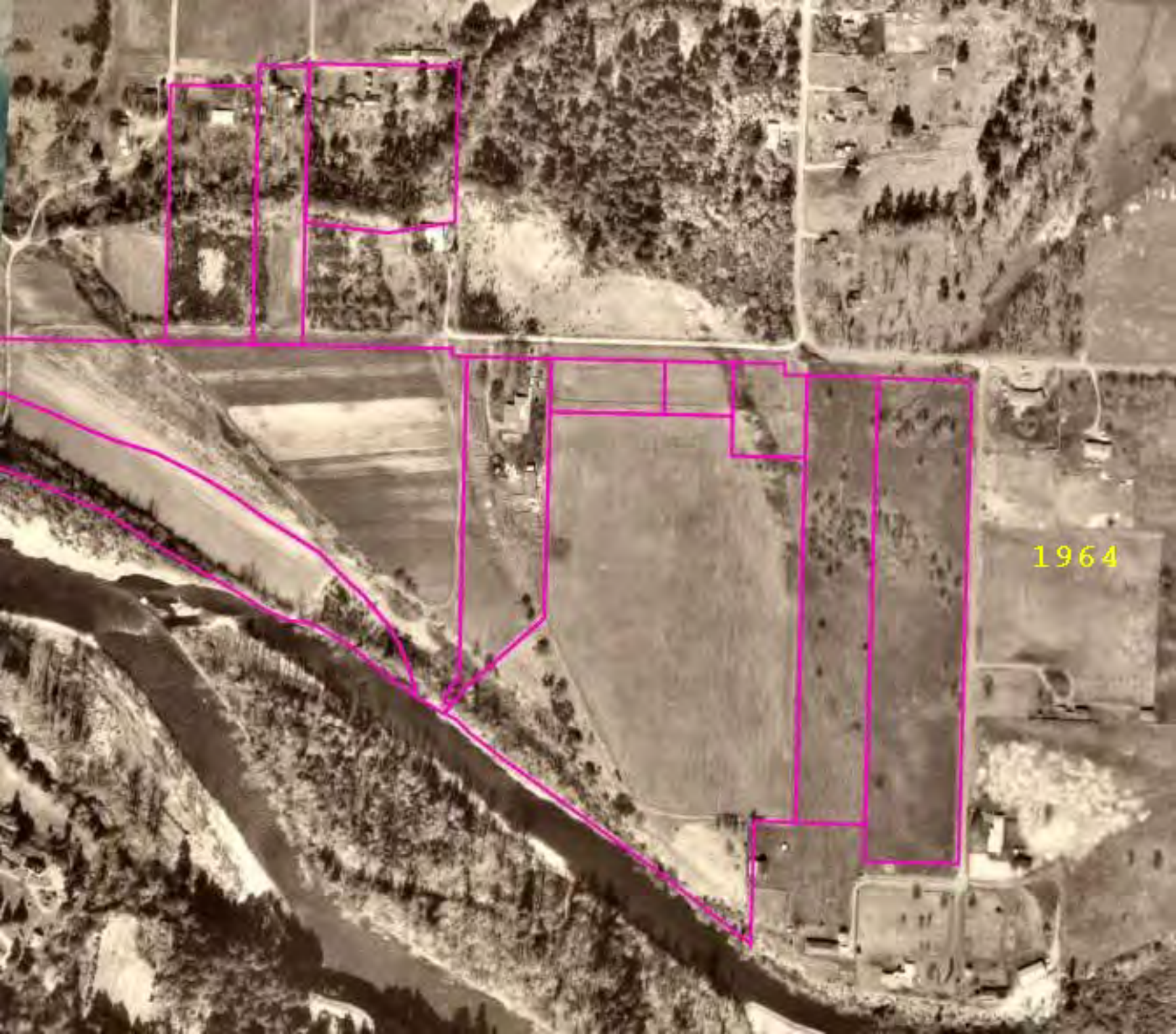
1948





1956





1964





1974

1974



1979







1983





1989  
Photo





1996





2004



## ***Attachment B***

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### **Photograph Log**

## ATTACHMENT B PHOTOGRAPH LOG

**Project Name:** Regional Industrial Inventory Project - Site 29  
**Project Number:** 1901-00



**Client:** Group MacKenzie  
**Location:** Clackamas, Oregon

<b>Photo No:</b> 1	
<b>Photo Date:</b> March. 6, 2012	
<b>Orientation:</b> South	
<b>Description:</b>  Unused dwelling/office adjacent to SE Capps Road.	
<b>Photo No:</b> 2	
<b>Photo Date:</b> March. 6, 2012	
<b>Orientation:</b> South	
<b>Description:</b>  Heavy equipment storage area adjacent to SE Capps Road.	

## ATTACHMENT B PHOTOGRAPH LOG

**Project Name:** Regional Industrial Inventory Project - Site 29  
**Project Number:** 1901-00

**Client:** Group MacKenzie  
**Location:** Clackamas, Oregon


<b>Photo No:</b> 3	
<b>Photo Date:</b> March. 6, 2012	
<b>Orientation:</b> Southwest	
<b>Description:</b>  Clackamas Compost Products facility, at southwest portion of the site.	
<b>Photo No:</b> 4	
<b>Photo Date:</b> March. 6, 2012	
<b>Orientation:</b> West-southwest	
<b>Description:</b>  Former Clackamas Sand and Gravel pit, viewed from SE Wilde Road.	



## ATTACHMENT B PHOTOGRAPH LOG

**Project Name:** Regional Industrial Inventory Project - Site 29  
**Project Number:** 1901-00

**Client:** Group MacKenzie  
**Location:** Clackamas, Oregon

<b>Photo No:</b> 5	
<b>Photo Date:</b> March. 6, 2012	
<b>Orientation:</b> Southwest	
<b>Description:</b>  Former Clackamas Sand and Gravel pit, viewed from SE Wilde Road.	
<b>Photo No:</b> 6	
<b>Photo Date:</b> March. 6, 2012	
<b>Orientation:</b> West	
<b>Description:</b>  Former Clackamas Sand and Gravel pit, viewed from SE Wilde Road.	

## ***Appendix H***

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### **Site 33: Coffee Creek Site Summary**

## ***Appendix H —Site 33: Coffee Creek Site Summary***

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### ***Attachments***

- A      Aerial Photographs
- B      Photograph Log





## **Appendix H —Site 33: Coffee Creek Site Summary**

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This Appendix presents a summary of information about environmental conditions at site 33.

### **1.0 Aerial Photography Review**

A summary of historical activities at the site, based on a review of aerial photography, is presented below. Copies of aerial photography are included in Attachment A.

1936 – Approximately the west half the site is used for agricultural purposes. Crops mostly appear to consist of grasses or other cover crops. The eastern half of the site consists of undeveloped forest land. Approximately four buildings, which appear to be dwellings, are visible at the west side of the site, near SW Garden Acres Road. A number of smaller structures, possibly consisting of barns or other agriculture support buildings, are present in the vicinity of the buildings. Several small orchards are visible in the vicinity of the buildings.

1948 – Approximately half of the forested area that was visible on the 1936 aerial photograph has been removed and converted to agricultural use. An electrical transmission corridor is visible adjacent to the east side of the site. A number of structures, which appear to support the electrical transmission lines, are present southeast of the site.

1956 – No significant changes are visible at the site. A small amount of additional development is visible in the electrical transmission corridor.

1964 – No significant changes are visible, with the exception that several small structures have been added near the northeast corner of the site.

1970 – No significant changes are visible at the site. Property east of the site has been graded to prepare for industrial development.

1980 – No significant changes are visible at the site. Several large structures have been constructed east of the site.

1990 – A small area adjacent to and south of the site has been converted from farmland to a parking/equipment storage area. Several new structures have been added at the western portion of the site. Commercial development areas have expanded east of the site, with approximately ten new structures visible.

1998 – A portion of the Peters Road alignment, south of the site, has moved to the north.



## **Appendix H —Site 33: Coffee Creek Site Summary**

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2005 – No significant changes are visible at the site. The Coffee Creek Correctional Facility has been constructed northwest of the site.

### **2.0 Review of DEQ Facility Profiler**

No regulatory listings for facilities that appear to pose a significant environmental risk were identified for properties at or adjacent to the site.

### **3.0 Site Reconnaissance**

The site was observed on December 7, 2011 from public rights of way adjacent to the site. The site is currently in residential use. Several dwellings, a horse boarding/training facility, and several greenhouses are present at the west side of the site, near SW Garden Acres Road. Dwellings are surrounded by open areas, some of which are used for pasture. Outbuildings and detached garages are present at most of the properties, near the dwellings. Obvious potential sources of contamination, such as ASTs and USTs, were not visible during the site reconnaissance; however, views of the site were obscured in a number of locations by dense vegetation and structures. The dwellings are in a rural area without obvious signs of a municipal sanitary sewer system, suggesting that septic systems are in use at the site. A photograph log is included in Attachment B.

### **4.0 File Review**

A file review was not performed because the site is not included in DEQ's listings of properties with documented or suspected hazardous substance impacts.

### **5.0 Summary of Environmental Conditions**

Aerial photography indicates that the site has been in agricultural use since at least 1936. Crops apparently consisted primarily of grasses and cover crops; however, some small orchards and several greenhouses are/were present at the west side of the site. The exact types of crops grown at the site are unclear based on the review of aerial photography. Pesticides and herbicides (pesticides) that were commonly applied to crops in Oregon include inorganic, organochlorines, and organophosphate compounds. The pesticide residues most often detected in Oregon soil are lead, arsenic, cadmium, and mercury (inorganic compounds); and DDT, dieldrin, and toxaphene (organic compounds). Studies have shown that pesticides may accumulate on agricultural lands at concentrations that exceed acceptable risk levels. Analytical data are unavailable to confirm whether residual pesticides are present in soil at the site.



## **Appendix H —Site 33: Coffee Creek Site Summary**

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Small (200- to 1,000-gallon) ASTs and USTs, used for storing petroleum hydrocarbon fuel (gasoline, diesel, and heating oil) are common at residential and farm properties. ASTs and USTs were not visible during the site reconnaissance; are not visible on the aerial photographs; and the DEQ Facility Profiler database does not indicate that ASTs and/or USTs are present at the site. Despite the absence of tank records or other indications, ASTs and USTs may be present at the site (in use or decommissioned). Because ASTs/USTs are common sources of environmental contamination, the potential for leaking ASTs/USTs is considered an environmental concern.

An assessment for residual pesticide concentrations in soil, particularly in the vicinity of the greenhouses, and for petroleum ASTs/USTs (and possible releases) should be performed prior to site development. The information obtained during the assessment can be used to determine whether the site is impacted, and if so, to plan for proper tank decommissioning, soil management and for protection of worker health and the environment during future development activities.

Assuming the site is developed for industrial purposes, the majority of the site is likely to be covered with asphalt-concrete or concrete surfaces, preventing human and ecological exposure to pesticides in soil. Under this scenario, assuming moderate levels of pesticide impacts, remediation to address pesticides in soil is not likely to be necessary. If redevelopment plans include the construction or alteration of wetlands, ponds, or other significant natural habitat within areas formerly used for agriculture and impacted by pesticides, pesticide concentrations are high, or significant human/ecological exposure is expected, additional pesticide remediation may be necessary.

If ASTs and/or USTs are present at the site, it will be necessary to decommission the tanks and possibly remediate associated contamination, if any. Assessment and remediation for small residential/farm petroleum tanks is commonly simple and limited to shallow soil. In some cases, however, residential/farm tank releases affect groundwater or other sensitive environments, increasing the complexity and costs of assessment and remediation.

### **6.0 Conceptual Remediation Cost Estimate**

Based on the assumptions listed above, the costs for an assessment of residual pesticide concentrations in soil is approximately \$15,000, and the costs for an AST/UST assessment, including subsurface sampling, is in the range of \$20,000.

The cost for remediation of petroleum impacts, if any, from residential/farm ASTs/USTs is difficult to constrain without site-specific information. For planning purposes, however, it is reasonable to assume that small residential/farm heating oil/diesel USTs/ASTs can be decommissioned for approximately \$5,000 to \$10,000 each and remediation of petroleum impacted soil can be performed for approximately \$10,000 to





## ***Appendix H —Site 33: Coffee Creek Site Summary***

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\$20,000 for each release area. Therefore, assuming that four ASTs/USTs are present at the site, combined decommissioning and remediation costs may range between \$20,000 and \$120,000.

A remediation cost estimate was not prepared for pesticides in soil because asphalt-concrete, concrete pavement, and building foundations will presumably be installed during industrial development of the site, preventing human and ecological exposure to pesticides in soil and removing the need for other remediation efforts. If pesticide-impacted soil is removed from the site during earthwork activities, additional handling/disposal costs may be incurred.

In summary, the cost for an assessment of pesticides in soil is likely to be in the range of \$15,000. An assessment for AST/UST impacts will likely cost approximately \$20,000. The cost for decommissioning and remediation of petroleum ASTs/USTs (assuming four small residential/farm tanks are present) may range between \$20,000 and \$120,000. Assuming that pesticide and AST/UST assessments are completed for \$35,000 and AST/UST decommissioning and remediation costs fall between the low and high estimates (i.e., the average, or \$70,000), total costs will be in the range of \$100,000. If the magnitude and extent of contaminant impacts at the site, if any, are large or sensitive environments or groundwater are impacted, assessment and remediation costs may increase.

A pesticide assessment can be completed in less than three months. The pesticide assessment should be performed prior to initiating site preparation/development activities because the assessment data should be used to inform decisions regarding worker health and safety and soil management. Small residential/farm ASTs and USTs, used for storing petroleum hydrocarbon fuels, can commonly be assessed and remediated in less than six months. Assuming AST/UST impacts are limited to soil, and not groundwater, remediation normally can be completed concurrent with site development activities. In some cases, overall UST/AST decommissioning and remediation costs can be reduced by using equipment and personnel that have been mobilized for other general site preparation and development tasks.

No permitting is required for assessment activities or for decommissioning of small unregulated residential/farm ASTs, although DEQ reporting is required for most UST work. If larger, regulated USTs are decommissioned, it will be necessary to notify DEQ prior to the decommissioning activities. In summary, based on the assumptions described above, the timeframe for assessment and remediation should be less than six months.



## ***Attachment A***

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### **Aerial Photographs**

























## ***Attachment B***

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### **Photograph Log**



## ATTACHMENT B PHOTOGRAPH LOG

**Project Name:** Regional Industrial Inventory Project - Site 33  
**Project Number:** 1901-00



**Client:** Group MacKenzie  
**Location:** Wilsonville, Oregon

<b>Photo No:</b> 1	
<b>Photo Date:</b> Dec. 7, 2011	
<b>Orientation:</b> East	
<b>Description:</b>  Dwelling at the east side of Garden Acres Road.	
<b>Photo No:</b> 2	
<b>Photo Date:</b> Dec. 7, 2011	
<b>Orientation:</b> Southeast	
<b>Description:</b>  Barn at the east side of Garden Acres Road.	

## ATTACHMENT B PHOTOGRAPH LOG

**Project Name:** Regional Industrial Inventory Project - Site 33  
**Project Number:** 1901-00

**Client:** Group MacKenzie  
**Location:** Wilsonville, Oregon



<b>Photo No:</b> 3	
<b>Photo Date:</b> Dec. 7, 2011	
<b>Orientation:</b> East	
<b>Description:</b>  Barn at the east side of Garden Acres Road.	
<b>Photo No:</b> 4	
<b>Photo Date:</b> Dec. 7, 2011	
<b>Orientation:</b> Southeast	
<b>Description:</b>  Horse pasture at the east side of Garden Acres Road.	



## ATTACHMENT B PHOTOGRAPH LOG

**Project Name:** Regional Industrial Inventory Project - Site 33  
**Project Number:** 1901-00

**Client:** Group MacKenzie  
**Location:** Wilsonville, Oregon



<b>Photo No:</b> 5	
<b>Photo Date:</b> Dec. 7, 2011	
<b>Orientation:</b> East	
<b>Description:</b>  Dwelling at the east side of Garden Acres Road.	
<b>Photo No:</b> 6	
<b>Photo Date:</b> Dec. 7, 2011	
<b>Orientation:</b> Southeast	
<b>Description:</b>  Dwelling at the southeast side of Garden Acres Road.	



## ATTACHMENT B PHOTOGRAPH LOG

**Project Name:** Regional Industrial Inventory Project - Site 33  
**Project Number:** 1901-00

**Client:** Group MacKenzie  
**Location:** Wilsonville, Oregon

<b>Photo No:</b> 7	
<b>Photo Date:</b> Dec. 7, 2011	
<b>Orientation:</b> Southeast	
<b>Description:</b>  Greenhouses at the east side of Garden Acres Road.	
<b>Photo No:</b> 8	
<b>Photo Date:</b> Dec. 7, 2011	
<b>Orientation:</b> East	
<b>Description:</b>  Barn and dwelling at the east side of Garden Acres Road.	

## ***Appendix I***

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### **Site 37: Orr Family Farm Site Summary**

# ***Appendix I —Site 37: Orr Family Farm Site Summary***

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## ***Attachments***

- A      Aerial Photographs
- B      Photograph Log





## **Appendix I —Site 37: Orr Family Farm Site Summary**

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This Appendix presents a summary of information about environmental conditions at site 37.

### **1.0 Aerial Photography Review**

A summary of historical activities at the site, based on a review of aerial photography, is presented below. Copies of aerial photography are included in Attachment A.

1936 – Approximately the northern half the site is used for agricultural purposes. Crops mostly appear to consist of grasses or other cover crops. The southern half of the site consists of forest land, which appears to be immature, possibly indicating recent forestry practices. One to two dwellings are present in a cluster at the northwest corner of the site. An unpaved roadway appears to be present between the forested southwest corner of the site and agricultural areas at the north portion of the site. Surrounding properties consist of forest land and agriculture land.

1947 – The site appears generally unchanged. A utility transmission corridor has been constructed south and west of the site. Land north of the site, across the Tualatin-Sherwood Highway, has been cleared for agricultural use.

1955 – Approximately two additional structures have been constructed in the cluster at the northwest corner of the site. Additional forest has been cleared, and a dwelling has been constructed north of the site.

1964 – A utility corridor, oriented in a northwest-southeast alignment, has been constructed across the southern portion of the site. Apparent dwellings and outbuildings have been constructed in two clusters to the west and south of the southwest corner of the site. An additional utility corridor (the third of three) has been constructed south of the site.

1970 – The site appears generally unchanged, with the exception that a small area of forest at the central portion of the site appears to have been removed.

1980 – The site appears generally unchanged. Forest has been removed from land south of the site. A small commercial building has been constructed north of the site, across the Tualatin-Sherwood Highway.

1990 – The site appears generally unchanged. Forest has been removed from land southeast of the site.

1998 – The site appears generally unchanged. Forest has been removed from land east of the site. Several large structures have been constructed north and west of the site. The Tualatin-Sherwood Highway alignment has been altered northwest of the site.



## **Appendix I —Site 37: Orr Family Farm Site Summary**

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2005 – A pond and drainage channel have been constructed at the northeast portion of the site. Additional commercial development has occurred north and west of the site.

### **2.0 Review of DEQ Facility Profiler**

No regulatory listings for facilities that appear to pose a significant environmental risk were identified at the site. The Facility Profiler lists a facility, located approximately 1,200 feet west of the site, as a contaminated property – Endicott Trucking Company, 21410 SW Dahlke Ln., Sherwood (DEQ Environmental Cleanup and Site Information [ECSI] number 1599). This listing is discussed in Section 4.7.4.

### **3.0 Site Reconnaissance**

The site was observed on December 27, 2011 from public rights of way. Most of the site consists of undeveloped forest land; however, the northeast portion of the site is in agricultural use (cover crops) and a dwelling and several outbuildings are present at the northwest portion of the site, near the Tualatin-Sherwood Highway. Obvious potential sources of contamination, such as ASTs and USTs, were not visible during the site reconnaissance; however, developed areas were distant from public rights of way and views of the site were obscured in a number of locations by vegetation and structures. The dwellings are in a rural area without obvious signs of a municipal sanitary sewer system, suggesting that septic systems are in use at the site. Land to the north, northeast, and northwest of the site is occupied by a number of commercial and light industrial facilities. A photograph log is included in Attachment B.

### **4.0 File Review**

DEQ's ECSI database was reviewed to obtain information about environmental conditions at the Endicott Trucking Co. property (21410 SW Dahlke Ln., Sherwood). The ECSI listing indicates that the Endicott Trucking Co. property is impacted by diesel, oil, and other substances, spilled as a result of poor housekeeping practices when the property was used as a truck repair facility. The ECSI report also indicates that petroleum-impacted soil, generated at an off-site property was stockpiled at the Endicott Trucking Co. property. DEQ files do not indicate that any investigation or cleanup has occurred at the property. Based on the information presented in the ECSI database and the distance between the subject site and the Endicott Trucking Co. property, it appears unlikely that the releases at the Endicott trucking Co. property will affect the subject site.



## **Appendix I —Site 37: Orr Family Farm Site Summary**

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### **5.0 Summary of Environmental Conditions**

Aerial photography indicates that the site has been in agricultural use since at least 1936. Crops apparently consisted primarily of grasses and cover crops. The exact types of crops grown at the site are unclear based on the review of aerial photography. Pesticides and herbicides (pesticides) that were commonly applied to crops in Oregon include inorganic, organochlorines, and organophosphate compounds. The pesticide residues most often detected in Oregon soil are lead, arsenic, cadmium, and mercury (inorganic compounds); and DDT, dieldrin, and toxaphene (organic compounds). Studies have shown that pesticides may accumulate on agricultural lands at concentrations that exceed acceptable risk levels. Analytical data are unavailable to confirm whether residual pesticides are present in soil at the site.

Small (200- to 1,000-gallon) ASTs and USTs, used for storing petroleum hydrocarbon fuel (gasoline, diesel, and heating oil) are common at residential and farm properties. ASTs and USTs were not visible during the site reconnaissance; are not visible on the aerial photographs; and the DEQ Facility Profiler database does not indicate that ASTs and/or USTs are present at the site. Despite the absence of tank records or other indications, ASTs and USTs may be present at the site (in use or decommissioned). Because ASTs/USTs are common sources of environmental contamination, the potential for leaking ASTs/USTs is considered an environmental concern.

An assessment for residual pesticide concentrations in soil and for petroleum ASTs/USTs (and possible releases) should be performed prior to site development. The information obtained during the assessment can be used to determine whether the site is impacted, and if so, to plan for proper tank decommissioning, soil management, and for protection of worker health and the environment during future development activities.

Assuming the site is developed for industrial purposes, the majority of the site is likely to be covered with asphalt-concrete or concrete surfaces, preventing human and ecological exposure to pesticides in soil. Under this scenario, assuming moderate levels of pesticide impacts, remediation to address pesticides in soil is not likely to be necessary. If redevelopment plans include the construction or alteration of wetlands, ponds, or other significant natural habitat within areas formerly used for agriculture and impacted by pesticides, pesticide concentrations are high, or significant human/ecological exposure is expected, additional pesticide remediation may be necessary.

If ASTs and/or USTs are present at the site, it will be necessary to decommission the tanks and possibly remediate associated contamination, if any. Assessment and remediation for small residential/farm petroleum tanks is commonly simple and limited to shallow soil. In some cases, however, residential/farm tank releases affect groundwater or other sensitive environments, increasing the complexity and costs of assessment and remediation.





## **Appendix I —Site 37: Orr Family Farm Site Summary**

### **6.0 Conceptual Remediation Cost Estimate**

Based on the assumptions listed above, the costs for an assessment of residual pesticide concentrations in soil is approximately \$15,000, and the costs for an AST/UST assessment, including subsurface sampling, is in the range of \$10,000.

The costs for remediation of petroleum impacts, if any, from residential/farm ASTs/USTs is difficult to constrain without site-specific information. For planning purposes, however, it is reasonable to assume that small residential/farm heating oil/diesel USTs/ASTs can be decommissioned for approximately \$5,000 to \$10,000 each and remediation of petroleum impacted soil can be performed for approximately \$10,000 to \$20,000 for each release area. Therefore, assuming that one AST or UST is present at the site, combined decommissioning and remediation costs may range between \$5,000 and \$20,000.

A remediation cost estimate was not prepared for pesticides in soil because asphalt-concrete, concrete pavement, and building foundations will presumably be installed during industrial development of the site, preventing human and ecological exposure to pesticides in soil and removing the need for other remediation efforts. If pesticide-impacted soil is removed from the site during earthwork activities, additional handling/disposal costs may be incurred.

In summary, the costs for an assessment of pesticides in soil are likely to be in the range of \$15,000. An assessment for AST/UST impacts will likely cost approximately \$10,000. The cost for decommissioning and remediation of petroleum ASTs/USTs (assuming one small residential/farm tanks are present) may range between \$5,000 and \$20,000. Assuming that pesticide and AST/UST assessments are completed for \$25,000 and AST/UST decommissioning and remediation costs fall between the low and high estimates (i.e., the average, or \$12,500), total costs will be in the range of \$37,500. If the magnitude and extent of contaminant impacts at the site, if any, are large or sensitive environments or groundwater are impacted, assessment and remediation costs may increase.

A pesticide assessment can be completed in less than three months. The pesticide assessment should be performed prior to initiating site preparation/development activities because the assessment data should be used to inform decisions regarding worker health and safety and soil management. Small residential/farm ASTs and USTs, used for storing petroleum hydrocarbon fuels, can commonly be assessed and remediated in less than six months. Assuming AST/UST impacts are limited to soil, and not groundwater, remediation normally can be completed concurrent with site development activities. In some cases, overall UST/AST decommissioning and remediation costs can be reduced by using equipment and personnel that have been mobilized for other general site preparation and development tasks. No permitting is required for assessment activities or for decommissioning of small unregulated residential/farm ASTs, although DEQ reporting is required for most UST work. If larger, regulated USTs are decommissioned, it will be necessary to notify DEQ prior to the decommissioning activities. In summary, based on the assumptions described above, the timeframe for assessment and remediation should be less than six months.



## ***Attachment A***

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### **Aerial Photographs**









9-12-64

















## ***Attachment B***

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### **Photograph Log**



## ATTACHMENT B PHOTOGRAPH LOG

**Project Name:** Regional Industrial Inventory Project - Site 37  
**Project Number:** 1901-00

**Client:** Group MacKenzie  
**Location:** Tualatin, Oregon

<b>Photo No:</b> 1	
<b>Photo Date:</b> Dec. 27, 2011	
<b>Orientation:</b> South	
<b>Description:</b>  Agricultural area, dwelling, and accessory structures viewed from SW Tualatin-Sherwood Road.	
<b>Photo No:</b> 2	
<b>Photo Date:</b> Dec. 27, 2011	
<b>Orientation:</b> Southeast	
<b>Description:</b>  Agricultural area and dwelling viewed from SW Tualatin-Sherwood Road.	

## ATTACHMENT B PHOTOGRAPH LOG

**Project Name:** Regional Industrial Inventory Project - Site 37  
**Project Number:** 1901-00



**Client:** Group MacKenzie  
**Location:** Tualatin, Oregon

<b>Photo No:</b> 3	
<b>Photo Date:</b> Dec. 27, 2011	
<b>Orientation:</b> South	
<b>Description:</b> Agricultural area viewed from SW Tualatin-Sherwood Road.	
<b>Photo No:</b> 4	
<b>Photo Date:</b> Dec. 27, 2011	
<b>Orientation:</b> Southeast	
<b>Description:</b> Agricultural area viewed from SW Tualatin-Sherwood Road.	

## ATTACHMENT B PHOTOGRAPH LOG

**Project Name:** Regional Industrial Inventory Project - Site 37  
**Project Number:** 1901-00

**Client:** Group MacKenzie  
**Location:** Tualatin, Oregon

<b>Photo No:</b> 5	
<b>Photo Date:</b> Dec. 27, 2011	
<b>Orientation:</b> South	
<b>Description:</b> Agricultural area viewed from SW Tualatin-Sherwood Road.	
<b>Photo No:</b> 6	
<b>Photo Date:</b> Dec. 27, 2011	
<b>Orientation:</b> Southwest	
<b>Description:</b> Agricultural area viewed from SW Tualatin-Sherwood Road.	



## ***Appendix J***

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### **Site 55/56: East Evergreen Site Summary**

## **Appendix J — Site 55/56: East Evergreen Site Summary**

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### **Attachments**

- A      Aerial Photographs
- B      Photograph Log



## **Appendix J — Site 55/56: East Evergreen Site Summary**

This Appendix presents a summary of information about environmental conditions at sites 55/56. Sites 55 and 56 are contiguous prospective development sites. For this evaluation, they were treated as a single site.

### **1.0 Aerial Photography Review**

A summary of historical activities at the site, based on a review of aerial photography, is presented below. Copies of aerial photography are included in Attachment A.

1936 – The majority of the site appears to be used for agricultural purposes. Crops appear to consist of grasses and cover crops. Forest land is present at the northwest corner of the site and along a drainage channel at the southwest corner of the site. Dwellings and ancillary structures (farm buildings) are present in three clusters at the site.

1947 – No significant changes are visible.

1955 – A small portion of forest land at the northwest corner of the site has been converted to agriculture use.

1963 – A field at the southwest portion of the site has apparently been converted to nursery or orchard use.

1970 – No significant changes are visible.

1980 – Several small structures have been constructed at the southwest portion of the site.

1990 – No significant changes are visible.

1998 – A small structure has been constructed adjacent to and east of the southeast corner of the site. A large building (currently occupied by Solar World) has been constructed south of the site, on the south side of NW Evergreen Road.

2005 – No significant changes are visible.

### **2.0 Review of DEQ Facility Profiler**

No regulatory listings for facilities that appear to pose a significant environmental risk were identified for properties at or adjacent to the site.





## **Appendix J — Site 55/56: East Evergreen Site Summary**

### **3.0 Site Reconnaissance**

The site was observed on December 7, 2011 from public rights of way. The site is currently in residential/agricultural use. Dwellings and farm buildings are present in three clusters at the site, near Evergreen Road, near and NW 253rd Avenue, and at the central portion of the site. It was not possible to closely observe the structures due to their distance from public rights of way. The dwellings and buildings are surrounded by farmed areas with cover crops. Obvious potential sources of contamination, such as ASTs and USTs, were not visible during the site reconnaissance. The dwellings are in a rural area without obvious signs of a municipal sanitary sewer system, suggesting that septic systems are in use at the site. A photograph log is included in Attachment B.

### **4.0 File Review**

A file review was not performed for the site because the site is not included in DEQ's listings of properties with documented or suspected hazardous substance impacts.

### **5.0 Summary of Environmental Conditions**

Aerial photography indicates that the site has been in agricultural use since at least 1936. The types of crops grown at the site are unclear based on the review of aerial photography; however, agricultural uses apparently consisted primarily of grasses and cover crops. An orchard or nursery occupied the southwest portion of the site.

Pesticides and herbicides (pesticides) that were commonly applied to crops in Oregon include inorganic, organochlorines, and organophosphate compounds. The pesticide residues most often detected in Oregon soil are lead, arsenic, cadmium, and mercury (inorganic compounds); and DDT, dieldrin, and toxaphene (organic compounds). Studies have shown that pesticides may accumulate on agricultural lands at concentrations that exceed acceptable risk levels. Analytical data are unavailable to confirm whether residual pesticides are present in soil at the site.

Small (200- to 1,000-gallon) ASTs and USTs, used for storing petroleum hydrocarbon fuel (gasoline, diesel, and heating oil) are common at residential and farm properties. Indications of ASTs and USTs were not visible on the aerial photographs or during the site reconnaissance, and the DEQ Facility Profiler database does not indicate that ASTs and/or USTs are present at the site. Despite the absence of tank records or indications of ASTs/USTs, ASTs and USTs may be present at the site (in use or decommissioned). Because ASTs/USTs are common sources of environmental contamination, the potential for leaking ASTs/USTs is considered an environmental concern.



## **Appendix J — Site 55/56: East Evergreen Site Summary**

An assessment for residual pesticide concentrations in soil and for petroleum ASTs/USTs (and possible releases) should be performed prior to site development. The information obtained during the assessment can be used to determine whether the site is impacted, and if so, to plan for proper tank decommissioning, soil management, and for protection of worker health and the environment during future development activities.

Assuming the site is developed for industrial purposes, the majority of the site is likely to be covered with asphalt-concrete or concrete surfaces, preventing human and ecological exposure to contaminants in soil via direct contact. Under this scenario, assuming moderate levels of pesticide impacts, remediation to address pesticides in soil is not likely to be necessary. If redevelopment plans include the construction or alteration of wetlands, ponds, or other significant natural habitat within areas formerly used for agriculture and impacted by pesticides, pesticide concentrations are high, or significant human/ecological exposure is expected, additional pesticide remediation may be necessary.

If ASTs and/or USTs are present at the site, it will be necessary to decommission the tanks and possibly remediate contamination, if any. Assessment and remediation for small residential/farm petroleum tanks is commonly simple and limited to shallow soil. In some cases, however, residential/farm tank releases can affect groundwater or other sensitive environments, increasing the complexity and costs of assessment and remediation.

### **6.0 Conceptual Assessment and Remediation Cost Estimate**

Based on the assumptions listed above, the costs for an assessment of residual pesticide concentrations in soil is in the range of \$15,000, and the costs for an AST/UST assessment, including subsurface sampling, is in the range of \$15,000. The costs for remediation of petroleum impacts, if any, from residential/farm ASTs/USTs are difficult to constrain without site-specific information. For planning purposes, however, it is reasonable to assume that small residential/farm USTs/ASTs can be decommissioned for approximately \$5,000 to \$10,000 each and remediation of petroleum impacted soil can be performed for approximately \$10,000 to \$20,000 for each release area. Therefore, assuming that three ASTs/USTs are present at the site, combined UST/AST decommissioning and remediation costs may range between \$15,000 and \$90,000.

A remediation cost estimate was not prepared for pesticides in soil because asphalt-concrete, concrete pavement, and building foundations will presumably be installed during industrial development of the site, preventing human and ecological exposure to pesticides in soil and removing the need for other remediation efforts. If pesticide-impacted soil is removed from the site during earthwork activities, additional handling/disposal costs may be incurred.



## **Appendix J — Site 55/56: East Evergreen Site Summary**

In summary, the costs for an assessment of pesticides in soil are likely to be in the range of \$15,000. An assessment for AST/UST impacts will also likely cost approximately \$15,000. Thus, the cost for assessment, decommissioning and remediation of petroleum ASTs/USTs (assuming three small residential/farm tanks are present) may range between \$30,000 and \$105,000. Assuming that pesticide and AST/UST assessments are completed for \$30,000 and AST/UST decommissioning, and remediation costs fall between the low and high estimates (i.e., the average, or \$52,500), total costs will be in the range of \$82,500. If the magnitude and extent of contaminant impacts at the site, if any, are large or sensitive environments or groundwater are impacted, assessment and remediation costs may increase.

A pesticide assessment can be completed in less than three months. The pesticide assessment should be performed prior to initiating site preparation/development activities because the assessment data should be used to inform decisions regarding worker health and safety and soil management. Small residential/farm ASTs and USTs, used for storing petroleum hydrocarbon fuels, can commonly be assessed and remediated in less than six months. Assuming AST/UST impacts are limited to soil, and not groundwater, remediation normally can be completed concurrent with site development activities. No permitting is required for assessment activities or for decommissioning of small unregulated residential/farm ASTs, although DEQ reporting is required for most UST work. If larger, regulated USTs are decommissioned, it will be necessary to notify DEQ prior to the decommissioning activities. In some cases, overall UST/AST decommissioning and remediation costs can be reduced by using equipment and personnel that have been mobilized for other general site preparation and development tasks. No permitting is required for assessment activities or for decommissioning of small unregulated residential/farm ASTs, although DEQ reporting is required for most UST work. If larger, regulated USTs are decommissioned, it will be necessary to notify DEQ prior to the decommissioning activities. In summary, based on the assumptions described above, the timeframe for assessment and remediation should be less than six months.





## ***Attachment A***

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### **Aerial Photographs**

























## ***Attachment B***



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### **Photograph Log**

## ATTACHMENT B PHOTOGRAPH LOG

**Project Name:** Regional Industrial Inventory Project - Site 55/56  
**Project Number:** 1901-00

**Client:** Group MacKenzie  
**Location:** Hillsboro, Oregon

<b>Photo No:</b> 1	
<b>Photo Date:</b> Dec. 7, 2011	
<b>Orientation:</b> North	
<b>Description:</b> Agricultural fields viewed from NW 253 <sup>rd</sup> Avenue.	
<b>Photo No:</b> 2	
<b>Photo Date:</b> Dec. 7, 2011	
<b>Orientation:</b> North	
<b>Description:</b> Agricultural fields and a stormwater ditch viewed from NW 253 <sup>rd</sup> Avenue..	



## ATTACHMENT B PHOTOGRAPH LOG

**Project Name:** Regional Industrial Inventory Project - Site 55/56  
**Project Number:** 1901-00

**Client:** Group MacKenzie  
**Location:** Hillsboro, Oregon

<b>Photo No:</b> 3	
<b>Photo Date:</b> Dec. 7, 2011	
<b>Orientation:</b> West	
<b>Description:</b> An agricultural field, barn and accessory structures at the southeast portion of the site, viewed from NW 253 <sup>rd</sup> Avenue.	
<b>Photo No:</b> 4	
<b>Photo Date:</b> Dec. 7, 2011	
<b>Orientation:</b> Northwest	
<b>Description:</b> View of an agricultural field, with a dwelling and farm structures visible in the background. The photograph was taken from NW 253 <sup>rd</sup> Avenue.	

## ATTACHMENT B PHOTOGRAPH LOG

**Project Name:** Regional Industrial Inventory Project - Site 55/56  
**Project Number:** 1901-00

**Client:** Group MacKenzie  
**Location:** Hillsboro, Oregon

<b>Photo No:</b> 5	
<b>Photo Date:</b> Dec. 7, 2011	
<b>Orientation:</b> South	
<b>Description:</b>  A dwelling and barn at the east side of the site, viewed from NW 253 <sup>rd</sup> Avenue.	
<b>Photo No:</b> 6	
<b>Photo Date:</b> Dec. 7, 2011	
<b>Orientation:</b> West	
<b>Description:</b>  Taken from NW 253 <sup>rd</sup> Avenue, on the East boarder of the lot, looking West toward an agricultural field containing grass.	

## ***Appendix K***

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### **Site 62: Rock Creek Site Summary**



## ***Appendix K —Site 62: Rock Creek Site Summary***

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### ***Attachments***

- A      Aerial Photographs
- B      Photograph Log



## **Appendix K —Site 62: Rock Creek Site Summary**

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This Appendix presents a summary of information about environmental conditions at site 62.

### **1.0 Aerial Photography Review**

A summary of historical activities at the site, based on a review of aerial photography, is presented below. Copies of aerial photography are included in Attachment A.

1936 – The site is in agricultural use. Cover crops appear to be present over most of the site, although small orchard areas are present in the central and southeast portions of the site. Two clusters of small structures, which appear to consist of dwellings and outbuildings, are present at the site; one cluster is in the southeast corner and the other is in the central area. Several small buildings are visible north, south, and southwest of the site.

1945 – The site appears generally unchanged.

1948 – The site appears generally unchanged.

1956 – A small building was added to the cluster at the southeast corner of the site. Several buildings were removed from the property north of the site.

1961 – Two small structures were added to the cluster at the central area of the site.

1970 – The site appears generally unchanged.

1980 – Several small buildings were constructed in a cluster at the east-central portion of the site.

1990 – Several buildings, which appear to be dwellings, were constructed in the vicinity of the site.

1998 – A residential development was constructed southwest of the site.

2005 – No significant changes are visible.

### **2.0 Review of DEQ Facility Profiler**

A leaking heating oil UST incident (DEQ File No. 03-02-5509) was identified by the DEQ Facility Profiler at the property at 14850 SE 162<sup>nd</sup> Avenue. The Facility Profiler map suggests that the incident corresponds to



## **Appendix K—Site 62: Rock Creek Site Summary**

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the subject site; however, Clackamas County records<sup>1</sup> indicate that the listed address does not currently exist and if it did exist, it would be at least 200 feet north of the subject site. Therefore, it is unclear if the incident documented by DEQ File No. 03-02-5509 occurred at the site or an off-site location.

The DEQ online LUST report for the incident indicates that a heating oil release was reported to DEQ in March 2002 and the released was cleaned up by April 2002. Reportedly the release was limited to soil. Based on information provided by DEQ, it appears that the LUST incident poses little risk to the site, regardless of whether it occurred at the site or on a nearby property.

### **3.0 Site Reconnaissance**

The site was observed on December 27, 2011 from public rights of way near the site. The site is currently in residential/agricultural use. Dwellings and farm buildings are present at the central portion of the site, the east portion of the site, and the southeast portion of the site near Highway 212. It was not possible to closely observe the structures at the site due to their distance from public rights of way. The dwellings and farm buildings are surrounded by farmed areas, some of which were planted with cover crops and others that were fallow at the time of the site reconnaissance. Obvious potential sources of contamination, such as ASTs and USTs, were not visible during the site reconnaissance. The dwellings are in a rural area without obvious signs of a municipal sanitary sewer system, suggesting that septic systems are in use at the site. A photograph log is included in Attachment B.

### **4.0 File Review**

The online LUST file for 14850 SE 162<sup>nd</sup> Avenue was reviewed, as discussed in Section 2.

### **5.0 Summary of Environmental Conditions**

Aerial photography indicates that the site has been in agricultural use since at least 1936. The types of crops grown at the site are unclear based on the review of aerial photography; however, agricultural uses apparently consisted primarily of grasses and cover crops.

Pesticides and herbicides (pesticides) that were commonly applied to crops in Oregon include inorganic, organochlorine, and organophosphate compounds. The pesticide residues most often detected in Oregon soil are lead, arsenic, cadmium, and mercury (inorganic compounds); and DDT, dieldrin, and toxaphene (organic compounds). Studies have shown that pesticides may accumulate on agricultural lands at

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<sup>1</sup> <http://web5.co.clackamas.or.us/taxmap/>





## **Appendix K —Site 62: Rock Creek Site Summary**

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concentrations that exceed acceptable risk levels. Analytical data are unavailable to confirm whether residual pesticides are present in soil at the site.

The DEQ Facility Profiler database indicates that a heating oil UST was historically present at 14850 SE 162<sup>nd</sup> Avenue; however, it is unclear if the release occurred at the subject site and, regardless of the release location, it was reportedly cleaned up to DEQ's satisfaction.

Small (200- to 1,000-gallon) ASTs and USTs, used for storing petroleum hydrocarbon fuel (gasoline, diesel, and heating oil) are common at residential and farm properties. ASTs and USTs were not visible during the site reconnaissance; are not visible on the aerial photographs; and the DEQ Facility Profiler database does not indicate that ASTs and/or USTs are present at the site. Despite the absence of tank records or other indications, ASTs and USTs may be present at the site (in use or decommissioned). Because ASTs/USTs are common sources of environmental contamination, the potential for leaking ASTs/USTs is considered an environmental concern.

An assessment for residual pesticide concentrations in soil and for petroleum ASTs/USTs (and possible releases) should be performed prior to site development. The information obtained during the assessment can be used to determine whether the site is impacted, and if so, to plan for proper tank decommissioning, soil management and for protection of worker health and the environment during future development activities.

Assuming the site is developed for industrial purposes, the majority of the site is likely to be covered with asphalt-concrete or concrete surfaces, preventing human and ecological exposure to contaminants in soil. Under this scenario, assuming moderate levels of pesticide impacts, remediation to address pesticides in soil is not likely to be necessary. If redevelopment plans include the construction or alteration of wetlands, ponds, or other significant natural habitat within areas formerly used for agriculture and impacted by pesticides, pesticide concentrations are high, or significant human/ecological exposure is expected, additional pesticide remediation may be necessary.

If ASTs and/or USTs are present at the site, it will be necessary to decommission the tanks and possibly remediate contamination, if any. Assessment and remediation for small residential/farm petroleum tanks is commonly simple and limited to shallow soil. In some cases, however, residential/farm tank releases can affect groundwater or other sensitive environments, increasing the complexity and costs of assessment and remediation.

### **6.0 Conceptual Remediation Cost Estimate**

Based on the assumptions listed above, the costs for an assessment of residual pesticide concentrations in soil is in the range of \$15,000, and the costs for an AST/UST assessment, including subsurface sampling, is



## ***Appendix K —Site 62: Rock Creek Site Summary***

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in the range of \$15,000. The costs for remediation of petroleum impacts, if any, from residential/farm ASTs/USTs are difficult to constrain without site-specific information. For planning purposes, however, it is reasonable to assume that small residential/farm heating oil/diesel USTs/ASTs can be decommissioned for approximately \$5,000 to \$10,000 each and remediation of petroleum impacted soil can be performed for approximately \$10,000 to \$20,000 for each release area. Therefore, assuming that three ASTs/USTs are present at the site (one at each building cluster), combined UST/AST decommissioning and remediation costs may range between \$15,000 and \$90,000.

No costs are included for the release at 14850 SE 162<sup>nd</sup> Avenue, because: (1) it is unclear if the release at 14850 SE 162<sup>nd</sup> occurred at the subject site; and (2) the release has been cleaned up to DEQ's satisfaction.

A remediation cost estimate was not prepared for pesticides in soil because asphalt-concrete, concrete pavement, and building foundations will presumably be installed during industrial development of the site, preventing human and ecological exposure to pesticides in soil and removing the need for other remediation efforts. If pesticide-impacted soil is removed from the site during earthwork activities, additional handling/disposal costs may be incurred.

In summary, the costs for an assessment of pesticides in soil are likely to be in the range of \$15,000. An assessment for AST/UST impacts will also likely cost approximately \$15,000. The cost for decommissioning and remediation of petroleum ASTs/USTs (assuming three small residential/farm tanks are present) may range between \$15,000 and \$90,000. Assuming that pesticide and AST/UST assessments are completed for \$30,000 and AST/UST assessment, decommissioning, and remediation costs fall between the low and high estimates (i.e., the average, or \$52,500), total costs will be in the range of \$82,500. If the magnitude and extent of contaminant impacts at the site, if any, are large or sensitive environments or groundwater are impacted, assessment and remediation costs may increase.

A pesticide assessment can be completed in less than three months. The pesticide assessment should be performed prior to initiating site preparation/development activities because the assessment data should be used to inform decisions regarding worker health and safety and soil management. Small residential/farm ASTs and USTs, used for storing petroleum hydrocarbon fuels, can commonly be assessed and remediated in less than six months. Assuming AST/UST impacts are limited to soil, and not groundwater, remediation normally can be completed concurrent with site development activities. In some cases, overall UST/AST decommissioning and remediation costs can be reduced by using equipment and personnel that have been mobilized for other general site preparation and development tasks. No permitting is required for assessment activities or for decommissioning of small unregulated residential/farm ASTs, although DEQ reporting is required for most UST work. If larger, regulated USTs are decommissioned, it will be necessary to notify DEQ prior to the decommissioning activities. In summary, based on the assumptions described above, the timeframe for assessment and remediation should be less than six months.



## ***Attachment A***

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### **Aerial Photographs**





























## ***Attachment B***

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### **Photograph Log**



## ATTACHMENT B PHOTOGRAPH LOG

**Project Name:** Regional Industrial Inventory Project - Site 62  
**Project Number:** 1901-00



**Client:** Group MacKenzie  
**Location:** Clackamas, Oregon

<b>Photo No:</b> 1	
<b>Photo Date:</b> Dec. 27, 2011	
<b>Orientation:</b> East	
<b>Description:</b> Agricultural area viewed from SE 162 <sup>nd</sup> Avenue.	
<b>Photo No:</b> 2	
<b>Photo Date:</b> Dec. 27, 2011	
<b>Orientation:</b> Northeast	
<b>Description:</b> Agricultural area viewed from SE 162 <sup>nd</sup> Avenue.	

## ATTACHMENT B PHOTOGRAPH LOG

**Project Name:** Regional Industrial Inventory Project - Site 62  
**Project Number:** 1901-00

**Client:** Group MacKenzie  
**Location:** Clackamas, Oregon



<b>Photo No:</b> 3	
<b>Photo Date:</b> Dec. 27, 2011	
<b>Orientation:</b> East	
<b>Description:</b>  Agricultural area and accessory structures viewed from SE 162 <sup>nd</sup> Avenue.	
<b>Photo No:</b> 4	
<b>Photo Date:</b> Dec. 27, 2011	
<b>Orientation:</b> East	
<b>Description:</b>  Agricultural area, dwelling, and accessory structures viewed from SE 162 <sup>nd</sup> Avenue.	



## ATTACHMENT B PHOTOGRAPH LOG

**Project Name:** Regional Industrial Inventory Project - Site 62  
**Project Number:** 1901-00

**Client:** Group MacKenzie  
**Location:** Clackamas, Oregon

<b>Photo No:</b> 5	
<b>Photo Date:</b> Dec. 27, 2011	
<b>Orientation:</b> East	
<b>Description:</b>  Agricultural area viewed from SE 162 <sup>nd</sup> Avenue.	
<b>Photo No:</b> 6	
<b>Photo Date:</b> Dec. 27, 2011	
<b>Orientation:</b> Southeast	
<b>Description:</b>  Agricultural area viewed from SE 162 <sup>nd</sup> Avenue.	

## ***Appendix L***

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### **Site 104: Hillsboro Urban Reserves Site Summary**



# Appendix L —Site 104: Hillsboro Urban Reserves Site Summary

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## Attachments

- A      Aerial Photographs
- B      Photograph Log



## ***Appendix L —Site 104: Hillsboro Urban Reserves Site Summary***

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This Appendix presents a summary of information about environmental conditions at site 104.

### ***1.0 Aerial Photography Review***

A summary of historical activities at the site, based on a review of aerial photography, is presented below. Copies of aerial photography are included in Attachment A.

1936 – The majority of the site is in agricultural use. Crops appear to generally consist of grasses and cover crops. Forest land is present at the western portion of the site and along drainages elsewhere at the site. Dwellings and ancillary structures (possibly farms or shop buildings) are present in two clusters at areas of the site.

1947 – A structure has been constructed at the southwest portion of the site, adjacent to NW Sewell Road. U.S. Highway 26 has been constructed adjacent to and north of the site.

1956 – Most forested areas have been removed from the site. Several small new structures have been constructed in the vicinity of other buildings at the site.

1963 – Several small new structures have been constructed in the existing building clusters at the site.

1970 – No significant changes are visible.

1980 – No significant changes are visible.

1990 – A small structure has been constructed at the west-central portion of the site.

1998 – Several new structures have been constructed in the clusters at the west side of the site.

2005 – No significant changes are visible.

### ***2.0 Review of DEQ Facility Profiler***

No regulatory listings for facilities that appear to pose a significant environmental risk were identified for properties at or adjacent to the site.



## ***Appendix L —Site 104: Hillsboro Urban Reserves Site Summary***

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### **3.0 Site Reconnaissance**

The site was observed on December 7, 2011 from public rights of way near the site. The site is currently in residential/agricultural use. Dwellings and farm buildings are present at the site, near NW Sewell Road and NW Meek Road, and in the central portion of the site, north of NW 253rd Avenue. It was not possible to closely observe the structures due to their distance from public rights of way. The dwellings and farm buildings are surrounded by farmed areas, some of which were planted with cover crops; others were fallow at the time of the site reconnaissance. Obvious potential sources of contamination, such as ASTs and USTs, were not visible during the site reconnaissance. The dwellings are in a rural area without obvious signs of a municipal sanitary sewer system, suggesting that septic systems are in use at the site. A photograph log is included in Attachment B.

### **4.0 File Review**

A file review was not performed because the site and nearby properties are not included in DEQ's listings of properties with documented or suspected hazardous substance impacts.

### **5.0 Summary of Environmental Conditions**

Aerial photography indicates that the site has been in agricultural use since at least 1936. The types of crops grown at the site are unclear based on the review of aerial photography; however, agricultural uses apparently consisted primarily of grasses and cover crops.

Pesticides and herbicides (pesticides) that were commonly applied to crops in Oregon include inorganic, organochlorine, and organophosphate compounds. The pesticide residues most often detected in Oregon soil are lead, arsenic, cadmium, and mercury (inorganic compounds); and DDT, dieldrin, and toxaphene (organic compounds). Studies have shown that pesticides may accumulate on agricultural lands at concentrations that exceed acceptable risk levels. Analytical data are unavailable to confirm whether residual pesticides are present in soil at the site.

Small (200- to 1,000-gallon) ASTs and USTs, used for storing petroleum hydrocarbon fuel (gasoline, diesel, and heating oil) are common at residential and farm properties. ASTs and USTs are not visible on the aerial photographs and the DEQ Facility Profiler database does not indicate that ASTs and/or USTs are present at the site. Despite the absence of tank records or indications on aerial photography, ASTs and USTs may be present at the site (in-use or decommissioned). Because ASTs/USTs are common sources of environmental contamination, the potential for leaking ASTs/USTs is considered an environmental concern.



## ***Appendix L —Site 104: Hillsboro Urban Reserves Site Summary***

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An assessment for residual pesticide concentrations in soil and for petroleum ASTs/USTs (and possible releases) should be performed prior to site development. The information obtained during the assessment can be used to determine whether the site is impacted, and if so, to plan for proper tank decommissioning, soil management and for protection of worker health and the environment during future development activities.

Assuming the site is developed for industrial purposes, the majority of the site is likely to be covered with asphalt-concrete or concrete surfaces, preventing human and ecological exposure to contaminants in soil. Under this scenario, assuming moderate levels of pesticide impacts, remediation to address pesticides in soil is not likely to be necessary. If redevelopment plans include the construction or alteration of wetlands, ponds, or other significant natural habitat within areas formerly used for agriculture and impacted by pesticides, pesticide concentrations are high, or significant human/ecological exposure is expected, additional pesticide remediation may be necessary.

If ASTs and/or USTs are present at the site, it will be necessary to decommission the tanks and possibly remediate contamination, if any. Assessment and remediation for small residential/farm petroleum tanks is commonly simple and limited to shallow soil. In some cases, however, residential/farm tank releases can affect groundwater or other sensitive environments, increasing the complexity and costs of assessment and remediation.

### ***6.0 Conceptual Remediation Cost Estimate***

Based on the assumptions listed above, the costs for an assessment of residual pesticide concentrations in soil is in the range of \$15,000, and the costs for an AST/UST assessment, including subsurface sampling, is in the range of \$15,000. The costs for remediation of petroleum impacts, if any, from residential/farm ASTs/USTs are difficult to constrain without site-specific information. For planning purposes, however, it is reasonable to assume that small residential/farm heating oil/diesel USTs/ASTs can be decommissioned for approximately \$5,000 to \$10,000 each and remediation of petroleum impacted soil can be performed for approximately \$10,000 to \$20,000 for each release area. Therefore, assuming that three ASTs/USTs are present at the site, combined UST/AST decommissioning and remediation costs may range between \$15,000 and \$90,000.

A remediation cost estimate was not prepared for pesticides in soil because asphalt-concrete, concrete pavement, and building foundations will presumably be installed during industrial development of the site, preventing human and ecological exposure to pesticides in soil and removing the need for other remediation efforts. If pesticide-impacted soil is removed from the site during earthwork activities, additional handling/disposal costs may be incurred.



## ***Appendix L —Site 104: Hillsboro Urban Reserves Site Summary***

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In summary, the costs for an assessment of pesticides in soil are likely to be in the range of \$15,000. An assessment for AST/UST impacts will also likely cost approximately \$15,000. The cost for decommissioning and remediation of petroleum ASTs/USTs (assuming three small residential/farm tanks are present) may range between \$15,000 and \$90,000. Assuming that pesticide and AST/UST assessments are completed for \$30,000 and AST/UST assessment, decommissioning, and remediation costs fall between the low and high estimates (i.e., the average, or \$52,500), total costs will be in the range of \$82,500. If the magnitude and extent of contaminant impacts at the site, if any, are large or sensitive environments or groundwater are impacted, assessment and remediation costs may increase.

A pesticide assessment can be completed in less than three months. The pesticide assessment should be performed prior to initiating site preparation/development activities because the assessment data should be used to inform decisions regarding worker health and safety and soil management. Small residential/farm ASTs and USTs, used for storing petroleum hydrocarbon fuels, can commonly be assessed and remediated in less than six months. Assuming AST/UST impacts are limited to soil, and not groundwater, remediation normally can be completed concurrent with site development activities. In some cases, overall UST/AST decommissioning and remediation costs can be reduced by using equipment and personnel that have been mobilized for other general site preparation and development tasks. No permitting is required for assessment activities or for decommissioning of small unregulated residential/farm ASTs, although DEQ reporting is required for most UST work. If larger, regulated USTs are decommissioned, it will be necessary to notify DEQ prior to the decommissioning activities. In summary, based on the assumptions described above, the timeframe for assessment and remediation should be less than six months.



## ***Attachment A***

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### **Aerial Photographs**

























## ***Attachment B***

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### **Photograph Log**



## ATTACHMENT B PHOTOGRAPH LOG

**Project Name:** Regional Industrial Inventory Project - Site 104  
**Project Number:** 1901-00



**Client:** Group MacKenzie  
**Location:** Hillsboro, Oregon

<b>Photo No:</b> 1	
<b>Photo Date:</b> Dec. 7, 2011	
<b>Orientation:</b> East	
<b>Description:</b>  Agricultural fields at the west side of the site, viewed from NW Sewell Road. A dwelling and accessory structures are visible in the background.	
<b>Photo No:</b> 2	
<b>Photo Date:</b> Dec. 7, 2011	
<b>Orientation:</b> East	
<b>Description:</b>  Agricultural fields at the west side of the site, viewed from NW Sewell Road. A dwelling and accessory structures are visible in the background.	

## ATTACHMENT B PHOTOGRAPH LOG

**Project Name:** Regional Industrial Inventory Project - Site 104  
**Project Number:** 1901-00



**Client:** Group MacKenzie  
**Location:** Hillsboro, Oregon

<b>Photo No:</b> 3	
<b>Photo Date:</b> Dec. 7, 2011	
<b>Orientation:</b> Northwest	
<b>Description:</b>  Agricultural fields at the west side of the site, viewed from NW Meek Road.	
<b>Photo No:</b> 4	
<b>Photo Date:</b> Dec. 7, 2011	
<b>Orientation:</b> East	
<b>Description:</b>  Agricultural fields, a dwelling, and accessory structures at the central portion of the site, viewed from NW Meek Road.	

## ATTACHMENT B PHOTOGRAPH LOG

**Project Name:** Regional Industrial Inventory Project - Site 104  
**Project Number:** 1901-00

**Client:** Group MacKenzie  
**Location:** Hillsboro, Oregon

<b>Photo No:</b> 5	
<b>Photo Date:</b> Dec. 7, 2011	
<b>Orientation:</b> South	
<b>Description:</b>  Agricultural fields, a dwelling, and accessory structures at the central portion of the site, viewed from NW Meek Road.	
<b>Photo No:</b> 6	
<b>Photo Date:</b> Dec. 7, 2011	
<b>Orientation:</b> East	
<b>Description:</b>  Agricultural fields, a dwelling, and accessory structures at the southwest portion of the site, viewed from NW Sewell Road.	

## PURPOSE AND METHODOLOGICAL OVERVIEW

In a world economy with shorter product life cycles, highly technical and costly capital improvements, and a globally competitive market, firms requiring large industrial sites are growing more sensitive to market timing and site flexibility. In today's economy, the Portland Metropolitan area is competing on a global scale in the recruitment and retention of large and expanding firms; with these firms increasingly unable or willing to overcome challenging site development issues. In their site selection, firms face many choices in many cities, acting rationally to locate in the least costly and challenging locations. This new paradigm raises questions about the competitiveness of our regional land inventory. Until sites are marketed as user ready, is there a truly effective supply for large industrial site demand from the perspective of traded-sector firms seeking to locate or expand in our region? It was recently discovered that the metro area has only a handful of 25-100+ acre sites suitable for shovel ready development<sup>1</sup>. With this in mind, it would be prudent to consider factors which limit industrial land choice, and develop strategies for improving and diversifying industrial land supply within our urban growth boundary and reserves areas.

Herein lays the function of this analysis—to move beyond a classically planning-driven approach to land evaluation, and underscore the *market-driven* realities of our regional land inventory. Simply put, our analysis evaluates Phase II sites from the perspective of market participants. This term market participant can include a host of entities, including land owners, end-users, land developers, and public agencies, among others. This is a critically important point of view; as in reality, *market participants* facilitate development activity, which is fundamentally dictated by economic and fiscal constraints.

This perspective allows us to expand on a simple *inventory* of large industrial sites, and better understand the variety of constraints which limit industrial "choice". Here, we recognize the dynamic between the costs of improving lower tier sites, the market's willingness to provide private investment, and the eventual economic and fiscal benefits of having user ready sites. In doing so, we inform policy decisions at all levels of government, as well as in the business community. Topics can range from the assessment of risk, to the marginal fiscal and community benefits of public capital investment.

In the pages below, we provide a narrative describing our methodological approach to both determining market viability and forecasting associated economic and fiscal benefits.

### Market Viability Analysis Methodology

This analysis evaluates the costs associated with the identified constraints of Phase II sites *in relation to* the future value of the site. This "cost-value" approach translates the sum of development costs into an assessment of the market's ability or inability to bring sites to a user ready (Tier 1) status.

In their investment decisions, market participants will evaluate the balance of dollar costs<sup>2</sup>, time, and risk against the future value of the investment. Presented numerically.

$$1.1 \qquad \qquad \qquad \text{Future Value} \geq \sum(\text{Dollar Cost, Time, Risk})$$

When this equation holds true, and the future value of a site outweighs or is at least equal to the sum of costs associated with site development, the market will tend to produce development activity in the long-run, all else equal. But this balance does not always hold true. Particularly for sites with considerable constraints; the equation is reversed:

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<sup>1</sup> Portland Business Alliance. *Land Availability, Limited Options, An Analysis of Industrial Land Ready for Future Employers*, April 2012.

<sup>2</sup> Including acquisition



$$1.2 \quad \text{Future Value} < \sum(\text{Dollar Cost}, \text{Time}, \text{Risk})$$

In this condition, a number of outcomes could occur. When the differential between cost and value is narrow, enough time may pass for future land values to appreciate to a level which may persuade market activity<sup>3</sup>. Alternatively, a market participant with a lower risk and time threshold may emerge. However, when the differential is large relative to future value, the potential reward is not sufficient to encourage private investment. In this instance, the more likely scenario is for the site to remain in an unusable condition—or eventually transition to a higher use (justifying higher future value).

With this basic foundation in mind, we evaluate each half this balance individually below. We then reconcile this value/cost balance to determine the aforementioned differential, and elaborate on its meaning and implications on site readiness.

Our evaluation process starts with an assumption of each site beginning in a best case scenario; that is, owners are motivated and sites are aggregated. We understand this is clearly not always the case, and recognize aggregation as a costly obstacle to site development. However, aggregation costs and timing are difficult to estimate and therefore are not included in the analysis; for this analysis we erred on the side of a conservative cost estimate.

#### Costs: Dollar Cost, Time, and Risk

Our cost analysis evaluated the development constraints precluding Tier 1 status. Examples include wetland mitigation, environmental cleanup, transportation, and infrastructure. Group Mackenzie provided dollar costs (Hard Costs) and development schedules (time) for each identified constraint. We then consider Soft Costs<sup>4</sup>, and utilized the development schedules for each activity to calculate the time cost of money<sup>5</sup>. Development schedules were also used to quantify the cost of risk<sup>6</sup>—the premium required to encourage investment. Taken together, these baseline inputs determine the total cost of bringing the site to Tier 1. Stated numerically:

$$1.3 \quad \text{Total Site Development Cost} = \sum(\text{Hard Cost}, \text{Soft Cost}, \text{Time Cost}, \text{Risk Premium})$$

In addition to site development, we must also consider an acquisition price an entity would pay a current land owner for sites "as-is". This is a difficult assumption to make, as it does not indicate the residual "value" of the land from a purely market perspective. Rather, it represents the price a land owner would reasonably enter contract as a strike price today. In reality, the real strike price is going to vary widely by site. Absent every aggregated site being listed on the open market, we have no true way of knowing what this will be. As a necessary supplement, we assumed that an across the board strike price of \$4.50 per-square-foot would reasonably encourage land owners to enter contract negotiations. Therefore, the entire right side of equations 1.1 and 1.2 is represented by the following:

$$1.4 \quad \sum(\text{Dollar Cost}, \text{Time}, \text{Risk}) = (\text{Strike Price} + \text{Total Site Development Cost})$$

<sup>3</sup> Although land appreciation generally requires increasing scarcity relative to demand.

<sup>4</sup> Calculated at 20% of Hard Costs. Represent architectural, engineering, legal, fees etc.

<sup>5</sup> Calculated at a 7% annualized rate from the period dollars are spent in the development schedule to site completion.

<sup>6</sup> Risk thresholds were estimated linearly as 2.5% for every 6 months of development time, from a 24 month basis of 15%. For example, a site with a site development period of 24 months would be associated with a 15% return on costs, while a site with a 30 month development timeline would require a 1.75% return. Risk premiums were grossed up by 1/6th for site with moderate brownfield remediation and by 1/3rd for sites requiring significant brownfield remediation.

#### Future Value:

On the left side of equations 1.1 and 1.2, we calculate the future market value of each site as a Tier 1 site; in other words, after site development activities have occurred. The future value of a site is simply a function of its current value as-if a Tier 1 site, time, and an assumed land appreciation (or depreciation) rate. Again, numerically:

$$1.5 \quad \text{Future Value} = \text{Current Tier 1 Price}(1 + \text{Appreciation Rate})^t$$

Where  $t$  = Site Development Period

Time in this case is the actual site development period provided by Group Mackenzie, and our land appreciation rate is consistent with 30-year growth in inflation<sup>7</sup>. However, our assumption of current Tier 1 value for each site required more diligence. This assumption was derived out of both quantitative and qualitative elements<sup>8</sup>. Where available, we began with comparable sale and listing prices by submarket. This information provided a sound basis, but data points were limited and land deals are often highly unique. Therefore, two alternative sources of information were consulted; the industrial real estate brokerage team at CBRE and member brokers of the local SIOR chapter. Each of the Phase 2 sites were discussed with these experts and a price was identified for market ready, similar sized sites in each of the submarkets where the sites were located. Their responses were combined with the physical data to determine a market ready price<sup>9</sup>.

#### Reconciliation of Value and Costs:

Finally, we reconcile equation 1.1 to determine the differential between the future value of a site and its associated costs. This differential represents the "Market Viability Gap" or "Surplus" of the site. Numerically:

$$1.6 \quad MV = \text{Future Value} - \sum(\text{Dollar Cost, Time, Risk})$$

Where MV is negative, a viability gap exists; the cost to acquire and provide infrastructure exceeds expected market value. Where MV is positive, the site should attract the interest of the market—within the construct of this model.

Therefore, whereas they exist, we look to identify "market viability gaps" of constrained sites. We quantify these gaps to understand "how far away" the site is from market viability. Because we have an assumption of land appreciation, we can quantify this assumption both in terms of dollars and market timing. This allows us to understand the magnitude of the gaps, and begin thinking about solutions to improve market viability.

To this end, we developed a model that allows us to isolate the marginal impacts of every variable informing our analysis. This allows us to answer a whole host of questions. For example, we can answer, "What is the marginal impact on market viability of providing transportation infrastructure to Site-X?"; or "How much faster is Site-X viable if a land owner is willing to accept a \$4.00 strike price?"; or even "How much assistance is necessary to encourage private investment to improve Site-X to Tier 1?". Through this process, we developed a key metric that indicates overall market viability. This metric effectively answers this final question, and quantifies the dollar "gap assistance" that would attract the market's interest today.

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<sup>7</sup> As measured by the Consumer Price Index.

<sup>8</sup> For this assumption, we enlisted the help of Mike Wells, Managing Direct of the Portland CBRE office.

<sup>9</sup> This price was then reviewed by the consultant team and Kirk Olsen of Dermondy Properties, and a member of the Project Management Team, for a final determination.

## Economic and Fiscal Impact Methodology

Now that we have quantified the necessary gap that sites would require for improvement, we must consider the potential benefits those catalytic investments could generate. This process begins with the assumption of a Tier 1 site and motivated end user. This analysis is theoretical in nature, as Group Mackenzie has produced concept plans on each site to represent a conceptual end user. Based on what we know about how these types of industries operate, and the costs of building their facilities<sup>10</sup>, we can derive economic and fiscal estimates of these activities. This analysis considered the following impacts:

Economic Impacts from site development, facility construction, and on-going operations:

- Business Revenues, (*Direct, Indirect/Induced*)
- Jobs, (*Direct, Indirect/Induced*)
- Payroll Wages, (*Direct, Indirect/Induced*)

Fiscal Impacts from site development, facility construction, and on-going operations :

- Property Tax Revenues from Real Property
- State Payroll Tax from Payroll Wage Impacts

This analysis did not consider the impacts of personal property taxes on equipment and capital. For large users, the assessment of such property is determined on an individual basis, with complicated measures of depreciation, value, and incentives. Again, our analysis erred on the side of conservative estimates vs. speculating on these broadly varying impacts. We note that these investments can be significant, especially among high-tech and clean-tech users. As such, our findings are highly conservative.

### IMPLAN Economic Impact Methodology:

To model the economic impacts of various activities, JOHNSON REID utilized IMPLAN (IMPact for PLANning)<sup>11</sup> input/output multiplier model methodology. Developed by the Forest Service to assist in land and resource management planning, IMPLAN is an economic impact model designed for analyzing the effects of industry activity (employment, income or business revenues) upon all other industries in an economic area.

Economic impact analysis generally seeks to assess changes in overall economic activity within a specific geographic area as a result of a change in one or many specific activities; in this case, site development, facility construction, and on-going business activity. The ripple effect of a gain or loss in economic activity is identified in three stages: *Direct Impacts*, *Indirect Impacts* and *Induced Impacts*.

- *Direct Impacts*: The actual change in activity affecting a local economy. For example, if a new high-tech building is constructed, direct economic impacts comprise the business revenues for that firm/user, as well as the jobs required by that business and the labor income paid.
- *Indirect Impacts*: The response of all other local businesses within the geographic area to the direct impact. Continuing the previous example, indirect impacts of a high-tech user would comprise revenues for related vendors, i.e. materials wholesalers, subcontractors, etc., and the jobs and labor income thereby generated.
- *Induced Impacts*: The response of households within the geographic area affected by direct and indirect impacts. In the given example, induced impacts would be the increase in all categories of spending by households in the geography directly or indirectly employed by the businesses' activities.

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<sup>10</sup> Per-Square-Foot construction cost by facility type were provided by Group Mackenzie

<sup>11</sup> Minnesota IMPLAN Group (MIG), Inc., Stillwater, Minnesota.

Because IMPLAN's multiplier approach recognizes the relationship between revenues, jobs, and payroll, only one input is needed to determine the others. Therefore, job estimates could be used to determine business revenues, or vice versa. Below we describe our approach to estimating each activity type.

*Site Development:*

We calculated economic impacts based on the dollar cost and site development schedules provided by Group Mackenzie. Hard and soft impacts were considered separately and summed.

*Facility Construction:*

We began with estimates of facility construction costs for different types of structures (e.g. production, office) provided by Group Mackenzie. These dollar costs were inputs in the IMPLAN model to produce jobs and payroll estimates. However, we needed to make assumptions of the rate to which firms in different industries absorb space. We wanted to avoid making hypothetical phasing estimates of conceptual plans. Therefore, all of our facility construction and on-going impacts are related to a linear build-out over a determined period of time. But what rate do different industries absorb space? We evaluated case studies of large industrial expansion from around the region to determine typical absorption periods. This ranged from all development in one-year for warehouse & distribution to as much as 120,000 per year for cleantech in Hillsboro.

*On-Going Activity:*

As mentioned above, on-going impacts are included in the model at the rate of facility construction. Direct job impacts were used as the IMPLAN input for on-going operations. To create direct job estimates we utilized average employment densities outlined in Metro's Urban Growth Report<sup>12</sup>.

Fiscal Impacts:

Our analysis considered only taxes on real property and state payroll tax associated with payroll impact estimates outlined above.

*Property Tax Impacts:*

Property tax revenues were calculated on the *net-new* assessed value created by facility construction. Future assessed values were estimated by applying the cost of replacement to the changed property ratio (CPR) for industrial development in each respective county. For example, in year-one if there were a \$1,000,000 facility improvement on a site in Multnomah County, that increase in real market value would be multiplied by 0.876 (the industrial CPR in Multnomah County) to determine assessed value. Property taxes are levied<sup>13</sup> on assessed values by the according millage rate for each site. We assume a maximum annual assessed value increase on existing land and improvements of 3% in accordance with Measure 50.

*State Payroll Tax Impacts:*

State payroll taxes are applied to all taxable income<sup>14</sup> according to the state's current 2012 tax rates<sup>15</sup>. Payroll taxes were considered on payroll associated with the direct, indirect, and induced impacts of all construction and on-going activities.

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<sup>12</sup> Metro, 2009-2030 Urban Growth Report, January 2010.

<sup>13</sup> Where a site is located in an Enterprise Zone, property tax impacts are frozen for five years beginning with the first year of facility construction.

<sup>14</sup> Taxable income is assumed to be 75% of total payroll wage. Reduction accounts for federal withholding, standard deductions, and other miscellaneous deductions.

<sup>15</sup> Oregon Department of Revenue, Oregon Withholding Tax Formulas, January 2012



## Site 13 ICDC Entercom

Portland, Oregon

Warehouse & Distribution

### Market Feasibility Analysis

PHYSICAL CHARACTERISTICS			
Site Size:	48.5 Acres		
Net Developable Size:	46 Acres		
SITE DEVELOPMENT PARAMETERS			
Site Development Timeline:	28 Months		
	\$	\$/sq. ft.	
<b>Hard Costs:</b>	<b>\$742,200</b>	<b>\$0.37</b>	
<b>Off-Site</b>	Water:	\$23,000	\$0.01
	Sewer:	\$18,000	\$0.01
	Stormwater:	\$18,000	\$0.01
	Transportation:	\$0	\$0.00
<b>On Site</b>	Wetland Mitigation:	\$105,000	\$0.05
	Slope Mitigation:	\$0	\$0.00
	Building Pad Surcharge:	\$563,200	\$0.28
	Floodplain Cut/Fill Mitigation:	\$0	\$0.00
	Environmental Cleanup:	\$15,000	\$0.01
<b>Soft Costs:</b>	<b>\$148,440</b>	<b>\$0.07</b>	
<b>Time Costs:</b>	<b>\$54,925</b>	<b>\$0.03</b>	
<b>Threshold Return (Risk):</b>	<b>\$148,056</b>	<b>\$0.07</b>	
<b>TOTAL SITE DEVELOPMENT COSTS:</b>	<b>\$1,093,620</b>	<b>\$0.55</b>	
INCOME/SALE ANALYSIS			
Estimated Value at Development Ready:	\$12,893,168	\$6.43	
MARKET FEASIBILITY ANALYSIS			
Residual Land Basis:	\$11,799,547	\$5.89	
Assumed Acquisition/Strike Price:	\$9,016,920	\$4.50	
Feasibility Gap/Surplus:	\$2,782,627	\$1.39	
<b>MARKET TIME TO FEASIBILITY:</b>	<b>-5.9 Years</b>		

#### MARGINAL IMPACTS of SITE CONSTRAINTS ON SITE FEASIBILITY

Data Not Applicable. The Site does not have a Market Viability Gap

### Economic and Fiscal Impact Analysis

FACILITY CHARACTERISTICS			
Build-Out Period:	1.0 Years		
Facility Size:	864,800 Sq. Ft.		
Investment in Real Property:	\$25,944,000		
Use Type:	W&D		
ECONOMIC IMPACT ANALYSIS FINDINGS			

#### Average Annual Construction Impacts

		Jobs	Economic Activity	Payroll
<b>Site Development (Year 1-2)</b>	Direct:	2.9	\$360,000	\$120,000
	In/Ind:	1.9	\$240,000	\$120,000
<b>Facility Construction (Year 3)</b>	Direct:	248.6	\$25,920,000	\$13,320,000
	In/Ind:	158.3	\$20,400,000	\$6,480,000

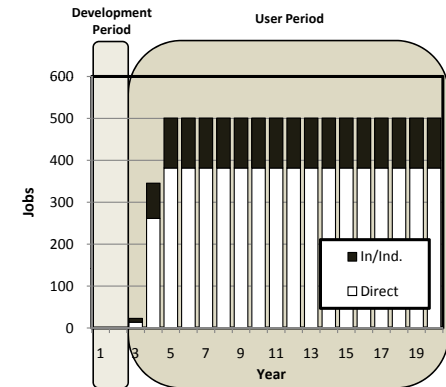
**TOTAL INVESTMENT IN LAND AND IMPROVEMENTS: \$26,800,000**

#### Total Annual Operations Impacts @ Full-Capacity

		Jobs	Economic Activity	Payroll
<b>On-going Operations (Year 4+)</b>	Direct:	382	\$27,500,000	\$17,100,000
	In/Ind:	119	\$16,100,000	\$4,900,000
	<b>Total:</b>	<b>501</b>	<b>\$43,600,000</b>	<b>\$22,000,000</b>

"When fully developed the project will have an estimated 1,004 employees on site producing \$332 million in annual economic activity. Indirect and Induced impacts would support an additional 1,395 jobs and \$216 million in economic activity."

#### ANNUAL EMPLOYMENT LEVEL (ALL IMPACTS)



### FISCAL IMPACT ANALYSIS FINDINGS

#### Annual Fiscal Impacts at Full-Capacity

	Payroll	Property
Direct:	\$1,100,000	\$900,000
In/Ind:	\$300,000	Not Available
<b>Total:</b>	<b>\$1,400,000</b>	<b>\$900,000</b>

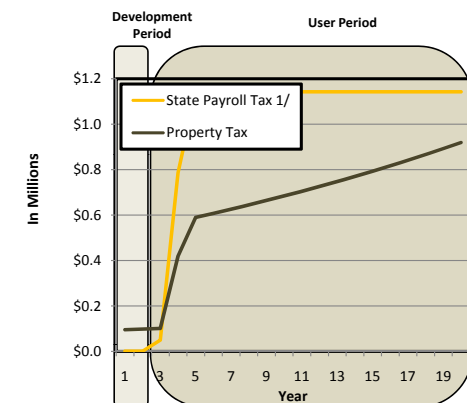
"When fully developed, the project will support \$7.9 million in payroll tax and \$2.3 million in property taxes annually."

#### Cumulative 20-Year Tax Creation

	Payroll	Property
Direct:	\$19,100,000	\$12,600,000
In/Ind:	\$5,500,000	Not Available
<b>Total:</b>	<b>\$24,600,000</b>	<b>\$12,600,000</b>

"Over a 20-year period the project will create \$91.4 million in payroll tax revenue and \$23.3 million in property tax revenue."

#### ANNUAL TAX REVENUE (DIRECT IMPACTS ONLY)



1/ Direct Impacts Only

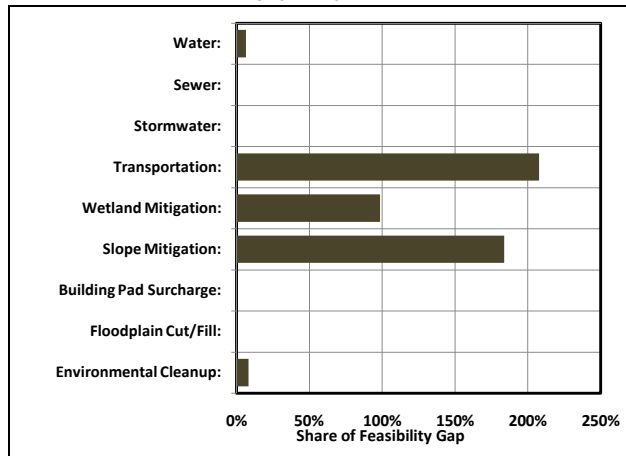
\* Impacts will not sum to equal 100% as they are not mutually exclusive.

**Site 29 Clackamas County**  
Clackamas, Oregon  
General Manufacturing

**Market Feasibility Analysis**

PHYSICAL CHARACTERISTICS			
Site Size:		61.93 Acres	
Net Developable Size:		40 Acres	
SITE DEVELOPMENT PARAMETERS			
Site Development Timeline:		21 Months	
		\$	\$/sq. ft.
Hard Costs:		\$1,603,000	\$0.92
Off-Site	Water:	\$20,000	\$0.01
	Sewer:	\$0	\$0.00
	Stormwater:	\$0	\$0.00
	Transportation:	\$665,000	\$0.38
On Site	Wetland Mitigation:	\$308,000	\$0.18
	Slope Mitigation:	\$585,000	\$0.34
	Building Pad Surcharge:	\$0	\$0.00
	Floodplain Cut/Fill Mitigation:	\$0	\$0.00
	Environmental Cleanup:	\$25,000	\$0.01
Soft Costs:		\$320,600	\$0.18
Time Costs:		\$57,371	\$0.03
Threshold Return (Risk):		\$263,400	\$0.15
TOTAL SITE DEVELOPMENT COSTS:		\$2,244,371	\$1.29
INCOME/SALE ANALYSIS			
Estimated Value at Development Ready:		\$9,640,047	\$5.53
MARKET FEASIBILITY ANALYSIS			
Residual Land Basis:		\$7,395,676	\$4.24
Assumed Acquisition/Strike Price:		\$7,840,800	\$4.50
Feasibility Gap/Surplus:		(\$445,124)	(\$0.26)
MARKET TIME TO FEASIBILITY:			3.3 Years

**MARGINAL IMPACTS of SITE CONSTRAINTS  
ON SITE FEASIBILITY**



\* Impacts will not sum to equal 100% as they are not mutually exclusive.

**Economic and Fiscal Impact Analysis**

FACILITY CHARACTERISTICS			
Build-Out Period:	13.0 Years		
Facility Size:	472,500 Sq. Ft.		
Investment in Real Property:	\$39,690,000		
Use Type:	General Manufacturing		

**ECONOMIC IMPACT ANALYSIS FINDINGS**

**Average Annual Construction Impacts**

		Economic		
		Jobs	Activity	Payroll
<b>Site Development (Year 1-2)</b>	Direct:	8.3	\$1,080,000	\$480,000
	In/Ind:	5.4	\$720,000	\$240,000
<b>Facility Construction (Year 3-15)</b>	Direct:	29.3	\$3,000,000	\$1,560,000
	In/Ind:	18.6	\$2,400,000	\$720,000

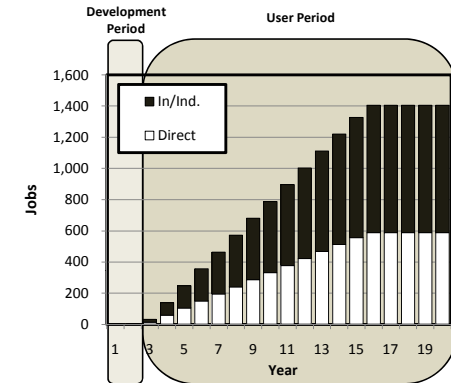
**TOTAL INVESTMENT IN LAND AND IMPROVEMENTS: \$41,600,000**

**Total Annual Operations Impacts @ Full-Capacity**

		Economic		
		Jobs	Activity	Payroll
<b>On-going Operations (Year 16+)</b>	Direct:	588	\$194,400,000	\$26,600,000
	In/Ind:	817	\$126,600,000	\$42,700,000
	<b>Total:</b>	<b>1,405</b>	<b>\$321,000,000</b>	<b>\$69,300,000</b>

"When fully developed the project will have an estimated 1,004 employees on site producing \$332 million in annual economic activity. Indirect and Induced impacts would support an additional 1,395 jobs and \$216 million in economic activity."

**ANNUAL EMPLOYMENT LEVEL (ALL IMPACTS)**



**FISCAL IMPACT ANALYSIS FINDINGS**

**ANNUAL TAX REVENUE (DIRECT IMPACTS ONLY)**

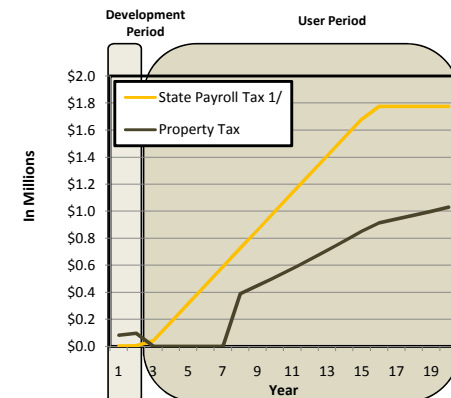
Annual Fiscal Impacts at Full-Capacity			
		Payroll	Property
Direct:	\$1,800,000	\$1,800,000	\$1,000,000
In/Ind:	\$2,900,000	\$2,900,000	Not Available
<b>Total:</b>	<b>\$4,700,000</b>	<b>\$4,700,000</b>	<b>\$1,000,000</b>

"When fully developed, the project will support \$7.9 million in payroll tax and \$2.3 million in property taxes annually."

**Cumulative 20-Year Tax Creation**

		Payroll	Property
Direct:	\$20,100,000	\$20,100,000	\$10,000,000
In/Ind:	\$32,100,000	\$32,100,000	Not Available
<b>Total:</b>	<b>\$52,200,000</b>	<b>\$52,200,000</b>	<b>\$10,000,000</b>

"Over a 20-year period the project will create \$91.4 million in payroll tax revenue and \$23.3 million in property tax revenue."



1/ Direct Impacts Only

## Site 55-56 EVERGREEN

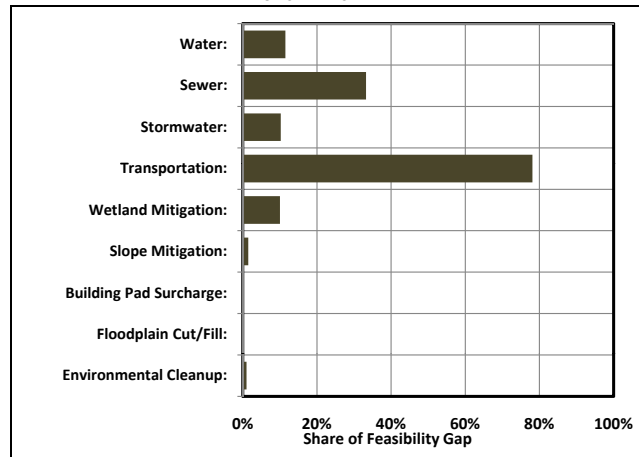
Hillsboro, Oregon

Globally Scaled Clean Tech

### Market Feasibility Analysis

PHYSICAL CHARACTERISTICS			
Site Size:	116.6 Acres		
Net Developable Size:	116.6 Acres		
SITE DEVELOPMENT PARAMETERS			
Site Development Timeline:	33 Months		
	\$	\$/sq. ft.	
<b>Hard Costs:</b>	<b>\$13,095,800</b>	<b>\$2.58</b>	
Off-Site	Water:	\$1,032,000	\$0.20
	Sewer:	\$2,986,800	\$0.59
	Stormwater:	\$919,500	\$0.18
	Transportation:	\$7,070,000	\$1.39
On Site	Wetland Mitigation:	\$875,000	\$0.17
	Slope Mitigation:	\$130,000	\$0.03
	Building Pad Surcharge:	\$0	\$0.00
	Floodplain Cut/Fill Mitigation:	\$0	\$0.00
	Environmental Cleanup:	\$82,500	\$0.02
<b>Soft Costs:</b>	<b>\$2,619,160</b>	<b>\$0.52</b>	
<b>Time Costs:</b>	<b>\$784,105</b>	<b>\$0.15</b>	
<b>Threshold Return (Risk):</b>	<b>\$2,940,000</b>	<b>\$0.58</b>	
<b>TOTAL SITE DEVELOPMENT COSTS:</b>	<b>\$19,439,064</b>	<b>\$3.83</b>	
INCOME/SALE ANALYSIS			
Estimated Value at Development Ready:	\$28,955,449	\$5.70	
MARKET FEASIBILITY ANALYSIS			
Residual Land Basis:	\$9,516,385	\$1.87	
Assumed Acquisition/Strike Price:	\$22,855,932	\$4.50	
Feasibility Gap/Surplus:	(\$13,339,547)	(\$2.63)	
<b>MARKET TIME TO FEASIBILITY:</b>	<b>15.6 Years</b>		

#### MARGINAL IMPACTS of SITE CONSTRAINTS ON SITE FEASIBILITY



\* Impacts will not sum to equal 100% as they are not mutually exclusive.

### Economic and Fiscal Impact Analysis

FACILITY CHARACTERISTICS			
Build-Out Period:	14.0 Years		
Facility Size:	1,692,000 Sq. Ft.		
Investment in Real Property:	\$173,712,000		
Use Type:	Clean Tech		
ECONOMIC IMPACT ANALYSIS FINDINGS			

#### Average Annual Construction Impacts

		Jobs	Economic Activity	Payroll
Site Development (Year 1-3)	Direct:	43.2	\$5,760,000	\$2,640,000
	In/Ind:	28.0	\$3,720,000	\$1,200,000
Facility Construction (Year 3-16)	Direct:	118.9	\$12,360,000	\$6,360,000
	In/Ind:	75.7	\$9,720,000	\$3,120,000

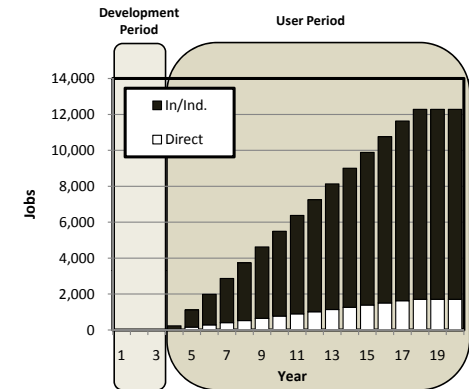
**TOTAL INVESTMENT IN LAND AND IMPROVEMENTS: \$189,400,000**

#### Total Annual Operations Impacts @ Full-Capacity

		Jobs	Economic Activity	Payroll
On-going Operations (Year 17+)	Direct:	1,714	\$1,211,300,000	\$232,100,000
	In/Ind:	10,564	\$1,592,700,000	\$516,000,000
	<b>Total:</b>	<b>12,278</b>	<b>\$2,804,000,000</b>	<b>\$748,100,000</b>

"When fully developed the project will have an estimated 1,714 employees on site producing \$1.2 billion in annual economic activity. Indirect and Induced impacts would support an additional 10,564 jobs and \$1.6 billion in economic activity."

#### ANNUAL EMPLOYMENT LEVEL (ALL IMPACTS)



### FISCAL IMPACT ANALYSIS FINDINGS

#### Annual Fiscal Impacts at Full-Capacity

	Payroll	Property
Direct:	\$15,600,000	\$4,300,000
In/Ind:	\$34,400,000	Not Available
<b>Total:</b>	<b>\$50,000,000</b>	<b>\$4,300,000</b>

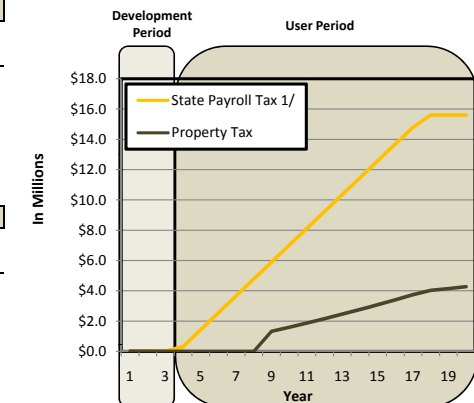
"When fully developed, the project will support \$50 million in payroll tax and \$4.3 million in property taxes annually."

#### Cumulative 20-Year Tax Creation

	Payroll	Property
Direct:	\$152,600,000	\$35,000,000
In/Ind:	\$335,900,000	Not Available
<b>Total:</b>	<b>\$488,500,000</b>	<b>\$35,000,000</b>

"Over a 20-year period the project will create \$488 million in payroll tax revenue and \$35 million in property tax revenue."

#### ANNUAL TAX REVENUE (DIRECT IMPACTS ONLY)



1/ Direct Impacts Only

## Site 62 Rock Creek

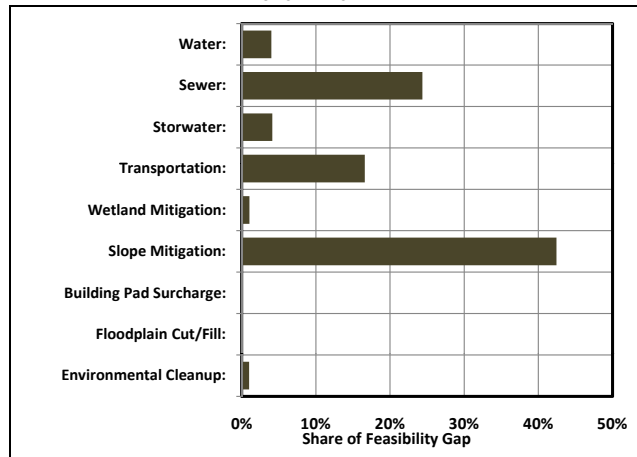
Happy Valley, OR

High-Tech User

### Market Feasibility Analysis

PHYSICAL CHARACTERISTICS			
Site Size:		40.83 Acres	
Net Developable Size:		34.18 Acres	
SITE DEVELOPMENT PARAMETERS			
Site Development Timeline:		30 Months	
		\$	\$/sq. ft.
Hard Costs:		\$8,218,500	\$5.52
Off-Site	Water:	\$350,000	\$0.24
	Sewer:	\$2,172,000	\$1.46
	Stormwater:	\$360,000	\$0.24
	Transportation:	\$1,480,000	\$0.99
On Site	Wetland Mitigation:	\$88,000	\$0.06
	Slope Mitigation:	\$3,686,000	\$2.48
	Building Pad Surcharge:	\$0	\$0.00
	Floodplain Cut/Fill Mitigation:	\$0	\$0.00
	Environmental Cleanup:	\$82,500	\$0.06
Soft Costs:		\$1,643,700	\$1.10
Time Costs:		\$578,480	\$0.39
Threshold Return (Risk):		\$1,725,885	\$1.16
TOTAL SITE DEVELOPMENT COSTS:		\$12,166,565	\$8.17
INCOME/SALE ANALYSIS			
Estimated Value at Development Ready:		\$5,857,121	\$3.93
MARKET FEASIBILITY ANALYSIS			
Residual Land Basis:		(\$6,309,443)	(\$4.24)
Assumed Acquisition/Strike Price:		\$6,699,964	\$4.50
Feasibility Gap/Surplus:		(\$13,009,407)	(\$8.74)
MARKET TIME TO FEASIBILITY:		42.1 Years	

#### MARGINAL IMPACTS of SITE CONSTRAINTS ON SITE FEASIBILITY



\* Impacts will not sum to equal 100% as they are not mutually exclusive.

### Economic and Fiscal Impact Analysis

FACILITY CHARACTERISTICS			
Build-Out Period:		9.0 Years	
Facility Size:		580,200 Sq. Ft.	
Investment in Real Property:		\$62,118,000	
Use Type:		High-Tech	

#### ECONOMIC IMPACT ANALYSIS FINDINGS

##### Average Annual Construction Impacts

		Jobs	Economic Activity	Payroll
Site Development (Year 1-3)	Direct:	29.8	\$3,960,000	\$1,800,000
	In/Ind:	19.4	\$2,520,000	\$840,000
Facility Construction (Year 3-12)	Direct:	66.1	\$6,960,000	\$3,600,000
	In/Ind:	42.1	\$5,400,000	\$1,680,000

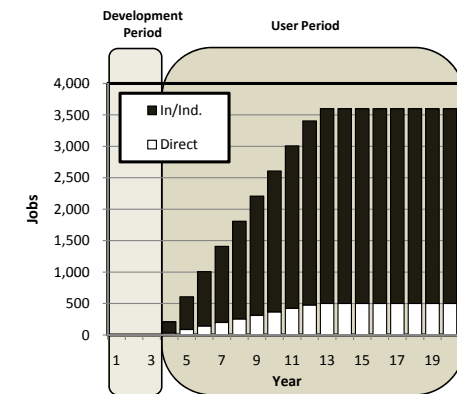
**TOTAL INVESTMENT IN LAND AND IMPROVEMENTS: \$72,000,000**

##### Total Annual Operations Impacts @ Full-Capacity

		Jobs	Economic Activity	Payroll
On-going Operations (Year 13+)	Direct:	502	\$355,100,000	\$68,000,000
	In/Ind:	3,097	\$466,900,000	\$151,300,000
	<b>Total:</b>	<b>3,599</b>	<b>\$822,000,000</b>	<b>\$219,300,000</b>

"When fully developed the project will have an estimated 502 employees on site producing \$355 million in annual economic activity. Indirect and Induced impacts would support an additional 3,097 jobs and \$467 million in economic activity."

#### ANNUAL EMPLOYMENT LEVEL (ALL IMPACTS)



#### FISCAL IMPACT ANALYSIS FINDINGS

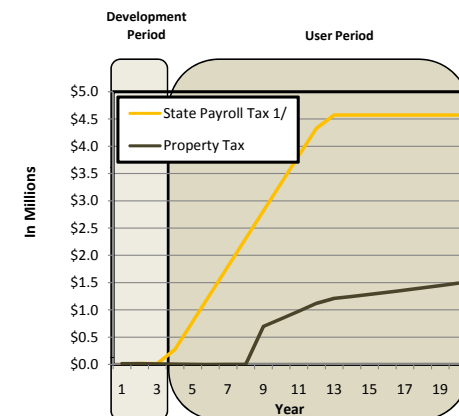
##### ANNUAL TAX REVENUE (DIRECT IMPACTS ONLY)

Annual Fiscal Impacts at Full-Capacity		
	Payroll	Property
Direct:	\$4,600,000	\$1,500,000
In/Ind:	\$10,100,000	Not Available
<b>Total:</b>	<b>\$14,700,000</b>	<b>\$1,500,000</b>

"When fully developed, the project will support \$14.7 million in payroll tax and \$1.5 million in property taxes annually."

Cumulative 20-Year Tax Creation		
	Payroll	Property
Direct:	\$57,400,000	\$14,400,000
In/Ind:	\$126,200,000	Not Available
<b>Total:</b>	<b>\$183,600,000</b>	<b>\$14,400,000</b>

"Over a 20-year period the project will create \$183 million in payroll tax revenue and \$14.4 million in property tax revenue."



1/ Direct Impacts Only

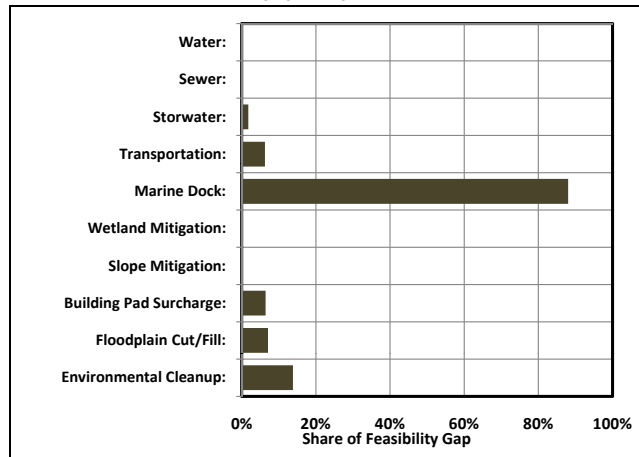


**Site 2 Time Oil**  
Portland, Oregon  
*River Dependent Heavy Manufacturing*

**Market Feasibility Analysis**

PHYSICAL CHARACTERISTICS			
Site Size:		51.7 Acres	
Net Developable Size:		39.4 Acres	
SITE DEVELOPMENT PARAMETERS			
Site Development Timeline:		72 Months	
		\$	\$/sq. ft.
Hard Costs:		\$19,155,200	\$11.16
Off-Site	Water:	\$36,000	\$0.02
	Sewer:	\$30,000	\$0.02
	Stormwater:	\$300,000	\$0.17
	Transportation:	\$1,080,000	\$0.63
	Marine Dock:	\$14,180,000	\$8.26
On Site	Wetland Mitigation:	\$0	\$0.00
	Slope Mitigation:	\$0	\$0.00
	Building Pad Surcharge:	\$1,029,600	\$0.60
	Floodplain Cut/Fill Mitigation:	\$1,745,600	\$1.02
	Environmental Cleanup:	\$754,000	\$0.44
Soft Costs:		\$3,831,040	\$2.23
Time Costs:		\$2,370,664	\$1.38
Threshold Return (Risk):		\$10,726,912	\$6.25
TOTAL SITE DEVELOPMENT COSTS:		\$36,083,816	\$21.02
INCOME/SALE ANALYSIS			
Estimated Value at Development Ready:		\$13,352,817	\$7.78
MARKET FEASIBILITY ANALYSIS			
Residual Land Basis:		(\$22,730,999)	(\$13.24)
Assumed Acquisition/Strike Price:		\$7,723,188	\$4.50
Feasibility Gap/Surplus:		(\$30,454,187)	(\$17.74)
MARKET TIME TO FEASIBILITY:		46.3 Years	

**MARGINAL IMPACTS of SITE CONSTRAINTS  
ON SITE FEASIBILITY**



\* Impacts will not sum to equal 100% as they are not mutually exclusive.

**Economic and Fiscal Impact Analysis**

FACILITY CHARACTERISTICS			
Build-Out Period:		13.0 Years	
Facility Size:		580,000 Sq. Ft.	
Investment in Real Property:		\$54,180,000	
Use Type:		General Manufacturing	

**ECONOMIC IMPACT ANALYSIS FINDINGS**

**Average Annual Construction Impacts**

		Jobs	Economic Activity	Payroll
Site Development (Year 1-6)	Direct:	7.5	\$960,000	\$480,000
	In/Ind:	4.9	\$600,000	\$240,000
Facility Construction (Year 7-19)	Direct:	39.9	\$4,200,000	\$2,160,000
	In/Ind:	25.4	\$3,240,000	\$1,080,000

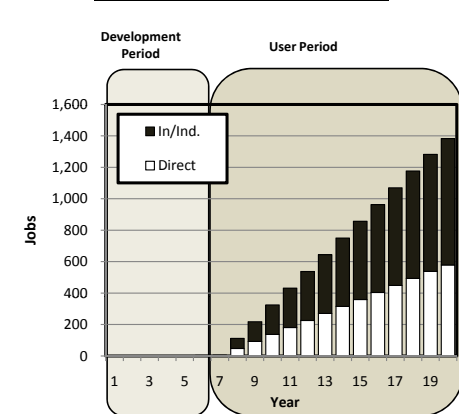
**TOTAL INVESTMENT IN LAND AND IMPROVEMENTS:** **\$77,200,000**

**Total Annual Operations Impacts @ Full-Capacity**

		Jobs	Economic Activity	Payroll
On-going Operations (Year 20+)	Direct:	579	\$191,500,000	\$26,200,000
	In/Ind:	804	\$124,700,000	\$42,100,000
	<b>Total:</b>	<b>1,384</b>	<b>\$316,200,000</b>	<b>\$68,300,000</b>

"When fully developed the project will have an estimated 579 employees on site producing \$191 million in annual economic activity. Indirect and Induced impacts would support an additional 804 jobs and \$124 million in economic activity."

**ANNUAL EMPLOYMENT LEVEL (ALL IMPACTS)**



**FISCAL IMPACT ANALYSIS FINDINGS**

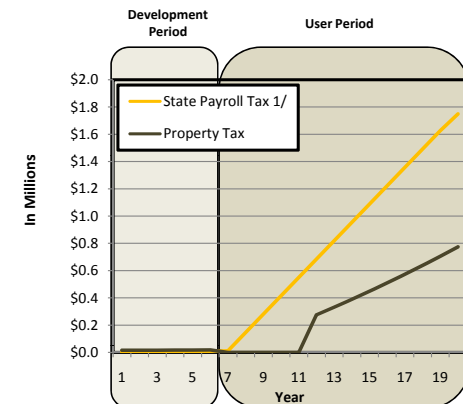
**ANNUAL TAX REVENUE (DIRECT IMPACTS ONLY)**

Annual Fiscal Impacts at Full-Capacity		
	Payroll	Property
Direct:	\$1,700,000	\$800,000
In/Ind:	\$2,800,000	Not Available
<b>Total:</b>	<b>\$4,500,000</b>	<b>\$800,000</b>

"When fully developed, the project will support \$4.5 million in payroll tax and \$800,000 in property taxes annually."

Cumulative 20-Year Tax Creation		
	Payroll	Property
Direct:	\$12,400,000	\$4,700,000
In/Ind:	\$19,700,000	Not Available
<b>Total:</b>	<b>\$32,100,000</b>	<b>\$4,700,000</b>

"Over a 20-year period the project will create \$32.1 million in payroll tax revenue and \$4.7 million in property tax revenue."



1/ Direct Impacts Only

## Site 15-16 UPS/Cereghino

Gresham, Oregon  
General Manufacturing

### Market Feasibility Analysis

PHYSICAL CHARACTERISTICS			
Site Size:		93.08 Acres	
Net Developable Size:		74.45 Acres	
SITE DEVELOPMENT PARAMETERS			
Site Development Timeline:		42 Months	
		\$	\$/sq. ft.
Hard Costs:		\$3,053,500	\$0.94
Off-Site	Water:	\$17,000	\$0.01
	Sewer:	\$40,000	\$0.01
	Stormwater:	\$0	\$0.00
	Transportation:	\$0	\$0.00
On Site	Wetland Mitigation:	\$1,387,500	\$0.43
	Slope Mitigation:	\$0	\$0.00
	Building Pad Surcharge:	\$1,594,000	\$0.49
	Floodplain Cut/Fill Mitigation:	\$0	\$0.00
	Environmental Cleanup:	\$15,000	\$0.00
Soft Costs:		\$610,700	\$0.19
Time Costs:		\$383,893	\$0.12
Threshold Return (Risk):		\$824,445	\$0.25
TOTAL SITE DEVELOPMENT COSTS:		\$4,872,538	\$1.50
INCOME/SALE ANALYSIS			
Estimated Value at Development Ready:		\$21,609,655	\$6.66
MARKET FEASIBILITY ANALYSIS			
Residual Land Basis:		\$16,737,117	\$5.16
Assumed Acquisition/Strike Price:		\$14,593,689	\$4.50
Feasibility Gap/Surplus:		\$2,143,428	\$0.66
MARKET TIME TO FEASIBILITY:		0.0 Years	

#### MARGINAL IMPACTS OF SITE CONSTRAINTS ON SITE FEASIBILITY

Data Not Applicable. The Site does not have a Market Viability Gap

### Economic and Fiscal Impact Analysis

FACILITY CHARACTERISTICS	
Build-Out Period:	16.0 Years
Facility Size:	1,060,000 Sq. Ft.
Investment in Real Property:	\$98,700,000
Use Type:	General Manufacturing
ECONOMIC IMPACT ANALYSIS FINDINGS	

#### Average Annual Construction Impacts

		Jobs	Economic Activity	Payroll
Site Development (Year 1-4)	Direct:	7.9	\$1,080,000	\$480,000
	In/Ind:	5.1	\$720,000	\$240,000
Facility Construction (Year 4-19)	Direct:	59.1	\$6,120,000	\$3,120,000
	In/Ind:	37.6	\$4,800,000	\$1,560,000

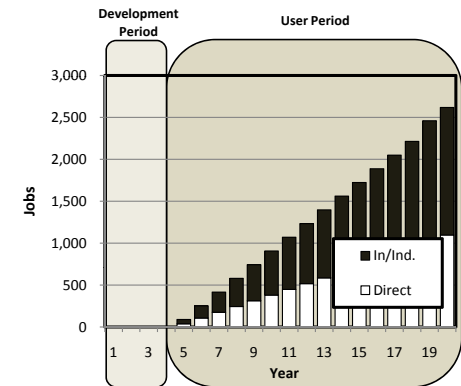
TOTAL INVESTMENT IN LAND AND IMPROVEMENTS: \$102,400,000

#### Total Annual Operations Impacts @ Full-Capacity

		Jobs	Economic Activity	Payroll
On-going Operations (Year 20+)	Direct:	1,094	\$361,800,000	\$49,600,000
	In/Ind:	1,520	\$235,700,000	\$79,500,000
	Total:	2,615	\$597,500,000	\$129,100,000

"When fully developed the project will have an estimated 1,094 employees on site producing \$361 million in annual economic activity. Indirect and Induced impacts would support an additional 1,520 jobs and \$235 million in economic activity."

#### ANNUAL EMPLOYMENT LEVEL (ALL IMPACTS)



#### FISCAL IMPACT ANALYSIS FINDINGS

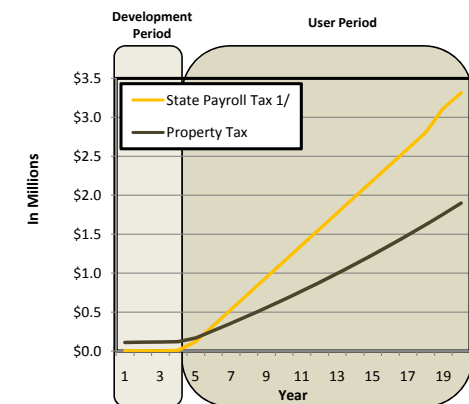
#### ANNUAL TAX REVENUE (DIRECT IMPACTS ONLY)

Annual Fiscal Impacts at Full-Capacity		
	Payroll	Property
Direct:	\$3,300,000	\$1,900,000
In/Ind:	\$5,300,000	Not Available
Total:	\$8,600,000	\$1,900,000

"When fully developed, the project will support \$8.6 million in payroll tax and \$1.9 million in property taxes annually."

Cumulative 20-Year Tax Creation		
	Payroll	Property
Direct:	\$26,900,000	\$16,100,000
In/Ind:	\$42,900,000	Not Available
Total:	\$69,800,000	\$16,100,000

"Over a 20-year period the project will create \$69.8 million in payroll tax revenue and \$16.1 million in property tax revenue."



1/ Direct Impacts Only

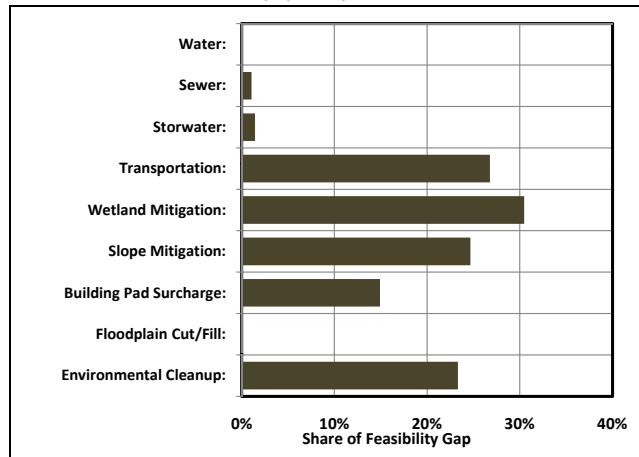
\* Impacts will not sum to equal 100% as they are not mutually exclusive.

**Site 19 Port TRIP**  
**Troutdale, Oregon**  
Warehouse & Distribution

**Market Feasibility Analysis**

PHYSICAL CHARACTERISTICS			
Site Size:		53.9 Acres	
Net Developable Size:		53.9 Acres	
SITE DEVELOPMENT PARAMETERS			
Site Development Timeline:		75 Months	
		\$	\$/sq. ft.
Hard Costs:		\$20,237,250	\$8.62
Off-Site	Water:	\$14,000	\$0.01
	Sewer:	\$187,500	\$0.08
	Stormwater:	\$255,000	\$0.11
	Transportation:	\$4,825,000	\$2.06
On Site	Wetland Mitigation:	\$5,494,750	\$2.34
	Slope Mitigation:	\$4,750,000	\$2.02
	Building Pad Surcharge:	\$1,686,000	\$0.72
	Floodplain Cut/Fill Mitigation:	\$0	\$0.00
	Environmental Cleanup:	\$3,025,000	\$1.29
Soft Costs:		\$4,047,450	\$1.72
Time Costs:		\$4,827,922	\$2.06
Threshold Return (Risk):		\$11,730,625	\$5.00
TOTAL SITE DEVELOPMENT COSTS:		\$40,843,247	\$17.40
INCOME/SALE ANALYSIS			
Estimated Value at Development Ready:		\$14,157,131	\$6.03
MARKET FEASIBILITY ANALYSIS			
Residual Land Basis:		(\$26,686,116)	(\$11.37)
Assumed Acquisition/Strike Price:		\$10,565,478	\$4.50
Feasibility Gap/Surplus:		(\$37,251,594)	(\$15.87)
MARKET TIME TO FEASIBILITY:		50.0 Years	

**MARGINAL IMPACTS of SITE CONSTRAINTS**  
**ON SITE FEASIBILITY**



\* Impacts will not sum to equal 100% as they are not mutually exclusive.

**Economic and Fiscal Impact Analysis**

FACILITY CHARACTERISTICS			
Build-Out Period:		1.0 Years	
Facility Size:		1,020,000 Sq. Ft.	
Investment in Real Property:		\$30,600,000	
Use Type:		W&D	

**ECONOMIC IMPACT ANALYSIS FINDINGS**

**Average Annual Construction Impacts**

		Jobs	Economic Activity	Payroll
<b>Site Development (Year 1-6)</b>	Direct:	29.4	\$3,840,000	\$1,800,000
	In/Ind:	19.1	\$2,520,000	\$840,000
<b>Facility Construction (Year 7)</b>	Direct:	293.3	\$30,600,000	\$15,720,000
	In/Ind:	186.7	\$24,000,000	\$7,680,000

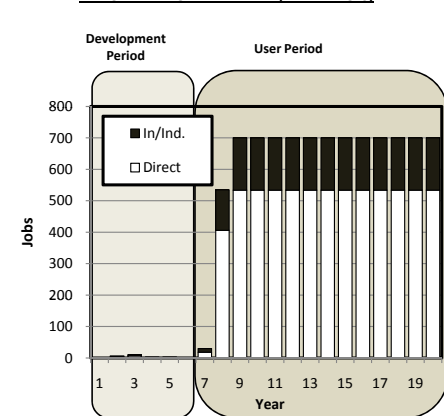
**TOTAL INVESTMENT IN LAND AND IMPROVEMENTS:** **\$54,900,000**

**Total Annual Operations Impacts @ Full-Capacity**

		Jobs	Economic Activity	Payroll
<b>On-going Operations (Year 8+)</b>	Direct:	534	\$38,500,000	\$24,000,000
	In/Ind:	166	\$22,500,000	\$6,900,000
	<b>Total:</b>	<b>700</b>	<b>\$61,000,000</b>	<b>\$30,900,000</b>

"When fully developed the project will have an estimated 534 employees on site producing \$38.5 million in annual economic activity. Indirect and Induced impacts would support an additional 166 jobs and \$22.5 million in economic activity."

**ANNUAL EMPLOYMENT LEVEL (ALL IMPACTS)**



**FISCAL IMPACT ANALYSIS FINDINGS**

**Annual Fiscal Impacts at Full-Capacity**

		Payroll	Property
<b>Direct:</b>		\$1,600,000	\$600,000
	<b>In/Ind:</b>	\$500,000	Not Available
	<b>Total:</b>	<b>\$2,100,000</b>	<b>\$600,000</b>

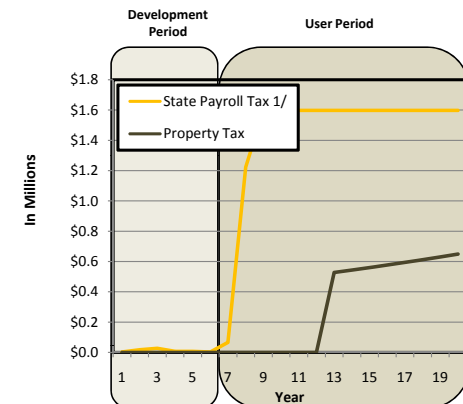
"When fully developed, the project will support \$2.1 million in payroll tax and \$600,000 in property taxes annually."

**Cumulative 20-Year Tax Creation**

		Payroll	Property
<b>Direct:</b>		\$20,500,000	\$4,700,000
	<b>In/Ind:</b>	\$5,900,000	Not Available
	<b>Total:</b>	<b>\$26,400,000</b>	<b>\$4,700,000</b>

"Over a 20-year period the project will create \$26.4 million in payroll tax revenue and \$4.7 million in property tax revenue."

**ANNUAL TAX REVENUE (DIRECT IMPACTS ONLY)**



1/ Direct Impacts Only

## Site 24 Jean Johnson

Gresham, Oregon

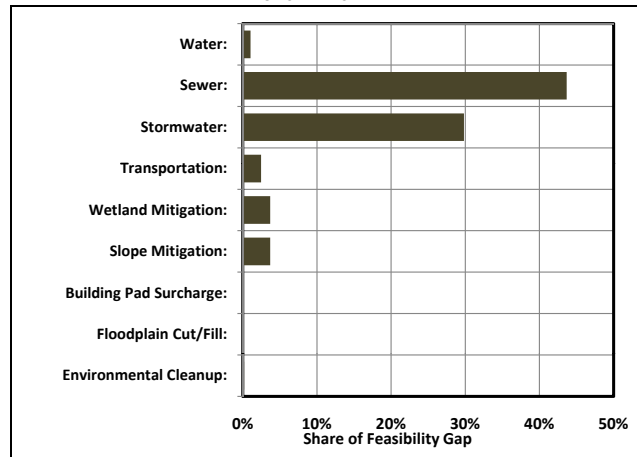
High-Tech User

### Market Feasibility Analysis

PHYSICAL CHARACTERISTICS			
Site Size:	37.17 Acres		
Net Developable Size:	33.82 Acres		
SITE DEVELOPMENT PARAMETERS			
Site Development Timeline:	42 Months		
	\$	\$/sq. ft.	
<b>Hard Costs:</b>	<b>\$8,677,200</b>	<b>\$5.89</b>	
Off-Site	Water:	\$100,200	\$0.07
	Sewer:	\$4,268,000	\$2.90
	Stormwater:	\$2,914,000	\$1.98
	Transportation:	\$250,000	\$0.17
On Site	Wetland Mitigation:	\$788,000	\$0.53
	Slope Mitigation:	\$342,000	\$0.23
	Building Pad Surcharge:	\$0	\$0.00
	Floodplain Cut/Fill Mitigation:	\$0	\$0.00
	Environmental Cleanup:	\$15,000	\$0.01
Soft Costs:	\$1,735,440	\$1.18	
Time Costs:	\$673,634	\$0.46	
Threshold Return (Risk):	\$2,342,844	\$1.59	
<b>TOTAL SITE DEVELOPMENT COSTS:</b>	<b>\$13,429,118</b>	<b>\$9.12</b>	
INCOME/SALE ANALYSIS			
Estimated Value at Development Ready:	\$4,908,251	\$3.33	
MARKET FEASIBILITY ANALYSIS			
Residual Land Basis:	(\$8,520,867)	(\$5.78)	
Assumed Acquisition/Strike Price:	\$6,629,396	\$4.50	
Feasibility Gap/Surplus:	(\$15,150,263)	(\$10.28)	
<b>MARKET TIME TO FEASIBILITY:</b>	<b>51.2 Years</b>		

#### MARGINAL IMPACTS of SITE CONSTRAINTS

##### ON SITE FEASIBILITY



\* Impacts will not sum to equal 100% as they are not mutually exclusive.

### Economic and Fiscal Impact Analysis

FACILITY CHARACTERISTICS			
Build-Out Period:	9.0 Years		
Facility Size:	620,000 Sq. Ft.		
Investment in Real Property:	\$59,856,000		
Use Type:	High Tech		

#### ECONOMIC IMPACT ANALYSIS FINDINGS

##### Average Annual Construction Impacts

		Jobs	Economic Activity	Payroll
Site Development (Year 1-4)	Direct:	22.5	\$3,000,000	\$1,440,000
	In/Ind:	14.6	\$1,920,000	\$600,000
Facility Construction (Year 4-12)	Direct:	63.7	\$6,600,000	\$3,480,000
	In/Ind:	40.6	\$5,160,000	\$1,680,000

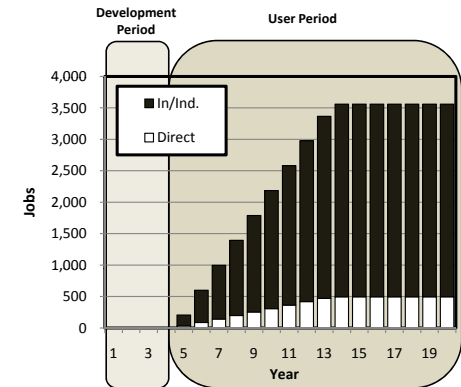
**TOTAL INVESTMENT IN LAND AND IMPROVEMENTS: \$70,300,000**

##### Total Annual Operations Impacts @ Full-Capacity

		Jobs	Economic Activity	Payroll
On-going Operations (Year 13+)	Direct:	497	\$351,300,000	\$67,300,000
	In/Ind:	3,064	\$462,000,000	\$149,700,000
	<b>Total:</b>	<b>3,561</b>	<b>\$813,300,000</b>	<b>\$217,000,000</b>

"When fully developed the project will have an estimated 497 employees on site producing \$351 million in annual economic activity. Indirect and Induced impacts would support an additional 3,095 jobs and \$462 million in economic activity."

##### ANNUAL EMPLOYMENT LEVEL (ALL IMPACTS)



#### FISCAL IMPACT ANALYSIS FINDINGS

##### Annual Fiscal Impacts at Full-Capacity

	Payroll	Property
Direct:	\$4,500,000	\$1,100,000
In/Ind:	\$10,000,000	Not Available
<b>Total:</b>	<b>\$14,500,000</b>	<b>\$1,100,000</b>

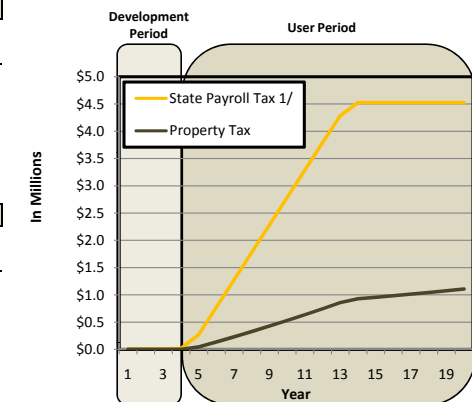
"When fully developed, the project will support \$14.5 million in payroll tax and \$1.1 million in property taxes annually."

##### Cumulative 20-Year Tax Creation

	Payroll	Property
Direct:	\$52,200,000	\$11,000,000
In/Ind:	\$114,900,000	Not Available
<b>Total:</b>	<b>\$167,100,000</b>	<b>\$11,000,000</b>

"Over a 20-year period the project will create \$167 million in payroll tax revenue and \$11 million in property tax revenue."

##### ANNUAL TAX REVENUE (DIRECT IMPACTS ONLY)



1/ Direct Impacts Only

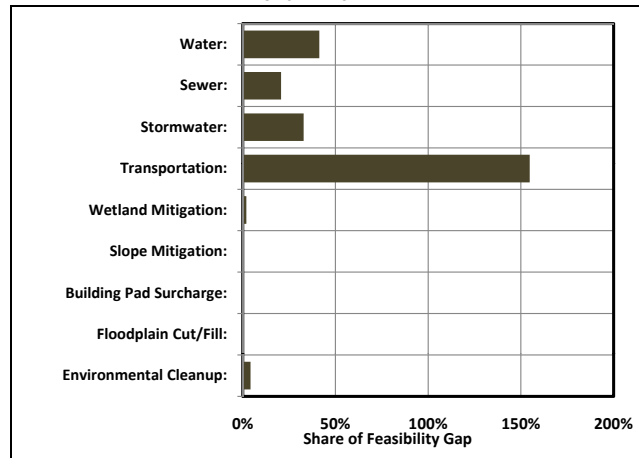


**Site 33 Coffee Creek**  
Wilsonville, Oregon  
Business Park

**Market Feasibility Analysis**

PHYSICAL CHARACTERISTICS		
Site Size:	85.23 Acres	
Net Developable Size:	68.33 Acres	
SITE DEVELOPMENT PARAMETERS		
Site Development Timeline:	24 Months	
	\$	\$/sq. ft.
<b>Hard Costs:</b>	<b>\$6,452,500</b>	<b>\$2.17</b>
<b>Off-Site</b>	Water:	\$1,040,000 \$0.35
	Sewer:	\$520,000 \$0.17
	Stormwater:	\$826,500 \$0.28
	Transportation:	\$3,920,000 \$1.32
<b>On Site</b>	Wetland Mitigation:	\$46,000 \$0.02
	Slope Mitigation:	\$0 \$0.00
	Building Pad Surcharge:	\$0 \$0.00
	Floodplain Cut/Fill Mitigation:	\$0 \$0.00
	Environmental Cleanup:	\$100,000 \$0.03
<b>Soft Costs:</b>	<b>\$1,290,500</b>	<b>\$0.43</b>
<b>Time Costs:</b>	<b>\$241,432</b>	<b>\$0.08</b>
<b>Threshold Return (Risk):</b>	<b>\$1,161,450</b>	<b>\$0.39</b>
<b>TOTAL SITE DEVELOPMENT COSTS:</b>	<b>\$9,145,882</b>	<b>\$3.07</b>
INCOME/SALE ANALYSIS		
Estimated Value at Development Ready:	\$18,961,631	\$6.37
MARKET FEASIBILITY ANALYSIS		
Residual Land Basis:	\$9,815,749	\$3.30
Assumed Acquisition/Strike Price:	\$13,394,047	\$4.50
Feasibility Gap/Surplus:	(\$3,578,298)	(\$1.20)
<b>MARKET TIME TO FEASIBILITY:</b>	<b>7.9 Years</b>	

**MARGINAL IMPACTS of SITE CONSTRAINTS  
ON SITE FEASIBILITY**



\* Impacts will not sum to equal 100% as they are not mutually exclusive.

**Economic and Fiscal Impact Analysis**

FACILITY CHARACTERISTICS		
Build-Out Period:	12.0 Years	
Facility Size:	1,073,800 Sq. Ft.	
Investment in Real Property:	\$87,592,800	
Use Type:	General Manufacturing	

**ECONOMIC IMPACT ANALYSIS FINDINGS**

**Average Annual Construction Impacts**

		Jobs	Economic Activity	Payroll
<b>Site Development (Year 1-2)</b>	Direct:	29.3	\$3,840,000	\$1,800,000
	In/Ind:	19.0	\$2,520,000	\$840,000
<b>Facility Construction (Year 3-14)</b>	Direct:	70.0	\$7,320,000	\$3,720,000
	In/Ind:	44.5	\$5,760,000	\$1,800,000

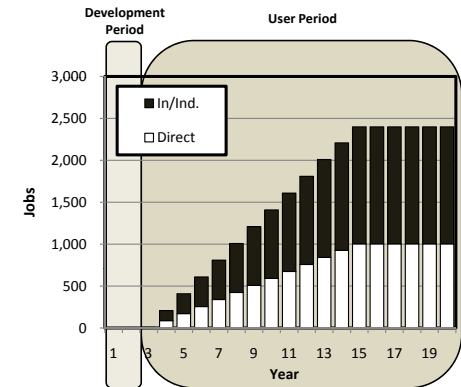
**TOTAL INVESTMENT IN LAND AND IMPROVEMENTS: \$95,300,000**

**Total Annual Operations Impacts @ Full-Capacity**

		Jobs	Economic Activity	Payroll
<b>On-going Operations (Year 15+)</b>	Direct:	1,004	\$332,100,000	\$45,500,000
	In/Ind:	1,395	\$216,300,000	\$73,000,000
	<b>Total:</b>	<b>2,400</b>	<b>\$548,400,000</b>	<b>\$118,500,000</b>

"When fully developed the project will have an estimated 1,004 employees on site producing \$332 million in annual economic activity. Indirect and Induced impacts would support an additional 1,395 jobs and \$216 million in economic activity."

**ANNUAL EMPLOYMENT LEVEL (ALL IMPACTS)**



**FISCAL IMPACT ANALYSIS FINDINGS**

**Annual Fiscal Impacts at Full-Capacity**

	Payroll	Property
Direct:	\$3,000,000	\$1,900,000
In/Ind:	\$4,900,000	Not Available
<b>Total:</b>	<b>\$7,900,000</b>	<b>\$1,900,000</b>

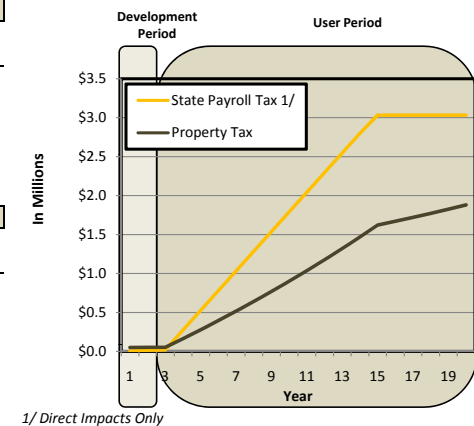
"When fully developed, the project will support \$7.9 million in payroll tax and \$2.3 million in property taxes annually."

**Cumulative 20-Year Tax Creation**

	Payroll	Property
Direct:	\$35,100,000	\$19,300,000
In/Ind:	\$56,200,000	Not Available
<b>Total:</b>	<b>\$91,300,000</b>	<b>\$19,300,000</b>

"Over a 20-year period the project will create \$91.4 million in payroll tax revenue and \$23.3 million in property tax revenue."

**ANNUAL TAX REVENUE (DIRECT IMPACTS ONLY)**



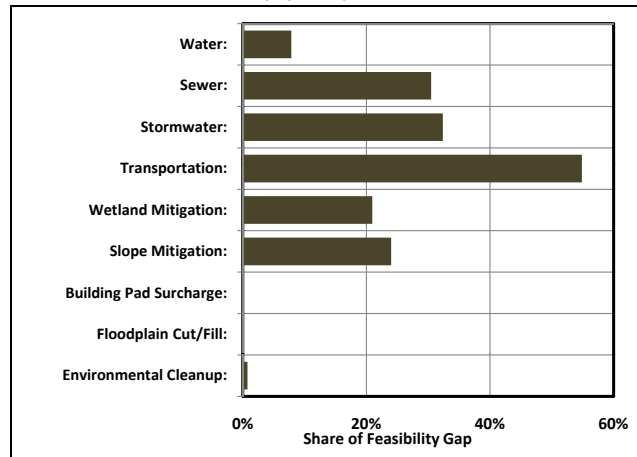
1/ Direct Impacts Only

**Site 37(a) Orr Family A**  
 Sherwood, Oregon  
 General Manufacturing

**Market Feasibility Analysis**

PHYSICAL CHARACTERISTICS		
Site Size:	46.36 Acres	
Net Developable Size:	42.84 Acres	
SITE DEVELOPMENT PARAMETERS		
Site Development Timeline:	36 Months	
	\$	\$/sq. ft.
<b>Hard Costs:</b>	<b>\$4,501,750</b>	<b>\$2.41</b>
<b>Off-Site</b>	Water:	\$207,000 \$0.11
	Sewer:	\$805,000 \$0.43
	Stormwater:	\$855,000 \$0.46
	Transportation:	\$1,480,000 \$0.79
<b>On Site</b>	Wetland Mitigation:	\$525,000 \$0.28
	Slope Mitigation:	\$611,000 \$0.33
	Building Pad Surcharge:	\$0 \$0.00
	Floodplain Cut/Fill Mitigation:	\$0 \$0.00
	Environmental Cleanup:	\$18,750 \$0.01
<b>Soft Costs:</b>	<b>\$900,350</b>	<b>\$0.48</b>
<b>Time Costs:</b>	<b>\$322,648</b>	<b>\$0.17</b>
<b>Threshold Return (Risk):</b>	<b>\$1,080,420</b>	<b>\$0.58</b>
<b>TOTAL SITE DEVELOPMENT COSTS:</b>	<b>\$6,805,168</b>	<b>\$3.65</b>
INCOME/SALE ANALYSIS		
Estimated Value at Development Ready:	\$11,228,914	\$6.02
MARKET FEASIBILITY ANALYSIS		
Residual Land Basis:	\$4,423,746	\$2.37
Assumed Acquisition/Strike Price:	\$8,397,497	\$4.50
Feasibility Gap/Surplus:	(\$3,973,751)	(\$2.13)
<b>MARKET TIME TO FEASIBILITY:</b>	<b>13.3 Years</b>	

**MARGINAL IMPACTS of SITE CONSTRAINTS  
ON SITE FEASIBILITY**



\* Impacts will not sum to equal 100% as they are not mutually exclusive.

**Economic and Fiscal Impact Analysis**

FACILITY CHARACTERISTICS	
Build-Out Period:	15.0 Years
Facility Size:	789,500 Sq. Ft.
Investment in Real Property:	\$73,518,000
Use Type:	General Manufacturing
ECONOMIC IMPACT ANALYSIS FINDINGS	

**Average Annual Construction Impacts**

		Jobs	Economic Activity	Payroll
<b>Site Development (Year 1-3)</b>	Direct:	13.6	\$1,800,000	\$840,000
	In/Ind:	8.8	\$1,200,000	\$360,000
<b>Facility Construction (Year 4-18)</b>	Direct:	47.0	\$4,920,000	\$2,520,000
	In/Ind:	29.9	\$3,840,000	\$1,200,000

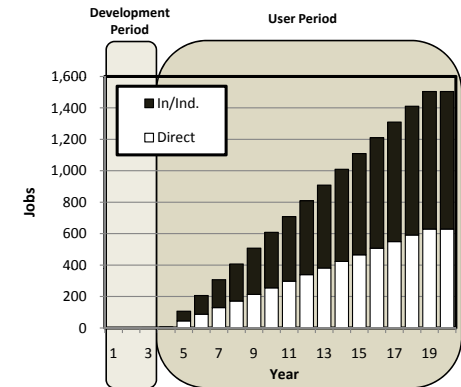
**TOTAL INVESTMENT IN LAND AND IMPROVEMENTS: \$78,900,000**

**Total Annual Operations Impacts @ Full-Capacity**

		Jobs	Economic Activity	Payroll
<b>On-going Operations (Year 19+)</b>	Direct:	630	\$208,200,000	\$28,500,000
	In/Ind:	875	\$135,600,000	\$45,700,000
	<b>Total:</b>	<b>1,504</b>	<b>\$343,800,000</b>	<b>\$74,200,000</b>

"When fully developed the project will have an estimated 630 employees on site producing \$208 million in annual economic activity. Indirect and induced impacts would support an additional 875 jobs and \$135 million in economic activity."

**ANNUAL EMPLOYMENT LEVEL (ALL IMPACTS)**



**FISCAL IMPACT ANALYSIS FINDINGS**

**Annual Fiscal Impacts at Full-Capacity**

	Payroll	Property
Direct:	\$1,900,000	\$1,400,000
In/Ind:	\$3,100,000	Not Available
<b>Total:</b>	<b>\$5,000,000</b>	<b>\$1,400,000</b>

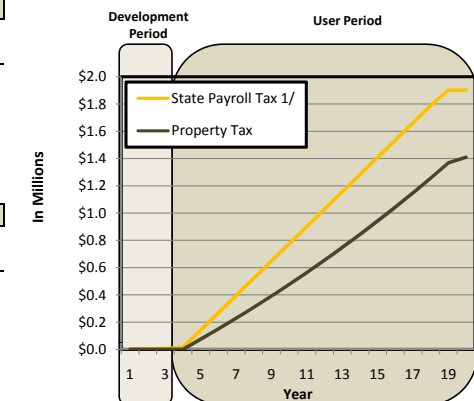
"When fully developed, the project will support \$5 million in payroll tax and \$1.4 million in property taxes annually."

**Cumulative 20-Year Tax Creation**

	Payroll	Property
Direct:	\$17,300,000	\$11,600,000
In/Ind:	\$27,600,000	Not Available
<b>Total:</b>	<b>\$44,900,000</b>	<b>\$11,600,000</b>

"Over a 20-year period the project will create \$44.9 million in payroll tax revenue and \$11.6 million in property tax revenue."

**ANNUAL TAX REVENUE (DIRECT IMPACTS ONLY)**



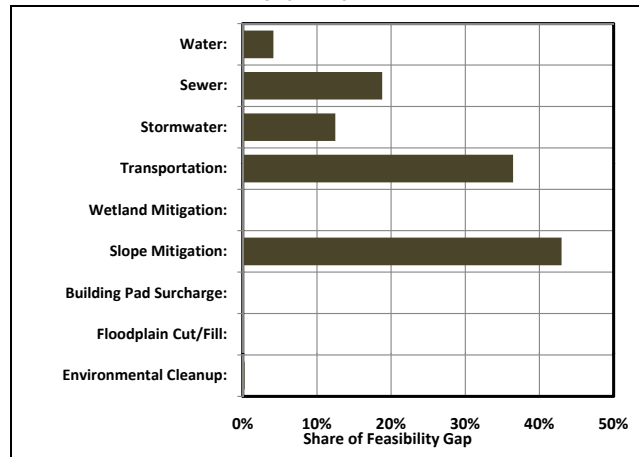
1/ Direct Impacts Only

**Site 37(B) Orr Family B**  
 Sherwood, Oregon  
 Business Park

**Market Feasibility Analysis**

PHYSICAL CHARACTERISTICS			
Site Size:		49.9 Acres	
Net Developable Size:		29.59 Acres	
SITE DEVELOPMENT PARAMETERS			
Site Development Timeline:		25 Months	
		\$	\$/sq. ft.
Hard Costs:		\$9,203,250	\$7.14
Off-Site	Water:	\$333,000	\$0.26
	Sewer:	\$1,488,000	\$1.15
	Stormwater:	\$1,006,000	\$0.78
	Transportation:	\$2,940,000	\$2.28
On Site	Wetland Mitigation:	\$12,000	\$0.01
	Slope Mitigation:	\$3,405,500	\$2.64
	Building Pad Surcharge:	\$0	\$0.00
	Floodplain Cut/Fill Mitigation:	\$0	\$0.00
	Environmental Cleanup:	\$18,750	\$0.01
Soft Costs:		\$1,840,650	\$1.43
Time Costs:		\$481,325	\$0.37
Threshold Return (Risk):		\$1,699,697	\$1.32
TOTAL SITE DEVELOPMENT COSTS:		\$13,224,922	\$10.26
INCOME/SALE ANALYSIS			
Estimated Value at Development Ready:		\$7,545,796	\$5.85
MARKET FEASIBILITY ANALYSIS			
Residual Land Basis:		(\$5,679,126)	(\$4.41)
Assumed Acquisition/Strike Price:		\$5,800,232	\$4.50
Feasibility Gap/Surplus:		(\$11,479,358)	(\$8.91)
MARKET TIME TO FEASIBILITY:		33.4 Years	

**MARGINAL IMPACTS of SITE CONSTRAINTS  
ON SITE FEASIBILITY**



\* Impacts will not sum to equal 100% as they are not mutually exclusive.

**Economic and Fiscal Impact Analysis**

FACILITY CHARACTERISTICS			
Build-Out Period:		7.0 Years	
Facility Size:		398,000 Sq. Ft.	
Investment in Real Property:		\$26,268,000	
Use Type:		Business Park/General Man	

**ECONOMIC IMPACT ANALYSIS FINDINGS**

**Average Annual Construction Impacts**

		Economic		
		Jobs	Activity	Payroll
<b>Site Development (Year 1-2)</b>	Direct:	40.1	\$5,280,000	\$2,520,000
	In/Ind:	26.0	\$3,360,000	\$1,200,000
<b>Facility Construction (Year 3-9)</b>	Direct:	36.0	\$3,720,000	\$1,920,000
	In/Ind:	22.9	\$3,000,000	\$960,000

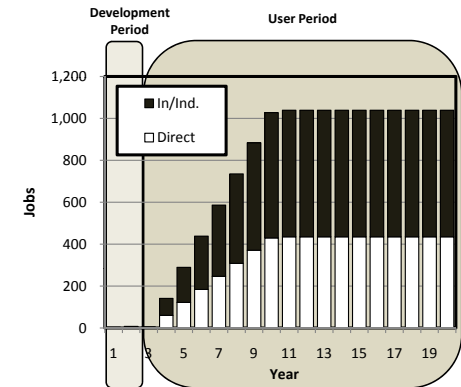
**TOTAL INVESTMENT IN LAND AND IMPROVEMENTS: \$37,300,000**

**Total Annual Operations Impacts @ Full-Capacity**

		Economic		
		Jobs	Activity	Payroll
<b>On-going Operations (Year 10+)</b>	Direct:	435	\$143,800,000	\$19,700,000
	In/Ind:	604	\$93,700,000	\$31,600,000
	<b>Total:</b>	<b>1,039</b>	<b>\$237,500,000</b>	<b>\$51,300,000</b>

"When fully developed the project will have an estimated 435 employees on site producing \$143 million in annual economic activity. Indirect and induced impacts would support an additional 604 jobs and \$93.7 million in economic activity."

**ANNUAL EMPLOYMENT LEVEL (ALL IMPACTS)**



**FISCAL IMPACT ANALYSIS FINDINGS**

**Annual Fiscal Impacts at Full-Capacity**

		Payroll	Property
Direct:	\$1,300,000	\$600,000	
	\$2,100,000		Not Available
	<b>Total:</b>	<b>\$3,400,000</b>	<b>\$600,000</b>

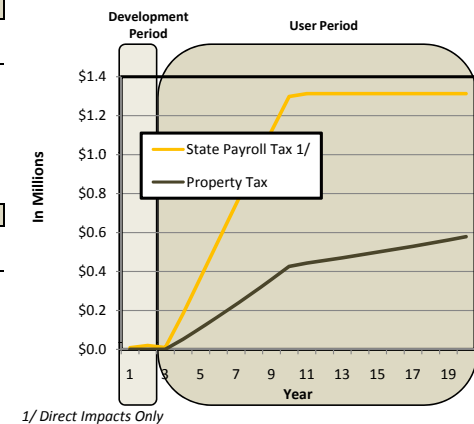
"When fully developed, the project will support \$3.4 million in payroll tax and \$600,000 in property taxes annually."

**Cumulative 20-Year Tax Creation**

		Payroll	Property
Direct:	\$18,400,000	\$6,700,000	
	\$29,400,000		Not Available
	<b>Total:</b>	<b>\$47,800,000</b>	<b>\$6,700,000</b>

"Over a 20-year period the project will create \$47.8 million in payroll tax revenue and \$6.7 million in property tax revenue."

**ANNUAL TAX REVENUE (DIRECT IMPACTS ONLY)**



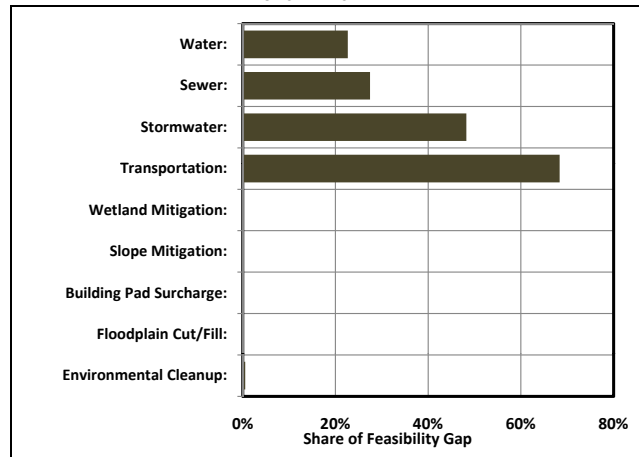
1/ Direct Impacts Only

**Site 104 Hillsboro U.R.**  
Hillsboro, Oregon  
Clean-Tech

**Market Feasibility Analysis**

PHYSICAL CHARACTERISTICS			
Site Size:		320 Acres	
Net Developable Size:		309.4 Acres	
SITE DEVELOPMENT PARAMETERS			
Site Development Timeline:		48 Months	
		\$	\$/sq. ft.
Hard Costs:		\$30,097,000	\$2.23
Off-Site	Water:	\$4,077,000	\$0.30
	Sewer:	\$4,940,000	\$0.37
	Stormwater:	\$8,687,500	\$0.64
	Transportation:	\$12,310,000	\$0.91
On Site	Wetland Mitigation:	\$0	\$0.00
	Slope Mitigation:	\$0	\$0.00
	Building Pad Surcharge:	\$0	\$0.00
	Floodplain Cut/Fill Mitigation:	\$0	\$0.00
	Environmental Cleanup:	\$82,500	\$0.01
Soft Costs:		\$6,019,400	\$0.45
Time Costs:		\$2,420,681	\$0.18
Threshold Return (Risk):		\$9,029,100	\$0.67
TOTAL SITE DEVELOPMENT COSTS:		\$47,566,181	\$3.53
INCOME/SALE ANALYSIS			
Estimated Value at Development Ready:		\$79,765,995	\$5.92
MARKET FEASIBILITY ANALYSIS			
Residual Land Basis:		\$32,199,814	\$2.39
Assumed Acquisition/Strike Price:		\$60,648,588	\$4.50
Feasibility Gap/Surplus:		(\$28,448,774)	(\$2.11)
MARKET TIME TO FEASIBILITY:		14.4 Years	

**MARGINAL IMPACTS of SITE CONSTRAINTS  
ON SITE FEASIBILITY**



\* Impacts will not sum to equal 100% as they are not mutually exclusive.

**Economic and Fiscal Impact Analysis**

FACILITY CHARACTERISTICS	
Build-Out Period:	15.0 Years
Facility Size:	3,083,000 Sq. Ft.
Investment in Real Property:	\$334,890,000
Use Type:	Clean Tech
ECONOMIC IMPACT ANALYSIS FINDINGS	

**Average Annual Construction Impacts**

		Jobs	Economic Activity	Payroll
Site Development (Year 1-4)	Direct:	68.2	\$9,000,000	\$4,200,000
	In/Ind:	44.3	\$5,760,000	\$1,920,000
Facility Construction (Year 5-19)	Direct:	214.0	\$22,320,000	\$11,520,000
	In/Ind:	136.2	\$17,520,000	\$5,640,000

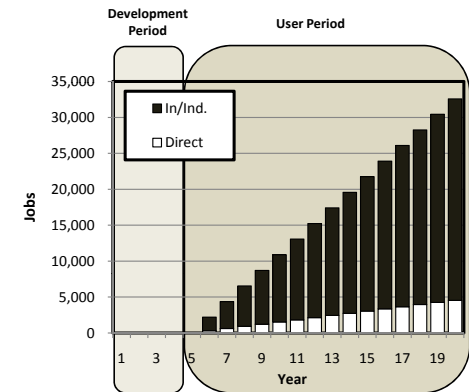
**TOTAL INVESTMENT IN LAND AND IMPROVEMENTS: \$371,000,000**

**Total Annual Operations Impacts @ Full-Capacity**

		Jobs	Economic Activity	Payroll
On-going Operations (Year 20+)	Direct:	4,548	\$3,214,200,000	\$615,900,000
	In/Ind:	28,030	\$4,226,300,000	\$1,369,300,000
	<b>Total:</b>	<b>32,579</b>	<b>\$7,440,500,000</b>	<b>\$1,985,200,000</b>

"When fully developed the project will have an estimated 4,548 employees on site producing \$3.2 billion in annual economic activity. Indirect and Induced impacts would support an additional 28,030 jobs and \$1.9 billion in economic activity."

**ANNUAL EMPLOYMENT LEVEL (ALL IMPACTS)**



**FISCAL IMPACT ANALYSIS FINDINGS**

**Annual Fiscal Impacts at Full-Capacity**

		Payroll	Property
Direct:		\$41,400,000	\$9,200,000
	In/Ind:	\$91,300,000	Not Available
	<b>Total:</b>	<b>\$132,700,000</b>	<b>\$9,200,000</b>

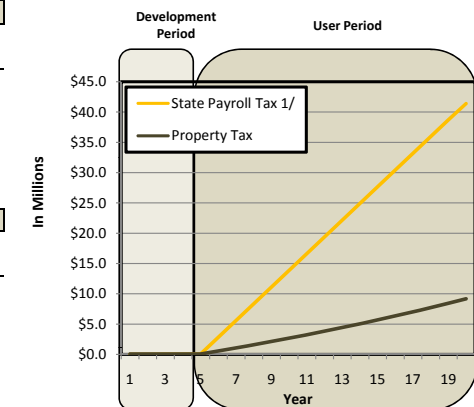
"When fully developed, the project will support \$132 million in payroll tax and \$9.2 million in property taxes annually."

**Cumulative 20-Year Tax Creation**

		Payroll	Property
Direct:		\$332,200,000	\$69,300,000
	In/Ind:	\$731,300,000	Not Available
	<b>Total:</b>	<b>\$1,063,500,000</b>	<b>\$69,300,000</b>

"Over a 20-year period the project will create \$1 billion in payroll tax revenue and \$69 million in property tax revenue."

**ANNUAL TAX REVENUE (DIRECT IMPACTS ONLY)**



1/ Direct Impacts Only