

# APPENDIX A

**A-1 GIS Development Packet**

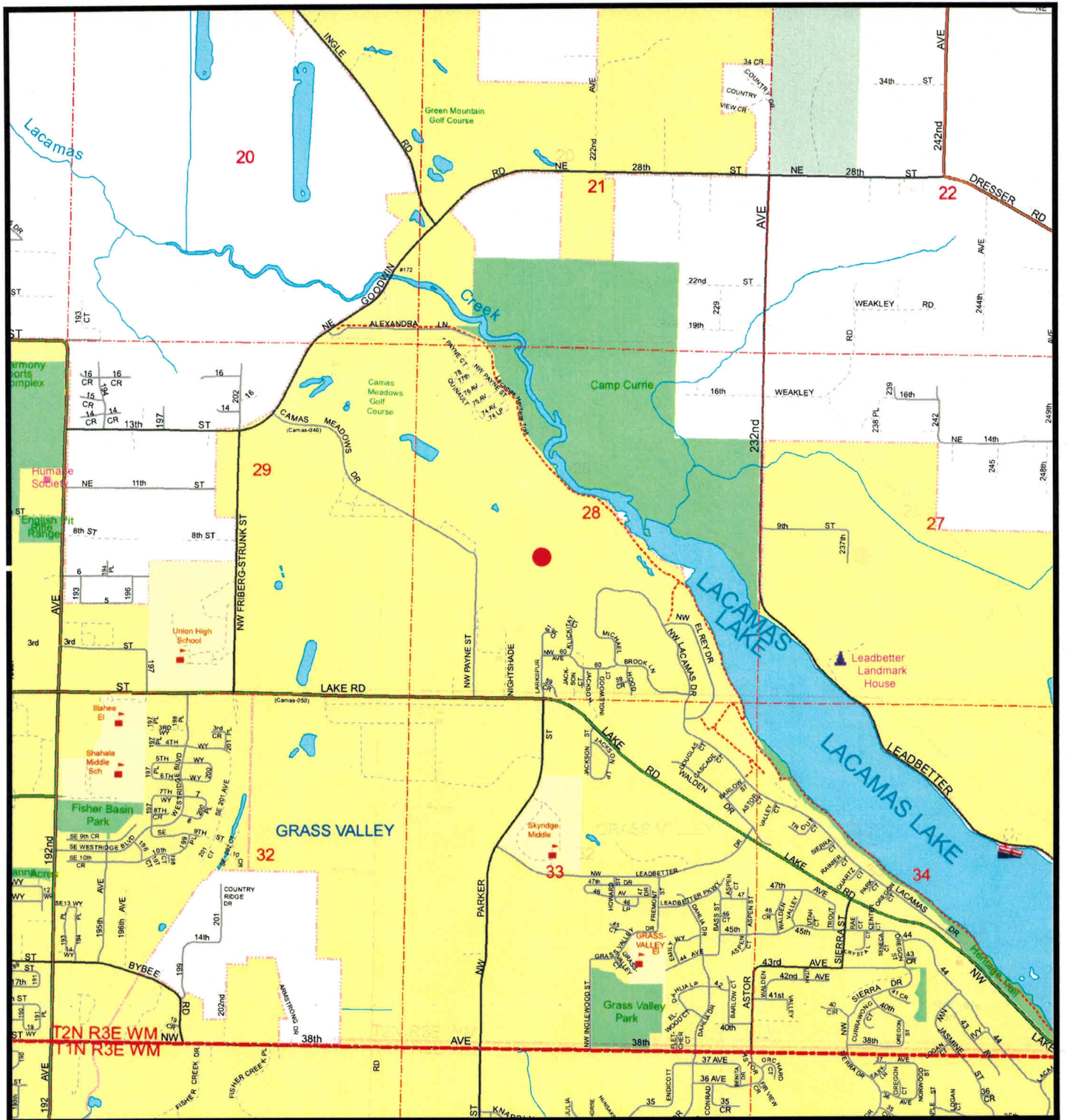
**A-2 FIRM Map**


**A-3 Historic Basin Maps**

- 1) Fig. 1A Historic Basin Map**
- 2) Fig 1B Historic Basin Map – add projects**
- 3) Fig 2A Project Areas**
- 4) Fig 2B Soils Map**
- 5) Fig 3 Post Subbasin Map**

**A-4 Selected Soils Data**

**A-5 Isopluvial Maps**






Geographic Information System

### General Location Map

Printed on: February 04, 2015


Account No: 175948000, 986031650  
 Owner: CHINOOK LAND OWNERS GROUP LLC  
 Address: 1400 NW 63RD ST  
 C/S/Z: VANCOUVER, WA 98663

1:24,000



0 0.1 0.2 0.3 0.4 0.5 Miles

● Subject Property Location



Developer's GIS Packet: Page 1 of 15

Information shown on this map was collected from several sources. Clark County accepts no responsibility for any inaccuracies that may be present.

# Property Information Fact Sheet

## Mailing Information:

Account No.: 175948000, 986031650  
Owner: CHINOOK LAND OWNERS GROUP LLC  
Address: 1400 NW 63RD ST  
C/S/Z: VANCOUVER, WA 98663

Assessed Parcel Size: 36.43 Ac  
Property Type: UNUSED LAND TIMBERED.

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## PARCEL LOCATION FINDINGS:

Quarter Section(s): SE 1/4,S28,T2N,R3E,  
SW 1/4,S28,T2N,R3E

Municipal Jurisdiction: Camas

Urban Growth Area: Camas

Zoning: BP, R-15

Zoning Overlay: PlannedIndustrialDevelopmentOverlay

Comprehensive Plan Designation: IND,  
SFL

Columbia River Gorge NSA: No Mapping Indicators

Building Moratorium: No Mapping Indicators

Late-Comer Area: No Mapping Indicators

Trans. Impact Fee Area: Camas

Park Impact Fee District: No Mapping Indicators

Neighborhood Association: No Mapping Indicators

School District: Camas

Elementary School: Grass Valley

Junior High School: Skyridge Middle

Senior High School: Camas

Fire District: Camas Washougal FD

Sewer District: Camas

Water District: None

Wildland: No Mapping Indicators

Historic Sites: No Mapping Indicators

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## ENVIRONMENTAL CONSTRAINTS:

Soil Type(s): CvA, 21.3% of parcel

HcB, 2.1%

HcD, 67.0%

HcE, 0.4%

LeB, 9.2%

Hydric Soils: Hydric, 21.3% of parcel

Non-Hydric, 78.7%

Flood Zone Designation: 500 Year Flood Area,  
Floodway Fringe,  
Outside Flood Area

CARA: Category 2 Recharge Areas

Liquefaction Susceptibility: Very Low

NEHRP: C

Slope: 0 - 5 percent, 56.2% of parcel

10 - 15 percent, 12.5%

15 - 25 percent, 2.9%

5 - 10 percent, 28.4%

Landslide Hazards: Slopes > 15%

Slope Stability: No Mapping Indicators

Priority Habitat and Species Areas: Riparian Habitat Conservation Area,  
Species

Priority Species Area Buffer: WDFW Priority Species Buffer

Priority Habitat Area Buffer: No Mapping Indicators

Archeological Predictive: High, 85.2% of parcel

Moderate-High, 14.8%

Archeological Site Buffers: Mapping Indicators Found

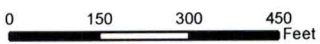
## \*\*\*NOTE\*\*\*

This data is compiled from many sources and scales. Clark county makes this information available as a service, and accepts no responsibility for any inaccuracy, actual or implied.



Geographic Information System

1:3,600



Developer's GIS Packet: Page 5 of 15

### 2014 Aerial Photography with Contours

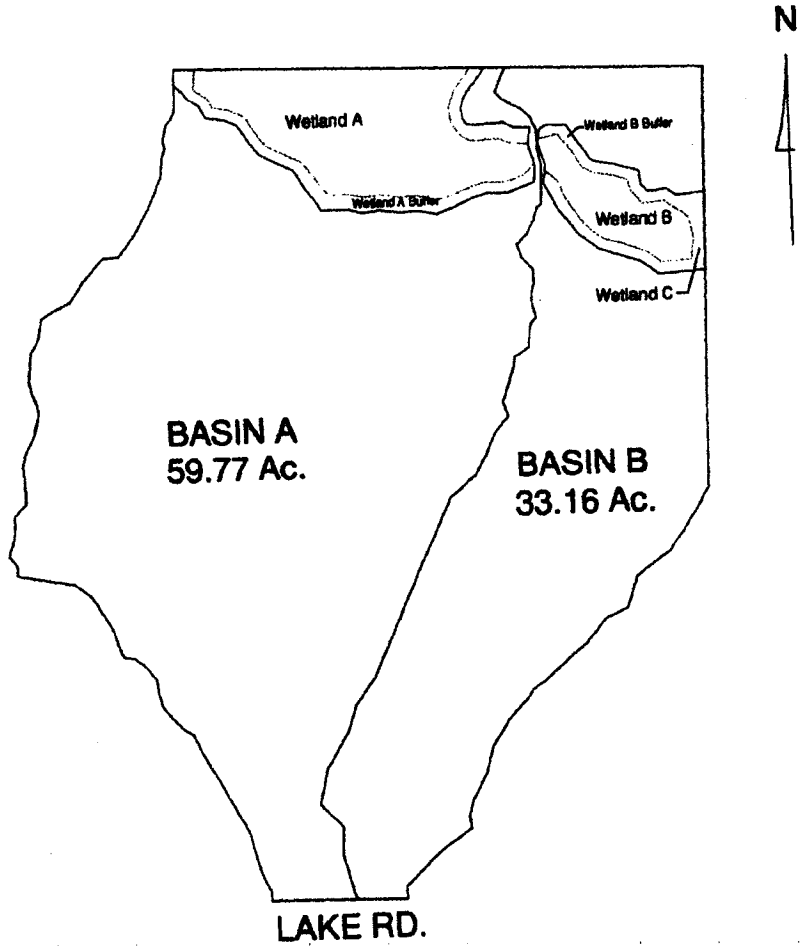
Account No: 175948000, 986031650  
 Owner: CHINOOK LAND OWNERS GROUP LLC  
 Address: 1400 NW 63RD ST  
 C/S/Z: VANCOUVER, WA 98663

- Proposed Development Area
- 2' Elevation Contours

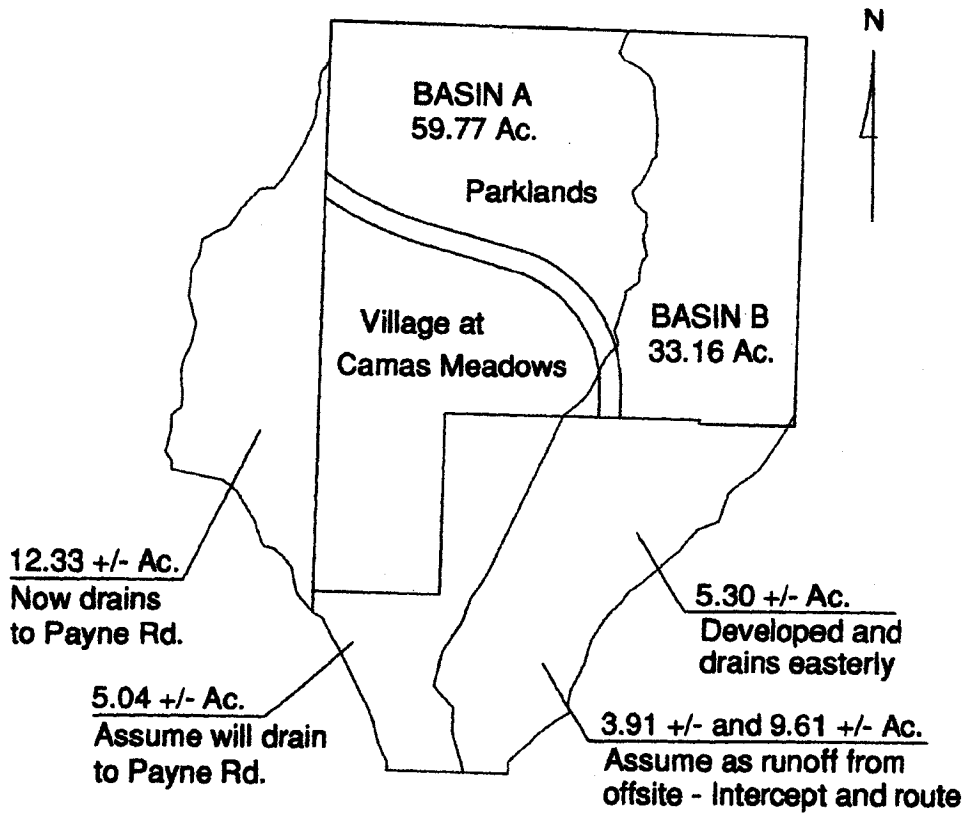
Printed on: February 04, 2015

23120	23121	23122
23129	23128	23127
23132	23133	23134

Information shown on this map was collected from several sources. Clark County accepts no responsibility for any inaccuracies that may be present.

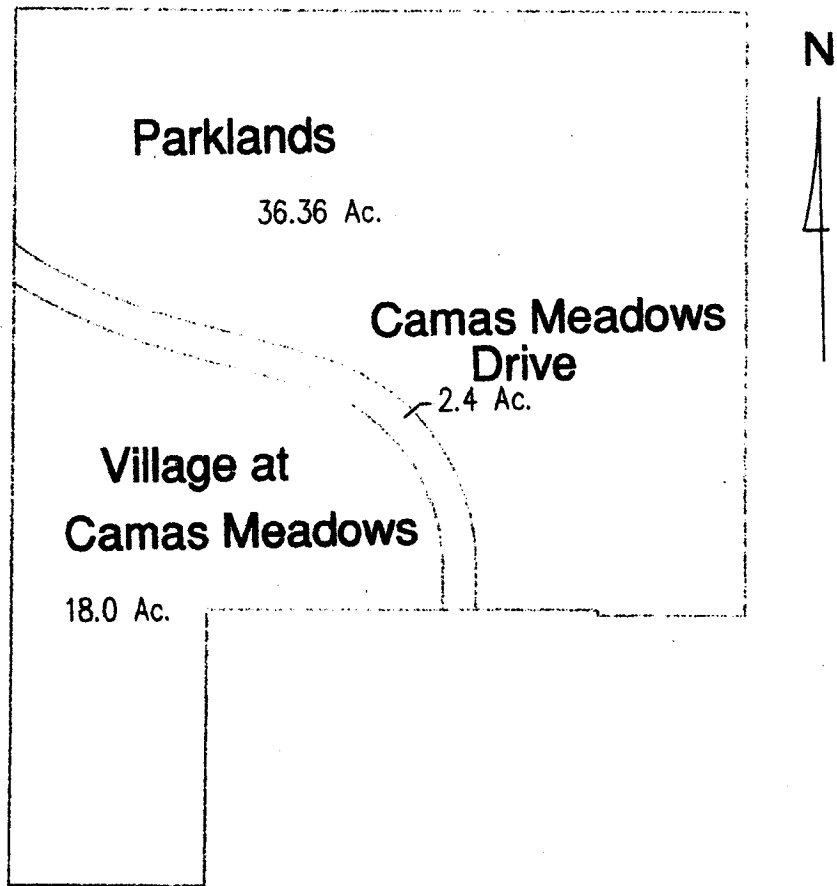


**FIG. 1A HISTORIC BASIN MAP**

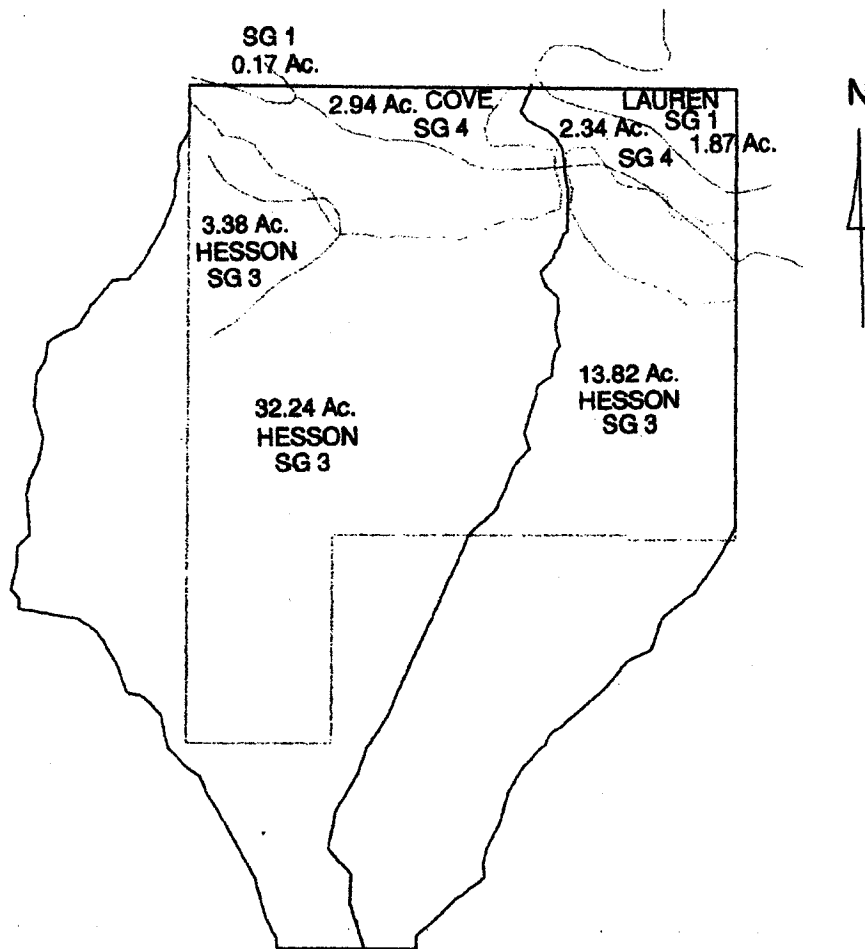


**FIG. 1B HISTORIC BASIN MAP**

**- add PROJECTS**

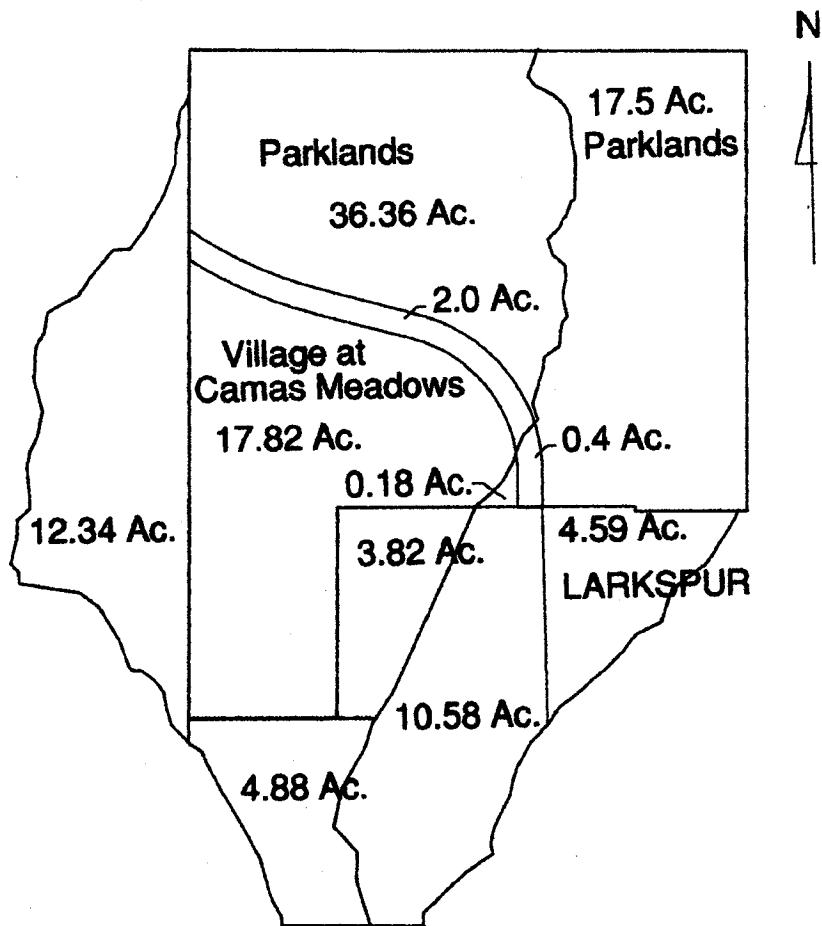


**FIG. 2A PROJECT AREAS**

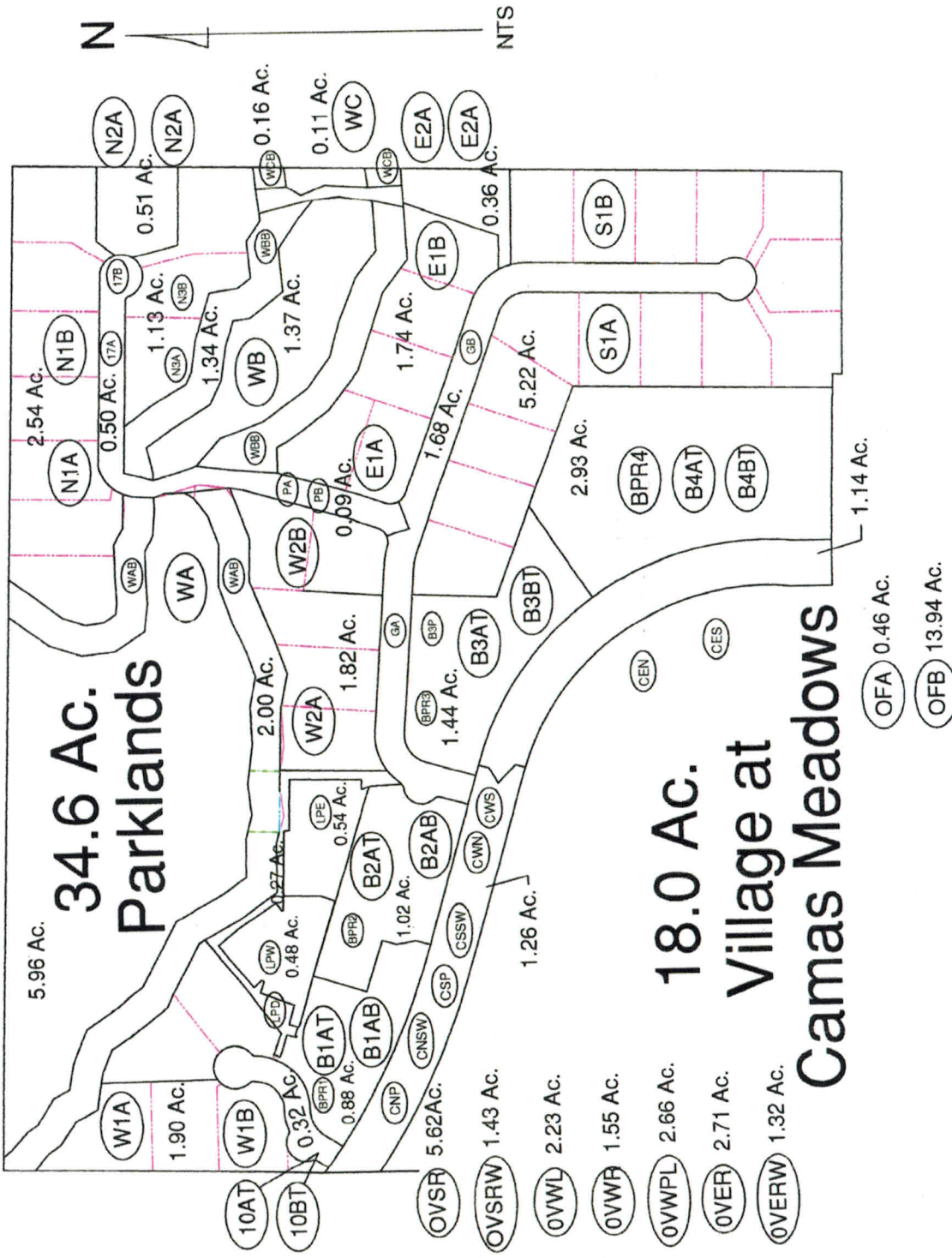


**FIG. 2B SOILS MAP**





**FIG. 1C HISTORIC BASIN MAP**  
**- add PROJECTS**



**FIG. 3 - POST SUBBASIN AREAS**

## SOIL INFORMATION

– selected text from USDA Soil Survey report of Clark County, Washington issued November 1972

### See Geotech Report, Appendix E

➤ See page 10 for table with depth to bedrock information.

### Cove Series

– selected text from USDA Soil Survey report of Clark County, Washington issued November 1972.

The Cove series consists of deep, very poorly drained, mostly nearly level soils (fig. 3). These soils have a clayey subsoil. They formed in water-laid deposits in old lakes and ponds. The native vegetation is deciduous trees, sedges, reeds, and water-tolerant shrubs and grasses.

Cove soils are used primarily for pasture.

**Cove silty clay loam, 0 to 3 percent slopes (CvA).**—This soil is in concave drainageways and in large, flat, old lakebeds. The slope is generally less than 1 percent.

In a typical profile the surface layer is very dark gray silty clay about 4 inches thick. Below this is firm clay about 32 inches thick. It is black in the upper part and very dark gray and mottled in the lower part. The underlying material, to a depth of 54 inches, is mottled, light olive-gray gravelly silty clay loam.

Included in mapping were small areas where the surface layer is gravelly silt loam, silty clay, or clay. Also included were areas where the subsoil is gravelly clay.

This soil is **very poorly drained and very slowly permeable**. Tillage is difficult. The available water capacity and fertility are low. The effective rooting depth averages less than 15 inches. **Surface runoff is very slow, and ponding is common in winter unless drainage is provided. There is no hazard of erosion.**

Water-tolerant grasses and legumes are well suited, but these plants must also resist drought because this soil is droughty in summer. Tall fescue, meadow foxtail, birdsfoot trefoil, and white Dutch clover are suited grasses and legumes

### Hesson Series

– selected text from USDA Soil Survey report of Clark County, Washington issued November 1972.

The Hesson series consists of deep, well-drained soils that are mostly level to gently rolling. Some areas are hilly and very steep. These are moderately fine textured soils that have a fine textured subsoil. The parent material is deeply weathered, mixed old alluvium that contains varying amounts of gravel. The original vegetation is a heavy growth of Douglas-fir and a scattering of western redcedar and grand fir. The understory consists principally of vine maple, salal, Oregongrape, ferns, and red huckleberry.

All the acreage has been logged. Areas not in cultivation are in second-growth timber. The understory is similar in composition to that of the native stands. Red alder is dominant in some areas. The annual precipitation ranges from 50 inches to more than 60 inches.

**Hesson clay loam, 0 to 8 percent slopes (HcB).**—This is the dominant soil of the high terraces along the mountain foot slopes in the county. In most places the slope is 2 to 5 percent. The relief is undulating. Slopes are generally short to moderate in length.

## SOIL INFORMATION

– selected text from USDA Soil Survey report of Clark County, Washington issued November 1972

In a typical profile the surface layer is dark reddish brown clay loam about 8 inches thick. The subsurface layer is dark reddish-brown clay loam about 4 inches thick. Below this layer is friable, dark reddish-brown clay loam about 10 inches thick. The next layer, to a depth of about 91 inches, is reddish-brown clay. In sequence from the top, the uppermost 18 inches is friable, the next 39 inches is firm, and the lower 12 inches is very firm.

Included in mapping were some areas that are nearly level or are slightly depressional and have a slightly mottled layer at a depth of 30 to 40 inches. This indicates reduced permeability and a temporary perched water table during rainy periods.

This soil is well drained and has moderately slow permeability. The available water capacity is high, and fertility is moderate. Problems arise in the proper scouring of tillage equipment when the soil is worked at about field capacity. Tillage is difficult when the surface layer is nearly dry. Surface runoff is slow, and the erosion hazard is slight.

**Hesson clay loam, 8 to 20 percent slopes (HcD).**—This soil is similar to Hesson clay loam, 0 to 8 percent slopes, except that the surface layer generally is 1 to 2 inches thinner. In places where erosion has been active, the surface layer is 2 to 4 inches thinner. The slopes are generally single and are moderate in length.

Most areas of this soil are cleared and in cultivation, but use is less intensive than on Hesson clay loam, 0 to 8 percent slopes. Runoff is medium, and the erosion hazard is moderate where the surface is left bare in winter.

### Lauren Series

– selected text from USDA Soil Survey report of Clark County, Washington issued November 1972.

The Lauren series consists of deep, somewhat excessively drained, nearly level to gently sloping soils on terraces 50 to 300 feet above the Columbia River. In a few places, on terrace fronts, the soils are steep to very steep. These are very gravelly soils that formed in mixed Columbia River alluvium that contained some volcanic ash. Lauren soils are in the southwestern part of the county, in the vicinity of Mill Plain, Orchards, and Fourth Plain. The original vegetation was Douglas-fir, grand fir, bigleaf maple, vine maple, salal, and ferns. The average annual precipitation is about 48 inches.

Nearly all the acreage is cleared and in cultivation or suburban development. There are a few stands of second growth Douglas-fir in farm woodlots.

**Lauren gravelly loam, 0 to 8 percent slopes (LgB).**—This soil occurs on terraces. The slopes are generally less than 4 percent and approach 8 percent only along the terrace breaks.

In a typical profile the surface layer is very dark brown gravelly and very gravelly loam about 20 inches thick. Below the surface layer is friable, dark-brown very gravelly loam about 13 inches thick. The next layer is dark-brown very gravelly coarse sandy loam about 11 inches thick. The underlying material, to a depth of 70 inches, is dark-brown very gravelly loamy coarse sand.

Included in mapping were a few small areas where very gravelly loamy coarse sand is within 30 inches of the surface. This soil is somewhat excessively drained and easily tilled. Permeability generally is

# SOIL INFORMATION

– selected text from USDA Soil Survey report of Clark County, Washington issued November 1972

moderately rapid, but it is rapid in the substratum. The available water capacity is moderate. Fertility is moderate. Surface runoff is slow, and the erosion hazard is slight.

Note: This geotech report by Columbia West Engineering, Inc. reports the following.

*The Web Soil Survey (United States Department of Agriculture, Natural Resource Conservation Service [USDA NRCS], 2013 Website) indicates the site is underlain by three soil types. Hesson clay loam soils are mapped on the majority of the site from the northwest corner to the southwest corner of the property, while Cove silty clay loam and Lauren gravelly loam soils are mapped in the northern and northwestern portions of the property, respectively. Soils resembling the Lauren series were not encountered during subsurface excavation.\**

*Although actual on-site soils may vary from the broad USDA descriptions, Lauren soils are generally coarse-textured, well drained soils with rapid permeability. Cove soils are generally fine-textured, poorly drained soils with very slow permeability and high shrinkswell potential. Hesson soils are fine-textured, well drained soils with moderately slow permeability and moderate shrink-swell potential.*

\* Review of the report reveals that TP1 and TP 2 were explored in this area of the site. Poorly graded GRAVEL with silt and sand was observed. Refusal was within 2.5 to 3 feet of the surface.

Permeability: Cove soils are at the wetland and listed at less than 0.06 in/hr in the 0-36 inch depth. Hesson soils located south of the wetlands and listed at less than 0.63 to 2.0 in/hr in the 0-22 inch depth.

This indicates that some infiltration will occur at the proposed biorention facilities even though the majority will be collected in underdrain systems and conveyed in the storm system piping. Also, some infiltration may occur at the proposed systems in the wetland buffers – not significant.

Cove: CvA.	0-36	Clay-----	CH	A-7	-----	100	70-80	<0.06	0.14-0.16	5.6-7.3
	36-54	Gravelly silty clay loam.	CL	A-7	65-75	60-70	50-60	0.06-0.20	0.15-0.17	5.6-7.3
Cove, thin solum: CwA.	0-14	Silty clay loam....	CL	A-7	-----	100	85-95	0.06-0.20	0.19-0.21	4.5-6.0
	14-21	Clay-----	CH	A-7	-----	100	70-80	<0.06	0.14-0.16	5.6-7.3
	21-60	Silt loam-----	ML or CL	A-4 or A-6.	-----	100	65-75	0.06-0.20	0.19-0.21	6.6-7.3
Dollar: DoB.	0-32	Loam (fragipan)---	ML or CL	A-4	100	90-95	60-70	0.63-2.0	0.16-0.18	4.5-6.0
	32-60	Loam (fragipan)---	ML or CL	A-4	100	95-100	60-70	<0.06	0.06-0.08	4.5-6.0
Fill land: Fn.	(?)	(?)-----	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)
Gee: GeB, GeD, GeE, GeF.	0-22	Silt loam-----	ML or CL	A-6	-----	100	70-85	0.63-2.0	0.19-0.21	5.1-6.0
	22-72	Silty clay loam....	CL	A-6	-----	100	70-80	<0.06	0.06-0.08	5.1-6.0
Gumboot: GuB.	0-12	Silt loam-----	OL	A-7	90-95	85-95	75-85	0.63-2.0	0.19-0.21	4.5-7.3
	12-50	Gravelly silty clay loam.	CL	A-6	90-100	85-95	65-75	0.06-0.2	0.19-0.21	6.1-7.3
	50-60	Very gravelly silty clay.	GC	A-7	40-50	35-50	25-35	<0.06	0.06-0.08	6.1-7.3
Hesson: HcB, HcD, HcE, HcF.	0-22	Clay loam-----	CL	A-7	85-95	85-95	65-75	0.63-2.0	0.19-0.21	4.5-6.0
	22-91	Clay-----	CH	A-7	85-90	85-90	75-85	0.2-0.63	0.14-0.16	4.5-6.0
HgB, HgD, HhE.	0-22	Gravelly clay loam.	SC	A-6	75-85	70-80	40-50	0.63-2.0	0.14-0.16	4.5-6.0
	22-91	Gravelly clay-----	CH	A-7	75-85	70-80	60-70	0.2-0.63	0.11-0.13	4.5-6.0

**Figure A-2: 2-Year, 24-Hour Clark County Isopluvial Map**

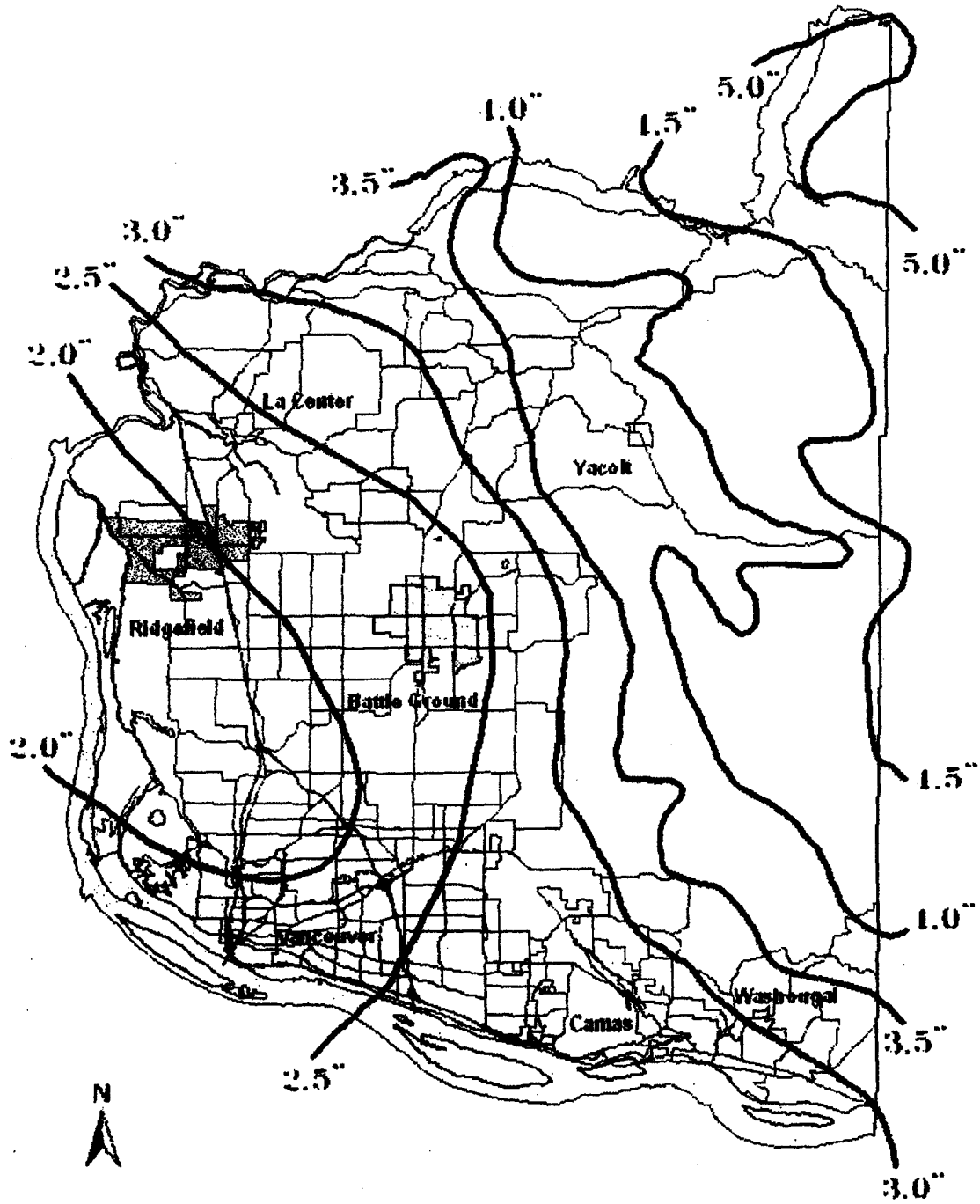


Figure A-3: 10-Year, 24-Hour Clark County Isopluvial Map

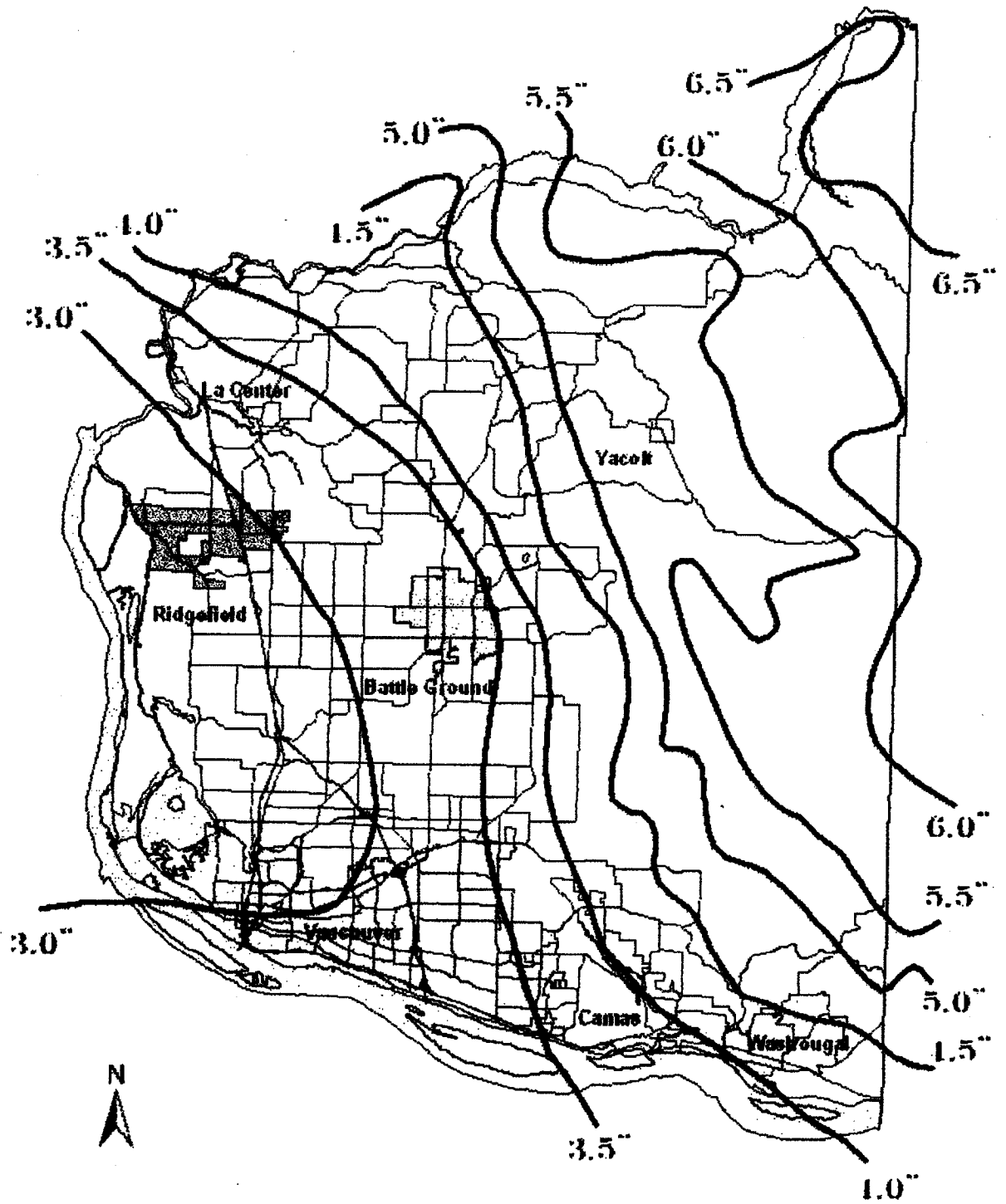


Figure A-4: 25-Year, 24-Hour Clark County Isopluvial Map

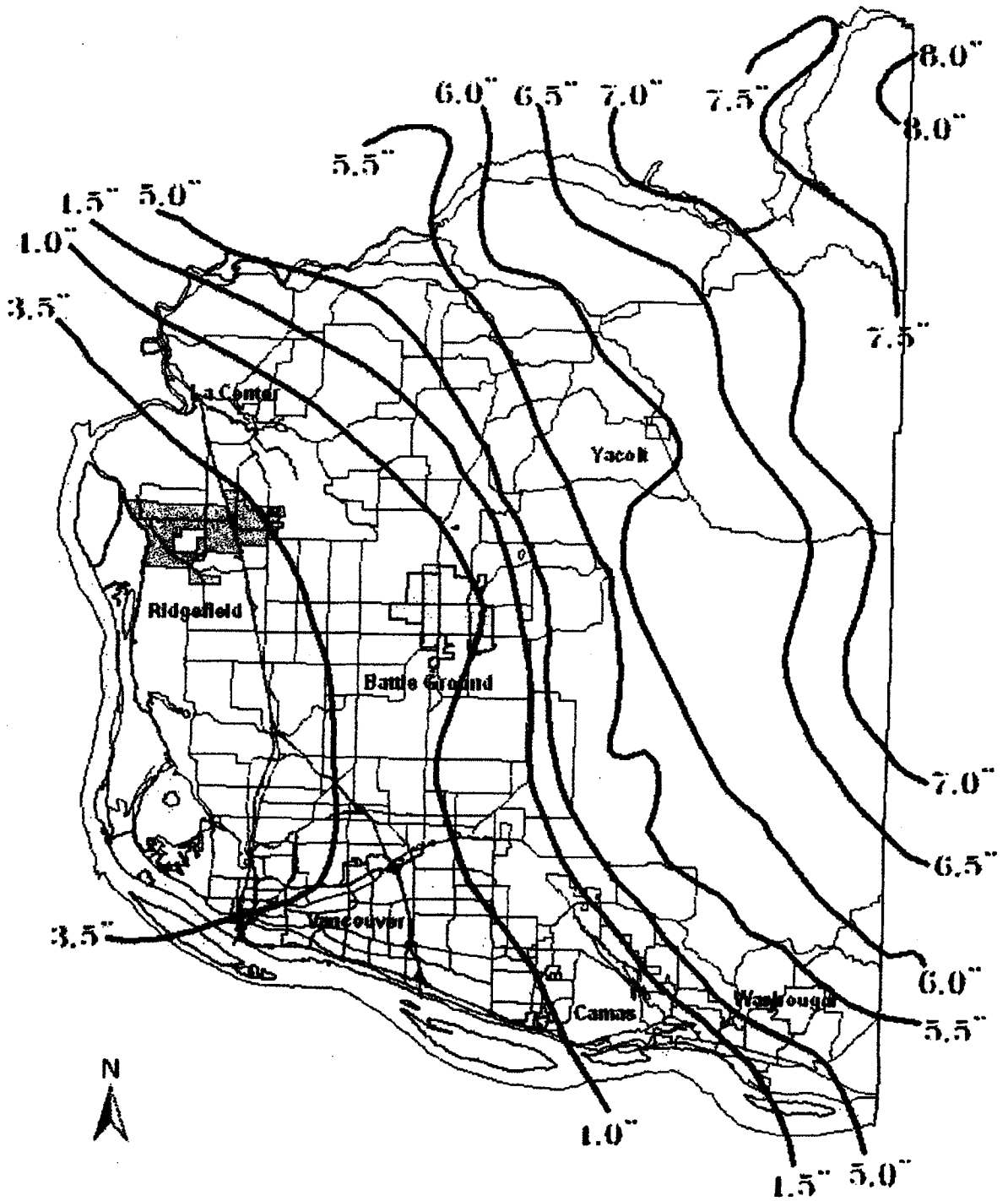




Figure A-5: 100-Year, 24-Hour Clark County Isopluvial Map

