



Memorandum

Date: July 14, 2009

To: Dana Field, Oregon Department of State Lands
Bill Abadie, United States Army Corps of Engineers

cc: Elton Kemnitz, Garret Creek Mitigation Bank LLC; Steve Binns, Garret Creek Mitigation Bank LLC

From: Brent Haddaway, ICF Jones and Stokes

Subject: **Vegetation Monitoring Results**

Ms Field and Mr. Abadie:

The purpose of this memorandum is to document the results of the Year 1 vegetation monitoring performed at the Garret Creek Mitigation Bank performed on June 24, 2009. This memorandum specifically addresses performance standards for vegetation described in the Garret Creek Mitigation Bank Instrument. The fieldwork was performed by Elton Kemnitz, Levi MacDonald, and myself. I identified all plants and recorded data, Mr. Kemnitz and Mr. MacDonald assisted by laying out measuring tapes, flagging quadrat locations, and generating random numbers. All data calculations were performed by ICF Jones & Stokes.

Data was collected within quadrats or via line intercept along transect lines evenly spaced along planted portions of the mitigation bank site. Areas of existing vegetation were not included in vegetation surveys; these areas had no planting densities to record and invasive species cover results did not warrant survey of the existing vegetation areas (cover was >1% in surveyed areas). A baseline was established along the upland buffer edge (toe of slope), extending the length of the site (Appendix A). Transects were measured east/west or north/south off the baseline and used to measure invasive species cover via line intercept method. Rectangular quadrats (3 feet X 50 feet) were established at random intervals along each transect to measure planted stem density. A 3 X 3 foot quadrat was also established for each transect to estimate cover of herbaceous species – herbaceous cover data is not presented in this memorandum but is available if requested. ICF Jones & Stokes recommends evaluating herbaceous species in Year 3 of monitoring; most herbaceous cover is currently annual or horticultural species that do not provide insight to site hydrologic conditions.

Monitoring results indicate that vegetation performance standards have been met for Year 1. Planted woody vegetation appears to have a survival rate of nearly 100%, and invasive species cover within planted portions of the site was recorded as <1%. Volunteer seedling Oregon ash

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(*Fraxinus latifolia*) was observed in many areas within the site. A total of 6 species contributed at least 5% of the relative abundance of living stems. Clumps of 5 or more Oregon ash seedlings were counted as one living plant during stem density data collection in 4 quadrats. Vegetation data for stem density, relative abundance of woody stems, and invasive species cover are displayed in Tables 1-3. Complete data for each plot can be found in Appendix B.

Table 1. Wetland Area Stem Density Results by Species

Species	Average Occurrence per Quadrat	Stems/acre	Relative abundance
S Lasiandra	1.263158	366.315789	32%
F Latifolia	1.052632	305.263158	26%
P. balsamifera	0.210526	61.0526316	5%
S Sitchensis	0.526316	152.631579	13%
P menzesii	0	0	0%
R Nutkana	0.421053	122.105263	11%
C Stolonifera	0.315789	91.5789474	8%
P capitatus	0.105263	30.5263158	3%
S albus	0.105263	30.5263158	3%
Total	4	1160	101%

Table 2. Upland Area Stem Density Results by Species

Species	Average Occurrence per Quadrat	Stems/acre	Relative Abundance
S Lasiandra	1	290	31%
F Latifolia	1.5	435	23%
P. balsamifera	1.333333	386.6667	31%
S Sitchensis		0	
P menzesii	1	290	19%
R Nutkana		0	
C Stolonifera		0	
P capitatus		0	
S albus		0	
Total	2.6	754	104%

Table 3. Invasive Species Cover by Transect

Species	Transect Intercept (feet)	Total Transect Length (feet)	Aerial Cover
Phalaris arundinacea	5.5	5943	>1%
Cirsium arvense	4.0	5943	>1%
Total	9.5	5943	>1%

Please contact me with any questions regarding the methods used or results from this vegetation monitoring effort.

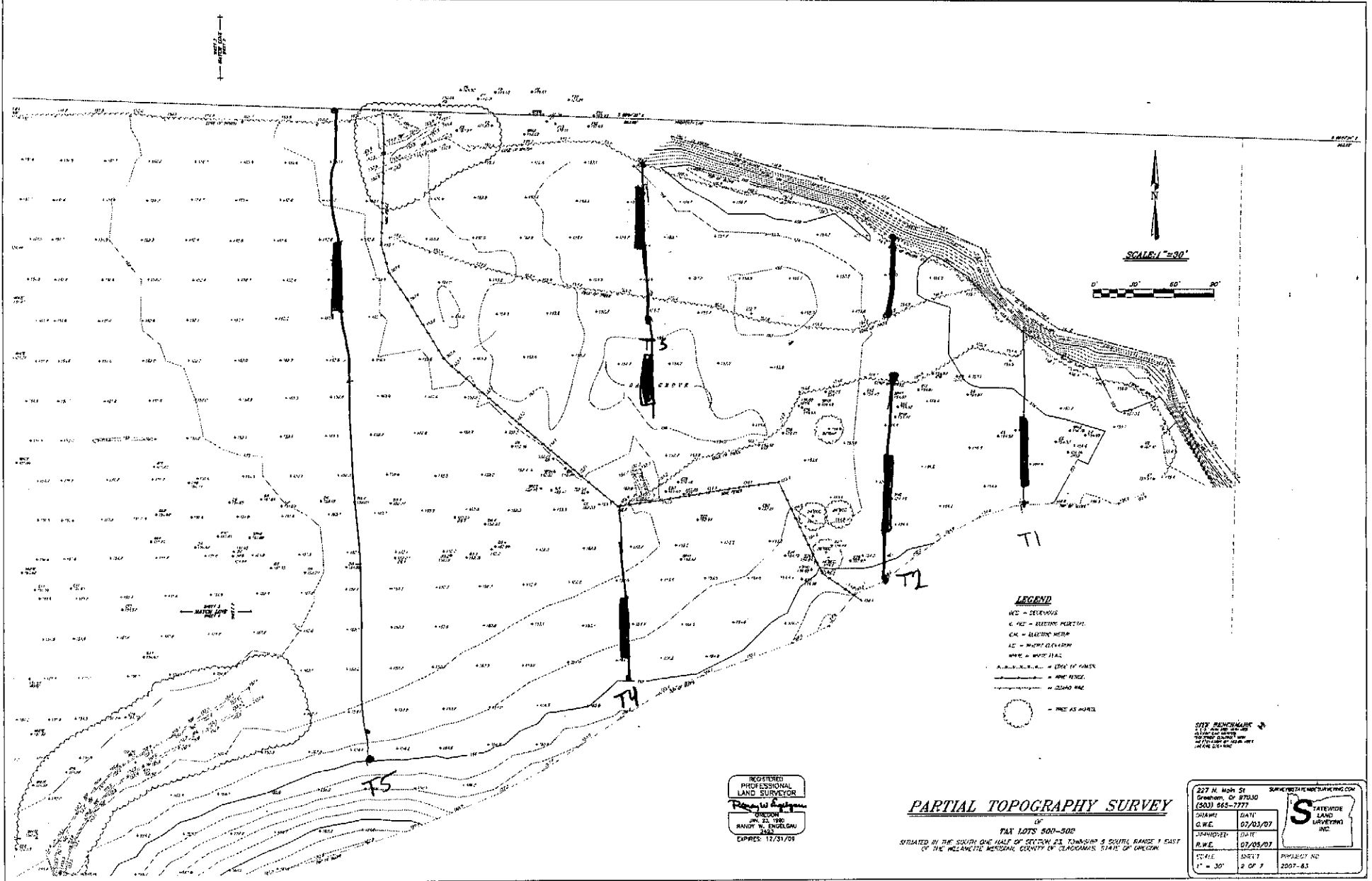
Sincerely,



Brent Haddaway PWS
ICF Jones & Stokes

Appendix A

Approximate Vegetation Transect and Quadrat Locations



- LEGEND**
- DEPRESSION
 - - - - - ELEVATION POINT
 - ELECTRIC WIRE
 - WATER MAIN
 - GAS WIRE
 - FENCE
 - ROAD
 - - - - - - PINE ASH POINT

REGISTERED
PROFESSIONAL
LAND SURVEYOR
Dwight W. Engelson
JULY 22, 1980
RANDY W. ENGELSON
2002
EXPIRES 12/31/09

PARTIAL TOPOGRAPHY SURVEY

OF
TAX LOTS 300-309
SITUATED IN THE SOUTH ONE HALF OF SECTION 21, TOWNSHIP 3 SOUTH, RANGE 1 EAST
OF THE MERIDIAN, MADISON COUNTY IN THE STATE OF INDIANA.

OFF ENGINEER
112 S. W. 10th St.
Madison, IN 47020
PHONE: 317-251-1111
FAX: 317-251-1112

227 N. HIGH ST. GREENSBORO, IN 47030 (303) 855-7777	SURVEYDATEENGINEERING.COM
DATE: 07/03/07	STATEWIDE LAND SURVEYING INC.
STATE: IN	
DATE: 07/03/07	PROJECT NO: 2007-63
SHEET: 1	
TOTAL SHEETS: 7	

T10 T9 T8 T7 T6

LEGEND

- = TERRACE
- - - - = SECTION BOUNDARY
- = ELEVATION METRIC
- = BENCH ELEVATION
- = 100' FEET
- = 200' FEET
- = 300' FEET
- = 400' FEET
- = 500' FEET
- = 600' FEET
- = 700' FEET
- = 800' FEET
- = 900' FEET
- = 1000' FEET
- = 1100' FEET
- = 1200' FEET
- = 1300' FEET
- = 1400' FEET
- = 1500' FEET
- = 1600' FEET
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- = 9300' FEET
- = 9400' FEET
- = 9500' FEET
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- = 10000' FEET

PARTIAL TOPOGRAPHY SURVEY

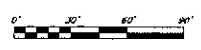
TAX LOTS 504-508

SITUATED IN THE SOUTH ONE HALF OF SECTION 21 TOWNSHIP 5 SOUTH RANGE 1 EAST OF THE MERIDIAN, WASHINGTON COUNTY OF CLACKAMAS, STATE OF OREGON

227 N Main St Gresham, Or 97030 (503) 665-7777		STATEWIDE LAND SURVEYING INC.
TAX MAP	DATE	
C.W.C.	07/01/07	
APPROVED:	DATE	
R.W.E.	07/05/07	
SCALE	SHEET	PROJECT NO.
1" = 30'	4 OF 7	2007-63



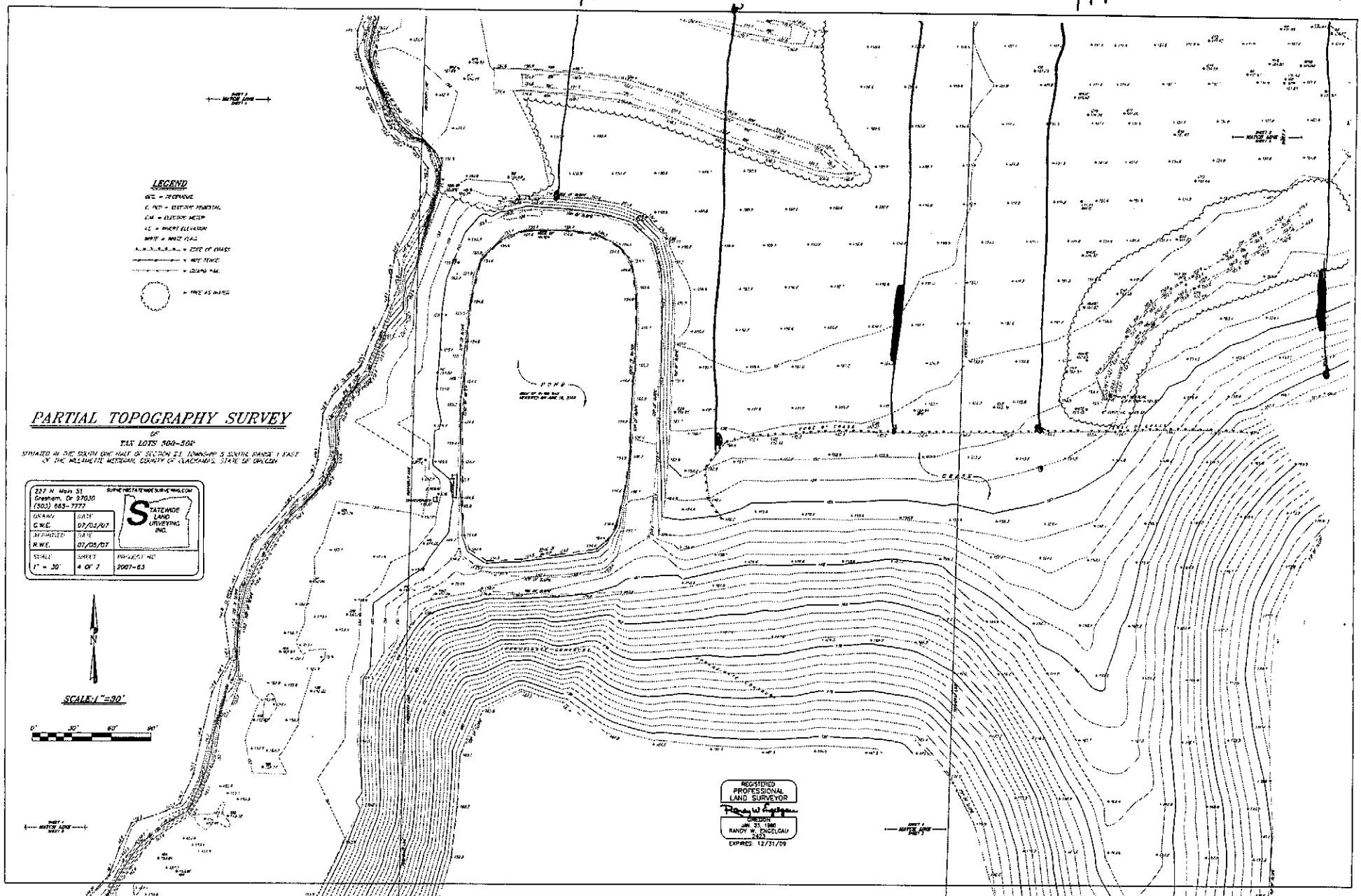
SCALE 1"=30'

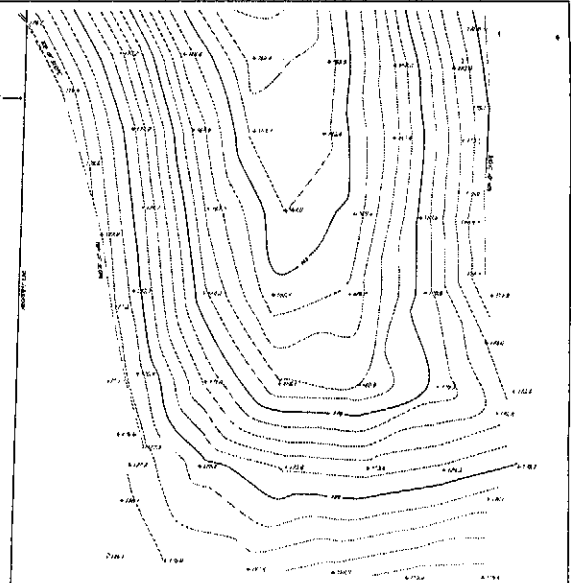
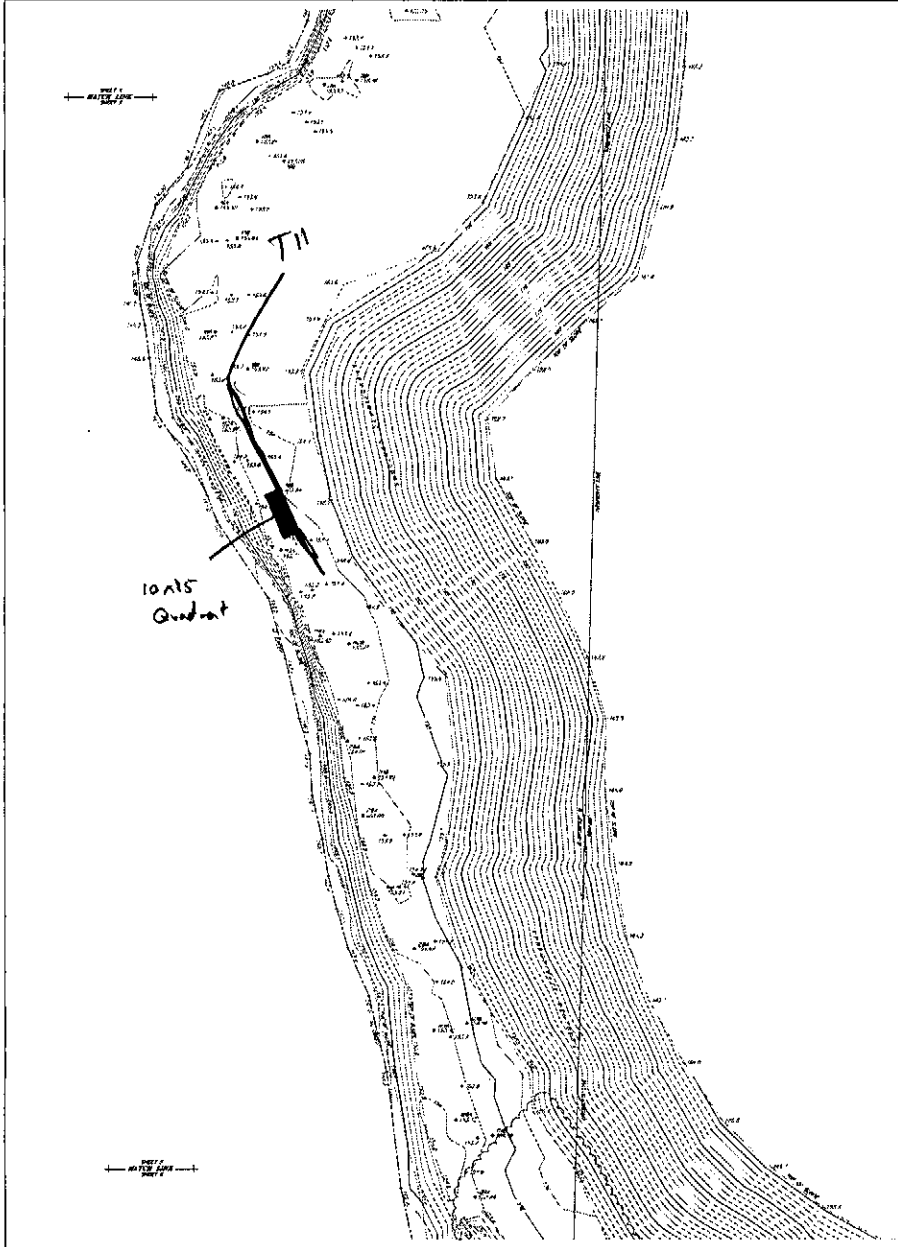


REGISTERED
PROFESSIONAL
LAND SURVEYOR

Randy H. Finckelau

OR 27 1988
RANDY H. FINCKELAU
EXPIRES 12/31/09





LEGEND

- SEC. = SECTION
- R.M.E. = ELEVATION MORTGAGE
- E.M. = ELEVATION MESH
- LE = LEVEL QUANTUM
- W.F. = WHITE FLAG
- = EDGE OF BRUSH
- = 100' FENCE
- = 20' LAND PEG
- = 100' AT MARK



SCALE: 1" = 30'

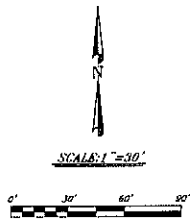


PARTIAL TOPOGRAPHY SURVEY

OF
TAX LOTS 500-512
SITUATED IN THE SOUTH ONE HALF OF SECTION 23, TOWNSHIP 5 SOUTH, RANGE 1 EAST
OF THE WILLAMETTE MERIDIAN, COUNTY OF CLATSOP, STATE OF OREGON

REGISTERED
PROFESSIONAL
LAND SURVEYOR
Randy W. Hartzel
JAN 21 1980
RANDY W. HARTZEL
7422
EXPIRES: 12/31/09

227 N. MAIN ST. CLATSOP, OR 97130 (503) 888-7777		SURVEYING & MEASUREMENTS CO.	
DATE C.M.E.	DATE 07/03/07	S	TERRAPIN LAND SURVEYING INC.
APPROVED R.W.E.	DATE 07/03/07		
SCALE 1" = 30'	SHEET 5 OF 7	PROJECT NO. 2007-63	



LEGEND

- XXX - BENCHMARK
- - UTILITY RIGHTS
- - ELEVATION MARK
- - WIRE ELEVATION
- - WIRE FLAG
- - SIDE OF CORNER
- - MET POST
- - SURVEY PIN
- - PINE AS NAILS

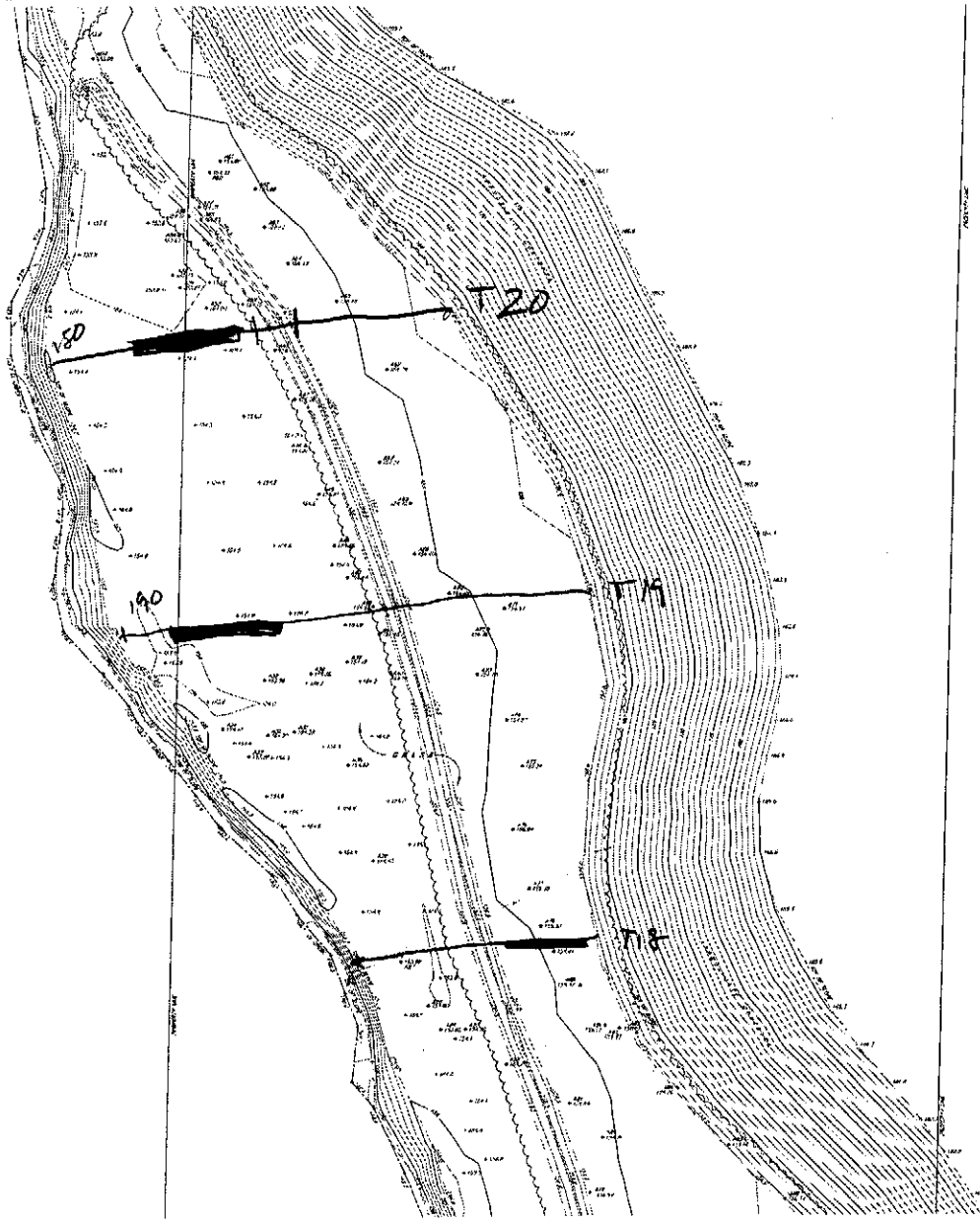
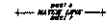
PARTIAL TOPOGRAPHY SURVEY

TAX LOTS 200-002

SITUAED IN THE SOUTHWEST CORNER OF SECTION 22, TOWNSHIP 5 SOUTH, RANGE 1 EAST
IN THE WILLAMETTE METROPOLITAN CLERK'S OFFICE, CLATSOP COUNTY, STATE OF OREGON.

227 N. Main St. Clatsop, Or 97130 (503) 463-7777	SURVEY@TATEMORLANDSURVEYING.COM
COMPANY DATE C.W.E. R.W.E. SCALE SHEET	TATEMOR LAND SURVEYING INC. 01/03/07 07/05/07 1" = 30' 6 OF 7
PROJECT NO. 2007-03	

REGISTERED
PROFESSIONAL
LAND SURVEYOR
Randy W. Engleau
OREGON
NOV. 23, 1989
RANDY W. ENGLEAU
5229
EXPIRES: 12/31/09



PARTIAL TOPOGRAPHY SURVEY

TAX LOTS 000-003

SITUATED IN THE SOUTH EAST PART OF SECTION 23, TOWNSHIP 5 SOUTH, RANGE 1 EAST OF THE WILHELMIC MOUNTAIN COUNTY OF OREGON.

127 N Main St Gresham, Or 97030 (503) 655-7777	STATEWIDE LAND SURVEYING INC.
DATE 07/01/07	REGISTERED PROFESSIONAL LAND SURVEYOR Randy W. Englehart JUN 23 1990 RANCO W. ENGLEHART SEAS
DATE 07/05/07	
SCALE 1" = 30'	PROJECT NO. 2007-63

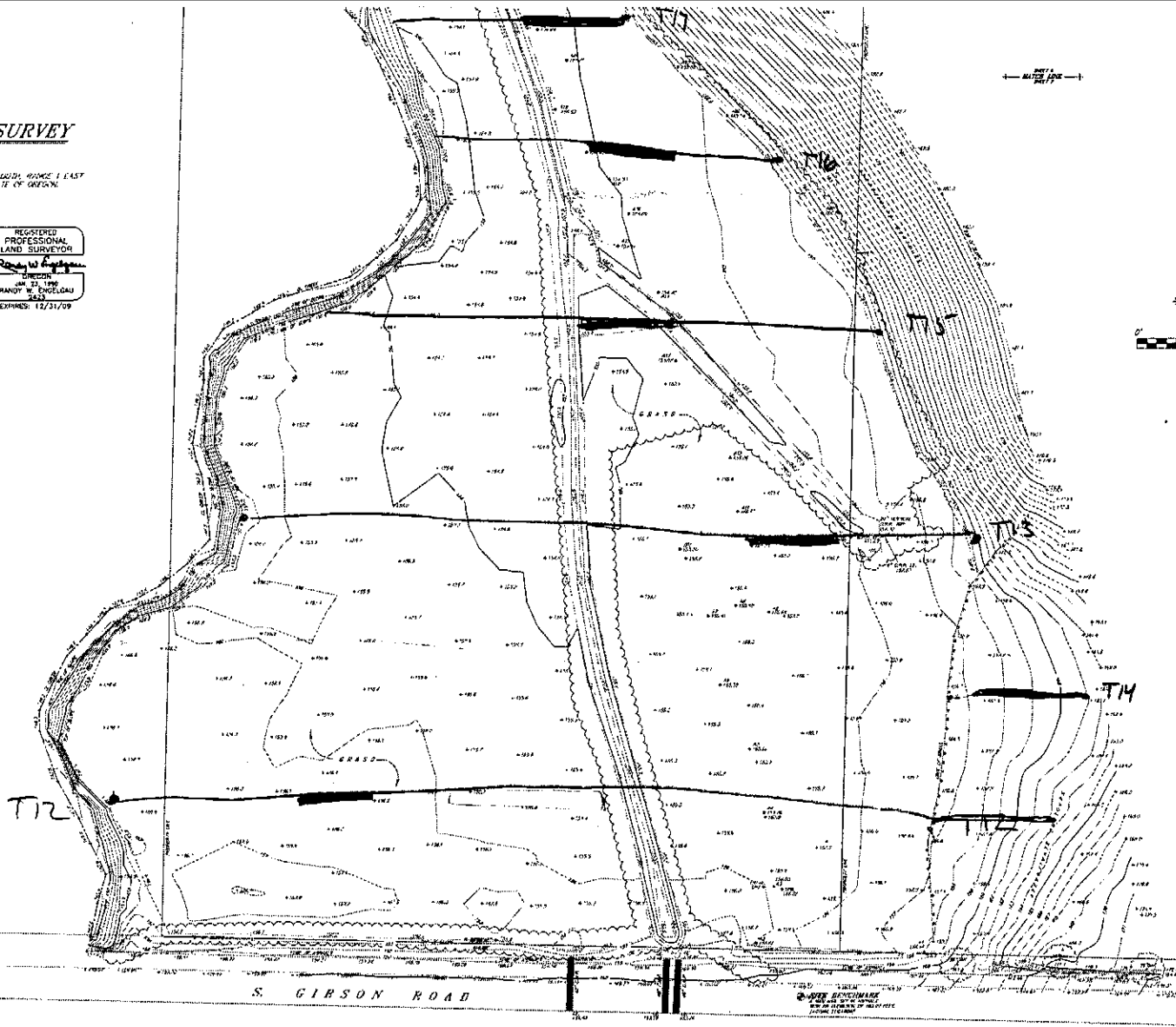
REGISTERED
PROFESSIONAL
LAND SURVEYOR
Randy W. Englehart
JUN 23 1990
RANCO W. ENGLEHART
SEAS
EXPIRES 12/31/09

SCALE: 1" = 30'



LEGEND

- CONTOUR - ELEVATION
- E. FENCE - ELECTRIC FENCE
- E. M. - ELECTRIC METER
- LC - LAND CLEARING
- WATER - WATER TANK
- - FOOT OF 10/150
- - WIRE FENCE
- - GRADE FENCE
- - 100' AS NOTED



S. GIBSON ROAD

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