Design of the
Nelson Slough
Wetland Restoration Project

Prepared for:

United States
National Park Service

Klondike Gold Rush
National Historic Park

Prepared by:

Streamcraft
P.O. Box 696
Haines, Alaska

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Introduction

The National Park Service has identified for wetland restoration a section of Nelson Slough adjacent to the old town site of Dyea. This short portion of Nelson Slough has been severely degraded by sustained, heavy horse and motor vehicle traffic. In the area of the crossing the original wetland morphology has been altered, the wetland soil is non-existent, and wetland vegetation has been eliminated. The purpose of this project is to create a design for the restoration of the degraded area. The restoration goal is the creation of wetland habitat that is equivalent, in form and function, to the undisturbed wetland area immediately upstream of the degraded section.

Figure 1. Degraded Section

Field Review

On May 21, 2003 Mark Sogge of Streamcraft visited the site with Meg Hahr, Natural Resource Program Manager for the National Park Service. Discussed during the visit were the specific objectives for the restoration. The undisturbed section of the slough just upstream of the footbridge was closely examined and chosen to serve as an analog for the restoration. The design closely mimics the contours of the undisturbed section and, once revegetated, will blend in with the existing wetlands both upstream and downstream.

Survey data collection

A project centerline was established based on the slough contours upstream and downstream of the degraded section. Beginning at station 0+00, 50' downstream of the edge of the disturbance, ground elevation was measured by completing cross-sections at 25' intervals. A relative elevation for the project was established by assigning the elevation of 100' to a U.S. Department of Interior, Bureau of Land Management monument approximately 400' downstream of the project site. The monument is BLM S1249, established in the 2001 Cadastral Survey.

A two foot long section of rebar was driven to ground level to establish a bench mark near the project site. Similarly, rebar was placed to establish the beginning station 0+00 and the ending station 1+75. Global Positioning System (GPS) coordinates were

recorded at each rebar to facilitate recovery. This information is provided on the Plan Sheet 2.

In addition to standard cross section plots, the elevation information was used to generate a contour map of the site (see Plan Sheet 4). Contours were plotted on 0.5' intervals. This map serves as a base map for the site. A similar contour map with the new design elevations has been generated (see Plan Sheet 5).

Wetland soil depths were measured at station 1+50 and 1+75. Soil depth varied from 0.2' to 0.5', with the deeper soil generally found near the edges of the wetland areas, furthest from the slough centerline. The location of spruce tree line relative to the stream centerline was measured.

Site Description

A study of the wetlands of the Dyea area was conducted for the National Park Service (NPS) by Koren Bosworth in August 2000. This study provides an excellent description of the wetland just upstream of the degraded area:

> The channel is straight and wide, 20 to 30 feet wide and 8 to 12 inches deep. It shallows evenly downstream, until it is just saturated at the footbridge. The groundwater fed flow in September was sluggish to stagnant. The pH was 5.0..... The substrate is gravels and sands under fine organic sediments. The upper section of the channel is dominated by an aquatic grass, *Poa palustris*, and two aquatic herbs, *Hippuris vulgaris*, and *Calitriche verna*. The aquatics, *Poa palustris, Rumex fenestratus,* and *Carex lyngbyei* dominate the lower part of the channel. *Carex lygbyei* is a salt-tolerant sedge that indicates that this section of channel is at the upper limit of the tidal influence or was recently, before it was uplifted. The banks of the channel have many estuarine meadow plants with young spruce coming in.

The shape of the area to be restored has been altered by the traffic that moved through it. It is no longer a channel, but is instead shaped like a broad, oval pond. While it is unlikely that the basic groundwater and tidal driven hydrology has been altered by the human activity, there is no doubt that the wetland soil and vegetative ecosystem has been dramatically impacted. There is no sign of fine, organic laden wetland soil found just upstream, and, in May, the site was not vegetated at all. Instead the ground surface is composed of bare alluvial material.

Hydrology

As the centerline vertical profile of the area indicates (see Plan Sheet 6), there is a high berm of material at station 0+25. The elevation of this berm is 1.33' higher that the deepest part of the pond in the degraded section. Interestingly, the berm is also 1.15' higher than the existing wetland elevation at station 1+75, which is 50' upstream of the area to be restored. This berm restricts water flow and serves to create the backwater that floods the pond and the wetlands upstream of the foot bridge during periods of high

ground water. A remnant channel leads out of the existing pond area and allows for the ingress and egress of fish during periods of high water.

The restored wetland design does not alter the existing hydrology of the site. The new wetland area will be very similar is shape and elevation to existing high value wetlands above the bridge and will experience similar water regimes.

Geomorphology
The site is located in the broad alluvial floodplain of the Taiya River. The slough has the general shape of a flood channel of the river, but no longer acts as such. The zone of tidal influence currently extends, or has very recently extended, into the restoration area. The impact of the salt water incursions is evident primarily in the composition and distribution of the vegetation rather than the shaping of the topography. The flood channel shape of the undisturbed wetlands above the footbridge does not exhibit the sharp banks of a young, active channel but is instead smoothed by the deposition and creation of wetland soils. However, there is a small channel that runs down the center of the wetlands, indicating that there is, at times, significant enough flow to maintain this channel profile.

Soils
Alluvial gravels and sands laid down by the Taiya River form the underlying base of this wetland area. The thin layer of wetland soil in the undisturbed areas is primarily organic in nature, with a fine mineral content. It is composed of a web of interlaced root systems.

Vegetation
Please refer to the above quote from the study by Koren Bosworth.

Restoration Plan

Design
In accordance with the stated goals of this design, the undisturbed wetland just upstream of the footbridge was used to create a template for the degraded area. The west (left looking upstream) side of the cross section measured at station 1+50 was chosen as the model shape to be utilized for both sides of the restoration area. Specifically, this grade was applied to the cross sections at station 0+75 and 1+00. The resulting symmetrical design results in a slightly wider profile than the sections upstream, increasing the surface area available for aquatic plant colonization, and increasing the flooded volume in comparison to the upstream sections. Similarly, the broader profile increases the relative area exposed to various soil saturation levels. This will allow for the establishment of the maximum variety of plant species and, over the long term, result in the development of a diverse yet stable ecosystem.

Applying the same cross section profile through the entire restored section will also facilitate the blending of the restored area into the existing ground contours at stations 0+50 and 1+25. It is the intent of the design to avoid the removal of any established vegetation adjacent to the restored section. Instead, the gravels and wetland soils will be

shaped to merge into the existing ground elevations. The creation of the resulting irregular edge is preferable to the construction of smooth uniform transitions.

The design also incorporates a three foot wide gravel bottom stream channel similar in shape to the channel found at station 1+75 and further upstream. This channel ties into the V-channel found at station 0+50. Although channelized flows are currently restricted by the higher grade found at station 0+25, this channel may function under certain flows and reflects the probable original morphology of the area. If sufficient flow does not occur, the channel will slowly fill and become colonized by wetland vegetation. The design centerline profile closely matches the existing ground elevations, requiring only minimal excavation in some areas.

A slight meander has been introduced into the system to reflect the sinuosity common to sloughs in this area. However, the curvature is limited by the restricted area of the project.

The centerline profile of the restoration design matches the deepest part of the restored wetlands with the centerline elevation of the wetlands at station 1+75. This will allow for the establishment of vegetation tolerant of the same water regime. The restored wetland has been specifically designed to be successfully colonized by the existing vegetation upstream.

HOW DO THEY KNOW? REF. SITE WHERE?

Soils

The gravel material used to reconstruct the underlying shape of the wetland should be similar to the typical gravels deposited by the Taiya River. This will assure that the drainage patterns of the restored site are closely matched to the surrounding site. Although it is not possible to recreate the river flow placement of the adjacent material, proper shaping and equipment compaction of the material should result in equivalent function and adequate stability.

The wetland soil is a very important component of the success of the project. It is critical that the soil support the establishment of the wetland vegetation. It would be ideal to use soils from another equivalent wetland site that is to be destroyed by a development of some sort. Soils taken from an area that was recently wetlands but no longer functions as such due to a change in the water regime caused by such events as river relocation or post-glacial uplift would also function well. Soils from either of the these two sources would be known to support wetland plants, would contain microbial communities known to be compatible with wetland conditions, and would most likely not contain invasive weed seeds, unless these plants are already common in the area.

Topsoil imported into the area may function adequately if it is known to support plant growth. Poor quality soil will slow the development of a healthy plant community.

Soil depths in the existing wetland upstream of the restoration site are quite shallow, indicating the relative immaturity of these wetlands. It was only recently that this slough was an active river flood channel with strong tidal salt water incursions. The restored

area wetland soil depth specified in this design is 0.5 feet, tapering into the adjacent undisturbed areas and into the center channel. This depth will provide for the critical support the newly planted *Carex lyngbyei* require and will provide an adequate depth for downward root growth. The soil should not be compacted as this will restrict root development.

Vegetation

The sedge *Carex lyngbyei* will be planted throughout the restored wetland up to the relative project elevation of 100.00 feet. This sedge is common in the wetlands both above and below the restoration site. This plant is known to be strongly rhizomatous and very easy to transplant as a sprig. At the recommendation of Nancy Moore, a plant ecologist at the Alaska Department of Natural Resources, Native Plant Nursery in Palmer, Alaska, the specified spacing for the sprig planting is 3 feet. This spacing should allow for the rapid revegetation of the area.

Carex lyngbyei plants may be commercially available if they are ordered in the fall, allowing for the growth of the plants through the winter and successful planting in the spring. The sedge may also be harvested from other sites in the Taiya River valley, and either separated and planted as sprigs or as small mats. A known plant supplier is:

- Landscape Alaska, 5157 Glacier Hwy, Juneau, AK 99801-9516 907-780-4916

The harvesting, site preparation and planting methods delineated in "Streambank Revegetation and Protection; a guide for Alaska" (see references) should be followed for the transplanting of the sedge. Planting should occur in the early summer, prior to site flooding but after the period of the lowest groundwater elevations.

The grass *Poa palustris* (common name: Fowl Bluegrass) is common in the wetlands upstream of the restoration site. An intensive search was conducted to determine the availability of *Poa palustris* seed in Alaska. Since the search was unsuccessful this seed was not specified for this project. However, if a source can be found it would be the design recommendation to seed all the new wetland soil, following the supplier's directions for density and fertilizer, if any. This seeding would serve to bind the exposed soil surfaces and the development of the root system would accelerate the establishment of functional wetland soil.

The estimate of quantities and costs in this report includes the application of coir matting to protect the wetland soil surfaces from erosion. It is not the recommendation of this design to place this material if planting and seeding can be accomplished in a timely and successful manner. The matting will protect the soil surface but will cause the planting of the *Carex* to be very difficult. A hole would have to be cut for each sprig. Also, the fabric would have to be kept in place, and this could be quite difficult given the shallow unconsolidated nature of the wetland soil and the high winds common in the area.

A general note in the plans calls for the possible planting of young spruce trees above the 100 foot elevation. If completed, this work should be done in the early spring. It is not

necessary to prune spruce trees back when transplanting. It is very important to plant trees with a largely undisturbed root system. Tree location (if any) is to be determined by NPS staff.

Construction Implementation

The following is a suggested work plan for the implementation of this restoration project. The plan does not necessarily delineate all steps necessary to construct the project. A contractor hired for this work may choose to accomplish the required work in a different order or with different equipment.

Workplan

1. Reestablish project centerline. Locate rebar set at station 0+00 and 1+75. Set centerline stations at stations 0+50, 0+75, 1+00 and 1+00.
2. Locate project temporary bench mark (TBM).
3. Establish (check) TBM elevation using the BLM monument noted on the plan sheets.
4. Set grade stakes for gravel placement.
5. Import gravels.
6. Place gravels to grade, blending into upstream and downstream existing contours.
7. Track walk the gravels to stabilize.
8. Survey stream channel; grades and location.
9. Excavate or fill stream channel as necessary.
10. Set grade stakes for wetland soil placement.
11. Import wetland soils.
12. Place wetland soils to grade, blending into upstream and downstream existing contours. Wetland soils are not to be compacted in any way.
13. Hand rake all wetland soil surfaces.
14. Plant and seed. Water if necessary.

Equipment

1. Gravel Placement: loader, end dump trucks, small dozer, grader.
2. Channel excavation: small backhoe or hand shovel.
3. Wetland soil placement: end dump trucks, loader, backhoe.
4. Planting: rakes and shovels.

Access

1. Equipment will access the site from the parking lot on the west side.
2. Work will be sequenced to allow equipment to leave the site without disturbing finished grades or planted areas.

REFERENCES:

Bosworth, Koren S.,2000. Wetlands of the Dyea Area of the Lower Taiya River Valley. National Park Service, Klondike Gold Rush National Historic Park, Skagway, Alaska.

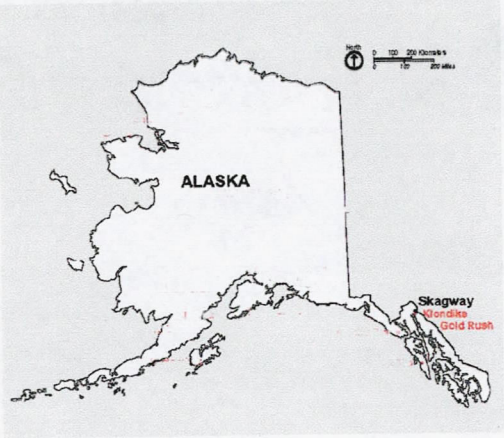
France, R. L. , 2003. Wetland Design: Principles and Practices for Landscape Architects and Land-use Planners. W.W. Norton and Company, New York, NY.

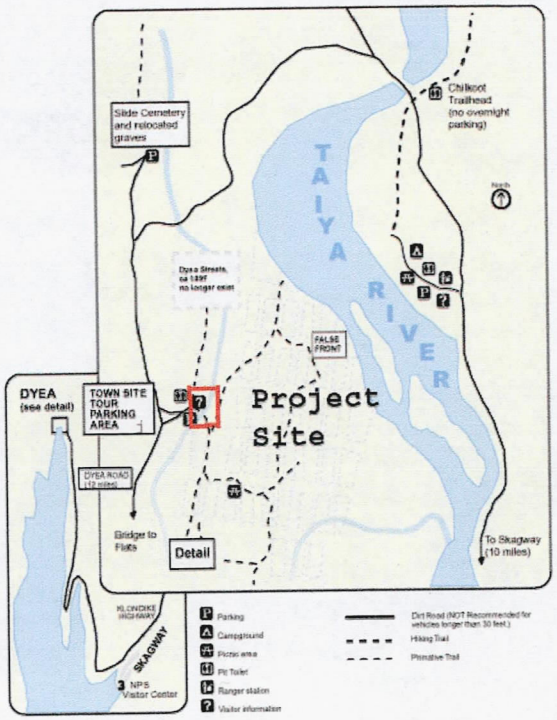
Hall, Judy K., 1995. Native Plants of Southeast Alaska. Windy Ridge Publishing, Haines, Alaska.

Kusler, Jon and Mary E. Kentula, editors, 1990. Wetland Creation and Restoration: The Status of the Science. Island Press, Washington, D.C.

Muhlberg, Gay and Nancy J. Moore, 1998. Streambank Revegetation and Protection; a guide for Alaska. Technical Report No. 98-3. Alaska Department of Fish and Game/Alaska Department of Natural Resources. Anchorage, Alaska.

Location and Site Map





Nelson Slough Wetland Restoration Project

PREPARED FOR

United States National Park Service

Klondike Gold Rush National Historic Park

BY

Streamcraft

HAINES, ALASKA

DRAWING INDEX

NELSON SLOUGH
WETLAND RESTORATION

GENERAL NOTES:

SURVEY NOTES

- **ALL PROJECT MEASUREMENTS ARE IN FEET.**
- PROJECT SURVEY DATA COLLECTED ON 5/21/03.
- PROJECT VERTICAL SURVEY DATA IS BASED ON AN ELEVATION ASSIGNED TO AN EXISTING SURVEY POINT, NOT ON TRUE ELEVATION.
- THE ELEVATION OF 100.00 FEET WAS ASSIGNED TO THE U.S DEPARTMENT OF INTERIOR SURVEY MONUMENT BLM S1249 LOCATED APPROX. 400 FEET DOWNSTREAM OF THE PROJECT SITE
- REBAR WAS PLACED TO LOCATE THE ENDS OF THE PROJECT CENTER LINE AND TO PROVIDE A TEMPORARY BENCH MARK (TBM).
  - TBM ELEVATION 101.79 FEET
  - TBM GPS COORDINATES
    - 08V 0479793 UTM 6595944
  - STATION 0+00 GPS COORDINATES
    - 08V 04799796 UTM 6595927
  - STATION 1+75 GPS COORDINATES
    - 08V 0479837 UTM 6595965
- FOR ADDITIONAL CENTERLINE REFERENCE A NAIL WAS DRIVEN INTO THE UNDERSIDE OF THE FOOTBRIDGE. THE STATION IS 1+34.35.

MATERIALS

- GRAVEL FILL SHALL BE SIMILAR IN NATURE TO THE ALLUVIAL MATERIAL PRESENT ON THE PROJECT SITE.
- WETLAND SOIL SHALL BE COMPOSED PRIMARILY OF ORGANIC MATERIAL, WITH THE MINERAL CONTENT COMPOSED OF SILT OR SILT-LIKE MATERIAL.

CONSTRUCTION STAKING

- GRAVEL FILL ELEVATIONS SHALL BE STAKED PRIOR TO CONSTRUCTION AND CHECKED AFTER CONSTRUCTION.
- WETLAND SOIL FINISH ELEVATIONS SHALL BE STAKED PRIOR TO CONSTRUCTION AND CHECKED AFTER CONSTRUCTION.

CONSTRUCTION METHODS

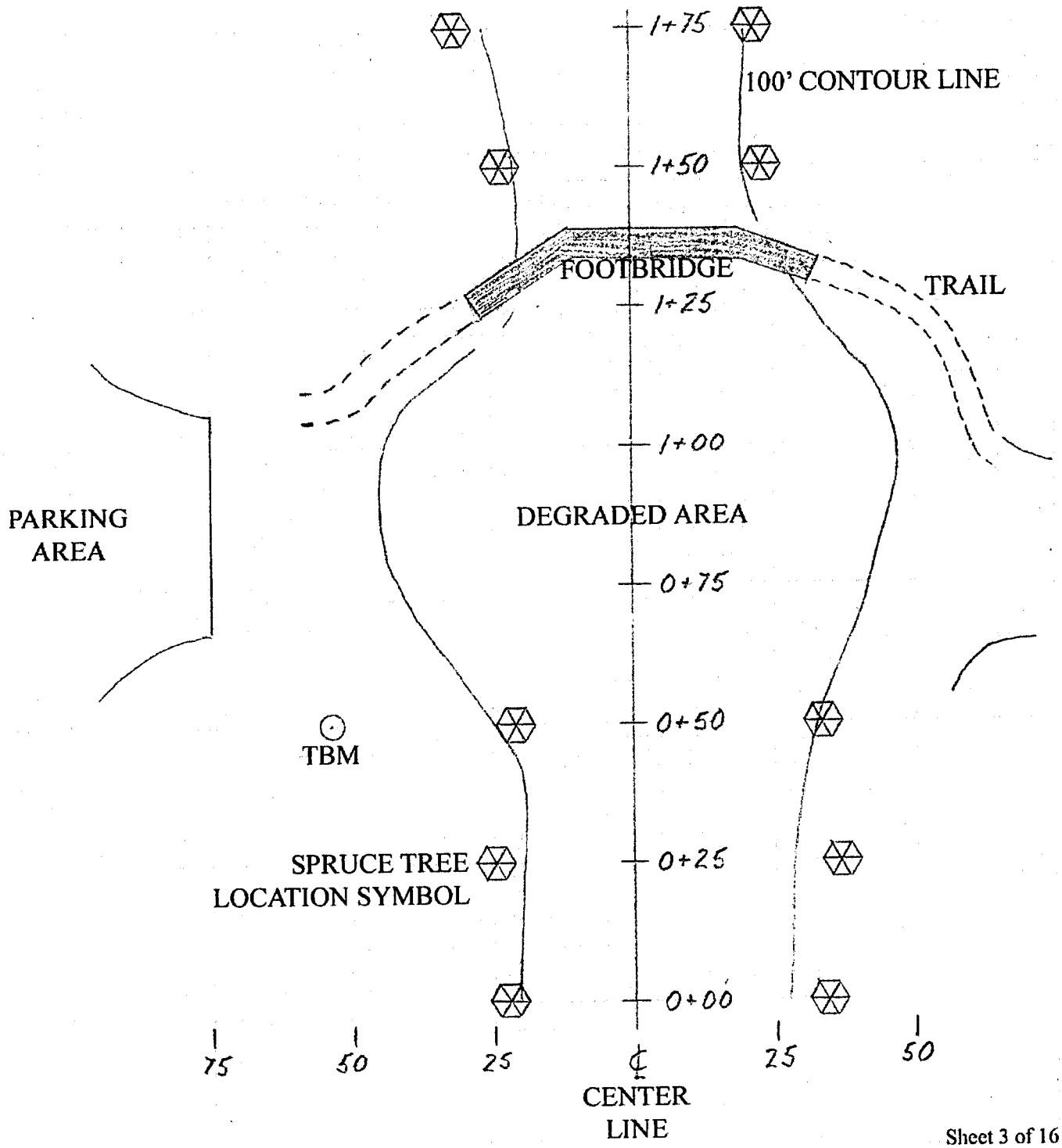
- GRAVEL FILL AND WETLAND SOIL WILL BE BLENDED INTO THE EXISTING GROUND CONTOURS AT STATION 0+50 AND STATION 1+25 TO CREATE THE DESIGN PLAN CONTOURS.
- ALL NEW GRAVEL SURFACES WILL BE TRACK WALKED WITH A DOZER
- WETLAND SOILS WILL NOT BE COMPACTED AND WILL BE HAND RAKED AFTER PLACEMENT.

VEGETATION

- SPRIGS OF *CAREX LYGBYEI* SHALL BE PLANTED ON 3 FOOT CENTERS IN ALL THE NEW WETLAND SOIL UP TO THE ELEVATION OF 100 FEET.
- ADDITIONAL SEEDING OR THE PLACEMENT OF EROSION CONTROL FABRIC WILL BE CONDUCTED UNDER THE DIRECTION OF THE NATIONAL PARK SERVICE (NPS) STAFF.
- SPRUCE TREES SHOULD BE PLANTED ABOVE THE 100 FOOT CONTOUR LINE, AT LOCATIONS DETERMINED BY NPS STAFF.

NELSON SLOUGH
WETLAND RESTORATION

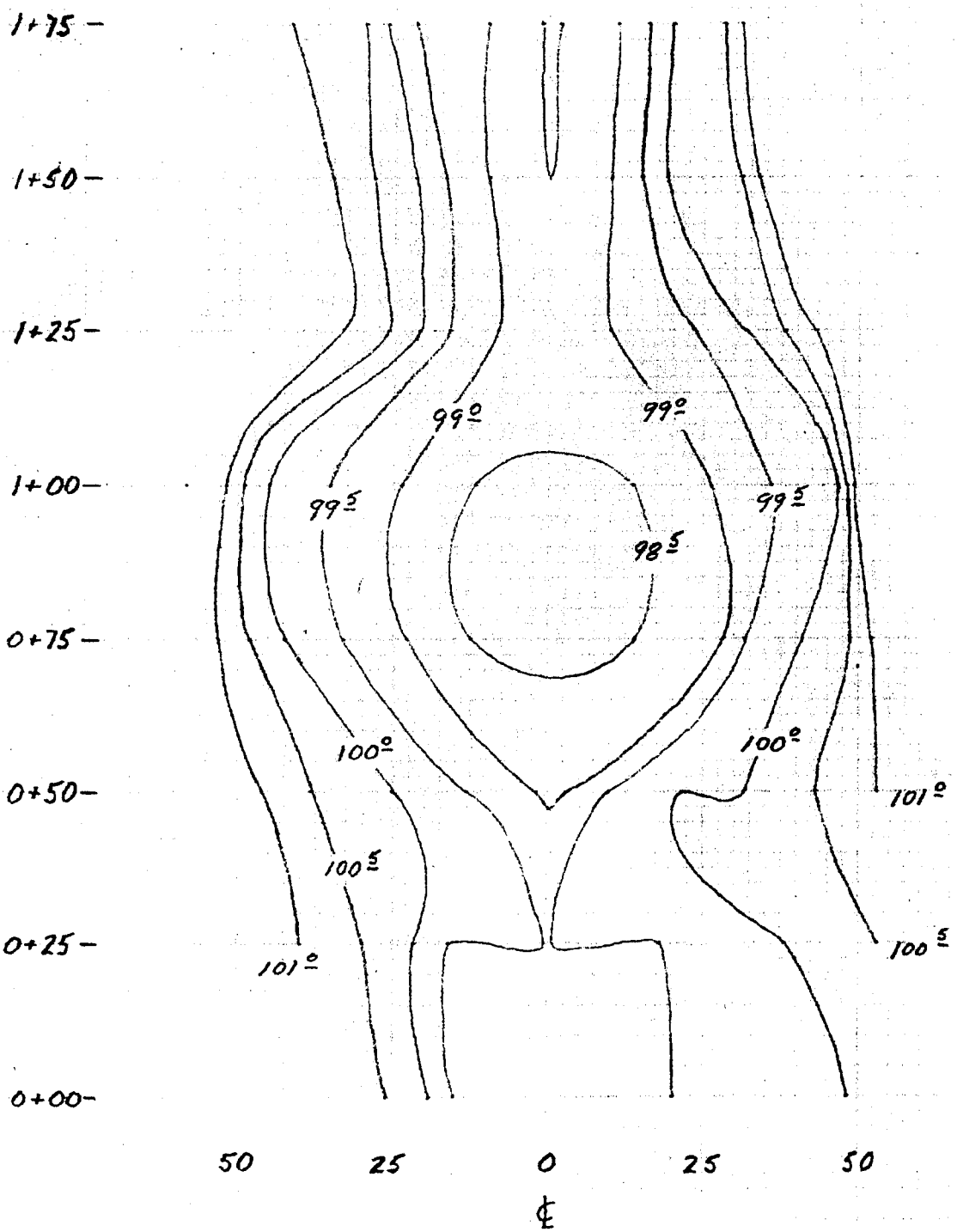
SITE PLAN



Streamcraft

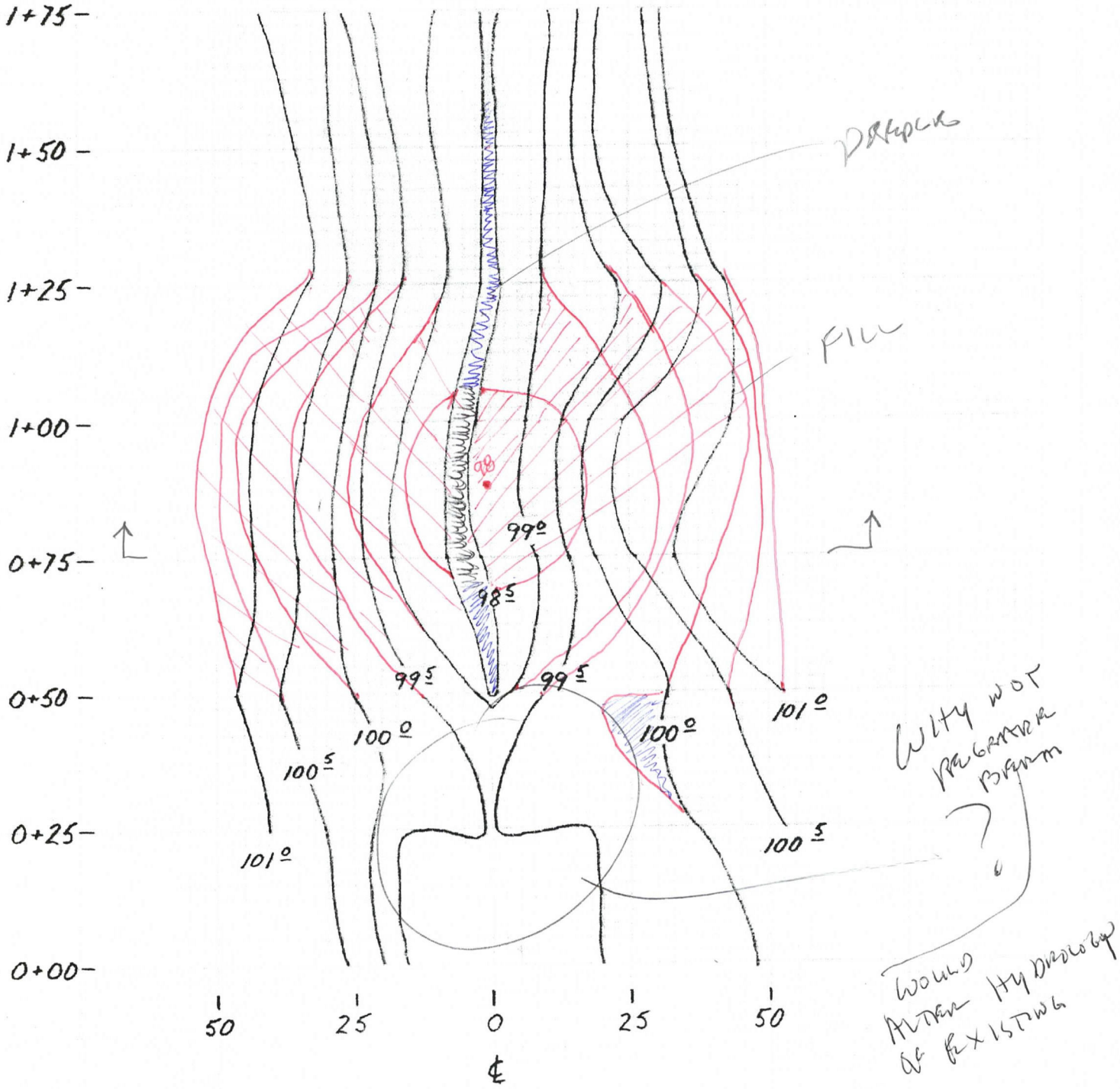
NELSON SLOUGH
WETLAND RESTORATION

CONTOUR MAP
ORIGINAL GROUND
(EXISTING)



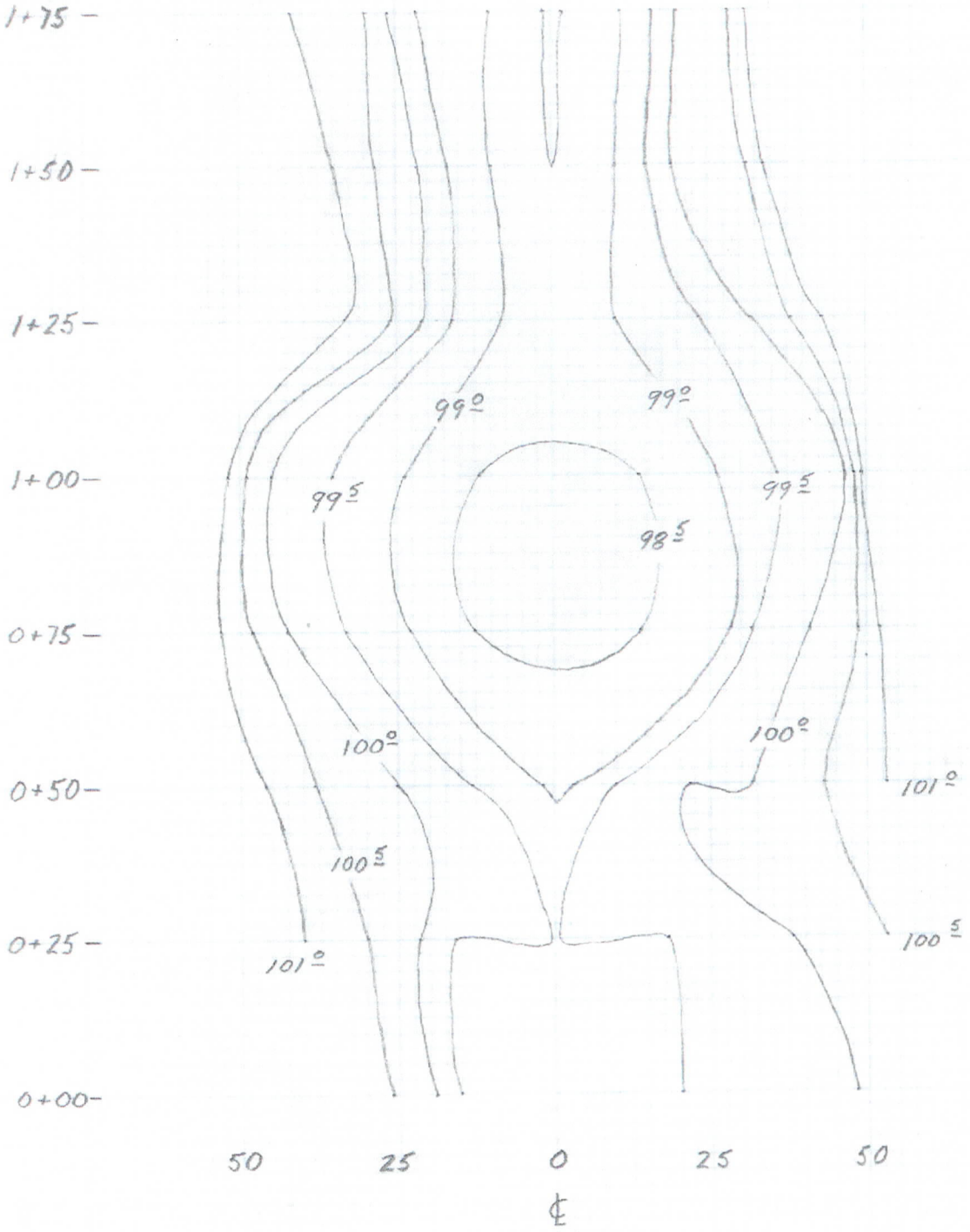
NELSON SLOUGH
WETLAND RESTORATION

CONTOUR MAP
RESTORATION DESIGN



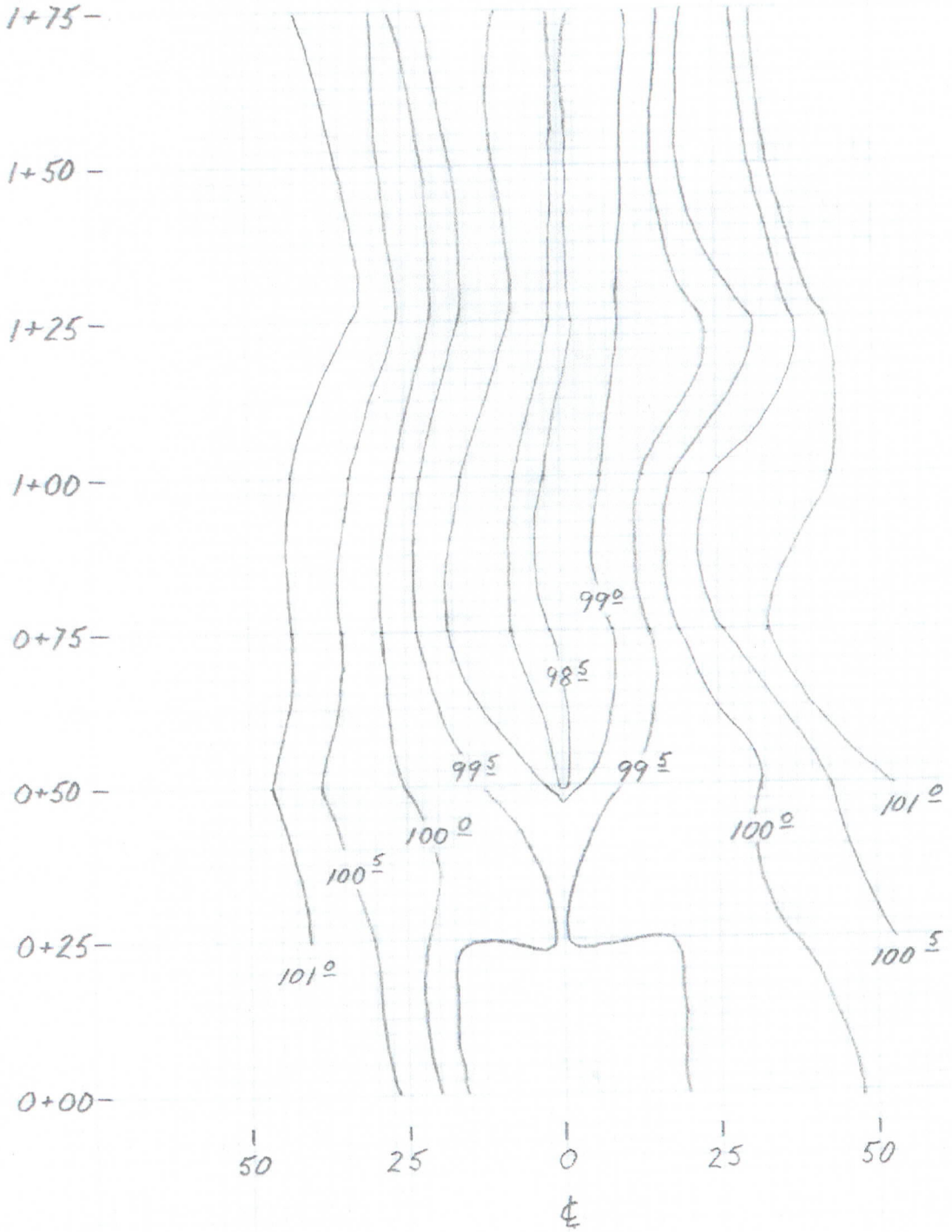
NELSON SLOUGH
WETLAND RESTORATION

CONTOUR MAP
ORIGINAL GROUND
(EXISTING)



NELSON SLOUGH
WETLAND RESTORATION

CONTOUR MAP
RESTORATION DESIGN



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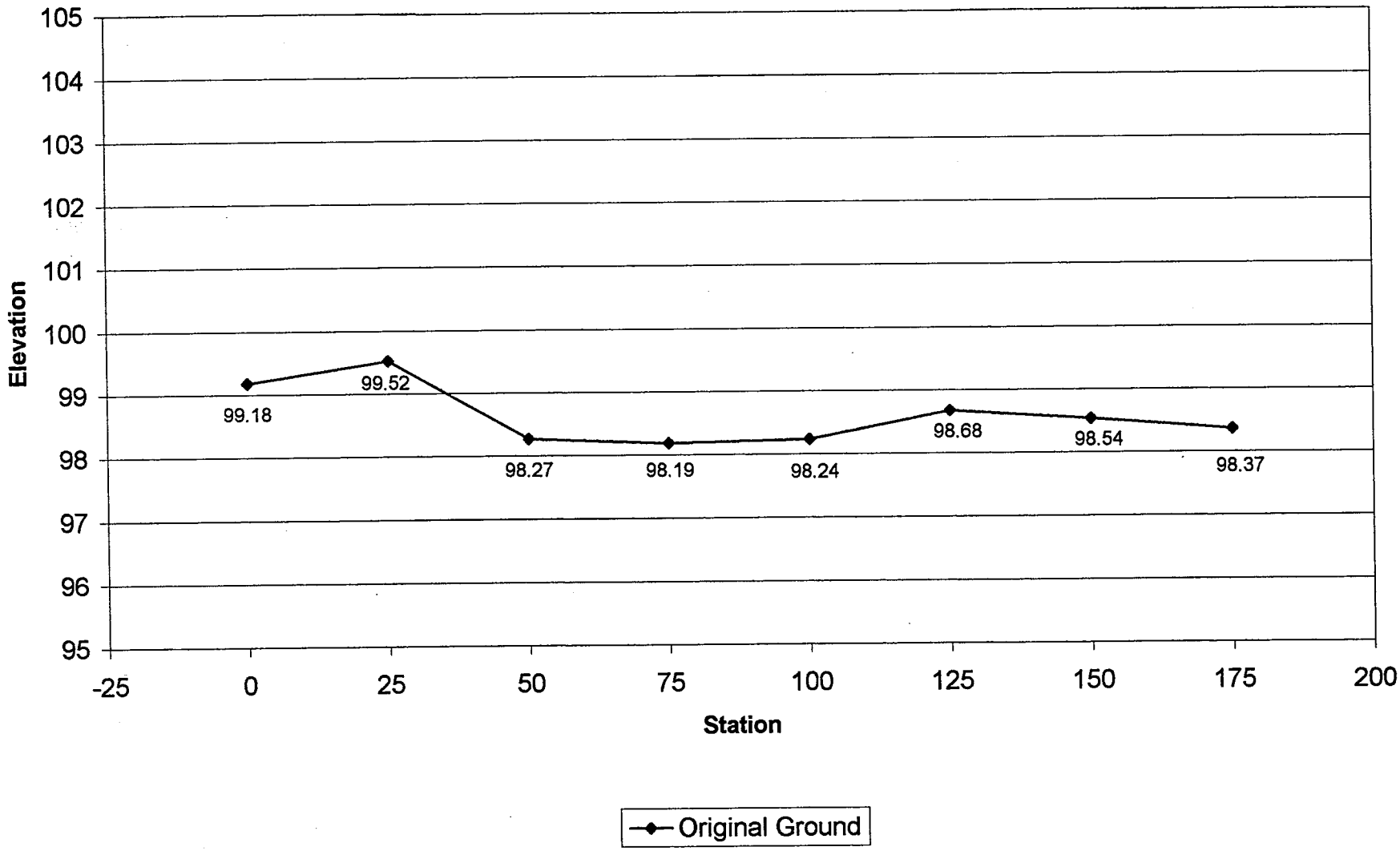
Nelson Slough Wetland Restoration
Original Ground Elevations

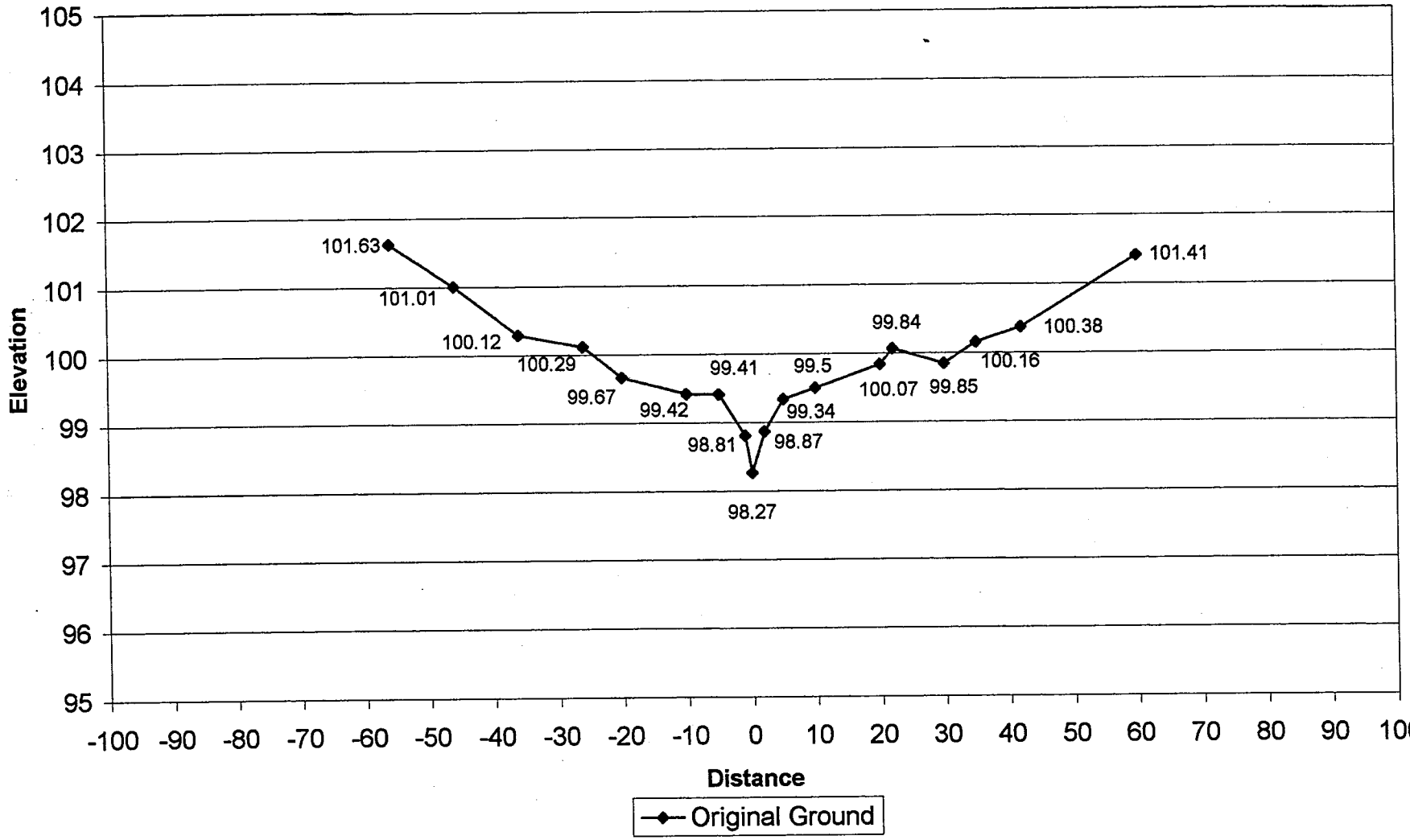
Centerline Profile



Nelson Slough Wetland Restoration

Original Ground Elevations

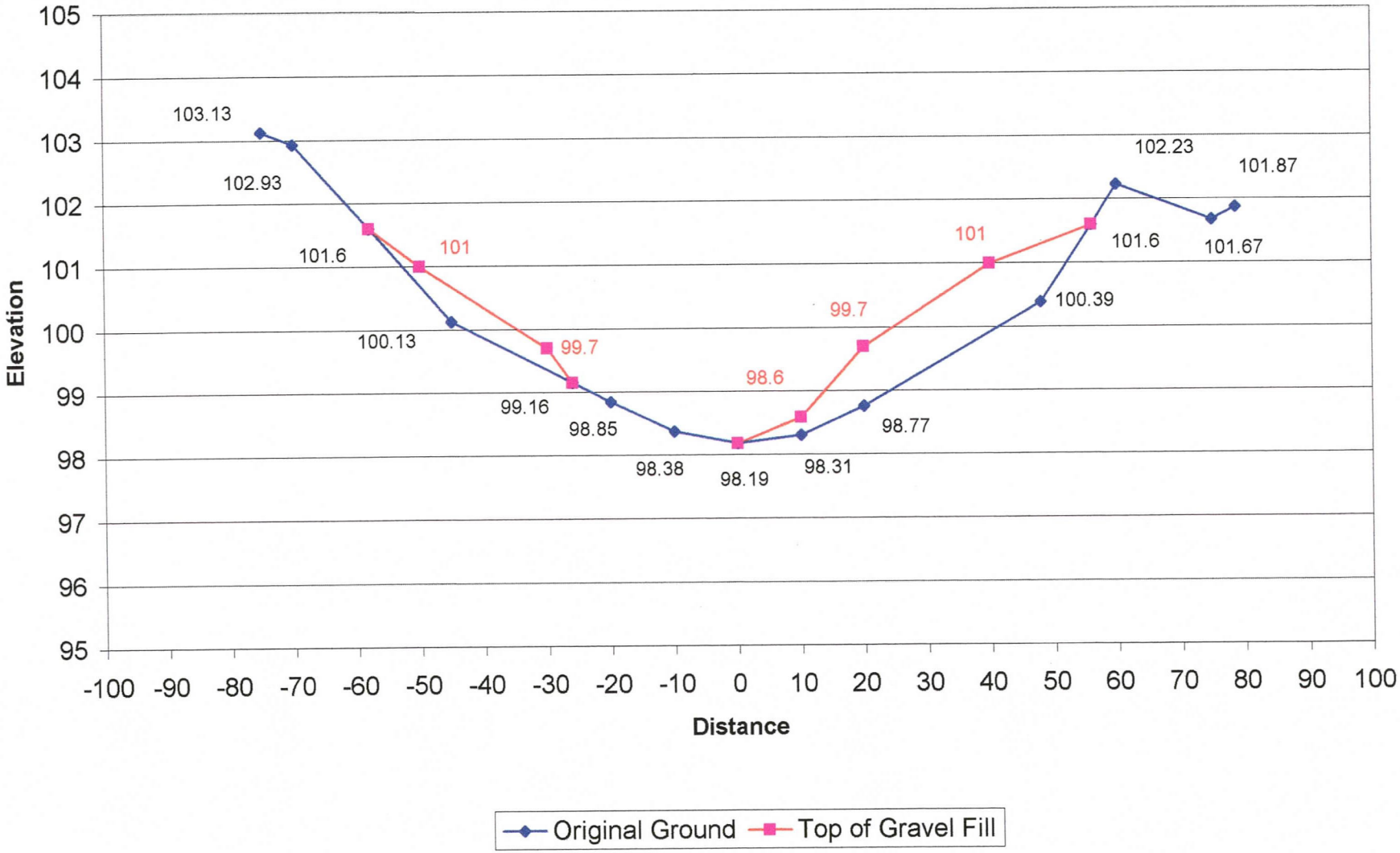
Station 0+50



Nelson Slough Wetland Restoration

Gravel Fill - Finish Elevations

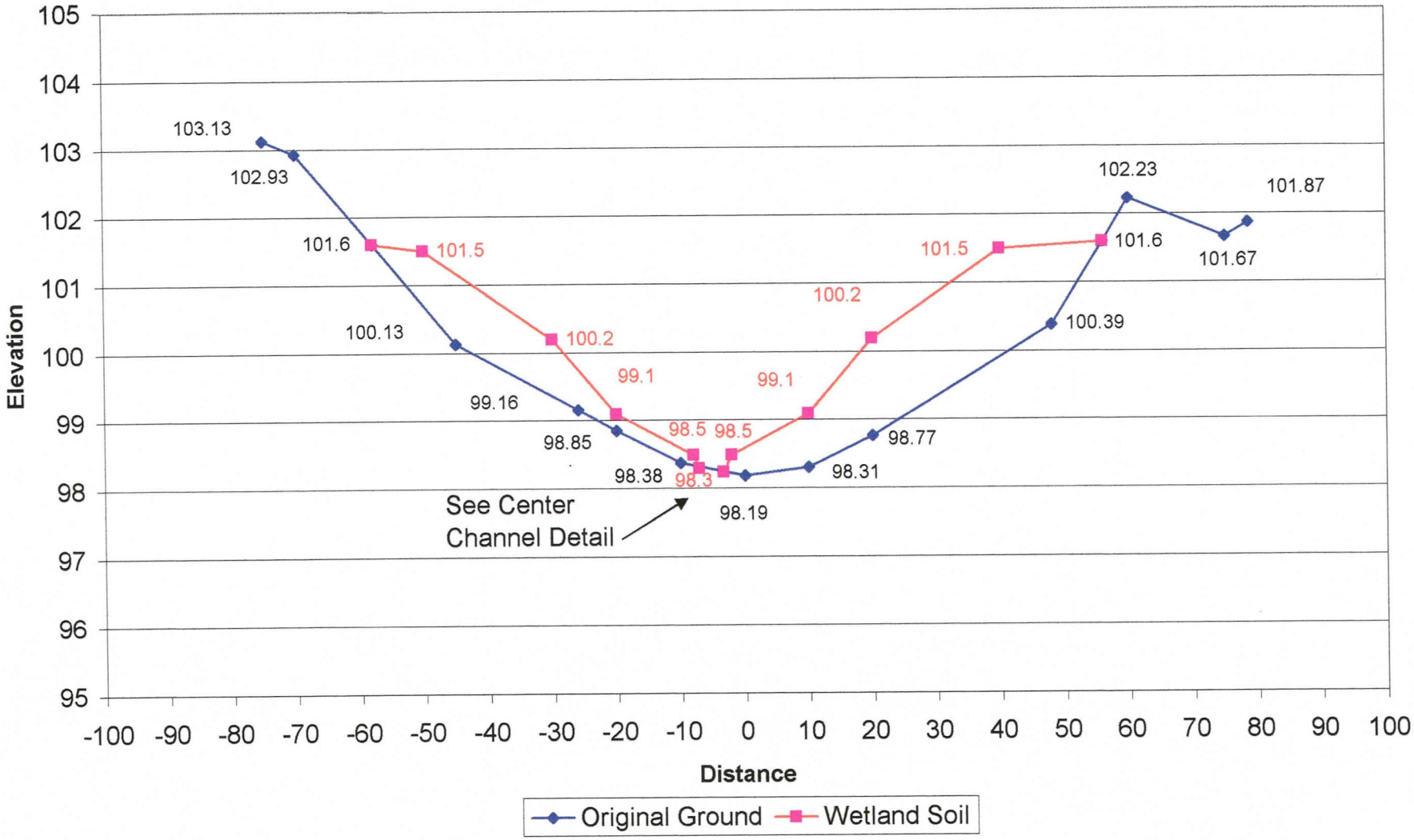
Station 0+75



Nelson Slough Wetland Restoration

Wetland Soil - Finish Elevations

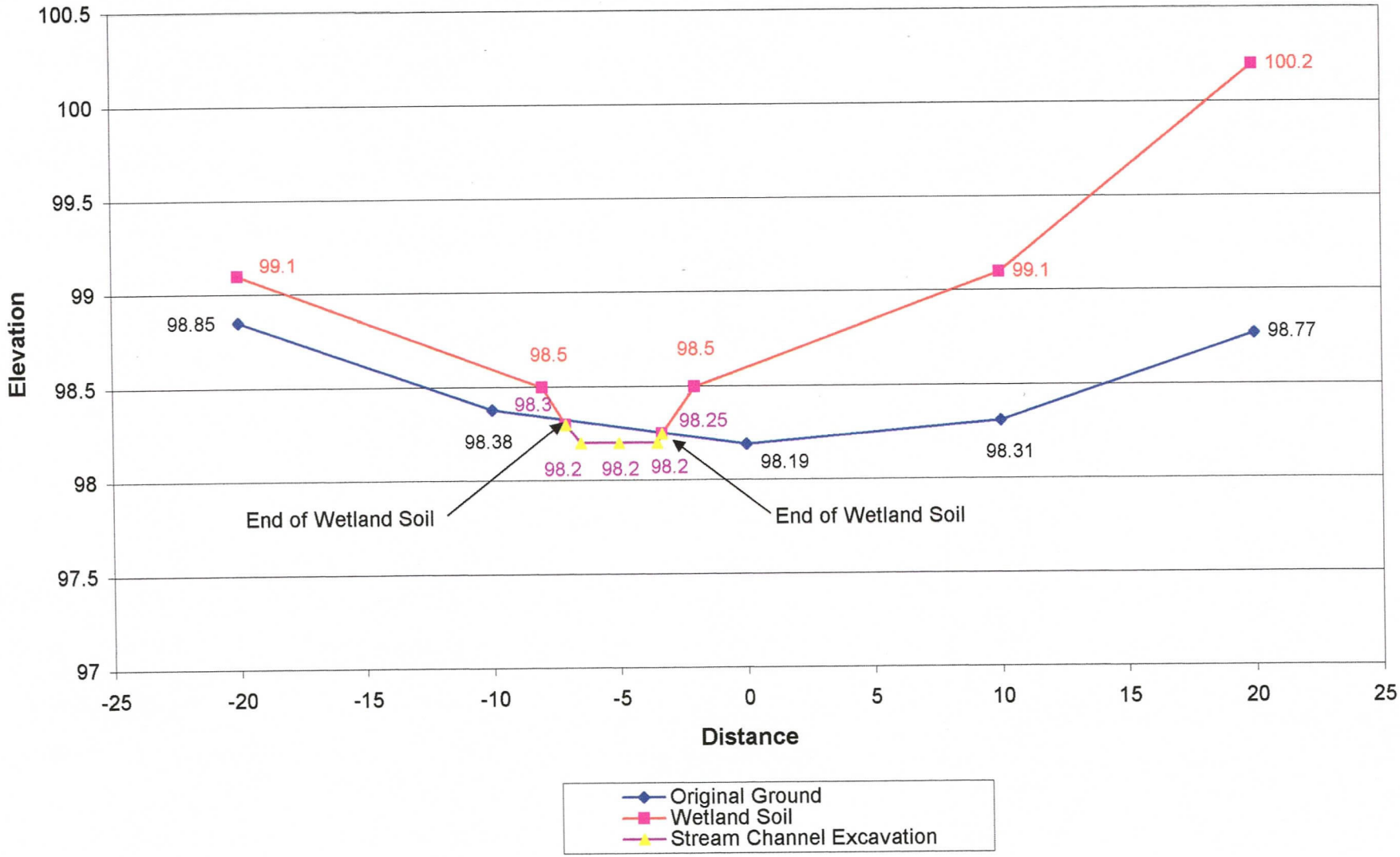
Station 0+75



Nelson Slough Wetland Restoration

Center Channel Detail

Station 0+75



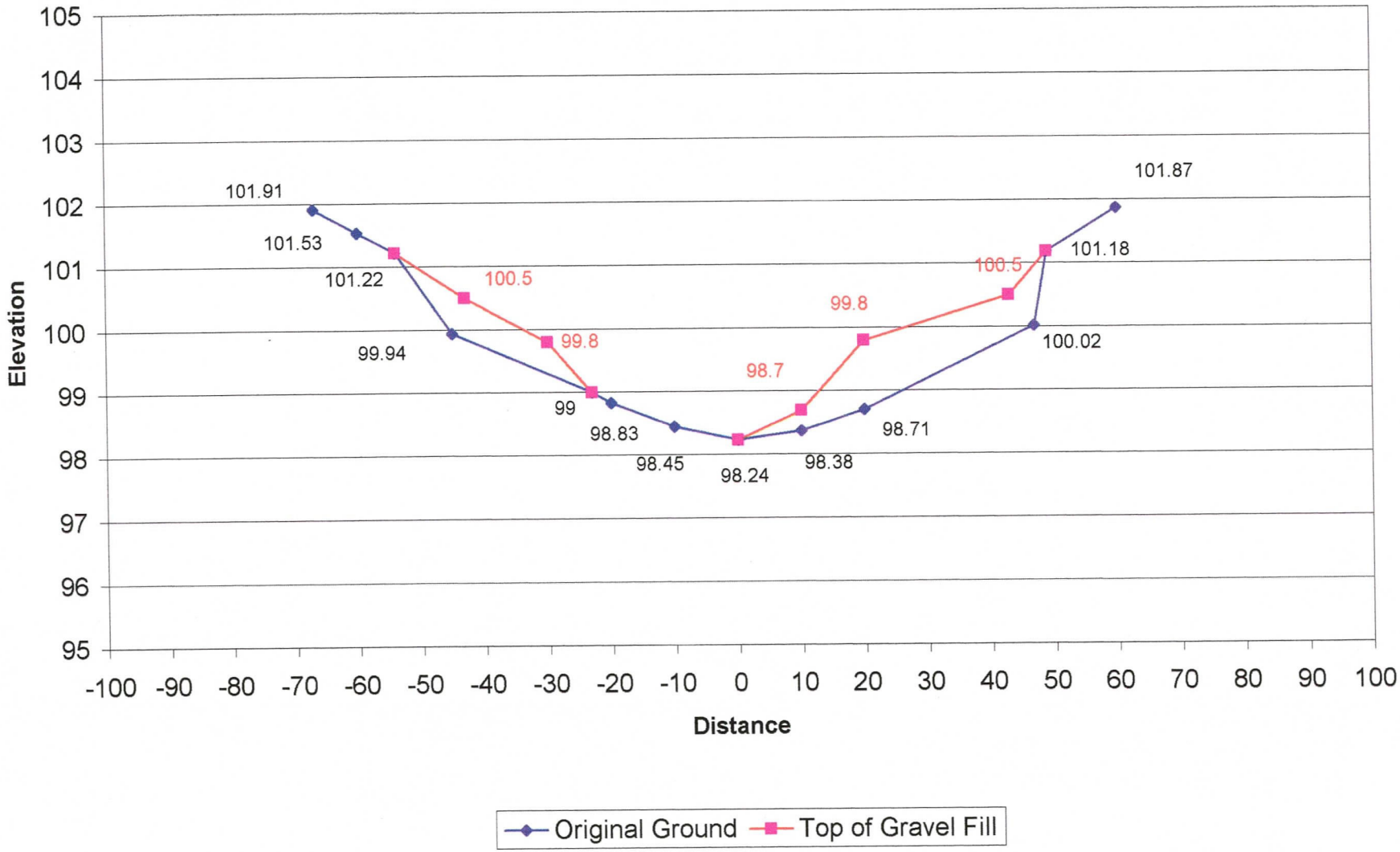
Nelson Slough Wetland Restoration
Cross Section Survey Information

Station 0+75												
	Original Ground			Gravel Fill			Wetland Soil			Center Channel Detail		
	Elev	Distance		Elev	Distance		Elev	Distance		Elev	Distance	
	103.13	-75					101.6	-58				
	102.93	-70					101.5	-50				
	101.6	-58		101.6	-58		100.2	-30				
	100.13	-45		101	-50		99.1	-20				
	99.16	-26		99.7	-30		98.5	-8		98.3	-7.1	
	98.85	-20		99.16	-26		98.3	-7.1		98.2	-6.5	
	98.38	-10								98.2	-5	
	98.19	0		98.19	0		98.25	-3.3		98.2	-3.5	
	98.31	10		98.6	10		98.5	-2		98.25	-3.3	
	98.77	20		99.7	20		99.1	10				
	100.39	48		101	40		100.2	20				
	101.6	56		101.6	56		101.5	40				
	102.23	60					101.6	56				
	101.67	75										
	101.87	78.7										

Nelson Slough Wetland Restoration

Gravel Fill - Finish Elevations

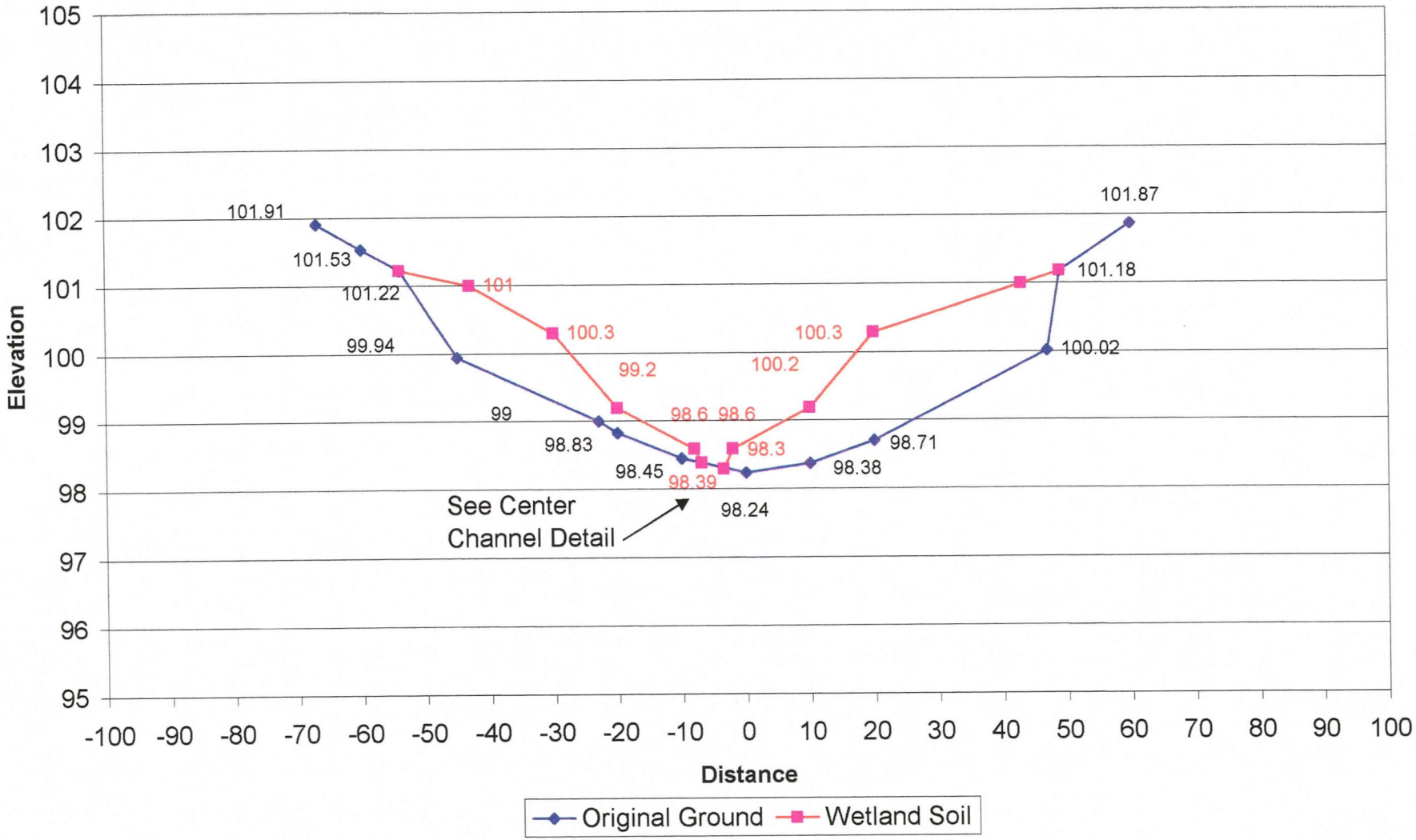
Station 1+00



Nelson Slough Wetland Restoration

Wetland Soil - Finish Elevations

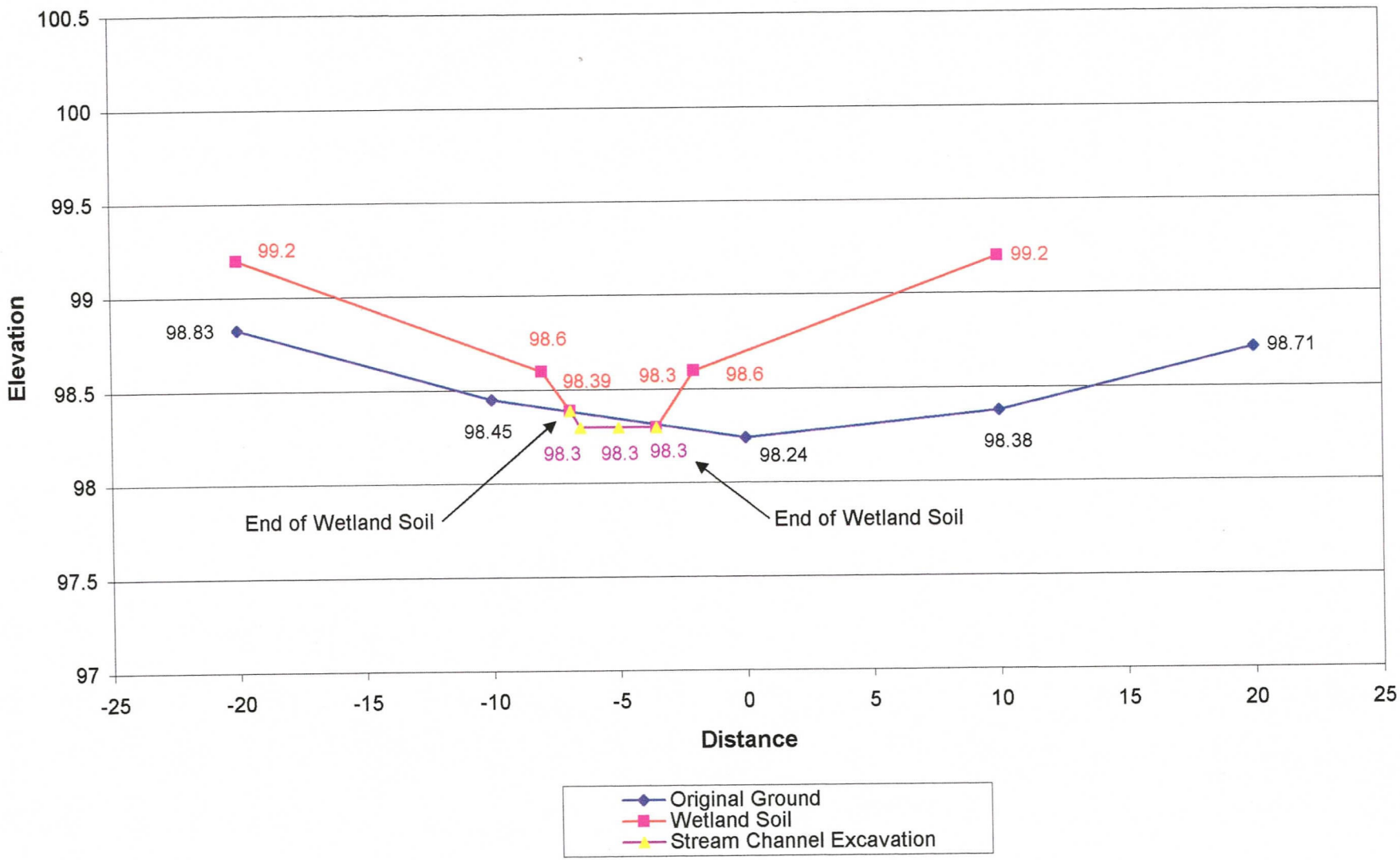
Station 1+00



Nelson Slough Wetland Restoration

Center Channel Detail

Station 1+00

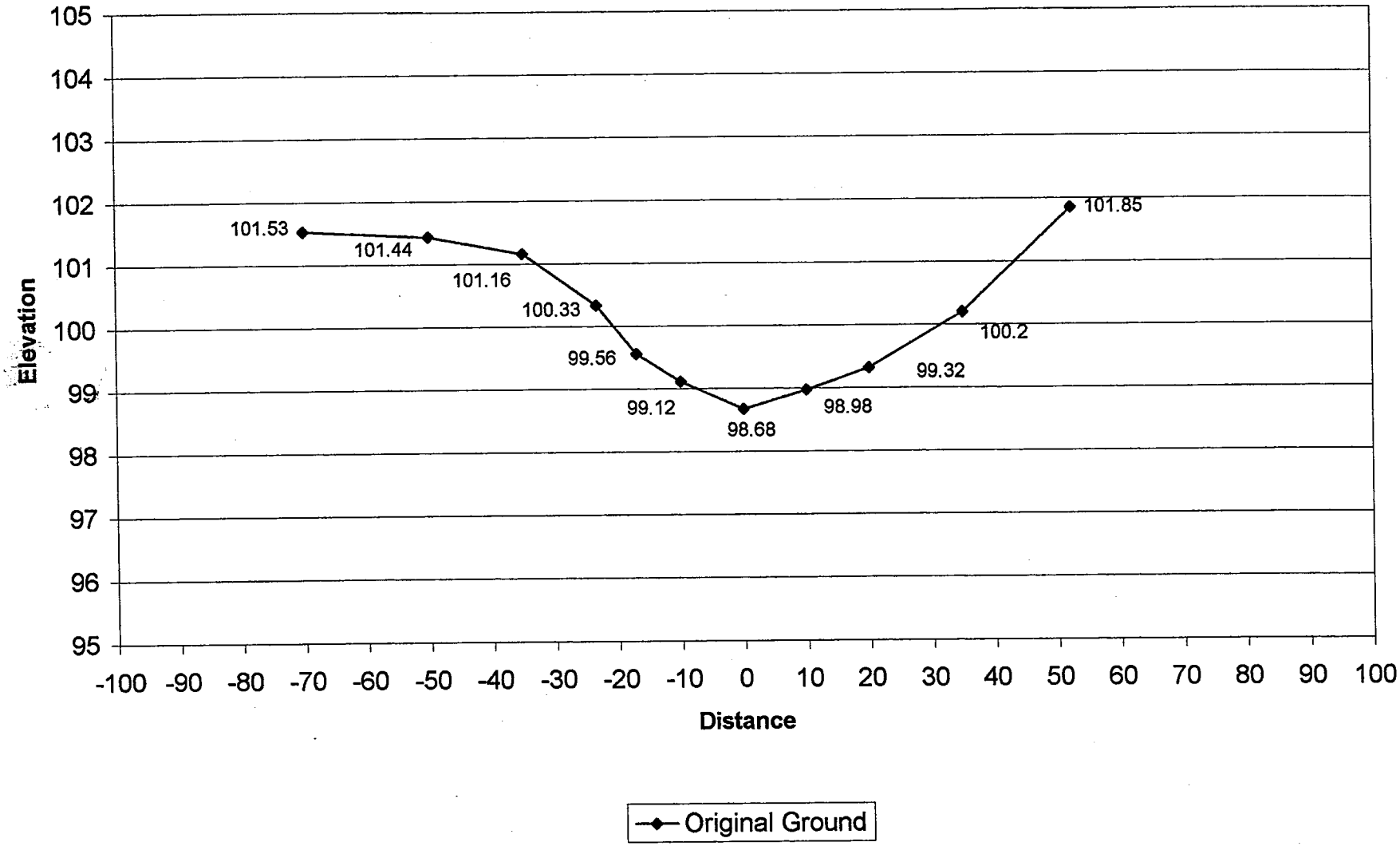


Nelson Slough Wetland Restoration
Cross Section Survey Information

Station 1+00												
	Original Ground			Gravel Fill			Wetland Soil			Center Channel Detail		
	Elev	Distance		Elev	Distance		Elev	Distance		Elev	Distance	
	101.91	-67		101.22	-54		101.22	-54				
	101.53	-60		100.5	-43		101	-43				
	101.22	-54		99.8	-30		100.3	-30				
	99.94	-45		99	-23		99.2	-20				
	99	-23					98.6	-8		98.39	-6.9	
	98.83	-20		98.24	0		98.39	-6.9		98.3	-6.5	
	98.45	-10		98.7	10					98.3	-5	
	98.24	0		99.8	20					98.3	-3.5	
	98.38	10		100.5	43		98.3	-3.5				
	98.71	20		101.18	49		98.6	-2				
	100.02	47					99.2	10				
	101.18	49					100.3	20				
	101.87	60					101	43				
							101.18	49				

Nelson Slough Wetland Restoration
Original Ground Elevations

Station 1+25



Nelson Slough Estimate of Quantities and Costs

Location	Description	Quantity	Units	Unit cost	Cost	Assumptions
Material Costs						
	Pit Run Gravels (alluvial)	90	cy	12	1080	
	Wetland Soil	75	cy	27	2025	
	Carex lyngbyei sprigs	500	each	2.25	1125	Order the fall before needed
	Coir Mat (erosion control fabric)	600	sy	1.75	1050	
			Subtotal =		5300	
Construction Costs (materials and installation)						
	Pit Run Gravel (alluvial)	90	cy	80	7200	
	Wetland Soil	75	cy	80	6000	
	Carex lyngbyei sprigs	500	each	4.25	2125	Order the fall before needed
	Coir Mat (erosion control fabric)	600	sy	3	1800	
			Subtotal =		17100	

Note: If it is not possible to order the Carex lyngbyei sprigs in the fall, then the estimated price will double to $4.50 each. The estimated planting cost of $2.00 each will remain the same.

EXPENSIVE $6.50

GENETIC – VARIABILITY – PALMER SPRIGS FROM SURROUNDING WETLANDS.

Nelson Slough Wetland Restoration
End Areas

WETLAND End Areas

Station	**SF**	DMD		0	0	0	0	0	0	0	0	0	0	0	0
0+50	**0**	0	Elevation												
		0	Distance												
				0	0	0	0	0	0	0	0	0	0	0	0
Station	**SF**	DMD		0	1602.08	4572	5782.6	2974.8	0	0	0	0	0	0	0
0+75 LT	**9.27**	14,931	Elevation	99.16	100.13	101.6	99.7	99.16							
Gravel		14,913	Distance	16	45	58	30	16							
				0	4462.2	5807.54	3048	1595.2	0	0	0	0	0	0	0
Station	**SF**	DMD		0	0	987.7	2007.8	4876.8	5656	3988	1972	981.9	0	0	0
0+75 RT	**39.15**	20,470	Elevation	98.19	98.31	98.77	100.39	101.6	101	99.7	98.6	98.19			
Gravel		20,392	Distance	0	10	20	48	56	40	20	10	0			
				0	981.9	1966.2	4740.96	5621.84	4064	2020	997	0	0	0	0
Station	**SF**	DMD		0	2298.62	4554.9	5427	4291.4	2970	0	0	0	0	0	0
1+00 LT	**13.65**	19,542	Elevation	99	99.94	101.22	100.5	99.8	99						
Gravel		19,515	Distance	23	45	54	43	30	23						
				0	4455	5396.76	4352.46	3015	2295.4	0	0	0	0	0	0
Station	**SF**	DMD		0	0	987.1	2000.4	4755.46	4924.5	4291.4	1974	982.4	0	0	0
1+00 RT	**33.085**	19,915	Elevation	98.24	98.38	98.71	100.02	101.18	100.5	99.8	98.7	98.24			
Gravel		19,849	Distance	0	10	20	47	49	43	20	10	0			
				0	982.4	1967.6	4639.37	4900.98	4350.74	2010	998	0	0	0	0
Station	**SF**	DMD		0	688.66	988.5	1983.2	1595.2	3048	5887	5010	2973	1970	796.16	0
0+75 LT	**13.31**	24,940	Elevation	99.52	98.38	98.85	99.16	99.7	101.6	101.5	100.2	99.1	98.5	99.52	
Wetland		24,913	Distance	7	10	20	16	30	58	50	30	20	8	7	
Soil				0	995.2	1967.6	1581.6	2974.8	5782.6	5080	3045	2004	792.8	689.5	0
Station	**SF**	DMD		0	-294.57	0	997	2020	4064	5684	4008	1982	985	-196.5	0
0+75 RT	**24.365**	19,249	Elevation	98.25	98.19	98.6	99.7	101	101.6	101.5	100.2	99.1	98.5	98.25	
Wetland		19,200	Distance	-3	0	10	20	40	56	40	20	10	-2	-3	
Soil				0	0	981.9	1972	3988	5656	4064	2030	1002	-198.2	-295.5	0
Station	**SF**	DMD		0	689.15	988.3	1980	2295.4	3015	4352.46	5454	4312.9	2976	1972	787.2
1+00 LT	**17.83**	28,822	Elevation	98.4	98.45	98.83	99	99.8	100.5	101.22	101	100.3	99.2	98.6	98.4
Wetland		28,787	Distance	7	10	20	23	30	43	54	43	30	20	8	7
Soil				0	984	1969	2273.09	2970	4291.4	5427	4352.46	3030	2006	793.6	690.2
Station	**SF**	DMD		0	-343.84	0	998	2010	4350.74	4949	4312.9	1984	986	-196.6	0
1+00 RT	**23.83**	19,050	Elevation	98.3	98.24	98.7	99.8	100.5	101.18	101	100.3	99.2	98.6	98.3	
Wetland		19,003	Distance	-3.5	0	10	20	43	49	43	20	10	-2	-3.5	
Soil				0	0	982.4	1974	4291.4	4924.5	4350.74	2020	1003	-198.4	-345.1	0

NELSON SLOUGH
WETLAND RESTORATION

WETLAND SOIL
QUANTITY CALCULATIONS

NELSON SLOUGH WETLAND SOIL VOLUMES

LEFT SIDE (West)							RIGHT SIDE (East)					
STATION	END AREA	SUM	AVERAGE	LENGTH	CUBIC YARDS		STATION	END AREA	SUM	AVERAGE	LENGTH	CUBIC YARDS
50.0	0.0						50.0	0.0				
		13.3	6.7	25.0	6.2				24.4	12.2	25.0	11.3
75.0	13.310						75.0	24.365				
		31.1	15.6	25.0	14.4				48.2	24.1	25.0	22.3
100.0	17.830						100.0	23.830				
		17.8	8.9	25.0	8.3				23.8	11.9	25.0	11.0
125.0	0.0						125.0	0.0				
				TOTAL	28.8						TOTAL	44.6
											GRAND	
											TOTAL	73.5

NELSON SLOUGH
WETLAND RESTORATION

GRAVEL QUANTITY CALCULATIONS

LEFT SIDE (West)							RIGHT SIDE (East)					
STATION	END AREA	SUM	AVERAGE	LENGTH	CUBIC YARDS		STATION	END AREA	SUM	AVERAGE	LENGTH	CUBIC YARDS
50.0	0.0						50.0	0.0				
		9.3	4.6	25.0	4.3				39.2	19.6	25.0	18.1
75.0	9.270						75.0	39.150				
		22.9	11.5	25.0	10.6				72.2	36.1	25.0	33.4
100.0	13.650						100.0	33.085				
		13.7	6.8	25.0	6.3				33.1	16.5	25.0	15.3
125.0	0.0						125.0	0.0				
				TOTAL	21.2						TOTAL	66.9
											GRAND TOTAL	88.1

NELSON SLOUGH WETLAND RESTORATION - GRAVEL VOLUMES

LEFT SIDE (West)

STATION	END AREA	SUM	AVERAGE	LENGTH	CUBIC YARDS
50.0	0.0				
		9.3	4.6	25.0	4.3
75.0	9.270				
		22.9	11.5	25.0	10.6
100.0	13.650				
		13.7	6.8	25.0	6.3
125.0	0.0				
				TOTAL	21.2

RIGHT SIDE (East)

STATION	END AREA	SUM	AVERAGE	LENGTH	CUBIC YARDS
50.0	0.0				
		39.2	19.6	25.0	18.1
75.0	39.150				
		72.2	36.1	25.0	33.4
100.0	33.085				
		33.1	16.5	25.0	15.3
125.0	0.0				
				TOTAL	66.9
				GRAVEL GRAND TOTAL	**88.1**

NELSON SLOUGH WETLAND RESTORATION - WETLAND SOIL VOLUMES

LEFT SIDE (West)

STATION	END AREA	SUM	AVERAGE	LENGTH	CUBIC YARDS
50.0	0.0				
		13.3	6.7	25.0	6.2
75.0	13.310				
		31.1	15.6	25.0	14.4
100.0	17.830				
		17.8	8.9	25.0	8.3
125.0	0.0				
				TOTAL	28.8

RIGHT SIDE (East)

STATION	END AREA	SUM	AVERAGE	LENGTH	CUBIC YARDS
50.0	0.0				
		24.4	12.2	25.0	11.3
75.0	24.365				
		48.2	24.1	25.0	22.3
100.0	23.830				
		23.8	11.9	25.0	11.0
125.0	0.0				
				TOTAL	44.6
				SOIL GRAND TOTAL	**73.5**

NELSON SLOUGH WETLAND SOIL VOLUMES

LEFT SIDE (West)							RIGHT SIDE (East)					
STATION	END AREA	SUM	AVERAGE	LENGTH	CUBIC YARDS		STATION	END AREA	SUM	AVERAGE	LENGTH	CUBIC YARDS
50.0	0.0						50.0	0.0				
		13.3	6.7	25.0	6.2				24.4	12.2	25.0	11.3
75.0	13.310						75.0	24.365				
		31.1	15.6	25.0	14.4				48.2	24.1	25.0	22.3
100.0	17.830						100.0	23.830				
		17.8	8.9	25.0	8.3				23.8	11.9	25.0	11.0
125.0	0.0						125.0	0.0				
				TOTAL	28.8						TOTAL	44.6
											GRAND	
											TOTAL	73.5

DYEA WETLAND GRAVEL VOLUMES

LEFT SIDE (West)

STATION	END AREA	SUM	AVERAGE	LENGTH	CUBIC YARDS
50.0	0.0				
		9.3	4.6	25.0	4.3
75.0	9.270				
		22.9	11.5	25.0	10.6
100.0	13.650				
		13.7	6.8	25.0	6.3
125.0	0.0				
				TOTAL	21.2

RIGHT SIDE (East)

STATION	END AREA	SUM	AVERAGE	LENGTH	CUBIC YARDS
50.0	0.0				
		39.2	19.6	25.0	18.1
75.0	39.150				
		72.2	36.1	25.0	33.4
100.0	33.085				
		33.1	16.5	25.0	15.3
125.0	0.0				
				TOTAL	66.9
				GRAVEL GRAND TOTAL	**88.1**

NELSON SLOUGH WETLAND SOIL VOLUMES

LEFT SIDE (West)

STATION	END AREA	SUM	AVERAGE	LENGTH	CUBIC YARDS
50.0	0.0				
		13.3	6.7	25.0	6.2
75.0	13.310				
		31.1	15.6	25.0	14.4
100.0	17.830				
		17.8	8.9	25.0	8.3
125.0	0.0				
				TOTAL	28.8

RIGHT SIDE (East)

STATION	END AREA	SUM	AVERAGE	LENGTH	CUBIC YARDS
50.0	0.0				
		24.4	12.2	25.0	11.3
75.0	24.365				
		48.2	24.1	25.0	22.3
100.0	23.830				
		23.8	11.9	25.0	11.0
125.0	0.0				
				TOTAL	44.6
				SOIL GRAND TOTAL	**73.5**

WETLAND End Areas

Station	SF	DMD		0	0	0	0	0	0	0	0	0	0	0	0
0+50	0	0	Elevation												
		0	Distance												
				0	0	0	0	0	0	0	0	0	0	0	0
Station	SF	DMD		0	1602.08	4572	5782.6	2974.8	0	0	0	0	0	0	0
0+75 LT	9.27	14,931	Elevation	99.16	100.13	101.6	99.7	99.16							
Gravel		14,913	Distance	16	45	58	30	16							
				0	4462.2	5807.54	3048	1595.2	0	0	0	0	0	0	0
Station	SF	DMD		0	0	987.7	2007.8	4876.8	5656	3988	1972	981.9	0	0	0
0+75 RT	39.15	20,470	Elevation	98.19	98.31	98.77	100.39	101.6	101	99.7	98.6	98.19			
Gravel		20,392	Distance	0	10	20	48	56	40	20	10	0			
				0	981.9	1966.2	4740.96	5621.84	4064	2020	997	0	0	0	0
Station	SF	DMD		0	2298.62	4554.9	5427	4291.4	2970	0	0	0	0	0	0
1+00 LT	13.65	19,542	Elevation	99	99.94	101.22	100.5	99.8	99						
Gravel		19,515	Distance	23	45	54	43	30	23						
				0	4455	5396.76	4352.46	3015	2295.4	0	0	0	0	0	0
Station	SF	DMD		0	0	987.1	2000.4	4755.46	4924.5	4291.4	1974	982.4	0	0	0
1+00 RT	33.085	19,915	Elevation	98.24	98.38	98.71	100.02	101.18	100.5	99.8	98.7	98.24			
Gravel		19,849	Distance	0	10	20	47	49	43	20	10	0			
				0	982.4	1967.6	4639.37	4900.98	4350.74	2010	998	0	0	0	0
Station	SF	DMD		0	688.66	988.5	1983.2	1595.2	3048	5887	5010	2973	1970	796.16	0
0+75 LT	13.31	24,940	Elevation	99.52	98.38	98.85	99.16	99.7	101.6	101.5	100.2	99.1	98.5	99.52	
Wetland		24,913	Distance	7	10	20	16	30	58	50	30	20	8	7	
Soil				0	995.2	1967.6	1581.6	2974.8	5782.6	5080	3045	2004	792.8	689.5	0
Station	SF	DMD		0	-294.57	0	997	2020	4064	5684	4008	1982	985	-196.5	0
0+75 RT	24.365	19,249	Elevation	98.25	98.19	98.6	99.7	101	101.6	101.5	100.2	99.1	98.5	98.25	
Wetland		19,200	Distance	-3	0	10	20	40	56	40	20	10	-2	-3	
Soil				0	0	981.9	1972	3988	5656	4064	2030	1002	-198.2	-295.5	0
Station	SF	DMD		0	689.15	988.3	1980	2295.4	3015	4352.46	5454	4312.9	2976	1972	787.2
1+00 LT	17.83	28,822	Elevation	98.4	98.45	98.83	99	99.8	100.5	101.22	101	100.3	99.2	98.6	98.4
Wetland		28,787	Distance	7	10	20	23	30	43	54	43	30	20	8	7
Soil				0	984	1969	2273.09	2970	4291.4	5427	4352.46	3030	2006	793.6	690.2
Station	SF	DMD		0	-343.84	0	998	2010	4350.74	4949	4312.9	1984	986	-196.6	0
1+00 RT	23.83	19,050	Elevation	98.3	98.24	98.7	99.8	100.5	101.18	101	100.3	99.2	98.6	98.3	
Wetland		19,003	Distance	-3.5	0	10	20	43	49	43	20	10	-2	-3.5	
Soil				0	0	982.4	1974	4291.4	4924.5	4350.74	2020	1003	-198.4	-345.1	0

HAINES HIGHWAY
MP 25.5 TO LITTLE BOULDER CREEK

646(1) Stream Channel Construction

Stream Channel
Excavation
186+00 to 189+00 RT

LEFT SIDE (West)

STATION	END AREA	SUM	AVERAGE	LENGTH	CUBIC YARDS
50.0	0.0				
		9.3	4.6	25.0	4.3
75.0	9.270				
		22.9	11.5	25.0	10.6
100.0	13.650				
		13.7	6.8	25.0	6.3
125.0	0.0				
				TOTAL	21.2
CALCULATED BY:					
DATE:					

HAINES HIGHWAY
MP 25.5 TO LITTLE BOULDER CREEK

646(1) Stream Channel Construction

Stream Channel
Excavation
186+00 to 189+00 RT

STATION	END AREA
50.0	0.0
75.0	39.150
100.0	33.085
125.0	0.0

NELSON SLOUGH
WETLAND RESTORATION

Original Ground Cross Sections

Left					Center Line					Right
Station 1+25										
101.53	101.44	101.16	100.33	99.56	99.12	98.68	98.98	99.32	100.2	101.85
70	50	35	23.3	17	10	0	10	20	35	52.3

Station 1+50																
101.64	101	100.43	99.77	99.3	99.04	99.82	98.54	98.63	98.7	98.97	99.08	99.18	99.46	99.79	100.2	100.09	101.82
45	35	25	20	15	10	5	0	4	5	6	10	12	14	17	20	27	44

Station 1+75															
101.41	100.88	100.36	99.48	99.2	99.01	98.87	98.37	98.45	98.73	98.96	99.19	99.9	100.1	100.51	101.94
45	35	29	22	15	10	5	0	2	3	10	15	18	23	28	38

NELSON SLOUGH
WETLAND RESTORATION

Cross Sections - Station 1+00

	Left				Center Line					Right		
Original Ground Cross Section												
	101.91	101.53	101.22	99.94	99	98.83	98.45	98.24	98.38	98.71	100.02	101.18	101.87
	67	60	54	45	23	20	10	0	10	20	47	49	60
Wetland Soil - Design Finish Grades													
		101.22	101	100.3	99.2	98.6	98.39		98.3	98.6	99.2	100.3	101	101.18
		54	43	30	20	8	6.9		3.5	2	10	20	43	49
Gravel Fill - Design Finish Grades													
				101.22	100.5	99.8	99	98.24	98.7	99.8	100.5	101.18	
				54	43	30	23	0	10	20	43	49	

NOTE: SEE PLAN SHEETS FOR DETAILED DESIGN ELEVATION INFORMATION

NELSON SLOUGH
WETLAND RESTORATION

Cross Sections - Station 0+75

	Left							Center Line						Right
Original Ground Cross Section														
	103.13	102.93	101.6	100.13	99.16	98.85	98.38	98.19	98.31	98.77	100.39	101.6	102.23	101.67	101.87
	75	70	58	45	26	20	10	0	10	20	48	56	60	75	78.7
Wetland Soil - Design Finish Grades															
	101.6	101.5	100.2	99.1	98.5	98.3	98.25	98.5		99.1	100.2	101.5	101.6		
	58	50	30	20	8	7.1	3.3	2		10	20	40	56		
Gravel Fill - Design Finish Grades															
101.3	101	99.7	99.16	98.3	98.2	98.2	98.2	98.25	98.19	98.6	99.7	101	101.6		
58	50	30	26	7.1	6.5	5	3.5	3.3	0	10	20	40	56		

NOTE: SEE PLAN SHEETS FOR DETAILED DESIGN ELEVATION INFORMATION

NELSON SLOUGH
WETLAND RESTORATION

Original Ground Cross Sections

Left | Center Line | Right

Station 0+00

100.93	100.13	99.33	99.3	99.18	99.03	99.47	99.62	99.67
35	19	13.5	8	0	10	20	31.7	35

Station 0+25

101.01	100.79	100.08	99.53	99.36	99.52	99.44	99.54	99.64	99.91	100.17
40	35	22	17	10	0	10	20	26	34	40

Station 0+50

101.63	101.01	100.29	100.12	99.67	99.42	99.41	98.81	98.27	98.87	99.34	99.5	99.84	100.07	99.85	100.16	100.38	101.41
56	46	36	26	20	10	5	1	0	2	5	10	20	22	30	35	42	60

Nelson Slough Wetlands Restoration
Original Ground Elevations

Centerline Profile
Original Ground

Station	Elev.
0	99.18
25	99.52
50	98.27
75	98.19
100	98.24
125	98.68
150	98.54
175	98.37

Nelson Slough Wetlands Restoration
Original Ground Elevations

1+25
Original Ground

Elev	Distance
101.53	-70
101.44	-50
101.16	-35
100.33	-23.3
99.56	-17
99.12	-10
98.68	0
98.98	10
99.32	20
100.2	35
101.85	52.3

1+50
Original Ground

Elev	Distance
101.64	-45
101	-35
100.43	-25
99.77	-20
99.3	-15
99.04	-10
98.82	-5
98.54	0
98.63	4
98.7	5
98.97	6
99.08	10
99.18	12
99.46	14
99.79	17
100.2	20
100.09	27
101.82	44

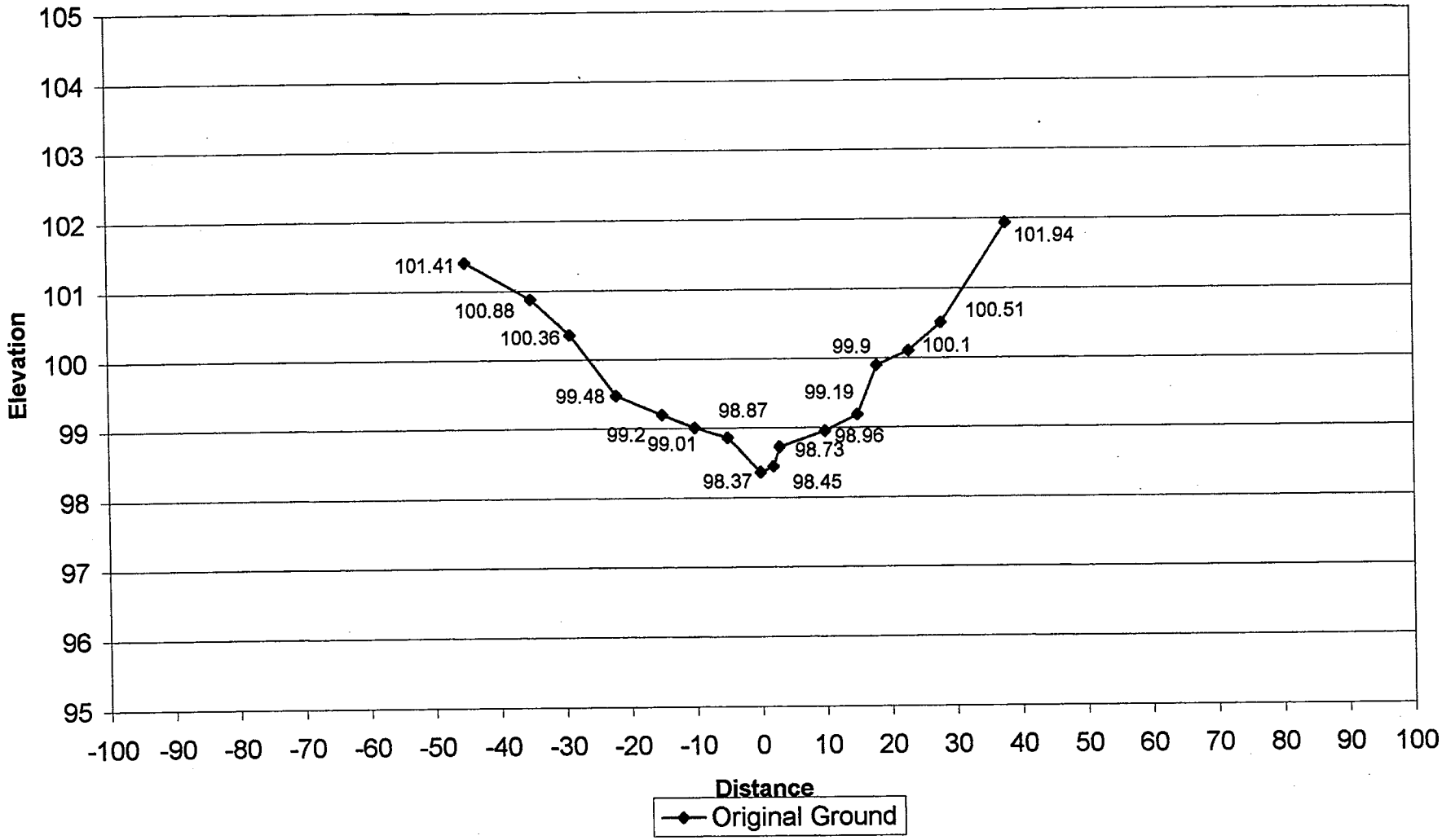
1+75
Original Ground

Elev	Distance
101.41	-45
100.88	-35
100.36	-29
99.48	-22
99.2	-15
99.01	-10
98.87	-5
98.37	0
98.45	2
98.73	3
98.96	10
99.19	15
99.9	18
100.1	23
100.51	28
101.94	38

Nelson Slough Wetland Restoration

Original Ground Elevations

Station 1+75

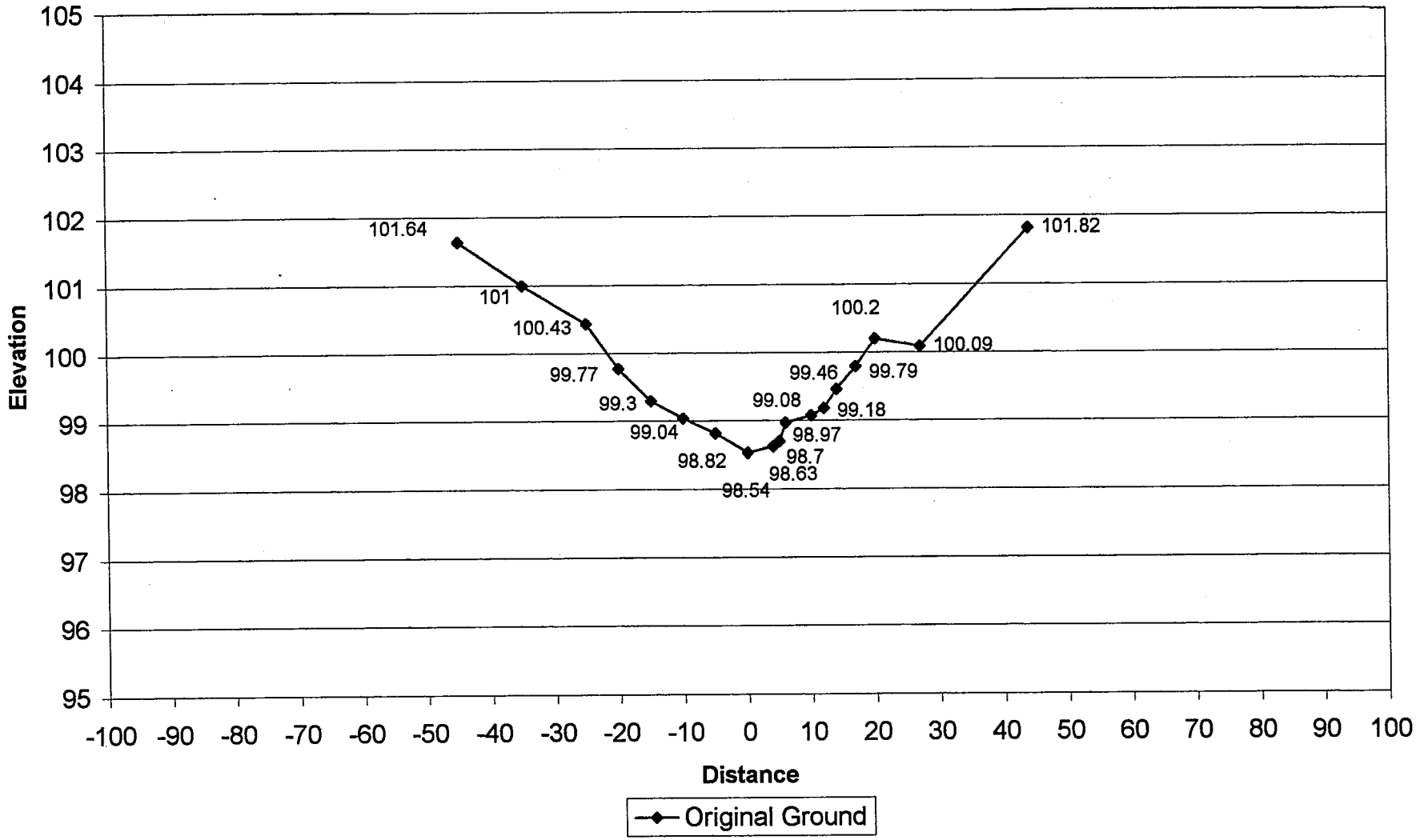


Streamcraft

Nelson Slough Wetland Restoration

Original Ground Elevations

Station 1+50



Streamcraft

Nelson Slough Wetlands Restoration
Cross Section Survey Information

Station 1+00

Left							Center Line						
Original Ground Cross Section													
103.13	102.93	101.6	100.13	99.16	98.85	98.38	98.19	98.31	98.77	100.39	101.6	102.23	101.67	101.87
75	70	58	45	26	20	10	0	10	20	48	56	60	75	78.7
Wetland Soil - Finish Grades														
101.6	101.5	100.2	99.1	98.5	98.3	98.25	98.5		99.1	100.2	101.5	101.6		
58	50	30	20	8	7.1	3.3	2		10	20	40	56		
Gravel Fill - Finish Grades														
101.3	101	99.7	99.16	98.3	98.2	98.2	98.2	98.25	98.19	98.6	99.7	101	101.6	
58	50	30	26	7.1	6.5	5	3.5	3.3	0	10	20	40	56	

Nelson Slough Wetland Restoration
Original Ground Elevations

0+00
Original Ground

Elev	Distance
100.93	-35
100.13	-19
99.33	-13.5
99.3	-8
99.18	0
99.03	10
99.47	20
99.62	31.7
99.67	35

0+25
Original Ground

Elev	Distance
101.01	-40
100.79	-35
100.08	-22
99.53	-17
99.36	-10
99.52	0
99.44	10
99.54	20
99.64	26
99.91	34
100.17	40

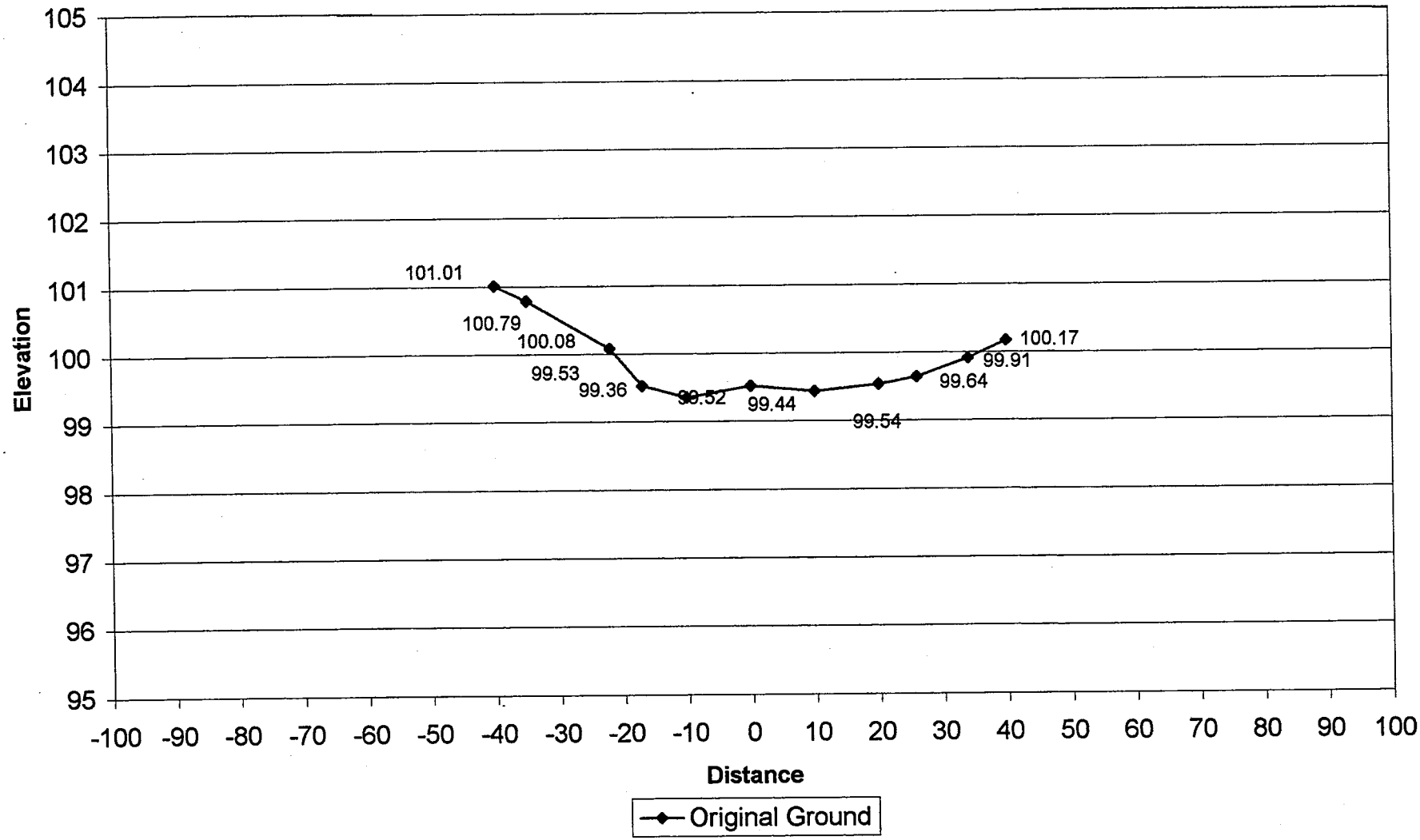
0+50
Original Ground

Elev	Distance
101.63	-56
101.01	-46
100.29	-36
100.12	-26
99.67	-20
99.42	-10
99.41	-5
98.81	-1
98.27	0
98.87	2
99.34	5
99.5	10
99.84	20
100.07	22
99.85	30
100.16	35
100.38	42
101.41	60

Nelson Slough Wetland Restoration

Original Ground Elevations

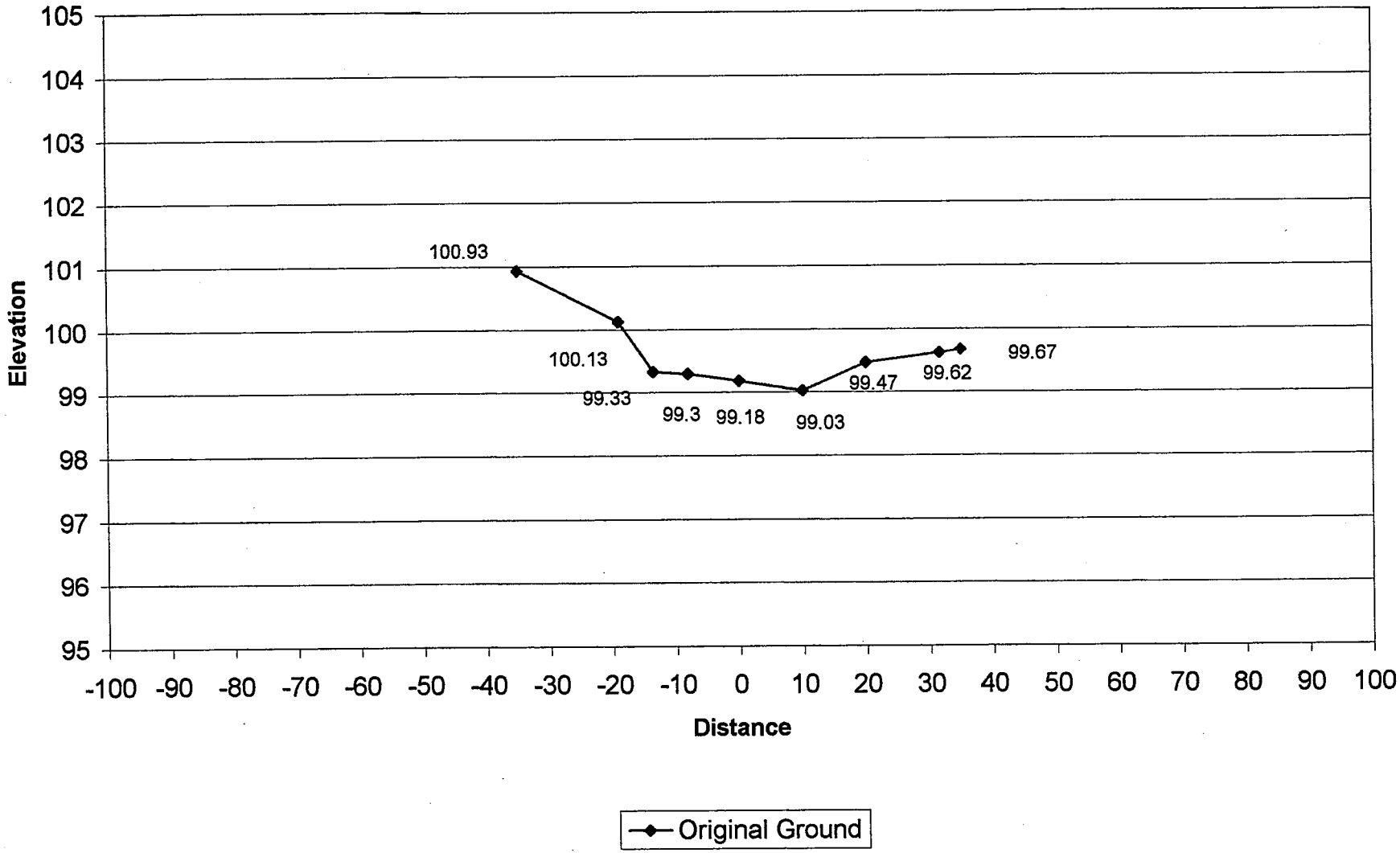
Station 0+25



Streamcraft

Nelson Slough Wetland Restoration
Original Ground Elevations

Station 0+00



Streamcraft

Nelson Slough Wetlands Restoration
Cross Section Survey Information

Station 0+75

Left							Center Line						
Original Ground Cross Section													
103.13	102.93	101.6	100.13	99.16	98.85	98.38	98.19	98.31	98.77	100.39	101.6	102.23	101.67	101.87
75	70	58	45	26	20	10	0	10	20	48	56	60	75	78.7
Wetland Soil - Finish Grades														
101.6	101.5	100.2	99.1	98.5	98.3	98.25	98.5		99.1	100.2	101.5	101.6		
58	50	30	20	8	7.1	3.3	2		10	20	40	56		
Gravel Fill - Finish Grades														
101.3	101	99.7	99.16	98.3	98.2	98.2	98.2	98.25	98.19	98.6	99.7	101	101.6	
58	50	30	26	7.1	6.5	5	3.5	3.3	0	10	20	40	56	

KGLO - NELSON SLOUGH
FINAL COMPLETION REPORT

Brief Quantified Description of Final Product/Outcome: 2/23/05

This objective of this project is to restore the natural structure and function of Nelson Slough, a degraded wetland, thus improving habitat for anadromous fish species including coho salmon.

In order to repair environmental damage caused by decades of human, equestrian, and vehicle traffic, a wetland restoration project was carried out at Nelson Slough, in the Dyea townsite of Klondike Gold Rush National Historical Park. Prior to the summer of 2004, all required permits for the project were secured including a US Army Corps of Engineers section 404 permit and an Alaska Department of Natural Resources Fish Habitat Permit. Plant materials were collected in nearby upstream and downstream locations for transplanting in the restored slough area. Species collected included Lyngby's sedge (Carex lyngbyei), Sitka spruce (Picea sitchensis), wild iris (Iris setosa), and sweet gale (Myrica gale). Plant collections were carried out by NPS seasonal staff with the assistance of 12 members of the Southeast Alaska Guidance Association (SAGA) youth work crew under the direction of the KLGO Biologist. Water quality monitoring occurred prior to, during and post construction using a HydroLab MiniSonde probe and data collector. Parameters measured included: temperature, pH level, dissolved oxygen content, salinity, and turbidity. In order to track the long term progress of the restoration at Nelson Slough, four photo points were established in the project area.

In 2003, KLGO used base funds to contract with Streamcraft, Inc., a local firm specializing in wetland and stream restoration, to produce a restoration design for the site. In June of 2004, KLGO used WRD funding to hire local contractors and a temporary biological technician to implement the restoration plan. The restoration design required 125 cubic yards of gravel and 93 cubic yards of soil to be transported to the site and placed to grade according to the design plan. The reconfiguration of the channel profile occurred over 2 days. Immediately after the placement of the gravels and soil, NPS field crews transplanted the previously collected wetland and upland plants in the project area and resumed monitoring of the site. Of the nearly 200 plants that were relocated, very little mortality was observed during the first summer despite record-setting heat and weeks of drought. In addition to the successful native transplants, the site also contained several species of non-native forbs that NPS field crews worked to control via mechanical treatments (hand pulling and mowing). In addition, nearly 4 pounds of native plant seeds were collected in 2004 for sowing in early 2005. Removing exotic plants, revegetating the area with natives, on-going monitoring, and developing an interpretive program for the area will ensure the long-term success of the restoration project.

This project has helped Klondike Gold Rush National Historical Park to meet is GPRA Goals. Visitor Understanding , 10% Water Quantity: Protect and/or restore, 40% Visitor satisfaction, 10% Species of Management Concern, 20% Other acres restoration, 20%

The total project cost was $34,770 (KLGO contributed approximately $15K in the form of base funded Biologist and Biological Technician salary towards the completion of this project). During this fiscal year, $ 19,770 in funds were provided by NRPP-WRD. All the money was obligated in accordance with the project's Detailed Implementation Plan.

Nelson Slough Restoration
Fish Habitat Permit FH04-I-0022

Nelson Slough prior to restoration - 11 May 2004

Nelson Slough post restoration and revegetation – 8 August 2004

Kevin Noon
02/23/2005 01:52 PM
MST

To: Meg Hahr/KLGO/NPS@NPS
cc:
Subject: Re: Fw: Nelson Slough - PMIS # 91341

Meg,

We would love to have you publish the story of the restoration.

I spoke to Jeff Selleck who is the editor for the Natural Resources Year in Review and Park Science. He recommended a 400 to 500 word article, with your photo's by the end of March for Park Science, or by mid September for NRYR. He suggested that managers would like to read about how you solved special problems, genetic stock plants were grown in advance, costs to complete the project, and whatever you think is interesting.

Mark Flora suggested that we will also publish it in the WRD Annual Report. There is a fourth publication that might be interested; the regions Alaska Park Science publication.

I am happy to help write or edit your article if you wish.

Let me know if I can help.

Kevin

Kevin F. Noon, Ph.D. PWS
Wetland Scientist
Water Resources Division
National Park Service (303) 969 2815
P.O. Box 25287 fax:(303) 987 6792
Denver, Colorado 80225 kevin_noon@nps.gov

Meg Hahr

Meg Hahr
02/23/2005 08:18 AM
YST

To: Kevin Noon/DENVER/NPS@NPS
cc:
Subject: Re: Fw: Nelson Slough - PMIS # 91341

Thanks so much for all of your help with this project, Kevin. It would be great to work with you again one day!
Meg

Kevin Noon

Kevin Noon
02/23/2005 10:09 AM
MST

To: Meg Hahr/KLGO/NPS@NPS
cc:
Subject: Re: Fw: Nelson Slough - PMIS # 91341

Meg,

Wonderful photo's: Two pictures worth 2,000 words. Great project, just wish I could have come up for a visit. That will close my file!

Thanks

Kevin

Kevin F. Noon, Ph.D. PWS
Wetland Scientist
Water Resources Division
National Park Service (303) 969 2815
P.O. Box 25287 fax:(303) 987 6792
Denver, Colorado 80225 kevin_noon@nps.gov

Meg Hahr

Meg Hahr
02/23/2005 07:44 AM
YST

To: Kevin Noon/DENVER/NPS@NPS
cc:
Subject: Re: Fw: Nelson Slough - PMIS # 91341

Hi Kevin-

Here are two photos I sent to the Corps and the State for our permits. Will they work for what you need?

Meg

Kevin Noon

Kevin Noon
02/23/2005 08:39 AM
MST

To: Meg Hahr/KLGO/NPS@NPS
cc:
Subject: Re: Fw: Nelson Slough - PMIS # 91341

Meg

I will use your write-up in the PMIS, Description of Final Product, as the Final Completion Report and recommend closing the project file.

Can you send me some before and after photographs?

Thanks

Kevin

Kevin F. Noon, Ph.D. PWS
Wetland Scientist
Water Resources Division
National Park Service (303) 969 2815
P.O. Box 25287 fax:(303) 987 6792
Denver, Colorado 80225 kevin_noon@nps.gov

Meg Hahr

Meg Hahr
02/22/2005 03:21 PM
YST

To: Kevin Noon/DENVER/NPS@NPS
cc:
Subject: Fw: Nelson Slough - PMIS # 91341

Hi Kevin-

I just wanted to check in with you to see whether there is anything else you need from to close out this project. Is the completion report in PMIS sufficient or do you need something more detailed for your files?

Meg

Meg Hahr
Natural Resources Program Manager
Klondike Gold Rush National Historical Park
P.O. Box 517
Skagway, Alaska 99840
Phone: (907) 983 - 9228
Fax: (907) 983 - 2385

----- Forwarded by Meg Hahr/KLGO/NPS on 02/22/2005 03:20 PM -----

Kevin Noon
11/29/2004 03:49 PM
MST

To: Meg Hahr/KLGO/NPS@NPS
cc:
Subject: Re: Nelson Slough

Thanks Meg,
Looks great.
Kevin

Kevin F. Noon, Ph.D. PWS
Wetland Scientist
Water Resources Division
National Park Service (303) 969 2815
P.O. Box 25287 fax:(303) 987 6792
Denver, Colorado 80225 kevin_noon@nps.gov

Meg Hahr

Meg Hahr
11/29/2004 10:30 AM
YST

To: Kevin Noon/DENVER/NPS@NPS
cc:
Subject: Re: Nelson Slough

Hi Kevin-

I added 2 more paragraphs of info into the PMIS completion report (#91341). I hope this is what you needed. Let me know if you need more.

Meg

Meg Hahr
Natural Resources Program Manager
Klondike Gold Rush National Historical Park

P.O. Box 517
Skagway, Alaska 99840
Phone: (907) 983 - 9228
Fax: (907) 983 - 2385

Kevin Noon

Kevin Noon
11/24/2004 01:40 PM
MST

To: Meg Hahr/KLGO/NPS@NPS
cc:
Subject: Nelson Slough

Meg,

Mark Flora and I are putting together annual reports and we would like you to elaborate on the status of the Nelson Slough project. We need you to write a paragraph that describes the status of the Nelson Slough project, specifically, how the money was obligated or exactly what was accomplished this year. You say in your report to congress that the "money was obligated in accordance with the project's Detailed Implementation Plan." We need you to summarize exactly what that was in a paragraph.

Thanks for your help. Please email directly back to both of us.

Kevin

Kevin F. Noon, Ph.D. PWS
Wetland Scientist
Water Resources Division
National Park Service (303) 969 2815
P.O. Box 25287 fax:(303) 987 6792
Denver, Colorado 80225 kevin_noon@nps.gov