2006 ANNUAL REPORT OF OPERATIONS AND MAINTENANCE ACTIVITIES

PARTIAL RIVER CHANNELIZATION PROJECT FORMER SINCLAIR REFINERY SITE

WELLSVILLE, NEW YORK

Prepared For

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1.0 OVERVIEW

1.1 Introduction

This document presents a summary of the 2006 operation and maintenance activities for the Partial River Channelization Project at the Former Sinclair Refinery Site Operable Unit 1 (OU-1) located in Wellsville, New York (Figure 1). Operation and maintenance (O&M) procedures for this project are detailed in *Operations and Maintenance Plan for the Partial River Channelization on the Genesee River, Wellsville, New York* (O&M Plan); dated April 1992, and prepared by Ebasco Services. An electronic copy of this report is included as Appendix A.

1.2 Project Background

A Consent Decree, effective May 19, 1989, between Atlantic Richfield Company and the United States Environmental Protection Agency (USEPA) outlined, in part, that Atlantic Richfield Company protect the Central Elevated Landfill Area (CELA), and the smaller South Landfill Area (SLA) from inundation and erosion. A dike was constructed on the west bank of the river to protect the CELA and SLA from erosion and inundation by floodwater. The west dike is designed to protect against erosion and overtopping up to the 100-year flood elevation. Dike construction and bank riprap stabilization of the east bank of the river was performed to protect against erosion. The east dike and bank stabilization is designed to protect the east bank from erosion up to the bank full flood condition of the river. Figure 2 shows dike station locations used in construction and in referencing for this project.

The Consent Decree outlines that Atlantic Richfield maintains the Partial River Channelization Project in accordance with the procedures detailed in the above referenced O&M Plan. The O&M Plan contains details related to the project background and construction history.

1.3 Report Format

As previously stated, this report is being submitted to document the operations and maintenance activities that were conducted in 2006 and to meet the requirements of the Consent Decree. The remainder of this report is organized as follows:

- Section 2 outlines the approved requirements for operations, maintenance and reporting.
- Section 3 details the routine operation and maintenance activities performed during 2006.
- Section 4 discusses Genesee River flood inspections conducted in 2006.

- Section 5 summarizes 2006 project activities
- Section 6 describes other issues pertaining to the project.

2.0 OPERATION, MAINTENANCE AND REPORTING REQUIREMENTS

The purpose of this section is to specify the currently approved operations, maintenance and report requirements. The requirements are outlined in the O&M Plan and in subsequent correspondence between USEPA and Atlantic Richfield Company.

2.1 Operations Requirements

The O&M Plan requires that specific routine inspections be conducted. In addition, the O&M Plan requires additional inspections in the event that certain river flow conditions exist. The inspections are conducted using checklists developed for the O&M Plan. The operations requirements are described below.

- Annual visual inspection (for sloughing, erosion, etc.) during a low river flow period, which is defined as a flow rate of less than 180 cubic feet per second (cfs). Low flow conditions typically occur between June and October.
- Visual inspection after each major flood (i.e. 4,500 cfs), which can occur during any season of the year. A major flood is defined as when water in the river (east dike between stations 1+65 and 6+67) approaches the top of the east dike (Elevation 1496.00 ft above mean sea level [amsl]). Also, discharge data from U.S. Geological Survey gauging station 04221000, which is located about 1.8 miles downstream from the project site is used to verify the flood conditions and as a source for establishing a database for identifying flood conditions.
- The 1992 O&M plan required an annual check of the soil pH (maintained above 5.8) along the west dike during a period of low flow. Pursuant to USEPA's June 27, 2005 correspondence (Appendix B), the requirement for soil pH testing was modified to every 3 years as part of the agronomic soil testing. The soil agronomic testing was conducted in 2006.
- Annual visual inspection with photographs, during a low flow period, of the riverbed where sediment removal was performed to control and improve river flow condition (opposite west dike station 20+00), to check for shoaling.
- A patrol and visual inspection during each high water event for any damage that may jeopardize the integrity of the dike and protection of the landfill (provided safe conditions exist).
- A survey of the dike profile/cross section every 200 feet and at every slope transition during a low flow period by a licensed surveyor to determine dike settlement and changes in cross sections. The O&M Plan states that the frequency of the surveys will

be based on significant changes to the survey data. The O&M Plan also outlines an annual survey of the riverbed at the toe of the slopes during a low flow period, to check for displacement or unusual settlement of the riprap slope protection. The dike survey frequency was changed in 2002 to one survey every five years; this change is documented in a letter from EPA to Terry Moore dated November 8, 2002 and included as Appendix C. A survey was conducted in 2006 and the next survey is scheduled for 2011.

2.2 Maintenance Requirements

The O&M Plan requires that Atlantic Richfield perform such maintenance and inspections as may be necessary to assure the serviceability of the dikes and the 100-year flood protection of the CELA. Routine maintenance requirements to preserve the integrity of the dikes and landfill are detailed below. Additional maintenance activities may be required if conditions identified during inspections warrant.

- Along the west bank dike, lime application will be applied as necessary to maintain soil pH above 5.8.
- Along the west slope of the west dike, fertilizer will be applied as needed, based on the agronomic soil test performed every three years. An agronomic soil test was completed in 2006 and the next agronomic soil test is scheduled for 2009.
- Along the west bank dike, vegetation will be mowed when turf reaches a height of more than six inches. Mowing will not be closer than four inches to the ground in order to promote vigor and control woody plants and other noxious weeds. Vegetation should be allowed to attain a height of eight to twelve inches prior to the onset of winter.
- Remove woody growth, other than tall grass and vegetation, from both dikes annually.
- Maintenance of the road on the top of the west dike. Maintenance includes the repair of the roadway due to water ponding, removal of woody growth other than grass and aggregate replacement due to ruts, to preserve the six inch surface requirement.

2.3 Reports

The currently approved O&M Plan outlines the following reports and notifications.

- Atlantic Richfield will notify the USEPA 14 days prior to annual inspections.
- The USEPA will be notified of any corrective actions requiring more than 30 days to complete.
- An annual summary report of O&M activities for the previous year will be submitted to the USEPA and New York State Department of Environmental Conservation (NYSDEC).

3.0 2006 ROUTINE OPERATIONS AND MAINTENANCE ACTIVITIES

3.1 Overview of 2006 Routine Operations and Maintenance

Operations and maintenance activities conducted during 2006 included east and west dike low flow inspections. Woody growth removal was conducted in 2006 during the months of July and August. No significant operations or maintenance issues were identified in 2006.

3.2 Routine Operations

Annual Visual Inspections

East and west dike and the river bed low flow inspections were conducted on November 30, 2006. No significant issues were noted during the inspection. No corrective action requiring greater than 30 days to complete occurred in 2006.

A summary of the annual low flow dike inspection findings are provided below. At the time of the low flow inspection, the river gage height was 4.98 ft (approximately 292 cfs). This is slightly above the O&M plan requirement of 180 cfs, as the river stage was higher than normal during the fourth quarter 2006. Completed inspection checklists and inspection photographs are presented in Appendix D of this report. A summary of the annual flow inspection is provided below.

- No observed settlement, sloughing or loss of grade.
- No observed caving on either side of dike.
- No evidence of seepage, saturated areas, or sand boils.
- No evidence of riprap displacement or unusual settlement was observed at the toe of the riprap slope protection.
- Access roads were in good condition.
- No evidence of unauthorized traffic.
- Vegetative cover in good condition.
- Woody growth removal last completed in July/August 2006.
- No evidence of unauthorized excavation, loose sod, or sod removal.
- No evidence of fires or vandalism.
- No shoaling observed in the channel opposite west dike station 20+00.

Soil pH/Agronomic Testing

The soil pH was checked on September 5, 2006; the soil pH was 7.3 standard units. No application of lime or fertilizer will be necessary at this time. As described in Section 2.1, soil pH testing is now required every three years as part of agronomic testing. The next scheduled event will occur in 2009.

Surveys

As outlined in the O&M Plan, surveys of the west and east dikes were performed by a New York State Licensed Surveyor annually from 1992 through 2001 and then again in 2006. The 1992 and 1993 surveys were conducted by Douglas C. Meyers, P.C., Arcade, New York. James B. Ball, L.S., Wellsville, New York completed the surveys from 1994 through 2001, and 2006. The 1992 to 2001, and 2006, dike survey data is included as Table 1 for reference. A detailed review of the surveys completed between 1992 and 2001 was completed as part of the 2001 annual report preparation. Based on the review of this 10-year period of annual survey data, no significant settlement has occurred to the dikes. The O&M plan states that the frequency of surveys will be based on significant changes to the survey data. Review of the 10 years of survey data revealed that significant changes are more easily identified with visual surveys. Approval to modify the survey frequency from annually to every five years was granted in a letter dated November 08, 2002 from USEPA to Mr. Terry Moore, Atlantic Richfield (Appendix C). The next survey is scheduled for 2011. Results of the 2006 survey are discussed below.

The 2006 east and west dike cross-section field survey was completed on July 31, 2006 by James Ball, L.S. The survey consists of ground surface elevation measurement along dike transect lines approximately perpendicular to the river. The transects are spaced along both the east and west dikes every 200 ft as follows: (i) east dike stations 0+00 to 18+00; and (ii) west dike stations 0+00 to 22+00. Please see figure 2 for dike station and survey cross-section locations. The 2006 survey is generally consistent with the most recent previous survey, which was completed in 2001. A detailed review of the 2006 survey with field observations was completed by On-Site as documented in a March 30, 2007 letter. Based on the survey data and field observations made on March 27 and 29, 2007, the partial river channelization project appears in generally good condition. No major signs of erosion were observed. The toe area at and around west dike station 12+00 does show signs of minor scouring with minor riprap displacement. The 2006 survey cross-section drawings and March 30, 2007 letter are included as Appendix E.

3.3 Routine Maintenance

Lime/Fertilizer Application

Lime applications are required to maintain soil pH above 5.8. Fertilizer is applied as needed based upon agronomic soil testing. Soil testing, including pH and agronomic testing, is conducted every three years. The soil testing was completed in 2006 and no

application of lime or fertilizer is needed at this time; the next soil testing and possible applications of lime or fertilizer will be in 2009.

Mowing

The CELA side of the west dike was mowed on June 6, 2006 with specialized rental equipment.

Woody Growth Removal

Woody growth removal was completed in July and August 2006.

Roadway Maintenance

Maintenance including repair of the roadway on the top of the dike due to water ponding, removal of woody growth and aggregate replacement due to ruts is conducted when appropriate. Based upon routine inspections conducted in 2006, no roadway maintenance was conducted.

4.0 GENESEE RIVER FLOOD INSPECTION

The Genesee River is northerly flowing and located along the east side of the Former Sinclair Refinery Site. A United States Geologic Survey (USGS), Water Resources Division river gage station is located on the Genesee River approximately 1.8 miles down stream of the partial river channelization site. The station identification number is 04221000. The automatic gage measures water height (stage) and the USGS has developed an expanded rating table to correlate water height with stream flow (discharge).

The O&M Plan states that visual inspections will be made after each major flood (i.e. 4500 cfs). Major floods are defined in the O&M plan as when the water elevation in the river approaches the top of the east dike between stations 1+65 and 6+67 (elevation of 1,496 ft amsl). The USGS has defined flood stage to be a gage height of 11 ft, which equates to a flow of 8907 cfs. Based on historical measures, a flow greater than 7,000 cfs (gage height > 10 ft) is required for the water level to approach the top of the east dike.

Provisional 2006 gage height and stream flow data from the USGS river gage station are included in this report. Provisional data is subject to change by the USGS. The 2006 daily average stage and discharge data is presented in tabular form as Table 2 and graphically as Figure 3.

There was one event in 2006 which resulted in a flow that exceeded a daily average of 4500 cfs. The event occurred on January 14, 2006 and included a daily average flow of

4510 cfs and a daily average gauge height of 8.45 ft. It should be noted that while the flow exceeded 4500 cfs (4510 cfs) the event did not result in a gauge height reading greater than 10 ft, which is necessary for the water level to approach the top of the dike. The event lasted for one day. Although a formal high water event inspection was not documented, subsequent dike inspections showed no major damage to the project area.

5.0 Summary

Based on the results of inspections and observations over the past year, no evidence of significant deterioration, erosion and/or settlement at the Partial River Channelization Project site was noted. The toe area at and around west dike station 12+00 does show signs of minor scouring with minor riprap displacement. Routine maintenance was conducted; no additional maintenance was required or conducted in 2006.

6.0 OTHER ISSUES

Due to potential safety concerns related to current woody growth removal techniques, the manner in which growth is removed is being evaluated. During 2005, USEPA suggested the application of glyphosate herbicide (Rodeo ™, Round-up ™) to the cut stem as an effective method for woody growth control. This method, as well as other potential alternatives is currently under review. Any recommendations for modification to the current protocol will be submitted to EPA for approval prior to implementation.

Table 1

Genesee River Dike Surveyed Elevations (1992-2006)
Former Sinclair Refinery Site (OU-1)
Wellsville, New York
(ft msl)

Station & Distance From Baseline	Location Description	1992 Elevation	1993 Elevation	1994 Elevation	1995 Elevation	1996 Elevation	1997 Elevation	1998 Elevation	1999 Elevation	2000 Elevation	2001 Elevation	2006 Elevation	Change From 1992 to 2006	Change From 1993 to 2006	Change From 1999 to 2006	Change From 2000 to 2006	Change from 2001 to 2006	Average Elevation
East Dike Station 0+00																		
E000-55.0	Ground Surface		1499.42	1499.73	1499.41	1499.44	1499.45	1499.51	1499.54	1499.43	1499.52	1499.39		-0.03	-0.15	-0.04	-0.13	1499.48
E000-35.0	Slope Break	1499.80	1499.64	1499.73	1499.77	1499.75	1499.76	1499.81	1499.81	1499.79	1499.76	1499.78	-0.02	0.14	-0.03	-0.01	0.02	1499.76
E000-30.4	Start Riprap	1500.30	1500.27	1500.38	1500.31	1500.23	1500.26	1500.31	1500.31	1500.26	1500.26	1500.26	-0.04	-0.01	-0.05	0.00	0.00	1500.29
E000-19.5	Slope Crest	1500.15	1500.12	1500.24	1500.14	1500.10	1500.10	1500.18	1500.18	1500.14	1500.14	1500.10	-0.05	-0.02	-0.08	-0.04	-0.04	1500.14
E000-1	Slope Surface	1492.15	1492.75	1492.87	1492.72	1492.98	1492.73	1492.99	1493.29	1493.12	1492.96	1492.18	0.03	-0.57	-1.11	-0.94	-0.78	1492.79
East Dike Station 2+00																		
E200-55.0	Ground Surface		1496.45	1496.44	1496.41	1496.47	1496.47	1496.52	1496.56	1496.59	1496.53	1496.56		0.11	0.00	-0.03	0.03	1496.50
E200-35.0	Slope Break		1496.27	1496.31	1496.33	1496.33	1496.34	1496.39	1496.39	1496.36	1496.33	1496.35		0.08	-0.04	-0.01	0.02	1496.34
E200-26.2	Start Riprap	1496.30	1496.24	1496.33	1496.28	1496.24	1496.26	1496.33	1496.31	1496.28	1496.27	1496.24	-0.06	0.00	-0.07	-0.04	-0.03	1496.28
E200-14.5	Slope Crest	1496.45	1496.42	1496.52	1496.47	1496.44	1496.45	1496.50	1496.48	1496.43	1496.43	1496.43	-0.02	0.01	-0.05	0.00	0.00	1496.46
E200-5.6	Slope Surface	1492.70	1492.62	1492.78	1492.73	1492.72	1492.73	1492.80	1492.78	1492.75	1492.74	1492.92	0.22	0.30	0.14	0.17	0.18	1492.75
East Dike Station 4+00																		
E400-55.0	Ground Surface		1496.39	1496.45	1496.39	1496.46	1496.43	1496.47	1496.52	1496.55	1496.41	1496.55		0.16	0.03	0.00	0.14	1496.46
E400-35.0	Slope Break	1496.30	1496.18	1496.33	1496.38	1496.38	1496.37	1496.40	1496.40	1496.38	1496.34	1496.41	0.11	0.23	0.01	0.03	0.07	1496.35
E400-26.6	Start Riprap	1495.90	1495.83	1495.88	1495.88	1495.91	1495.89	1495.93	1495.92	1495.89	1495.85	1495.99	0.09	0.16	0.07	0.10	0.14	1495.90
E400-14.0	Slope Crest	1495.50	1495.46	1495.33	1495.50	1495.52	1495.49	1495.54	1495.53	1495.50	1495.49	1495.60	0.10	0.14	0.07	0.10	0.11	1495.50
E400-6.5	Slope Surface	1492.50	1492.51	1492.58	1492.58	1492.59	1492.52	1492.57	1492.58	1492.59	1492.50	1492.93	0.43	0.42	0.35	0.34	0.43	1492.59
East Dike Station 6+00																		
E600-55.0	Ground Surface		1496.21	1496.20	1496.18	1496.21	1496.21	1496.27	1496.25	1496.36	1496.26	1496.39		0.18	0.14	0.03	0.13	1496.25
E600-35.0	Slope Break	1496.05	1496.05	1496.07	1496.12	1496.12	1496.08	1496.13	1496.13	1496.12	1496.10	1496.12	0.07	0.07	-0.01	0.00	0.02	1496.10
E600-22.6	Start Riprap	1496.45	1496.36	1496.46	1496.12	1496.45	1496.36	1496.42	1496.40	1496.38	1496.39	1495.92	-0.53	-0.44	-0.48	-0.46	-0.47	1496.34
E600-13.7	Slope Crest	1496.10	1496.07	1496.09	1496.10	1496.06	1496.01	1496.08	1496.06	1496.04	1496.03	1496.03	-0.07	-0.04	-0.03	-0.01	0.00	1496.06
E600-4.7	Slope Surface	1492.35	1492.26	1492.29	1492.30	1492.26	1492.19	1492.22	1492.21	1492.15	1492.12	1492.63	0.28	0.37	0.42	0.48	0.51	1492.27
East Dike Station 8+00																		
E800-55.0	Ground Surface		1497.20	1497.28	1497.22	1497.19	1497.32	1497.31	1497.34	1497.35	1497.26	1497.36		0.16	0.02	0.01	0.10	1497.28
E800-35.0	Slope Break	1496.80	1496.73	1496.84	1496.87	1496.87	1496.91	1496.95	1496.95	1496.92	1496.91	1496.93	0.13	0.20	-0.02	0.01	0.02	1496.88
E800-18.7	Start Riprap	1496.80	1496.77	1496.91	1496.84	1496.78	1496.82	1496.86	1496.85	1496.81	1496.81	1496.83	0.03	0.06	-0.02	0.02	0.02	1496.83
E800-10.3	Slope Crest	1496.20	1496.12	1496.25	1496.18	1496.25	1496.29	1496.34	1496.32	1496.27	1496.28	1496.29	0.09	0.17	-0.03	0.02	0.01	1496.25
E800-2.5	Slope Surface	1493.10	1493.14	1493.26	1493.21	1493.16	1493.20	1493.21	1493.20	1493.16	1493.11	1493.23	0.13	0.09	0.03	0.07	0.12	1493.18
East Dike Station 10+00																		
E1000-55.0	Ground Surface		1499.08	1499.16	1499.07	1499.08	1499.11	1499.15	1499.20	1499.17	1499.12	1499.11		0.03	-0.09	-0.06	-0.01	1499.12
E1000-32.0	Slope Break	1498.50	1498.47	1498.58	1498.60	1498.53	1498.52	1498.56	1498.56	1498.54	1498.53	1498.50	0.00	0.03	-0.06	-0.04	-0.03	1498.54
E1000-29.0	Slope Break	1499.00	1498.95	1499.01	1499.06	1499.03	1499.07	1499.09	1499.09	1499.08	1499.06	1499.10	0.10	0.15	0.01	0.02	0.04	1499.05
E1000-27.6	Start Riprap	1499.00	1498.97	1498.98	1499.04	1499.00	1499.03	1499.02	1499.07	1499.03	1499.00	1498.95	-0.05	-0.02	-0.12	-0.08	-0.05	1499.01
E1000-18.4	Slope Crest	1498.95	1498.91	1499.03	1498.97	1498.93	1498.94	1498.95	1498.96	1498.96	1498.94	1498.94	-0.01	0.03	-0.02	-0.02	0.00	1498.95
E1000-5.2	Slope Surface	1493.35	1493.06	1493.17	1493.11	1493.09	1493.11	1493.11	1493.12	1493.11	1493.08	1493.29	-0.06	0.23	0.17	0.18	0.21	1493.15

Notes: Negative change indicates a decrease in elevation.
Positive change indicates a increase in elevation.

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East Dike Station 12+00																		
E1200-55.0	Ground Surface		1500.18	1500.26	1500.24	1500.21	1500.23	1500.30	1500.33	1500.32	1500.29	1500.28		0.10	-0.05	-0.04	-0.01	1500.26
E1200-35.0	Slope Break	1499.25	1499.17	1499.06	1499.23	1499.22	1499.22	1499.27	1499.26	1499.29	1499.25	1499.24	-0.01	0.07	-0.02	-0.05	-0.01	1499.22
E1200-29.0	Slope Break					1499.38	1499.35	1499.40	1499.40	1499.37	1499.36	1499.34			-0.06	-0.03	-0.02	1499.37
E1200-27.7	Start Riprap	1499.25	1499.23	1499.38	1499.35	1499.38	1499.20	1499.35	1499.32	1499.36	1499.34	1499.29	0.04	0.06	-0.03	-0.07	-0.05	1499.31
E1200-17.7	Slope Crest	1499.35	1499.27	1499.28	1499.31	1499.28	1499.25	1499.31	1499.30	1499.28	1499.24	1499.24	-0.11	-0.03	-0.06	-0.04	0.00	1499.28
E1200-4.5	Slope Surface	1493.80	1493.85	1493.99	1494.03	1494.03	1494.04	1494.09	1494.11	1494.07	1494.07	1494.29	0.49	0.44	0.18	0.22	0.22	1494.03
East Dike Station 14+00																		
E1400-55.0	Ground Surface		1499.55	1499.75	1499.57	1499.58	1499.61	1499.59	1499.63	1499.67	1499.67	1499.61		0.06	-0.02	-0.06	-0.06	1499.62
E1400-35.0	Slope Break	1499.30	1499.33	1499.46	1499.32	1499.37	1499.37	1499.30	1499.35	1499.43	1499.34	1499.33	0.03	0.00	-0.02	-0.10	-0.01	1499.35
E1400-28.0	Slope Break	1499.55	1499.55	1499.62	1499.65	1499.67	1499.69	1499.69	1499.69	1499.69	1499.67	1499.69	0.14	0.14	0.00	0.00	0.02	1499.65
E1400-25.5	Start Riprap	1499.10	1499.12	1499.17	1499.15	1499.16	1499.42	1499.43	1499.58	1499.50	1499.45	1499.11	0.01	-0.01	-0.47	-0.39	-0.34	1499.29
E1400-15.0	Slope Crest	1499.35	1499.32	1499.52	1499.35	1499.34	1499.34	1499.35	1499.34	1499.34	1499.31	1499.24	-0.11	-0.08	-0.10	-0.10	-0.07	1499.35
E1400-3.8	Slope Surface	1494.90	1494.88	1495.12	1494.96	1494.92	1494.91	1494.91	1494.86	1494.78	1494.77	1494.75	-0.15	-0.13	-0.11	-0.03	-0.02	1494.89
East Dike Station 16+00																		
E1600-55.0	Ground Surface		1499.23	1499.30	1499.31	1499.23	1499.34	1499.32	1499.34	1499.25	1499.32	1499.29		0.06	-0.05	0.04	-0.03	1499.29
E1600-35.0	Slope Break		1498.90	1498.92	1498.97	1498.97	1499.01	1498.98	1499.00	1498.96	1498.96	1498.98		0.08	-0.02	0.02	0.02	1498.97
E1600-28.0	Slope Break	1499.05	1499.10	1499.13	1499.16	1499.16	1499.18	1499.20	1499.20	1499.19	1499.17	1499.16	0.11	0.06	-0.04	-0.03	-0.01	1499.15
E1600-26.4	Start Riprap	1499.55	1499.53	1499.58	1499.41	1499.50	1499.40	1499.46	1499.35	1499.40	1499.39	1499.36	-0.19	-0.17	0.01	-0.04	-0.03	1499.45
E1600-14.7	Slope Crest	1498.95	1498.91	1498.97	1498.93	1498.93	1498.94	1498.98	1498.94	1498.90	1498.88	1498.83	-0.12	-0.08	-0.11	-0.07	-0.05	1498.92
E1600-5.2	Slope Surface	1494.30	1494.44	1494.48	1494.47	1494.43	1494.41	1494.45	1494.41	1494.37	1494.36	1494.34	0.04	-0.10	-0.07	-0.03	-0.02	1494.41
East Dike Station 18+00																		
E1800-55.0	Ground Surface		1500.09	1499.90	1499.92	1500.17	1500.25	1500.22	1500.12	1500.18	1500.18	1500.11		0.02	-0.01	-0.07	-0.07	1500.11
E1800-35.0	Slope Break	1499.60	1499.59	1499.49	1499.51	1499.62	1499.65	1499.67	1499.70	1499.77	1499.63	1499.69	0.09	0.10	-0.01	-0.08	0.06	1499.63
E1800-25.0	Slope Break				1499.57	1499.57	1499.57	1499.60	1499.60	1499.59	1499.56	1499.59			-0.01	0.00	0.03	1499.58
E1800-23.4	Start Riprap	1499.50	1499.48	1499.56	1499.57	1499.55	1499.49	1499.57	1499.52	1499.57	1499.54	1499.69	0.19	0.21	0.17	0.12	0.15	1499.55
E1800-13.9	Slope Crest	1499.15	1499.12	1499.07	1499.19	1499.14	1499.15	1499.16	1499.16	1499.16	1499.11	1499.14	-0.01	0.02	-0.02	-0.02	0.03	1499.14
E1800-5.7	Slope Surface	1496.10	1495.13	1495.09	1495.21	1495.20	1495.15	1495.16	1495.18	1495.17	1495.11	1495.13	-0.97	0.00	-0.05	-0.04	0.02	1495.24
West Dike Station 0+00																		
W000-39.5	River Side	1492.06	1492.10	1492.07	1492.08	1492.10												1492.08
W000-38.3	River Side											1489.67						1489.67
W000-36.0	River Side						1491.87	1492.08	1492.04	1492.14	1492.03							1492.03
W000-9.7	River Side	1506.16	1506.11	1506.11	1506.12	1506.10	1506.05											1506.11
W000-6.4	River Side							1505.93	1506.10	1506.08	1506.01	1506.00			-0.10	-0.08	-0.01	1506.02
W000-0	Baseline	1505.86	1505.86	1505.88	1505.91	1505.91	1505.88	1505.90	1505.91	1505.89	1505.90	1505.88	0.02	0.02	-0.03	-0.01	-0.02	1505.89
W000-4.4	Swale Side										1505.77	1505.87					0.10	1505.82
W000-31.3	Swale Side	1492.06	1492.00	1492.10	1492.09	1492.09	1492.98	1493.14	1493.11	1492.90	1492.95	1492.72	0.66	0.72	-0.39	-0.18	-0.23	1492.56
W000-40	Swale Side	1490.51	1490.59	1490.47	1490.52	1490.66	1490.75	1491.20	1491.17	1490.67	1491.27	1491.12	0.61	0.53	-0.05	0.45	-0.15	1490.81

Notes: Negative change indicates a decrease in elevation.
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Table 1

Genesee River Dike Surveyed Elevations (1992-2006)
Former Sinclair Refinery Site (OU-1)
Wellsville, New York
(ft msl)

Station & Distance From Baseline	Location Description	1992 Elevation	1993 Elevation	1994 Elevation	1995 Elevation	1996 Elevation	1997 Elevation	1998 Elevation	1999 Elevation	2000 Elevation	2001 Elevation	2006 Elevation	Change From 1992 to 2006	Change From 1993 to 2006	Change From 1999 to 2006	Change From 2000 to 2006	Change from 2001 to 2006	Average Elevation
West Dike Station 2+00																		
W200-46.7	River Side	1491.76	1491.76	1491.73	1491.84	1491.79	1491.89	1492.34	1491.76	1491.80	1491.78	1491.60	-0.16	-0.16	-0.16	-0.20	-0.18	1491.82
W200-7.3	River Side	1506.46	1506.48	1506.42	1506.48	1506.45	1506.58	1506.64	1506.61	1506.56	1506.65	1506.65	0.19	0.17	0.04	0.09	0.00	1506.54
W200-0	Baseline	1506.81	1506.77	1506.81	1506.83	1506.83	1506.81	1506.81	1506.82	1506.82	1506.82	1506.82	0.01	0.05	0.00	0.00	0.00	1506.81
W200-9.5	Swale Side	1506.26	1506.25	1506.22	1506.15	1506.10	1506.20	1506.10	1506.13	1506.29	1506.20	1506.14	-0.12	-0.11	0.01	-0.15	-0.06	1506.19
W200-18	Swale Side		1502.73	1502.63	1502.75	1502.62	1502.61	1502.47	1502.55	1502.78	1502.68	1502.57		-0.16	0.02	-0.21	-0.11	1502.64
W200-30.8	Swale Side	1498.56	1501.77	1501.64	1501.66	1501.69	1501.53	1501.39	1501.68	1501.78	1501.85	1501.56	3.00	-0.21	-0.12	-0.22	-0.29	1501.37
West Dike Station 4+00																		
W400-90	River Side	1491.46																1491.46
W400-82.1	River Side		1491.42	1491.50	1491.44	1491.40	1491.51	1491.44	1491.36	1490.98	1491.36							1491.38
W400-79.7	River Side	1496.11	1496.11															1496.11
W400-74.1	River Side		1495.70	1497.34	1495.77	1495.75	1495.73	1495.74	1495.66	1495.68	1495.68	1495.63		-0.07	-0.05	-0.05	-0.05	1495.87
W400-64.7	River Side	1497.56																1497.56
W400-59.9	River Side		1497.37	1498.33	1497.44	1497.42	1497.40	1497.42	1497.38	1497.37	1497.41	1497.40		0.03	0.02	0.03	-0.01	1497.49
W400-49.2	River Side	1498.16																1498.16
W400-47.5	River Side		1498.35	1498.33	1498.42	1498.39	1498.38	1498.38	1498.36	1498.36	1498.38	1498.38		0.03	0.02	0.02	0.00	1498.37
W400-6.9	River Side	1506.96	1506.91	1506.79	1506.78	1506.79	1506.67	1506.69	1506.77	1506.85	1506.77	1506.84	-0.12	-0.07	0.07	-0.01	0.07	1506.80
W400-0	Baseline	1506.96	1506.91	1506.93	1506.96	1506.96	1506.95	1506.96	1506.97	1506.97	1506.97	1506.96	0.00	0.05	-0.01	-0.01	-0.01	1506.95
W400-5.8	CELA Side				1506.90	1506.88	1506.84	1506.93	1506.92	1507.00	1506.93	1506.91			-0.01	-0.09	-0.02	1506.91
W400-6.0	CELA Side	1507.01	1507.00	1507.00														1507.00
W400-18.0	CELA Side		1501.48	1501.38	1501.47	1501.46	1501.46	1501.49	1501.48	1501.44	1501.49	1501.53		0.05	0.05	0.09	0.04	1501.47
W400-24.2	CELA Side	1499.46																1499.46
W400-31.6	CELA Side	1498.71	1498.66	1498.64	1498.72	1498.69	1498.69	1498.69	1498.68	1498.67	1498.70							1498.69
West Dike Station 6+00																		
W600-68.4	River Side	1497.16	1497.21	1496.90	1497.16	1497.25	1497.12	1497.20	1497.16	1497.14	1497.14	1497.15	-0.01	-0.06	-0.01	0.01	0.01	1497.14
W600-47.5	River Side	1498.46	1498.50	1498.45	1498.52	1498.58	1498.56	1498.60	1498.58	1498.52	1498.45	1498.58	0.12	0.08	0.00	0.06	0.13	1498.53
W600-31.3	River Side	1498.31	1498.36	1498.29	1498.37	1498.34	1498.32	1498.37	1498.34	1498.30	1498.34	1498.34	0.03	-0.02	0.00	0.04	0.00	1498.33
W600-8.0	River Side	1507.01	1507.00	1506.93	1506.98	1506.93	1506.90	1506.85	1506.91	1506.87	1506.86	1506.76	-0.25	-0.24	-0.15	-0.11	-0.10	1506.91
W600-0	Baseline	1506.96	1506.92	1506.91	1506.95	1506.95	1506.93	1506.97	1506.96	1506.95	1506.95	1506.96	0.00	0.04	0.00	0.01	0.01	1506.95
W600-5.4	CELA Side	1506.96	1507.05	1506.83	1506.88	1506.90	1506.89	1506.85	1506.92	1506.90	1507.03	1506.92	-0.04	-0.13	0.00	0.02	-0.11	1506.92
W600-16.2	CELA Side		1500.66	1500.56	1500.61	1500.42	1500.54	1500.58	1500.22	1500.54	1500.53	1500.77		0.11	0.55	0.23	0.24	1500.54
W600-16.7	CELA Side	1501.01																1501.01
West Dike Station 8+00																		
W800-55.0	River Side		1499.38	1499.17	1499.26	1499.29	1499.41	1499.39	1499.31	1499.46	1499.26	1499.33		-0.05	0.02	-0.13	0.07	1499.33
W800-49.0	River Side	1499.47	1499.48	1499.33	1499.40	1499.39	1499.35	1499.57	1499.42	1499.46	1499.46	1499.46	-0.01	-0.02	0.04	0.00	0.00	1499.44
W800-46.0	River Side	1498.87	1498.84	1499.13	1499.19	1499.14	1499.18	1499.20	1499.19	1499.16	1499.17	1499.24	0.37	0.40	0.05	0.08	0.07	1499.12
W800-28.8	River Side	1499.62	1499.61	1499.55	1499.62	1499.58	1499.60	1499.60	1499.60	1499.61	1499.61	1499.68	0.06	0.07	0.08	0.07	0.07	1499.61

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Table 1

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West Dike Station 8+00 Continued																		
W800-7.5	River Side	1507.12	1507.02	1506.88	1506.99	1506.91	1506.93	1506.91	1506.90	1506.87	1506.83	1506.84	-0.28	-0.18	-0.06	-0.03	0.01	1506.93
W800-0	Baseline	1507.12	1507.02	1507.00	1507.00	1507.00	1507.02	1507.00	1507.00	1507.00	1507.01	1507.06	-0.06	0.04	0.06	0.06	0.05	1507.02
W800-7.3	CELA Side	1507.17	1507.08	1506.96	1506.97	1506.85	1507.00	1506.96	1507.02	1507.09	1507.06	1507.04	-0.13	-0.04	0.02	-0.05	-0.02	1507.02
W800-14.0	CELA Side		1502.43	1502.30	1502.37	1502.31	1502.20	1502.34	1502.20	1502.33	1502.28	1502.36		-0.07	0.16	0.03	0.08	1502.31
W800-15.5	CELA Side	1503.27	1503.27	1502.15	1502.30	1502.21	1502.22	1502.21	1502.15	1502.09	1502.19	1502.00	-1.27	-1.27	-0.15	-0.09	-0.19	1502.37
West Dike Station 10+00																		
W1000-64.5	River Side	1497.07	1497.08	1496.96	1496.96	1497.16	1497.18	1497.32	1497.22	1497.45	1497.27	1497.21	0.14	0.13	-0.01	-0.24	-0.06	1497.17
W1000-57.5	River Side	1496.22	1496.27	1496.11	1496.10	1496.32	1496.22	1496.28	1496.32	1496.43	1496.34	1496.21	-0.01	-0.06	-0.11	-0.22	-0.13	1496.26
W1000-54.5	River Side	1495.57	1495.57	1495.52	1495.52	1495.88	1495.91	1495.85	1495.84	1495.96	1495.93	1495.92	0.35	0.35	0.08	-0.04	-0.01	1495.77
W1000-38.8	River Side	1495.22	1495.27	1495.22	1495.28	1495.25	1495.25	1495.23	1495.25	1495.23	1495.25	1495.27	0.05	0.00	0.02	0.04	0.02	1495.25
W1000-7.2	River Side	1507.22	1507.02	1506.98	1506.79	1506.69	1506.77	1506.73	1507.08	1506.78	1506.73	1506.74	-0.48	-0.28	-0.34	-0.04	0.01	1506.87
W1000-0	Baseline	1507.22	1507.02	1507.15	1507.15	1507.15	1507.16	1507.15	1507.16	1507.15	1507.17	1507.16	-0.06	0.14	0.00	0.01	-0.01	1507.15
W1000-5.6	CELA Side	1507.32	1507.29	1507.28	1507.23	1507.21	1507.19	1507.14	1507.27	1507.26	1507.20	1507.31	-0.01	0.02	0.04	0.05	0.11	1507.25
W1000-13.3	CELA Side	1503.32	1502.99	1502.90	1502.85	1502.86	1502.73	1502.82	1502.90	1502.87	1502.90	1502.90	-0.42	-0.09	0.00	0.03	0.00	1502.91
W1000-14.7	CELA Side		1502.70	1502.66	1502.64	1502.59	1502.57	1502.25	1502.57	1502.54	1502.56	1502.29		-0.41	-0.28	-0.25	-0.27	1502.54
West Dike Station 12+00																		
W1200-89.0	River Side					1494.95	1492.95	1493.22	1493.27	1493.01	1493.08							1493.41
W1200-87.0	River Side					1492.11	1491.90	1492.18	1491.89	1491.45	1491.79							1491.89
W1200-84.0	River Side	1495.17	1495.29	1495.18	1495.23							1491.57						1494.49
W1200-75.5	River Side	1495.17	1494.95	1494.63	1494.56													1494.83
W1200-74.0	River Side	1493.32	1493.22	1493.05	1492.97	1490.10												1492.53
W1200-70.0	River Side										1495.22	1495.14						1495.18
W1200-68.5	River Side		1491.70															1491.70
W1200-62.3	River Side	1494.22	1494.21	1494.14	1494.19							1492.35						1493.82
W1200-60.4	River Side					1493.91	1493.82	1494.14	1494.08	1494.04	1494.03							1494.00
W1200-60.3	River Side											1495.41						1495.41
W1200-44.2	River Side	1493.67	1493.67	1494.00	1493.52	1494.06	1493.82	1494.10	1494.10	1494.05	1494.07	1494.08	0.41	0.41	-0.02	0.03	0.01	1493.92
W1200-8.0	River Side	1508.07	1507.95	1507.75	1507.73	1507.60	1507.74	1507.74	1507.73	1507.72	1507.79	1507.61	-0.46	-0.34	-0.12	-0.11	-0.18	1507.77
W1200-0	Baseline	1508.17	1508.10	1508.10	1508.11	1508.11	1508.11	1508.12	1508.13	1508.11	1508.09	1508.08	-0.09	-0.02	-0.05	-0.03	-0.01	1508.11
W1200-5.7	CELA Side	1508.17																1508.17
W1200-6.0	CELA Side		1508.11	1508.01	1507.91	1508.00	1508.07	1507.86	1508.05	1507.91	1507.87	1508.00		-0.11	-0.05	0.09	0.13	1507.98
W1200-13.4	CELA Side		1504.40	1504.34	1504.34	1504.29	1504.26	1504.25	1504.26	1504.42	1504.32	1504.33		-0.07	0.07	-0.09	0.01	1504.32
W1200-15.5	CELA Side	1503.52	1504.42	1504.30	1504.13	1504.05	1503.99	1504.06	1504.05	1504.08	1504.05	1503.89	0.37	-0.53	-0.16	-0.19	-0.16	1504.05
West Dike Station 14+00																		
W1400-83.0	River Side	1496.92	1496.88	1496.88	1496.90	1496.88												1496.89
W1400-73.5	River Side	1497.62	1497.68	1497.68	1497.70	1497.68												1497.67
W1400-70.0	River Side	1495.12	1495.23	1495.41	1495.53	1495.06	1495.18	1495.17	1495.18	1495.20	1495.22	1495.14	0.02	-0.09	-0.04	-0.06	-0.08	1495.22
W1400-60.3	River Side	1495.47	1495.46	1495.43	1495.52	1495.46	1495.46	1495.47	1495.49	1495.44	1495.48	1495.41	-0.06	-0.05	-0.08	-0.03	-0.07	1495.46
W1400-53.4	River Side	1494.87	1494.85	1494.81	1495.01	1495.33	1495.20	1495.06	1495.11	1495.44	1494.99	1495.10	0.23	0.25	-0.01	-0.34	0.11	1495.07

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(ft msl)

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West Dike Station 14+00 Continued																		
W1400-41.6	River Side	1494.47	1494.50	1494.42	1494.52	1494.51	1494.51	1494.46	1494.47	1494.46	1494.48	1494.99	0.52	0.49	0.52	0.53	0.51	1494.53
W1400-7.0	River Side	1508.57	1508.50	1508.42	1508.47	1508.42	1508.14	1508.39	1508.38	1508.40	1508.42	1508.39	-0.18	-0.11	0.01	-0.01	-0.03	1508.41
W1400-0	Baseline	1508.37	1508.27	1508.26	1508.30	1508.28	1508.27	1508.25	1508.29	1508.28	1508.29	1508.28	-0.09	0.01	-0.01	0.00	-0.01	1508.29
W1400-6.2	CELA Side	1508.42																1508.42
W1400-6.3	CELA Side		1508.31	1508.29	1508.17	1508.15	1508.21	1508.18	1508.22	1508.25	1508.24	1508.37		0.06	0.15	0.12	0.13	1508.24
W1400-12.5	CELA Side		1505.10	1505.01	1505.06	1504.96	1504.74	1504.69	1504.97	1504.95	1504.85	1504.87		-0.23	-0.10	-0.08	0.02	1504.92
W1400-17.0	CELA Side	1502.87	1504.48	1504.35	1504.42	1504.03	1504.04	1504.01	1504.05	1504.03	1504.12	1504.15	1.28	-0.33	0.10	0.12	0.03	1504.05
West Dike Station 16+00																		
W1600-76.0	River Side	1496.95	1496.82	1496.75	1496.69	1496.86	1496.84	1497.06	1496.99	1497.26	1497.16	1497.55	0.60	0.73	0.56	0.29	0.39	1496.99
W1600-58.0	River Side	1496.80	1496.82	1496.24	1496.85	1496.71	1496.98	1496.73	1497.12	1497.35	1497.93	1497.25	0.45	0.43	0.13	-0.10	-0.68	1496.98
W1600-41.2	River Side	1496.60	1496.60	1496.47	1496.78	1496.90	1496.94	1497.01	1497.14	1497.41	1497.21	1497.51	0.91	0.91	0.37	0.10	0.30	1496.96
W1600-6.6	River Side	1509.45	1509.41	1509.36	1509.40	1509.32	1509.31	1509.32	1509.29	1509.24	1509.27	1509.23	-0.22	-0.18	-0.06	-0.01	-0.04	1509.33
W1600-0	Baseline	1508.85	1508.74	1508.74	1508.79	1508.79	1508.78	1508.78	1508.79	1508.76	1508.76	1508.75	-0.10	0.01	-0.04	-0.01	-0.01	1508.78
W1600-6.3	CELA Side	1508.75	1508.72	1508.67	1508.66	1508.73	1508.61	1508.65	1508.67	1508.66	1508.69	1508.78	0.03	0.06	0.11	0.12	0.09	1508.69
W1600-14.0	CELA Side		1506.38	1506.32	1506.33	1506.27	1505.93	1506.25	1506.23	1506.19	1506.12	1506.07		-0.31	-0.16	-0.12	-0.05	1506.21
W1600-19.2	CELA Side	1503.25	1505.62	1505.56	1505.60	1505.54	1505.33	1505.55	1505.50	1505.32	1505.48	1505.47	2.22	-0.15	-0.03	0.15	0.01	1505.29
West Dike Station 18+00																		
W1800-56.0	River Side	1495.45																1495.45
W1800-52.4	River Side											1495.21						1495.21
W1800-52.3	River Side	1496.10	1496.13	1495.73														1495.99
W1800-51.8	River Side				1496.10	1496.10	1495.43	1495.97	1495.94	1496.25	1495.90							1495.96
W1800-43.0	River Side	1497.65	1497.65	1497.58	1497.63	1497.58	1497.95	1497.79	1497.80	1497.80	1497.80	1497.74	0.09	0.09	-0.06	-0.06	-0.06	1497.72
W1800-27.0	River Side	1502.85	1502.87	1502.76	1502.85	1502.77	1502.80	1502.82	1502.77	1502.72	1502.71	1502.31	-0.54	-0.56	-0.46	-0.41	-0.40	1502.75
W1800-20.7	River Side	1503.60	1503.66	1503.40	1503.61	1503.59	1503.51	1503.51	1503.47	1503.64	1503.47	1503.48	-0.12	-0.18	0.01	-0.16	0.01	1503.54
W1800-6.3	River Side	1509.65	1509.65	1509.53	1509.56	1509.47	1509.47	1509.49	1509.46	1509.45	1509.45	1509.41	-0.24	-0.24	-0.05	-0.04	-0.04	1509.51
W1800-0	Baseline	1508.95	1508.98	1508.70	1508.72	1508.70	1508.74	1508.75	1508.75	1508.74	1508.74	1508.73	-0.22	-0.25	-0.02	-0.01	-0.01	1508.77
W1800-7.5	CELA Side	1509.10	1509.07	1508.69	1508.88	1508.73	1508.88	1508.83	1508.77	1508.85	1508.84	1508.83	-0.27	-0.24	0.06	-0.02	-0.01	1508.86
W1800-14.5	CELA Side		1505.90	1506.10	1506.12	1506.07	1506.09	1506.07	1506.03	1506.03	1506.02	1505.78		-0.12	-0.25	-0.25	-0.24	1506.02
W1800-17.4	CELA Side	1503.85	1505.84	1505.78	1505.81	1505.76	1505.74	1505.69	1505.73	1505.72	1505.72	1505.39	1.54	-0.45	-0.34	-0.33	-0.33	1505.55
West Dike Station 20+00																		
W2000-196.0	River Side	1501.76																1501.76
W2000-179.0	River Side	1496.31																1496.31
W2000-177.5	River Side				1496.39													1496.39
W2000-150.0	River Side	1495.91																1495.91
W2000-135.0	River Side	1495.21																1495.21
W2000-126.6	River Side				1496.00													1496.00
W2000-107.0	River Side	1495.31																1495.31
W2000-104.7	River Side				1495.16													1495.16

Notes: Negative change indicates a decrease in elevation.
Positive change indictes a increase in elevation.

Table 1

Genesee River Dike Surveyed Elevations (1992-2006)
Former Sinclair Refinery Site (OU-1)
Wellsville, New York
(ft msl)

Station & Distance From Baseline	Location Description	1992 Elevation	1993 Elevation	1994 Elevation	1995 Elevation	1996 Elevation	1997 Elevation	1998 Elevation	1999 Elevation	2000 Elevation	2001 Elevation	2006 Elevation	Change From 1992 to 2006	Change From 1993 to 2006	Change From 1999 to 2006	Change From 2000 to 2006	Change from 2001 to 2006	Average Elevation
West Dike Station 20+00 Continued																		
W2000-90.0	River Side	1494.01			1494.01													1494.01
W2000-77.9	River Side				1493.42													1493.42
W2000-62.9	River Side				1492.36													1492.36
W2000-56.0	River Side	1493.21	1493.21		1494.06													1493.49
W2000-52.0	River Side	1495.96	1496.00	1495.46	1496.00	1495.96	1495.93	1495.66	1495.69	1496.24	1495.62							1495.85
W2000-42.8	River Side	1496.26	1496.39	1496.57	1496.69	1496.80	1497.05	1497.08	1497.19	1497.39	1497.04							1496.85
W2000-19.6	River Side	1504.71	1504.72	1504.25	1504.64	1504.63	1504.63	1504.60	1504.64	1504.60	1504.59							1504.60
W2000-5.8	River Side	1509.71	1509.78	1509.68	1509.75	1509.65	1509.59	1509.52	1509.55	1509.52	1509.51	1509.54	-0.17	-0.24	-0.01	0.02	0.03	1509.62
W2000-0	Baseline	1509.31	1509.31	1509.24	1509.26	1509.26	1509.23	1509.23	1509.25	1509.25	1509.23	1509.24	-0.07	-0.07	-0.01	-0.01	0.01	1509.26
W2000-8.0	CELA Side	1509.36																1509.36
W2000-9.0	CELA Side		1509.14	1508.93	1509.03	1508.90	1508.89	1509.01	1509.06	1509.09	1509.03	1509.08		-0.06	0.02	-0.01	0.05	1509.02
W2000-16.4	CELA Side		1505.42	1505.42	1505.33	1505.26	1505.38	1505.35	1505.39	1505.40	1505.79	1505.20		-0.22	-0.19	-0.20	-0.59	1505.39
W2000-19.4	CELA Side	1503.56	1505.05	1505.06	1504.99	1504.87	1504.93	1504.95	1504.97	1504.87	1504.90	1504.84	1.28	-0.21	-0.13	-0.03	-0.06	1504.82
West Dike Station 22+00																		
W2200-65.0	River Side	1494.71	1494.81	1494.81	1494.71													1494.76
W2200-55.0	River Side	1495.56	1495.62	1495.42	1496.51	1495.47	1496.02	1496.36	1496.20	1496.48	1496.37							1496.00
W2200-49.0	River Side	1498.41	1498.43	1498.37	1498.40	1498.34	1498.30	1498.33	1498.32	1498.33	1498.33	1498.30	-0.11	-0.13	-0.02	-0.03	-0.03	1498.35
W2200-40.6	River Side	1498.51	1498.55	1498.76	1498.66	1498.90	1498.74	1498.64	1498.73	1498.71	1498.67	1498.76	0.25	0.21	0.03	0.05	0.09	1498.69
W2200-19.8	River Side	1504.56	1504.55	1504.51	1505.00	1504.56	1505.06	1505.05	1505.00	1504.99	1505.02	1505.01	0.45	0.46	0.01	0.02	-0.01	1504.85
W2200-6.3	River Side	1509.96	1509.99	1509.84	1510.02	1510.05	1510.03	1510.01	1510.01	1509.98	1509.98	1509.92	-0.04	-0.07	-0.09	-0.06	-0.06	1509.98
W2200-0	Baseline	1509.96	1509.88	1509.85	1509.88	1509.86	1509.85	1509.85	1509.86	1509.85	1509.83	1509.82	-0.14	-0.06	-0.04	-0.03	-0.01	1509.86
W2200-7.3	CELA Side	1509.69	1509.73	1509.64	1509.66	1509.67	1509.63	1509.69	1509.76	1509.72	1509.67	1509.60	-0.09	-0.13	-0.16	-0.12	-0.07	1509.68
W2200-16.6	CELA Side	1504.66		1504.51	1504.62	1504.53	1504.55	1504.62	1504.63	1504.55	1504.62	1504.63	-0.03		0.00	0.08	0.01	1504.59
W2200-17.7	CELA Side	1504.31	1504.58	1504.47	1504.34	1504.58	1504.54	1504.59	1504.56	1504.59	1504.52	1504.52	0.21	-0.06	-0.04	-0.07	0.00	1504.51
										Maximum Change			3.00	0.91	0.56	0.53	0.51	
										Minimum Change			-1.27	-1.27	-1.11	-0.94	-0.78	
										Average Change			0.09	0.01	-0.02	-0.02	-0.01	

Notes: Negative change indicates a decrease in elevation.
Positive change indictes a increase in elevation.

Table 2

2005 Daily Average Stage and Discharge
Genesee River at Wellsville, New York
USGS Station 04221000

Date	Stage (ft)	Discharge (cu ft/sec)
1/1/2006	5.13	397
1/2/2006	5.17	429
1/3/2006	6.02	1120
1/4/2006	5.71	823
1/5/2006	5.88	972
1/6/2006	5.68	794
1/7/2006	5.51	653
1/8/2006	5.43	592
1/9/2006	5.39	566
1/10/2006	5.36	550
1/11/2006	5.33	531
1/12/2006	5.87	973
1/13/2006	5.58	704
1/14/2006	8.45	4510
1/15/2006	6.95	2220
1/16/2006	6.16	1260
1/17/2006	5.88	971
1/18/2006	6.79	2040
1/19/2006	6.12	1230
1/20/2006	5.93	1020
1/21/2006	5.87	960
1/22/2006	5.63	751
1/23/2006	5.56	688
1/24/2006	5.45	609
1/25/2006	5.4	570
1/26/2006	5.26	476
1/27/2006	5.17	428
1/28/2006	5.2	442
1/29/2006	5.29	502
1/30/2006	5.49	637
1/31/2006	5.3	507
2/1/2006	5.19	438
2/2/2006	5.15	414
2/3/2006	5.4	580
2/4/2006	5.5	669
2/5/2006	6.63	1830
2/6/2006	5.89	983
2/7/2006	5.71	819
2/8/2006	5.58	705
2/9/2006	5.43	599
2/10/2006	5.38	556
2/11/2006	5.3	504
2/12/2006	5.22	455
2/13/2006	5.13	399
2/14/2006	5.11	388
2/15/2006	5.09	376
2/16/2006	5.20	441
2/17/2006	5.42	585
2/18/2006	5.16	400
2/19/2006	5.01	300
2/20/2006	5.13	280
2/21/2006	5.03	310
2/22/2006	5.07	300
2/23/2006	4.97	310
2/24/2006	4.93	289
2/25/2006	4.88	263
2/26/2006	4.88	240
2/27/2006	4.85	234
2/28/2006	4.87	234
3/1/2006	5.04	220
3/2/2006	4.81	210
3/3/2006	4.93	200
3/4/2006	4.82	190
3/5/2006	4.97	190
3/6/2006	4.71	170
3/7/2006	4.67	150
3/8/2006	4.66	140
3/9/2006	4.91	287
3/10/2006	5.60	737
3/11/2006	5.44	604
3/12/2006	5.35	543
3/13/2006	6.30	1560
3/14/2006	7.02	2330
3/15/2006	6.10	1200
3/16/2006	5.82	922
3/17/2006	5.63	752
3/18/2006	5.44	606
3/19/2006	5.34	536
3/20/2006	5.28	489
3/21/2006	5.17	423
3/22/2006	5.13	400
3/23/2006	5.07	363
3/24/2006	5.04	346
3/25/2006	5.01	332
3/26/2006	4.98	313
3/27/2006	4.92	284
3/28/2006	4.90	270
3/29/2006	4.87	260
3/30/2006	4.84	246
3/31/2006	4.82	236
4/1/2006	4.99	321
4/2/2006	4.98	314
4/3/2006	5.05	373
4/4/2006	6.07	1190
4/5/2006	5.54	675
4/6/2006	5.49	643
4/7/2006	5.55	696
4/8/2006	5.60	730
4/9/2006	5.39	564
4/10/2006	5.30	510
4/11/2006	5.24	464
4/12/2006	5.19	436
4/13/2006	5.30	509
4/14/2006	5.50	680
4/15/2006	5.67	796
4/16/2006	5.39	564
4/17/2006	5.31	514
4/18/2006	5.25	469
4/19/2006	5.18	433
4/20/2006	5.11	386
4/21/2006	---	320
4/22/2006	5.24	472
4/23/2006	5.37	554
4/24/2006	5.33	524
4/25/2006	5.20	443
4/26/2006	5.14	406
4/27/2006	5.08	369
4/28/2006	5.02	340
4/29/2006	4.97	308
4/30/2006	4.92	281
5/1/2006	4.87	259
5/2/2006	4.83	240
5/3/2006	4.80	224
5/4/2006	4.77	210
5/5/2006	4.77	208
5/6/2006	4.73	188

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Table 2

2005 Daily Average Stage and Discharge
Genesee River at Wellsville, New York
USGS Station 04221000

Date	Stage (ft)	Discharge (cu ft/sec)
5/7/2006	4.70	172
5/8/2006	4.66	156
5/9/2006	4.65	151
5/10/2006	4.62	142
5/11/2006	4.66	158
5/12/2006	5.20	446
5/13/2006	4.84	245
5/14/2006	4.82	232
5/15/2006	4.79	219
5/16/2006	4.87	260
5/17/2006	4.81	231
5/18/2006	4.80	226
5/19/2006	4.89	266
5/20/2006	4.82	233
5/21/2006	4.88	266
5/22/2006	4.89	268
5/23/2006	4.80	224
5/24/2006	4.75	200
5/25/2006	4.72	181
5/26/2006	4.73	187
5/27/2006	4.79	220
5/28/2006	4.71	180
5/29/2006	4.65	152
5/30/2006	4.61	136
5/31/2006	4.66	158
6/1/2006	5.12	412
6/2/2006	5.27	496
6/3/2006	6.17	1340
6/4/2006	5.74	849
6/5/2006	5.50	652
6/6/2006	5.25	473
6/7/2006	5.11	386
6/8/2006	5.01	333
6/9/2006	4.97	310
6/10/2006	4.92	284
6/11/2006	4.82	236
6/12/2006	4.75	202
6/13/2006	4.71	178
6/14/2006	4.67	160
6/15/2006	4.63	146
6/16/2006	4.59	127
6/17/2006	4.56	114
6/18/2006	4.53	104
6/19/2006	4.74	205
6/20/2006	4.75	198
6/21/2006	4.58	123
6/22/2006	4.55	110
6/23/2006	4.89	270
6/24/2006	4.68	165
6/25/2006	4.59	125
6/26/2006	4.97	382
6/27/2006	6.04	1160
6/28/2006	5.96	1070
6/29/2006	5.58	711
6/30/2006	5.32	520
7/1/2006	5.14	407
7/2/2006	5.01	334
7/3/2006	4.93	289
7/4/2006	5.04	352
7/5/2006	4.96	306
7/6/2006	4.81	228
7/7/2006	4.74	196
7/8/2006	4.69	169
7/9/2006	4.66	156
7/10/2006	4.63	143
7/11/2006	4.62	142
7/12/2006	4.84	256
7/13/2006	5.47	641
7/14/2006	4.89	269
7/15/2006	4.75	202
7/16/2006	4.69	171
7/17/2006	4.62	140
7/18/2006	4.57	119
7/19/2006	4.54	108
7/20/2006	4.51	99
7/21/2006	4.55	112
7/22/2006	4.94	311
7/23/2006	4.99	323
7/24/2006	4.67	164
7/25/2006	4.59	127
7/26/2006	4.63	146
7/27/2006	4.57	117
7/28/2006	5.31	565
7/29/2006	5.09	378
7/30/2006	4.83	241
7/31/2006	4.72	183
8/1/2006	4.65	151
8/2/2006	4.60	129
8/3/2006	4.62	143
8/4/2006	4.79	218
8/5/2006	4.61	135
8/6/2006	4.53	105
8/7/2006	4.49	89
8/8/2006	4.49	90
8/9/2006	4.45	76
8/10/2006	4.43	69
8/11/2006	4.41	64
8/12/2006	4.39	59
8/13/2006	4.38	57
8/14/2006	4.37	54
8/15/2006	4.40	60
8/16/2006	4.38	57
8/17/2006	4.36	51
8/18/2006	4.34	46
8/19/2006	4.42	73
8/20/2006	4.77	210
8/21/2006	4.49	89
8/22/2006	4.41	63
8/23/2006	4.38	56
8/24/2006	4.37	52
8/25/2006	4.38	56
8/26/2006	4.51	96
8/27/2006	4.65	163
8/28/2006	4.84	246
8/29/2006	5.94	1150
8/30/2006	5.36	556
8/31/2006	4.93	287
9/1/2006	4.76	207
9/2/2006	6.02	1510
9/3/2006	6.87	2150
9/4/2006	5.78	883
9/5/2006	5.44	604
9/6/2006	5.28	494
9/7/2006	5.20	443
9/8/2006	5.03	341
9/9/2006	4.94	290
9/10/2006	4.88	264
9/11/2006	4.81	227
9/12/2006	4.76	205
9/13/2006	4.96	303
9/14/2006	4.98	317
9/15/2006	4.88	264

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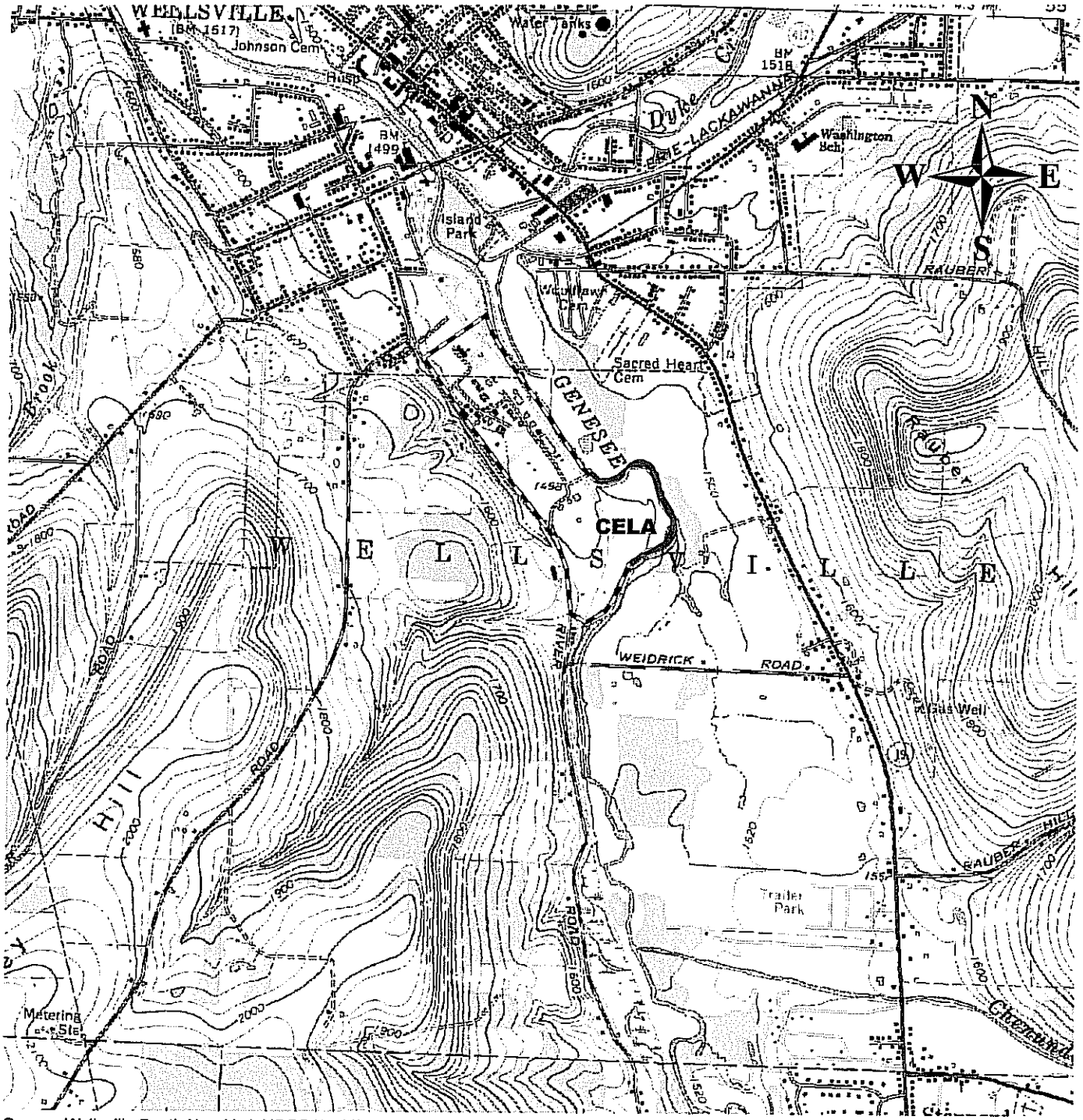
Table 2

2005 Daily Average Stage and Discharge
Genesee River at Wellsville, New York
USGS Station 04221000

Date	Stage (ft)	Discharge (cu ft/sec)
9/16/2006	4.81	229
9/17/2006	4.76	204
9/18/2006	4.71	176
9/19/2006	4.66	159
9/20/2006	4.64	149
9/21/2006	4.65	151
9/22/2006	4.61	133
9/23/2006	4.61	136
9/24/2006	4.64	147
9/25/2006	4.62	139
9/26/2006	4.58	122
9/27/2006	4.55	112
9/28/2006	4.71	187
9/29/2006	5.01	334
9/30/2006	4.74	196
10/1/2006	4.79	220
10/2/2006	4.73	191
10/3/2006	4.68	165
10/4/2006	4.86	257
10/5/2006	5.15	412
10/6/2006	4.89	268
10/7/2006	4.81	229
10/8/2006	4.77	208
10/9/2006	4.73	188
10/10/2006	4.70	173
10/11/2006	4.68	166
10/12/2006	4.76	203
10/13/2006	4.72	184
10/14/2006	4.67	160
10/15/2006	4.65	155
10/16/2006	4.62	141
10/17/2006	4.75	202
10/18/2006	5.09	377
10/19/2006	5.00	328
10/20/2006	7.40	2930
10/21/2006	7.01	2310
10/22/2006	6.13	1230
10/23/2006	5.93	1020
10/24/2006	5.78	878
10/25/2006	5.66	776
10/26/2006	5.48	632
10/27/2006	5.38	558
10/28/2006	6.49	1670
10/29/2006	6.43	1570
10/30/2006	6.08	1180
10/31/2006	5.96	1050
11/1/2006	5.77	871
11/2/2006	5.62	739
11/3/2006	5.50	646
11/4/2006	5.40	576
11/5/2006	5.32	519
11/6/2006	5.24	463
11/7/2006	5.18	430
11/8/2006	5.21	447
11/9/2006	5.16	418
11/10/2006	5.07	364
11/11/2006	5.07	370
11/12/2006	5.69	811
11/13/2006	5.39	564
11/14/2006	5.36	548
11/15/2006	5.34	532
11/16/2006	6.73	2260
11/17/2006	7.81	3430
11/18/2006	6.53	1690
11/19/2006	6.11	1210
11/20/2006	5.86	953
11/21/2006	5.65	767
11/22/2006	5.50	649
11/23/2006	5.40	572
11/24/2006	5.31	512
11/25/2006	5.23	460
11/26/2006	5.17	424
11/27/2006	5.10	383
11/28/2006	5.05	353
11/29/2006	5.01	329
11/30/2006	4.98	315
12/1/2006	5.57	760
12/2/2006	5.59	729
12/3/2006	5.26	478
12/4/2006	5.21	448
12/5/2006	5.16	418
12/6/2006	5.12	390
12/7/2006	5.14	407
12/8/2006	5.07	340
12/9/2006	5.05	330
12/10/2006	4.99	323
12/11/2006	5.00	326
12/12/2006	5.02	340
12/13/2006	5.02	337
12/14/2006	4.98	314
12/15/2006	4.95	295
12/16/2006	4.92	280
12/17/2006	4.88	262
12/18/2006	4.89	266
12/19/2006	4.87	256
12/20/2006	4.83	238
12/21/2006	4.81	230
12/22/2006	4.84	247
12/23/2006	5.12	393
12/24/2006	4.97	309
12/25/2006	4.98	317
12/26/2006	5.93	1030
12/27/2006	5.53	672
12/28/2006	5.38	561
12/29/2006	5.33	528
12/30/2006	5.27	483
12/31/2006	5.22	455

Notes: Provisional data provided by USGS and is subject to change
& - Value was computed from affected unit values

Site Location



Source: Wellsville South New York USGS 7.5 Minute Topographic Quadrangle, 1965, Photorevised 1978

Legend

- Approximate Site Boundary
- Approximate Area of River Channelization

2,000 1,000 0 2,000 Feet

1 inch equals 2,000 feet

ON-SITE TECHNICAL SERVICES, INC.
72 Railroad Avenue Wellsville, NY 14895

FIGURE NO.	1
PROJECT	WELLSVILLE OU-1
DOCUMENT	2006 RIVER REPORT
FILE NO.	SITELOC.MXD

N:\ARCO_WLSV\OU1REPORTS\2006RIVERREPORTS\FIGURES\SITELOC.MXD

EAST & WEST DIKE STATION AND SURVEY CROSS-SECTION LOCATIONS

1999 Aerial Photograph

Legend

△ Approximate Location of Dike Station

——— Dike Survey Cross-Section Location

300 150 0 300

Feet

1 inch equals 300 feet

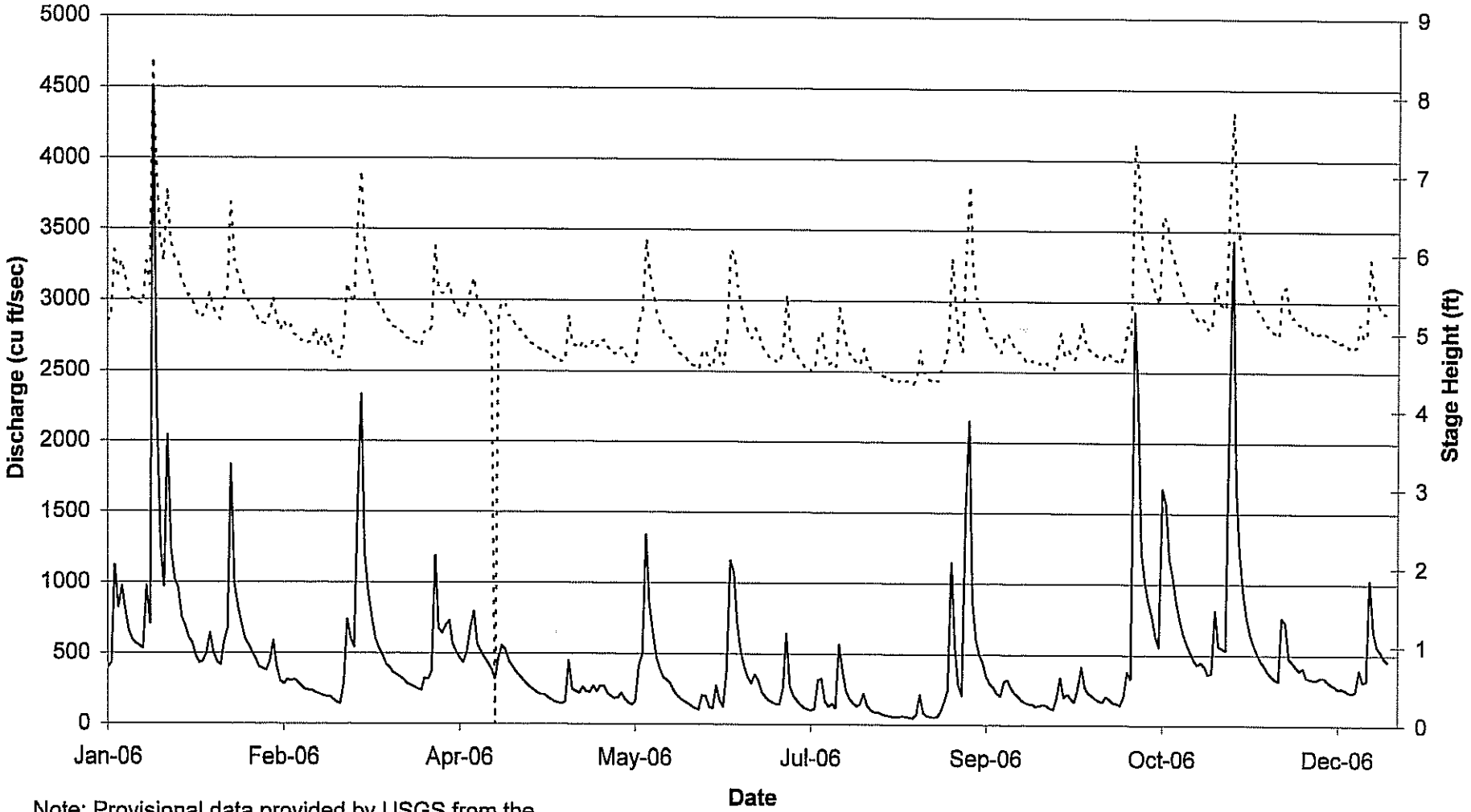
ON-SITE TECHNICAL SERVICES, INC.

72 Railroad Avenue Wellsville, NY 14895

FIGURE NO.	2
PROJECT	WELLSVILLE OU-1
DOCUMENT	2006 RIVER REPORT
FILE NO.	DIKE.MXD

N:\ARCO_WI\SVOU1\REPORTS\2006RIVERREPORTS\FIGURES\DIKE.MXD

Figure 3
Genesee River Daily Average Discharge and Stage
Wellsville, New York



Note: Provisional data provided by USGS from the Wellsville, New York gauge station and is subject to revision

-----Original Message-----
From: Negrelli.Mike@epamail.epa.gov
[mailto:Negrelli.Mike@epamail.epa.gov]
Sent: Monday, June 27, 2005 4:08 PM
To: Hufford, Walter
Cc: mfmoore@gw.dec.state.ny.us
Subject: OU1 Monitoring

Walt-
After discussion with Maurice, we agree to ARCO's proposal to suspend SVOC analysis from the CELA monitoring program as they have been non-detect since 1998. However, EPA reserves the right to have SVOC analysis resume should conditions at the CELA change at some point in the future that would lead us to believe the analysis should be resumed. Further, I believe we have previously agreed to your request to changing the soil pH analysis from annually to every three years, both in the CELA monitoring program and partial river channelization monitoring program. Please inform Jerry Palmer and Jon Brandis at On-Site Health and Safety of this determination.

If you have any questions on this matter, please do not hesitate to contact me.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

NOV 0 8 2002

BY FEDEX

Terry Moore
Environmental Manager
BP/ARCO Environmental Remediation, L.L.C.
1701 Summit Avenue, Suite 2
Plano, TX 75074

Re: Sinclair Refinery Site, Wellsville, New York

Dear Mr. Moore:

This letter is in response to the Atlantic Richfield Company's ("ARCO's") letter to the U.S. Environmental Protection Agency ("EPA"), dated April 24, 2002, regarding proposed modifications to certain Operation and Maintenance (O&M) requirements for the first operable unit (OU1) at the Sinclair Refinery site in Wellsville, New York. Specifically, ARCO's letter requests modifications to the frequency of elevation surveys of the river channel and banks associated with OU1 and discontinuation of analyzing dissolved metals in the annual ground water sampling (total metals will continue to be analyzed).

ARCO notes that the O&M Manual for OU1 states that the frequency of surveying of cross sections of the dikes will depend on significant changes in surveying data (the elevation surveys of the river bed have no corresponding mention of changing the frequency based on observations). Surveys performed by ARCO annually for the past ten years have indicated no significant changes in survey data for either the dike cross sections or river bed. Accordingly, EPA approves modifying the survey frequency from annually to every five years. As ARCO notes in its letter, annual inspections and periodic patrols following high water events shall continue.

ARCO also requests a discontinuation of the analysis for dissolved metals in the annual ground water sampling. This request is based on recent sampling events showing metals to be below MCLs and a good correlation between dissolved and total metals concentrations (ARCO will continue to perform total metals analysis annually). Therefore, EPA approves of ARCO's proposal to discontinue dissolved metals analysis in the annual ground water sampling at OU1. However, at the request of the New York State Department of Environmental Conservation (NYSDEC), this approval shall be effective starting with the 2003 annual sampling event in order to allow the NYSDEC to collect split samples during the 2002 sampling event. Please contact Maurice Moore at the NYSDEC regional office (716-851-7220) at least two weeks prior to the sampling event in order to make arrangements.

If you have any questions on this matter, please contact me at (212) 637-4278 or by email at negrelli.mike@epa.gov.

Sincerely yours,

Michael J.Negrelli
Remedial Project Manager
New York Remediation Branch

cc: Wayne Mizerak - NYSDEC
Maurice Moore - NYSDEC/R.9

SINCLAIR REFINERY SITE
PARTIAL RIVER CHANNELIZATION
GENESEE RIVER
WELLSVILLE, NEW YORK

APPENDIX A

INSPECTION CHECKLIST

Inspection By: Kevin Dye / Scott Watson Sheet 1 of 2

Title: Field Tech Date: 11-30-06

Verified By: _____

Title: _____ Date: _____

Type of Inspection (check only one):

(✓) Annual during low flow.
( ) Immediately after a high water period.
( ) Other (explain)

Dike Station 0+00 to 18+50 (East/West) _____

Item Description	Condition*/Remarks
1. Settlement, sloughing or, loss of grade.	✓
2. Caving (either side of dike)	
3. Seepage, saturated areas, or sand boils.	✓
4. Riprap slope protection- evidence of displacement or unusual settlement, woody growth in riprap.	✓
5. Access roads	✓
6. Unauthorized traffic	✓

* Indicate satisfactory condition with a check; briefly describe conditions other than satisfactory; use additional sheets if more space is needed.

Observations and recommendations:

SINCLAIR REFINERY SITE
PARTIAL RIVER CHANNELIZATION
GENESEE RIVER
WELLSVILLE, NEW YORK

APPENDIX A

INSPECTION CHECKLIST

Inspection By: Kevin Dye / Scott Watson Sheet 2 of 2

Title: Field Tech Date: 11-30-06

Verified By: _____

Title: _____ Date: _____

Type of Inspection (check only one):

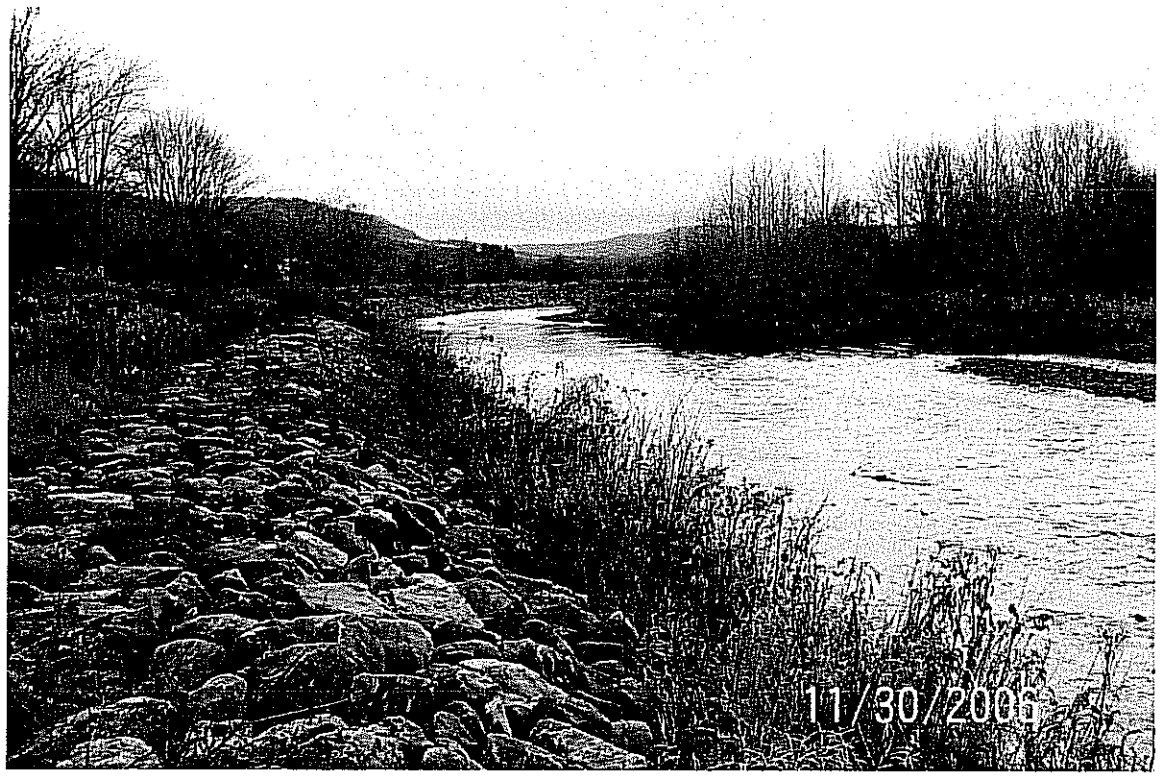
(✓) Annual during low flow.
( ) Immediately after a high water period.
( ) Other (explain)

Dike Station 0+00 to 18+50 (East/West) _____

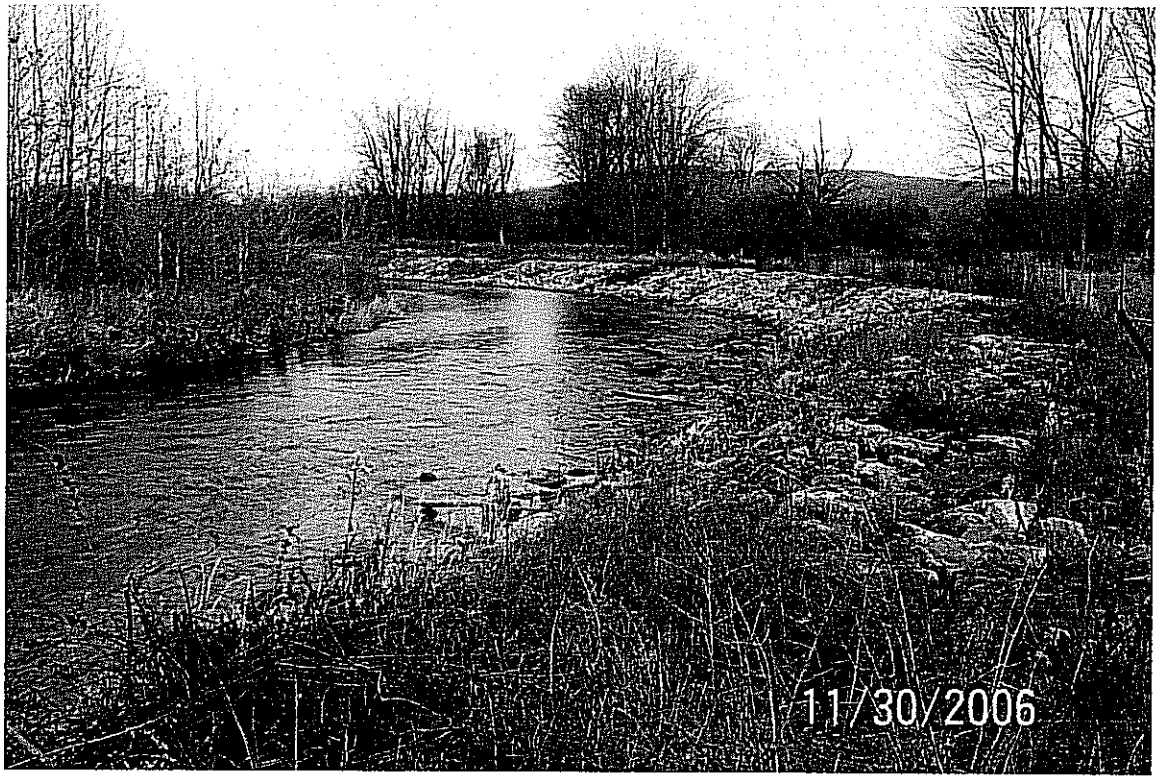
Item Description	Condition*/Remarks
7. Accumulation of drift, trash, and debris.	✓
8. Vegetative cover including soil pH check	✓
9. Weeds or undesirable vegetation.	✓
10. Unauthorized excavation, loose backfill or sod removal.	✓
11. Burrowing animals.	✓
12. Evidence of fires/vandalism	✓
13. Routine mowing	✓
14. Shoaling check (photograph)	✓

* Indicate satisfactory condition with a check; briefly describe conditions other than satisfactory; use additional sheets if more space is needed.

Observations and recommendations:



11/30/2006 East Dike Station 10+00 view to the South



11/30/2006 East Dike Station 17+00 view to the North

SINCLAIR REFINERY SITE
PARTIAL RIVER CHANNELIZATION
GENESEE RIVER
WELLSVILLE, NEW YORK

APPENDIX A

INSPECTION CHECKLIST

Inspection By: Kevin Dye / Scott Watson Sheet 1 of 2

Title: Field Tech Date: 11-30-06

Verified By: _____

Title: _____ Date: _____

Type of Inspection (check only one):

(✓) Annual during low flow.
( ) Immediately after a high water period.
( ) Other (explain)

Dike Station -2+40 to 26+00 (East/West) _____

Item	Description	Condition*/Remarks
1.	Settlement, sloughing or, loss of grade.	✓
2.	Caving (either side of dike)	✓
3.	Seepage, saturated areas, or sand boils.	✓
4.	Riprap slope protection- evidence of displacement or unusual settlement, woody growth in riprap.	✓
5.	Access roads	✓
6.	Unauthorized traffic	✓

* Indicate satisfactory condition with a check; briefly describe conditions other than satisfactory; use additional sheets if more space is needed.

Observations and recommendations:

SINCLAIR REFINERY SITE
PARTIAL RIVER CHANNELIZATION
GENESEE RIVER
WELLSVILLE, NEW YORK

APPENDIX A

INSPECTION CHECKLIST

Inspection By: Kevin Dye / Scott Watson Sheet 2 of 2

Title: Field Tech Date: 11-30-06

Verified By: _____

Title: _____ Date: _____

Type of Inspection (check only one):

(X) Annual during low flow.
( ) Immediately after a high water period.
( ) Other (explain)

Dike Station -2+40 to 26+00 (East (West) _____

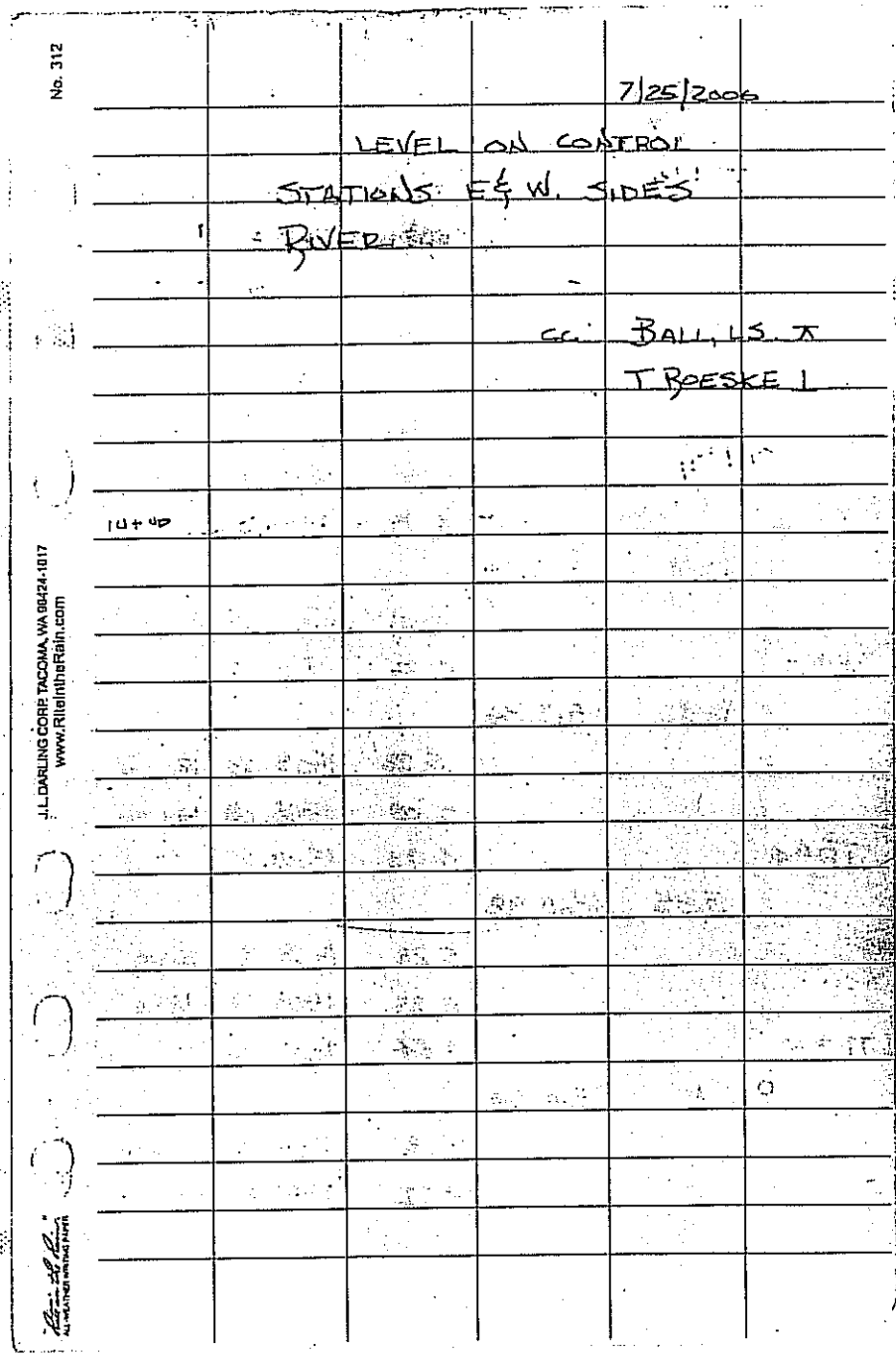
Item Description	Condition*/Remarks
7. Accumulation of drift, trash, and debris.	✓
8. Vegetative cover including soil pH check	✓
9. Weeds or undesirable vegetation.	✓
10. Unauthorized excavation, loose backfill or sod removal.	✓
11. Burrowing animals.	✓
12. Evidence of fires/vandalism	✓
13. Routine mowing	✓
14. Shoaling check (photograph)	✓

* Indicate satisfactory condition with a check; briefly describe conditions other than satisfactory; use additional sheets if more space is needed.

Observations and recommendations:

11/30/2006 West Dike Station 6+00 view to the South

11/30/2006 West dike station 24+00 view to the North


No. 312
7/25/2006
LEVEL ON CONTROL
STATIONS E & W. SIDES
RIVER
cc: BALL, L.S. T
T BOESKE L
J.L. DARLING CORP. TACOMA, WA 98424-1017
www.RiteInTheRain.com

③

EAST SIDE

TP#	BS	HT	F.S.	ELEV	REMARK
	5.35	1501.70			
			5.29	1496.41 ~~1506.99~~	#19
			5.58	1496.12	#20
TP#3			5.33	1496.37	—
	6.20	1502.57			
			5.64	1496.93	#16
			3.47	1499.10	#21
TP#4			3.05	1499.52	—
	5.95	1505.47			
			6.13	1499.34	#22
			5.78	1499.69	#23
TP#5			6.28	1499.19	—
	5.90	1505.09			
			5.93	1499.16	#24
			5.50	1499.59	#25
TP#6			5.21	1499.88	—
	5.65	1505.53			
			6.18	1499.35	#22
TP#7			6.37	1499.16	—
	2.54	1501.70			
			4.78	1496.92	#16
TP#8			5.34	1496.36	—
	5.83	1507.19			
			5.84	1496.35	#18
			2.42	1499.77	#17

7/31/2006

CROSS-SECTIONS

E & W SIDES GENESEE RIVER

SINCL. SITE, WLSV. N.Y.

STA: 0+00 ℄ - ELEV= 1505.88 ⊼ HI = 5.25' (200.21)

LEFT /		
WATERS EDGE 38.3' 39.5' ⊗ (1489.67)	6.4' ⊗	
* -16.21	+0.12'	
* 1489.67	1506.00	

STA: 0+00 ℄

RIGHT		
4.4' ⊗	31.3' ⊗	40' ⊗
* -0.01	-13.16	-14.76
* 1505.87	1492.72	1491.12

STA: 2+00 ℄ - ELEV= 1506.82 ⊼ HI = 5.36 (199.19)

46.7' ⊗	7.3' ⊗
-15.22	-0.17
1491.60	1506.65

STA: 2+00 ℄

9.5' ⊗	18' ⊗	30.8' ⊗
* -0.68	-4.25	-5.26
* 1506.14	1502.57	1501.56

STA: 4+00 ℄ - ELEV = 1506.96 ⊼ HI = 5.27 (199.02)

HIGH WATER 74.1' ⊗	59.9' ⊗	31.6' ⊗	6.9' ⊗	47.39' ⊗
-11.33	-9.56	-8.26	-0.12	-8.58
* 1495.63	1497.40	1498.7	1506.84	1498.38

STA: 4+00 ℄

FEN 5.0' ⊗	5.8' ⊗	18.0' ⊗
* +0.06	-0.05	-5.43
* 1507.02	1506.91	1501.53

STA: 6+00 ℄ - ELEV = 1506.96 ⊼ HI = 5.27

68.4' ⊗	47.5' ⊗	31.3' ⊗	8.0' ⊗
* -9.81	-8.38	-8.62	-0.20
* 1497.15	1498.58	1498.34	1506.76

STA: 6+00 ℄

5.4' ⊗	16.2' ⊗	25.4' ⊗ (1499.69)
* -0.04	-6.19	-7.27
* 1506.92	1500.77	1499.69

STA: 8+00 ℄ - ELEV. = 1507.06 ⊼ HI = 5.25

55.0 ⊗	49.0' ⊗	46.0' ⊗	28.8 ⊗	7.5' ⊗
-7.73	-7.60	-7.82	-7.38	-0.22
1499.33	1499.46	1499.24	1499.68	1506.84

STA: 8+00 ℄

6.4' ⊗	7.3' ⊗	14.0' ⊗	15.5' ⊗	22.3' ⊗
* +0.13	-0.02	-4.70	-5.06	-6.13
* 1507.19	1507.04	1502.36	1502.00	1500.93

LEFT

STA: 10+00 ℄ - ELEV. = 1507.16 ℸ HI. = 5.33

64.5' ⊗	57.5' ⊗	46.5' ⊗	38.8' ⊗	7.2' ⊗
-9.95	-10.95	-11.24	-11.89	-0.42
1497.21	1496.21	1495.92	1495.27	1506.74

STA: 12+00 ℄ - ELEV. = 1508.08 ℸ HI. = 5.38 (5.81)

84.0' ⊗ WATER-EDGE	75.8' ⊗	74.0' ⊗	62.3' ⊗ WATER-EDGE	44.2' ⊗	8.0' ⊗
-6.51	Hz₀	Hz₀	-15.73	-14.00	-0.47
1491.57			1492.35	1494.08	1507.61

STA: 14+00 ℄ - ELEV. = 1508.78 ℸ HI. = 5.29

70.0' ⊗	60.3' ⊗	53.4' ⊗	41.6' ⊗	7.0' ⊗
-13.14	-12.87	-13.18	-13.29	+0.11
1495.64	1495.41	1495.10	1494.99	1508.39

STA: 16+00 ℄ - ELEV. = 1508.75 ℸ HI. = 5.18

76.0' ⊗	58.0' ⊗	41.2' ⊗	6.6' ⊗	
-11.20	-11.50	-11.24	+0.48	
1497.55	1497.25	1497.51	1509.23	
		e/z	∝	

STA: 18+00 ℄ - ELEV. = 1508.73 ℸ HI. = 5.49

52.37 HIGH WATER	43.0' ⊗	27.0' ⊗	20.7' ⊗	6.3' ⊗
-13.52	-10.99	-6.42	-5.75	+0.68
1495.21	1497.74	1502.31	1503.48	1509.41

RIGHT

STA: 10+00 ℄

5.0' ⊗	6.3' ⊗	13.3' ⊗	14.7' ⊗	22.0' ⊗
+0.15	+0.20	-4.26	-4.87	-5.53
1507.31	1506.96	1502.90	1502.29	1501.63

STA: 12+00 ℄

6.0' ⊗	13.4' ⊗	15.5' ⊗	23.2' ⊗
-0.08	-3.75	-4.19	-4.80
1508.00	1504.33	1503.89	1503.28

STA: 14+00 ℄

6.3' ⊗	12.5' ⊗	17.0' ⊗	21.2' ⊗
-0.09	-3.41	-4.13	-4.04
1508.37	1504.87	1504.15	1504.24

STA: 16+00 ℄

8.0' ⊗	8.3' ⊗	14.0' ⊗	19.2' ⊗	23.5' ⊗
+0.07	+0.03	-2.68	-3.28	-3.34
1508.77	1508.78	1506.07	1505.47	1505.41

STA: 18+00 ℄

7.5' ⊗	14.5' ⊗	17.4' ⊗	21.5' ⊗
+0.10	-2.95	-3.34	-3.44
1508.83	1505.78	1505.39	1505.29

LEFT

STA: 20+00 ℄ - ELEV. = 1509.24 ℄ HI. = 5.30'

HIGH WAT 52.00'				
56.0' ⊗	42.8' ⊗	19.6' ⊗	5.8' ⊗	
+ -13.70	- 12.07	- 4.65	+ 0.30	
= 1495.54	1497.17	1504.59	1509.54	

STA: 22+00 ℄ - ELEV. = 1509.87 ℄ HI = 5.23'

HIGH WATER 68.64'				
49.0' ⊗	40.6' ⊗	19.8' ⊗	6.3' ⊗	
-14.59 + -11.52	-11.06	- 4.81	+ 0.10	
1495.28 = 1498.30	1498.76	1505.01	1509.92	

CROSS SECTIONS - WEST SIDE

RIGHT

STA: 20+00 ℄

7.6' ⊗	9.0' ⊗	16.4' ⊗	19.4' ⊗	23.8' ⊗
-0.07 +	- 0.16	- 4.04	- 4.40	- 4.65
1509.17 =	1509.08	1505.20	1504.84	1504.59

STA: 22+00 ℄

7.3' ⊗	16.6' ⊗	17.7' ⊗	19.2' ⊗
- 0.22 +	+ 5.19	- 5.30	- 5.05
1509.60 =	1504.63	1504.52	1504.77

④

CROSS SECTIONS: EAST SIDE

LEFT

#17
STA: 0+00, SET ℄ PIN 35'⊗ - ELEV = 1499.78 #18
℄ HI = BS. 124°45'17" PIN ⊗ 2+00

CROSS LINE AZ: 233°05'41"

55.0'⊗	35.0⊗	30.4⊗	19.5'⊗	1.0'⊗	0'⊗
-0.39		+0.47	+0.32	-7.60	-7.97
1499.39	1499.78	1500.25	1500.10	1492.18	1491.86

#18
STA: 2+00, SET ℄ PIN 35'⊗ - ELEV. = 1496.35 #19
℄ HI = 5.34 BS. 102°00'10" PIN ℄ ⊗ 4+00

CROSS LINE AZ: 190°47'38"

55'⊗	35.0⊗	26.2'⊗	14.5⊗	5.6'⊗	0'⊗
+0.21		-0.11	+0.08	-3.43	-7.17
1496.56	1496.35	1496.24	1496.43	1492.92	1489.18

#19
STA: 4+00, SET ℄ PIN 35'⊗ - ELEV = 1496.41 #20
℄ HI = 5.14 BS. 101°48'26" PIN ℄ ⊗ 6+00

CROSS LINE AZ: 191°35'07"

55'⊗	35.0⊗	26.6'⊗	14.0⊗	6.5'⊗	0'⊗
+0.14		-0.42	-0.81	-3.48	-6.56
1496.55	1496.41	1495.99	1495.60	1492.93	1489.85

#20
STA: 6+00, SET ℄ PIN 35'⊗ - ELEV. = 1496.12 #16
℄ HI = 5.21 BS 14°50'24" PIN ℄ ⊗ 8+00

CROSS LINE AZ: 192°27'32"

55.0'⊗	35.0⊗	22.6'⊗	13.7'⊗	4.7'⊗	0'⊗
+0.27	1496.12	-0.20	-0.09	-3.49	-5.66
1496.39		1495.92	1496.03	1492.63	1490.46

⑥

CROSS SECTIONS EAST SIDE

LEFT

#16
STA: 8+00, SET ℄ PIN 35'⊗ - ELEV = 1496.93 #21
℄ HI = 5.33 BS. 132°41'26" PIN ℄ ⊗ 10+00

CROSS LINE AZ: 220°51'26"

55'⊗	35.0⊗	18.7'⊗	10.3'⊗	2.5⊗	0⊗
+0.43		-0.10	-0.64	-3.70	-5.35
1497.36	1496.93	1496.83	1496.29	1493.23	1491.58

#21
STA: 10+00, SET ℄ PIN 29'⊗ - ELEV = 1499.10 #22
℄ HI = 5.11 BS. 130°59'02" PIN ℄ ⊗ 12+00

CROSS LINE AZ: 217°20'03"

55.0'⊗	32.0⊗	29.0⊗	27.6'⊗	18.4'⊗	5.2'⊗
+0.01	-0.60		-0.15	-0.16	-5.81
1499.11	1498.50	1499.10	1498.95	1498.94	1493.29

#22
STA: 12+00, SET ℄ PIN 29'⊗ - ELEV = 1499.34 #23
℄ HI = 5.10 BS 132°58'31" PIN ℄ ⊗ 14+00

CROSS LINE AZ: 220°34'37"

55'⊗	35.0⊗	27.7'⊗	17.7'⊗	4.5'⊗	
+0.94	-0.10	-0.05	-0.10	-5.05	
1500.28	1499.24	1499.29	1499.24	1494.29	

#23
STA: 14+00, SET ℄ PIN 28'⊗ - ELEV = 1499.69 #24
℄ HI = 4.90 BS 161°04'08" PIN ℄ ⊗ 16+00

CROSS LINE AZ: 230°35'32"

55'⊗	35'⊗	28.0'	25.5⊗	15.0⊗	3.8'⊗
-0.08	-0.36		-0.58	-0.45	-4.94
1499.61	1499.33	1499.69	1499.11	1499.24	1494.75

CROSS SECTIONS: EAST SIDE

LEFT

STA: 16+00 (#24), SET C PIN 28' ⊗ - ELEV = 1499.16

HI = 5.19 BS 192°37'23" PINE ⊗ 18+00 (#25)

CROSS LINE AZ: 268°10'14"

55' ⊗	35' ⊗	28.0' ⊗	26.4' ⊗	14.7' ⊗	5.2' ⊗
+ 0.13	-0.18		+0.20	-0.33	-4.82
1499.29	1498.98	1499.16	1499.36	1498.86	1494.34

STA: 18+00 (#25), SET C PIN 25' ⊗ - ELEV = 1499.59

HI = 5.20 BS 12°37'23" PINE ⊗ 16+00 (#24)

CROSS LINE AZ: 299°08'19"

55' ⊗	35. ⊗	25' ⊗	23.4'	13.9' ⊗	5.7' ⊗
+0.52	+0.10	1499.59	+0.10	-0.45	-4.46
1500.11	1499.69		1499.69	1499.14	1495.13

ON-SITE TECHNICAL SERVICES, INC
72 Railroad Avenue
Wellsville, New York 14895
Phone: (585) 593-1824
Fax: (585) 593-7471

March 30, 2007

Mr. Joseph Sontchi, CPG
Atlantic Richfield Company
28100 Torch Parkway, MC 2S
Warrenville, IL 60555-6955

Re: 2006 River Dike Survey, Partial River Channelization Project, Former Sinclair Refinery Site OU1, Wellsville, New York

Dear Joe:

The purpose of this letter is to transmit the attached 2006 Wellsville OU1 Genesee River Dike cross-section survey drawings and provide a review of the survey. The attached drawing presents the results of the 2006 survey as well as the 2001 survey (most recent previous survey).

The field survey was completed by James Ball Land Surveyor on July 31, 2006. The survey consists of ground surface elevation measurement along dike transect lines approximately perpendicular to the river. The transects are spaced along both the East and West dikes every 200 ft as follows: (i) East dike stations 0+00 to 18+00; and (ii) West dike stations 0+00 to 22+00. Please see attached figure for dike stations and survey cross-section locations.

The July 2006 survey was the first survey completed on a five year frequency. Prior surveys were completed annually from 1992 through 2001. The increased time between the 2006 survey and the previous survey made field point location more difficult and in some cases may have resulted in a slight location shift from previous surveys. This should be kept in mind when comparing the 2006 survey results to previous results.

On-Site has reviewed the cross-section drawings and on March 27 and 29, 2007 conducted field observations and photographs (attached) of several cross-section locations that show 2001 to 2006 elevation differences of approximately 0.5 ft or more. The following dike stations were observed: (i) East dike 0+00; (ii) East dike 6+00; (iii) West dike 12+00; (iv) West dike 14+00; (v) West dike 16+00; (vi) West dike 18+00; and (vii) West dike 20+00. Elevation changes from 2001 to 2006 and observations for these locations are discussed below.

East Dike 0+00

The riprap toe (intersection of base of dike and river bed) at this location exhibited an elevation decrease of 0.78 ft. An approximately 15 ft long depression along the toe of the dike can be observed as compared to the surrounding dike. There is no observation of recent erosion or scouring.

East Dike 6+00

The grass area above the riprap at the top of the dike shows a 0.47 ft elevation decrease. The top of the dike in this area appears slightly lower elevation than the surrounding area with evidence of recent ponding water. No signs of scouring or erosion were observed.

West Dike 12+00

This station shows an approximate elevation decrease of 1 ft at the toe of the dike. This area includes a small pond within the river channel immediately adjacent to the riprap dike toe. A soil exposed, near vertical slope, and displaced riprap are visible at this area. Based on the survey results and observations, some scouring of the dike toe may have occurred between 2001 and 2006.

West Dike 14+00

The near horizontal riprap area near the bottom of the dike at this station exhibited a 0.51 ft elevation increase. This increase may be attributed to the observed accumulation of woody debris.

West Dike 16+00

The toe of the dike at this station shows a decrease in elevation of 0.68 ft. The bottom of the dike at this location is near horizontal and typically has woody debris accumulated. No visible signs of erosion or scouring were observed. The decrease in elevation may be attributed to difference in survey location or the amount of debris present when surveyed.

West Dike 18+00

The dike toe at this station shows an approximate elevation decrease of 0.5 ft. No visible signs of erosion or scouring were observed. This elevation change may be due to a slight difference of survey location and or a shift in riprap. It should be noted that this portion of the dike was established prior to the partial river channelization project.

West Dike 20+00

This station exhibits an elevation decrease of 0.59 ft along the CELA side of the dike. A small depression in the dike slope was observed at this station. No evidence of erosion was observed.

Conclusion

Based on the survey data and observations made on March 27 and 29, 2007, the partial river channelization project appears in generally good condition. No major signs of erosion were observed. The toe area at and around West dike station 12+00 does show signs of minor scouring with minor riprap displacement. On-Site suggests a civil engineer with waterway proficiency, inspect the dikes and provide recommendations.

Sincerely,

Jonathan Brandes, P.G.

Scott Watson

Attachments