Report on 2004 Field Season

Monitoring the Effectiveness and Validating Response to the Road Related Mitigation Practices Implemented on the Pike's Peak Highway

Second Year

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Executive Summary

Monitoring the Effectiveness and Validating Response to the Road Related Mitigation Practices Implemented on the Pike's Peak Highway

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This report describes the second year's monitoring effort to determine effectiveness and validate response to road related mitigation practices implemented on the Pike's Peak highway as part of the Settlement Agreement between the Sierra Club and the United States Department of Agriculture – Forest Service in <u>Sierra Club v. Venneman</u>, Civil Action No. 98-M-662 (D. Colo.). The effectiveness-monitoring plan has been designed to determine how well the mitigation practices implemented contribute to meeting their objectives and focuses on the 14 mile-long, 300 foot-wide highway corridor (150 feet each side of highway centerline) starting at mile marker 7 and continuing to the summit. Validation monitoring documents how the properly implemented intervention practices affect the riparian, wetland and aquatic system of catchments within the influence of the Pike's Peak highway.

The objectives for the second year of monitoring were to re-measure the various features surveyed the first year and to continue to locate, identify, and establish baseline surveys for sites not surveyed in 2003. Precipitation measurements at the two lower elevation gauges indicated 2004 was a wetter year than 2003 (both in storm intensity and total volume) and, when compared to the Oregon State Climate Map mean monthly estimates, that 2004 was wetter than average. However, the high elevation gauge collected one inch less seasonal precipitation than in 2003 and total monthly rainfall (except for July) was less than both the average monthly precipitation estimates and the 2003 monthly values.

Thirteen cut slope and 29 fill slopes sites were monitored in 2004. Of the ~~three~~ treated cut slope sites, only one accumulated sediment while four of the ~~ten~~ untreated sites captured sediment. All five cut slope sites that accumulated sediment did so in both upper and lower silt fences. Of the 13 treated fill slope sites, two accumulated sediment (upper fence, only) while nine of the sixteen untreated sites accumulated sediment in the upper fence with two sites having sediment in the lower fence, as well. Two fill slope sites in Basin 1 that accumulated sediment in 2003 experienced no accumulation in 2004 after curbs were installed (September 2003) to prevent storm runoff from inundating the slopes.

Re-surveys of the eleven road cross section sites surveyed in 2003 showed both increases and decreases in road surface elevations of the cross sections. The average length-weighted volumetric change for Class 1 sites (slope < 0.1) was -0.018 $yard^3/ft$ and the average change for Class 2 sites (slope > 0.1) was -0.005 $yard^3/ft$. The negative values indicate an average "loss" of road surface material from 2003 to 2004 but because road maintenance practices periodically grade the surface, moving material into and out of these road reaches, road surface elevations can change without adding "new" material to the road, or losing it down the drainage system.

This year, four treated drainage ditch sites in Basin 2 were added to the sixteen drainage ditch sites surveyed in 2003. The only two treated ditches (in Basin 1) experienced far less change in cross sectional area than did the fourteen untreated ditches. However, the same road maintenance issues influencing road cross section elevations also apply to the untreated drainage ditch sites so direct comparison of variability between treated and untreated ditches is not a true measure of treatment effectiveness. In time, as more treated ditches are constructed, quantification of treatment effectiveness should improve.

In two years, 79 of the 97 identified conveyance channels have been surveyed. Average channel erosion within the 150 foot road easement is 1.0 $yard^3$/ft of channel. The balance of the conveyance channels will be surveyed in 2005 and then, except for channels below velocity dissipators, they will not be surveyed until the end of the monitoring term.

Seventeen rock weirs and one sediment pond were monitored in 2004 to determine their effectiveness in trapping sediment. Six of the silt fences below rock weirs (all in Basin 2) captured material that either passed through or under the weirs, indicating that these weirs are ~~completely~~ ^ effective at trapping sediment. This was the first operational year for the large sediment pond in Basin 2 that drains 1.3 miles of the highway. Five cross sections were installed in the pond to monitor volumetric change over time and three suspended sediment samples were taken above and below the pond during storm events to measure trap efficiency. The first sample yielded a 96% reduction in suspended sediment at the pond outlet but the last two samples recorded increases. Pond maintenance in response to intense storm events prompted three cross section surveys in 2004.

Conveyance channel surveys below four of the five rock apron velocity dissipators were installed to measure the effectiveness of the dissipators in reducing erosion. In Basin 1, summer storm intensity prompted the reconstruction of one structure that was initially undersized and an ineffective velocity dissipator. Monitoring these channels will continue on a regular basis to evaluate the effectiveness of the structures.

Stream channel dimension, particle size distribution of bed material and bars, and riparian vegetation components were re-measured at each of the 17 validation sites surveyed in 2003. Though dramatic changes were measured at some sites (in particular, Severy Creek 2 cross sections), as a group, highway impacted sites did not experience significantly more change than non-impacted sites, relatively speaking. The only parameter measured where a significant difference was detected between highway impacted and non-impacted streams (at the 0.05 level) was the D15 particle size from the pebble counts made of the bed material. In general, the data indicate that, as a group, the highway impacted sites became finer and the non-impacted sites became coarser.

Included with this report are three data DVD’s containing all survey data (field and post processing) plus digital photographs (recommended viewing) for all sites.

Acknowledgements

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Introduction

This report describes the second year's monitoring effort to determine effectiveness of road restoration practices and to validate response to road related mitigation practices implemented on the Pike's Peak highway as part of the Settlement Agreement between the Sierra Club and the United States Department of Agriculture – Forest Service in Sierra Club v. Venneman, Civil Action No. 98-M-662 (D. Colo.). The five major objectives of the road mitigation work are to:

- Stabilize road surface materials, cut slopes and fill slopes
- Reduce runoff velocities and dissipate erosive energy
- Collect runoff in armored ditches and conveyance channels
- Reduce erosion and sediment deposition in drainage channels
- Retain sediment in traps and ponds to reduce downstream sedimentation.

The effectiveness-monitoring plan was designed to determine how well the implemented mitigation practices contribute to meeting these objectives and focuses on the 14 mile-long, 300 foot-wide highway corridor (150 feet each side of highway centerline) starting at mile marker seven and continuing to the summit. Validation monitoring documents how the properly implemented intervention practices affect the riparian, wetland and aquatic system of catchments within the influence of the Pike's Peak highway.

The objectives in the second year of monitoring were to re-measure sites established in 2003 and to continue to locate, identify, and establish baseline surveys for various features that were not installed in 2003 (e.g. cut and fill slope silt fences in Basin 2 and conveyance channels). The monitoring plan calls for replicating "like" conditions for each feature measured, whether they're treated or untreated, control or impacted. Comparisons made, over time, of the relative change observed within a particular treatment type or control, against the relative change observed between treatment types will allow for separation of natural (expected) change from change observed as a result of some disturbance or treatment. What follows in this report are a description of the monitoring effort in 2004 and the comparisons of findings from 2003.

Site Location and Identification

A proposed 15 year monitoring study not only requires the initial identification of suitable sites, but the ability to relocate them, as well. Location of each cut and fill slope, road cross section, conveyance channel and drainage ditch, rock weir and sediment trap, precipitation gauge, and stream site were identified as a waypoint using a handheld Garmin ETrex Vista Global Positioning unit (GPS) which recorded latitude, longitude, and altitude. Each waypoint was given a unique code to distinguish it in the field as well a as provide an easy identifier for post processing convenience. The naming convention used for the effectiveness monitoring was a 5 character alpha-numeric code starting with three digits followed by two letters (e.g. 001RW, 007FS, etc.) where the numbers are sequential and the letters signify feature type (CS = Cut Slope, RX = Road Cross Section, etc.). The validation monitoring sites use a similar five character naming convention except the first four letters identify the stream and the last digit signifies the reach (e.g. OILC1 = Oil Creek, Reach 1; SVRY2 = Severy Creek, Reach 2; etc.). Appendix A has complete listing of all the sites including Site ID, Latitude, Longitude, Altitude, and Feature Description. It should be noted that while GPS technology is very good, accuracy is still dependent upon the available satellite constellation at the specific time of need and these coordinates should get one reasonably close to the desired feature but not necessarily to within one foot of a control point.

Every site has at least three Temporary Bench Marks (TBM's) or control points for use as relative reference points in order to repeatedly complete spatially similar three dimensional surveys. These TBM's are comprised of three foot lengths of 0.5 inch rebar pounded into the ground and protective with plastic yellow caps. Aluminum nursery tags identify the TBM's. Sites close in proximity may share TBM's so that every site may not have three unique control points, but every site has at least three points with which to register the survey.

Data

Data loggers and digital cameras make it easy to collect large quantities of data in a relatively short amount of time. It is not the intent of this report to produce hardcopy reproductions of every piece of data or image collected to date. Instead, pertinent and/or interesting examples will be presented in the body of this report while all relevant figures, tables, and charts will be contained in an appendix. All the data is available on three DVD's so that interested parties might have access to it.

Data on the DVD's is organized in hierarchical directories by monitoring type (effective or validation), by site or feature type, and by photo or survey type. File types encountered in the survey data include MS Excel 2002, Trimble Geomatics Office (TGO) 1.61, AutoDesks AutoCad 2004, and text files. Precipitation data was collected with a HOBO data logger and converted to MS Excel 2002 files. The TGO software is based on MS Access 2000 with surveying applications built in so if you have MS Access (or MS Excel) you do not need TGO to be able to read the raw survey data files. All photos are formatted as .jpg files and can be read by most operating systems.

Photograph location is defined by the directory it is located in (e.g. 102CS_08122004 contains photos of cut slope ID number 102CS taken on August 12, 2004.). Please note that cross section photos in the validation monitoring section have a photo board in them identifying cross section and bank (e.g. AL on the photo board denotes Cross Section A, Left Bank; BR denotes Cross Section B, Right Bank; etc.).

Effectiveness Monitoring

The objective of effectiveness monitoring is to assess the effectiveness of the intervention techniques in meeting their intended purpose. By installing silt fences on cut and fill slopes, permanent cross sections on drainage ditches, conveyance channels, and road surfaces and establishing baseline surveys of sediment traps, we hope to document , over time, the direct effects of the various mitigation practices implemented to stabilize those features.

Precipitation Gauges

Three Onset tipping bucket rain gauges with HOBO event data loggers were installed at approximate elevations of 10,000, 11,500, and 13,000 feet a.s.l. to index precipitation over the elevational range of the highway. Each gauge was mounted on top of a pressure treated six foot 4"x 4" post buried two feet into the ground. Hose clamps and silicone caulk were used to secure the gauges to the post, plumb and level. Rain gauge 075RG was located just uphill from the Halfway Picnic point near mile marker ten which is at the upper end of Priority Basin 2, in the subalpine zone. Rain gauge 076RG was located near the Severy Creek trailhead at the transition between the subalpine and the alpine zones. Rain gauge 077RG is located near the Devil's Playground well into the alpine. Table 1 contains the specific coordinates and precipitation totals for each gauge.

Table 1. Location, precipitation accumulation, and dates of operation for 3 rain gauges.

Gauge ID	Latitude (hddd°mm.mmm)	Longitude (hddd°mm.mmm)	Altitude (ft)	Total (in)	Dates of Operation - 2004
075RG	N38 53.797	W105 03.890	10,109	16.73	5/04 – 9/28
076RG	N38 52.582	W105 03.970	11,810	17.76	5/11 – 9/28
077RG	N38 51.783	W105 03.999	13,069	11.58	5/11 – 9/28

The data loggers record a date-time stamp for each tip of the rain gauge bucket (1 tip = 0.01 inches) from which volume, duration, and intensity (or rate) of each storm event can be determined. For our purposes, a storm event is defined as a series of tips where the time interval between successive tips is less than or equal to 60 minutes. A comparison of the monthly recorded precipitation volume for all three rain gauges for 2003 and 2004, as well as estimated long-term mean monthly precipitation derived from the Oregon State Climate map (Figure 1) shows that 2003 was much drier than 2004 and that 2004 was wetter than average for the lower two gauges (particularly in the months June through August) but drier than average for 077RG. Figure 2 displays maximum 30 and 60 minute intensity and total storm volume for all events recorded in 2004. It is interesting that the greatest number of high intensity storms occurred at the lowest elevation gauge and that the highest elevation gauge had only one storm where maximum 30 minute intensity was greater than 0.5 inches. The two storms with the greatest 30 minute intensity were measured at gauge 075RG and occurred within 24 hours of each other on July 15 and 16 (0.90 and 0.82 inches, respectively). Appendix B contains a complete listing of storm event tabulations for each rain gauge in 2004. Appendix B also contains the 30 and 60 minute intensity and total storm volume graphs for all three gauges in 2003 in order to compare the relative magnitude, intensity and frequency of storms measured at the three gauges between years.

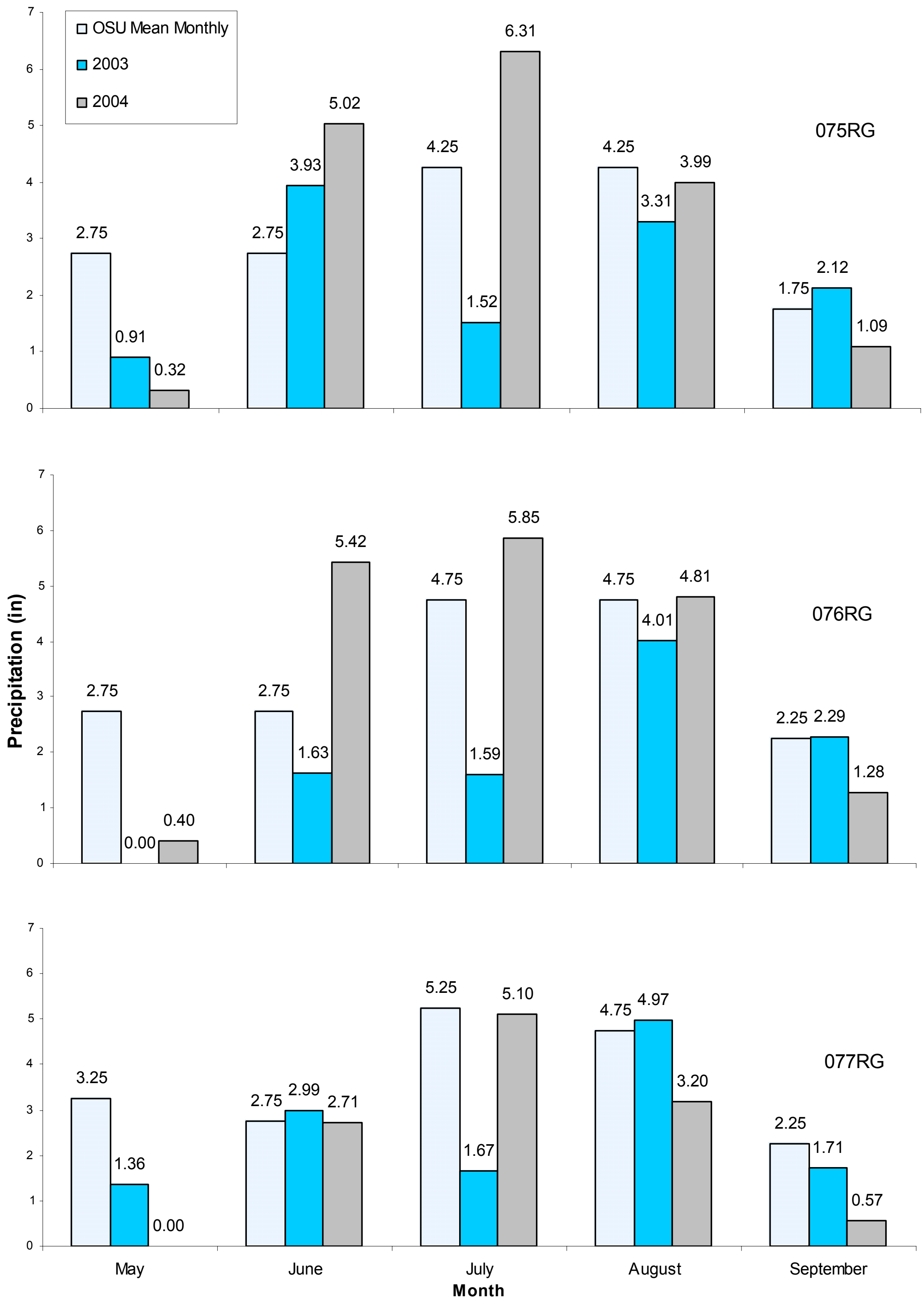

Figure 1. Comparison of monthly precipitation for 2003, 2004 and the long term mean as predicted by Oregon State Climate model for the 3 the rain gauges on the Pike's Peak Highway.

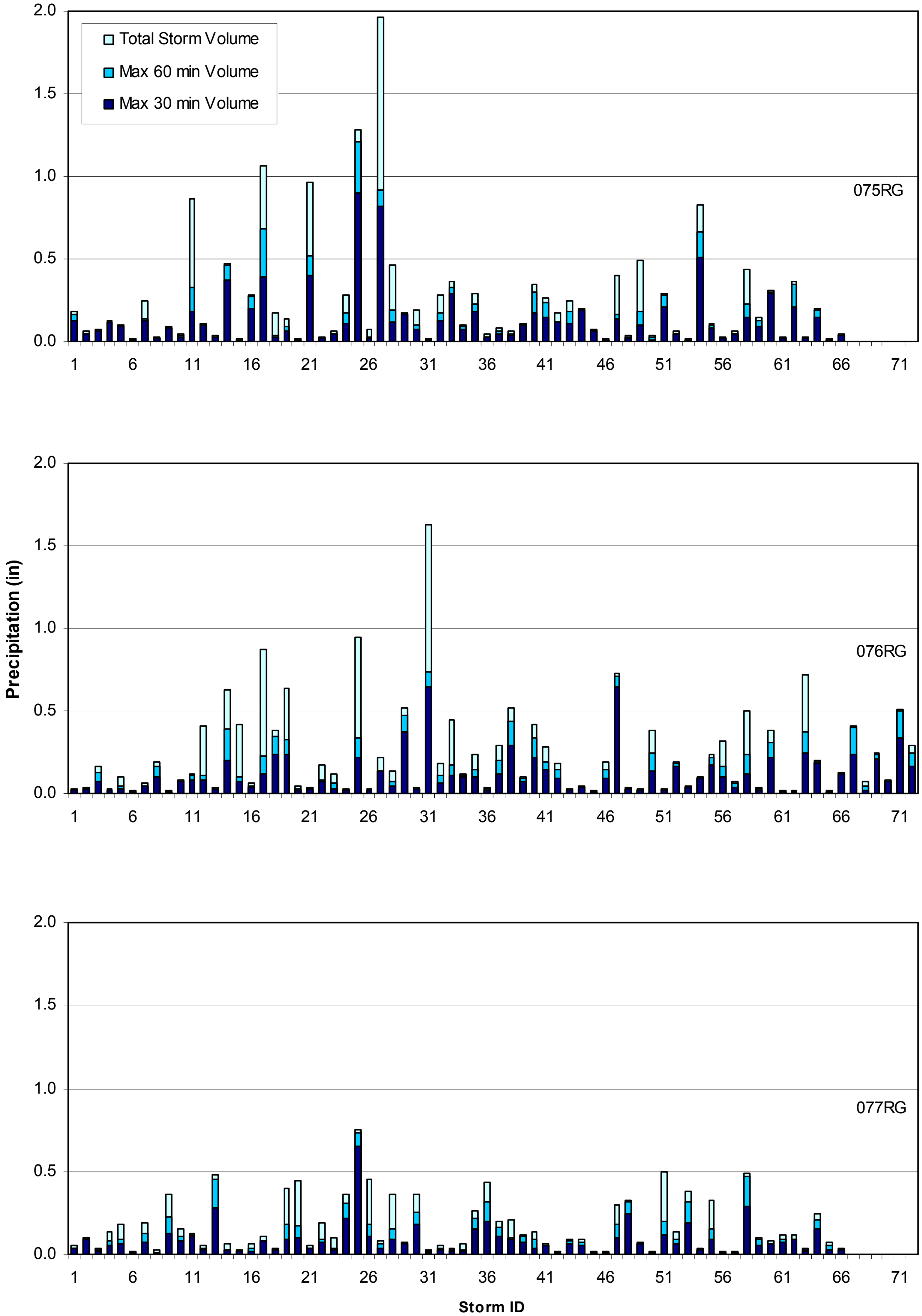

Figure 2. Maximum 30 and 60 minute intensity and total storm volume for the 3 rain gauges on Pike's Peak, 2004.

Cut and Fill Slopes

Stability on cut and fill slopes, and erosion reduction, may be achieved by reestablishing natural vegetation or through the use of geo-synthetic erosion control netting to "armor" the slopes, or by installing various types of structures to keep storm drainage off the slopes entirely. The best monitoring approach is to determine the effectiveness of these practices in reducing cut and fill slope erosion and subsequent sediment transport. Silt fencing installed at the base of the cut or fill slope captures the sediment eroded from the slope. Comparing the rate of eroded material being trapped, over time, at the base of treated and untreated cut and fill slopes is the best measure of the effectiveness of the mitigation practice in reducing erosion.

In 2004, thirteen cut slope and 29 fill slope sites were monitored for stability using silt fences to capture eroding material as described by Nankervis (2004). One of the concerns we had was would the silt fences installed in 2003 hold up over the winter. For the most part all the silt fences remained intact and functional and only required minimal maintenance or repair. However, the lower fence at 123CS was decimated by strong winds (Figure 3) and we learned that the pre-assembled (staked) silt fence material we originally purchased was not as durable as the fabric only material we purchased later.

Figure 3. Condition of lower silt fence at site 123CS in spring 2004.

Interestingly enough, the upper silt fence at 123CS remained intact and required only minimal repair.

This year we adjusted how the fences were installed. Initially, many fences were placed perpendicular to the slope and we found in some cases that pooling water (and sediment) went around the ends of the fence. In 2004, the ends of all fences were "cupped" uphill in order to capture and filter all the water entering the fenced area. Particle size distributions are presented in Appendix C for sediment grab samples taken from several cut and fill slope silt fences in 2004. Photographs of all sites are on the data DVD's.

Cut Slopes

Of the thirteen cut slopes measured in 2004, six were treated (three with fiber matrix in Basins 1 and 2 and three retaining wall sites in Basin 7) and seven were untreated cut slopes (Table 2). Even though 197CS is in Basin 2, it does not appear to be treated with anything though it is adjacent to a large slope covered with erosion control blankets. There is also a 2-track road above this site. Sediment accumulations initially surveyed in

Table 2. Summary of cut slope monitoring survey dates and total volumes for 2004.

Site ID	Basin #	Year Treated	Treatment Type	Survey Dates	Sediment Volume Upper/Lower (ft^3)
011CS	1	2001	Fiber Matrix	5/16/03	0 / 0
045CS	7	N/A	N/A	7/4/03	0 / 0
049CS	7	N/A	N/A	7/9/03	0 / 0
059CS	7	N/A	N/A	7/10/03	0 / 0
078CS	7	?	Retaining Wall	7/14/03	0 / 0
087CS	7	?	Retaining Wall	7/8/03	0 / 0
090CS	7	?	Retaining Wall	7/8/03	0 / 0
102CS	3 or 6	N/A	N/A	7/15/03 & 8/12/04	1.3 / 5.0
123CS	3 or 6	N/A	N/A	7/8/03 & 6/24, 7/22/04	9.6 / 1.5*
141CS	6	N/A	N/A	7/10/03 & 7/20, 8/12/04	8.6 / 12.4**
185CS	2	2003	Fiber Matrix	5/27/04	0 / 0
192CS	2	2003	Fiber Matrix	5/27/04, 9/24/04	1.1 / 1.1
197CS	2	2003	none	5/27/04, 7/20 & 9/24/04	3.4 / 11.2

*Lower fence at 123CS damaged over winter.
** Mid-July storms partially overwhelmed lower fence and piped under upper fence.

2004 for the lower fence at 123CS (1.5 ft^3 on 6/24) and the upper and lower fences at 141CS (3.2 and 7.0 ft^3, respectively on 7/20) are less than actual for the reasons identified in Table 2. However, once repaired the fences performed well the rest of the season, as did the other cut slope fences.

Unlike 2003 where no cut slope silt fences (upper or lower) accumulated any sediment, five sites accumulated material in 2004 and all five had sediment in both the upper and lower fences. Only one of those sites was a treated slope (192CS) and the upper and lower fence yielded the same amount of sediment. Erosion control on cut slopes may have more to do with location and exposure than the treatment. If a site was situated in a location where a precipitation event generated enough energy to cause "natural" erosion, then the cut slope eroded as well, if it wasn't then the cut slope, whether treated or not, did not produce any sediment. All fences above timberline (102CS, 123CS, and 141CS) accumulated sediment while only two below timberline did, and for fence 197CS the 2-track road on the hill slope above the site may influence storm runoff.

Fill Slopes

A summary of the fill slope monitoring sites for 2004 are listed in Table 3. With the completion of the Basin 2 mitigation work in 2003, we were able to add ten treated fill slope sites in 2004. The treatments consisted of curbs, fabric, ditches or changing the road drainage vector (e.g. 203FS is on the outside of a curve and the road drains away).

Table 3. Summary of fill slope monitoring survey dates and total volumes for 2004.

Site ID	Basin #	Year Treated	Treatment Type	Survey Dates	Sediment Volume Upper/Lower (ft^3)
001FS	1	2001	Fiber Matrix	7/2/03	0 / 0
007FS	1	2001,03	Fiber Matrix,Curb	9/23/03	0 / 0
039FS	1	2001,03	Fiber Matrix,Curb	9/24/03	0 / 0
043FS	7	N/A	N/A	7/8/03 & 7/28/04	7.7 / 0
048FS	7	N/A	N/A	7/21/03 & 7/28/04	17.0 / 0
052FS	7	N/A	N/A	7/10/03 & 7/28/04	5.0 / 0
055FS	7	N/A	N/A	8/12/03 & 7/28/04	29.4 / 0
074FS	7	N/A	N/A	7/3/03	0 / 0
079FS	7	?	Recycled Asphalt	7/3/03	0 / 0
083FS	7	?	Recycled Asphalt	7/10/03 & 8/13/04	13.7 / 0
086FS	7	?	Recycled Asphalt	7/9/03	0 / 0
088FS	7	?	Recycled Asphalt	7/8/03 & 7/20,8/12,8/25/04	38.4 / 15.2
093FS	7	?	Recycled Asphalt	7/3/03 & 8/12/04	4.5* / 0
098FS	3	N/A	N/A	7/14/03 & 6/22/04	6.2 / 0
101FS	3	N/A	N/A	8/13/03 & 6/24/04	7.0 / 0.9
103FS	6	N/A	N/A	7/14/03	0 / 0
105FS	6	N/A	N/A	7/10/03	0 / 0
124FS	6	N/A	N/A	7/8/03	0 / 0
128FS	5	N/A	N/A	7/14/03	0 / 0
177FS	2	2003	Asphalt Curb	5/26/04	0 / 0
183FS	2	2003	Ditch, Fabric	5/26/04	0 / 0
186FS	2	2003	Fabric	5/27/04	0 / 0
187FS	2	2003	Fabric	6/9/04	0 / 0
193FS	2	2003	Paved Road	5/27/04	0 / 0
194FS	2	2003	Ditch, Fabric	5/26/04	0 / 0
196FS	2	2003	Ditch, Fabric	5/19, 7/26/04	3.7 / 0
198FS	2	2003	Fabric	6/9/04	0 / 0
203FS	2	2003	Paved Road	5/27, 7/29/04	10.0 / 0
204FS	2	2003	Paved Road	6/9/04	0 / 0

*Storm runoff partially overwhelmed upper fence.

Curbs were also added in Basin 1 near sites 007FS and 039FS in 2003 changing the mitigation treatment. In Basin 7 we have 5 fill slope sites in a stretch of highway that was paved with recycled asphalt some time ago, but this is not associated with the current plan for highway improvement. As for the durability of the fill slope fences installed in 2003, most required only minimal maintenance though both fences at 098FS and 101FS required replacing after the surveys in June.

Observations from the second year of monitoring would indicate that if the current mitigation efforts for fill slopes are effective in keeping road drainage off the slopes, then the slopes appear to be relatively stable. Case in point, in 2003 fill slopes 007FS and 039FS accumulated substantial amounts of sediment, but after installing the curbs no material was captured in 2004. In fact, only two of the 13 treated fill slopes (under the current mitigation plan) collected sediment and then only in the upper fence (closest to the road). Neither of these sites appears to receive road drainage as 196FS has a paved drainage ditch and erosion control blanket between the fill slope and the road and 203FS is on the outside of a curve and the road slopes away from the fill slope. The storms in mid-July produced enough energy to cause rills to form on these slopes without additional runoff contributions from the road.

Nine of the sixteen untreated fill slope sites (including the recycled asphalt sites) accumulated sediment in upper fence but only two sites, 088FS and 101FS had sediment in the lower fence. Site 101FS was one of two sites to capture sediment in both fences in 2003 and did so again in 2004. Site 088FS was the only fill slope surveyed three times in 2004 as the mid-July storms moved material into the upper fence (not the lower) and mobilized material so that smaller storms in late-July/early-August transported sediment down the slope into the lower fence.

Similarity of sediment particle size distributions at the 15th, 35th, 50th, 84th, 95th, and 100th percentile from grab samples collected in the cut and fill slope silt fences was tested using Mielke and Barry (2001) permutation techniques at the 0.05 level (Table 4). The null hypothesis (H_o:) tested is that observations are similar among groups, based on Euclidean distance computed on the specified data. After testing combinations of the three fill slope silt fences each from 2003 and 2004, and the six cut slope fences from 2004, the p-values are all greater than 0.05 thus, we fail to reject the H_o: that the sediment particle size distributions are similar between: 1) fill slope sites in 2003 and 2004, 2) cut slope and fill slope sites in 2004, and 3) cut slope and 2003/2004 fill slope sites.

Table 4. Results (p-values) of permutations testing similarity of cut and fill slope sediment particle size distributions at the 0.05 level.

Group 1	Group 2	D15	D35	D50	D84	D95	D100
FS 2003	FS 2004	0.400	0.100	0.200	1.000	1.000	1.000
CS 2004	FS 2004	0.786	0.607	0.524	0.298	0.619	0.476
CS 2004	FS all	0.325	0.325	0.351	0.411	0.364	0.255

These results are interesting (and make sense) but we need larger samples sizes within a given year to improve our confidence in the test, especially if we are to compare upper and lower fences.

Highway Surface Stabilization

Initially, this phase of the monitoring plan was going to look at the effectiveness of several different kinds of treatments with respect to stabilizing the road surface. Since road stabilization has been narrowed down to one option (paving with asphalt) there was little need to implement a study design matrix containing one treatment. However, we did measure several sites in unpaved reaches of the road and stratify these reaches by slope; less than 10% and greater than 10% road slope. Table 5 lists the sites, Priority Basins and survey dates of all road cross section measured in 2004.

Table 5. Summary of road cross section monitoring sites measured in 2004.

Site ID	Basin	Slope Category	Slope	Survey Date
044RX	7	Class 1	0.0751	7/06
047RX	7	Class 2	0.1007	7/06
050RX	7	Class 2	0.1038	7/06
056RX	7	Class 2	0.1049	7/07
060RX*	7	Class 2	0.1006	7/30
062RX	7	Class 1	0.0971	7/30
072RX	7	Class 1	0.0966	8/03
154RX	3	Class 2	0.1032	8/05
156RX	6	Class 2	0.1022	8/05
158RX	6	Class 1	0.0483	8/04
160RX	6	Class 1	0.0268	8/04

*Only road reach without a corresponding drainage ditch survey

Five cross sections (labeled A-E) were resurveyed for each road reach. Like all other sites in this study, we used a resection to locate the survey instrument relative to the previously established permanent monuments to insure measuring the same cross section as in the prior survey. The same protocol is used to measure all cross sections, regardless of monitoring site, in this study. A tape stretched between end points guides the surveyor as they measure cross section topography moving left to right (facing downslope). Each road cross section was measured from the edge of the drainage ditch to the edge of the fill slope.

When calculating the geometry of the road cross sections, two things were done to the data to promote consistency and comparability between successive surveys. The first was to add two reference points, one or two foot in elevation above the left and right endpoints of the survey, to provide a reference elevation for cross sectional area calculations and graphing purposes. It makes the graphs easier to see and accounts for the crown and any other undulations in the road surface. The second is a procedure applied to all cross sections surveyed with a total station in this monitoring study and that is a correction to align all points in the cross section to the left pin-right pin vector (i.e. cross section end points). Even though we use a tag line between the end points to guide the cross section survey, directly positioning the prism over the tape for each and every shot is impossible and so by correcting the northing and easting coordinates of each internal cross section shot to match the vector between the left and right end pins, we get a true measure of distance. This correction typically is very small but is necessary when comparing measurements over time. With the arbitrary end point elevations and vector corrections made, road geometry calculations and graphs of all road cross sections were done. Appendix D contains a tabulation of all road cross section geometry and (overlay) graphs for each reach of the surveys done this year. Photographs of all sites are on the data DVD's.

Volumetric differences were calculated for all cross sections by calculating the average change in area for the five cross sections per reach and multiplying by the length of the road reach measured. A summary of volumetric change measured for each road reach between 2003 and 2004, sorted by slope class, is listed in Table 6. The average length-weighted difference for Slope Class 1 was -0.018 cubic yards/ft and in Slope Class 2 it was -0.005 cubic yards/ft (negative numbers indicate elevation reduction in 2004). Figure 4 depicts the average and range of annual differences in cross sectional area measured at each site and we can see variability at each site and across slope classes. For six of the reaches (3 in each slope category), cross sections experienced both scour and deposition, while just one reach, 047RX, only experienced deposition, and four reaches (2 in each slope category) only experienced scour. Because of the variability within the road reaches, it would be difficult to draw any solid conclusions from these data or extrapolate them across the entire length of unpaved road. In addition, road maintenance practices that periodically grade the road and drainage ditches move material into and out of these road reaches and between the cross sections without adding "new" material to the road, or losing it down the drainage system.

Table 6. Summary of volumetric change in road surface cross section area from 2003 to 2004.

Road Cross Section Identifier	Average Area Difference per Reach (ft^2)	Reach Length (ft)	Volumetric Difference 2003-2004 (ft^3)	Volumetric Difference 2003-2004 (cubic yards)	Slope	Slope Class
044RX	2.15	243.6	523.8	19.4	0.0751	1
062RX	0.04	257.8	9.7	0.4	0.0971	1
072RX	-1.15	218.9	-250.9	-9.3	0.0966	1
158RX	-2.31	214.4	-495.4	-18.3	0.0483	1
160RX	-1.54	225.1	-347.1	-12.9	0.0268	1
047RX	2.81	223.2	627.9	23.3	0.1007	2
050RX	-1.46	302.2	-442.7	-16.4	0.1038	2
056RX	-1.52	201.0	-305.5	-11.3	0.1049	2
060RX	1.19	198.4	237.0	8.8	0.1006	2
154RX	-2.80	229.7	-643.0	-23.8	0.1032	2
156RX	1.70	192.9	328.3	12.2	0.1022	2

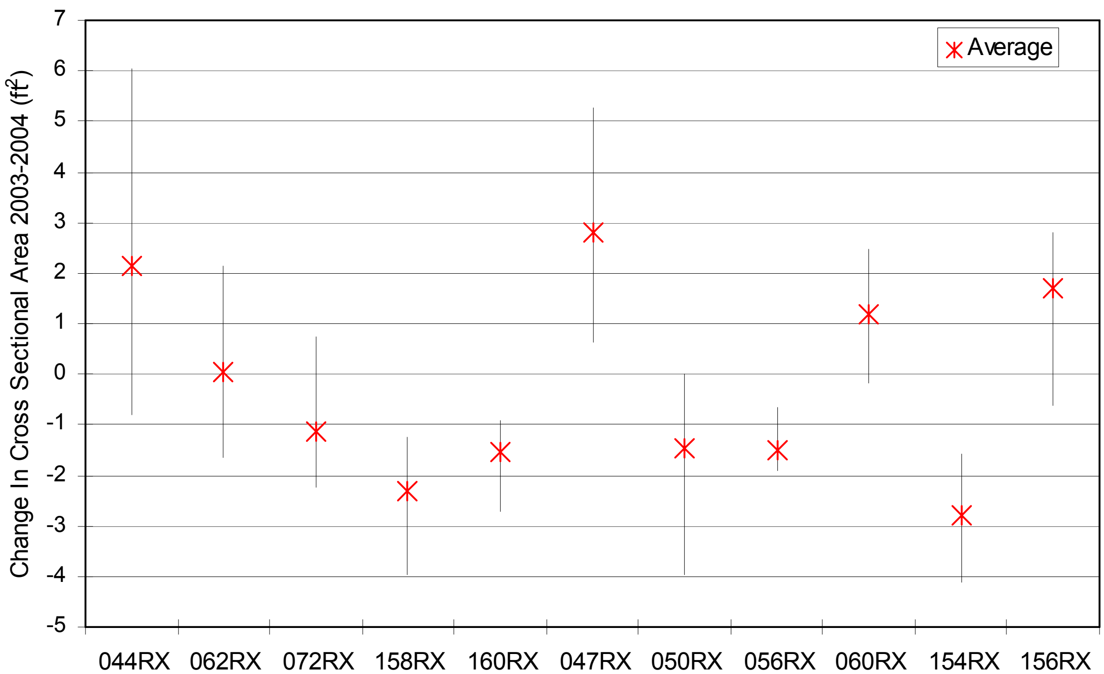

Figure 4. Average and range of cross sectional area differences from road reaches surveyed in 2003 and 2004.

Armoring Drainage Channels

The effectiveness monitoring for this phase focuses on measuring cross sections in roadside drainage ditches and conveyance channels to determine if the implemented mitigation practices reduce erosion and deposition in these features. The current mitigation treatments implemented in Basins 1 and 2 and proposed for the balance of the highway differ from what was initially planned. For example, instead of armoring drainage ditches, all reaches except those meeting the criteria stated in the latest Forest Service Design Review (Burke 2002) will be lined with shotcrete, which in Basin 2 was virtually the entire length of the road. We would expect little deposition and no erosion in ditches lined with shotcrete, so post-construction monitoring will be limited to ditches lined with erosion control fabric or ditches left untreated. Instead of relying solely on energy dissipating devices for erosion control in conveyance channels, where possible, completely removing the energy from the conveyance channels, as in Basin 2, is preferred. Here approximately 1.3 miles of the highway is drained by a single shotcrete-lined ditch which is routed into a single shotcrete-lined conveyance channel which flows into a large sediment detention pond eliminating many discharge points. Post-construction monitoring treatments for conveyance channels now include energy reduction or elimination, as well as energy dissipation.

Drainage Ditches

A summary of the 20 drainage ditch monitoring sites surveyed in 2004 are listed in Table 7. Sixteen of the sites were established in 2003 and resurveyed for comparison and 4 new sites in Basin 2 were established in 2004. Ten of the sites are associated with some treatment; the six ditches in Basins 1 and 2 are lined with erosion control blankets and are the only drainage ditches in these basins not lined with shotcrete. Four of the ditches in Basin 7 are adjacent to road surfaces paved with recycled asphalt but have no other treatment applied to the ditch. The ditches in Basin 7 will provide the longest measure of erosion as Basin 7 is currently the last basin scheduled for construction (USDA Forest Service 2000).

Similar to the road cross section surveys, there are five cross sections (labeled A-E) per drainage ditch monitoring site. The cross section end points are monumented on the cut slope side with rebar and on the road side with either a temporary or permanent marker.

Table 7. Summary of drainage ditch monitoring sites surveyed in 2004.

Site ID	Basin #	Year Treated	Treatment Type	Survey Date
005DD*	1	2001	Erosion Control Fabric	7/06
010DD*	1	2001	Erosion Control Fabric	7/07
042DD	7	N/A	N/A	7/06
046DD	7	N/A	N/A	7/06
051DD	7	N/A	N/A	7/06
057DD	7	N/A	N/A	7/07
061DD	7	N/A	N/A	7/30
071DD	7	N/A	N/A	8/03
080DD*	7	?	Recycled Asphalt	8/03
082DD*	7	?	Recycled Asphalt	8/03
085DD*	7	?	Recycled Asphalt	8/04
092DD*	7	?	Recycled Asphalt	8/04
107DD	3	N/A	N/A	8/05
155DD	6	N/A	N/A	8/05
157DD	6	N/A	N/A	8/04
159DD	6	N/A	N/A	8/04
182DD**	2	2003	Erosion Control Fabric	5/19
188DD**	2	2003	Erosion Control Fabric	5/28
195DD**	2	2003	Erosion Control Fabric	5/21
205DD**	2	2003	Erosion Control Fabric	5/28

*Drainage ditch sites not associated with road cross section surveys
**Initial survey performed in 2004

The procedure for surveying and relocating these cross sections is the same as for the road cross section sites. Using a tape stretched across the cross section as a guide, we survey as many verticals as needed to define the shape of the ditch. Post processing involves correcting the internal, channel defining shots to the left and right vector of cross section end points. We used surveyed “top of ditch” points as our reference for calculating the channel geometry. Appendix E contains a tabulation of channel geometry for all drainage ditch monitoring sites and (overlay) graphs of each cross section. Photographs of all drainage ditch sites are on the data DVD’s.

For comparison purposes, we are interested in only the sixteen ditches surveyed in both years. Figure 5 depicts the average and range of the cross sectional area differences between 2003 and 2004 for the 5 cross sections measured at each site. Values less than 0 indicate scour and values greater than 0 indicate deposition in the cross sections. In drainage ditches 042DD and 107DD all cross sections scoured and in 005DD, 092DD, and 155DD all cross sections experienced deposition. Note that Cross Section D of 042DD was the widest of any cross section surveyed and even though its width was reduced by 1 foot between 2003 and 2004, relatively small increases in depth resulted in a large change (-6.4 ft^2) in cross sectional area. Of the 6 ditches considered treated (all on the left side of the graph), only 005DD and 010DD have been treated under the current highway mitigation proposal and we can see from the graph that when compared to all other drainage ditch sites, these cross sections have relatively low variation in cross sectional area between years. However, scour at the 14 other drainage ditches surveyed can not be interpreted as sediment contributed to off road sites, nor can deposition be interpreted as sediment lost from road and cut slope surfaces. Maintenance practices on the highway periodically grade the drainage ditches and pull material back onto the highway surface altering the elevation and width of the ditches. What we can say is that for the drainage ditches treated adjacent to the paved reaches (because they aren't mechanically graded), scoured material will either be redistributed in the ditch or transported to sediment traps and deposition will reflect redistributed sediment or contributions from cut slopes, only. As time passes and more treated drainage ditches are constructed, we should be better able to quantify the effectiveness of the non-shotcreted drainage ditches.

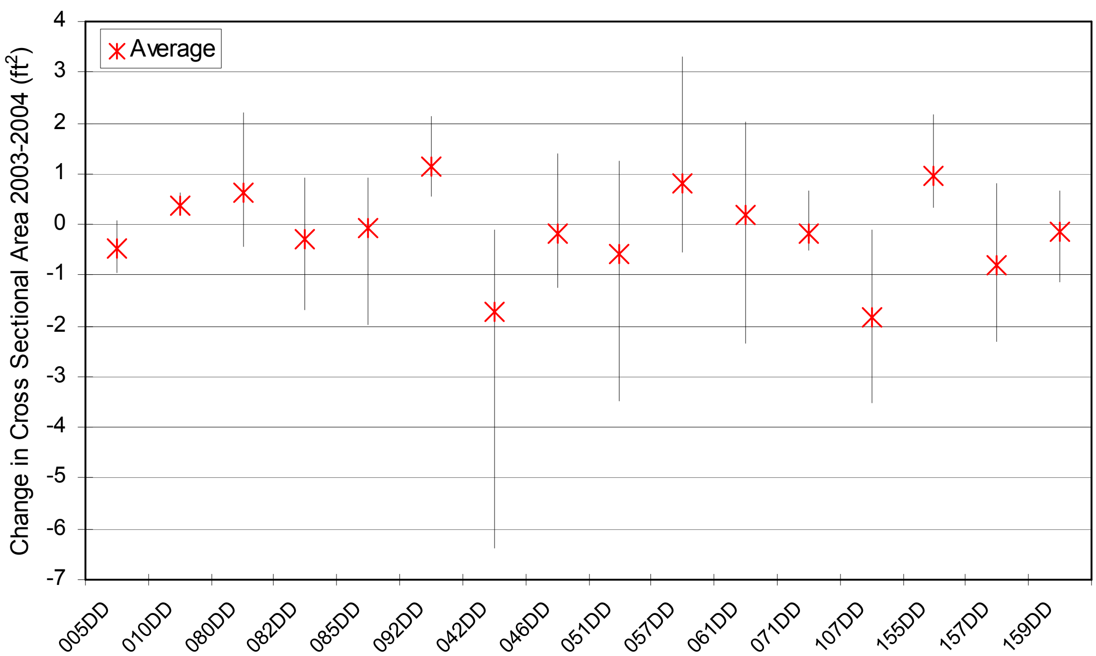

Figure 5. Average and range of cross sectional area differences from drainages ditches surveyed in 2003 and 2004.

Conveyance Channels

Of the 97 conveyance channels identified along the highway to date, ten were surveyed in 2003 and another 69 in 2004 (Table 8). Each channel had a series of three cross sections (labeled A-C) located within the 150 foot boundary of the highway corridor. Left and right cross section end points were monumented with rebar, providing a minimum of 6 fixed points by which to relocate future surveys. A tape stretched between the left and right end points was used as a tag line to guide the cross section survey and enough verticals were taken to describe the features of the channel. Post processing was similar to that of the drainage ditches where all points in the cross section were corrected to the left-right end point vector and "top of bank" reference points were used to calculate channel geometry. Photographs of all conveyance channels surveyed in 2004 are on the data DVD's. Appendix F contains tabulations of all channel geometry calculations and graphs of each cross section.

Table 8. Summary of conveyance channel monitoring sites visited in 2003 and 2004.

Site ID	Basin #	Year Treated	Treatment Type	Survey Date
004CC	1	2001	Fiber Matrix	7/21/2003
012CC	2	2003	Sediment Trap	7/23/2003
013CC	2	2003	Road Paved	7/23/2003
016CC	2	2003	Culvert Plugged	6/2/2004
017CC	2	2003	Fabric	6/17/2004
018CC	2	2003	Shot Crete Ditch	6/16/2004
019CC	2	2003	Fabric	6/16/2004
020CC	2	2003	Culvert Plugged	6/21/2004
021CC	2	2003	Shot Crete Ditch	6/9/2004
022CC	2	2003	Shot Crete Ditch	6/21/2004
023CC	2	2003	Culvert Plugged	6/21/2004
024CC	2	2003	Fabric	6/16/2004
025CC	2	2003	N/A	6/21/2004
026CC	2	2003	Fabric	6/22/2004
027CC	2	2003	Culvert Plugged	6/22/2004
028CC*	2	2003	Culvert Plugged	5/20/2003
029CC	2	2003	Fabric	6/30/2004
030CC	2	2003	Fabric	6/30/2004
031CC	2	2003	Fabric	6/30/2004
032CC	2	2003	Shot Crete Ditch	7/1/2004
033CC	2	2003	Fabric	7/1/2004
034CC	2	2003	Fabric	7/1/2004
035CC	2	N/A	N/A	7/1/2004
036CC	3	N/A	N/A	7/1/2004
037CC	3	N/A	N/A	7/7/2004
038CC	3	N/A	N/A	7/7/2004
040CC	1	2001	Curb	7/2/2003
053CC	7	N/A	N/A	7/21/2003
054CC	7	N/A	N/A	7/21/2003
058CC	7	N/A	N/A	7/21/2004
063CC	7	N/A	N/A	7/25/2003
064CC	7	N/A	N/A	7/21/2004
065CC	7	N/A	N/A	7/22/2004
066CC	7	N/A	N/A	7/22/2004

067CC	7	N/A	N/A	7/22/2004
068CC	7	N/A	N/A	7/25/2003
069CC	7	N/A	N/A	7/23/2004
070CC	7	N/A	N/A	7/3/2003
081CC	7	N/A	N/A	8/5/2004
084CC	7	N/A	N/A	8/19/2004
089CC	7	N/A	N/A	8/12/2004
091CC	7	N/A	N/A	8/13/2004
094CC	7	N/A	N/A	8/17/2004
095CC	5	N/A	N/A	8/17/2004
096CC	5	N/A	N/A	8/17/2004
097CC	5	N/A	N/A	8/17/2004
099CC	5	N/A	N/A	8/17/2004
104CC	5	N/A	N/A	8/26/2004
120CC	5	N/A	N/A	8/18/2004
121CC	5	N/A	N/A	8/26/2004
122CC	5	N/A	N/A	8/27/2004
125CC	5	N/A	N/A	8/27/2004
126CC	5	N/A	N/A	9/1/2004
127CC	5	N/A	N/A	9/1/2004
129CC	5	N/A	N/A	9/2/2004
130CC	5	N/A	N/A	9/2/2004
131CC	5	N/A	N/A	9/1/2004
132CC	5	N/A	N/A	9/1/2004
133CC	5	N/A	N/A	9/1/2004
134CC	5	N/A	N/A	9/1/2004
135CC	5	N/A	N/A	9/3/2004
136CC	5	N/A	N/A	9/3/2004
137CC	5	N/A	N/A	9/3/2004
138CC	5	N/A	N/A	9/3/2004
139CC	5	N/A	N/A	9/1/2004
140CC	5	N/A	N/A	9/1/2004
184CC	2	2003	Rock Weir	5/21/2004
189CC	2	2003	Velocity Dissipator	6/2/2004
190CC	2	2003	Velocity Dissipator	6/2/2004
191CC	2	2003	Velocity Dissipator	6/2/2004
175CC	1	2003	Curb, Vel. Dissipator	6/2 7/21,30 2004
206CC	2	2003	Fabric	6/17/2004
207CC	5	N/A	N/A	8/18/2004
208CC	7	N/A	N/A	8/19/2004
209CC	7	N/A	N/A	8/19/2004
210CC	2	2003	Shot Crete Ditch	8/25/2004
211CC	2	2003	Shot Crete Ditch	8/25/2004
212CC	7	N/A	N/A	8/25/2004
213CC	5	N/A	N/A	9/2/2004

*Forest Service may have previously surveyed Cross Sections A and B but we have not located the data as yet.

Individual conveyance channels contribute varying quantities of sediment downslope to the streams and reservoir below. Some of these channels likely have been in existence since the road was created and some have developed as recently as 2004. When taken in aggregate, the average sediment contribution from the 79 conveyance channels surveyed within the 300 foot corridor (150 ft either side of the road) is 1 cubic yard per linear foot of channel, or 11848.4 yards total. Figure 6 has a breakdown of sediment contribution by elevation zone over the length of the highway. The 9500 foot elevation zone has the most channels (27) and the widest range in sediment contribution. Only 2 elevation zones, at 11,000 and 13,500 feet, have maximum contributions of less than 1 yard per linear foot of channel. Remember, this only accounts for the volume of channel erosion within 150 feet on either side of the road and does not account for conveyance channels beyond the 150 foot boundary or sediment transported from the road surface, cut slopes, and drainage ditches.

In Basins 1 and 2, mitigation efforts to reduce conveyance channel erosion have consisted of plugging culverts and lining drainage ditches in order to redirect the road drainage to specific discharge sites like rock weirs, velocity dissipators, and sediment ponds. While direct road runoff has been eliminated, some of these channels are big enough to collect and concentrate rain/snow in such quantities that I would expect sediment contributions from them to continue for some time. Also, several of the velocity dissipators and rock weirs have not functioned as desired and new conveyance channels have formed below these sites (e.g. velocity dissipater above 175CC and rock weirs 178RW, 179RW, 180RW, and 181RW to name a few). And while the study design for conveyance channels calls for one initial survey and a survey at the end of the study period, 175CC was surveyed three times in 2004 because maintenance (additional rock) to the adjacent velocity dissipator resulted in obliterating the conveyance channel that had formed.

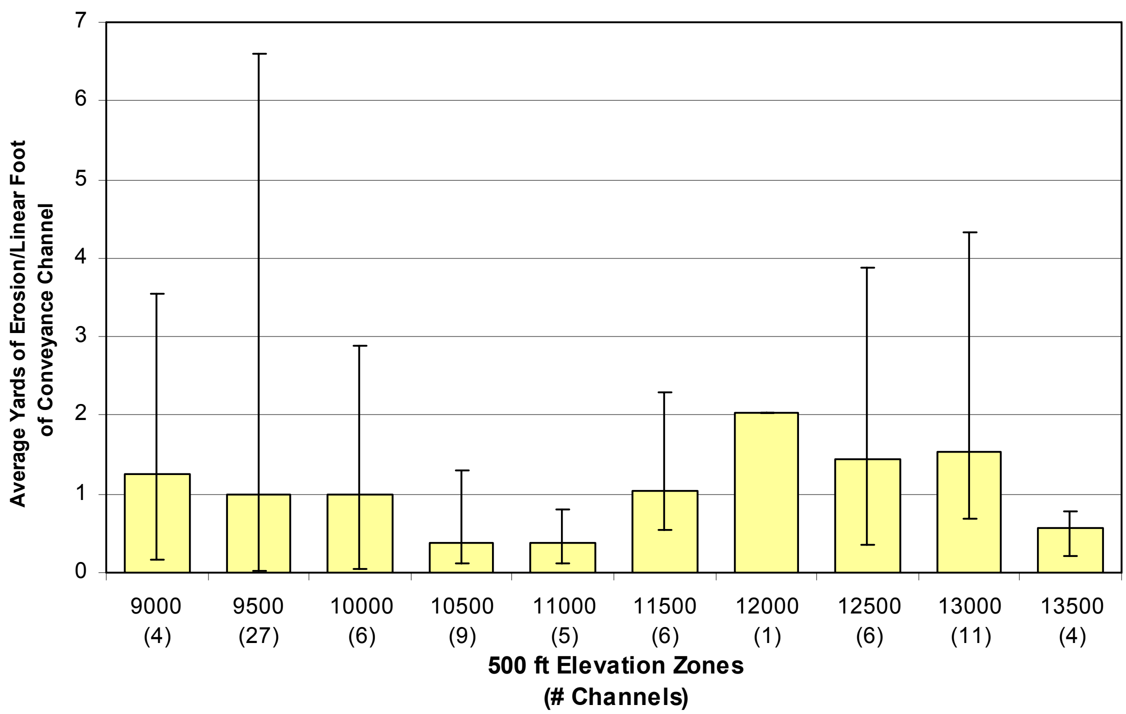

Figure 6. Average (maximum/minimum) yards of sediment per linear foot of conveyance channel, by elevation zone (150 ft on either side of highway).

Sediment Ponds and Traps

In 2004, 17 rock weirs were surveyed to determine their effectiveness in trapping sediment. Volume of sediment captured by each structure is determined by comparing two grid surveys of each basin and calculating fill volume differences from the DTM's. To determine effectiveness in trapping sediment, we installed silt fences below the rock weirs to capture any material that might pass over, under, or through the structure. These fences were surveyed in the same manner as the cut and fill slope silt fences. In 2004, rip-rap was added to several rock weirs at the terminus of the drainage ditches to dissipate energy as storm drainage scoured and piped through (under) the weirs (Figure 7) which altered the discharge location requiring us to extend the silt fences below these weirs. This also changed the void volume of the weirs and for the purpose of calculating sediment accumulation the area in each weir covered by the rip-rap was excluded.

Figure 7. Example of rip-rap velocity dissipator in rock weir 161RW.

A summary of survey location, dates and sediment volume accumulated is presented in Table 9. Eight weirs built in Basin 2 after the 2003 field season ended and required an initial survey in late May. Since no weirs were cleaned out in 2004, all seventeen weirs were resurveyed in late September to determine sediment accumulation for the year. Surveys of the five rock weirs in Basin 1 all indicate more sediment accumulation in 2004 than in 2003 with the exception of 008RW. The negative value for this weir is likely the result that some sediment was removed during installation of the rip-rap, as there is no evidence that sediment was lost over or through the weir. In fact, no weirs in Basin 1 had any sediment accumulation in the corresponding silt fences. In contrast, six

Table 9. Summary of sediment trap monitoring sites and sediment volumes in 2004.

Site ID	Basin #	Year Constructed	Survey Date 2004	2003 Sediment Volume (ft^3)	2004 Sediment Volume (ft^3)
002RW	1	2001	9/22	7.29	73.68
003RW	1	2001	9/22	30.49	68.3
006RW	1	2001	9/22	5.80	76.3
008RW	1	2001	9/22	40.20	-67.2
009RA	1	2001	9/22	12.36	42.9
152RW	2	2003	9/22	198.00*	43.5
153RW	2	2003	9/21		68.3
161RW	2	2003	9/21		9.6
162RW**	2	2003	9/21		13.7
176RW	2	2003	5/28 , 9/17		-3.3
178RW**	2	2003	5/28 , 9/17		13.4
179RW**	2	2003	5/28 , 9/17		-2.95
180RW**	2	2003	5/28 , 9/17		18.8
181RW	2	2003	5/28 , 9/17		3.34
200RW**	2	2003	5/26 , 9/21		16.1
201RW	2	2003	5/26 , 9/21		0.1
202RW**	2	2003	5/26 , 9/17		-7.3

*Value reflects volume of excavated material, not necessarily storm generated sediment.
**Sites with sediment accumulation in silt fence below weir.

of the twelve rock weirs in Basin 2 had sediment in the adjacent silt fences. It is interesting to note the relatively small values for sediment in weirs measured twice in 2004 as opposed to those where the base survey was September 2003. This may be an indication that freeze-thaw during the winter months contributes a fair bit of sediment, that loss due to piping or flow through is substantial (though the weir silt fences did not capture large volumes of material), or that the basins settled after construction and a heavy rain year. The latter two could certainly explain the negative volumes measured in Basin 2. The rock weirs are designed to act as small detention ponds, collecting storm drainage and releasing the water gradually while allowing the sediment to filter or settle out. Since all the weirs are located where the highway has been paved, sediment sources are limited to a few un-paved drainage ditches, cut slopes, and hill slopes.

Frequency distributions of sediment grab samples taken from all rock weirs and the six silt fences are presented in Appendix G. Similarity between rock weir (n=17) and cut slope (n=6), and rock weir (n=6) and associated weir silt fence (n=6) distributions were tested using Mielke and Barry (2001) at the 0.05 level (Table 10). We reject the H_o: that

Table 10. Results (p-values) of permutations testing similarity of sediment particle size distributions between rock weirs, cut slope and weir silt fences at the 0.05 level.

Group 1	Group 2	D15	D35	D50	D84	D95	D100
Rock Weir	Cut Slope	0.515	0.565	0.486	0.298	0.047	0.483
Rock Weir	Weir Fence	0.067	0.117	0.126	0.126	0.162	0.645

sediment sizes are similar at the 95th percentile for cut slopes and rock weirs (p-value = 0.047), and failed to reject the H_o: for the other eleven comparisons. This makes sense in that the largest material coming off the hill/cut slopes may not be delivered to the rock weirs at the same rate it comes off the slopes, where as the finer material is more easily transported. As for the silt fences below the rock weirs, we can say that these weirs were not effective in trapping all the sediment delivered to them. Four of the fences where piping was observed contained sediment with nearly the same particle size distribution as the associated weirs (Figure 8.). However, at sites 162RW and 179RW where material in the fence was finer than in the weir, the field crew observed water pooling and holding in the weirs as opposed to piping through. We have installed conveyance channel cross sections below all these weirs to monitor energy dissipation effectiveness as some channels have already begun to form.

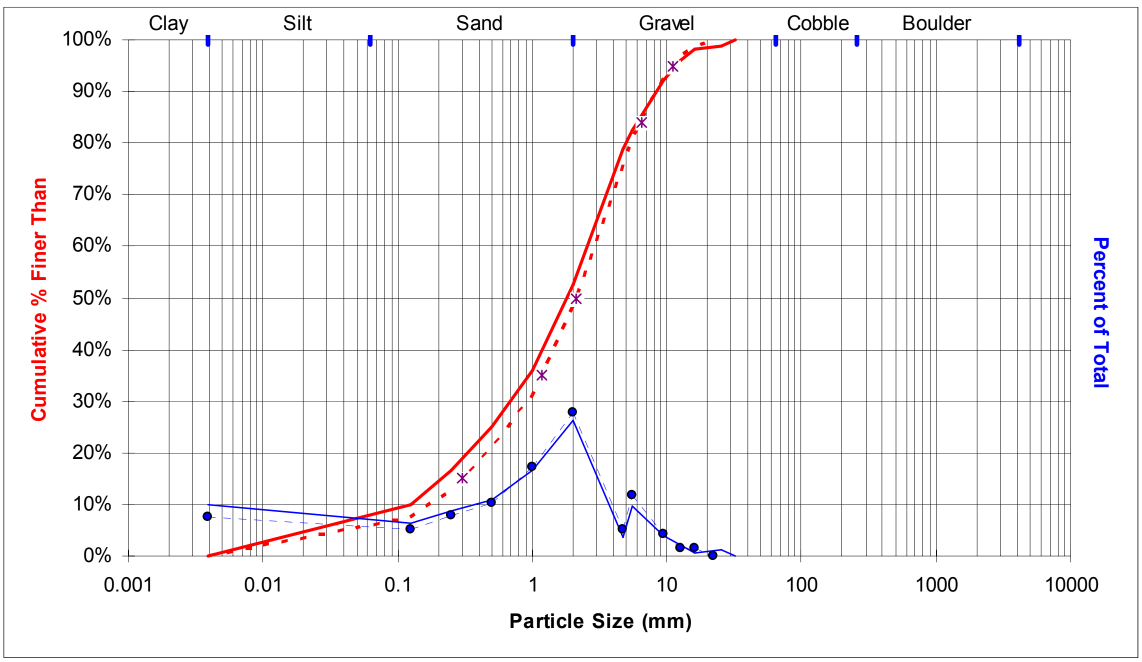

Figure 8. Particle size distribution of grab samples taken in 180RW and adjacent silt fence (Dashed line is weir, solid line is silt fence).

This was the first year the large sediment pond in Basin 2 (199RW) was in operation. Unlike the rock weirs which drain relatively small sections of road, this pond collects storm drainage from 1.3 miles of highway and in a long network of shotcrete drainage ditches and culverts diverting storm runoff from Crystal Creek (North Fork) into the Ski Creek basin. Water enters the pond, is filtered through a gravel-encased perforated standpipe, and discharged through a culvert downstream. The monitoring effort for the pond includes 5 cross sections to estimate volumetric changes in sediment accumulation, suspended sediment samples taken above the pond where the shotcrete conveyance channel ends and at the outlet (pipe) during storm runoff to measure effectiveness in capturing sediment, and 3 cross sections in the channel below the pond outlet (184CC) to measure changes in channel dimension. Storm intensities this year prompted modifications in the pond design to minimize in-pond erosion such as extending the rip-rap channel from the end of the shotcrete conveyance channel to the base of the pool, increasing the size of the rip-rap, adding rip-rap to the unprotected area below the grouted spillway, and adding roughness and erosion control blankets to the pond sides (Figure 9). We made three surveys of pond cross sections (Appendix G) but the in-pond erosion and mid-season construction make it impossible to determine the source of the material responsible for the changes in cross sectional area measured in 2004 (Table 11).

Figure #9. View of sediment pond 199RW from XSA in conveyance channel looking north. Note large rock in channel (forefront), rip-rap from grouted spillway down to the pond, erosion control measures within the basin such as excelsior logs, erosion control fabric, and woody debris.

Table 11. Summary of cross sectional area surveyed in 2004 for 199RW.

Cross Section	21-May	5-Aug	28-Sep	Change (ft^2) May-August	Change (ft^2) August-September
A	1299	1242	1245	54	-2
B	1199	1171	1177	22	-6
C	1354	1318	1312	42	6
D	1408	1384	1373	36	12
E	1561	1541	1522	38	19

To measure the sediment capturing effectiveness of the pond, we took 3 suspended sediment grab samples during rain events (Table 12). In the June 25 sample, 96% of the sediment entering the pond was trapped, but in both August samples, higher sediment concentrations were measured coming out of the pond than going in. However, after looking at the circumstances this may not be that unusual. All the storms were roughly 0.4 inches in total volume but the duration for the June storm was much shorter and the 30 minute maximum intensity much greater. The June storm was the first "good" event of the season and probably washed the winter/spring sediment accumulation from the drainage ditches down to the pond where the timing of sample coincided with the sediment plume. On the other hand, the August samples were taken at the tail end of prolonged storm events where the majority of sediment may have been washed into the pond prior to sampling while the finer material, in suspension, continued to pass through the gravel filter as the pond water receded. Photographs of all sites are contained on the data DVD's.

Table 12. Suspended sediment samples taken above and below sediment pond 199RW.

Date	Storm Volume (in)	Storm Duration (hr)	Max.30 Minute Intensity	Above (mg/l)	Below (mg/l)	Percent Change
25-Jun	0.47	0.86	0.37	6289.5	259.0	0.04
18-Aug	0.40	6.04	0.14	24.4	60.1	2.47
27-Aug	0.44	2.36	0.15	232.9	278.7	1.20

Energy Dissipators

There are five locations where water is discharged off the road and filtered through rip-rap without design of a weir or settling pond. Site 163RA is a rock apron in Basin 2 established in September 2003 (Figure 10). We installed a silt fence below the apron in

Figure 10. Rock apron site 163RA September 2003.

order to determine its effectiveness in reducing the sediment load but have not yet surveyed for conveyance channel cross sections below the apron to help determine its effectiveness in reducing storm runoff energy.

A second location is in Basin 1 near fill slope site 007FS where a curb was installed in 2003 to keep storm drainage off the fill slope. Water flows along the curb to a low point and then is piped down to the base of the fill slope through a culvert and discharged into rip-rap (Figure 11) where it is allowed to flow out over the hill slope. We installed conveyance channel site, 175CC, below the rip-rap on June 2, 2004 prior to any major storm event to measure the effectiveness of the rock in reducing storm drainage energy.

Figure 11. Velocity dissipator near site 007FS and above 175CC, June 2, 2004.

We surveyed 175CC on July (7/21) because the initial rock apron was ineffective at dissipating the energy and a conveyance channel was forming (see Appendix F for surveys of site 175CC). A second July survey (7/30) was performed because the rock apron was enlarged and we needed to reestablish a baseline survey at site 175CC after the construction obliterated the conveyance channel and our cross sections (Figure 12). Visually comparing Figures 11 and 12, you can see the difference in rock size and volume used in the initial versus reconstructed dissipater. The July 30 survey at 175CC will provide a good baseline with which to evaluate the effectiveness of the new, larger dissipater.

Figure 12. Reconstructed velocity dissipater above 175CC August 3, 2004.

The three other dissipators receive storm drainage from 188DD located across from the Halfway Point Picnic area at the upper region of Basin 2. Each is being monitored for velocity dissipation effectiveness by conveyance channel sites 189CC, 190CC, and 191CC located below the rock aprons.

Validation Monitoring

The objective of validation monitoring is to document the effect road mitigation practices have on the aquatic, wetland, and riparian communities that are within the influence of the Pike's Peak Highway. By monitoring features in both reference (non-highway influenced) and impaired streams, relative (converging or diverging) changes observed in these features over time between the 2 groups would be attributed to the road mitigation practices. The nine streams identified as either impacted or non-impacted by the presence and maintenance of the Pikes Peak Highway by ERO Resources Corporation (1999) are: North Catamount, South Catamount, Oil, and Boehmer Creeks as reference or non-impacted streams; and Ski, Severy, East Fork of Beaver, North Fork of Crystal, and West Fork of Beaver Creeks as stream systems impacted by the highway.

Stream Channel Surveys

After establishing a baseline condition for the various parameters in 2003, cross sections, pebble counts and grab samples, and vegetation cover were re-measured in 2004. The same equipment and methodology described by Nankervis (2003) was employed in 2004 surveys.

Cross Sections

The same five cross sections per reach were re-surveyed to document relative changes in active channel geometry. Appendix H contains the hydraulic geometry calculations for 2004, relative change in hydraulic geometry ((2003-2004)/2003), and cross section graphs of each site overlaying the 2003 and 2004 surveys. As a group, there was no significant difference between relative change in any of the cross sectional geometry parameters in highway impacted versus highway un-impacted (control) cross sections at the 0.05 level (Mielke and Barry 2001). Table 13 presents the results of this analysis testing the hypothesis that observations are similar among impacted and control sites, for p-values > 0.05 we fail to reject the H_o: that the observations are similar. Note that most of

Table 13. Results (p-values) of permutations testing similarity of highway impacted and un-impacted stream cross sectional geometry parameters at the 0.05 level.

Statistic	Width (ft)	Cross Sectional Area (ft^2)	Mean Depth (ft)	Maximum Depth (ft)	Wetted Perimeter (ft)	Hydraulic Radius (ft)	Width /Depth Ratio
n-control	35*	33	33	33	33	33	33
n-impact	54	54	54	54	54	54	54
p-value	0.728	0.291	0.413	0.057	0.923	0.416	0.650

*In 2003, two cross sections in BHMR1 did not have the area between the wetted width surveyed so parameters other than width were not calculable.

the p-values are not close to being significant with the exception of maximum depth. The magnitude of the storms in 2004 caused changes in the geometry of stream cross sections in both impacted and control streams, none more dramatic than Severy Creek 2 (Figure 13), but as obvious as those changes were many of the impacted sites (e.g. East and West Beaver Creeks 1 and Severy Creek 1) experienced relatively minor changes. Photographs of left and right bank and upstream and downstream views at each cross section, with photograph ID board, are contained on the data DVD's.

Particle Size Distribution

The particle size distribution of the bed material at each reach was determined using pebble count data and grab samples were taken from gravel bars at all sites (except SVRY1) as an index to what size of material is being transported and deposited. Appendix I contains all the particle size distribution data collected in 2004 as well as graphs overlaying 2003 and 2004 data for pebble counts and grab samples.

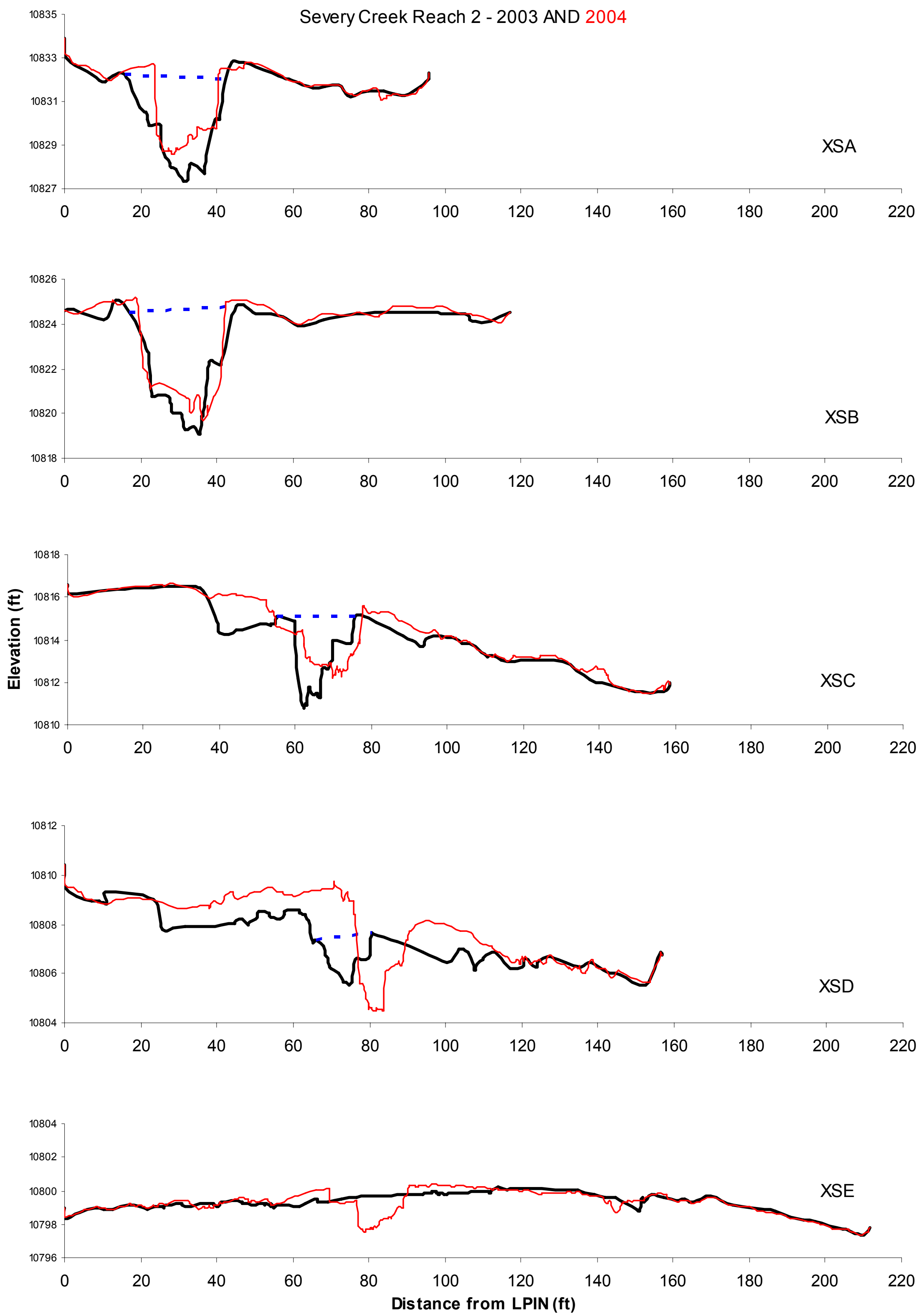

Figure 13. Overlay of 2003 and 2004 cross section surveys at Severy Creek 2.

Pebble Counts

Pebble counts (300 particles) in each reach were done to characterize the bed material of the active channel using the Bevenger and King Pebble Count Procedure (Bevenger and King, 1995). A tabulation of the 15th, 35th, 50th, 84th, 95th, and 100th percentile and graphs of the 2004 size distributions are presented in Appendix I. Analysis of the relative change in size distribution from 2003 to 2004 for 15th, 35th, 50th, 84th, 95th, and 100th percentile between impacted and un-impacted streams was tested using Mielke and Barry (2001) at the 0.05 level (Table 14). The 15th percentile (D15) is the only size fraction where we

Table 14. Results (p-values) of permutations testing similarity of highway impacted and un-impacted stream pebble count distributions at the 0.05 level.

Statistic	D15	D35	D50	D84	D95	D100
n-control	5*	7	7	7	7	7
n-impact	8*	10	10	10	10	10
p-value	0.005	0.226	0.719	0.885	0.069	0.516

*The relative change in the D15 group cannot be calculated at four sites because, in either 2003 or 2004, the smallest particles measured comprised more than 15% of the sample.

reject the H_o: that the observation are similar between impacted and control sites. The trend for the D15 appears to be that control sites became coarser and the impacted sites became finer (Figure 14). This is understandable if we consider that the ready supply (road) and storage of fines may be greater in impacted streams than in the control sites. With the greater than normal rainfall in 2004, after lower than normal precipitation for the past 4-5 years, there was a net export of fine material out of control reaches and a net import of fines into impacted reaches.

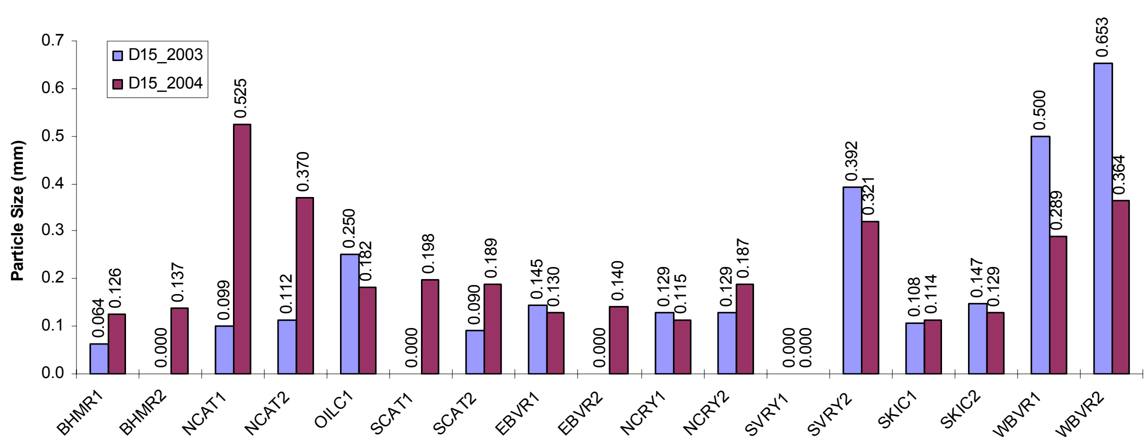

Figure 14. Comparison of the D15 from pebble count data for 2003 and 2004, by site.

Grab Samples

Particle size distributions of sediment taken with grab samples from gravel bars were made from all stream reaches this year except Severy Creek 1 (no bars present). A tabulation of the 15th, 35th, 50th, 84th, 95th, and 100th percentile and graphs of the 2004 size distributions from the grab samples are presented in Appendix I. Recall that last year, only eight bar samples were taken, one reach from each stream, except Boehmer Creek which had no depositional features in either reach in 2003. Analysis of the relative change in size distribution from 2003 to 2004 for 15th, 35th, 50th, 84th, 95th, and 100th percentile between impacted and un-impacted streams was tested using Mielke and Barry (2001) at the 0.05 level, comparing only the eight sites sampled in both 2003 and 2004 (Table 15). We failed to reject the H_o: that the relative changes in particles size distribution from 2003 to 2004 are similar between impacted and control sites for all size fractions. Please note that Severy Creek 1 (impacted) was the only reach in 2003 and 2004 without a depositional feature, while both Boehmer Creek reaches (control) had developed bars in 2004.

Table 15. Results (p-values) of permutations testing similarity of highway impacted and un-impacted stream bar sediment size distributions at the 0.05 level.

Statistic	D15	D35	D50	D84	D95	D100
n-control	3	3	3	3	3	3
n-impact	5	5	5	5	5	5
p-value	0.786	0.786	0.786	0.571	0.143	0.357

Vegetation

In general, the same photo points and techniques used by Nankervis (2003) to describe species composition and percent cover at the left and right top-of-bank of each cross section were employed in 2004. New photo points were established at Severy Creek 2 because the active channel changed its location so dramatically that what was the top-of-bank in 2003 is now mid-channel or buried. We photographed the new top-of-bank and recorded new distances, but there was no change in percent cover (0%) or species composition. Appendix J provides a tabulation of the data recorded in 2004 and side-by-side photographs of the 2003 and 2004 bank images. As the photographs in Appendix J show, there was not a dramatic change in species composition between 2003 ands 2004. However, one thing we noted in the field was the evidence of several over-bank flows and how grasses and forbs on some banks were dead or damaged, particularly at North and South Catamount 1 and 2, and Ski Creek 1 sites. Percent cover is an ocular estimate of the live material occupying that three foot section at the top of each bank. Comparing the relative change in percent cover estimated from 2003 to 2004 between impacted and un-impacted stream banks using Mielke and Barry (2001) at the 0.05 level, we failed to reject the H_o: that relative percent cover change between impacted and un-impacted stream bank vegetation was similar (p-value = 0.089).

References

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Appendix A

Site Locations for
Effectiveness and Validation Monitoring

2004

Site Locations for Effectiveness and Validation Monitoring 2004

Datum WGS 84

Site ID	Latitude (hddd°mm.mmm)	Longitude (hddd°mm.mmm)	Altitude (ft)	Feature Description
001FS	N38 55.211	W105 02.238	9410	Fill Slope
002RW	N38 55.224	W105 02.264	9410	Rock Weir/Apron
003RW	N38 55.200	W105 02.258	9416	Rock Weir/Apron
004CC	N38 55.132	W105 02.278	9431	Conveyance Channel
005DD	N38 55.087	W105 02.415	9447	Drainage Ditch
006RW	N38 55.109	W105 02.482	9415	Rock Weir/Apron
007FS	N38 55.094	W105 02.520	9414	Fill Slope
008RW	N38 55.075	W105 02.554	9417	Rock Weir/Apron
009RA	N38 55.046	W105 02.655	9443	Rock Weir/Apron
010DD	N38 54.907	W105 02.734	9457	Drainage Ditch
011CS	N38 54.909	W105 02.730	9459	Cut Slope
012CC	N38 54.748	W105 03.060	9528	Conveyance Channel
013CC	N38 54.730	W105 03.068	9525	Conveyance Channel
014CC	N38 54.691	W105 03.089	9519	Conveyance Channel
015CC	N38 54.603	W105 03.174	9547	Conveyance Channel
016CC	N38 54.602	W105 03.111	9525	Conveyance Channel
017CC	N38 54.510	W105 03.246	9565	Conveyance Channel
018CC	N38 54.472	W105 03.298	9576	Conveyance Channel
019CC	N38 54.457	W105 03.384	9599	Conveyance Channel
020CC	N38 54.345	W105 03.383	9637	Conveyance Channel
021CC	N38 54.299	W105 03.461	9668	Conveyance Channel
022CC	N38 54.288	W105 03.552	9692	Conveyance Channel
023CC	N38 54.272	W105 03.583	9701	Conveyance Channel
024CC	N38 54.289	W105 03.638	9715	Conveyance Channel
025CC	N38 54.258	W105 03.697	9744	Conveyance Channel
026CC	N38 54.232	W105 03.643	9752	Conveyance Channel
027CC	N38 54.183	W105 03.652	9771	Conveyance Channel
028CC	N38 54.149	W105 03.714	9818	Conveyance Channel
029CC	N38 54.145	W105 03.816	9856	Conveyance Channel
030CC	N38 54.134	W105 03.828	9855	Conveyance Channel
031CC	N38 54.130	W105 03.829	9861	Conveyance Channel
032CC	N38 54.159	W105 03.836	9858	Conveyance Channel
033CC	N38 54.106	W105 03.854	9886	Conveyance Channel
034CC	N38 54.037	W105 03.896	9940	Conveyance Channel
035CC	N38 53.909	W105 04.000	10060	Conveyance Channel
036CC	N38 53.866	W105 03.875	10126	Conveyance Channel
037CC	N38 53.821	W105 03.855	10217	Conveyance Channel
038CC	N38 53.759	W105 03.787	10254	Conveyance Channel
039FS	N38 54.910	W105 02.812	9455	Fill Slope
040CC	N38 54.914	W105 02.789	9464	Conveyance Channel
041CP	N38 53.807	W105 03.893	10072	Road Survey Control Point
042DD	N38 53.719	W105 03.746	10161	Drainage Ditch
043FS	N38 53.726	W105 03.764	10180	Fill Slope
044RX	N38 53.726	W105 03.763	10183	Road Cross Section
045CS	N38 53.657	W105 03.868	10266	Cut Slope
046DD	N38 53.658	W105 03.868	10268	Drainage Ditch
047RX	N38 53.658	W105 03.868	10268	Road Cross Section
048FS	N38 53.651	W105 03.880	10275	Fill Slope

Site Locations for Effectiveness and Validation Monitoring 2004

Site ID	Latitude (hddd°mm.mmm)	Longitude (hddd°mm.mmm)	Altitude (ft)	Feature Description
049CS	N38 53.592	W105 04.020	10406	Cut Slope
050RX	N38 53.593	W105 04.020	10404	Road Cross Section
051DD	N38 53.593	W105 04.021	10397	Drainage Ditch
052FS	N38 53.593	W105 04.021	10401	Fill Slope
053CC	N38 53.560	W105 04.127	10478	Conveyance Channel
054CC	N38 53.579	W105 04.148	10448	Conveyance Channel
055FS	N38 53.612	W105 04.095	10445	Fill Slope
056RX	N38 53.614	W105 04.096	10442	Road Cross Section
057DD	N38 53.613	W105 04.095	10445	Drainage Ditch
058CC	N38 53.513	W105 04.057	10512	Conveyance Channel
059CS	N38 53.353	W105 04.222	10697	Cut Slope
060RX	N38 53.354	W105 04.219	10691	Road Cross Section
061DD	N38 53.221	W105 04.381	10808	Drainage Ditch
062RX	N38 53.216	W105 04.381	10805	Road Cross Section
063CC	N38 53.223	W105 04.394	10803	Conveyance Channel
064CC	N38 53.448	W105 04.155	10634	Conveyance Channel
065CC	N38 53.382	W105 04.192	10679	Conveyance Channel
066CC	N38 53.336	W105 04.243	10701	Conveyance Channel
067CC	N38 53.297	W105 04.299	10736	Conveyance Channel
068CC	N38 53.251	W105 04.305	10841	Conveyance Channel
069CC	N38 53.019	W105 04.287	10989	Conveyance Channel
070CC	N38 52.956	W105 04.276	11028	Conveyance Channel
071DD	N38 52.972	W105 04.285	11017	Drainage Ditch
072RX	N38 52.972	W105 04.285	11015	Road Cross Section
073ST	N38 52.879	W105 04.311	11062	Sediment Trap
074FS	N38 52.927	W105 04.272	11053	Fill Slope
075RG	N38 53.797	W105 03.890	10109	Precipiatation Gauge
076RG	N38 52.582	W105 03.970	11810	Precipiatation Gauge
077RG	N38 51.783	W105 03.999	13069	Precipiatation Gauge
078CS	N38 53.331	W105 04.275	10478	Cut Slope
079FS	N38 52.882	W105 04.382	11254	Fill Slope
080DD	N38 52.865	W105 04.391	11256	Drainage Ditch
081CC	N38 52.943	W105 04.415	11194	Conveyance Channel
082DD	N38 52.787	W105 04.376	11284	Drainage Ditch
083FS	N38 52.777	W105 04.362	11288	Fill Slope
084CC	N38 52.796	W105 04.471	11360	Conveyance Channel
085DD	N38 52.786	W105 04.410	11313	Drainage Ditch
086FS	N38 52.602	W105 04.390	11447	Fill Slope
087CS	N38 52.435	W105 04.432	11542	Cut Slope
088FS	N38 52.388	W105 04.549	11590	Fill Slope
089CC	N38 52.391	W105 04.555	11580	Conveyance Channel
090CS	N38 52.366	W105 04.540	11604	Cut Slope
091CC	N38 52.402	W105 04.414	11643	Conveyance Channel
092DD	N38 52.432	W105 04.204	11781	Drainage Ditch
093FS	N38 52.399	W105 04.401	11642	Fill Slope
094CC	N38 52.540	W105 04.069	11873	Conveyance Channel
095CC	N38 52.452	W105 04.205	11787	Conveyance Channel
096CC	N38 52.379	W105 04.217	11746	Conveyance Channel
097CC	N38 52.381	W105 04.310	11678	Conveyance Channel
098FS	N38 52.265	W105 03.995	12242	Fill Slope

Site Locations for Effectiveness and Validation Monitoring 2004

Site ID	Latitude (hddd°mm.mmm)	Longitude (hddd°mm.mmm)	Altitude (ft)	Feature Description
099CC	N38 52.131	W105 04.046	12319	Conveyance Channel
100CC	N38 52.133	W105 03.936	12353	Conveyance Channel
101FS	N38 52.097	W105 03.875	12390	Fill Slope
102CS	N38 51.641	W105 04.063	12963	Cut Slope
103FS	N38 51.491	W105 04.021	12950	Fill Slope
104CC	N38 51.444	W105 03.894	12923	Conveyance Channel
105FS	N38 51.062	W105 03.694	13083	Fill Slope
106CC	N38 52.082	W105 03.858	12251	Conveyance Channel
107DD	N38 52.044	W105 03.824	12312	Drainage Ditch
108CC	N38 51.994	W105 03.769	12362	Conveyance Channel
109CC	N38 52.027	W105 03.825	12393	Conveyance Channel
110CC	N38 52.062	W105 03.914	12448	Conveyance Channel
111CC	N38 52.051	W105 03.992	12511	Conveyance Channel
112CC	N38 52.049	W105 03.933	12531	Conveyance Channel
113CC	N38 52.002	W105 03.873	12577	Conveyance Channel
114CC	N38 51.956	W105 03.840	12601	Conveyance Channel
115CC	N38 51.977	W105 03.995	12692	Conveyance Channel
116CC	N38 51.940	W105 04.080	12736	Conveyance Channel
117CC	N38 51.925	W105 04.141	12777	Conveyance Channel
118CC	N38 51.912	W105 04.177	12797	Conveyance Channel
119CC	N38 51.914	W105 04.032	12850	Conveyance Channel
120CC	N38 51.823	W105 04.090	12876	Conveyance Channel
121CC	N38 51.439	W105 03.804	12877	Conveyance Channel
122CC	N38 51.347	W105 03.789	12920	Conveyance Channel
123CS	N38 51.361	W105 03.782	12920	Cut Slope
124FS	N38 51.362	W105 03.788	12931	Fill Slope
125CC	N38 51.238	W105 03.806	12986	Conveyance Channel
126CC	N38 51.158	W105 03.789	13031	Conveyance Channel
127CC	N38 51.032	W105 03.697	13064	Conveyance Channel
128FS	N38 50.930	W105 03.732	13072	Fill Slope
129CC	N38 50.897	W105 03.662	13068	Conveyance Channel
130CC	N38 50.900	W105 03.177	13183	Conveyance Channel
131CC	N38 50.940	W105 03.382	13088	Conveyance Channel
132CC	N38 50.840	W105 03.274	13217	Conveyance Channel
133CC	N38 50.768	W105 03.213	13282	Conveyance Channel
134CC	N38 50.671	W105 03.035	13401	Conveyance Channel
135CC	N38 50.285	W105 02.872	13677	Conveyance Channel
136CC	N38 50.299	W105 02.931	13624	Conveyance Channel
137CC	N38 50.260	W105 02.755	13733	Conveyance Channel
138CC	N38 50.221	W105 02.605	13805	Conveyance Channel
139CC	N38 50.774	W105 03.110	13370	Conveyance Channel
140CC	N38 50.730	W105 03.195	13327	Conveyance Channel
141CS	N38 51.043	W105 03.690	13103	Cut Slope
152RW	N38 54.912	W105 02.837	9444	Rock Weir/Apron
153RW	N38 54.741	W105 03.066	9457	Rock Weir/Apron
154RX	N38 52.040	W105 03.817	12112	Road Cross Section
155DD	N38 51.245	W105 03.803	12917	Drainage Ditch
156RX	N38 51.244	W105 03.799	12922	Road Cross Section
157DD	N38 51.074	W105 03.684	13100	Drainage Ditch
158RX	N38 51.074	W105 03.683	13099	Road Cross Section

Site Locations for Effectiveness and Validation Monitoring 2004

Site ID	Latitude (hddd°mm.mmm)	Longitude (hddd°mm.mmm)	Altitude (ft)	Feature Description
159DD	N38 51.610	W105 04.072	13091	Drainage Ditch
160RX	N38 51.611	W105 04.072	13066	Road Cross Section
161RW	N38 54.720	W105 03.055	9516	Rock Weir/Apron
162RW	N38 54.887	W105 02.854	9518	Rock Weir/Apron
163RA	N38 54.665	W105 03.115	9528	Rock Weir/Apron
175CC	N38 55.104	W105 02.532	9437	Conveyance Channel
176RW	N38 54.146	W105 03.795	9838	Rock Weir
177FS	N38 55.302	W105 02.224	9323	Fill Slope
178RW	N38 54.142	W105 03.821	9839	Rock Weir
179RW	N38 54.127	W105 03.852	9851	Rock Weir
180RW	N38 54.055	W105 03.903	9906	Rock Weir
181RW	N38 54.025	W105 03.918	9919	Rock Weir
182DD	N38 54.895	W105 02.860	9430	Drainage Ditch
183FS	N38 54.675	W105 03.109	9453	Fill Slope
184CC	N38 54.708	W105 03.363	9308	Conveyance Channel
185CS	N38 54.536	W105 03.246	9532	Cut Slope
186FS	N38 54.524	W105 03.242	9538	Fill Slope
187FS	N38 54.281	W105 03.658	9711	Fill Slope
188DD	N38 54.075	W105 03.892	9894	Drainage Ditch
189CC	N38 54.073	W105 03.886	9887	Conveyance Channel
190CC	N38 54.095	W105 03.869	9871	Conveyance Channel
191CC	N38 54.117	W105 03.854	9855	Conveyance Channel
192CS	N38 54.183	W105 03.677	9786	Cut Slope
193FS	N38 54.821	W105 02.983	9507	Fill Slope
194FS	N38 54.811	W105 03.004	9506	Fill Slope
195DD	N38 54.827	W105 02.983	9505	Drainage Ditch
196FS	N38 54.872	W105 02.900	9497	Fill Slope
197CS	N38 54.364	W105 03.383	9640	Cut Slope
198FS	N38 54.497	W105 03.254	9560	Fill Slope
199RW	N38 54.688	W105 03.389	9326	Sediment Pond
200RW	N38 55.261	W105 02.246	9418	Rock Weir
201RW	N38 54.805	W105 03.021	9522	Rock Weir
202RW	N38 54.619	W105 03.132	9450	Rock Weir
203FS	N38 54.603	W105 03.139	9517	Fill Slope
204FS	N38 54.273	W105 03.572	9707	Fill Slope
205DD	N38 54.022	W105 03.927	9983	Drainage Ditch
206CC	N38 54.689	W105 03.097	9506	Conveyance Channel
207CC	N38 51.664	W105 04.062	12962	Conveyance Channel
208CC	N38 52.754	W105 04.445	11172	Conveyance Channel
209CC	N38 52.647	W105 04.411	11365	Conveyance Channel
210CC	N38 54.059	W105 03.916	9849	Conveyance Channel
211CC	N38 54.130	W105 03.844	9853	Conveyance Channel
212CC	N38 53.149	W105 04.311	10893	Conveyance Channel
213CC	N38 50.964	W105 03.391	13046	Conveyance Channel
214CC	N38 50.234	W105 02.661	13198	Conveyance Channel
215CC	N38 50.356	W105 02.792	13375	Conveyance Channel
BHMR1	N38 48.951	W105 03.040	11885	Boehmer Creek 1
BHMR2	N38 49.061	W105 03.027	11995	Boehmer Creek 2
EBVR1	N38 49.832	W105 03.612	12156	East Fork Beaver Creek 1
EBVR2	N38 49.907	W105 03.598	12190	East Fork Beaver Creek 2

Site Locations for Effectiveness and Validation Monitoring 2004

Site ID	Latitude (hddd°mm.mmm)	Longitude (hddd°mm.mmm)	Altitude (ft)	Feature Description
NCAT1	N38 54.746	W105 05.994	9415	North Catamount Creek 1
NCAT2	N38 54.402	W105 06.106	9519	North Catamount Creek 2
NCRY1*	N38 54.418	W105 03.199	9453	North Fork Crystal Creek 1 & 2
OILC1	N38 48.449	W105 06.511	10505	Oil Creek 1
SCAT1	N38 55.035	W105 04.112	9368	South Catamount Creek 1
SCAT2	N38 54.974	W105 04.181	9345	South Catamount Creek 2
SKIC1	N38 54.975	W105 04.078	9418	Ski Creek 1
SKIC2	N38 53.767	W105 03.987	10035	Ski Creek 2
SVRY1	N38 52.467	W105 03.039	10732	Severy Creek 1
SVRY2	N38 52.472	W105 03.339	10926	Severy Creek 2
WBVR1	N38 48.181	W105 05.710	10726	West Fork Beaver Creek 1
WBVR2	N38 48.349	W105 05.591	10698	West Fork Beaver Creek 2

* North Fork Crystal Creek 2 (NCRY2) is located 200 ft upstream from NCRY1

Appendix B

Summary of Storm Events for 3 Rain Gauges

075RG
076RG
077RG

2004

and

Maximum 30/60 Minute Intensity and Total Storm Volume Graphs for all 3 Gauges in 2003

Summary of Storms Measured at 075RG - 2004

DateTime Start	DateTime End	Storms (tips)	Storm Volume (in)	Duration (hr)	MedianTime	Ave Rate (in/hr)	Max Tips 30 min	Max Tips 60 min	Storm ID
13May04 10:08:06.5	13May04 11:12:12.5	18	0.18	1.068	13May04 10:40:09.5	0.168	13	16	1
14May04 08:53:55.0	14May04 09:13:46.5	6	0.06	0.331	14May04 09:03:50.7	0.181	5	5	2
02Jun04 13:23:10.5	02Jun04 13:52:43.5	7	0.07	0.492	02Jun04 13:37:57.0	0.142	6	6	3
05Jun04 14:21:27.0	05Jun04 14:31:41.0	13	0.13	0.171	05Jun04 14:26:34.0	0.762	12	12	4
10Jun04 00:48:01.5	10Jun04 01:06:22.0	10	0.1	0.306	10Jun04 00:57:11.7	0.327	9	9	5
16Jun04 23:58:39.5	17Jun04 00:00:13.5	2	0.02	0.026	16Jun04 23:59:26.5	0.766	1	1	6
17Jun04 19:25:33.5	17Jun04 21:33:15.0	25	0.25	2.128	17Jun04 20:29:24.2	0.117	13	14	7
19Jun04 18:00:56.0	19Jun04 18:09:44.5	3	0.03	0.147	19Jun04 18:05:20.2	0.204	2	2	8
21Jun04 11:53:11.5	21Jun04 12:11:23.5	9	0.09	0.303	21Jun04 12:02:17.5	0.297	8	8	9
21Jun04 13:11:36.5	21Jun04 13:45:39.0	5	0.05	0.567	21Jun04 13:28:37.7	0.088	3	4	10
22Jun04 07:42:53.0	22Jun04 11:41:33.5	86	0.86	3.978	22Jun04 09:42:13.3	0.216	18	33	11
24Jun04 17:05:05.5	24Jun04 17:20:00.5	11	0.11	0.249	24Jun04 17:12:33.0	0.442	10	10	12
24Jun04 23:20:59.0	24Jun04 23:48:48.5	4	0.04	0.464	24Jun04 23:34:53.7	0.086	3	3	13
25Jun04 12:46:04.0	25Jun04 13:37:48.5	47	0.47	0.862	25Jun04 13:11:56.2	0.545	37	46	14
25Jun04 17:12:25.0	25Jun04 17:50:32.0	2	0.02	0.635	25Jun04 17:31:28.5	0.031	0	1	15
26Jun04 13:54:11.5	26Jun04 14:50:35.0	28	0.28	0.940	26Jun04 14:22:23.2	0.298	20	27	16
27Jun04 14:40:22.5	27Jun04 20:04:41.0	106	1.06	5.405	27Jun04 17:22:31.7	0.196	39	68	17
28Jun04 14:47:58.5	28Jun04 20:28:22.0	17	0.17	5.673	28Jun04 17:38:10.3	0.030	3	4	18
29Jun04 14:27:46.0	29Jun04 16:02:51.0	14	0.14	1.585	29Jun04 15:15:18.5	0.088	6	9	19
29Jun04 17:33:08.5	29Jun04 17:54:15.0	2	0.02	0.352	29Jun04 17:43:41.8	0.057	1	1	20
30Jun04 10:26:11.5	30Jun04 16:56:01.5	96	0.96	6.497	30Jun04 13:41:06.5	0.148	40	52	21
06Jul04 16:42:31.5	06Jul04 17:05:02.5	3	0.03	0.375	06Jul04 16:53:47.0	0.080	2	2	22
10Jul04 18:28:28.5	10Jul04 18:45:38.5	6	0.06	0.286	10Jul04 18:37:03.5	0.210	5	5	23
14Jul04 14:26:41.5	14Jul04 17:31:30.5	28	0.28	3.080	14Jul04 15:59:06.0	0.091	11	17	24
15Jul04 16:35:06.5	15Jul04 18:01:28.0	128	1.28	1.439	15Jul04 17:18:17.2	0.889	90	121	25
16Jul04 02:02:57.0	16Jul04 03:49:17.0	7	0.07	1.772	16Jul04 02:56:07.0	0.039	2	3	26
16Jul04 12:38:16.5	16Jul04 22:27:07.5	196	1.96	9.814	16Jul04 17:32:42.0	0.200	82	92	27
17Jul04 14:50:39.5	17Jul04 18:52:55.5	46	0.46	4.038	17Jul04 16:51:47.5	0.114	12	19	28
18Jul04 19:16:09.0	18Jul04 19:39:46.5	17	0.17	0.394	18Jul04 19:27:57.7	0.432	16	16	29
19Jul04 18:36:58.5	19Jul04 20:46:33.0	19	0.19	2.160	19Jul04 19:41:45.8	0.088	7	10	30
20Jul04 19:59:29.0	20Jul04 20:09:04.5	2	0.02	0.160	20Jul04 20:04:16.7	0.125	1	1	31
22Jul04 13:18:56.0	22Jul04 15:37:51.0	28	0.28	2.315	22Jul04 14:28:23.5	0.121	13	17	32
22Jul04 22:32:09.0	22Jul04 23:47:00.0	36	0.36	1.247	22Jul04 23:09:34.5	0.289	29	33	33
23Jul04 14:51:28.0	23Jul04 15:27:55.0	10	0.1	0.608	23Jul04 15:09:41.5	0.165	7	9	34

Summary of Storms Measured at 075RG - 2004

DateTime Start	DateTime End	Storms (tips)	Storm Volume (in)	Duration (hr)	MedianTime	Ave Rate (in/hr)	Max Tips 30 min	Max Tips 60 min	Storm ID
23Jul04 17:31:30.0	23Jul04 18:54:25.5	29	0.29	1.382	23Jul04 18:12:57.7	0.210	18	23	35
24Jul04 12:38:44.0	24Jul04 13:46:39.0	5	0.05	1.132	24Jul04 13:12:41.5	0.044	3	3	36
24Jul04 15:06:41.5	24Jul04 16:16:58.5	8	0.08	1.171	24Jul04 15:41:50.0	0.068	5	6	37
24Jul04 18:45:14.0	24Jul04 19:22:21.5	6	0.06	0.619	24Jul04 19:03:47.7	0.097	4	5	38
26Jul04 15:24:39.5	26Jul04 15:47:10.5	11	0.11	0.375	26Jul04 15:35:55.0	0.293	10	10	39
28Jul04 16:01:17.5	28Jul04 17:14:14.0	35	0.35	1.216	28Jul04 16:37:45.7	0.288	17	30	40
04Aug04 18:39:55.0	04Aug04 19:50:02.5	26	0.26	1.169	04Aug04 19:14:58.7	0.222	15	24	41
05Aug04 00:50:11.0	05Aug04 02:30:59.5	17	0.17	1.680	05Aug04 01:40:35.2	0.101	12	12	42
05Aug04 17:18:19.5	05Aug04 18:50:17.0	25	0.25	1.533	05Aug04 18:04:18.2	0.163	11	18	43
06Aug04 14:40:02.5	06Aug04 14:56:24.0	20	0.2	0.273	06Aug04 14:48:13.2	0.734	19	19	44
06Aug04 19:02:35.5	06Aug04 19:19:32.5	7	0.07	0.283	06Aug04 19:11:04.0	0.248	6	6	45
08Aug04 15:58:26.0	08Aug04 15:59:45.5	2	0.02	0.022	08Aug04 15:59:05.7	0.906	1	1	46
18Aug04 11:14:21.0	18Aug04 17:16:27.5	40	0.4	6.035	18Aug04 14:15:24.3	0.066	14	16	47
18Aug04 18:53:41.0	18Aug04 19:43:04.5	4	0.04	0.823	18Aug04 19:18:22.7	0.049	2	3	48
18Aug04 22:04:32.0	19Aug04 01:54:12.0	49	0.49	3.828	18Aug04 23:59:22.0	0.128	10	18	49
19Aug04 03:37:55.5	19Aug04 04:29:13.0	4	0.04	0.855	19Aug04 04:03:34.2	0.047	1	3	50
19Aug04 16:13:42.5	19Aug04 16:59:07.5	29	0.29	0.757	19Aug04 16:36:25.0	0.383	21	28	51
19Aug04 18:03:24.5	19Aug04 18:31:41.0	6	0.06	0.471	19Aug04 18:17:32.7	0.127	5	5	52
20Aug04 13:21:42.5	20Aug04 13:28:06.0	2	0.02	0.107	20Aug04 13:24:54.2	0.188	1	1	53
20Aug04 17:22:35.0	20Aug04 19:33:41.0	83	0.83	2.185	20Aug04 18:28:08.0	0.380	51	66	54
21Aug04 15:37:59.5	21Aug04 16:13:54.5	11	0.11	0.599	21Aug04 15:55:57.0	0.184	8	10	55
21Aug04 17:28:58.5	21Aug04 17:39:40.5	3	0.03	0.178	21Aug04 17:34:19.5	0.168	2	2	56
22Aug04 16:16:51.5	22Aug04 16:30:04.5	6	0.06	0.220	22Aug04 16:23:28.0	0.272	5	5	57
27Aug04 14:41:37.5	27Aug04 17:03:14.0	44	0.44	2.360	27Aug04 15:52:25.7	0.186	15	23	58
31Aug04 16:41:17.0	31Aug04 17:50:11.5	15	0.15	1.148	31Aug04 17:15:44.2	0.131	9	13	59
04Sep04 14:25:02.5	04Sep04 14:59:26.5	31	0.31	0.573	04Sep04 14:42:14.5	0.541	29	30	60
04Sep04 19:02:42.5	04Sep04 19:06:19.5	3	0.03	0.060	04Sep04 19:04:31.0	0.498	2	2	61
19Sep04 15:58:21.5	19Sep04 16:49:01.0	36	0.36	0.844	19Sep04 16:23:41.2	0.426	21	35	62
21Sep04 13:57:35.5	21Sep04 14:19:33.0	3	0.03	0.366	21Sep04 14:08:34.2	0.082	2	2	63
22Sep04 10:05:25.0	22Sep04 10:49:42.0	20	0.2	0.738	22Sep04 10:27:33.5	0.271	15	19	64
24Sep04 16:45:17.0	24Sep04 17:00:59.0	2	0.02	0.262	24Sep04 16:53:08.0	0.076	1	1	65
26Sep04 19:20:50.0	26Sep04 19:37:10.5	5	0.05	0.272	26Sep04 19:29:00.2	0.184	4	4	66

Summary of Storms Measured at 076RG - 2004

DateTime Start	DateTime End	Storms (tips)	Storm Volume (in)	Duration (hr)	MedianTime	Ave Rate (in/hr)	Max Tips 30 min	Max Tips 60 min	Storm ID
12May04 17:40:54.5	12May04 17:43:42.0	3	0.03	0.047	12May04 17:42:18.2	0.645	2	2	1
13May04 08:23:21.0	13May04 08:28:18.5	4	0.04	0.083	13May04 08:25:49.7	0.484	3	3	2
13May04 10:04:16.5	13May04 11:14:29.5	16	0.16	1.170	13May04 10:39:23.0	0.137	7	13	3
14May04 09:35:54.0	14May04 09:41:33.0	3	0.03	0.094	14May04 09:38:43.5	0.319	2	2	4
17May04 19:57:42.5	17May04 22:58:37.5	10	0.1	3.015	17May04 21:28:10.0	0.033	3	5	5
18May04 13:30:50.5	18May04 13:33:21.5	2	0.02	0.042	18May04 13:32:06.0	0.477	1	1	6
02Jun04 13:53:01.5	02Jun04 13:59:42.0	6	0.06	0.111	02Jun04 13:56:21.7	0.539	5	5	7
05Jun04 13:48:58.5	05Jun04 15:35:16.0	19	0.19	1.772	05Jun04 14:42:07.2	0.107	10	16	8
09Jun04 17:11:27.5	09Jun04 17:34:51.5	2	0.02	0.390	09Jun04 17:23:09.5	0.051	1	1	9
10Jun04 00:54:01.5	10Jun04 01:04:50.5	8	0.08	0.180	10Jun04 00:59:26.0	0.444	7	7	10
16Jun04 23:49:28.0	17Jun04 00:38:09.5	12	0.12	0.812	17Jun04 00:13:48.7	0.148	8	11	11
17Jun04 19:27:17.0	18Jun04 02:01:51.5	41	0.41	6.576	17Jun04 22:44:34.3	0.062	8	11	12
19Jun04 18:00:17.5	19Jun04 18:07:50.0	4	0.04	0.126	19Jun04 18:04:03.7	0.318	3	3	13
22Jun04 08:09:08.5	22Jun04 11:40:15.5	63	0.63	3.519	22Jun04 09:54:42.0	0.179	20	39	14
24Jun04 16:49:58.0	24Jun04 22:05:21.0	42	0.42	5.256	24Jun04 19:27:39.5	0.080	7	10	15
24Jun04 23:12:25.0	24Jun04 23:44:21.5	6	0.06	0.532	24Jun04 23:28:23.2	0.113	4	5	16
25Jun04 12:37:18.0	25Jun04 22:10:48.5	87	0.87	9.558	25Jun04 17:24:03.3	0.091	12	23	17
26Jun04 15:02:40.0	26Jun04 16:45:39.0	38	0.38	1.716	26Jun04 15:54:09.5	0.221	24	35	18
27Jun04 14:39:16.5	27Jun04 19:02:58.0	64	0.64	4.395	27Jun04 16:51:07.2	0.146	24	33	19
27Jun04 22:00:18.0	27Jun04 23:01:24.5	5	0.05	1.018	27Jun04 22:30:51.2	0.049	2	3	20
28Jun04 07:25:19.5	28Jun04 07:54:03.0	4	0.04	0.479	28Jun04 07:39:41.2	0.084	3	3	21
28Jun04 16:14:56.5	28Jun04 20:32:19.5	17	0.17	4.290	28Jun04 18:23:38.0	0.040	7	8	22
29Jun04 14:05:06.5	29Jun04 15:48:14.5	12	0.12	1.719	29Jun04 14:56:40.5	0.070	3	6	23
29Jun04 17:27:27.0	29Jun04 17:46:15.0	3	0.03	0.313	29Jun04 17:36:51.0	0.096	2	2	24
30Jun04 10:15:42.5	30Jun04 16:22:50.5	95	0.95	6.119	30Jun04 13:19:16.5	0.155	22	34	25
01Jul04 20:02:45.5	01Jul04 20:07:24.5	3	0.03	0.077	01Jul04 20:05:05.0	0.387	2	2	26
10Jul04 18:31:38.0	10Jul04 20:13:18.5	22	0.22	1.695	10Jul04 19:22:28.2	0.130	14	14	27
14Jul04 14:52:58.5	14Jul04 17:30:18.0	14	0.14	2.622	14Jul04 16:11:38.2	0.053	5	7	28
15Jul04 16:38:42.5	15Jul04 18:06:03.5	52	0.52	1.456	15Jul04 17:22:23.0	0.357	37	47	29
16Jul04 03:13:25.0	16Jul04 03:28:26.0	4	0.04	0.250	16Jul04 03:20:55.5	0.160	3	3	30
16Jul04 12:35:09.5	16Jul04 18:58:46.5	163	1.63	6.394	16Jul04 15:46:58.0	0.255	65	74	31
16Jul04 20:24:06.0	16Jul04 22:12:41.0	18	0.18	1.810	16Jul04 21:18:23.5	0.099	6	11	32
17Jul04 14:03:26.5	17Jul04 19:14:27.5	45	0.45	5.184	17Jul04 16:38:57.0	0.087	11	17	33
18Jul04 19:23:16.5	18Jul04 19:54:36.5	12	0.12	0.522	18Jul04 19:38:56.5	0.230	10	11	34

Summary of Storms Measured at 076RG - 2004

DateTime Start	DateTime End	Storms (tips)	Storm Volume (in)	Duration (hr)	MedianTime	Ave Rate (in/hr)	Max Tips 30 min	Max Tips 60 min	Storm ID
19Jul04 18:37:46.0	19Jul04 21:01:06.5	24	0.24	2.389	19Jul04 19:49:26.2	0.100	10	15	35
20Jul04 16:10:15.0	20Jul04 16:54:41.5	4	0.04	0.741	20Jul04 16:32:28.3	0.054	2	3	36
22Jul04 11:29:57.5	22Jul04 15:28:39.5	29	0.29	3.978	22Jul04 13:29:18.5	0.073	12	20	37
22Jul04 22:28:52.0	23Jul04 00:27:40.0	52	0.52	1.980	22Jul04 23:28:16.0	0.263	29	44	38
23Jul04 14:52:50.0	23Jul04 15:25:24.0	10	0.1	0.543	23Jul04 15:09:07.0	0.184	7	9	39
23Jul04 17:35:27.5	23Jul04 19:03:48.5	42	0.42	1.473	23Jul04 18:19:38.0	0.285	22	34	40
24Jul04 13:34:17.5	24Jul04 16:17:24.5	28	0.28	2.719	24Jul04 14:55:51.0	0.103	15	19	41
24Jul04 18:14:51.5	24Jul04 19:21:29.0	18	0.18	1.110	24Jul04 18:48:10.3	0.162	9	15	42
25Jul04 16:14:10.5	25Jul04 16:21:13.5	3	0.03	0.117	25Jul04 16:17:42.0	0.255	2	2	43
26Jul04 15:45:21.5	26Jul04 15:53:39.0	5	0.05	0.138	26Jul04 15:49:30.2	0.362	4	4	44
27Jul04 14:31:42.5	27Jul04 14:58:24.0	2	0.02	0.445	27Jul04 14:45:03.2	0.045	1	1	45
28Jul04 16:07:30.5	28Jul04 17:50:21.5	19	0.19	1.714	28Jul04 16:58:56.0	0.111	9	15	46
04Aug04 19:01:24.5	04Aug04 20:04:41.0	73	0.73	1.055	04Aug04 19:33:02.7	0.692	65	71	47
05Aug04 00:52:56.5	05Aug04 00:58:50.5	4	0.04	0.098	05Aug04 00:55:53.5	0.407	3	3	48
05Aug04 02:01:18.0	05Aug04 02:23:14.0	3	0.03	0.366	05Aug04 02:12:16.0	0.082	2	2	49
05Aug04 17:28:10.5	05Aug04 18:53:20.0	38	0.38	1.419	05Aug04 18:10:45.3	0.268	14	25	50
06Aug04 14:38:20.5	06Aug04 14:48:42.0	3	0.03	0.173	06Aug04 14:43:31.2	0.174	2	2	51
06Aug04 18:46:29.0	06Aug04 19:19:52.0	19	0.19	0.556	06Aug04 19:03:10.5	0.341	16	18	52
07Aug04 15:36:10.5	07Aug04 15:57:36.5	5	0.05	0.357	07Aug04 15:46:53.5	0.140	4	4	53
08Aug04 15:56:32.5	08Aug04 16:04:00.5	10	0.1	0.124	08Aug04 16:00:16.5	0.804	9	9	54
18Aug04 11:54:53.5	18Aug04 13:17:07.0	24	0.24	1.370	18Aug04 12:36:00.2	0.175	17	22	55
18Aug04 14:24:12.5	18Aug04 17:24:06.0	32	0.32	2.998	18Aug04 15:54:09.2	0.107	10	16	56
18Aug04 18:42:29.5	18Aug04 19:21:56.5	7	0.07	0.658	18Aug04 19:02:13.0	0.106	4	6	57
18Aug04 21:23:38.0	19Aug04 01:53:04.5	50	0.5	4.491	18Aug04 23:38:21.2	0.111	12	24	58
19Aug04 03:53:58.5	19Aug04 04:31:10.5	4	0.04	0.620	19Aug04 04:12:34.5	0.065	2	3	59
19Aug04 16:16:02.0	19Aug04 18:24:46.0	38	0.38	2.146	19Aug04 17:20:24.0	0.177	22	31	60
19Aug04 20:27:25.0	19Aug04 20:38:20.5	2	0.02	0.182	19Aug04 20:32:52.7	0.110	1	1	61
20Aug04 13:29:03.5	20Aug04 13:43:49.0	2	0.02	0.246	20Aug04 13:36:26.2	0.081	1	1	62
20Aug04 17:39:03.0	20Aug04 22:24:33.5	72	0.72	4.758	20Aug04 20:01:48.2	0.151	25	37	63
21Aug04 15:43:52.5	21Aug04 16:16:28.5	20	0.2	0.543	21Aug04 16:00:10.5	0.368	18	19	64
21Aug04 17:28:05.0	21Aug04 17:32:28.5	2	0.02	0.073	21Aug04 17:30:16.7	0.273	1	1	65
22Aug04 16:08:20.5	22Aug04 16:27:49.0	13	0.13	0.325	22Aug04 16:18:04.7	0.401	12	12	66
28Aug04 10:23:01.0	28Aug04 11:22:42.5	41	0.41	0.995	28Aug04 10:52:51.7	0.412	24	40	67
31Aug04 16:44:43.5	31Aug04 17:52:56.5	7	0.07	1.137	31Aug04 17:18:50.0	0.062	2	5	68

Summary of Storms Measured at 076RG - 2004

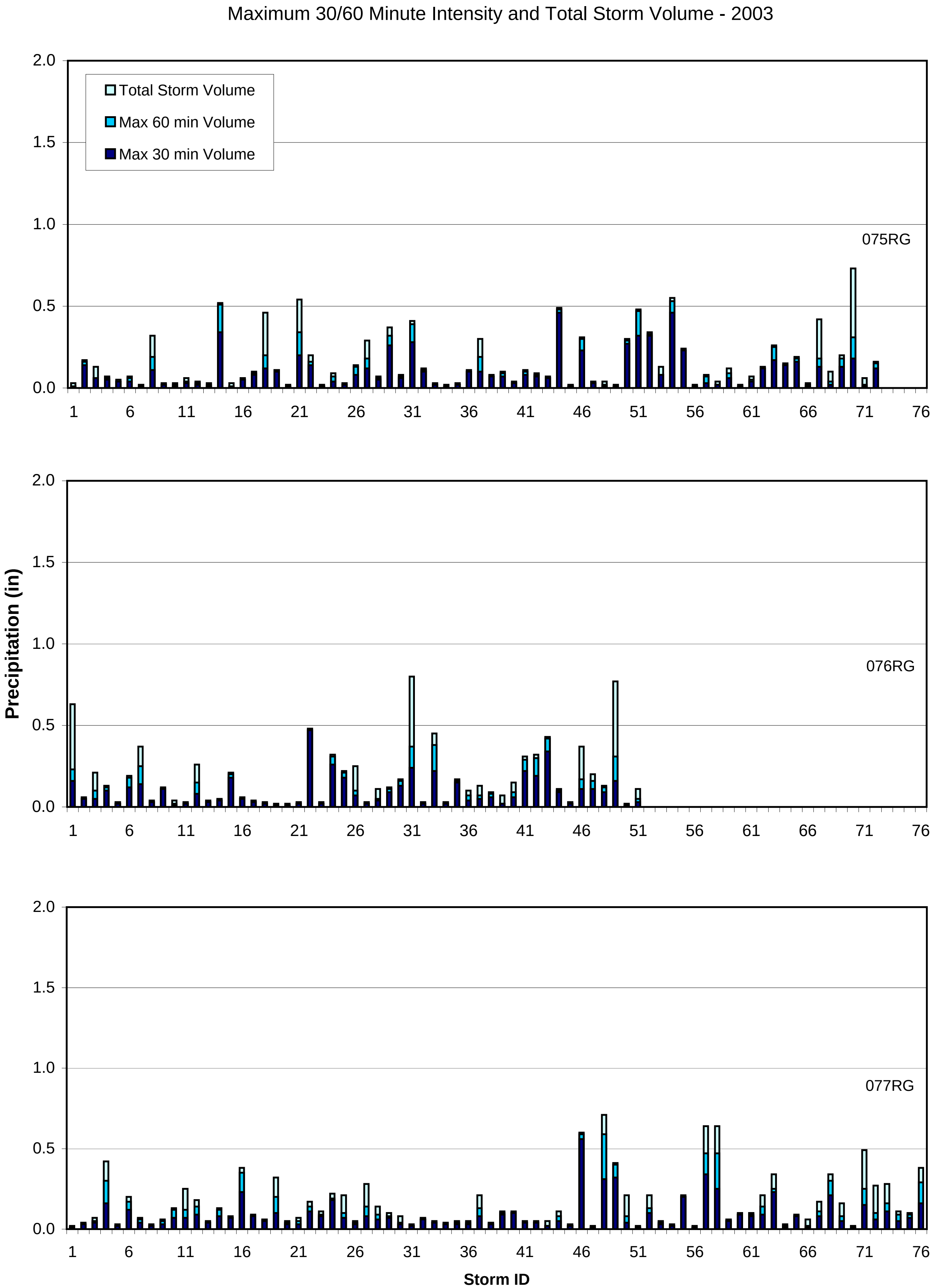
DateTime Start	DateTime End	Storms (tips)	Storm Volume (in)	Duration (hr)	MedianTime	Ave Rate (in/hr)	Max Tips 30 min	Max Tips 60 min	Storm ID
04Sep04 14:24:38.5	04Sep04 14:56:47.0	25	0.25	0.536	04Sep04 14:40:42.7	0.467	21	24	69
04Sep04 19:02:48.0	04Sep04 19:10:34.5	8	0.08	0.130	04Sep04 19:06:41.3	0.617	7	7	70
19Sep04 15:59:05.0	19Sep04 16:51:03.0	51	0.51	0.866	19Sep04 16:25:04.0	0.589	34	50	71
22Sep04 10:17:22.0	22Sep04 11:52:53.0	29	0.29	1.592	22Sep04 11:05:07.5	0.182	16	25	72

Summary of Storms Measured at 077RG - 2004

DateTime Start	DateTime End	Storms (tips)	Storm Volume (in)	Duration (hr)	MedianTime	Ave Rate (in/hr)	Max Tips 30 min	Max Tips 60 min	Storm ID
02Jun04 14:01:39.0	02Jun04 14:07:15.0	5	0.05	0.093	02Jun04 14:04:27.0	0.536	4	4	1
05Jun04 15:19:35.5	05Jun04 15:37:20.5	10	0.1	0.296	05Jun04 15:28:28.0	0.338	9	9	2
10Jun04 00:49:30.5	10Jun04 01:21:31.0	4	0.04	0.533	10Jun04 01:05:30.7	0.075	2	3	3
16Jun04 23:49:52.5	17Jun04 03:10:22.0	14	0.14	3.342	17Jun04 01:30:07.2	0.042	5	8	4
17Jun04 19:46:35.5	17Jun04 23:45:32.0	18	0.18	3.982	17Jun04 21:46:03.7	0.045	6	9	5
19Jun04 18:00:55.5	19Jun04 18:06:58.0	2	0.02	0.101	19Jun04 18:03:56.7	0.199	1	1	6
22Jun04 08:16:59.0	22Jun04 10:35:28.5	19	0.19	2.308	22Jun04 09:26:13.7	0.082	7	13	7
24Jun04 16:46:05.5	24Jun04 18:11:21.0	3	0.03	1.421	24Jun04 17:28:43.2	0.021	0	1	8
25Jun04 08:53:47.5	25Jun04 10:36:28.5	36	0.36	1.711	25Jun04 09:45:08.0	0.210	13	23	9
25Jun04 12:37:40.0	25Jun04 15:19:08.5	15	0.15	2.691	25Jun04 13:58:24.2	0.056	8	11	10
26Jun04 15:58:59.0	26Jun04 16:41:25.5	13	0.13	0.707	26Jun04 16:20:12.2	0.184	11	12	11
27Jun04 14:41:38.5	27Jun04 15:38:44.5	5	0.05	0.952	27Jun04 15:10:11.5	0.053	3	4	12
28Jun04 09:45:09.0	28Jun04 10:47:58.0	48	0.48	1.047	28Jun04 10:16:33.5	0.458	28	45	13
28Jun04 16:54:52.5	28Jun04 18:52:28.5	6	0.06	1.960	28Jun04 17:53:40.5	0.031	3	3	14
29Jun04 06:41:03.5	29Jun04 06:52:48.0	3	0.03	0.196	29Jun04 06:46:55.7	0.153	2	2	15
29Jun04 13:24:14.5	29Jun04 14:41:18.0	6	0.06	1.284	29Jun04 14:02:46.2	0.047	2	4	16
29Jun04 16:14:05.5	29Jun04 17:39:56.0	11	0.11	1.431	29Jun04 16:57:00.7	0.077	8	8	17
30Jun04 10:08:12.0	30Jun04 10:28:33.5	4	0.04	0.339	30Jun04 10:18:22.7	0.118	3	3	18
30Jun04 15:28:20.5	30Jun04 20:36:51.0	40	0.4	5.142	30Jun04 18:02:35.7	0.078	9	18	19
01Jul04 07:05:24.0	01Jul04 10:44:26.5	44	0.44	3.651	01Jul04 08:54:55.2	0.121	10	17	20
01Jul04 20:04:03.5	01Jul04 20:15:38.5	5	0.05	0.193	01Jul04 20:09:51.0	0.259	4	4	21
10Jul04 18:05:04.5	10Jul04 20:12:57.0	19	0.19	2.131	10Jul04 19:09:00.7	0.089	7	9	22
14Jul04 14:48:25.0	14Jul04 17:33:51.0	10	0.1	2.757	14Jul04 16:11:08.0	0.036	3	4	23
15Jul04 16:36:00.5	15Jul04 17:45:16.0	36	0.36	1.154	15Jul04 17:10:38.2	0.312	22	31	24
16Jul04 13:06:43.0	16Jul04 14:21:26.5	75	0.75	1.245	16Jul04 13:44:04.7	0.602	65	73	25
16Jul04 15:21:44.5	16Jul04 19:39:30.5	45	0.45	4.296	16Jul04 17:30:37.5	0.105	11	18	26
16Jul04 20:45:08.0	16Jul04 21:48:28.0	8	0.08	1.056	16Jul04 21:16:48.0	0.076	4	6	27
17Jul04 14:10:35.5	17Jul04 19:15:23.0	36	0.36	5.080	17Jul04 16:42:59.3	0.071	9	15	28
18Jul04 19:39:26.5	18Jul04 19:57:58.0	7	0.07	0.309	18Jul04 19:48:42.2	0.227	6	6	29
19Jul04 18:52:45.0	19Jul04 20:57:28.5	36	0.36	2.079	19Jul04 19:55:06.7	0.173	18	25	30
20Jul04 15:49:35.0	20Jul04 16:44:02.0	3	0.03	0.907	20Jul04 16:16:48.5	0.033	1	2	31
21Jul04 13:15:40.5	21Jul04 14:04:57.0	5	0.05	0.821	21Jul04 13:40:18.7	0.061	3	4	32
21Jul04 17:31:19.5	21Jul04 18:01:37.5	4	0.04	0.505	21Jul04 17:46:28.5	0.079	2	3	33
22Jul04 11:31:07.5	22Jul04 12:57:24.0	6	0.06	1.438	22Jul04 12:14:15.8	0.042	2	3	34

Summary of Storms Measured at 077RG - 2004

DateTime Start	DateTime End	Storms (tips)	Storm Volume (in)	Duration (hr)	MedianTime	Ave Rate (in/hr)	Max Tips 30 min	Max Tips 60 min	Storm ID
22Jul04 13:58:06.5	22Jul04 15:29:07.0	26	0.26	1.517	22Jul04 14:43:36.7	0.171	15	22	35
22Jul04 22:35:14.0	23Jul04 00:45:36.5	43	0.43	2.173	22Jul04 23:40:25.2	0.198	20	32	36
23Jul04 17:43:44.5	23Jul04 19:10:15.0	20	0.2	1.442	23Jul04 18:26:59.8	0.139	11	16	37
24Jul04 13:42:23.0	24Jul04 16:19:14.5	21	0.21	2.614	24Jul04 15:00:48.7	0.080	9	10	38
24Jul04 18:15:27.5	24Jul04 18:55:34.5	12	0.12	0.669	24Jul04 18:35:31.0	0.179	7	11	39
25Jul04 07:09:27.5	25Jul04 08:54:00.5	14	0.14	1.742	25Jul04 08:01:44.0	0.080	4	9	40
25Jul04 16:08:14.5	25Jul04 16:25:30.0	6	0.06	0.288	25Jul04 16:16:52.2	0.209	5	5	41
27Jul04 14:27:56.0	27Jul04 14:42:05.0	2	0.02	0.236	27Jul04 14:35:00.5	0.085	1	1	42
28Jul04 17:12:37.0	28Jul04 18:07:17.5	9	0.09	0.911	28Jul04 17:39:57.2	0.099	6	8	43
04Aug04 19:15:04.0	04Aug04 20:23:12.0	9	0.09	1.136	04Aug04 19:49:08.0	0.079	5	7	44
05Aug04 00:39:22.0	05Aug04 00:50:56.5	2	0.02	0.193	05Aug04 00:45:09.2	0.104	1	1	45
05Aug04 15:18:50.0	05Aug04 15:32:14.5	2	0.02	0.223	05Aug04 15:25:32.2	0.089	1	1	46
05Aug04 17:13:41.0	05Aug04 18:56:49.0	30	0.3	1.719	05Aug04 18:05:15.0	0.175	10	18	47
06Aug04 18:48:23.5	06Aug04 19:32:46.0	33	0.33	0.740	06Aug04 19:10:34.7	0.446	24	32	48
07Aug04 15:22:58.5	07Aug04 15:47:41.5	7	0.07	0.412	07Aug04 15:35:20.0	0.170	6	6	49
08Aug04 16:01:29.5	08Aug04 16:04:38.0	2	0.02	0.052	08Aug04 16:03:03.7	0.382	1	1	50
18Aug04 12:32:12.0	18Aug04 19:06:11.5	50	0.5	6.567	18Aug04 15:49:11.7	0.076	12	20	51
18Aug04 21:28:35.0	18Aug04 23:42:43.0	14	0.14	2.236	18Aug04 22:35:39.0	0.063	6	9	52
19Aug04 09:12:51.5	19Aug04 10:31:19.0	38	0.38	1.308	19Aug04 09:52:05.3	0.291	19	32	53
19Aug04 16:12:49.0	19Aug04 16:14:59.5	4	0.04	0.036	19Aug04 16:13:54.2	1.103	3	3	54
19Aug04 17:35:45.5	19Aug04 22:25:49.0	33	0.33	4.834	19Aug04 20:00:47.2	0.068	9	15	55
19Aug04 23:39:22.5	20Aug04 00:29:24.5	2	0.02	0.834	20Aug04 00:04:23.5	0.024	0	1	56
20Aug04 08:15:01.0	20Aug04 08:34:45.5	2	0.02	0.329	20Aug04 08:24:53.2	0.061	1	1	57
21Aug04 09:04:51.0	21Aug04 10:07:52.5	49	0.49	1.050	21Aug04 09:36:21.7	0.466	29	47	58
21Aug04 16:52:25.5	21Aug04 17:49:47.0	10	0.1	0.956	21Aug04 17:21:06.2	0.105	5	9	59
22Aug04 16:39:19.5	22Aug04 17:44:33.0	8	0.08	1.087	22Aug04 17:11:56.2	0.074	6	6	60
28Aug04 08:39:06.5	28Aug04 10:13:34.0	12	0.12	1.574	28Aug04 09:26:20.2	0.076	7	9	61
04Sep04 14:26:07.0	04Sep04 15:33:05.5	12	0.12	1.116	04Sep04 14:59:36.2	0.108	9	9	62
04Sep04 19:04:12.5	04Sep04 19:37:59.5	4	0.04	0.563	04Sep04 19:21:06.0	0.071	2	3	63
19Sep04 15:59:28.0	19Sep04 17:16:07.0	24	0.24	1.278	19Sep04 16:37:47.5	0.188	15	21	64
22Sep04 12:26:54.5	22Sep04 13:27:14.5	7	0.07	1.006	22Sep04 12:57:04.5	0.070	3	5	65
24Sep04 15:58:35.5	24Sep04 16:59:11.0	4	0.04	1.010	24Sep04 16:28:53.2	0.040	3	3	66


Maximum 30/60 Minute Intensity and Total Storm Volume - 2003
Total Storm Volume
Max 60 min Volume
Max 30 min Volume
075RG
076RG
077RG
Precipitation (in)
Storm ID

Appendix C

Particle Size Distribution of Cut and Fill Slope Silt Fence Sediment and Graphs

2004

Summary of Cut/Fill Slope Silt Fence Particle Size Distribution from Sieve Analysis of Grab Samples - 2004

			Particle Size Distribution - Grab Samples 2004					
Stream/Site Name	ID	Date	D15	D35	D50	D84	D95	D100
Pike's Peak Highway - Cut Slope	102CS Lower	081204	0.338	1.70	2.97	9.8	19.4	30
Pike's Peak Highway - Cut Slope	192CS Lower	092404	0.030	0.24	0.74	4.7	8.1	15
Pike's Peak Highway - Cut Slope	141CS Upper	081204	0.353	0.95	1.47	3.9	6.6	17
Pike's Peak Highway - Cut Slope	141CS Lower	081204	0.129	1.10	2.37	8.8	15.6	35
Pike's Peak Highway - Cut Slope	197CS Upper	092304	0.018	0.14	0.77	4.4	8.3	20
Pike's Peak Highway - Cut Slope	197CS Lower	092304	0.603	2.04	3.53	10.9	17.6	30
Pike's Peak Highway - Fill Slope	088FS Upper	042922	0.423	1.47	2.62	8.2	16.1	34
Pike's Peak Highway - Fill Slope	088FS Lower	042922	0.340	1.13	2.14	7.6	38.6	52
Pike's Peak Highway - Fill Slope	088FS Lower	111925	0.114	0.66	1.40	5.5	10.2	20

Sieve Analysis Worksheet

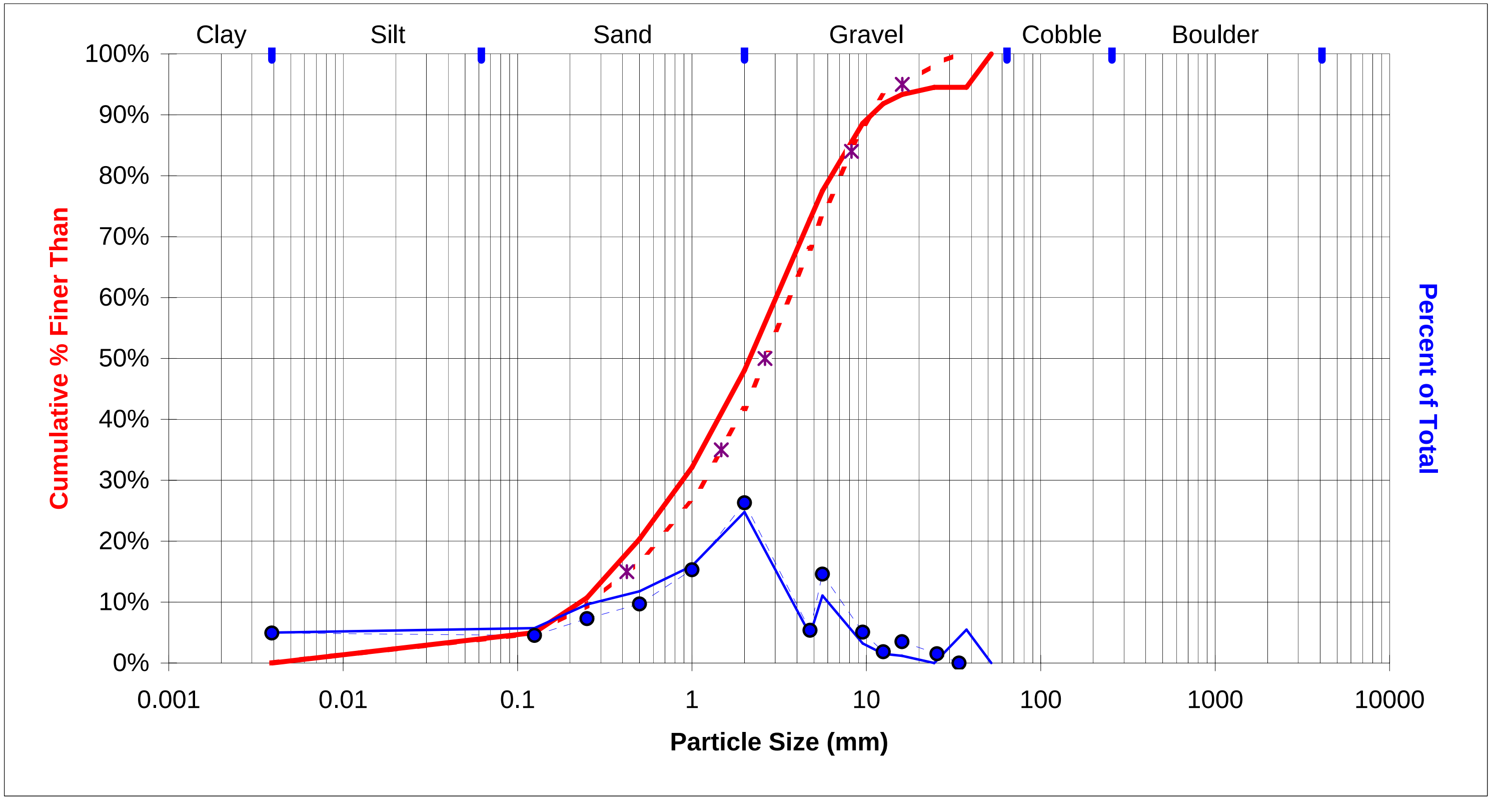
Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	**0.0%**	167.70
0.125	4.9%	154.00
0.25	9.5%	247.90
0.5	16.8%	329.60
1.0	26.5%	520.70
2.0	41.8%	894.30
4.8	68.1%	182.90
5.6	73.5%	496.20
9.5	88.0%	172.40
12.5	93.1%	62.80
16.0	95.0%	119.1
25.4	98.5%	52
34.0	100.0%	
45.0		
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Grab Samples of Sediment Accumulation Between Lower and Upper Fill Slope Silt Fences 2004

SITE NAME: Pike's Peak Highway - Fill Slope Upper/Lower
ID NUMBER: 088FS - Upper/Lower
DATE: 8/12/2004
CREW: lh, kg

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart	Year	Graph
0.42	1.47	2.62	8.22	16.07	34.0	Upper	Dashed
0.34	1.13	2.14	7.64	38.6	52.0	Lower	Solid



Sieve Analysis Worksheet

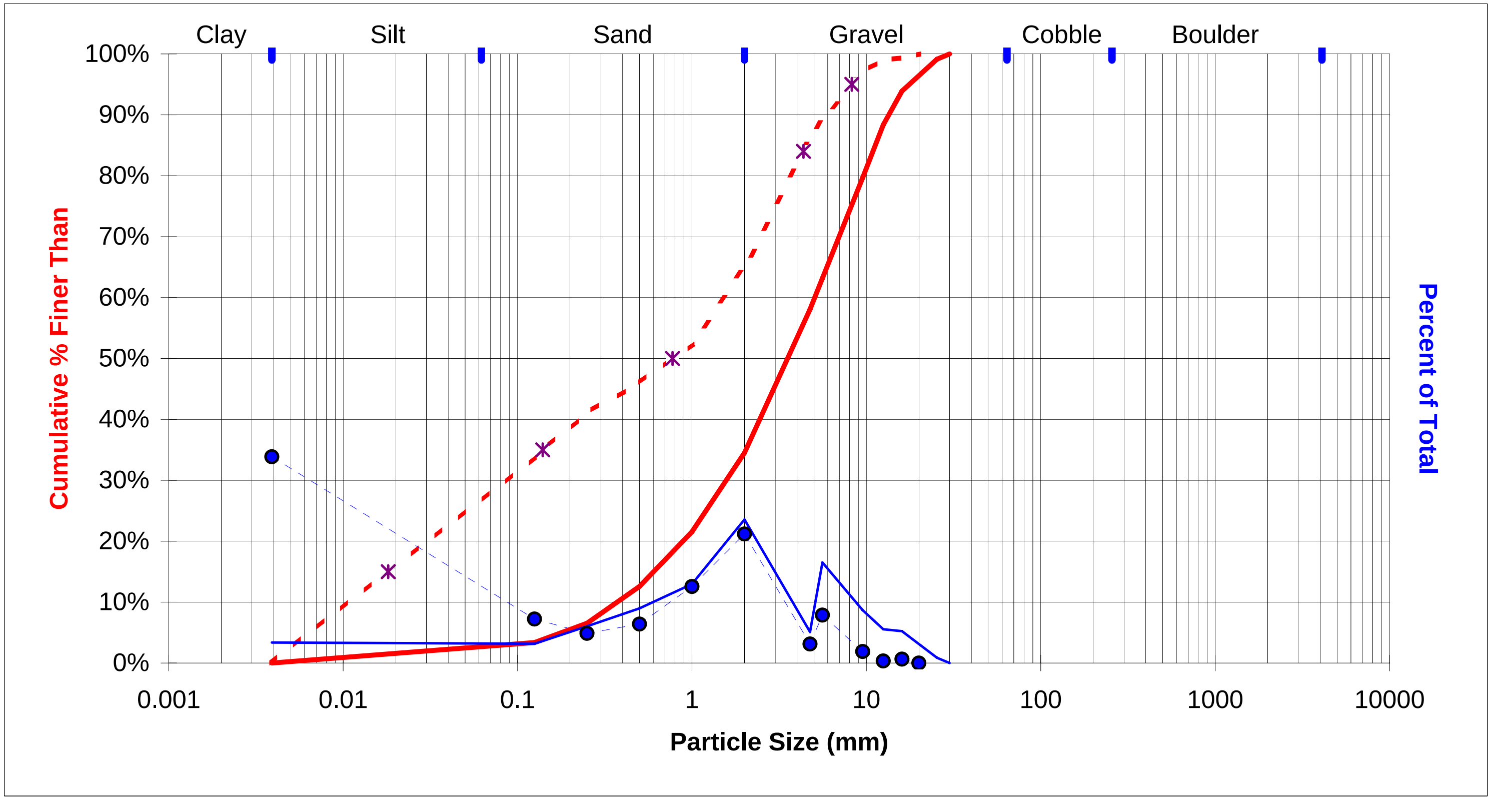
Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	**0.0%**	696.80
0.125	33.9%	148.80
0.25	41.1%	100.20
0.5	46.0%	131.80
1.0	52.4%	258.40
2.0	64.9%	436.00
4.8	86.1%	64.30
5.6	89.2%	161.90
9.5	97.1%	39.00
12.5	99.0%	7.10
16.0	99.4%	13.2
20.0	100.0%	
37.5		
45.0		
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Grab Samples of Sediment Accumulation Between Lower and Upper Cut Slope Silt Fences 2004

SITE NAME: Pike's Peak Highway - Cutl Slope Upper/Lower
ID NUMBER: 197CS - Upper/Lower
DATE: 9/23/2004
CREW: lh, kg

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart	Year	Graph
0.02	0.14	0.77	4.36	8.25	20.0	Upper	Dashed
0.60	2.04	3.53	10.9	17.6	30.0	Lower	Solid



Sieve Analysis Worksheet

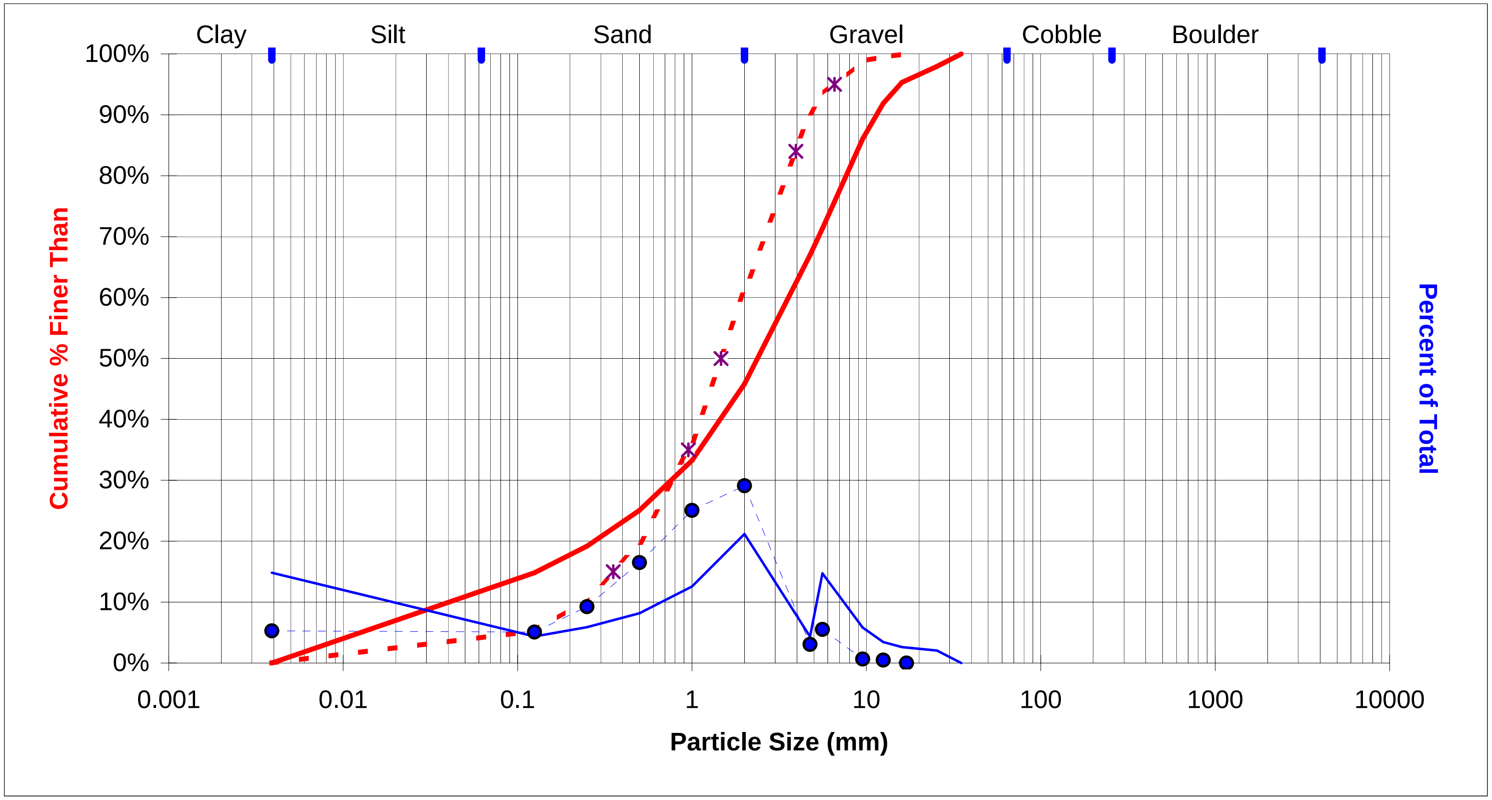
Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	0.0%	157.30
0.125	5.3%	151.30
0.25	10.4%	275.30
0.5	19.6%	490.50
1.0	36.1%	745.30
2.0	61.2%	865.70
4.8	90.3%	91.10
5.6	93.3%	164.00
9.5	98.9%	19.60
12.5	99.5%	14.40
17.0	100.0%	
25.4		
37.5		
45.0		
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Grab Samples of Sediment Accumulation Between Lower and Upper Cut Slope Silt Fences 2004

SITE NAME: Pike's Peak Highway - Cut Slope Upper/Lower
ID NUMBER: 141CS - Upper/Lower
DATE: 8/12/2004
CREW: lh, kg

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart	Year	Graph
0.35	0.95	1.47	3.94	6.57	17.0	Upper	Dashed
0.13	1.10	2.37	8.84	15.6	35.0	Lower	Solid



Sieve Analysis Worksheet

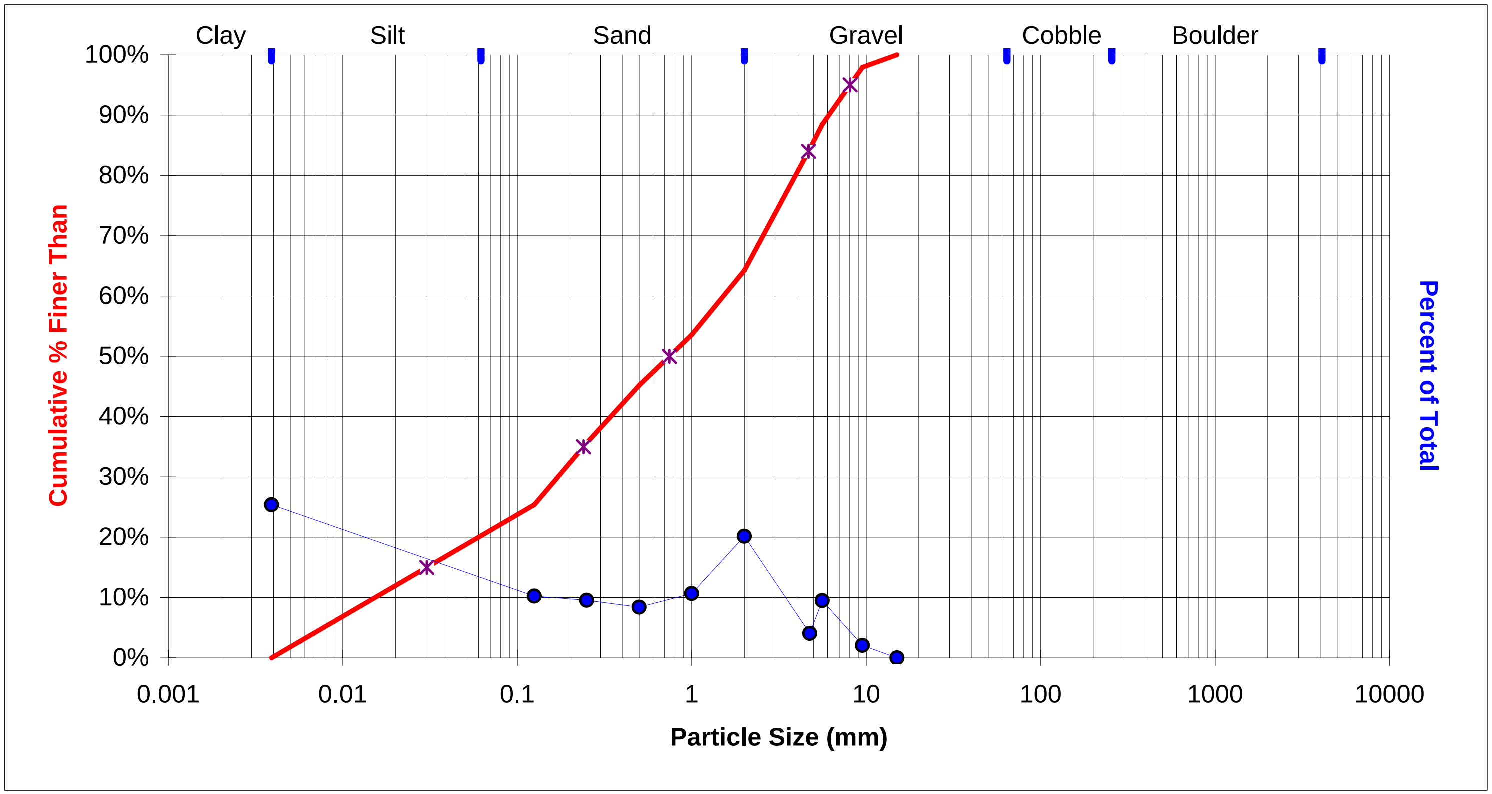
Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	**0.0%**	357.50
0.125	25.4%	144.30
0.3	35.6%	134.40
0.5	45.2%	118.30
1.0	53.6%	150.20
2.0	64.2%	284.00
4.8	84.4%	57.00
5.6	88.4%	133.70
9.5	97.9%	29
15.0	100.0%	
16.0		
25.4		
35.7		
45.0		
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Grab Sample of 2004 Sediment Accumulation in Cut Slope Silt Fence

SITE NAME: Pike's Peak Highway - Cut Slope - Lower
ID NUMBER: 192CS
DATE: 9/24/2004
CREW: lh, kg

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart
0.030	**0.240**	**0.745**	**4.669**	**8.077**	**15.0**



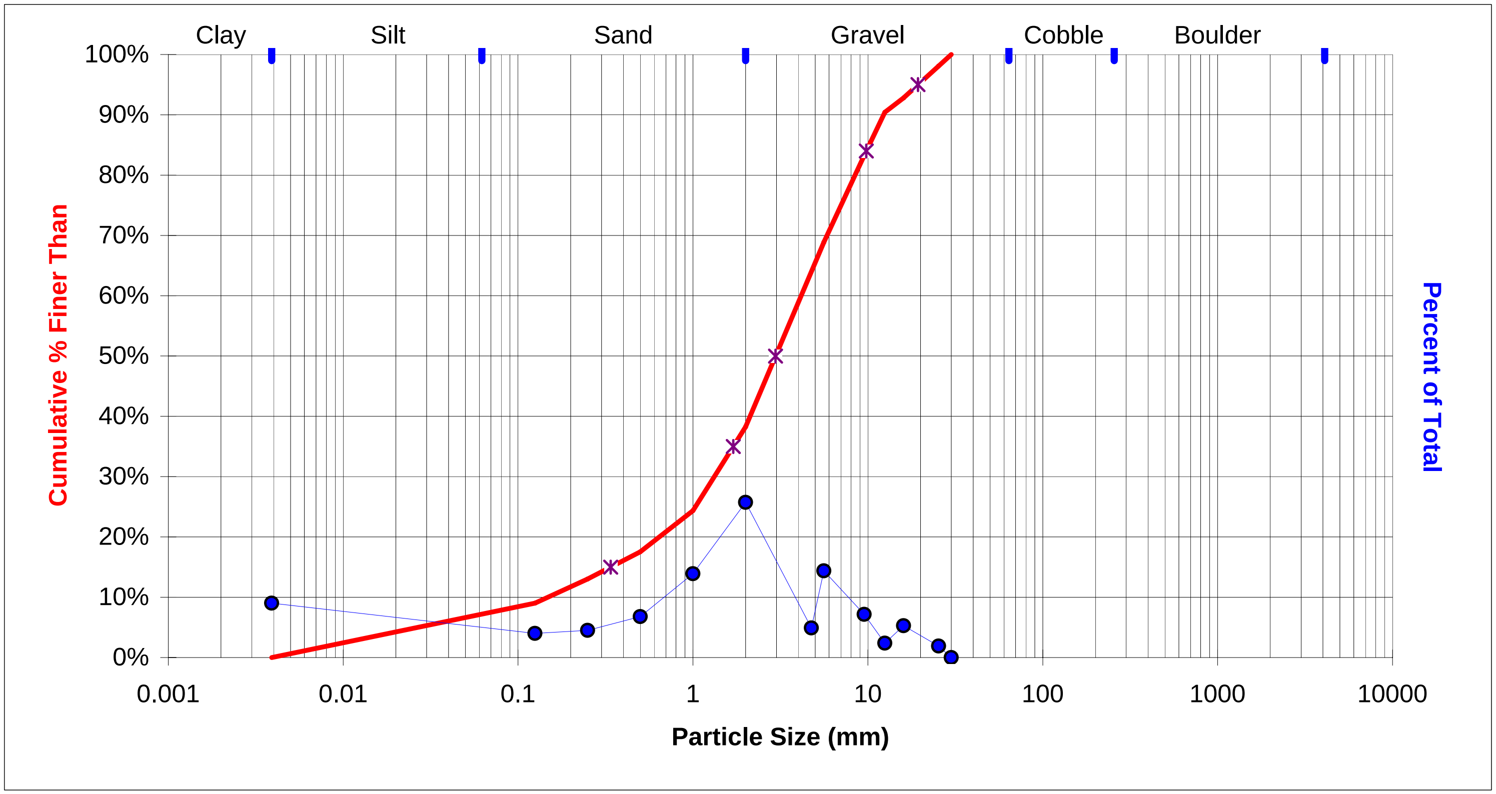
Sieve Analysis Worksheet

Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	**0.0%**	239.80
0.125	9.0%	106.40
0.25	13.0%	120.00
0.5	17.6%	180.70
1.0	24.4%	369.30
2.0	38.3%	683.60
4.8	64.0%	130.20
5.6	68.9%	381.80
9.5	83.3%	190.30
12.5	90.4%	63.60
16.0	92.8%	140.20
25.4	98.1%	50.5
30.0	100.0%	
45.0		
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Grab Sample of 2004 Sediment Accumulation in Cut Slope Silt Fence

SITE NAME: Pike's Peak Highway - Cut Slope - Lower
ID NUMBER: 102CS
DATE: 8/12/2004
CREW: lh, kg

Particle Size Distribution (mm)	D15	D35	D50	D84	D95	Lpart
	0.338	**1.700**	**2.968**	**9.790**	**19.363**	**30.0**



Sieve Analysis Worksheet

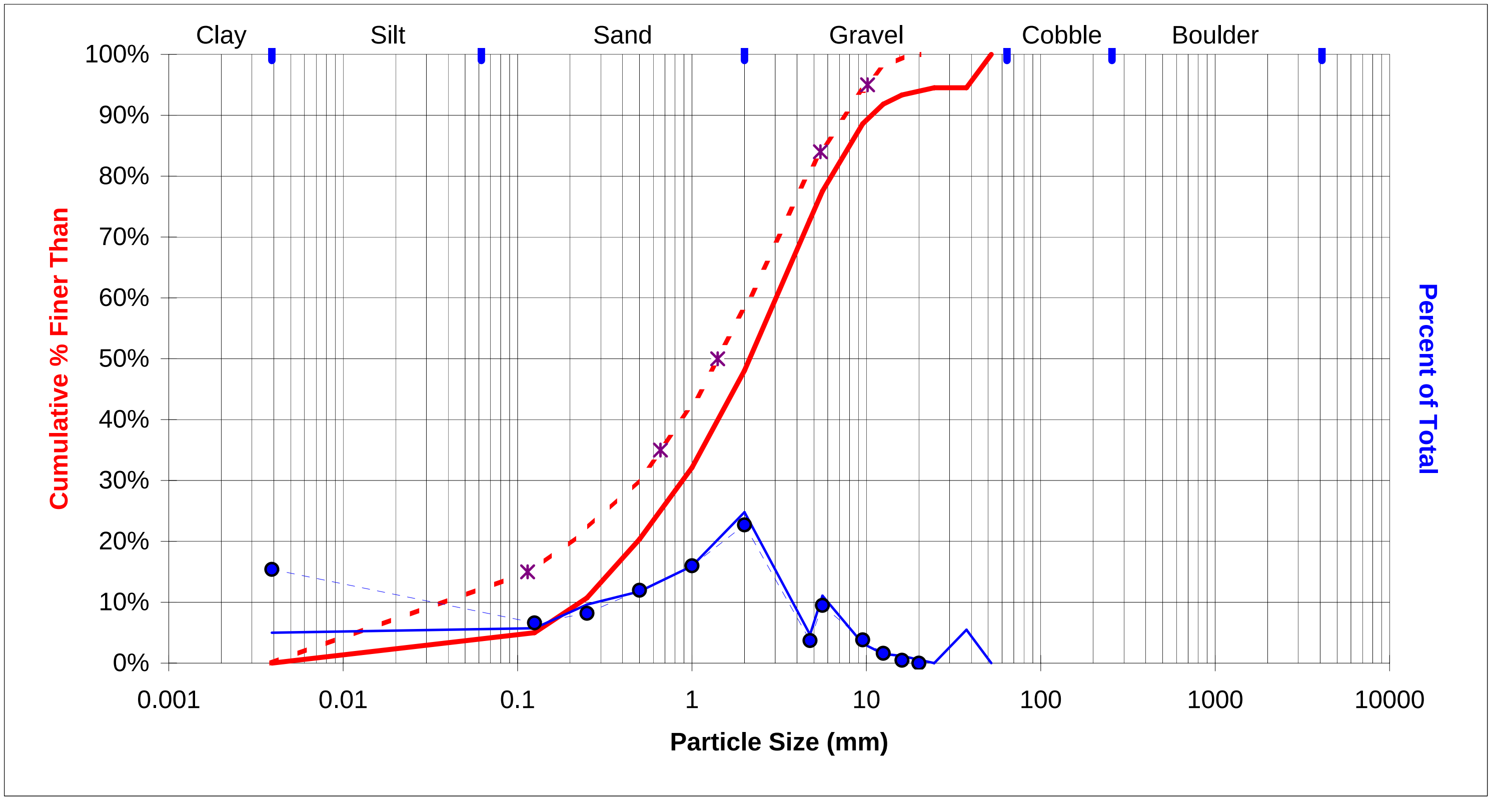
Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	**0.0%**	481.10
0.125	15.4%	206.60
0.25	22.0%	255.80
0.5	30.2%	373.90
1.0	42.2%	499.50
2.0	58.2%	709.50
4.8	80.9%	115.70
5.6	84.6%	296.50
9.5	94.1%	119.40
12.5	97.9%	50.60
16.0	99.5%	14.7
20.0	100.0%	
37.5		
45.0		
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Comparison Grab Samples of Sediment Accumulation in Lower Fill Slope Silt Fence 2004

SITE NAME: Pike's Peak Highway - Fill Slope Lower
ID NUMBER: 088FS - Lower
DATE: 8/12,8/25/2004
CREW: lh, kg

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart	Year	Graph
0.11	0.66	1.40	5.45	10.16	20.0	8/25/2004	Dashed
0.34	1.13	2.14	7.64	38.6	52.0	8/12/2004	Solid



Appendix D

Road Cross Sections
Cross Section Geometry and Graphs

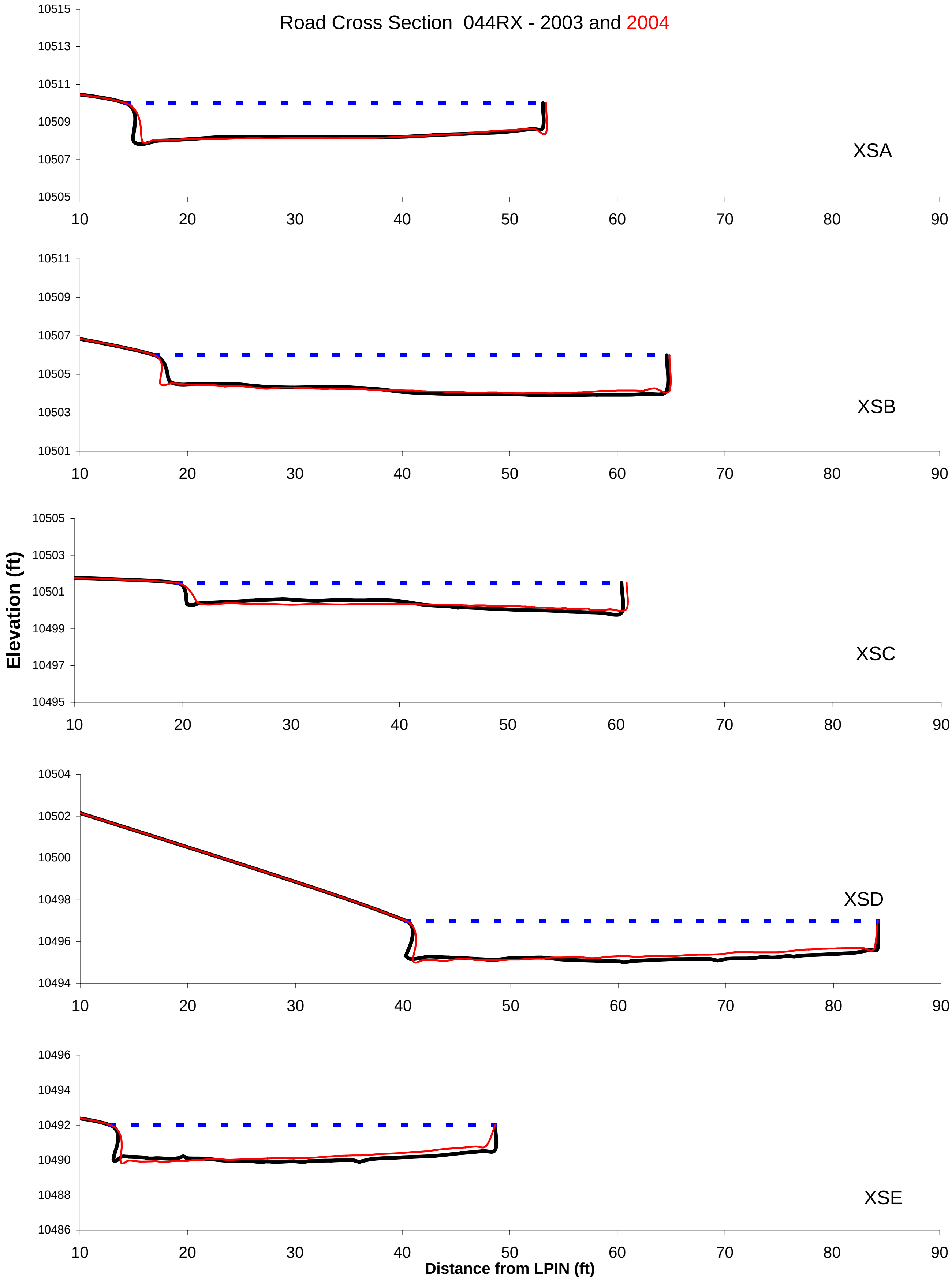
2004

Geometry of Road Cross Sections 2004

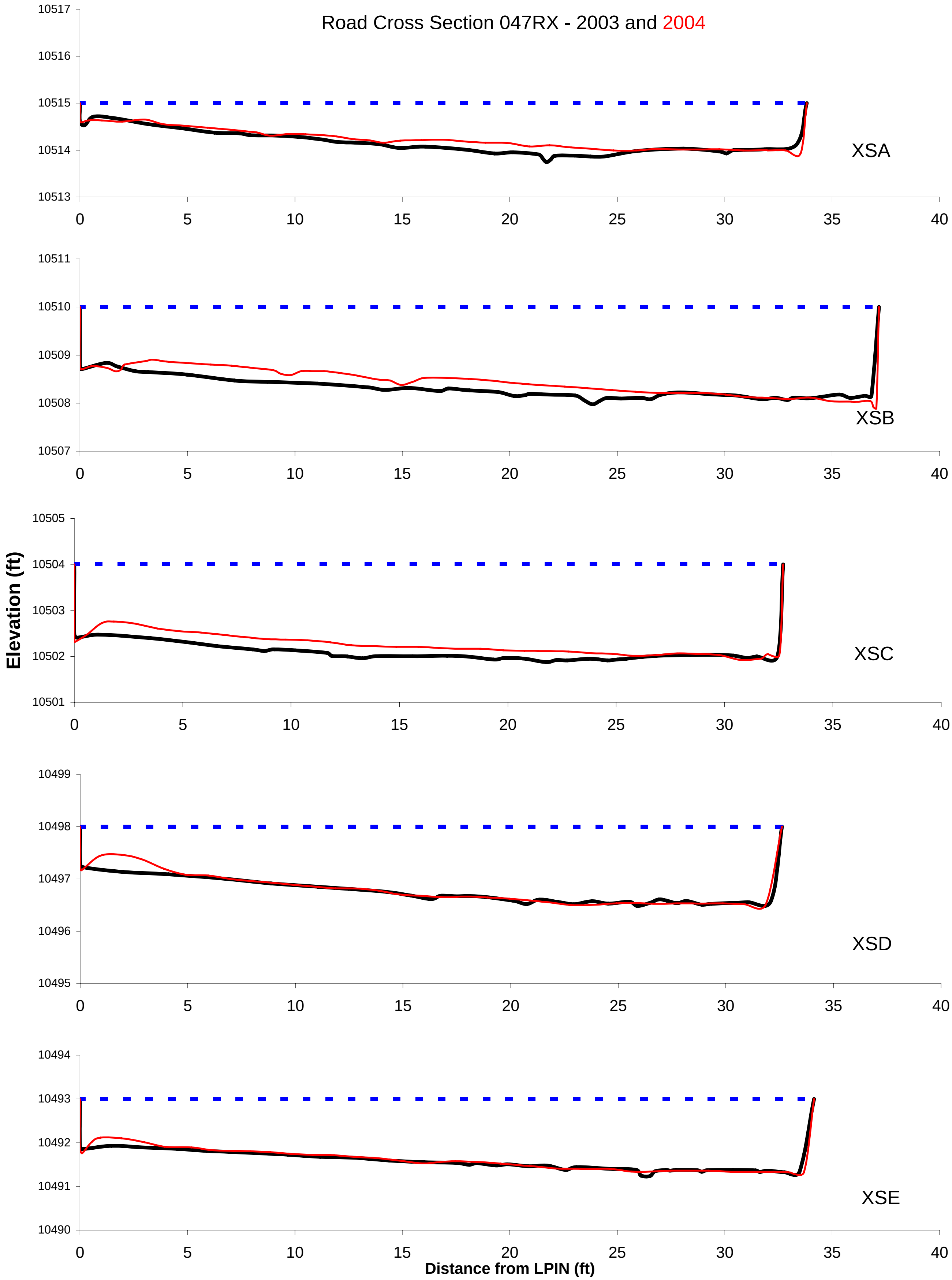
Road Cross Section Identifier	Date	Cross Section	Width (ft)	Cross Sectional Area (ft^2)	Mean Depth (ft)	Maximum Depth (ft)	Area Differences 2003-2004 (ft^2)
044RX	06Jul04	A	39.2	68.24	1.74	2.05	-0.64
044RX	06Jul04	B	47.9	85.80	1.79	1.99	0.48
044RX	06Jul04	C	41.5	49.61	1.20	1.48	-0.82
044RX	06Jul04	D	43.9	71.88	1.64	1.93	6.05
044RX	06Jul04	E	35.8	61.94	1.73	2.12	5.67
047RX	06Jul04	A	33.8	26.09	0.77	1.08	2.39
047RX	06Jul04	B	37.2	57.81	1.56	2.11	4.84
047RX	06Jul04	C	32.7	57.04	1.74	2.08	5.29
047RX	06Jul04	D	32.6	39.18	1.20	1.50	0.93
047RX	06Jul04	E	34.2	47.53	1.39	1.68	0.62
050RX	06Jul04	A	38.2	97.98	2.57	4.66	-0.61
050RX	06Jul04	B	33.5	84.59	2.53	3.18	-1.11
050RX	06Jul04	C	34.3	73.46	2.14	2.42	-1.63
050RX	06Jul04	D	35.7	79.84	2.24	2.40	-3.98
050RX	06Jul04	E	32.6	94.11	2.88	3.95	0.01
056RX	07Jul04	A	39.8	78.26	1.97	3.04	-0.64
056RX	07Jul04	B	34.9	101.36	2.90	4.07	-1.54
056RX	07Jul04	C	28.0	59.70	2.13	3.22	-1.85
056RX	07Jul04	D	30.3	81.66	2.69	3.56	-1.90
056RX	07Jul04	E	29.1	61.24	2.10	2.67	-1.67
060RX	30Jul04	A	29.6	61.14	2.07	2.82	1.61
060RX	30Jul04	B	30.8	52.19	1.70	2.31	-0.17
060RX	30Jul04	C	30.0	67.82	2.26	2.94	-0.15
060RX	30Jul04	D	30.5	37.69	1.23	1.70	2.47
060RX	30Jul04	E	32.1	66.77	2.08	2.28	2.21
062RX	30Jul04	A	35.9	53.74	1.50	2.09	0.75
062RX	30Jul04	B	32.9	39.30	1.19	1.66	0.02
062RX	30Jul04	C	36.2	58.38	1.61	2.06	2.13
062RX	30Jul04	D	33.9	27.53	0.81	1.35	-1.06
062RX	30Jul04	E	39.0	61.10	1.57	1.82	-1.65
072RX	03Aug04	A	37.6	77.27	2.05	2.51	-0.11
072RX	03Aug04	B	31.9	79.53	2.49	2.98	-2.04
072RX	03Aug04	C	36.2	96.19	2.66	3.40	-2.25
072RX	03Aug04	D	34.7	89.30	2.57	3.19	-2.06
072RX	03Aug04	E	36.0	77.49	2.15	2.88	0.73
154RX	05Aug04	A	27.2	41.70	1.53	2.02	-3.00
154RX	05Aug04	B	29.1	58.48	2.01	2.51	-2.76
154RX	05Aug04	C	29.2	46.40	1.59	2.00	-4.13
154RX	05Aug04	D	29.9	58.49	1.96	2.16	-1.57
154RX	05Aug04	E	30.0	39.45	1.32	1.55	-2.53
156RX	05Aug04	A	35.5	41.36	1.17	1.87	-0.62
156RX	05Aug04	B	35.9	59.33	1.65	2.57	2.55
156RX	05Aug04	C	32.9	63.15	1.92	2.46	1.89
156RX	05Aug04	D	32.0	57.08	1.79	2.24	2.81
156RX	05Aug04	E	33.7	63.80	1.89	2.60	1.88
158RX	04Aug04	A	48.8	55.53	1.14	1.55	-3.97
158RX	04Aug04	B	44.0	84.03	1.91	2.43	-2.36
158RX	04Aug04	C	47.1	80.21	1.70	2.17	-1.58

Geometry of Road Cross Sections 2004

Road Cross Section Identifier	Date	Cross Section	Width (ft)	Cross Sectional Area (ft^2)	Mean Depth (ft)	Maximum Depth (ft)	Area Differences 2003-2004 (ft^2)
158RX	04Aug04	D	42.9	94.88	2.21	2.65	-2.40
158RX	04Aug04	E	43.3	93.54	2.16	2.57	-1.25
160RX	04Aug04	A	36.7	61.07	1.66	1.89	-1.16
160RX	04Aug04	B	38.9	62.19	1.60	1.89	-0.91
160RX	04Aug04	C	39.9	35.60	0.89	1.47	-1.69
160RX	04Aug04	D	38.0	52.86	1.39	1.73	-1.23
160RX	04Aug04	E	38.7	63.69	1.64	1.83	-2.73



Road Cross Section 044RX - 2003 and 2004
XSA
XSB
XSC
XSD
XSE
Elevation (ft)
Distance from LPIN (ft)
10515
10513
10511
10509
10507
10505
10511
10509
10507
10505
10503
10501
10505
10503
10501
10499
10497
10495
10504
10502
10500
10498
10496
10494
10496
10494
10492
10490
10488
10486
10
20
30
40
50
60
70
80
90



Road Cross Section 047RX - 2003 and 2004
Elevation (ft)
Distance from LPIN (ft)
XSA
XSB
XSC
XSD
XSE
10517
10516
10515
10514
10513
10511
10510
10509
10508
10507
10505
10504
10503
10502
10501
10499
10498
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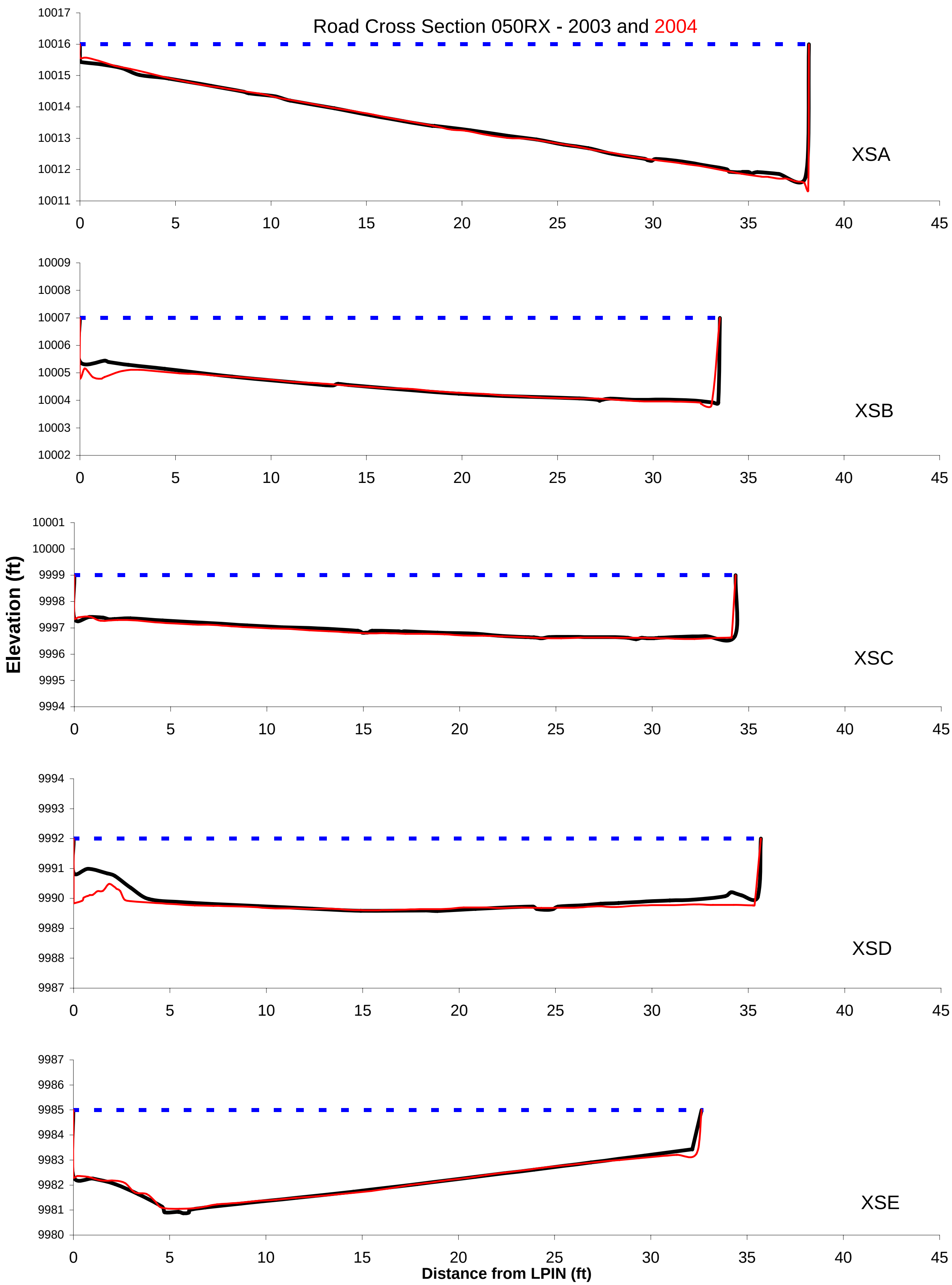
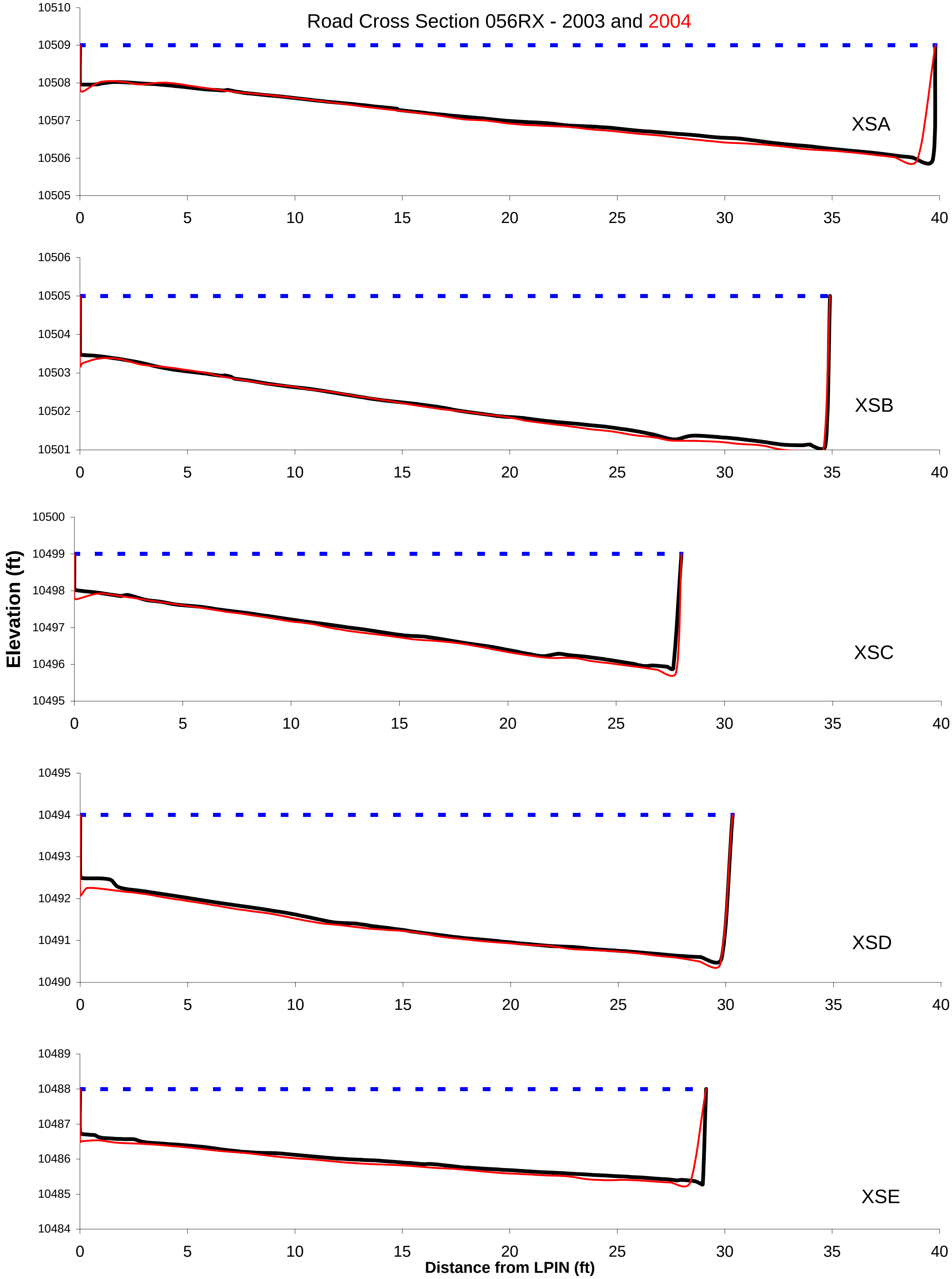
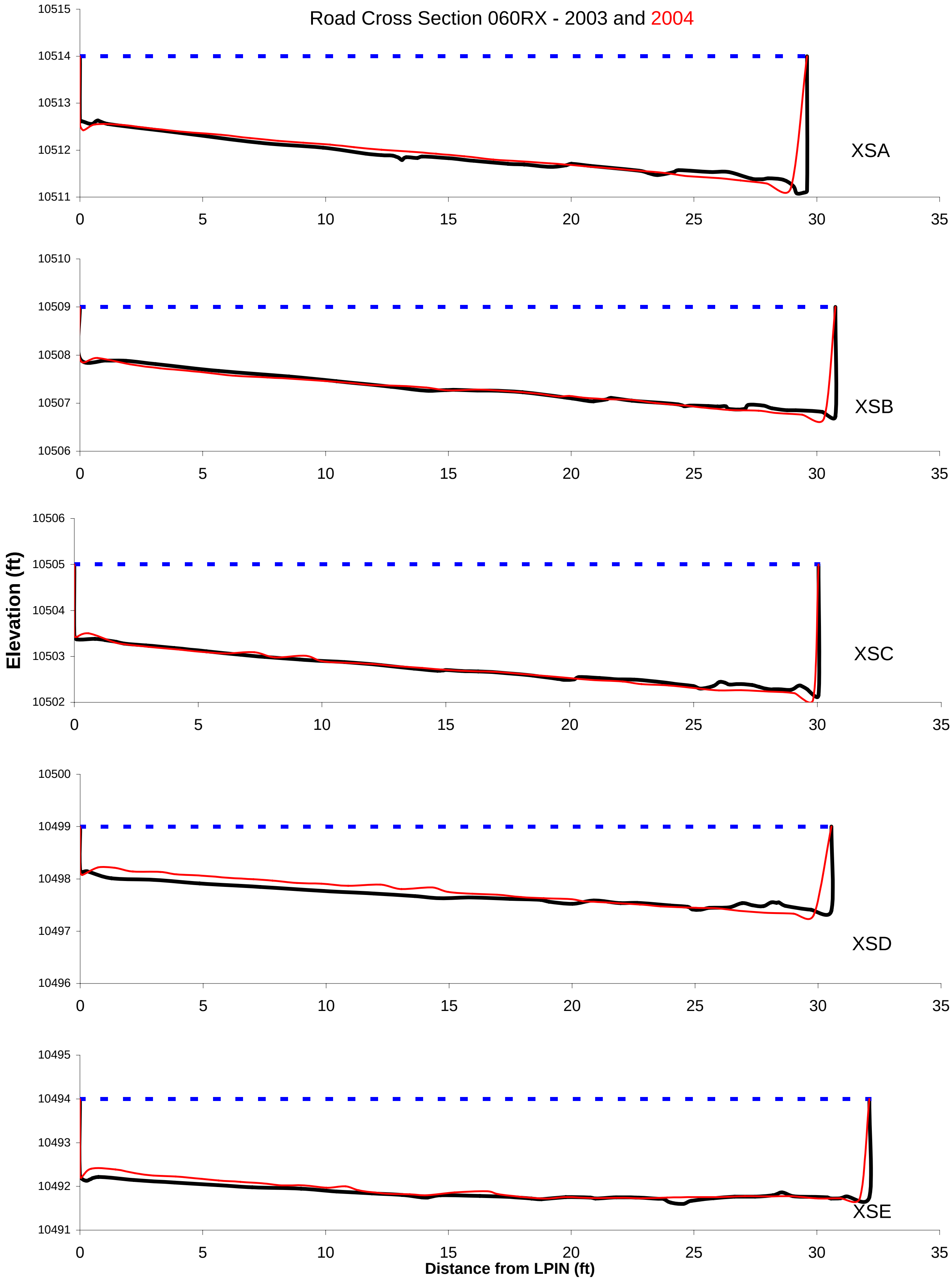
20
25
30
35
40



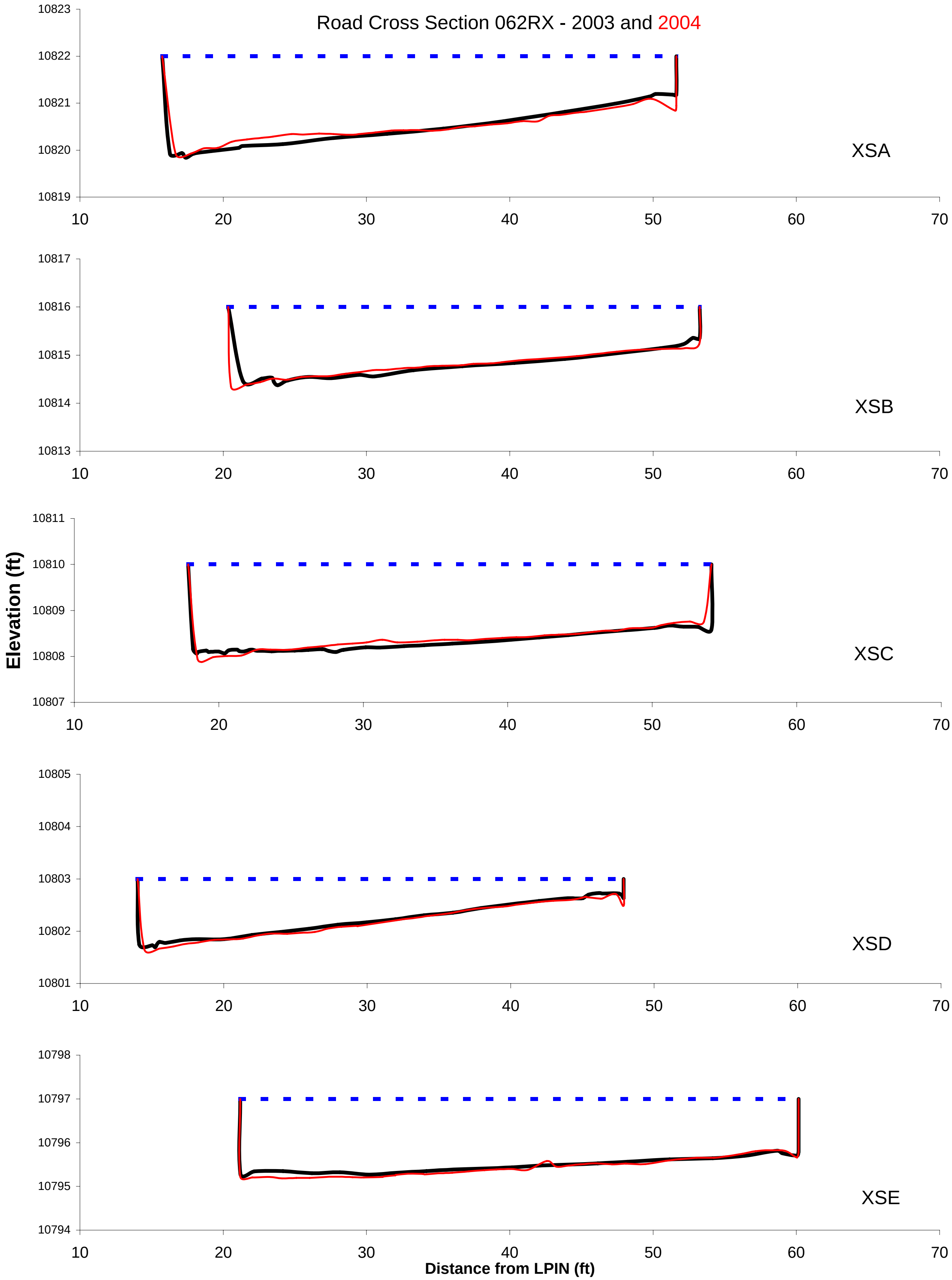
Road Cross Section 050RX - 2003 and 2004
Elevation (ft)
Distance from LPIN (ft)
XSA
XSB
XSC
XSD
XSE
10017
10016
10015
10014
10013
10012
10011
10009
10008
10007
10006
10005
10004
10003
10002
10001
10000
9999
9998
9997
9996
9995
9994
9993
9992
9991
9990
9989
9988
9987
9986
9985
9984
9983
9982
9981
9980
0
5
10
15
20
25
30
35
40
45

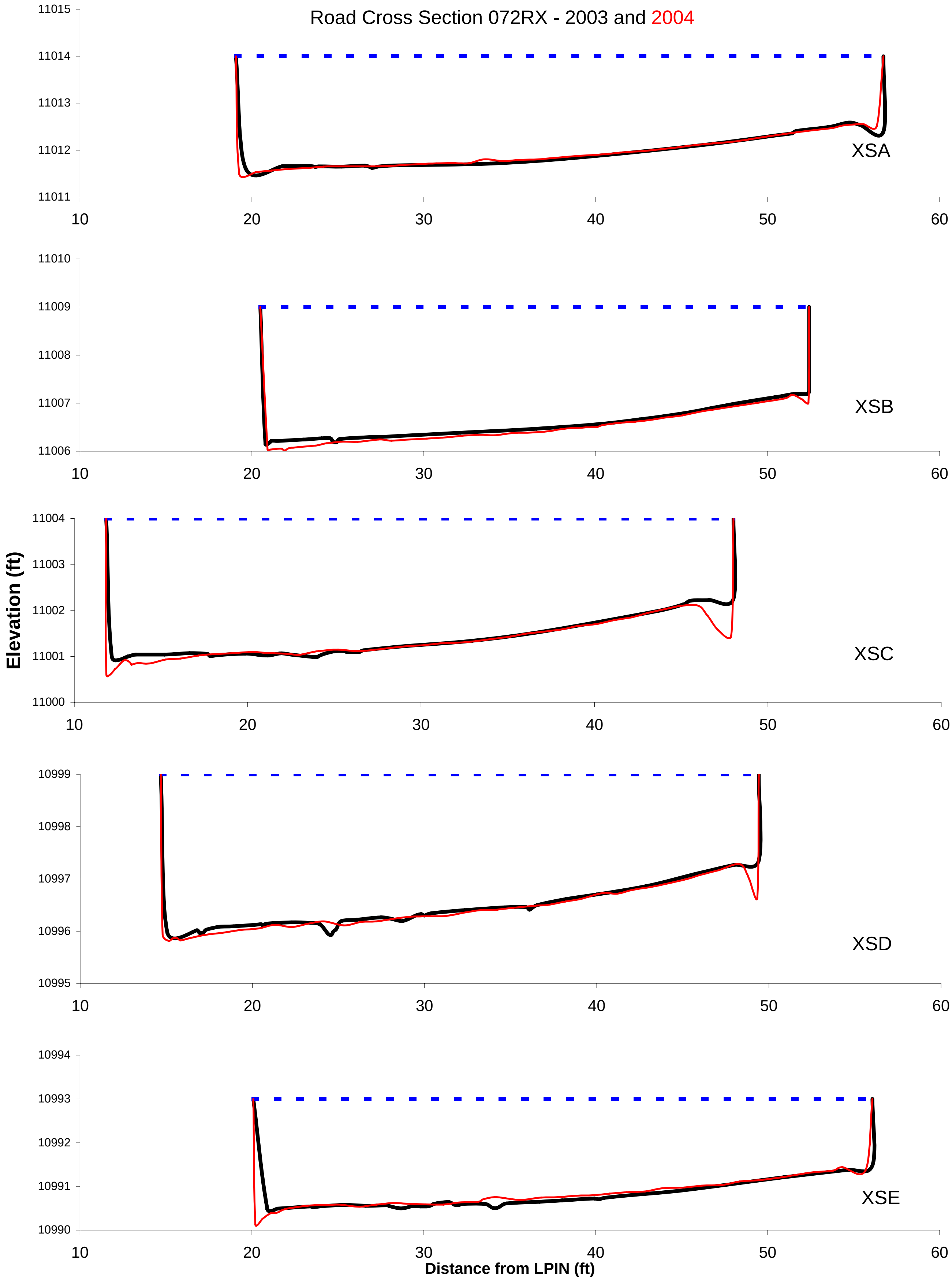


Road Cross Section 056RX - 2003 and 2004
XSA
XSB
XSC
XSD
XSE
Elevation (ft)
Distance from LPIN (ft)
10510
10509
10508
10507
10506
10505
10504
10503
10502
10501
10500
10499
10498
10497
10496
10495
10494
10493
10492
10491
10490
10489
10488
10487
10486
10485
10484
0
5
10
15
20
25
30
35
40

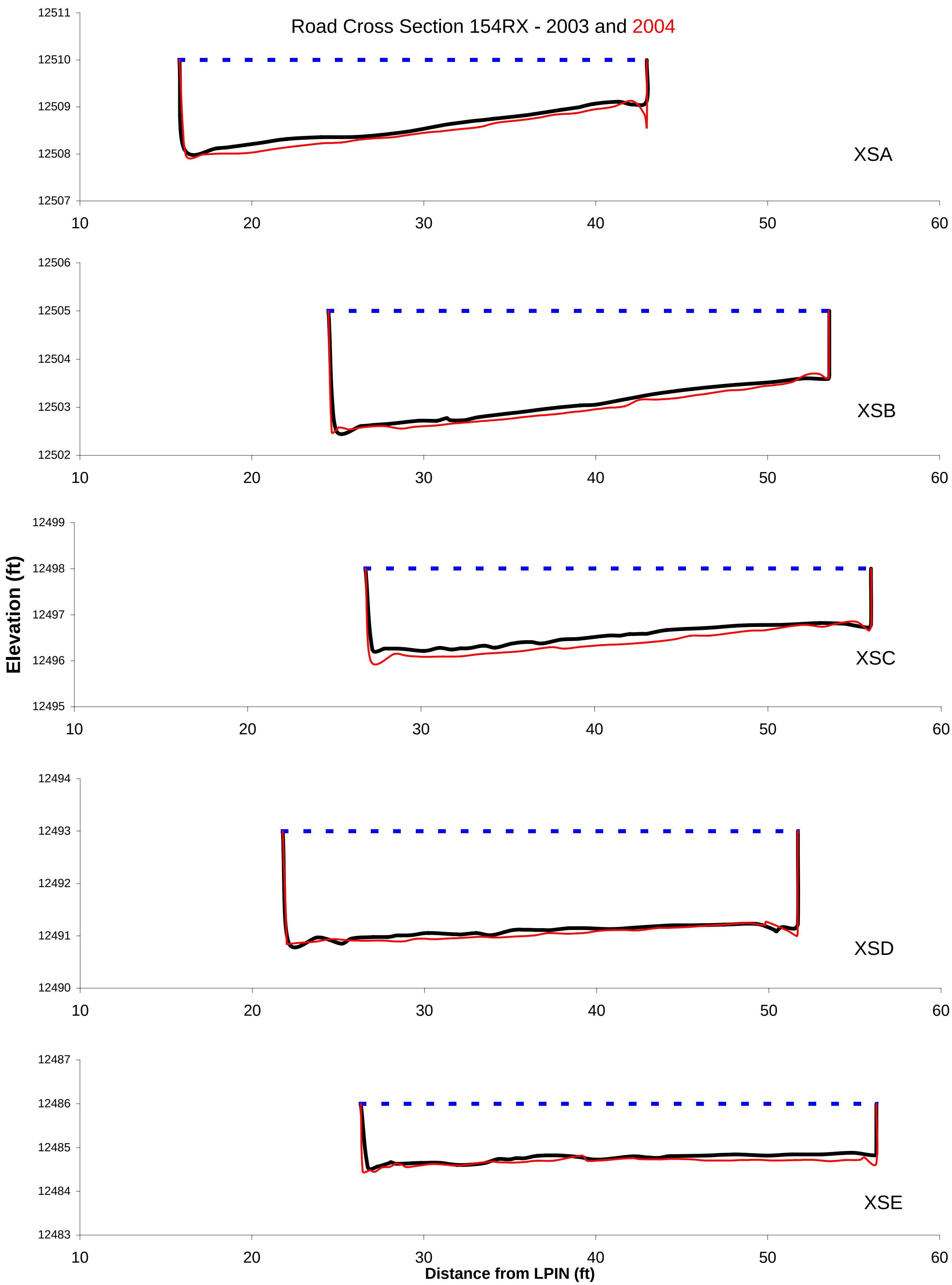


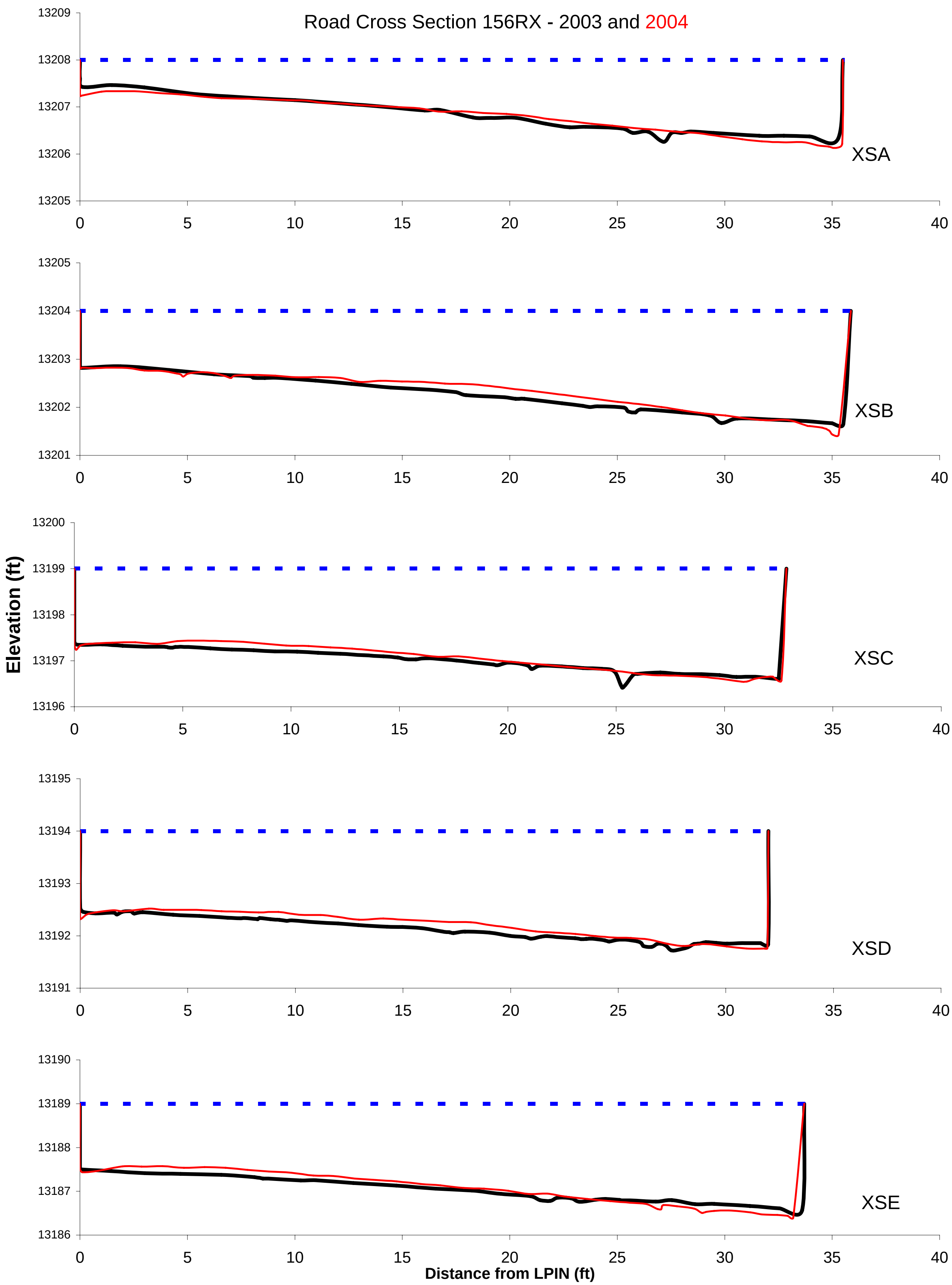
Road Cross Section 060RX - 2003 and 2004
XSA
XSB
XSC
XSD
XSE
Elevation (ft)
Distance from LPIN (ft)
10515
10514
10513
10512
10511
10510
10509
10508
10507
10506
10505
10504
10503
10502
10500
10499
10498
10497
10496
10495
10494
10493
10492
10491
0
5
10
15
20
25
30
35


Road Cross Section 062RX - 2003 and 2004
Elevation (ft)
Distance from LPIN (ft)
XSA
XSB
XSC
XSD
XSE
10823
10822
10821
10820
10819
10817
10816
10815
10814
10813
10811
10810
10809
10808
10807
10805
10804
10803
10802
10801
10798
10797
10796
10795
10794
10
20
30
40
50
60
70

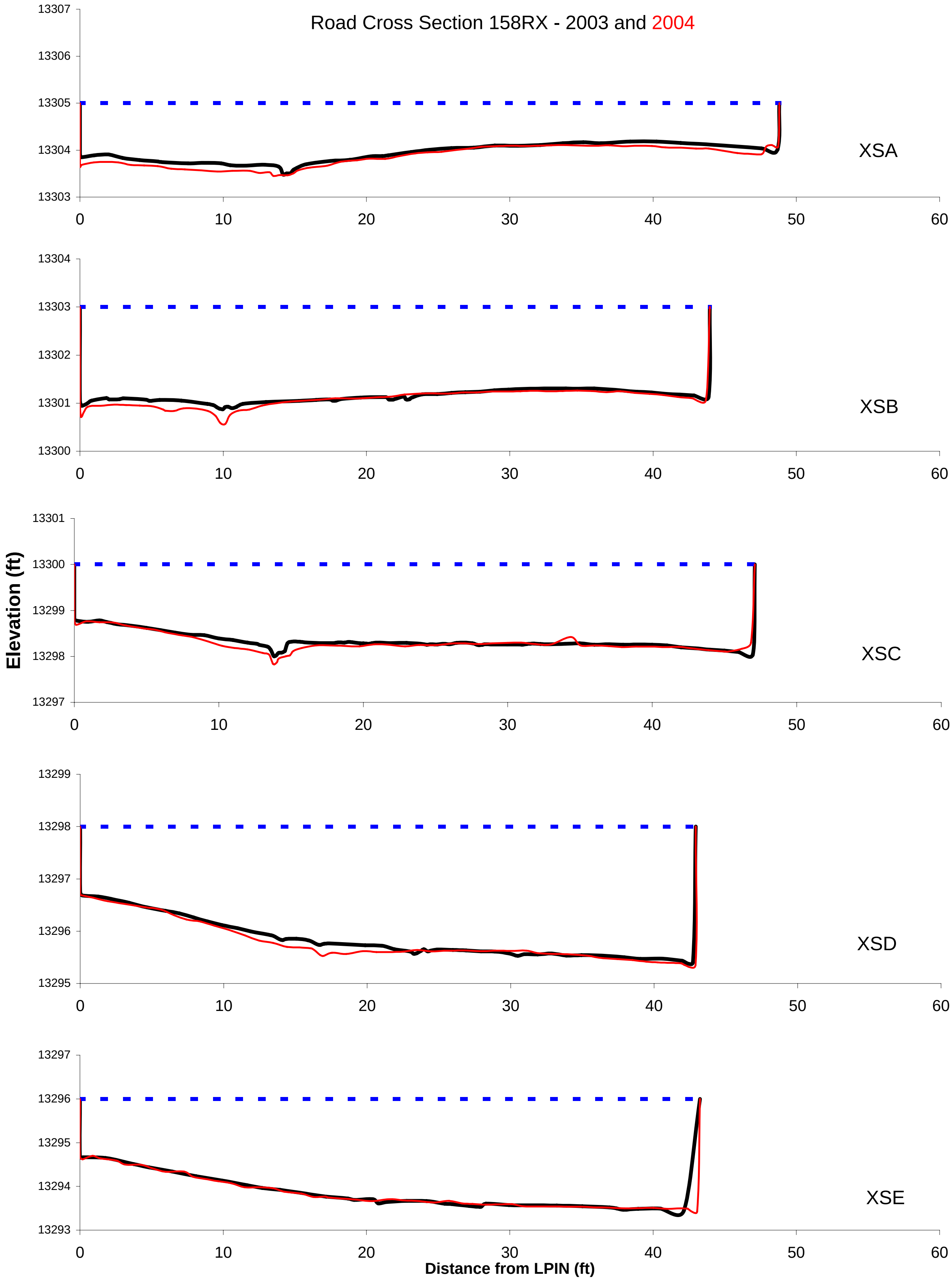


Road Cross Section 072RX - 2003 and 2004
XSA
XSB
XSC
XSD
XSE
Elevation (ft)
Distance from LPIN (ft)
11015
11014
11013
11012
11011
11010
11009
11008
11007
11006
11004
11003
11002
11001
11000
10999
10998
10997
10996
10995
10994
10993
10992
10991
10990
10
20
30
40
50
60

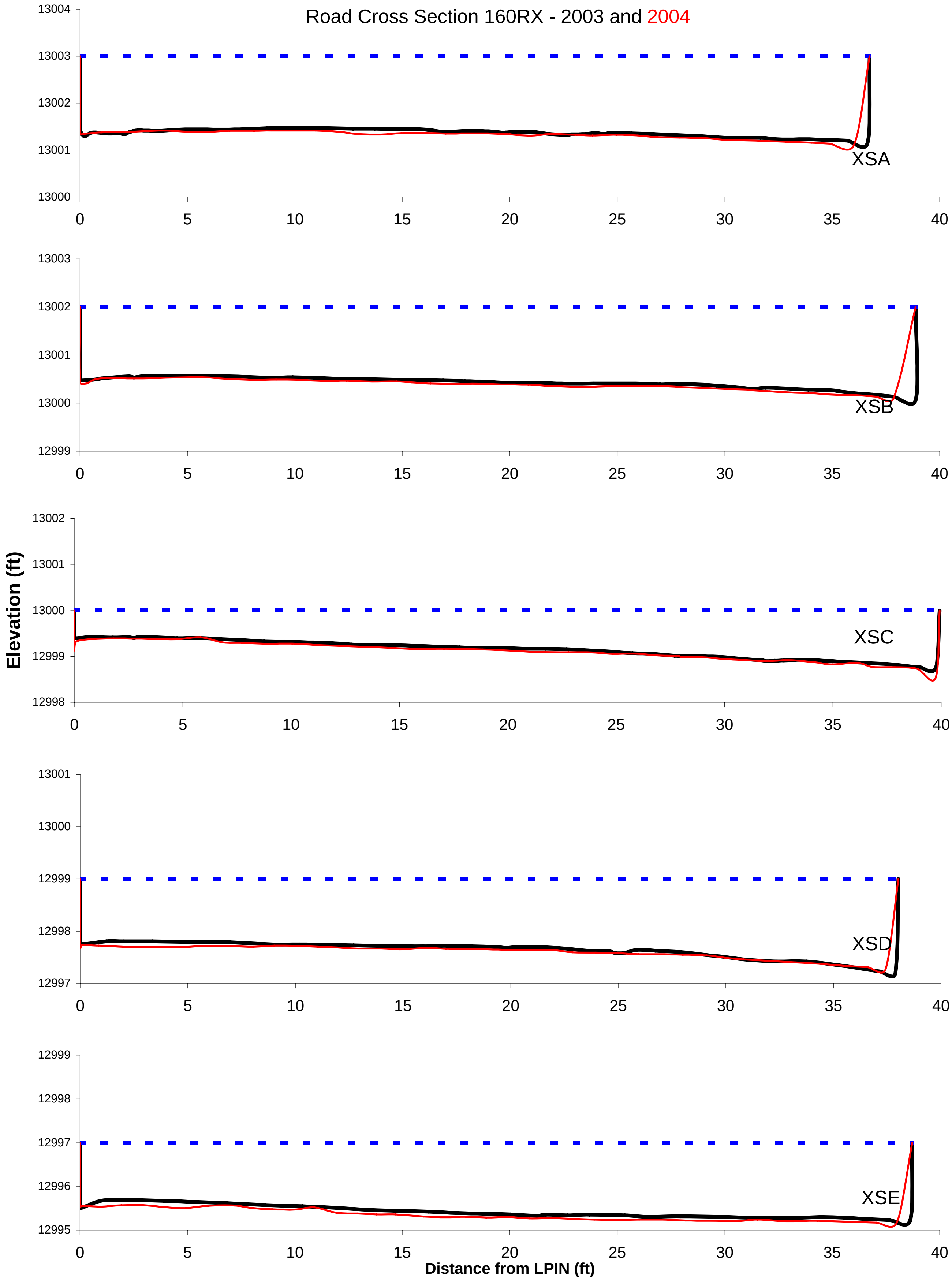

Road Cross Section 154RX - 2003 and 2004
12511
12510
12509
12508
12507
XSA
12506
12505
12504
12503
12502
XSB
12499
12498
12497
12496
12495
XSC
12494
12493
12492
12491
12490
XSD
12487
12486
12485
12484
12483
XSE
10
20
30
40
50
60
Elevation (ft)
Distance from LPIN (ft)



Road Cross Section 156RX - 2003 and 2004
Elevation (ft)
Distance from LPIN (ft)
XSA
XSB
XSC
XSD
XSE
13209
13208
13207
13206
13205
13204
13203
13202
13201
13200
13199
13198
13197
13196
13195
13194
13193
13192
13191
13190
13189
13188
13187
13186
0
5
10
15
20
25
30
35
40



Road Cross Section 158RX - 2003 and 2004
Elevation (ft)
Distance from LPIN (ft)
XSA
XSB
XSC
XSD
XSE
13307
13306
13305
13304
13303
13302
13301
13300
13299
13298
13297
13296
13295
13294
13293
0
10
20
30
40
50
60



Road Cross Section 160RX - 2003 and 2004
XSA
XSB
XSC
XSD
XSE
Elevation (ft)
Distance from LPIN (ft)
13004
13003
13002
13001
13000
12999
12998
12997
12996
12995
0
5
10
15
20
25
30
35
40

Appendix E

Drainage Ditches
Cross Section Geometry and Graphs

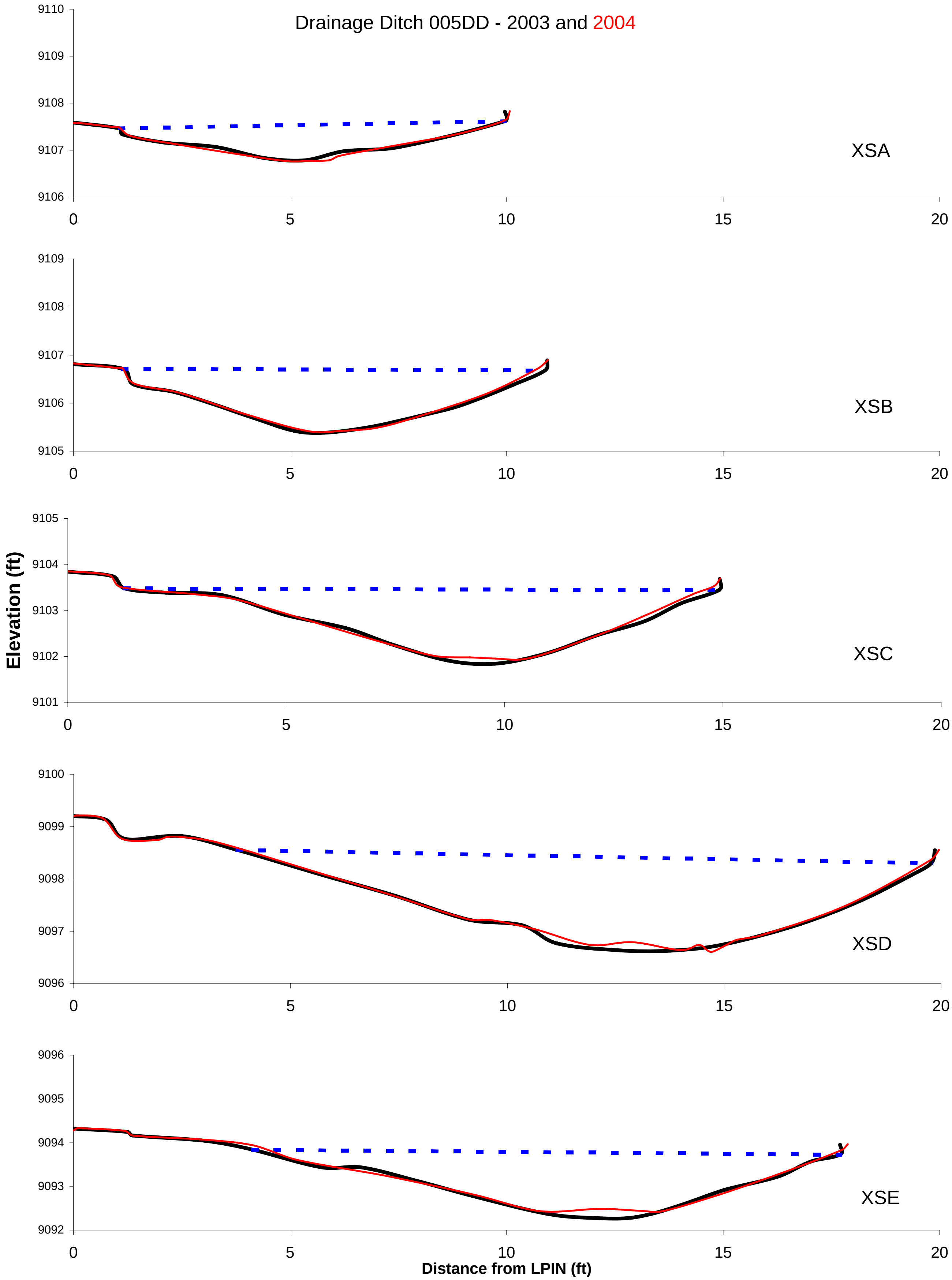
2004

Channel Geometry of Drainage Ditches 2004

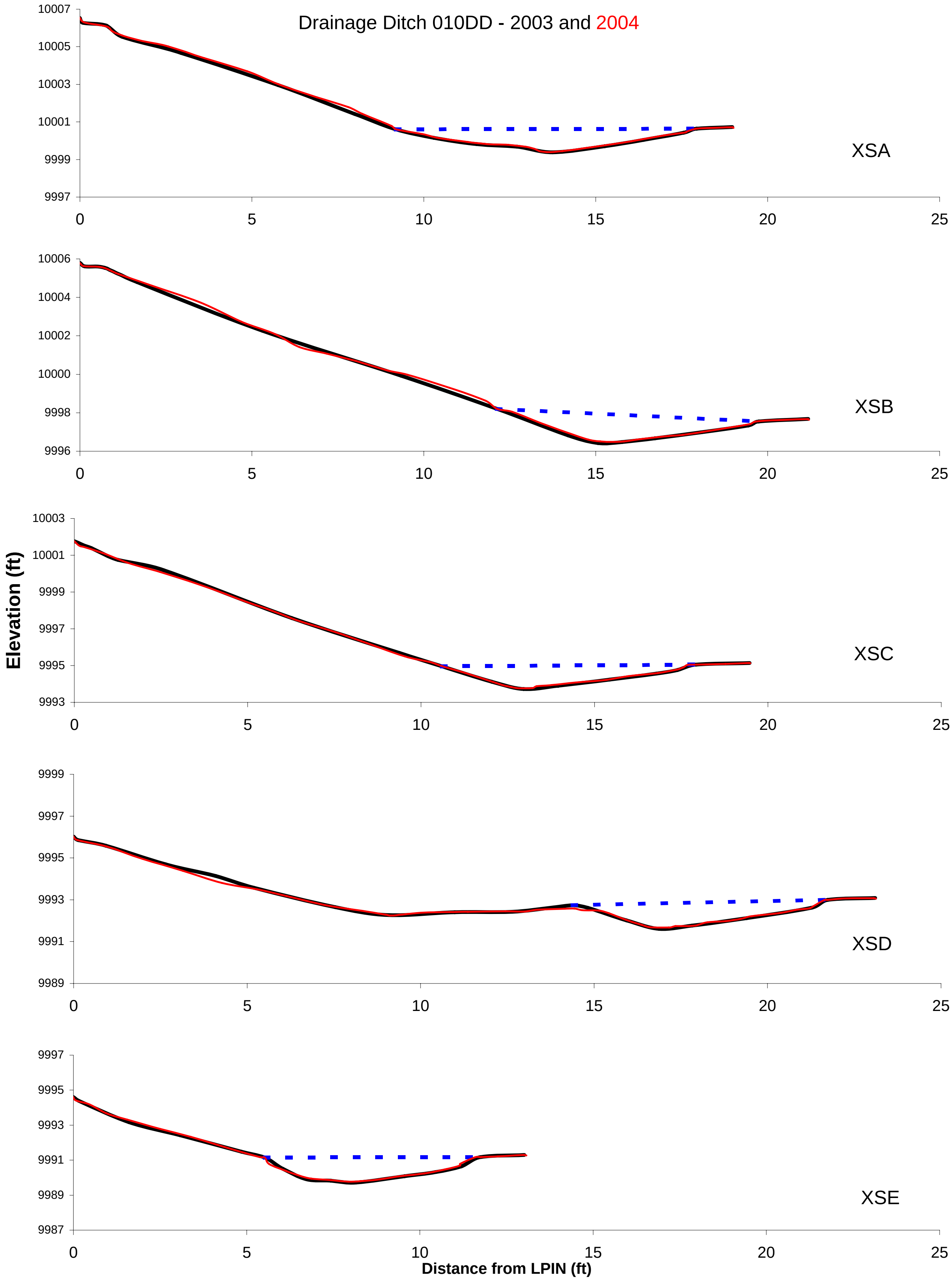
Drainage Ditch Identifier	Date	Cross Section	Width (ft)	Cross Sectional Area (ft^2)	Mean Depth (ft)	Maximum Depth (ft)	Wetted Perimeter (ft)	Hydraulic Radius (ft)	Width /Depth Ratio	Area Difference 2003-2004 (ft^2)
005DD	06Jul04	A	8.9	4.20	0.47	0.79	9.07	0.46	18.77	-0.32
005DD	06Jul04	B	9.6	7.78	0.81	1.29	10.04	0.77	11.75	0.06
005DD	06Jul04	C	13.6	11.21	0.83	1.58	14.02	0.80	16.39	-0.37
005DD	06Jul04	D	16.4	18.05	1.10	1.85	17.00	1.06	14.90	-0.87
005DD	06Jul04	E	13.6	12.00	0.88	1.45	13.99	0.86	15.38	-0.94
010DD	07Jul04	A	8.7	5.88	0.67	1.23	9.14	0.64	12.96	0.30
010DD	07Jul04	B	7.5	6.09	0.81	1.42	8.16	0.75	9.32	0.48
010DD	07Jul04	C	7.3	5.12	0.70	1.23	7.87	0.65	10.48	0.22
010DD	07Jul04	D	7.3	4.61	0.63	1.07	7.82	0.59	11.61	0.63
010DD	07Jul04	E	6.2	5.86	0.94	1.39	7.17	0.82	6.65	0.19
042DD	06Jul04	A	6.7	1.46	0.22	0.65	7.04	0.21	30.82	-0.34
042DD	06Jul04	B	7.2	4.51	0.63	1.38	7.83	0.58	11.51	-1.59
042DD	06Jul04	C	9.3	11.92	1.28	2.15	10.58	1.13	7.33	-0.12
042DD	06Jul04	D	27.0	45.74	1.69	2.69	28.78	1.59	15.98	-6.37
042DD	06Jul04	E	7.2	11.80	1.65	2.54	9.49	1.24	4.36	-0.13
046DD	06Jul04	A	2.6	1.43	0.54	0.76	3.26	0.44	4.85	-0.61
046DD	06Jul04	B	4.3	3.00	0.70	1.19	5.13	0.58	6.10	-1.25
046DD	06Jul04	C	5.7	2.91	0.51	1.10	6.34	0.46	11.34	-0.31
046DD	06Jul04	D	5.8	3.79	0.65	1.34	7.05	0.54	9.02	1.41
046DD	06Jul04	E	7.7	6.57	0.85	1.57	8.65	0.76	8.99	-0.22
051DD	06Jul04	A	5.5	4.72	0.86	1.47	7.53	0.63	6.34	-1.24
051DD	06Jul04	B	6.0	5.10	0.85	1.31	7.06	0.72	7.13	-0.50
051DD	06Jul04	C	6.1	5.97	0.98	1.70	7.85	0.76	6.18	1.24
051DD	06Jul04	D	5.9	6.29	1.06	1.67	7.42	0.85	5.60	0.99
051DD	06Jul04	E	10.2	13.51	1.33	2.06	12.94	1.04	7.66	-3.48
057DD	07Jul04	A	10.3	4.85	0.47	1.15	10.83	0.45	21.79	-0.53
057DD	07Jul04	B	7.8	4.63	0.60	1.44	8.63	0.54	13.00	0.57
057DD	07Jul04	C	9.5	10.27	1.08	1.95	11.00	0.93	8.86	3.31
057DD	07Jul04	D	5.4	3.89	0.72	1.17	7.59	0.51	7.50	0.48
057DD	07Jul04	E	7.6	5.60	0.73	1.42	8.38	0.67	10.41	0.22
061DD	30Jul04	A	6.5	2.31	0.36	0.73	7.03	0.33	18.21	0.33
061DD	30Jul04	B	9.2	3.33	0.36	1.12	9.77	0.34	25.51	2.02
061DD	30Jul04	C	11.4	3.41	0.30	1.06	12.03	0.28	37.84	0.68
061DD	30Jul04	D	8.7	2.54	0.29	0.93	9.09	0.28	29.52	0.25
061DD	30Jul04	E	5.6	4.18	0.75	1.18	6.48	0.65	7.42	-2.33
071DD	03Aug04	A	6.0	1.21	0.20	0.51	6.76	0.18	29.90	0.67
071DD	03Aug04	B	3.8	1.82	0.48	0.95	4.76	0.38	8.03	-0.20
071DD	03Aug04	C	4.7	2.01	0.43	1.00	5.56	0.36	10.94	-0.42
071DD	03Aug04	D	4.3	2.56	0.59	1.03	5.48	0.47	7.24	-0.49
071DD	03Aug04	E	5.3	2.76	0.52	1.04	5.96	0.46	10.16	-0.46
080DD	03Aug04	A	8.7	6.54	0.75	1.01	9.48	0.69	11.68	1.01
080DD	03Aug04	B	11.6	15.67	1.35	2.10	12.90	1.21	8.63	-0.43
080DD	03Aug04	C	10.1	12.12	1.20	2.45	11.67	1.04	8.39	2.22
080DD	03Aug04	D	11.2	17.44	1.56	2.53	13.37	1.30	7.20	0.06
080DD	03Aug04	E	11.4	16.62	1.46	2.78	13.34	1.25	7.81	0.24
082DD	03Aug04	A	9.9	9.79	0.99	1.47	10.71	0.91	9.95	0.91
082DD	03Aug04	B	6.4	6.02	0.94	1.61	7.75	0.78	6.87	-1.70
082DD	03Aug04	C	7.3	7.45	1.02	1.81	8.43	0.88	7.09	0.11
082DD	03Aug04	D	7.6	7.13	0.94	1.54	8.47	0.84	8.02	-0.09
082DD	03Aug04	E	6.1	4.77	0.78	1.40	7.16	0.67	7.85	-0.73
085DD	04Aug04	A	22.6	28.90	1.28	2.05	24.29	1.19	17.71	-1.97
085DD	04Aug04	B	10.4	10.01	0.96	1.86	12.25	0.82	10.84	0.69
085DD	04Aug04	C	10.2	8.30	0.81	1.30	10.80	0.77	12.54	-0.51
085DD	04Aug04	D	9.7	6.53	0.67	1.49	11.82	0.55	14.51	0.92
085DD	04Aug04	E	11.0	9.67	0.88	1.78	12.01	0.80	12.61	0.43

Channel Geometry of Drainage Ditches 2004

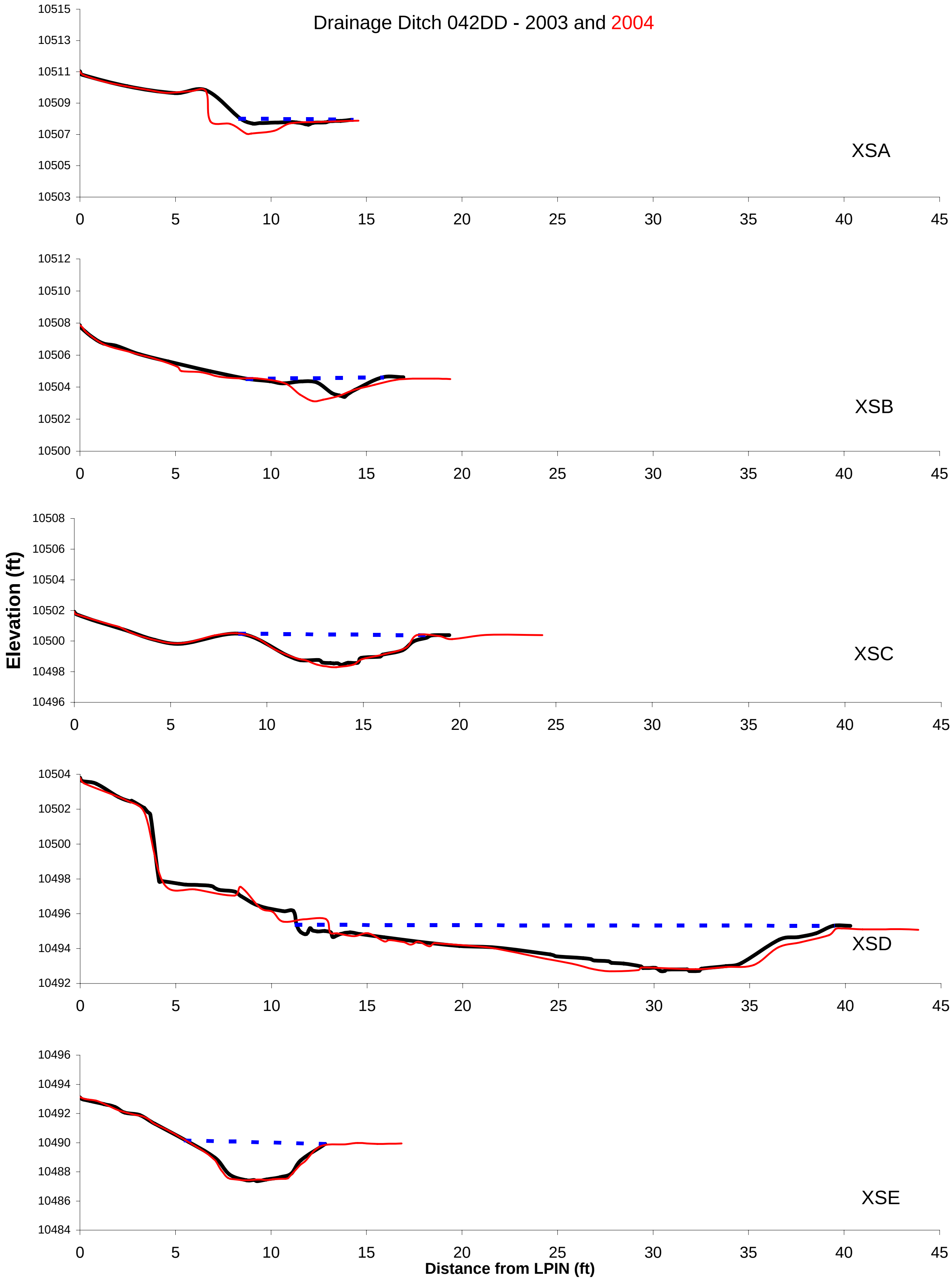
Drainage Ditch Identifier	Date	Cross Section	Width (ft)	Cross Sectional Area (ft^2)	Mean Depth (ft)	Maximum Depth (ft)	Wetted Perimeter (ft)	Hydraulic Radius (ft)	Width /Depth Ratio	Area Difference 2003-2004 (ft^2)
092DD	04Aug04	A	6.6	2.83	0.43	0.96	7.07	0.40	15.61	1.17
092DD	04Aug04	B	8.8	3.69	0.42	1.05	9.27	0.40	21.00	1.24
092DD	04Aug04	C	13.0	10.80	0.83	1.79	13.86	0.78	15.54	2.12
092DD	04Aug04	D	12.3	8.42	0.69	1.48	12.95	0.65	17.94	0.64
092DD	04Aug04	E	9.6	6.39	0.67	1.41	10.09	0.63	14.32	0.56
107DD	05Aug04	A	11.3	7.20	0.64	1.38	12.09	0.60	17.60	-2.39
107DD	05Aug04	B	9.0	9.02	1.00	1.66	10.28	0.88	9.05	-2.34
107DD	05Aug04	C	9.7	9.23	0.95	1.50	10.49	0.88	10.17	-3.51
107DD	05Aug04	D	8.5	6.76	0.80	1.30	9.36	0.72	10.61	-0.86
107DD	05Aug04	E	10.2	8.59	0.85	1.59	10.90	0.79	12.01	-0.09
155DD	05Aug04	A	3.9	0.44	0.11	0.34	4.27	0.10	35.49	0.79
155DD	05Aug04	B	5.5	1.32	0.24	0.46	5.95	0.22	23.19	1.10
155DD	05Aug04	C	5.4	2.03	0.37	0.56	5.73	0.36	14.53	0.35
155DD	05Aug04	D	5.1	2.09	0.41	0.83	5.59	0.37	12.66	0.44
155DD	05Aug04	E	7.8	3.37	0.43	0.80	8.47	0.40	18.15	2.17
157DD	04Aug04	A	6.6	3.77	0.57	1.12	7.29	0.52	11.51	-2.11
157DD	04Aug04	B	7.0	4.77	0.68	1.08	7.61	0.63	10.25	0.22
157DD	04Aug04	C	8.4	4.96	0.59	0.92	8.98	0.55	14.24	-2.32
157DD	04Aug04	D	6.0	2.52	0.42	0.75	6.29	0.40	14.14	0.82
157DD	04Aug04	E	6.8	2.63	0.39	0.67	7.51	0.35	17.63	-0.66
159DD	04Aug04	A	4.4	1.05	0.24	0.43	4.47	0.24	18.16	0.14
159DD	04Aug04	B	4.7	1.07	0.23	0.39	4.82	0.22	20.76	0.47
159DD	04Aug04	C	5.5	2.11	0.38	0.64	5.70	0.37	14.42	-1.14
159DD	04Aug04	D	7.2	2.83	0.39	0.66	7.38	0.38	18.40	0.68
159DD	04Aug04	E	6.1	3.13	0.52	0.88	6.39	0.49	11.70	-0.76
182DD	19May04	A	7.6	1.24	0.16	0.36	7.69	0.16	46.32	
182DD	19May04	B	6.6	5.86	0.89	1.88	7.98	0.73	7.38	
182DD	19May04	C	9.5	7.92	0.83	1.91	10.38	0.76	11.43	
182DD	19May04	D	10.9	4.15	0.38	1.18	11.44	0.36	28.74	
182DD	19May04	E	7.9	2.39	0.30	0.61	8.16	0.29	26.32	
188DD	28May04	A	17.0	7.40	0.43	1.03	17.22	0.43	39.26	
188DD	28May04	B	8.6	4.11	0.48	0.83	8.79	0.47	18.01	
188DD	28May04	C	8.6	2.65	0.31	0.64	8.75	0.30	28.08	
188DD	28May04	D	15.2	10.29	0.68	1.56	15.61	0.66	22.57	
188DD	28May04	E	13.7	4.32	0.31	0.59	13.80	0.31	43.54	
188DD	28May04	F	12.5	8.27	0.66	1.22	12.89	0.64	18.96	
188DD	28May04	G	8.6	3.80	0.44	1.02	8.91	0.43	19.51	
188DD	28May04	H	8.6	3.89	0.45	1.03	8.89	0.44	19.03	
195DD	21May04	A	12.1	7.41	0.61	1.35	12.48	0.59	19.87	
195DD	21May04	B	13.4	6.19	0.46	0.91	13.67	0.45	29.20	
195DD	21May04	C	8.5	3.70	0.44	0.77	8.68	0.43	19.47	
195DD	21May04	D	8.9	3.59	0.40	0.70	9.03	0.40	21.98	
195DD	21May04	E	5.4	2.41	0.45	0.79	5.67	0.43	12.08	
205DD	28May04	A	17.2	10.56	0.61	1.17	17.39	0.61	28.08	
205DD	28May04	B	12.9	8.91	0.69	1.31	13.18	0.68	18.59	
205DD	28May04	C	10.2	7.22	0.71	1.18	10.50	0.69	14.29	
205DD	28May04	D	11.4	9.29	0.81	1.44	11.81	0.79	14.05	
205DD	28May04	E	16.8	15.26	0.91	1.86	17.22	0.89	18.42	



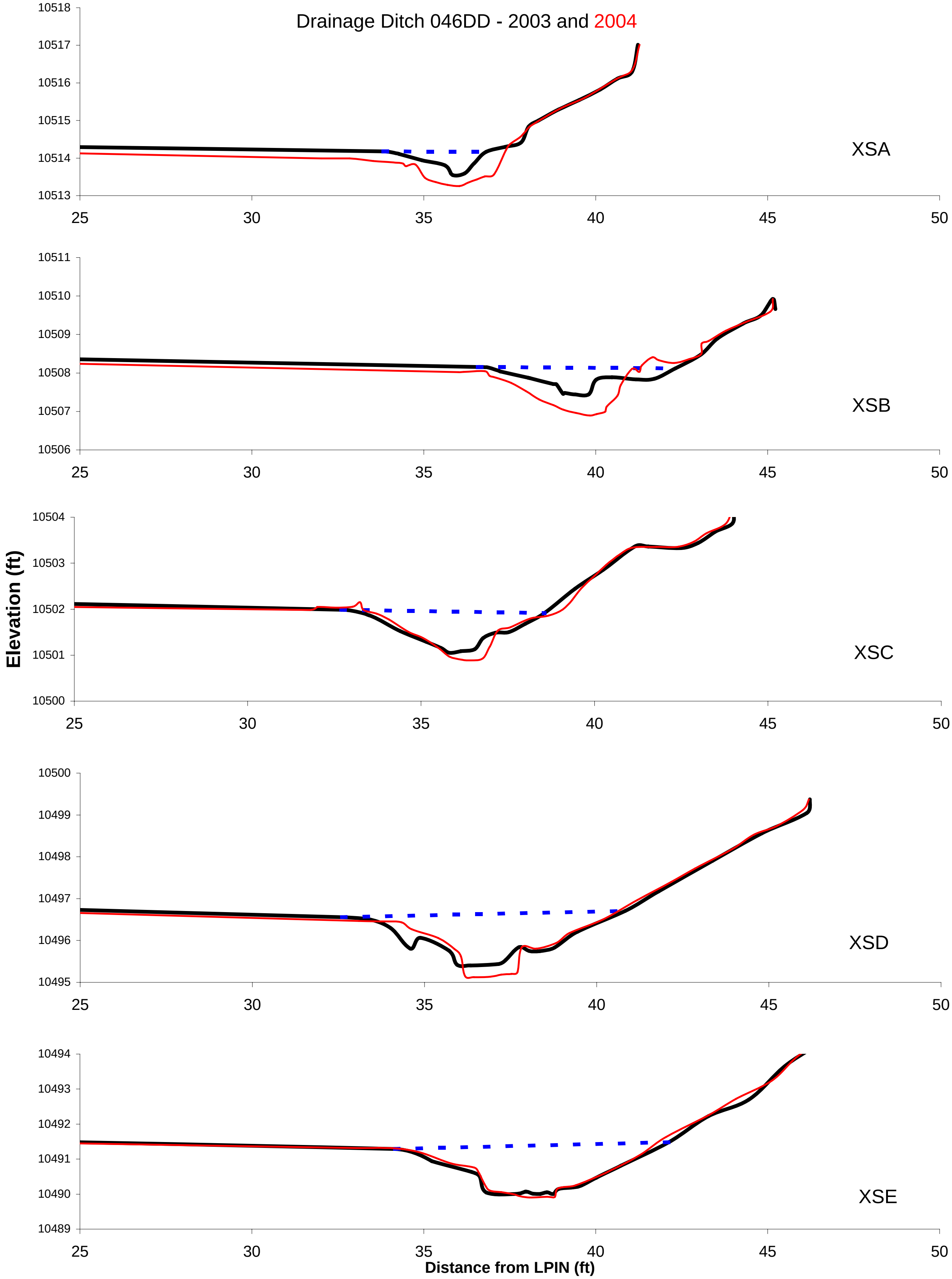
Drainage Ditch 005DD - 2003 and 2004
XSA
XSB
XSC
XSD
XSE
Elevation (ft)
Distance from LPIN (ft)



Drainage Ditch 010DD - 2003 and 2004
XSA
XSB
XSC
XSD
XSE
Elevation (ft)
Distance from LPIN (ft)
10007
10005
10003
10001
9999
9997
10006
10004
10002
10000
9998
9996
9995
9993
9991
9989
9987
0
5
10
15
20
25



Drainage Ditch 042DD - 2003 and 2004
XSA
XSB
XSC
XSD
XSE
Elevation (ft)
Distance from LPIN (ft)



Drainage Ditch 046DD - 2003 and 2004
Elevation (ft)
Distance from LPIN (ft)
XSA
XSB
XSC
XSD
XSE
10518
10517
10516
10515
10514
10513
10511
10510
10509
10508
10507
10506
10504
10503
10502
10501
10500
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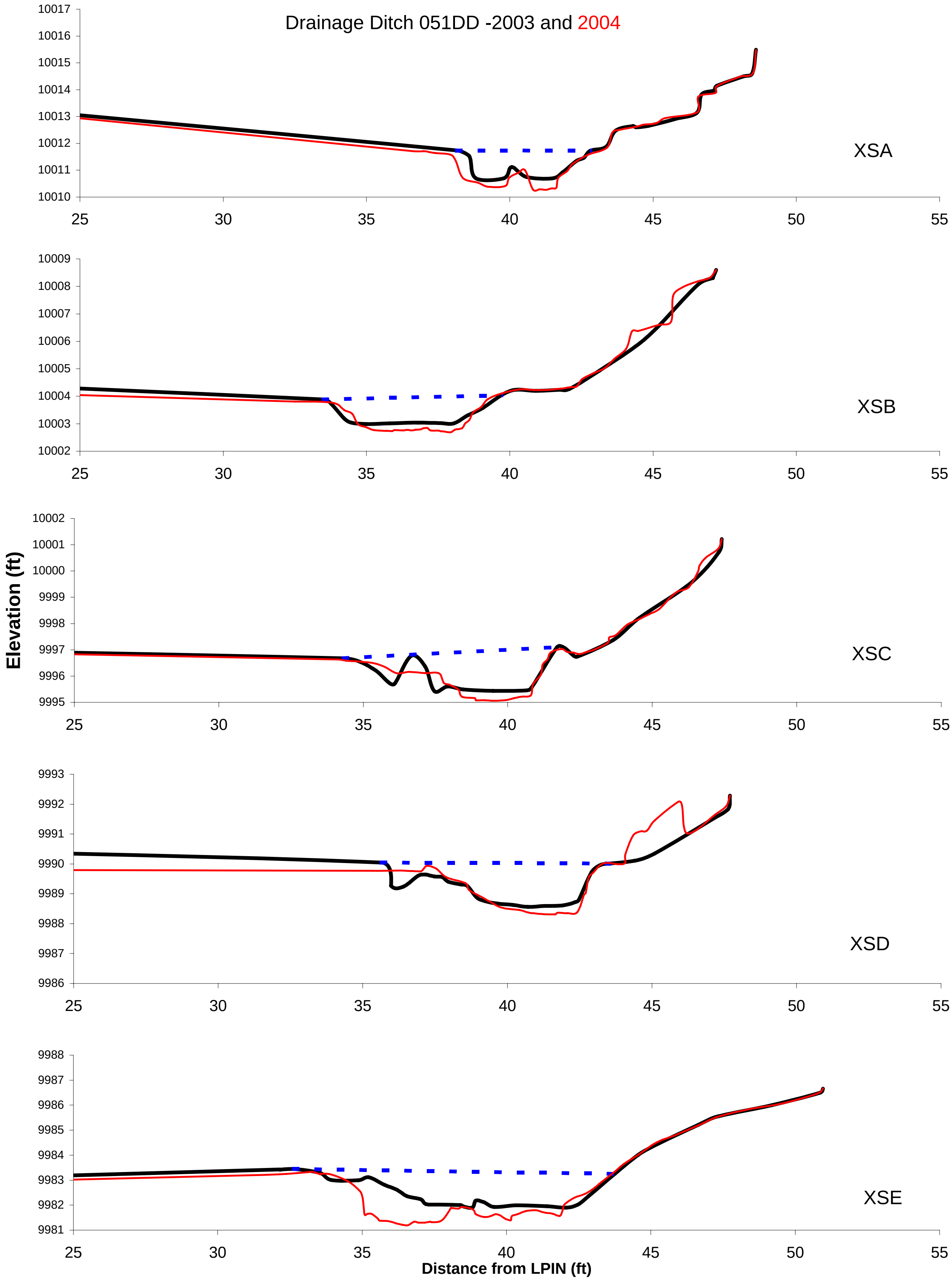
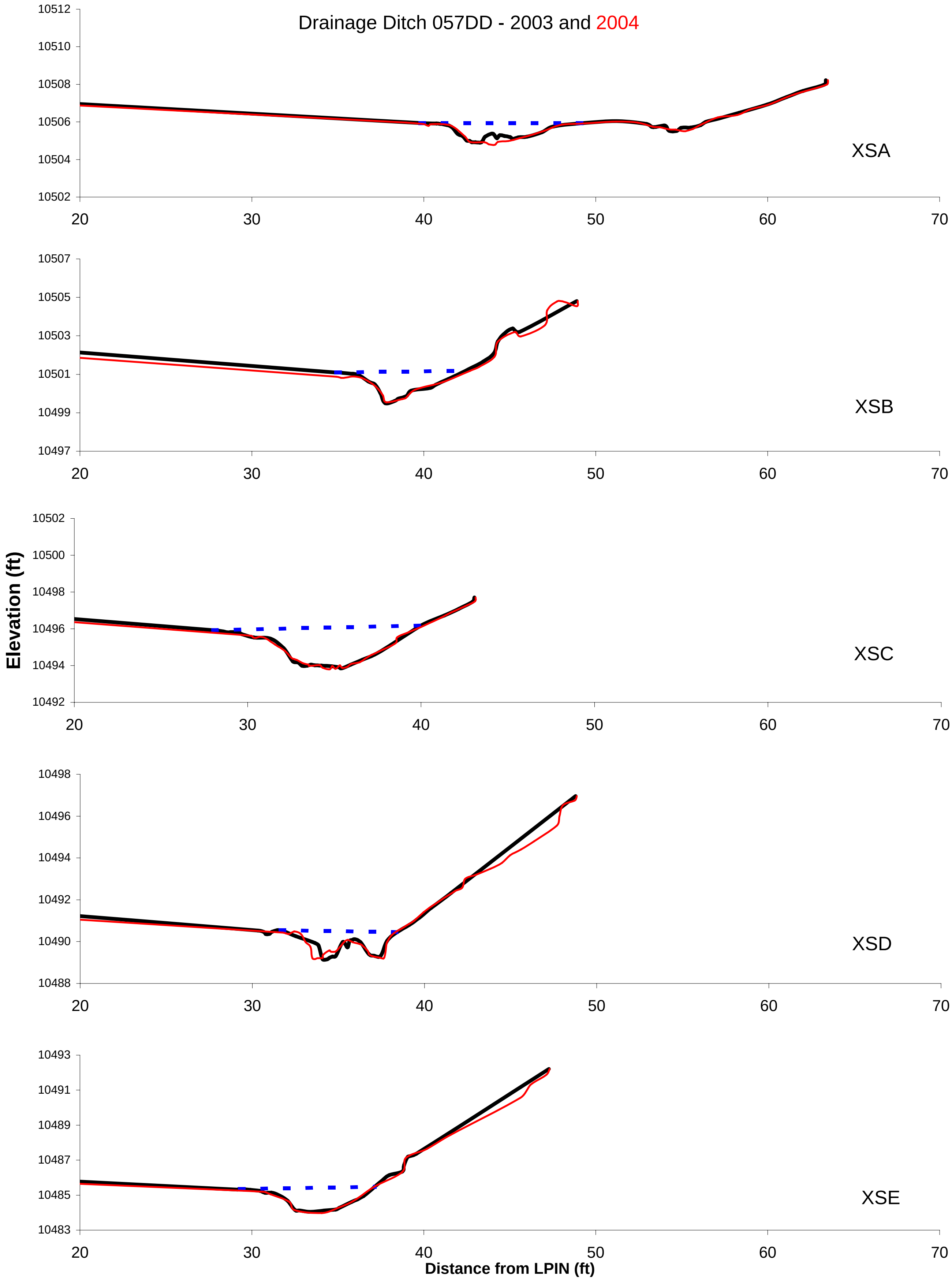
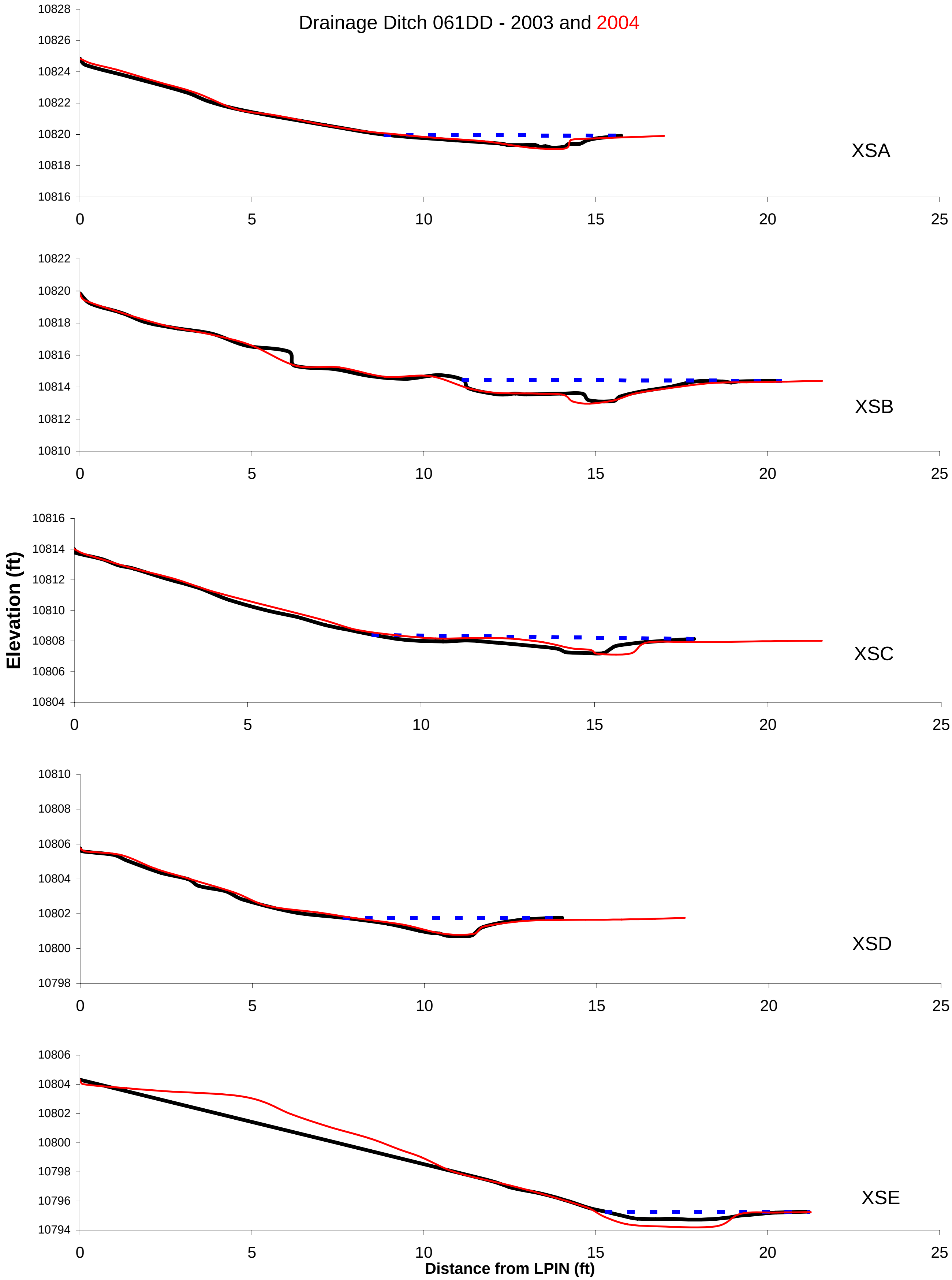
35
40
45
50



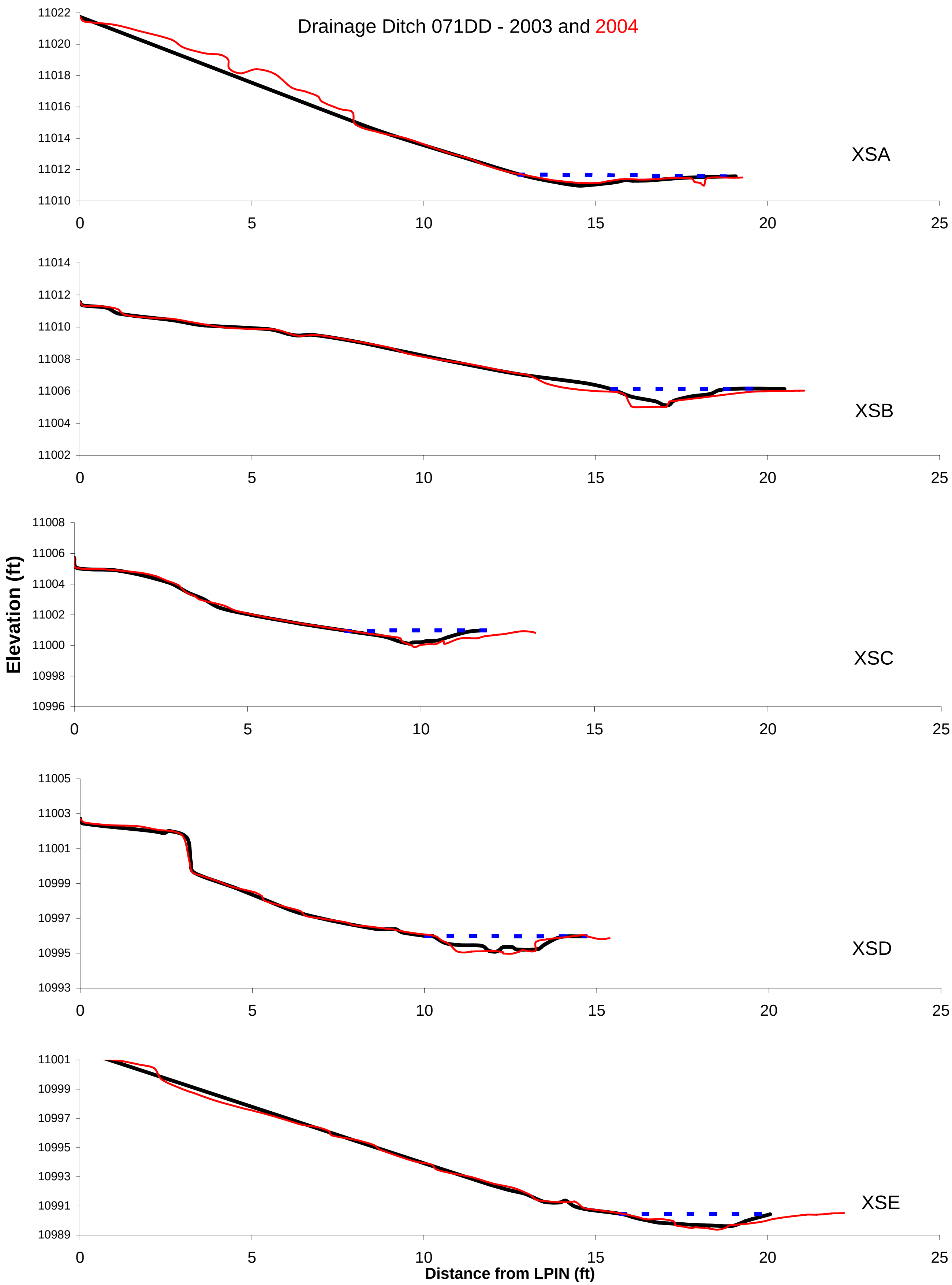
Drainage Ditch 051DD -2003 and 2004
XSA
XSB
XSC
XSD
XSE
Elevation (ft)
Distance from LPIN (ft)



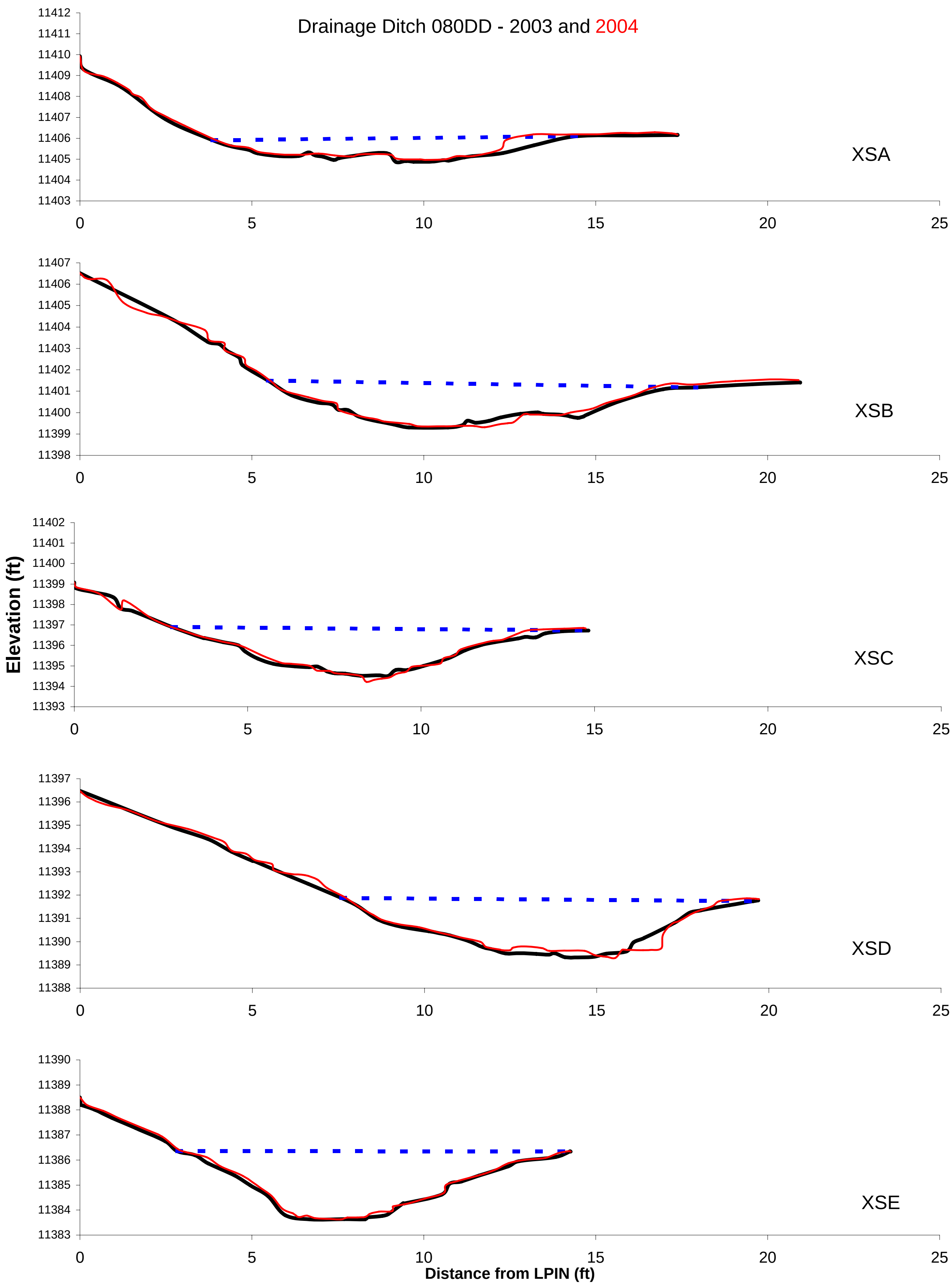
Drainage Ditch 057DD - 2003 and 2004
XSA
XSB
XSC
XSD
XSE
Elevation (ft)
Distance from LPIN (ft)
10512
10510
10508
10506
10504
10502
10507
10505
10503
10501
10499
10497
10502
10500
10498
10496
10494
10492
10498
10496
10494
10492
10490
10488
10493
10491
10489
10487
10485
10483
20
30
40
50
60
70



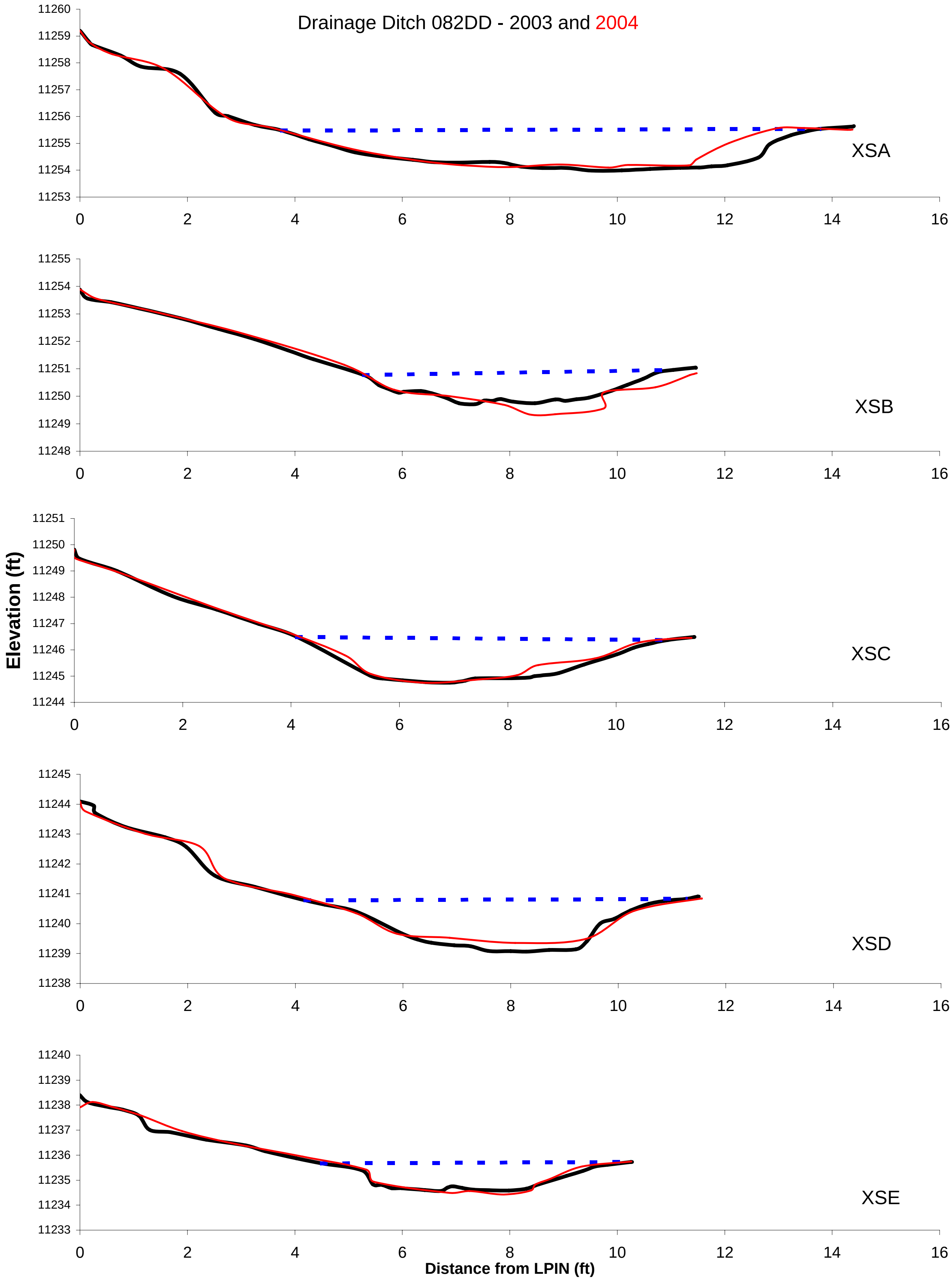
Drainage Ditch 061DD - 2003 and 2004
Elevation (ft)
Distance from LPIN (ft)
XSA
XSB
XSC
XSD
XSE

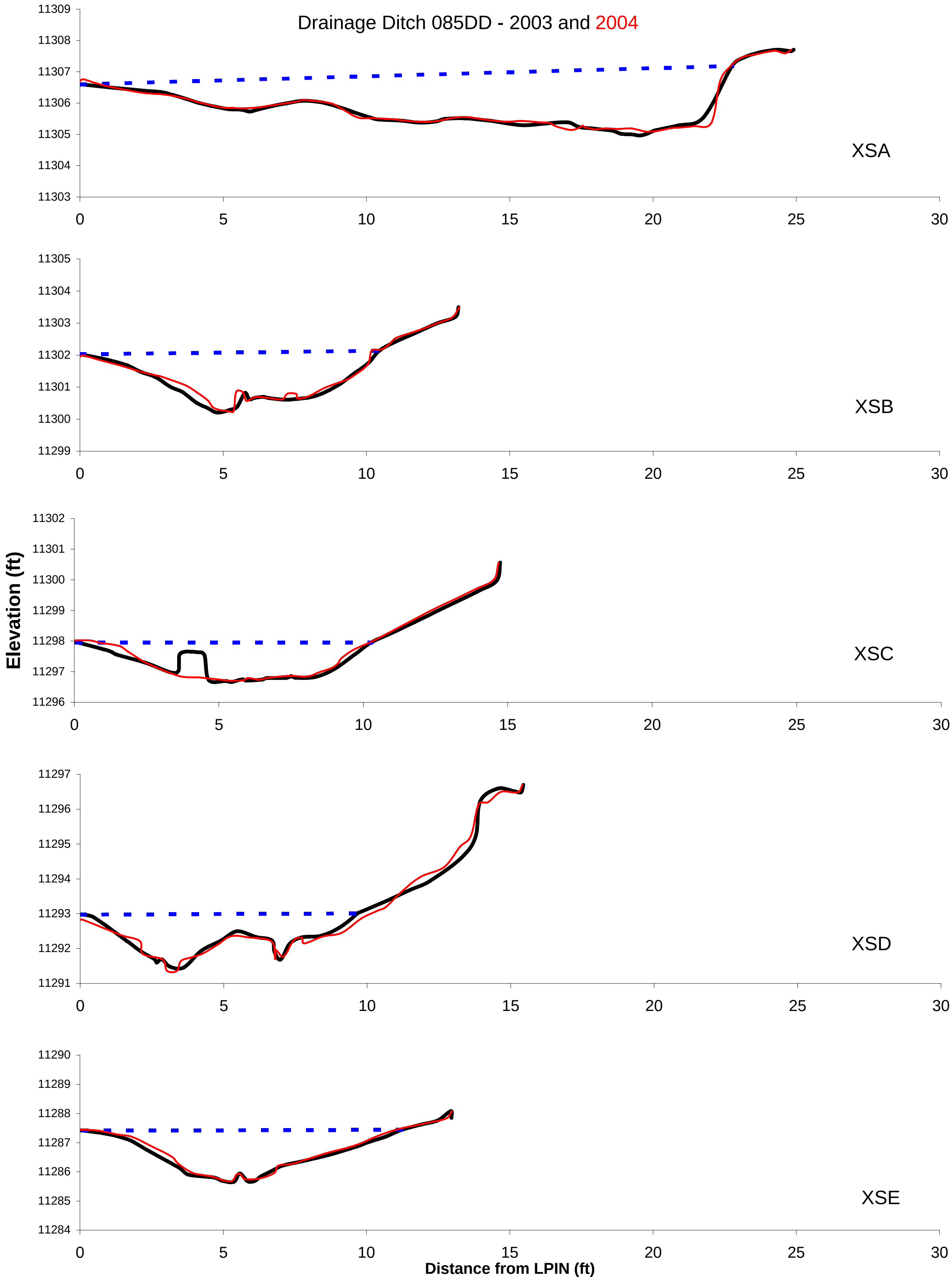


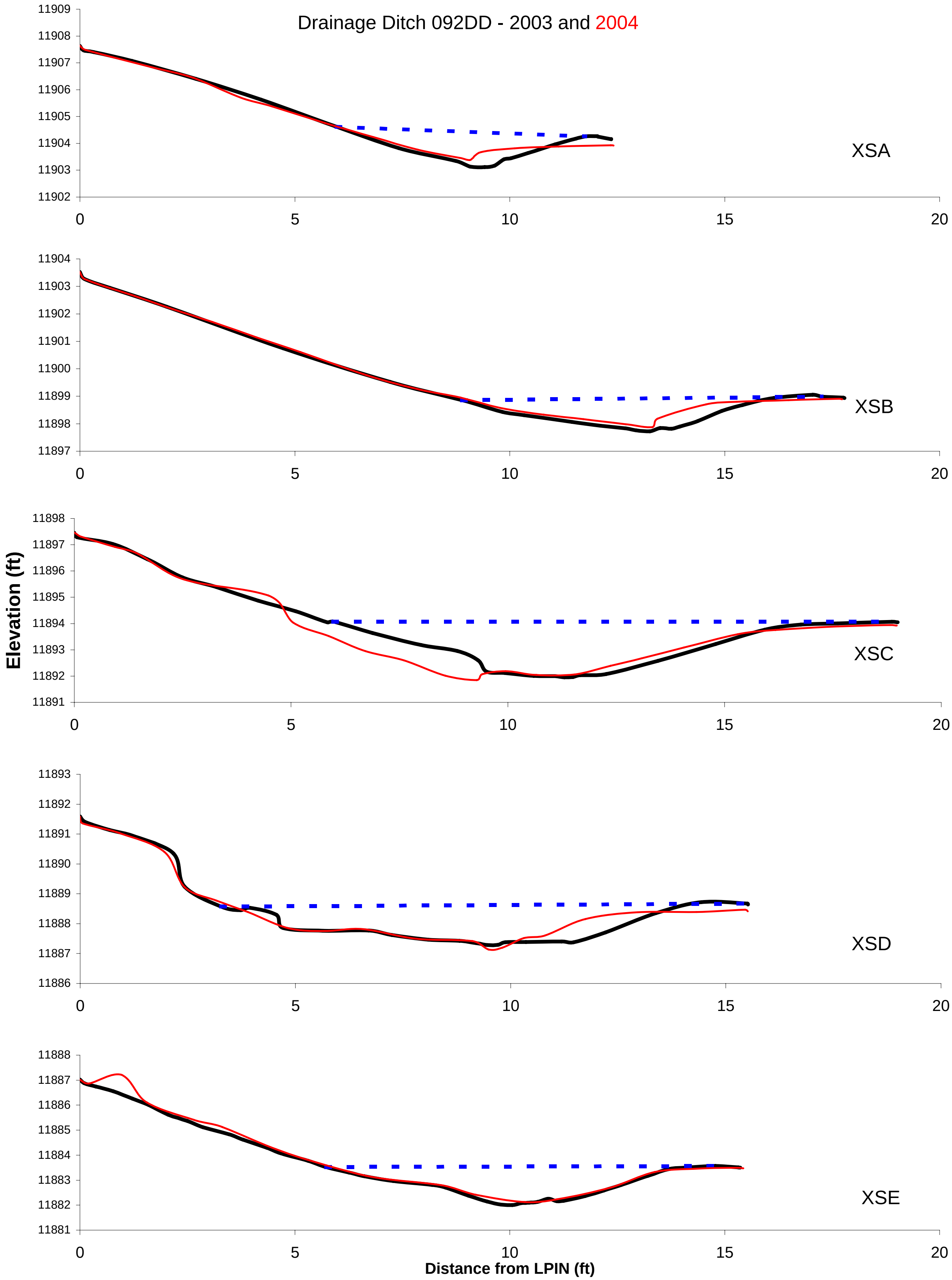
Drainage Ditch 071DD - 2003 and 2004
XSA
XSB
XSC
XSD
XSE
Elevation (ft)
Distance from LPIN (ft)
11022
11020
11018
11016
11014
11012
11010
11014
11008
11006
11004
11002
11000
10998
10996
11005
11003
11001
10999
10997
10995
10993
10991
10989
0
5
10
15
20
25

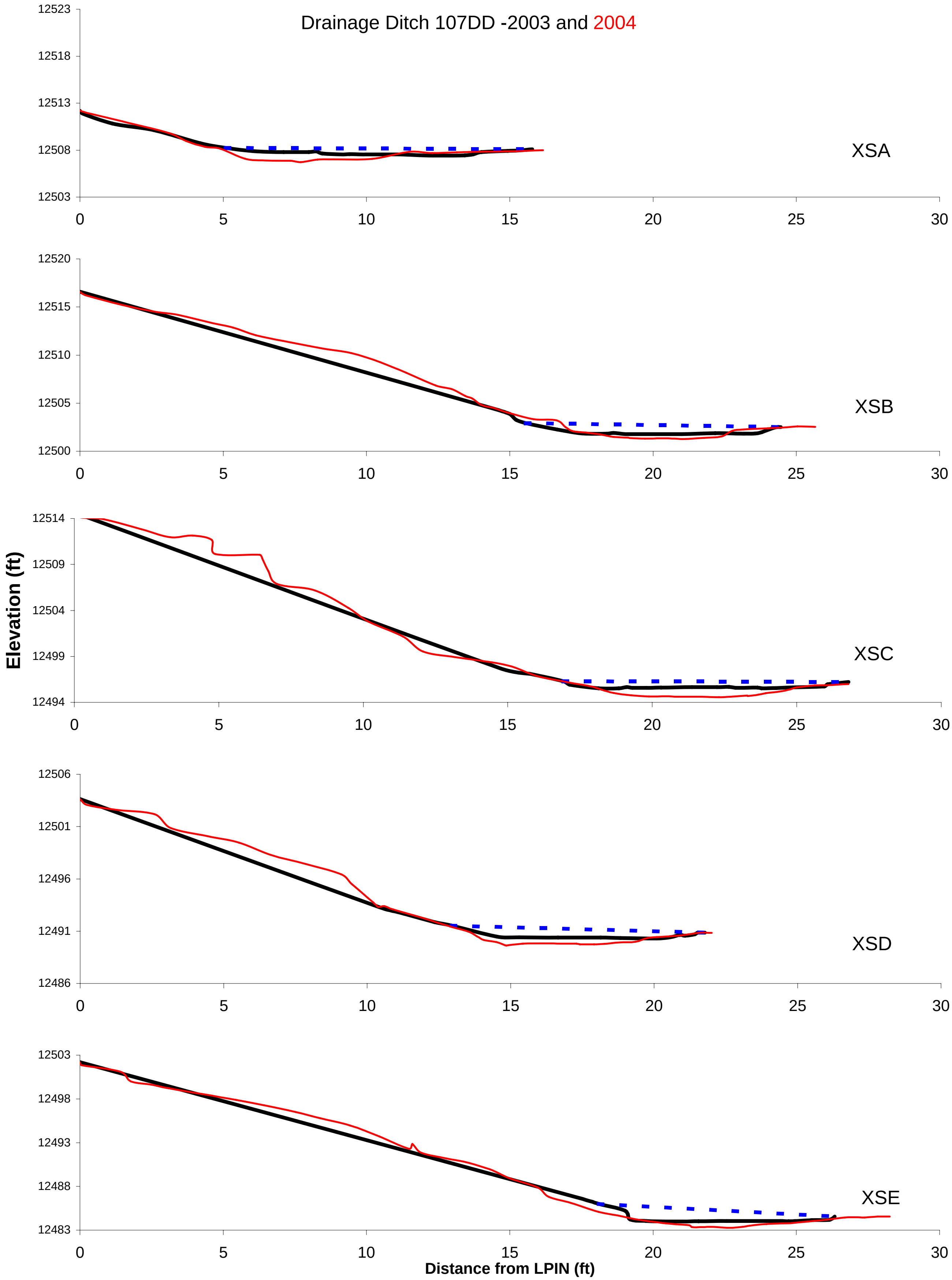


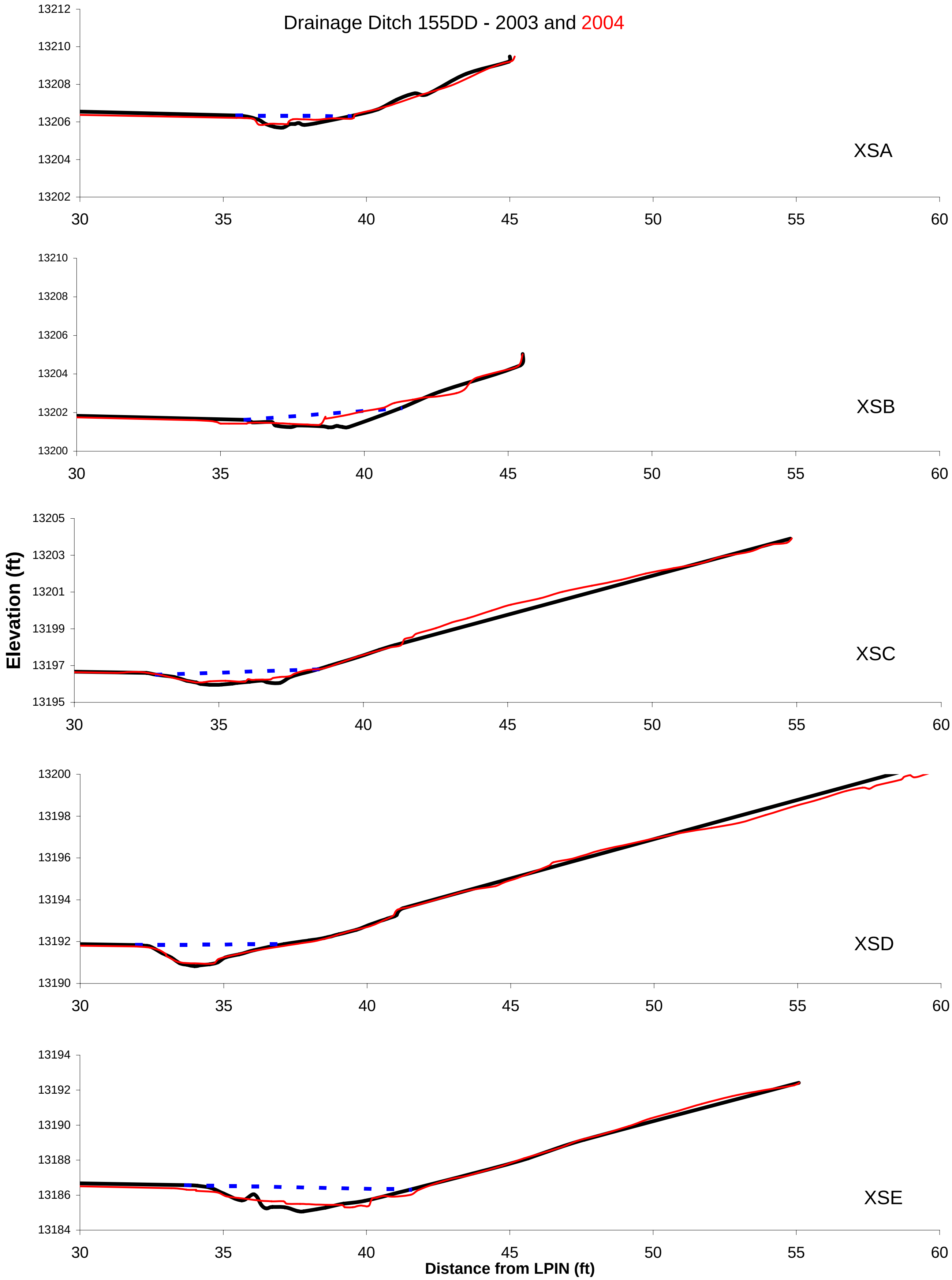
Drainage Ditch 080DD - 2003 and 2004
XSA
XSB
XSC
XSD
XSE
Elevation (ft)
Distance from LPIN (ft)
11412
11411
11410
11409
11408
11407
11406
11405
11404
11403
11402
11401
11400
11399
11398
11397
11396
11395
11394
11393
11392
11391
11390
11389
11388
11387
11386
11385
11384
11383
0
5
10
15
20
25


Drainage Ditch 082DD - 2003 and 2004
XSA
XSB
XSC
XSD
XSE
Elevation (ft)
Distance from LPIN (ft)
11260
11259
11258
11257
11256
11255
11254
11253
11251
11250
11249
11248
11247
11246
11245
11244
11243
11242
11241
11240
11239
11238
11237
11236
11235
11234
11233
0
2
4
6
8
10
12
14
16

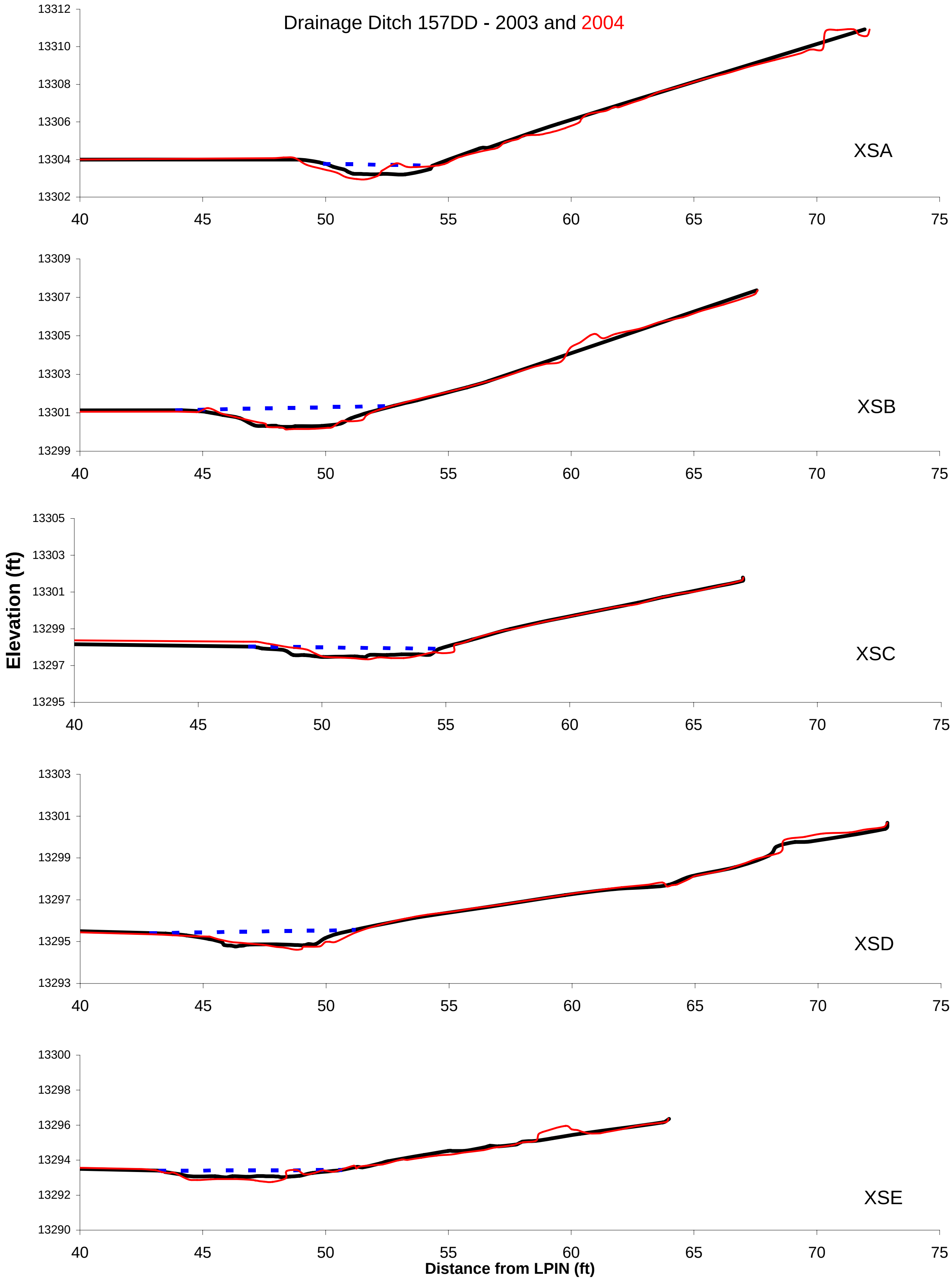

Drainage Ditch 085DD - 2003 and 2004
XSA
XSB
XSC
XSD
XSE
Elevation (ft)
Distance from LPIN (ft)
11309
11308
11307
11306
11305
11304
11303
11305
11304
11303
11302
11301
11300
11299
11302
11301
11300
11299
11298
11297
11296
11297
11296
11295
11294
11293
11292
11291
11290
11289
11288
11287
11286
11285
11284
0
5
10
15
20
25
30


Drainage Ditch 092DD - 2003 and 2004
11909
11908
11907
11906
11905
11904
11903
11902
0
5
10
15
20
XSA
11904
11903
11902
11901
11900
11899
11898
11897
XSB
11898
11897
11896
11895
11894
11893
11892
11891
XSC
11893
11892
11891
11890
11889
11888
11887
11886
XSD
11888
11887
11886
11885
11884
11883
11882
11881
XSE
Elevation (ft)
Distance from LPIN (ft)

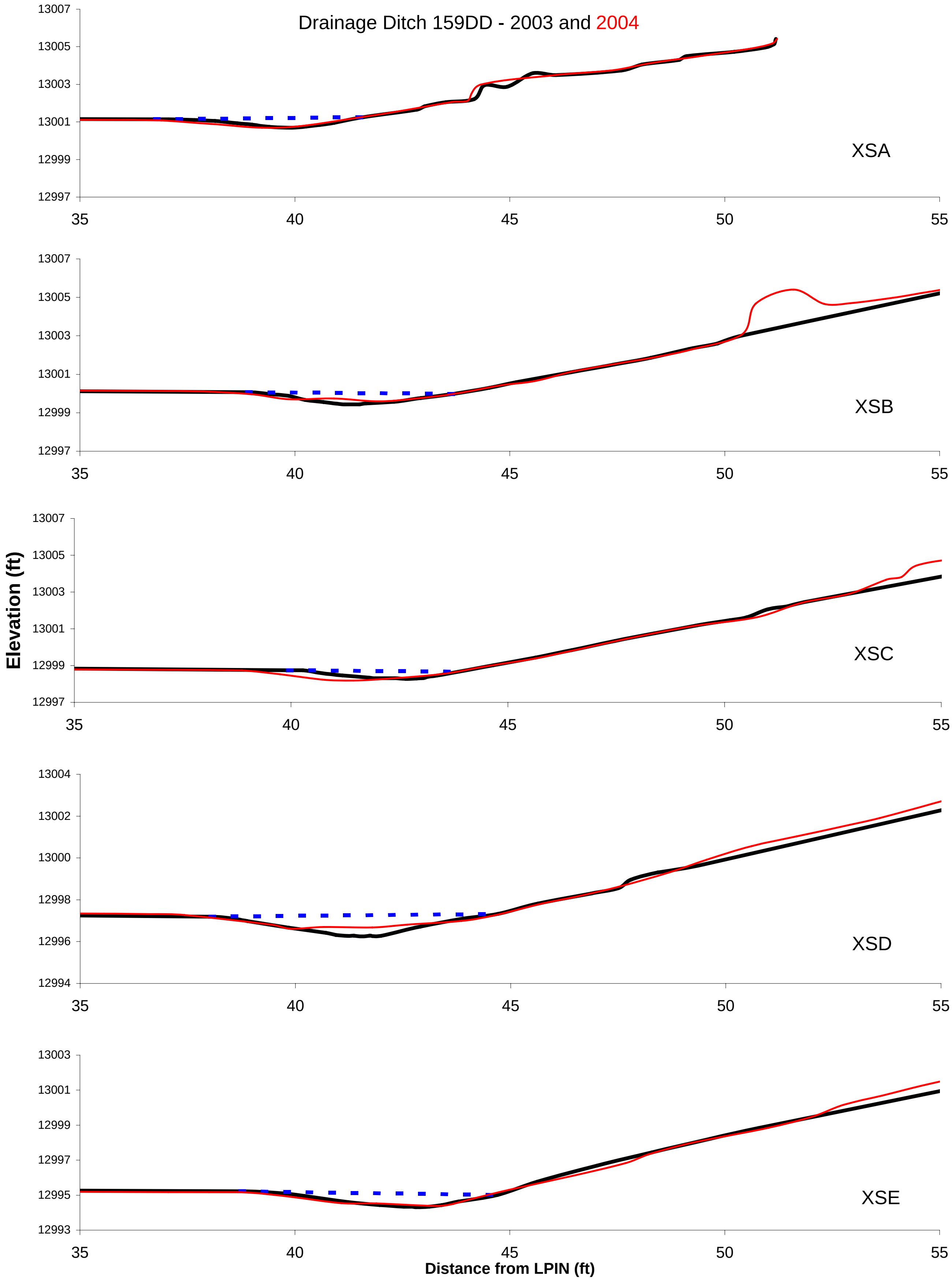

Drainage Ditch 107DD -2003 and 2004
Elevation (ft)
Distance from LPIN (ft)
XSA
XSB
XSC
XSD
XSE
12523
12518
12513
12508
12503
12520
12515
12510
12505
12500
12514
12509
12504
12499
12494
12506
12501
12496
12491
12486
12503
12498
12493
12488
12483
0
5
10
15
20
25
30



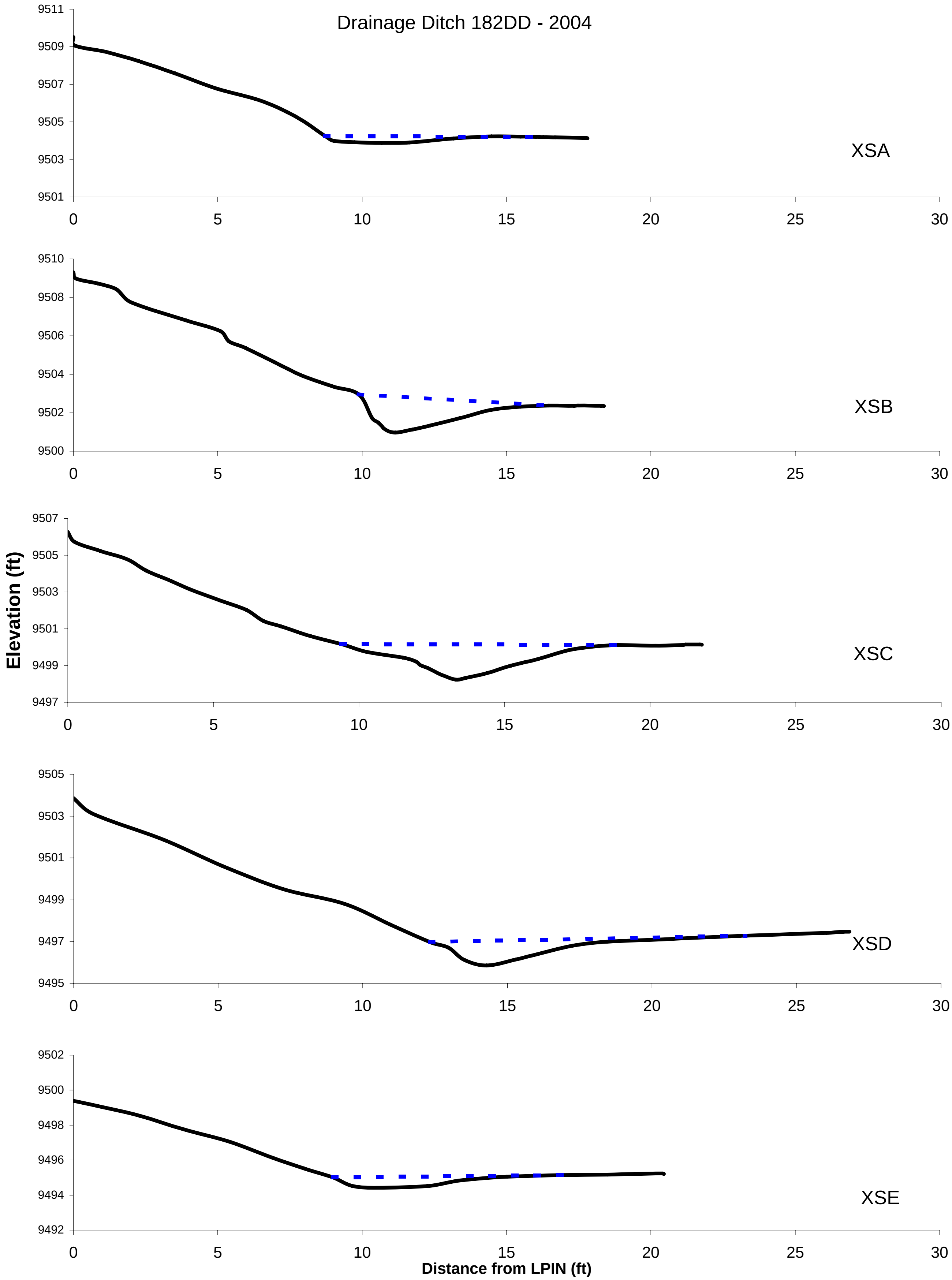
Drainage Ditch 155DD - 2003 and 2004
XSA
XSB
XSC
XSD
XSE
Elevation (ft)
Distance from LPIN (ft)
13212
13210
13208
13206
13204
13202
13200
13205
13203
13201
13199
13197
13195
13198
13196
13194
13192
13190
13188
13186
13184
30
35
40
45
50
55
60



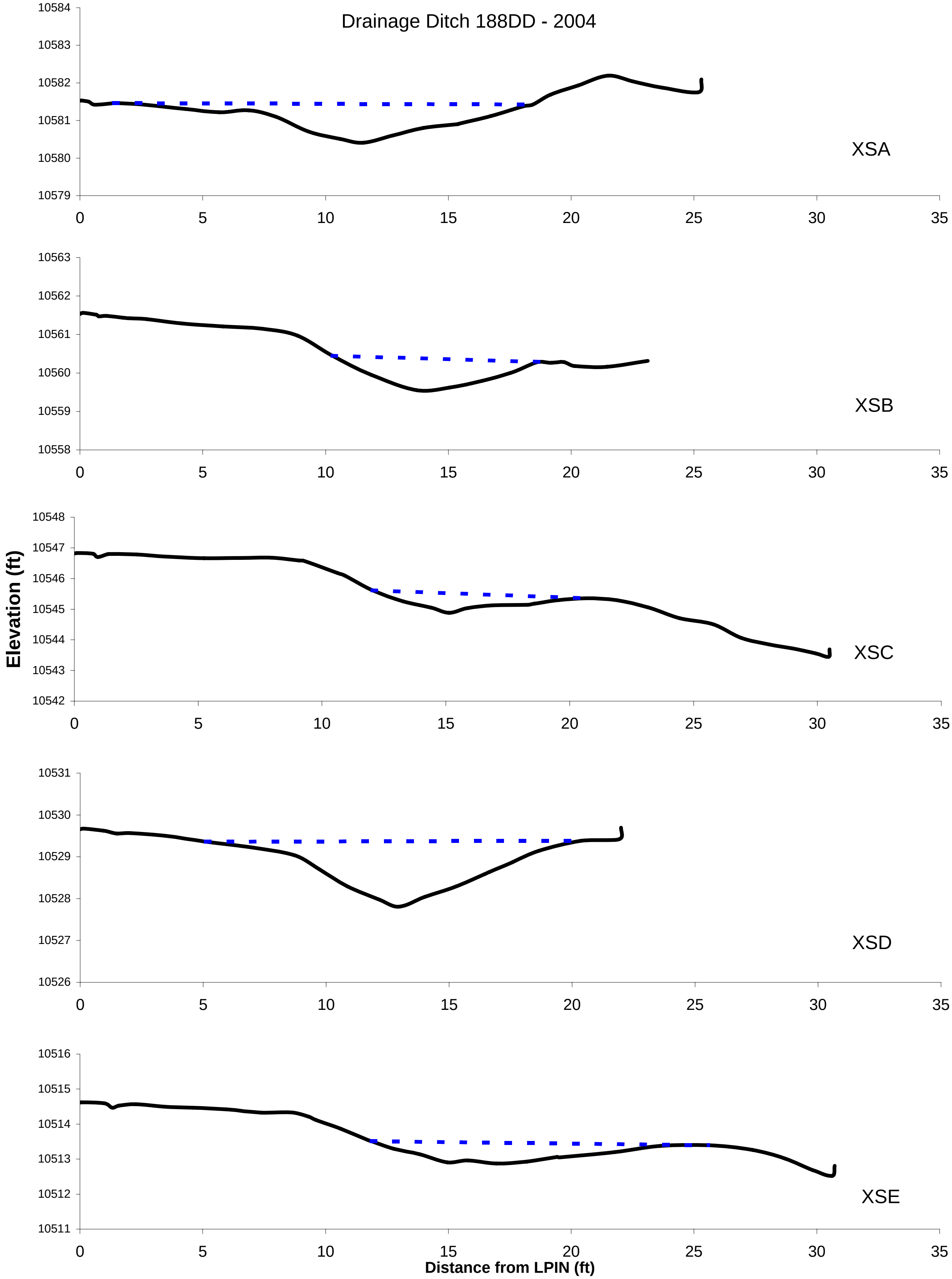
Drainage Ditch 157DD - 2003 and 2004
XSA
XSB
XSC
XSD
XSE
Elevation (ft)
Distance from LPIN (ft)
13312
13310
13308
13306
13304
13302
13309
13307
13305
13303
13301
13299
13305
13303
13301
13299
13297
13295
13303
13301
13299
13297
13295
13293
13300
13298
13296
13294
13292
13290
40
45
50
55
60
65
70
75

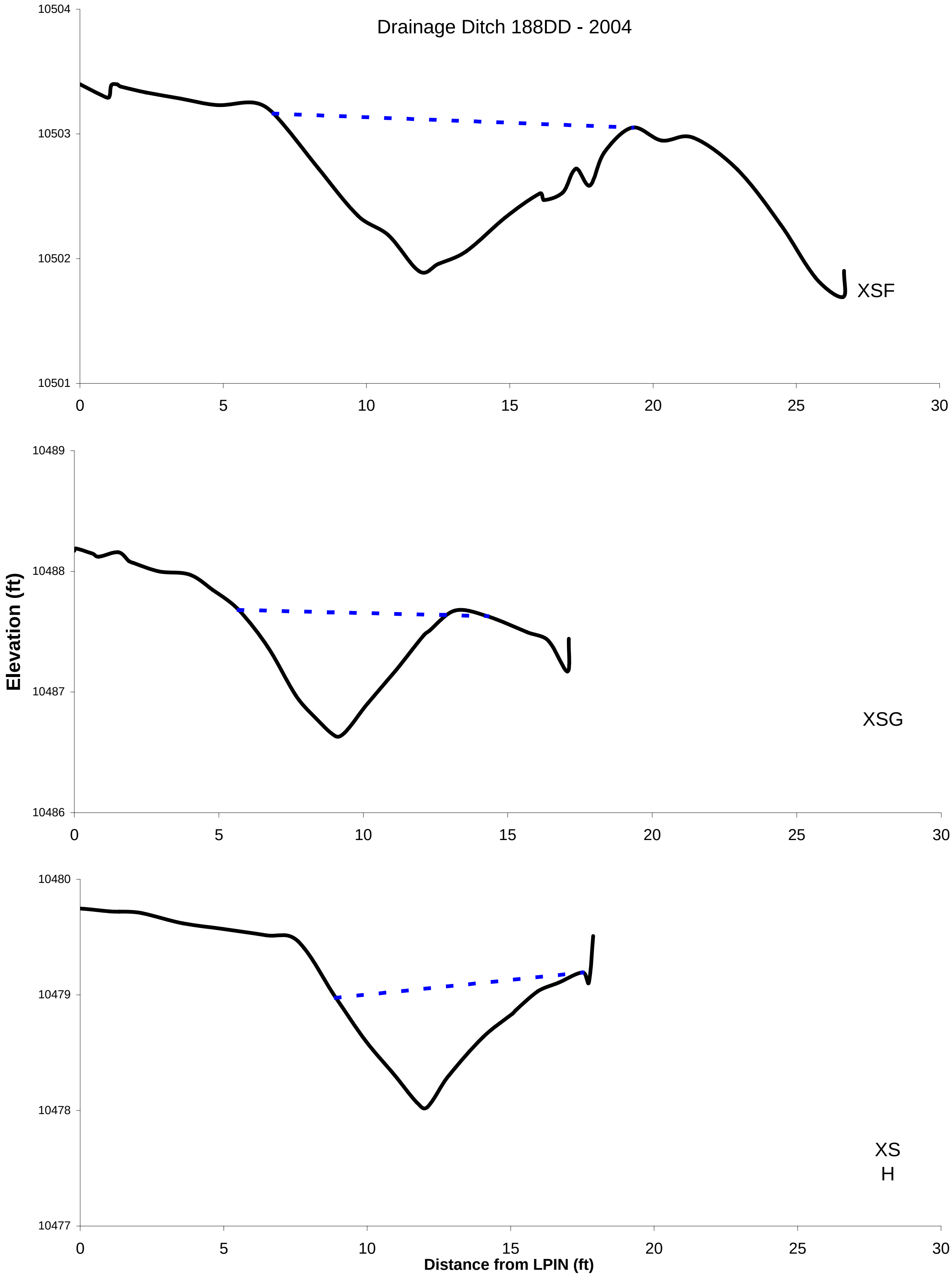


Drainage Ditch 159DD - 2003 and 2004
XSA
XSB
XSC
XSD
XSE
Elevation (ft)
Distance from LPIN (ft)
13007
13005
13003
13001
12999
12997
13004
13002
13000
12998
12996
12994
13003
12995
12993
35
40
45
50
55

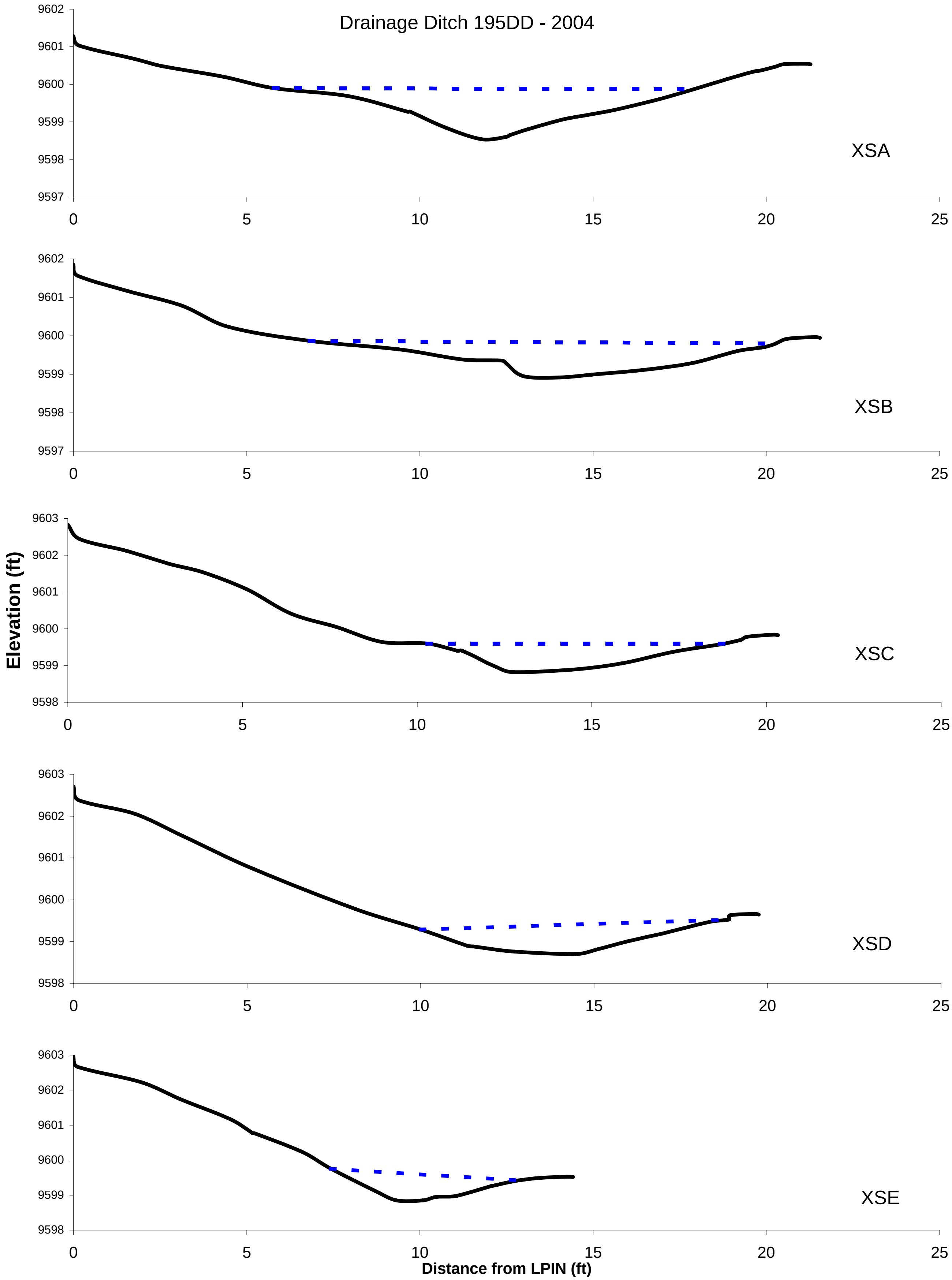


Drainage Ditch 182DD - 2004
XSA
XSB
XSC
XSD
XSE
Elevation (ft)
Distance from LPIN (ft)
9511
9509
9507
9505
9503
9501
9510
9508
9506
9504
9502
9500
9507
9505
9503
9501
9499
9497
9505
9503
9501
9499
9497
9495
9502
9500
9498
9496
9494
9492
0
5
10
15
20
25
30

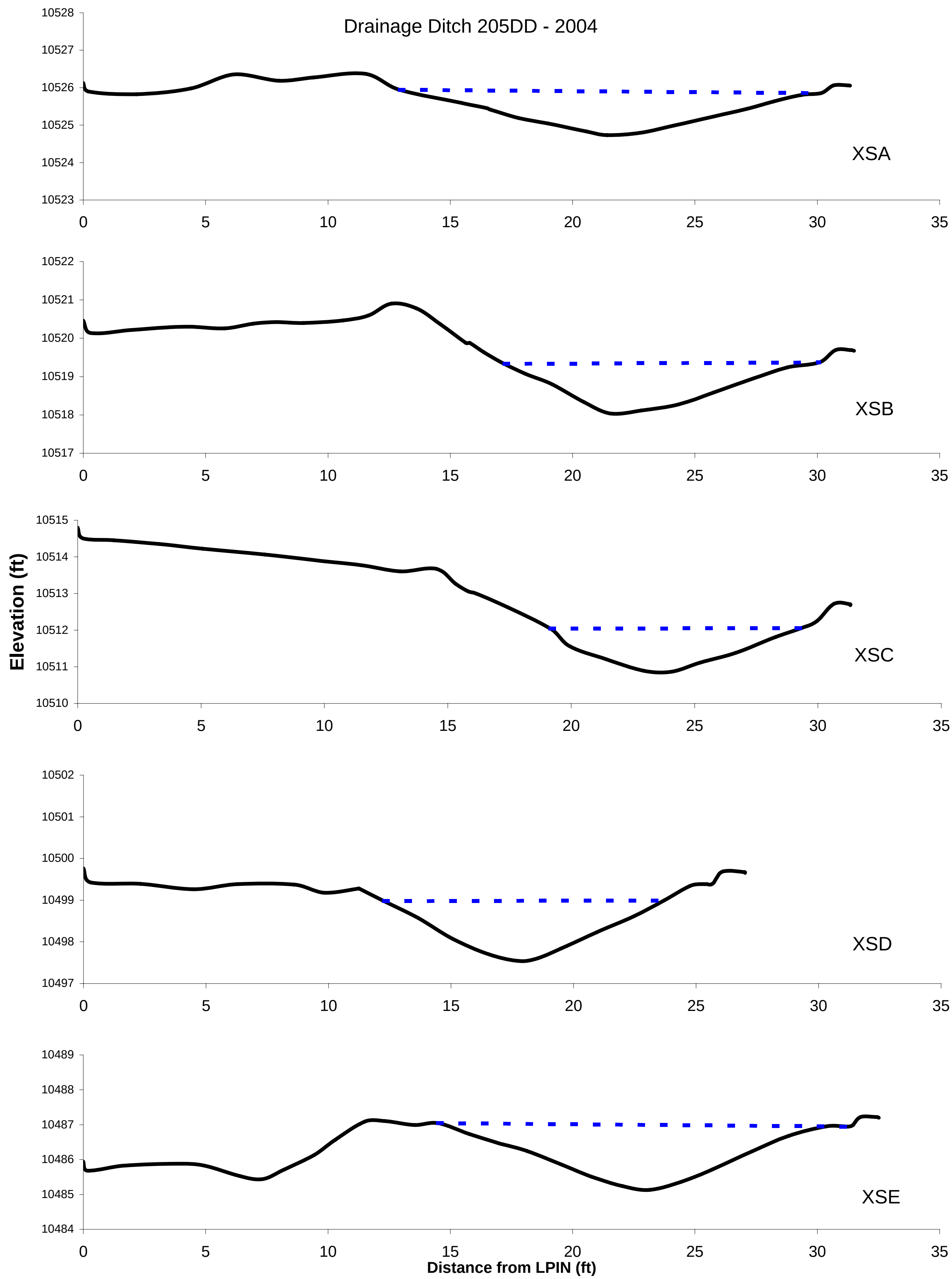

Drainage Ditch 188DD - 2004
XSA
XSB
XSC
XSD
XSE
Elevation (ft)
Distance from LPIN (ft)
10584
10583
10582
10581
10580
10579
10563
10562
10561
10560
10559
10558
10548
10547
10546
10545
10544
10543
10542
10531
10530
10529
10528
10527
10526
10516
10515
10514
10513
10512
10511
0
5
10
15
20
25
30
35



Drainage Ditch 188DD - 2004
Elevation (ft)
10504
10503
10502
10501
0
5
10
15
20
25
30
XSF
10489
10488
10487
10486
0
5
10
15
20
25
30
XSG
10480
10479
10478
10477
0
5
10
15
20
25
30
XS
H
Distance from LPIN (ft)



Drainage Ditch 195DD - 2004
XSA
XSB
XSC
XSD
XSE
Elevation (ft)
Distance from LPIN (ft)
9597
9598
9599
9600
9601
9602
9603
0
5
10
15
20
25



Drainage Ditch 205DD - 2004
Elevation (ft)
Distance from LPIN (ft)
XSA
XSB
XSC
XSD
XSE
10528
10527
10526
10525
10524
10523
10522
10521
10520
10519
10518
10517
10515
10514
10513
10512
10511
10510
10502
10501
10500
10499
10498
10497
10489
10488
10487
10486
10485
10484
0
5
10
15
20
25
30
35

Appendix F

Conveyance Channels
Cross Section Geometry and Graphs

2004

Channel Geometry of Conveyance Channels 2004

Conveyance Channel Identifier	Date	Cross Section	Width (ft)	Cross Sectional Area (ft^2)	Mean Depth (ft)	Maximum Depth (ft)	Wetted Perimeter (ft)	Hydraulic Radius (ft)	Width /Depth Ratio
016CC	02Jun04	A	9.6	2.22	0.23	0.54	9.68	0.23	41.48
016CC	02Jun04	B	11.7	11.03	0.94	2.29	13.45	0.82	12.44
016CC	02Jun04	C	5.1	2.65	0.52	1.26	6.49	0.41	9.74
017CC	17Jun04	A	8.7	3.40	0.39	0.93	9.59	0.36	22.19
017CC	17Jun04	B	10.4	2.86	0.27	0.48	10.48	0.27	38.00
017CC	17Jun04	C	25.5	14.91	0.59	1.12	25.60	0.58	43.49
018CC	16Jun04	A	9.9	11.48	1.16	2.80	12.97	0.88	8.50
018CC	16Jun04	B	22.6	45.90	2.03	6.29	27.62	1.66	11.17
018CC	16Jun04	C	12.9	31.12	2.41	3.89	15.86	1.96	5.37
019CC	16Jun04	A	5.3	3.59	0.68	1.50	6.27	0.57	7.85
019CC	16Jun04	B	18.9	16.94	0.90	2.98	22.22	0.76	21.09
019CC	16Jun04	C	21.8	14.56	0.67	1.72	22.56	0.65	32.75
020CC	21Jun04	A	14.2	59.26	4.17	6.70	20.80	2.85	3.40
020CC	21Jun04	B	12.7	54.09	4.26	7.34	22.86	2.37	2.98
020CC	21Jun04	C	13.5	25.40	1.88	3.33	15.37	1.65	7.21
021CC	09Jun04	A	10.2	24.74	2.43	5.78	16.50	1.50	4.19
021CC	09Jun04	B	9.3	27.43	2.95	5.76	15.38	1.78	3.15
021CC	09Jun04	C	14.1	36.21	2.56	5.33	18.18	1.99	5.51
022CC	21Jun04	A	5.1	1.77	0.34	0.74	5.40	0.33	14.90
022CC	21Jun04	B	12.9	4.84	0.37	0.71	13.59	0.36	34.44
022CC	21Jun04	C	11.3	8.37	0.74	2.05	12.54	0.67	15.34
023CC	21Jun04	A	7.0	10.52	1.51	2.73	9.09	1.16	4.63
023CC	21Jun04	B	3.9	2.64	0.68	1.21	5.04	0.52	5.67
023CC	21Jun04	C	8.7	10.20	1.17	2.39	10.14	1.01	7.40
024CC	16Jun04	A	9.4	47.34	5.02	8.35	21.29	2.22	1.88
024CC	16Jun04	B	19.5	261.40	13.39	19.13	46.86	5.58	1.46
024CC	16Jun04	C	18.4	224.87	12.20	16.83	50.42	4.46	1.51
025CC	21Jun04	A	11.1	21.04	1.90	5.27	16.51	1.27	5.81
025CC	21Jun04	B	5.6	1.33	0.24	0.58	5.86	0.23	23.96
025CC	21Jun04	C	3.6	7.98	2.20	4.57	10.93	0.73	1.66
026CC	22Jun04	A	1.7	0.29	0.17	0.39	1.89	0.16	9.71
026CC	22Jun04	B	4.2	0.90	0.21	0.56	4.46	0.20	19.67
026CC	22Jun04	C	2.6	0.50	0.19	0.34	2.89	0.17	14.01
027CC	22Jun04	A	13.5	108.08	8.01	10.92	29.06	3.72	1.68
027CC	22Jun04	B	7.3	27.84	3.81	8.65	20.62	1.35	1.91
027CC	22Jun04	C	11.0	58.88	5.38	7.75	20.41	2.89	2.04
029CC	30Jun04	A	5.3	2.73	0.52	1.32	6.73	0.41	10.24
029CC	30Jun04	Br	4.8	1.26	0.26	0.64	5.20	0.24	18.43
029CC	30Jun04	Br	1.5	0.47	0.30	0.40	1.91	0.24	5.11
029CC	30Jun04	C	7.1	3.21	0.45	1.28	7.81	0.41	15.61
030CC	30Jun04	A	16.2	38.90	2.40	4.20	18.60	2.09	6.76
030CC	30Jun04	Bl	31.6	24.66	0.78	1.58	33.49	0.74	40.57
030CC	30Jun04	Br	12.8	28.87	2.26	3.91	15.52	1.86	5.66
030CC	30Jun04	Cl	21.9	31.92	1.46	2.69	23.37	1.37	15.02
030CC	30Jun04	Cr	12.7	18.99	1.49	2.86	14.21	1.34	8.55
031CC	30Jun04	A	16.1	13.61	0.84	2.02	17.40	0.78	19.09
031CC	30Jun04	B	3.9	7.49	1.91	3.39	8.81	0.85	2.04
031CC	30Jun04	C	6.0	8.27	1.39	3.82	10.59	0.78	4.31

Channel Geometry of Conveyance Channels 2004

Conveyance Channel Identifier	Date	Cross Section	Width (ft)	Cross Sectional Area (ft^2)	Mean Depth (ft)	Maximum Depth (ft)	Wetted Perimeter (ft)	Hydraulic Radius (ft)	Width /Depth Ratio
032CC	01Jul04	A	8.3	32.69	3.96	6.09	15.64	2.09	2.09
032CC	01Jul04	B	9.3	26.59	2.86	5.26	15.42	1.72	3.26
032CC	01Jul04	C	5.9	8.57	1.45	2.47	8.34	1.03	4.09
033CC	01Jul04	A	20.6	63.29	3.07	5.88	24.84	2.55	6.72
033CC	01Jul04	B	17.5	49.93	2.85	5.07	22.29	2.24	6.14
033CC	01Jul04	C	17.9	35.68	2.00	4.62	21.31	1.67	8.96
034CC	01Jul04	Al	7.6	3.92	0.52	1.47	8.65	0.45	14.56
034CC	01Jul04	Ar	12.8	4.71	0.37	0.97	13.18	0.36	34.88
034CC	01Jul04	B	14.8	9.85	0.67	1.83	16.43	0.60	22.16
034CC	01Jul04	C	13.1	8.64	0.66	1.37	13.64	0.63	19.76
035CC	01Jul04	A	24.6	67.68	2.75	4.67	27.07	2.50	8.94
035CC	01Jul04	B	26.4	53.85	2.04	3.26	28.17	1.91	12.97
035CC	01Jul04	C	23.4	111.51	4.76	8.68	30.93	3.61	4.92
036CC	01Jul04	Al	7.7	2.36	0.31	0.54	7.92	0.30	25.22
036CC	01Jul04	Ar	5.8	0.94	0.16	0.33	5.94	0.16	36.53
036CC	01Jul04	Bl	4.3	1.34	0.31	0.67	4.64	0.29	13.78
036CC	01Jul04	Br	2.5	0.90	0.36	0.60	2.83	0.32	6.92
036CC	01Jul04	Cl	4.8	1.19	0.25	0.47	4.91	0.24	19.23
036CC	01Jul04	Cr	3.8	1.05	0.28	0.41	3.96	0.27	13.44
037CC	07Jul04	A	14.6	19.69	1.35	4.44	20.10	0.98	10.83
037CC	07Jul04	B	19.7	73.98	3.75	7.66	27.01	2.74	5.26
037CC	07Jul04	C	16.6	47.51	2.85	4.20	21.06	2.26	5.83
038CC	07Jul04	A	23.4	20.62	0.88	1.93	25.88	0.80	26.62
038CC	07Jul04	B	7.4	10.20	1.38	3.76	13.39	0.76	5.39
038CC	07Jul04	C	17.0	14.60	0.86	2.71	20.10	0.73	19.68
058CC	21Jul04	A	20.1	13.51	0.67	2.23	22.51	0.60	29.90
058CC	21Jul04	B	5.2	5.78	1.12	1.97	7.15	0.81	4.60
058CC	21Jul04	C	9.2	9.91	1.08	2.41	11.21	0.88	8.54
064CC	21Jul04	A	11.8	15.79	1.34	2.85	14.30	1.10	8.84
064CC	21Jul04	B	15.6	7.79	0.50	1.45	17.22	0.45	31.10
064CC	21Jul04	C	14.2	5.77	0.40	0.95	15.03	0.38	35.17
065CC	22Jul04	A	4.8	3.64	0.76	1.27	5.64	0.65	6.30
065CC	22Jul04	B	10.2	3.65	0.36	1.07	11.19	0.33	28.64
065CC	22Jul04	C	7.2	4.36	0.61	1.27	7.82	0.56	11.76
066CC	22Jul04	A	7.9	7.00	0.89	1.67	10.62	0.66	8.84
066CC	22Jul04	B	11.2	6.78	0.60	1.22	13.72	0.49	18.62
066CC	22Jul04	C	10.6	11.09	1.05	2.36	13.32	0.83	10.10
067CC	22Jul04	A	5.9	1.45	0.24	0.40	6.02	0.24	24.30
067CC	22Jul04	Ar	19.0	11.99	0.63	1.83	22.27	0.54	30.08
067CC	22Jul04	B	6.0	1.33	0.22	0.43	6.15	0.22	26.93
067CC	22Jul04	Br	22.9	20.59	0.90	2.27	28.44	0.72	25.41
067CC	22Jul04	C	6.9	2.35	0.34	0.68	7.22	0.33	20.29
067CC	22Jul04	Cr	25.1	15.70	0.63	1.94	30.42	0.52	40.16
069CC	23Jul04	Al	3.3	0.43	0.13	0.33	3.36	0.13	24.61
069CC	23Jul04	Ar	22.7	11.91	0.52	1.40	24.35	0.49	43.29
069CC	23Jul04	Bl	1.7	0.57	0.34	0.46	2.07	0.27	4.93
069CC	23Jul04	Br	8.4	4.73	0.56	1.46	9.15	0.52	14.86
069CC	23Jul04	C	18.5	9.89	0.54	0.98	18.94	0.52	34.47

Channel Geometry of Conveyance Channels 2004

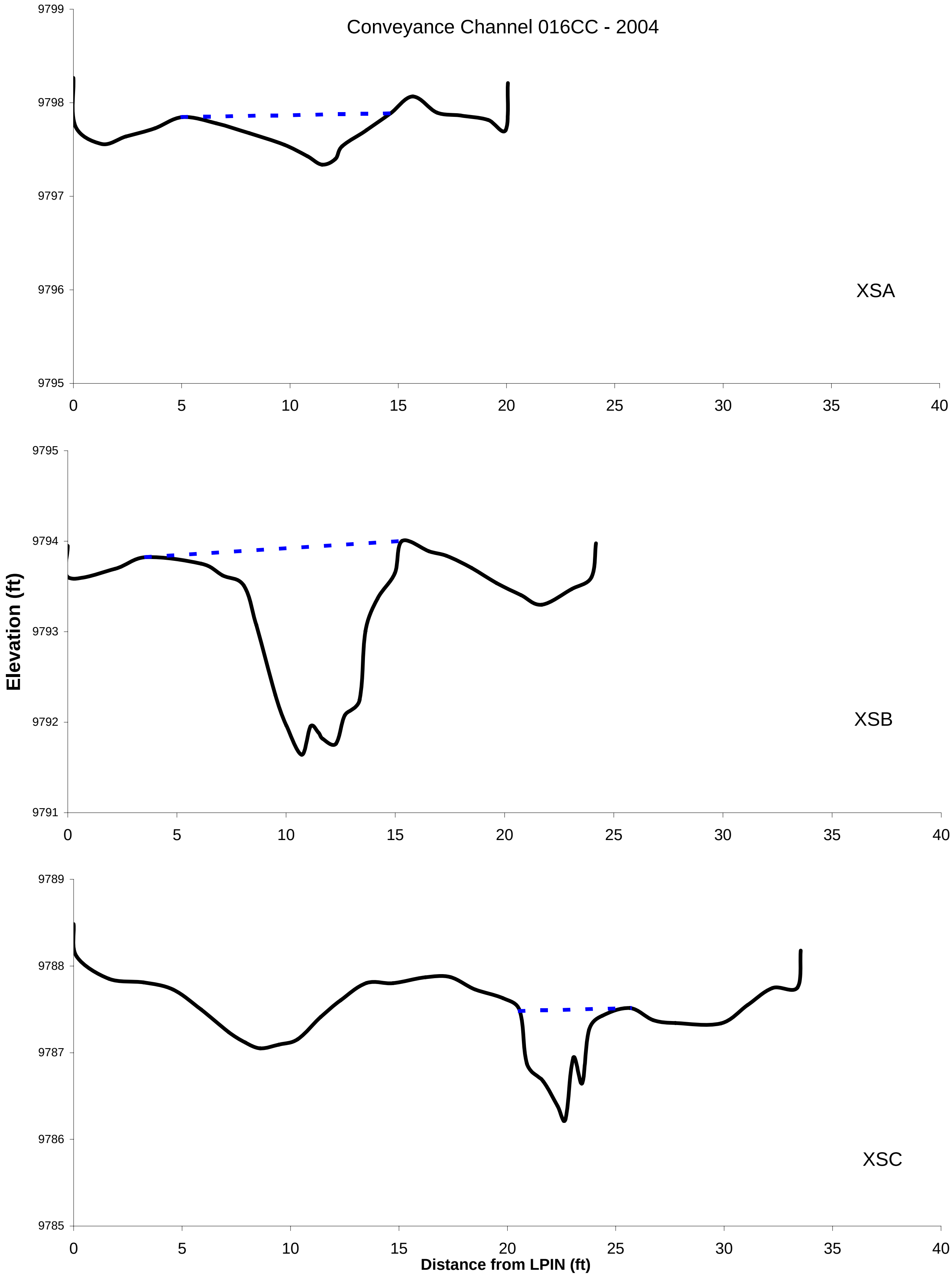
Conveyance Channel Identifier	Date	Cross Section	Width (ft)	Cross Sectional Area (ft^2)	Mean Depth (ft)	Maximum Depth (ft)	Wetted Perimeter (ft)	Hydraulic Radius (ft)	Width /Depth Ratio
081CC	05Aug04	A	10.5	6.24	0.59	1.00	11.97	0.52	17.73
081CC	05Aug04	B	13.7	3.84	0.28	0.68	14.14	0.27	49.00
081CC	05Aug04	Cl	3.9	1.87	0.47	1.09	4.98	0.38	8.34
081CC	05Aug04	Cr	9.5	6.25	0.66	1.24	10.10	0.62	14.35
084CC	19Aug04	Al	4.4	1.33	0.30	0.56	4.56	0.29	14.44
084CC	19Aug04	Ar	4.8	1.54	0.32	0.60	5.05	0.30	15.20
084CC	19Aug04	B	10.0	1.29	0.13	0.37	10.46	0.12	78.07
084CC	19Aug04	C	20.7	8.07	0.39	0.93	21.49	0.38	52.93
089CC	12Aug04	A	22.5	18.56	0.82	1.80	26.66	0.70	27.28
089CC	12Aug04	B	13.5	16.33	1.21	2.67	18.38	0.89	11.22
089CC	12Aug04	C	17.7	10.48	0.59	2.86	23.21	0.45	29.83
091CC	13Aug04	A	17.6	17.27	0.98	2.76	20.97	0.82	17.96
091CC	13Aug04	B	14.9	22.51	1.51	3.61	18.19	1.24	9.81
091CC	13Aug04	C	16.3	10.21	0.63	1.44	17.43	0.59	25.91
094CC	17Aug04	A	17.1	32.99	1.93	3.58	20.37	1.62	8.86
094CC	17Aug04	B	24.4	93.82	3.84	6.43	31.28	3.00	6.35
094CC	17Aug04	C	17.5	59.94	3.43	6.25	23.29	2.57	5.09
095CC	17Aug04	A	20.9	56.68	2.71	4.54	26.54	2.14	7.71
095CC	17Aug04	B	16.6	46.02	2.78	4.09	21.19	2.17	5.97
095CC	17Aug04	C	14.8	30.58	2.07	3.75	17.99	1.70	7.15
096CC	17Aug04	A	19.2	9.36	0.49	1.23	19.94	0.47	39.25
096CC	17Aug04	B	25.7	17.83	0.70	1.43	26.91	0.66	36.90
096CC	17Aug04	C	18.5	23.79	1.29	2.78	22.47	1.06	14.36
097CC	17Aug04	A	18.3	14.84	0.81	1.80	19.47	0.76	22.47
097CC	17Aug04	B	16.6	19.28	1.16	3.19	20.32	0.95	14.36
097CC	17Aug04	C	13.4	10.19	0.76	2.03	15.44	0.66	17.53
099CC	17Aug04	A	37.1	106.61	2.87	5.90	43.26	2.46	12.91
099CC	17Aug04	Bl	15.4	11.98	0.78	1.57	17.04	0.70	19.91
099CC	17Aug04	Br	26.0	58.05	2.23	4.30	29.48	1.97	11.67
099CC	17Aug04	C	27.6	42.71	1.55	3.07	33.62	1.27	17.81
104CC	26Aug04	A	15.5	20.30	1.31	3.56	19.60	1.04	11.85
104CC	26Aug04	B	22.2	38.39	1.73	3.30	24.82	1.55	12.86
104CC	26Aug04	C	27.6	59.18	2.14	3.94	32.35	1.83	12.90
120CC	18Aug04	A	34.3	26.07	0.76	1.50	36.56	0.71	45.04
120CC	18Aug04	B	36.2	18.27	0.51	1.20	37.86	0.48	71.60
120CC	18Aug04	Cl	13.2	6.95	0.53	1.14	13.47	0.52	25.15
120CC	18Aug04	Cr	25.7	27.97	1.09	2.37	28.07	1.00	23.59
121CC	26Aug04	A	58.7	47.32	0.81	2.36	61.49	0.77	72.92
121CC	26Aug04	B	80.9	236.39	2.92	8.07	90.66	2.61	27.66
121CC	26Aug04	C	16.2	30.24	1.86	3.08	18.35	1.65	8.71
122CC	27Aug04	A	20.5	41.74	2.04	3.22	24.22	1.72	10.05
122CC	27Aug04	B	15.8	30.85	1.95	3.30	18.83	1.64	8.10
122CC	27Aug04	C	23.6	38.19	1.62	3.67	27.67	1.38	14.57
125CC	27Aug04	A	19.7	19.62	1.00	2.02	21.19	0.93	19.68
125CC	27Aug04	B	8.2	9.86	1.20	1.64	10.17	0.97	6.90
125CC	27Aug04	C	38.4	39.00	1.01	1.62	40.82	0.96	37.89
126CC	01Sep04	A	20.4	16.96	0.83	1.70	22.95	0.74	24.56
126CC	01Sep04	B	13.0	15.96	1.22	2.32	16.50	0.97	10.67

Channel Geometry of Conveyance Channels 2004

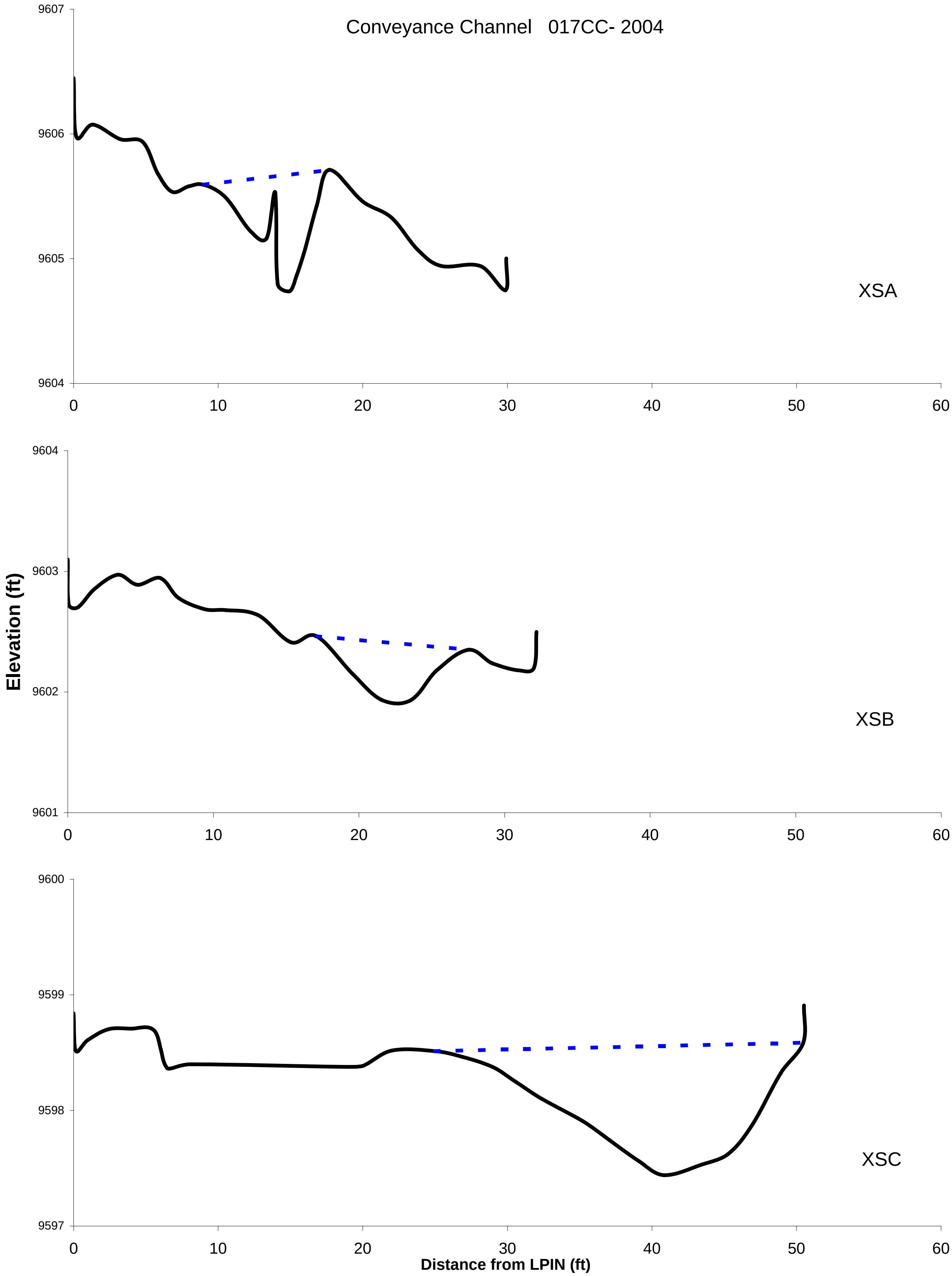
Conveyance Channel Identifier	Date	Cross Section	Width (ft)	Cross Sectional Area (ft^2)	Mean Depth (ft)	Maximum Depth (ft)	Wetted Perimeter (ft)	Hydraulic Radius (ft)	Width /Depth Ratio
126CC	01Sep04	C	34.3	34.80	1.01	2.61	37.91	0.92	33.84
127CC	01Sep04	A	12.6	19.12	1.51	2.40	15.15	1.26	8.37
127CC	01Sep04	B	24.2	49.79	2.05	3.10	28.37	1.76	11.80
127CC	01Sep04	C	25.0	41.01	1.64	2.66	30.87	1.33	15.23
129CC	02Sep04	A	17.6	35.58	2.02	3.15	24.51	1.45	8.74
129CC	02Sep04	B	15.8	45.76	2.89	5.81	24.01	1.91	5.46
129CC	02Sep04	C	22.5	57.96	2.57	5.34	26.29	2.20	8.76
130CC	02Sep04	A	22.6	20.08	0.89	1.87	23.44	0.86	25.34
130CC	02Sep04	B	60.9	91.58	1.50	3.36	67.87	1.35	40.43
130CC	02Sep04	C	47.5	99.85	2.10	4.33	54.65	1.83	22.61
131CC	01Sep04	A	27.4	85.74	3.13	5.39	30.28	2.83	8.73
131CC	01Sep04	B	32.4	94.39	2.91	5.42	34.70	2.72	11.13
131CC	01Sep04	C	55.7	169.53	3.04	5.15	62.22	2.72	18.32
132CC	01Sep04	A	27.1	53.36	1.97	3.24	29.42	1.81	13.79
132CC	01Sep04	B	19.8	41.65	2.10	3.80	31.34	1.33	9.40
132CC	01Sep04	C	17.3	25.09	1.45	2.48	22.01	1.14	11.97
133CC	01Sep04	A	12.4	20.97	1.69	3.12	17.04	1.23	7.37
133CC	01Sep04	B	11.6	14.51	1.25	2.28	13.33	1.09	9.23
133CC	01Sep04	C	57.5	72.47	1.26	2.18	60.45	1.20	45.65
134CC	01Sep04	A	25.9	28.98	1.12	1.87	27.01	1.07	23.14
134CC	01Sep04	B	23.1	31.33	1.36	2.62	24.48	1.28	17.01
134CC	01Sep04	C	29.4	37.07	1.26	2.34	31.54	1.18	23.33
135CC	03Sep04	A	8.6	6.15	0.72	1.29	13.66	0.45	12.00
135CC	03Sep04	B	8.7	4.99	0.57	1.15	10.74	0.46	15.30
135CC	03Sep04	C	10.3	6.60	0.64	1.55	13.57	0.49	16.11
136CC	03Sep04	A	25.7	20.02	0.78	1.80	31.78	0.63	33.09
136CC	03Sep04	B	15.0	19.08	1.27	2.09	17.06	1.12	11.80
136CC	03Sep04	C	28.6	24.39	0.85	1.98	33.22	0.73	33.56
137CC	03Sep04	A	27.8	25.60	0.92	1.47	33.48	0.76	30.22
137CC	03Sep04	Bl	12.2	6.24	0.51	1.03	13.23	0.47	23.66
137CC	03Sep04	Br	16.0	11.32	0.71	1.30	16.71	0.68	22.57
137CC	03Sep04	C	35.2	19.60	0.56	1.39	39.37	0.50	63.33
138CC	03Sep04	A	8.8	8.19	0.93	1.47	9.93	0.83	9.54
138CC	03Sep04	B	12.4	13.23	1.07	2.07	15.45	0.86	11.54
138CC	03Sep04	C	20.6	35.46	1.72	2.49	27.05	1.31	11.97
139CC	01Sep04	A	28.6	18.50	0.65	1.41	30.88	0.60	44.19
139CC	01Sep04	B	23.7	17.19	0.73	2.02	25.28	0.68	32.55
139CC	01Sep04	C	36.4	23.17	0.64	1.48	36.99	0.63	57.08
140CC	01Sep04	A	15.3	12.48	0.81	1.62	17.11	0.73	18.82
140CC	01Sep04	B	23.2	23.13	1.00	2.32	28.16	0.82	23.32
140CC	01Sep04	C	29.8	19.31	0.65	1.43	31.54	0.61	45.97
175CC	02Jun04	A	4.1	0.63	0.15	0.31	4.15	0.15	26.56
175CC	02Jun04	B	4.7	0.89	0.19	0.38	4.75	0.19	24.56
175CC	02Jun04	C	5.3	2.01	0.38	0.72	5.53	0.36	14.05
175CC	21Jul04	A	2.6	2.66	1.02	1.39	4.44	0.60	2.54
175CC	21Jul04	B	4.4	2.69	0.62	0.87	5.03	0.53	7.06
175CC	21Jul04	C	9.0	3.03	0.34	0.82	9.19	0.33	26.67
175CC	30Jul04	A	26.9	36.75	1.36	1.98	29.24	1.26	19.74

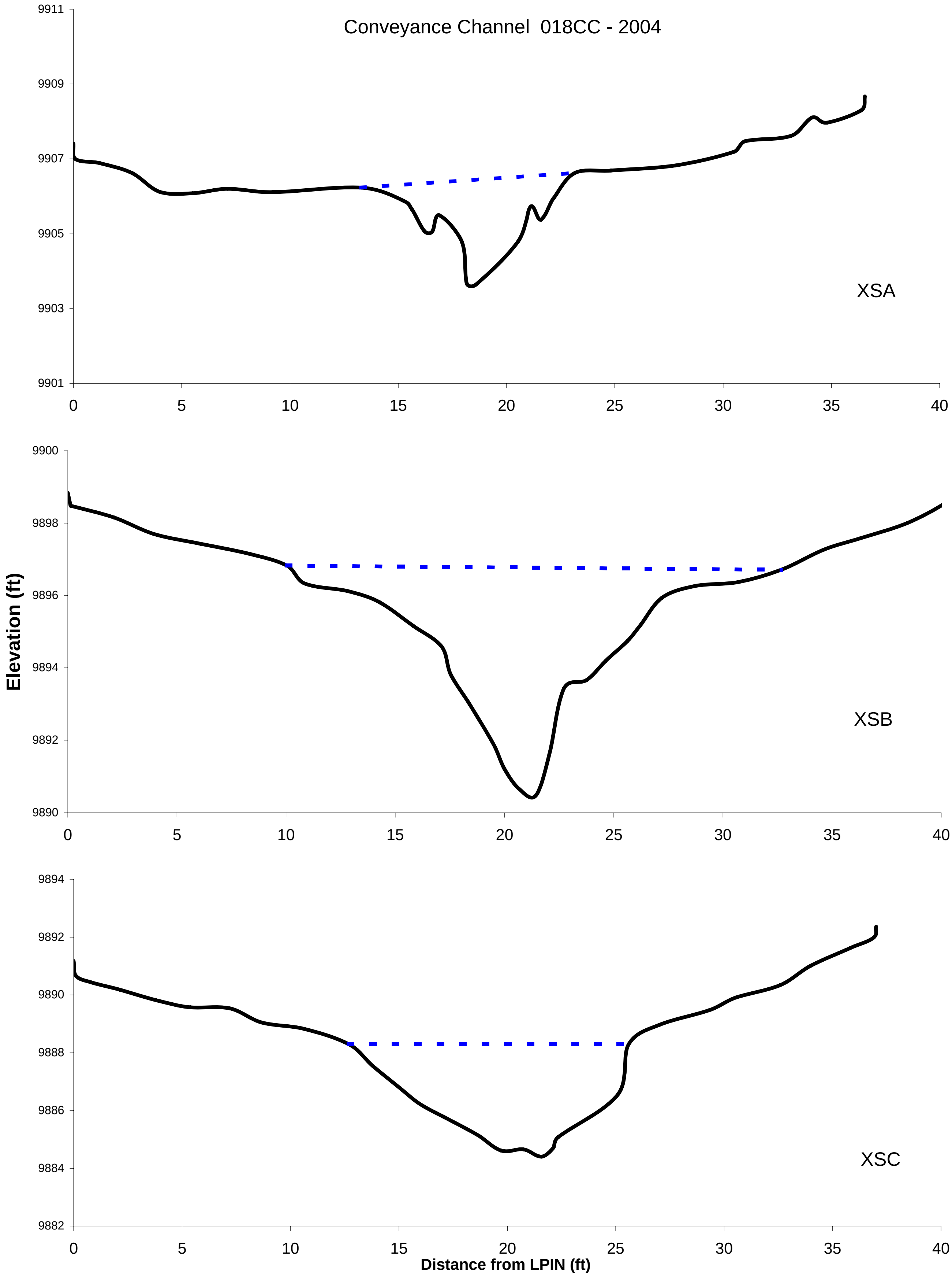
Channel Geometry of Conveyance Channels 2004

Conveyance Channel Identifier	Date	Cross Section	Width (ft)	Cross Sectional Area (ft^2)	Mean Depth (ft)	Maximum Depth (ft)	Wetted Perimeter (ft)	Hydraulic Radius (ft)	Width /Depth Ratio
175CC	30Jul04	B	8.3	1.02	0.12	0.40	8.56	0.12	67.24
175CC	30Jul04	C	7.5	2.54	0.34	0.76	7.77	0.33	22.27
184CC	21May04	A	28.0	71.38	2.55	4.89	29.96	2.38	10.95
184CC	21May04	B	40.8	132.60	3.25	5.55	43.45	3.05	12.54
184CC	21May04	C	22.9	83.29	3.64	6.71	26.79	3.11	6.28
189CC	02Jun04	A	16.2	4.31	0.27	0.40	16.27	0.26	61.12
189CC	02Jun04	B	17.5	4.91	0.28	0.41	17.55	0.28	62.28
189CC	02Jun04	C	12.7	4.85	0.38	0.60	12.74	0.38	33.09
190CC	02Jun04	A	12.2	1.32	0.11	0.20	12.24	0.11	112.99
190CC	02Jun04	B	7.7	0.68	0.09	0.14	7.69	0.09	86.43
190CC	02Jun04	C	8.7	0.61	0.07	0.12	8.68	0.07	122.95
191CC	02Jun04	A	19.6	4.30	0.22	0.28	19.60	0.22	89.03
191CC	02Jun04	B	5.2	1.19	0.23	0.95	6.09	0.20	22.99
191CC	02Jun04	C	3.8	0.54	0.14	0.27	3.83	0.14	26.21
206CC	17Jun04	A	1.9	0.64	0.34	0.70	2.40	0.27	5.44
206CC	17Jun04	B	10.3	3.02	0.29	0.44	10.39	0.29	35.40
206CC	17Jun04	C	15.0	8.00	0.53	0.99	15.20	0.53	28.30
207CC	18Aug04	A	11.3	14.40	1.27	1.89	14.56	0.99	8.89
207CC	18Aug04	B	9.2	6.25	0.68	1.14	11.54	0.54	13.64
207CC	18Aug04	C	18.5	7.94	0.43	1.57	21.53	0.37	43.04
208CC	19Aug04	A	13.3	9.84	0.74	1.73	15.56	0.63	18.06
208CC	19Aug04	Bl	3.6	1.48	0.41	0.86	4.08	0.36	8.79
208CC	19Aug04	Br	14.4	10.86	0.75	1.49	15.94	0.68	19.10
208CC	19Aug04	C	31.4	19.57	0.62	1.18	33.04	0.59	50.33
209CC	19Aug04	A	16.7	13.06	0.78	1.89	18.93	0.69	21.38
209CC	19Aug04	B	19.4	14.95	0.77	1.54	21.73	0.69	25.15
209CC	19Aug04	C	34.8	37.83	1.09	2.61	40.43	0.94	31.95
210CC	25Aug04	A	13.5	7.88	0.59	1.49	13.93	0.57	22.99
210CC	25Aug04	B	9.8	3.81	0.39	0.99	10.20	0.37	25.34
210CC	25Aug04	C	10.5	4.15	0.39	1.32	11.15	0.37	26.59
211CC	25Aug04	A	7.1	6.56	0.93	2.35	10.55	0.62	7.58
211CC	25Aug04	Bl	10.0	3.12	0.31	0.68	10.27	0.30	32.18
211CC	25Aug04	Br	7.3	4.36	0.60	1.26	8.13	0.54	12.19
211CC	25Aug04	C	9.5	5.76	0.60	1.19	10.12	0.57	15.73
212CC	25Aug04	A	10.1	6.46	0.64	1.40	11.38	0.57	15.76
212CC	25Aug04	B	7.8	4.10	0.53	0.98	8.86	0.46	14.81
212CC	25Aug04	C	9.0	8.43	0.93	1.88	11.07	0.76	9.69
213CC	02Sep04	Al	17.0	23.78	1.40	2.24	19.56	1.22	12.18
213CC	02Sep04	Ar	18.2	6.67	0.37	0.96	19.50	0.34	49.80
213CC	02Sep04	B	37.3	20.07	0.54	1.04	37.69	0.53	69.36
213CC	02Sep04	Cl	30.7	32.66	1.06	1.91	32.06	1.02	28.92
213CC	02Sep04	Cr	28.6	15.72	0.55	0.91	28.78	0.55	52.13

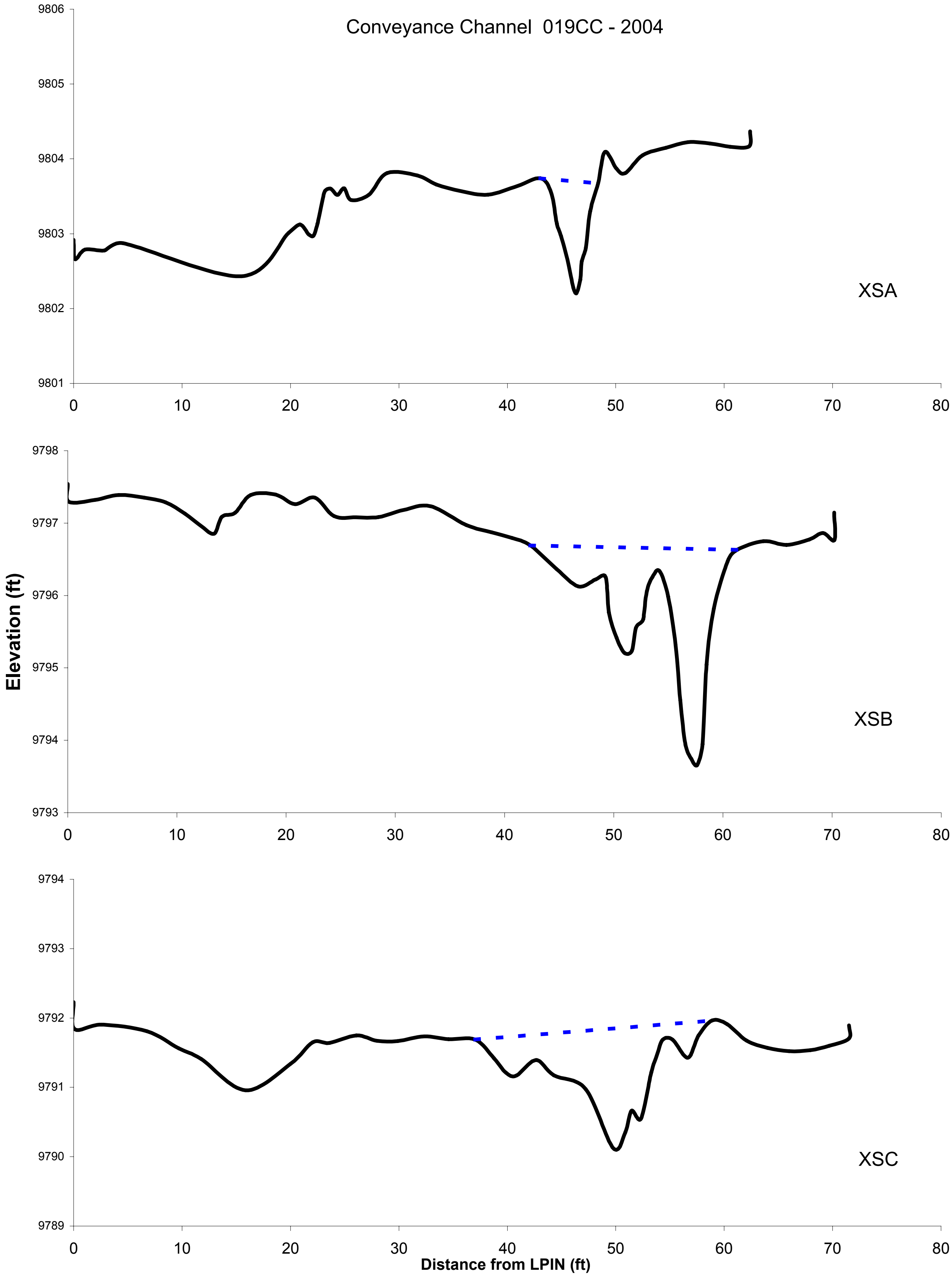


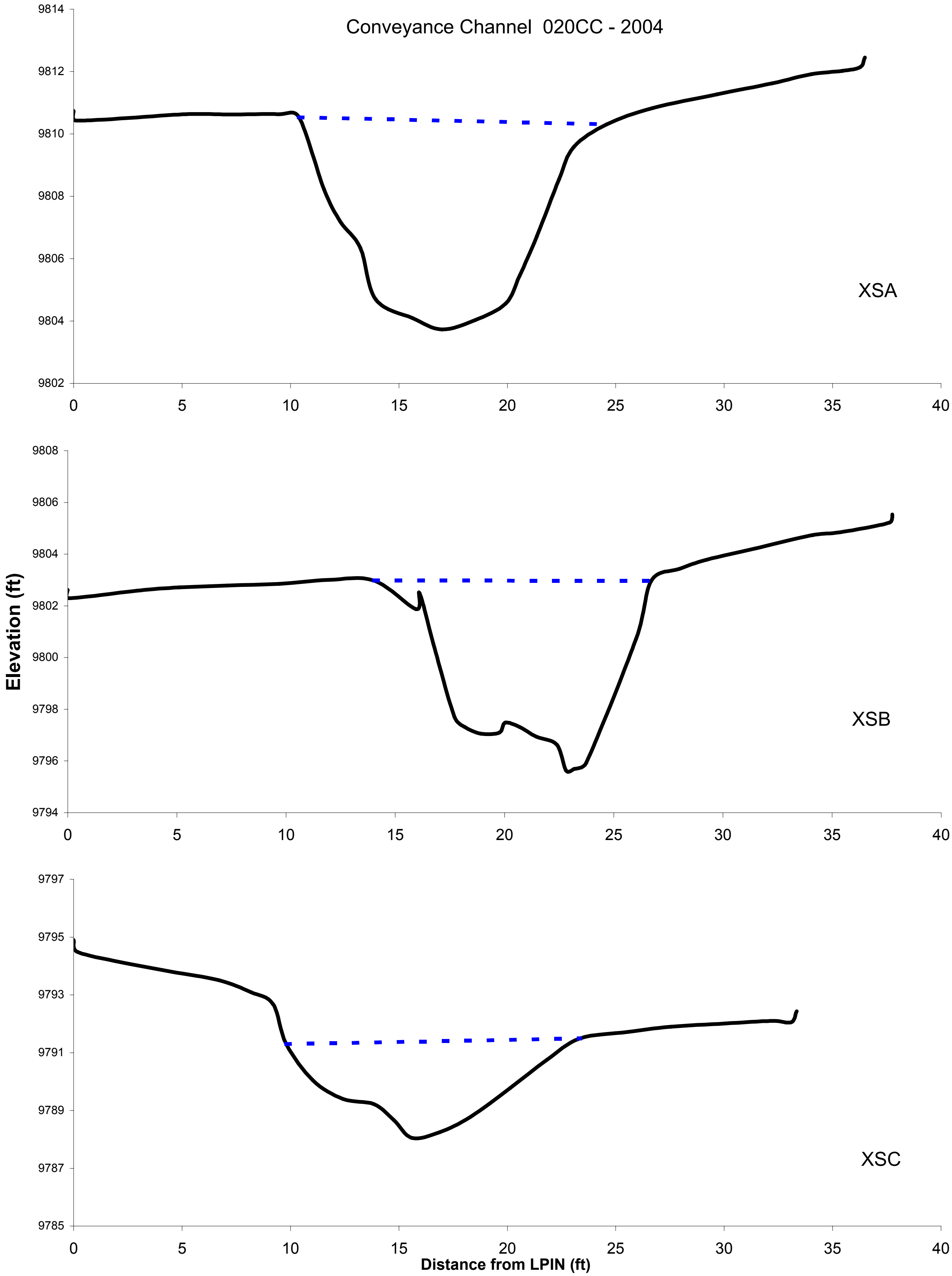
Conveyance Channel 016CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
9799
9798
9797
9796
9795
9794
9793
9792
9791
9789
9788
9787
9786
9785
0
5
10
15
20
25
30
35
40

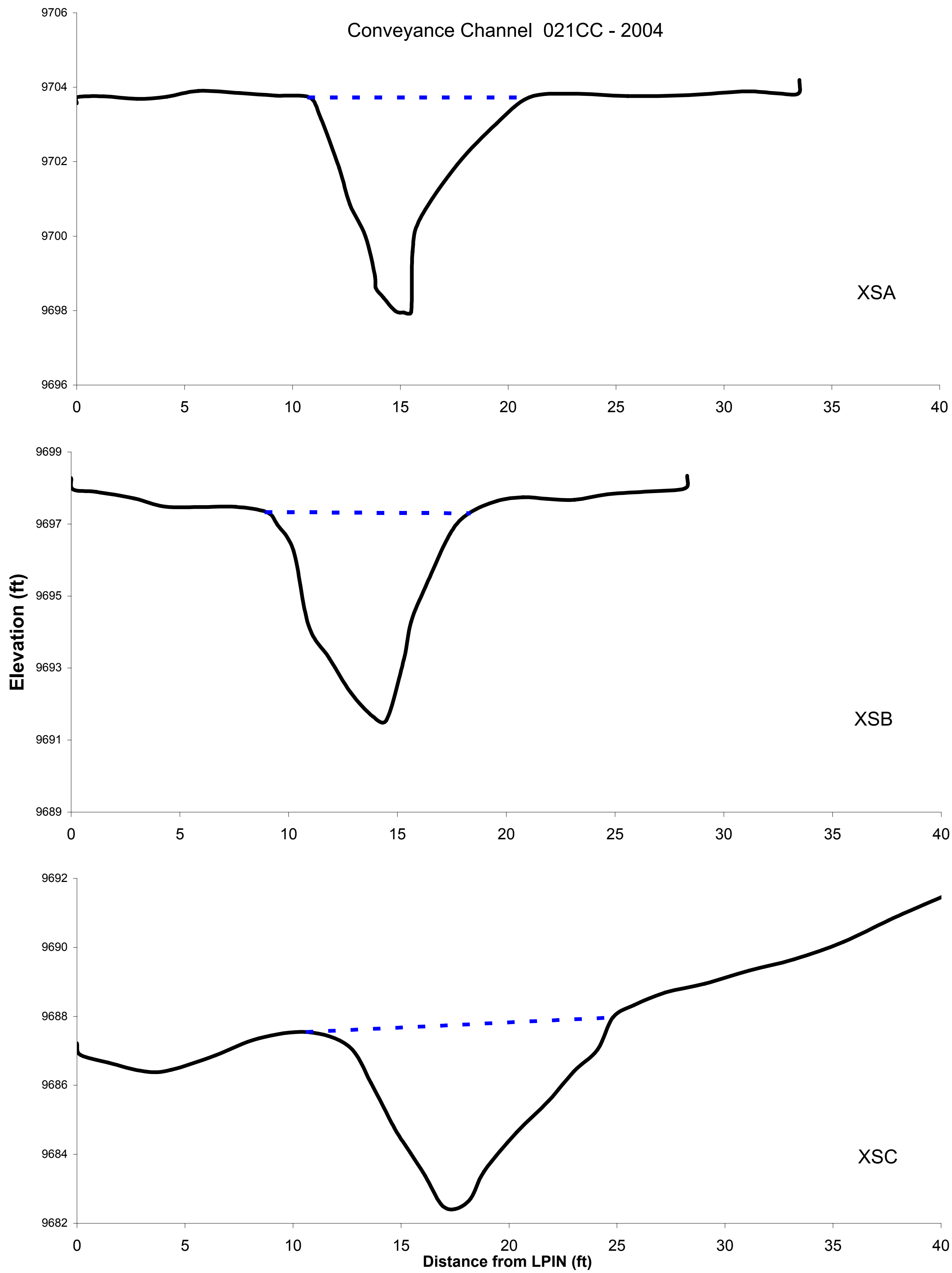

Conveyance Channel 017CC- 2004
9607
9606
9605
9604
XSA
0
10
20
30
40
50
60
9604
9603
9602
9601
XSB
Elevation (ft)
9600
9599
9598
9597
XSC
Distance from LPIN (ft)



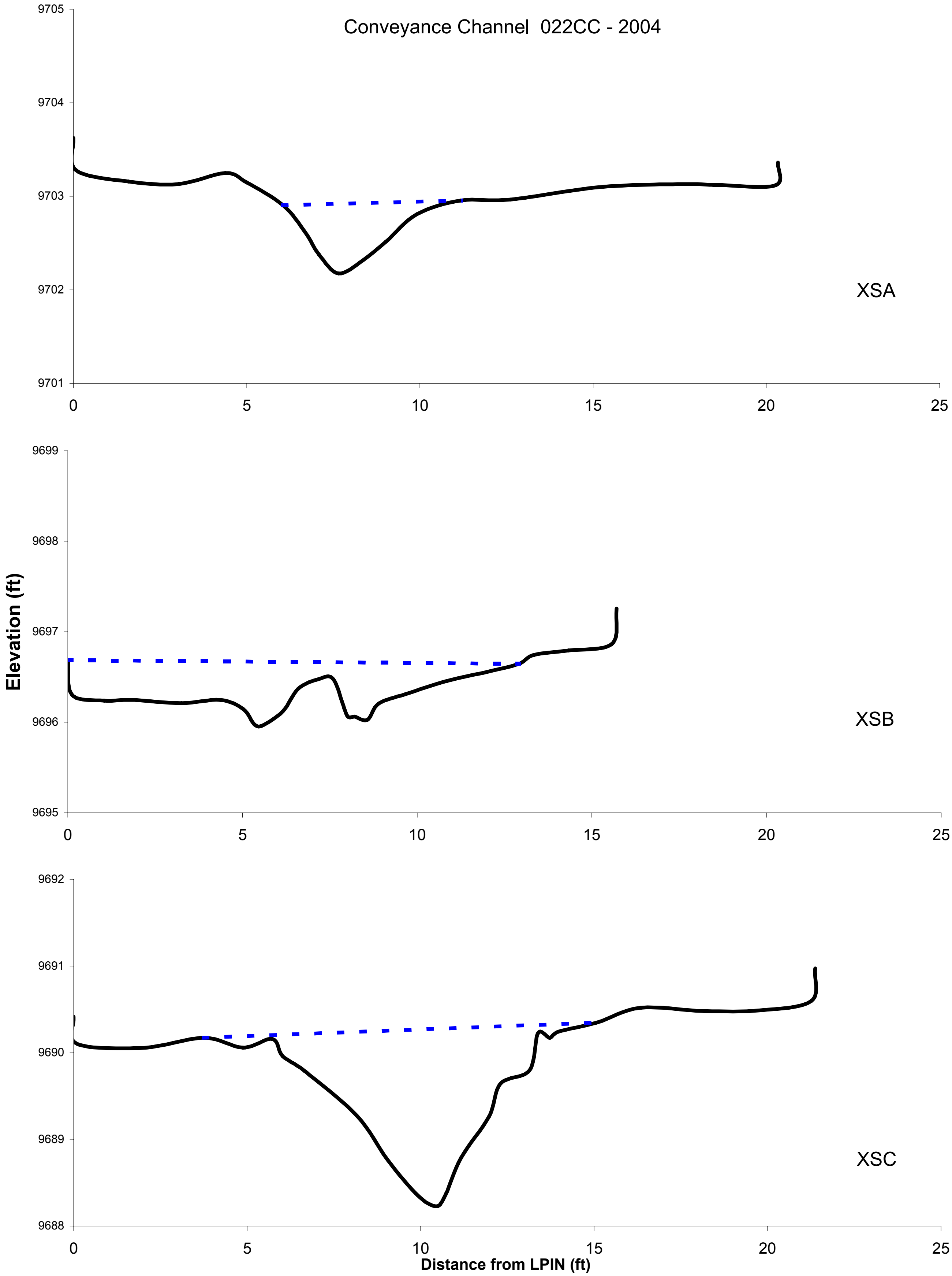
Conveyance Channel 018CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
9911
9909
9907
9905
9903
9901
9900
9898
9896
9894
9892
9890
9894
9892
9890
9888
9886
9884
9882
0
5
10
15
20
25
30
35
40

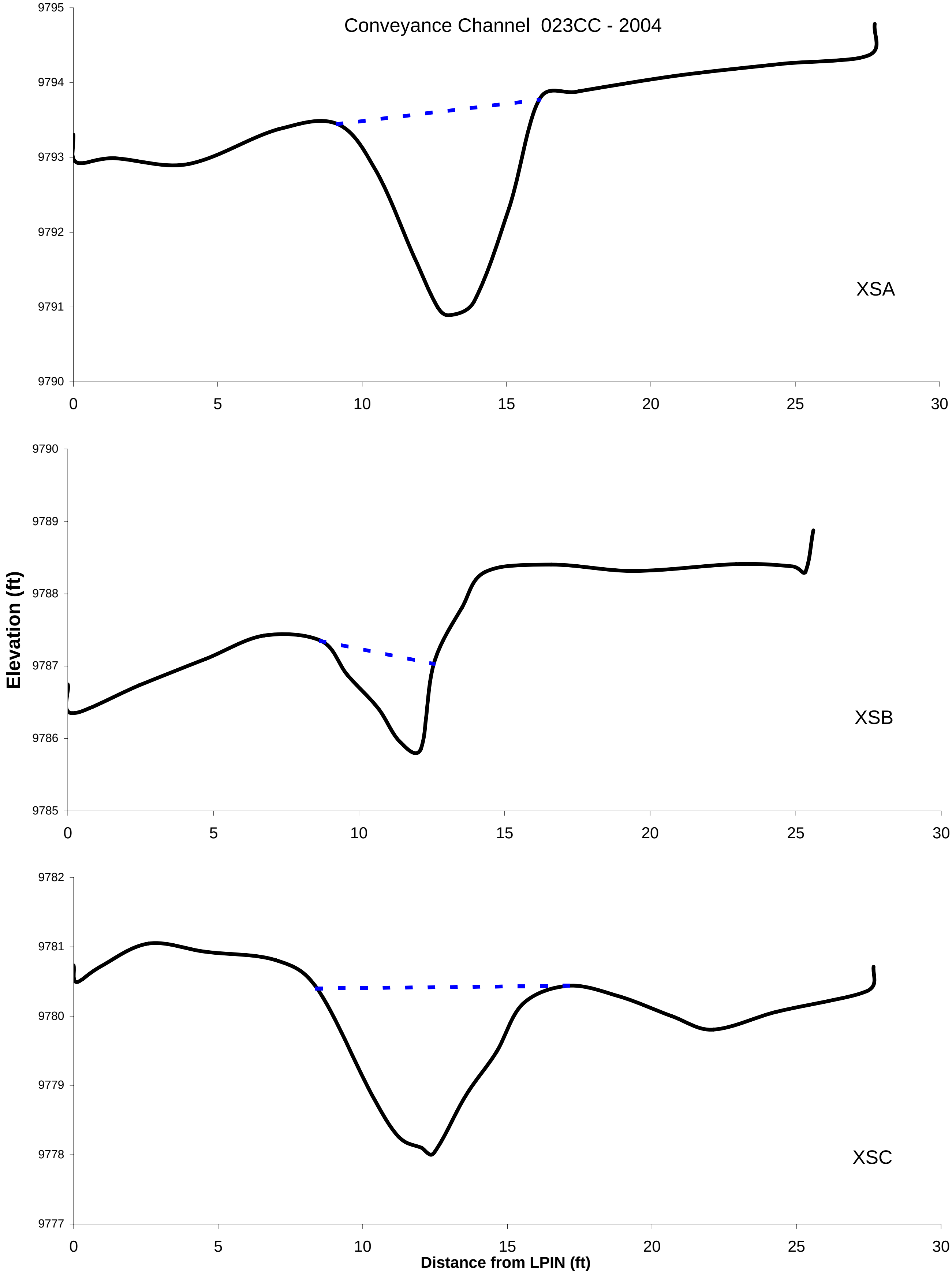

Conveyance Channel 019CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
9806
9805
9804
9803
9802
9801
9798
9797
9796
9795
9794
9793
9794
9793
9792
9791
9790
9789
0
10
20
30
40
50
60
70
80


Conveyance Channel 020CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
9814
9812
9810
9808
9806
9804
9802
9808
9806
9804
9802
9800
9798
9796
9794
9797
9795
9793
9791
9789
9787
9785
0
5
10
15
20
25
30
35
40

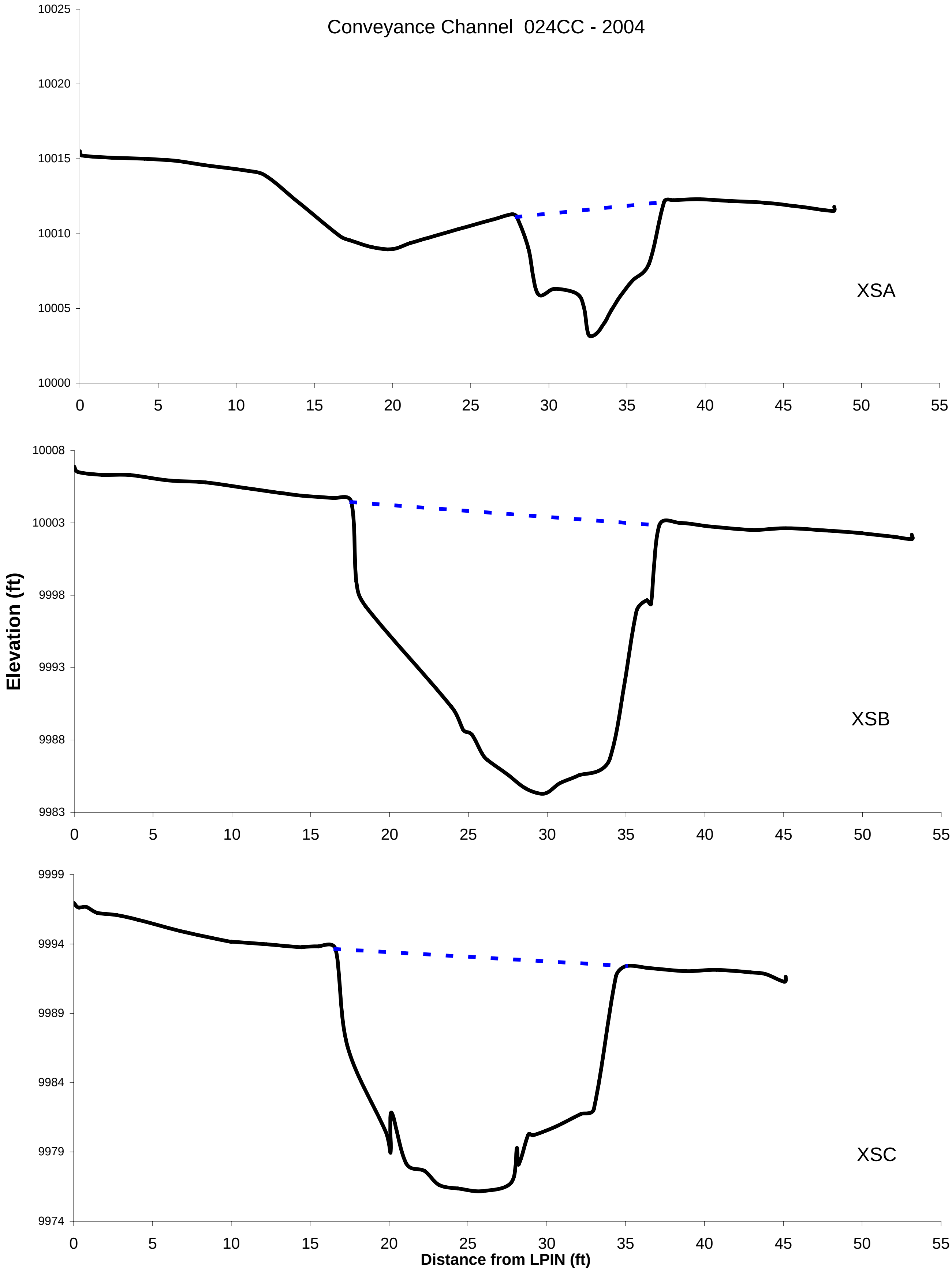


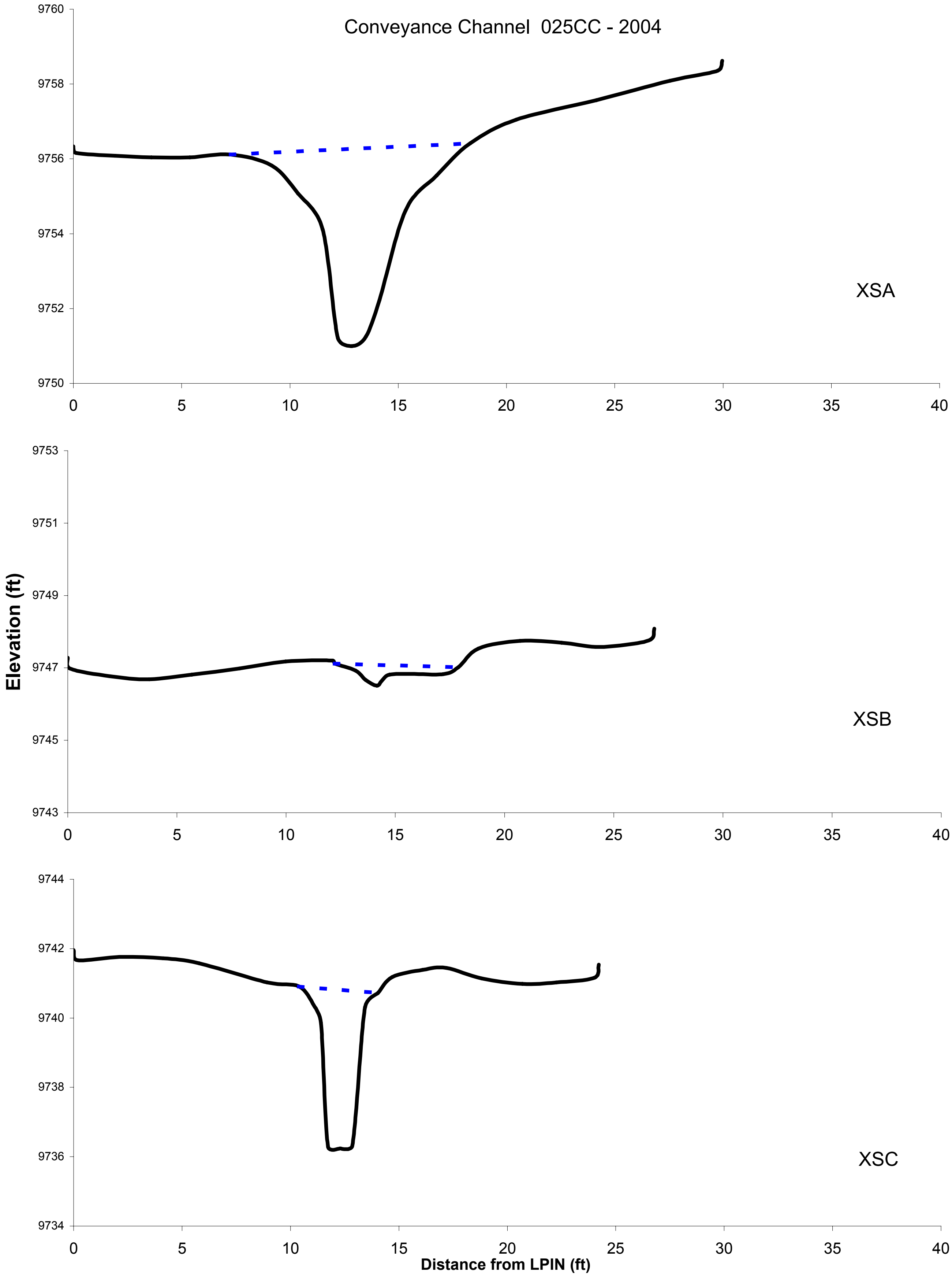
Conveyance Channel 021CC - 2004
9706
9704
9702
9700
9698
9696
0
5
10
15
20
25
30
35
40
XSA
9699
9697
9695
9693
9691
9689
0
5
10
15
20
25
30
35
40
XSB
Elevation (ft)
9692
9690
9688
9686
9684
9682
0
5
10
15
20
25
30
35
40
XSC
Distance from LPIN (ft)


Conveyance Channel 022CC - 2004
Elevation (ft)
Distance from LPIN (ft)
XSA
XSB
XSC
9705
9704
9703
9702
9701
9699
9698
9697
9696
9695
9692
9691
9690
9689
9688
0
5
10
15
20
25

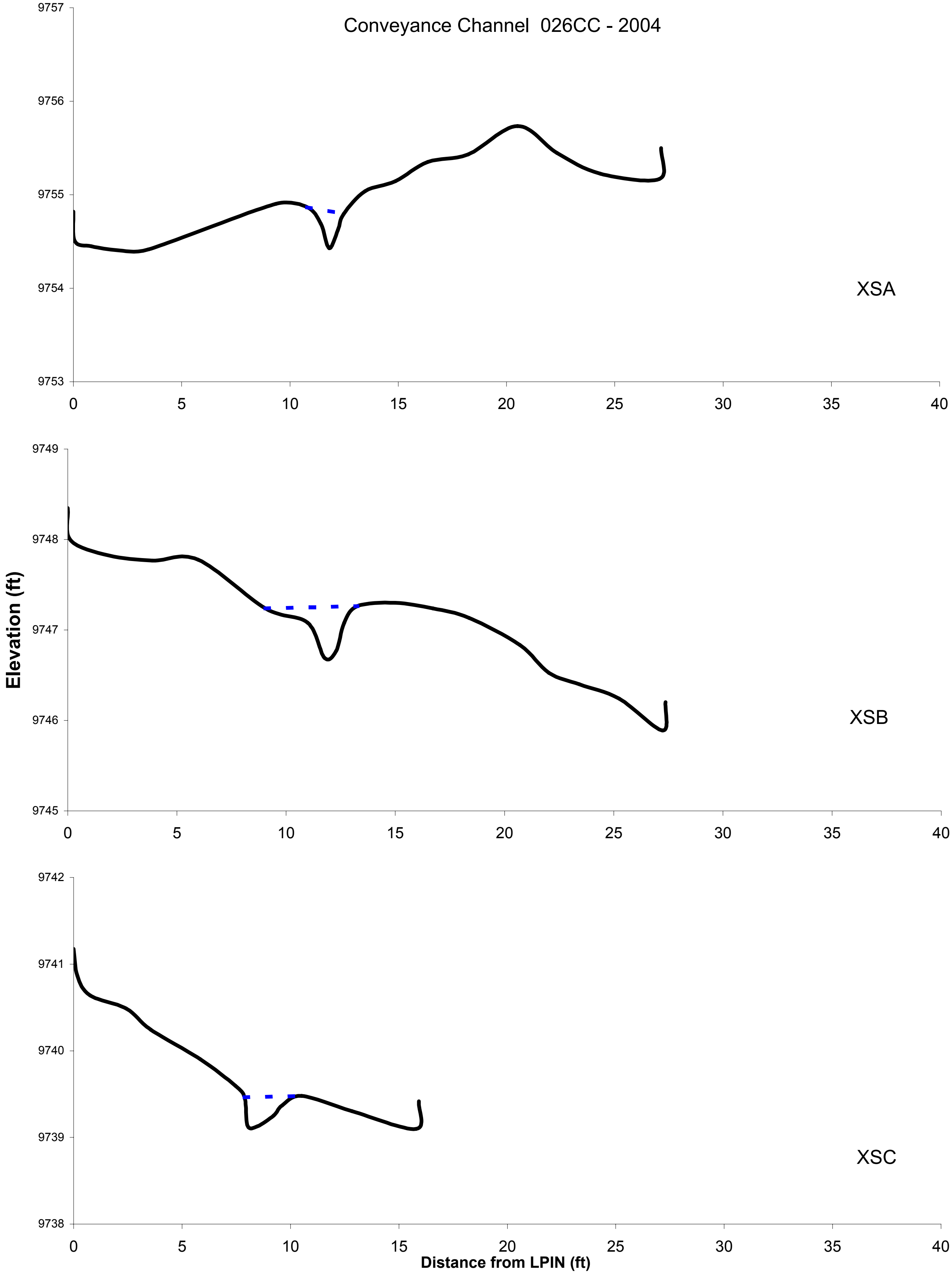


Conveyance Channel 023CC - 2004
9795
9794
9793
9792
9791
9790
0
5
10
15
20
25
30
XSA
9790
9789
9788
9787
9786
9785
XSB
Elevation (ft)
9782
9781
9780
9779
9778
9777
XSC
Distance from LPIN (ft)

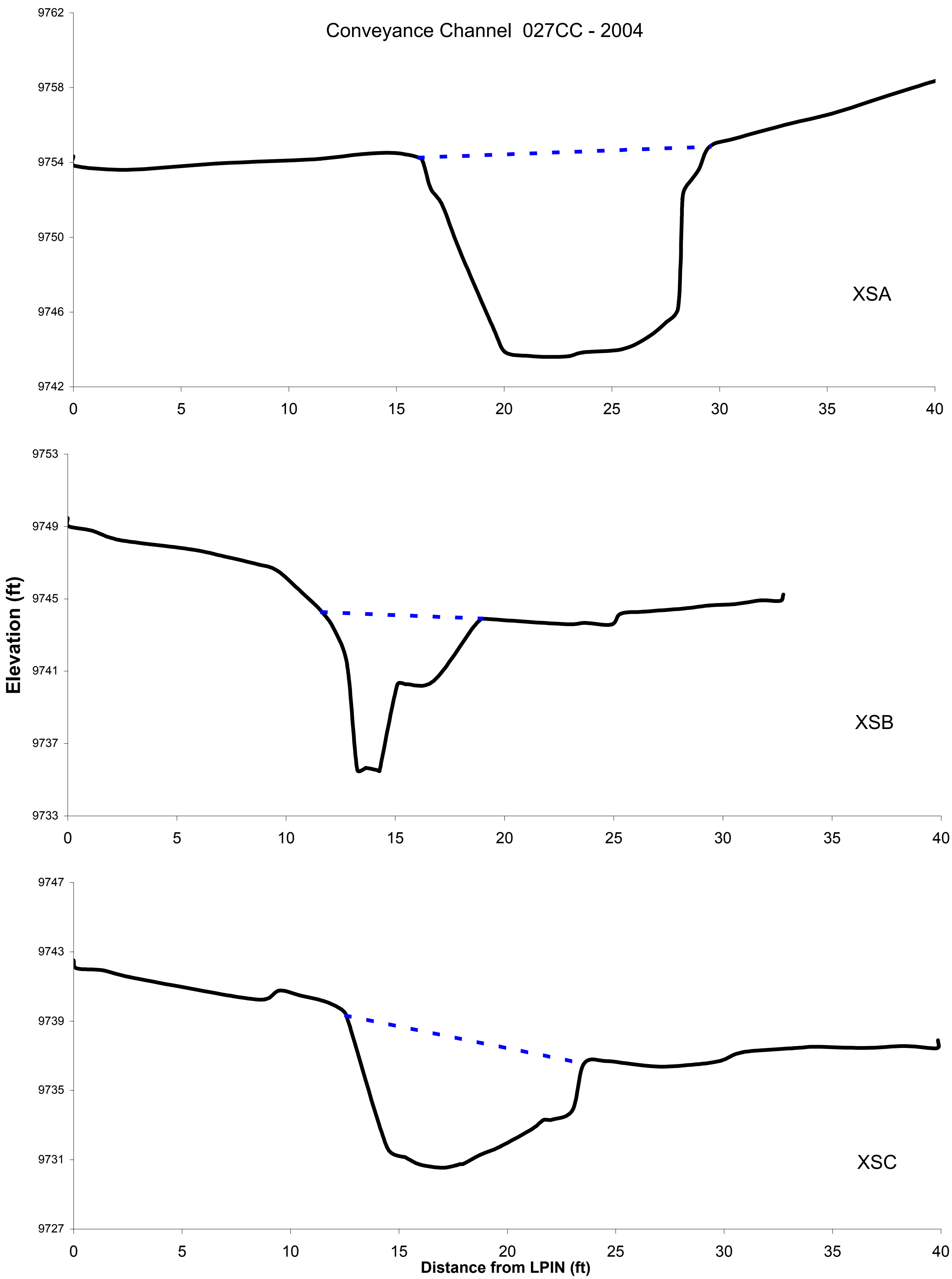

Conveyance Channel 024CC - 2004
Elevation (ft)
Distance from LPIN (ft)
XSA
XSB
XSC
10025
10020
10015
10010
10005
10000
10008
10003
9998
9993
9988
9983
9999
9994
9989
9984
9979
9974
0
5
10
15
20
25
30
35
40
45
50
55

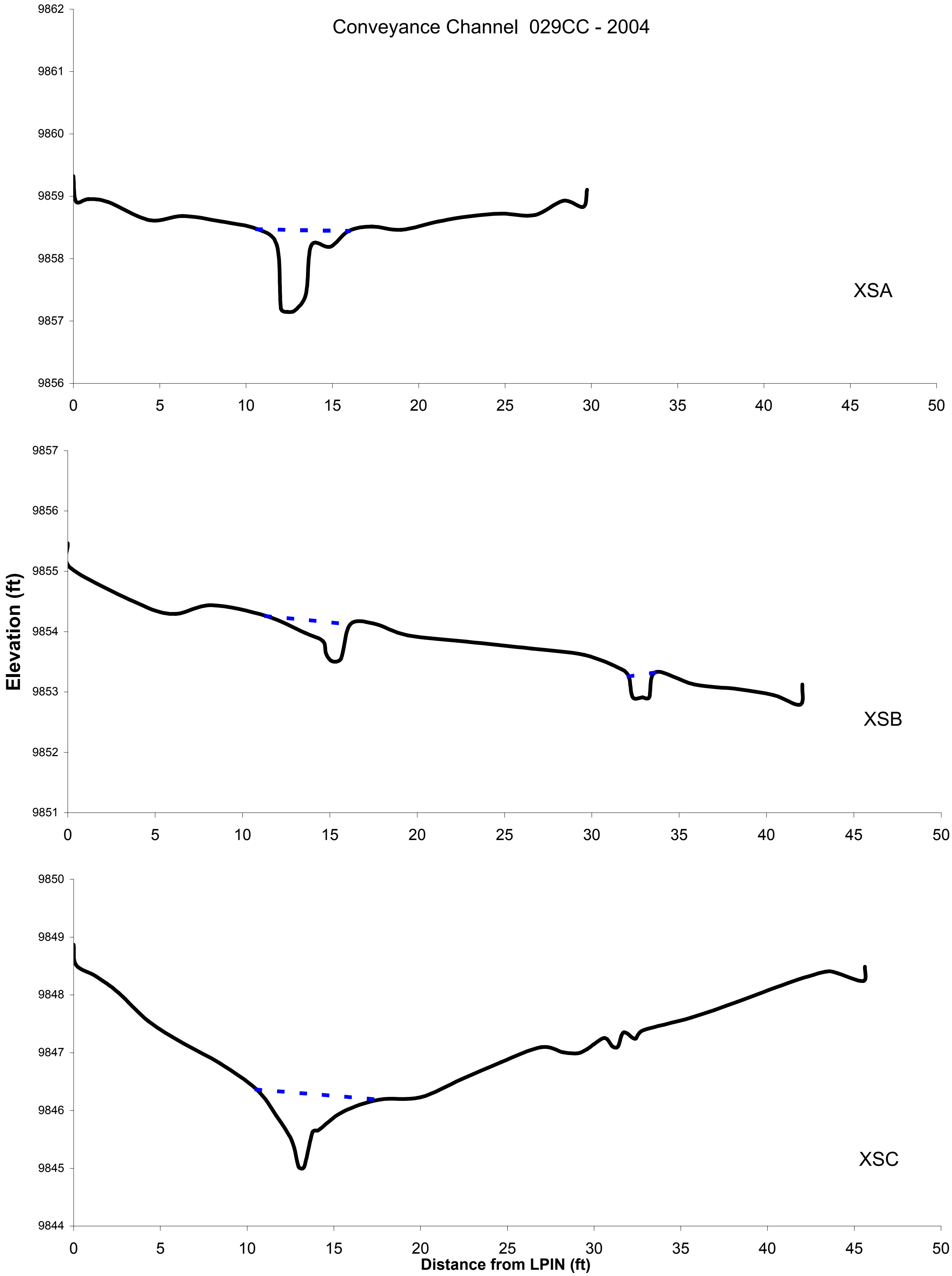


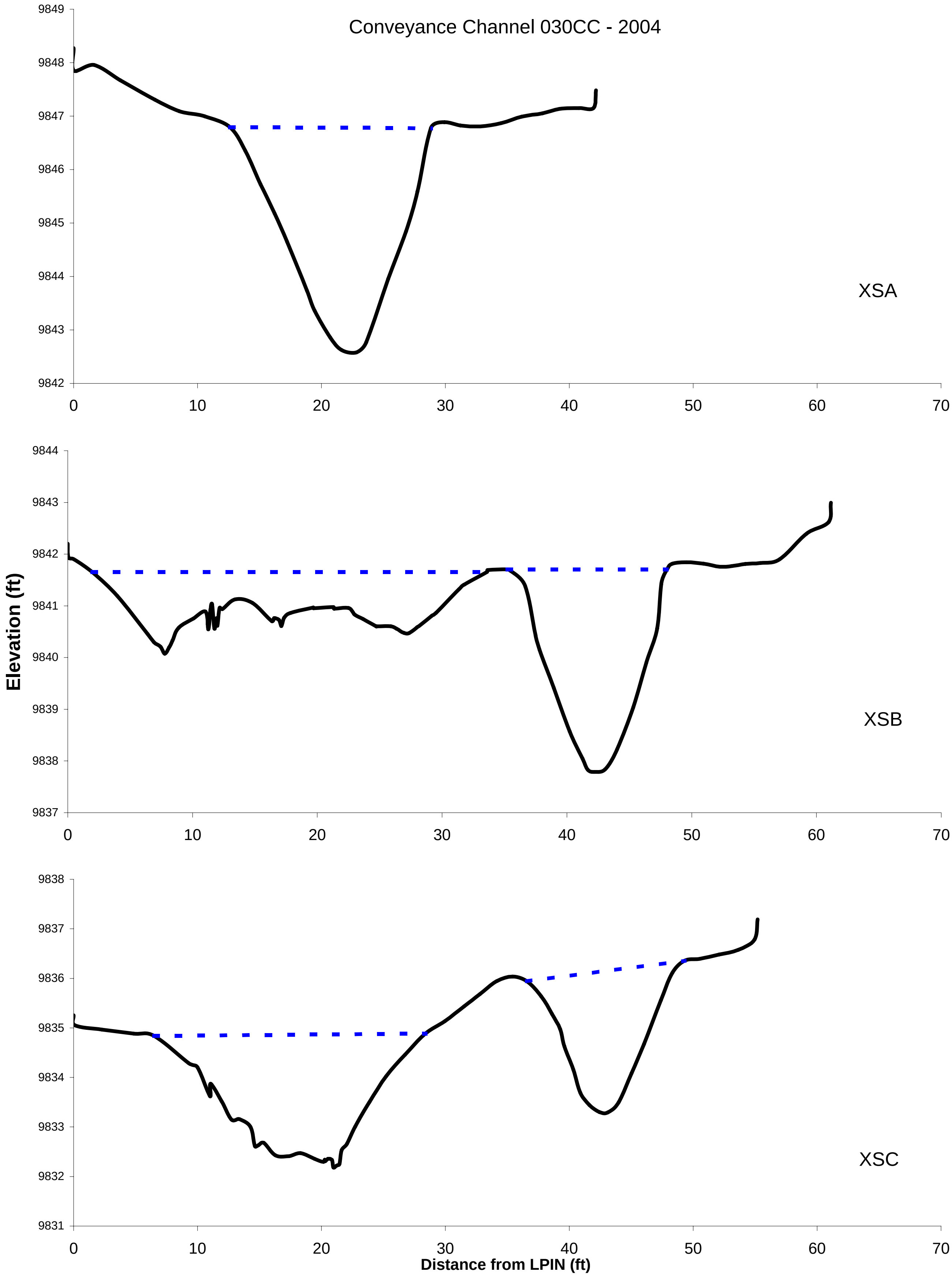
Conveyance Channel 025CC - 2004
9760
9758
9756
9754
9752
9750
0
5
10
15
20
25
30
35
40
XSA
9753
9751
9749
9747
9745
9743
XSB
Elevation (ft)
9744
9742
9740
9738
9736
9734
XSC
Distance from LPIN (ft)



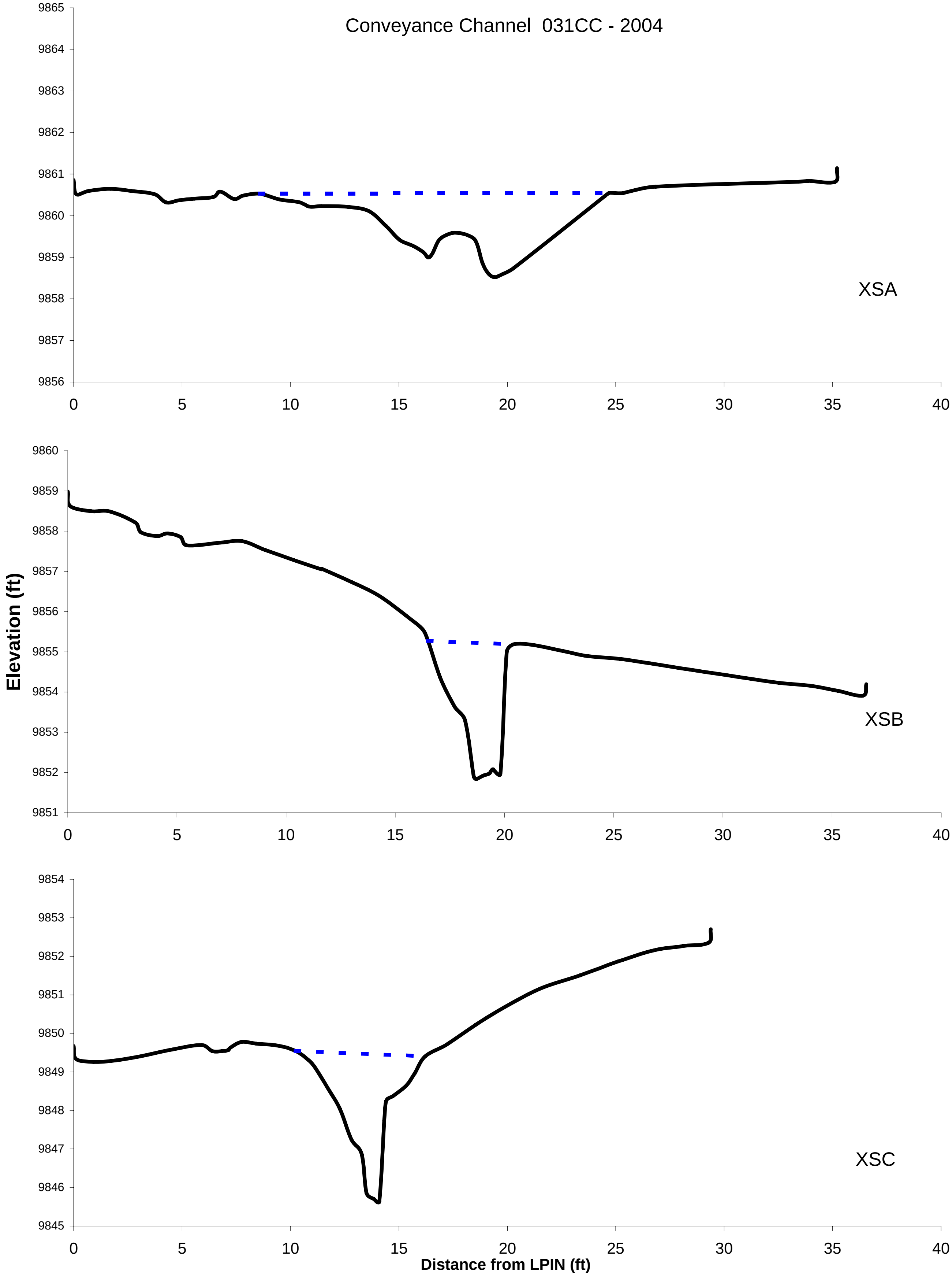
Conveyance Channel 026CC - 2004
Elevation (ft)
Distance from LPIN (ft)
XSA
XSB
XSC
9757
9756
9755
9754
9753
9749
9748
9747
9746
9745
9742
9741
9740
9739
9738
0
5
10
15
20
25
30
35
40


Conveyance Channel 027CC - 2004
9762
9758
9754
9750
9746
9742
0
5
10
15
20
25
30
35
40
XSA
9753
9749
9745
9741
9737
9733
XSB
Elevation (ft)
9747
9743
9739
9735
9731
9727
XSC
Distance from LPIN (ft)

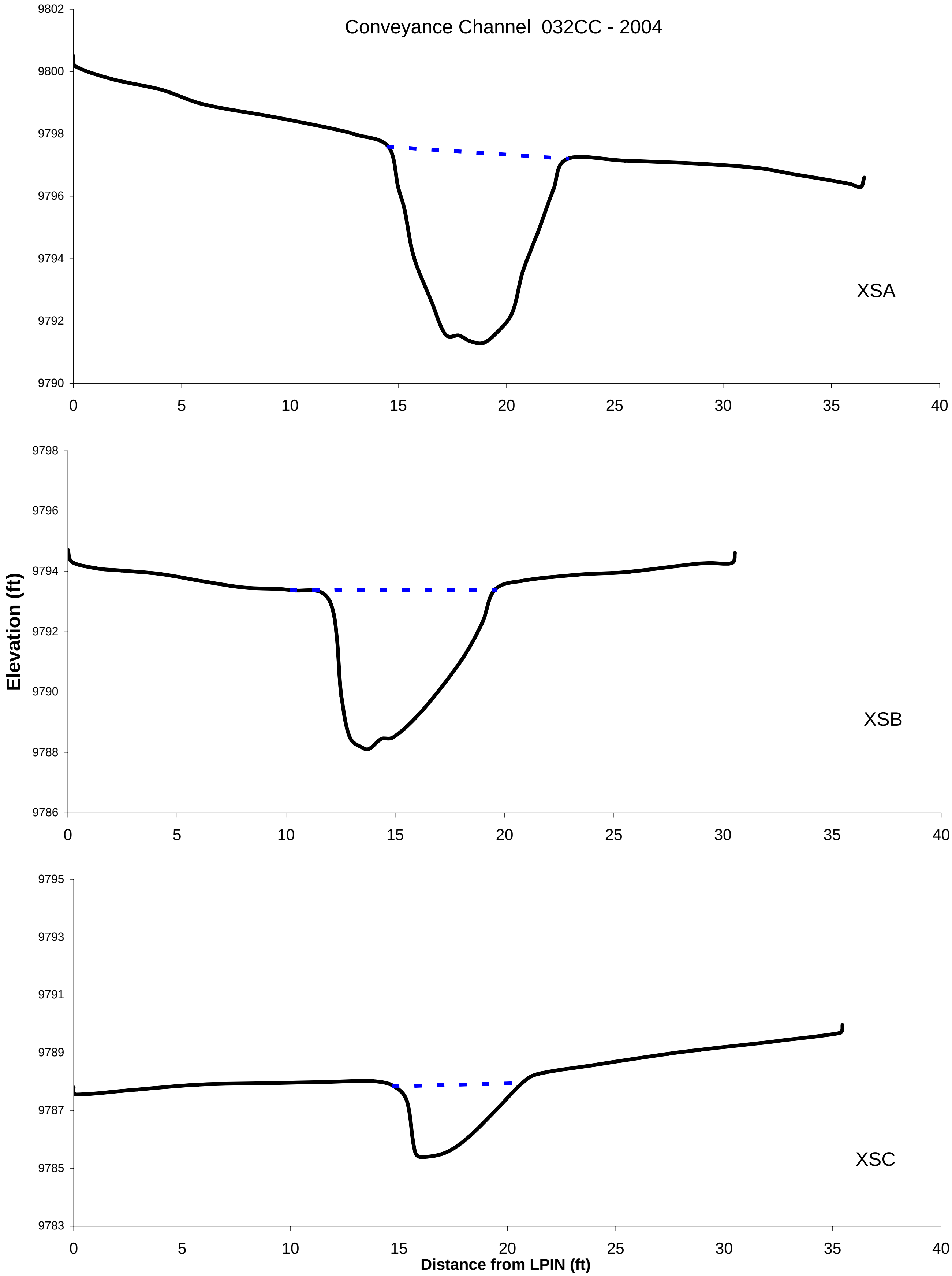

Conveyance Channel 029CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
9862
9861
9860
9859
9858
9857
9856
9857
9856
9855
9854
9853
9852
9851
9850
9849
9848
9847
9846
9845
9844
0
5
10
15
20
25
30
35
40
45
50



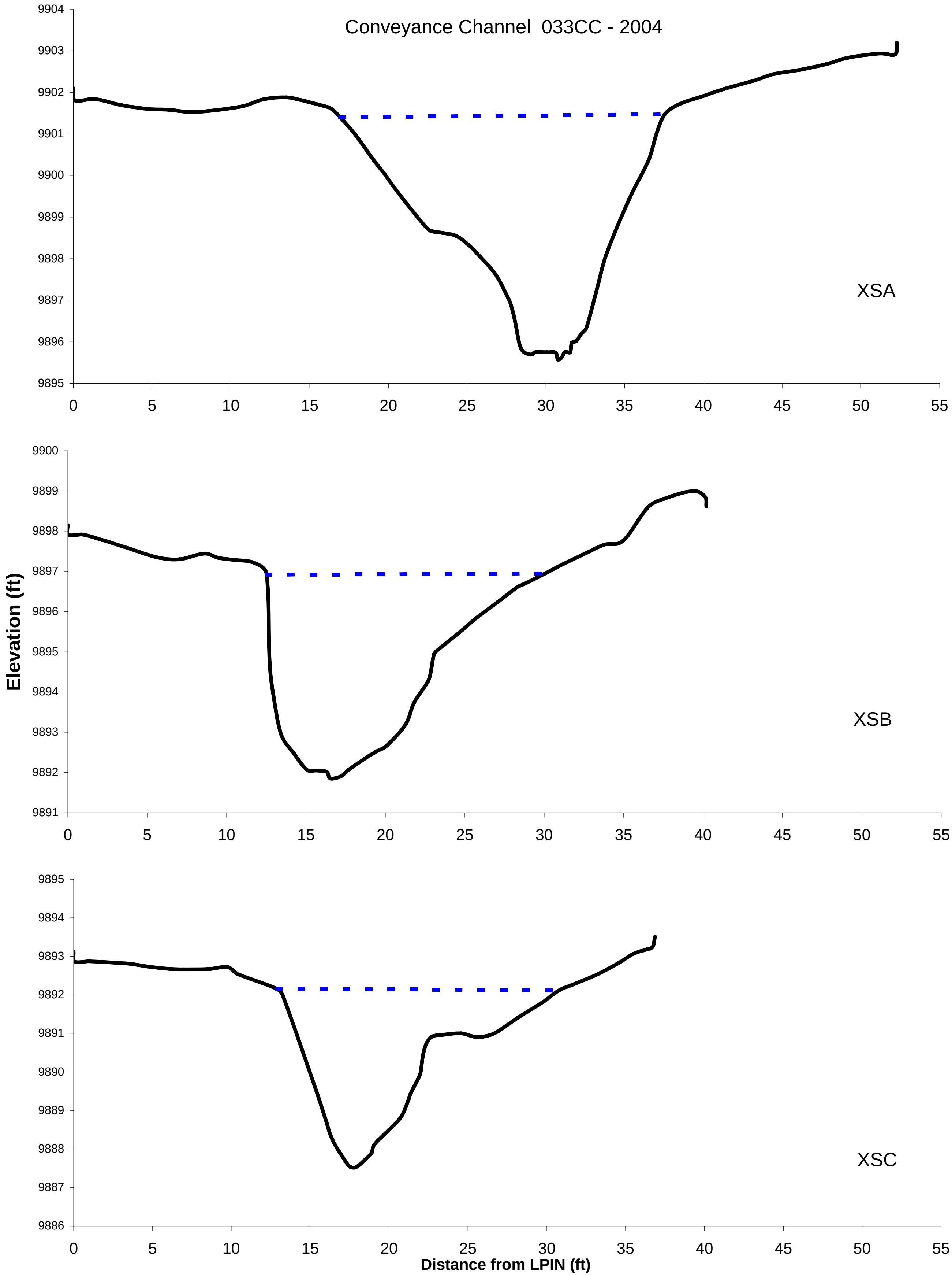
Conveyance Channel 030CC - 2004
Elevation (ft)
XSA
XSB
XSC
Distance from LPIN (ft)
9849
9848
9847
9846
9845
9844
9843
9842
9841
9840
9839
9838
9837
9836
9835
9834
9833
9832
9831
0
10
20
30
40
50
60
70

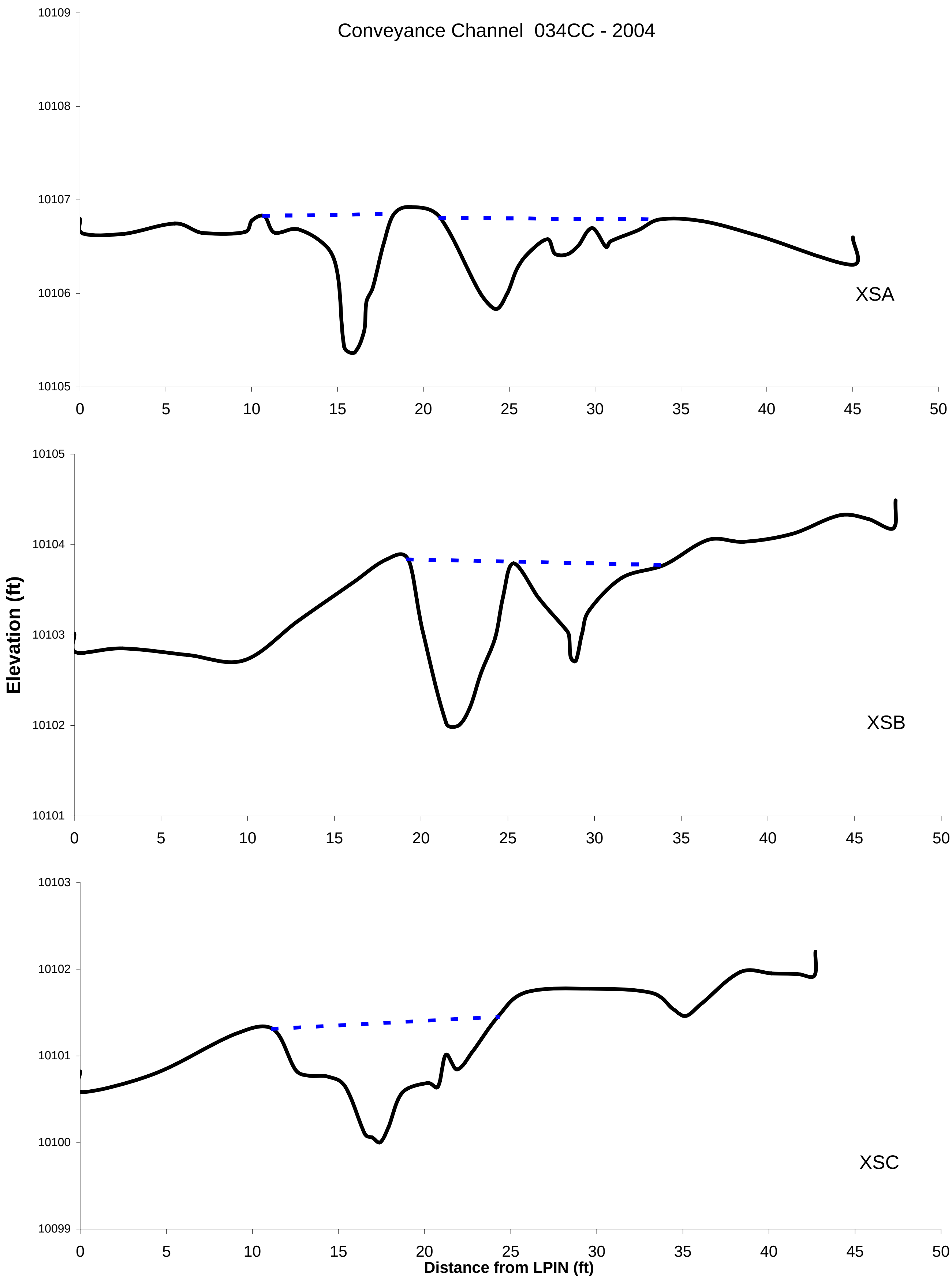


Conveyance Channel 031CC - 2004
9865
9864
9863
9862
9861
9860
9859
9858
9857
9856
0
5
10
15
20
25
30
35
40
XSA
9860
9859
9858
9857
9856
9855
9854
9853
9852
9851
XSB
Elevation (ft)
9854
9853
9852
9851
9850
9849
9848
9847
9846
9845
XSC
Distance from LPIN (ft)

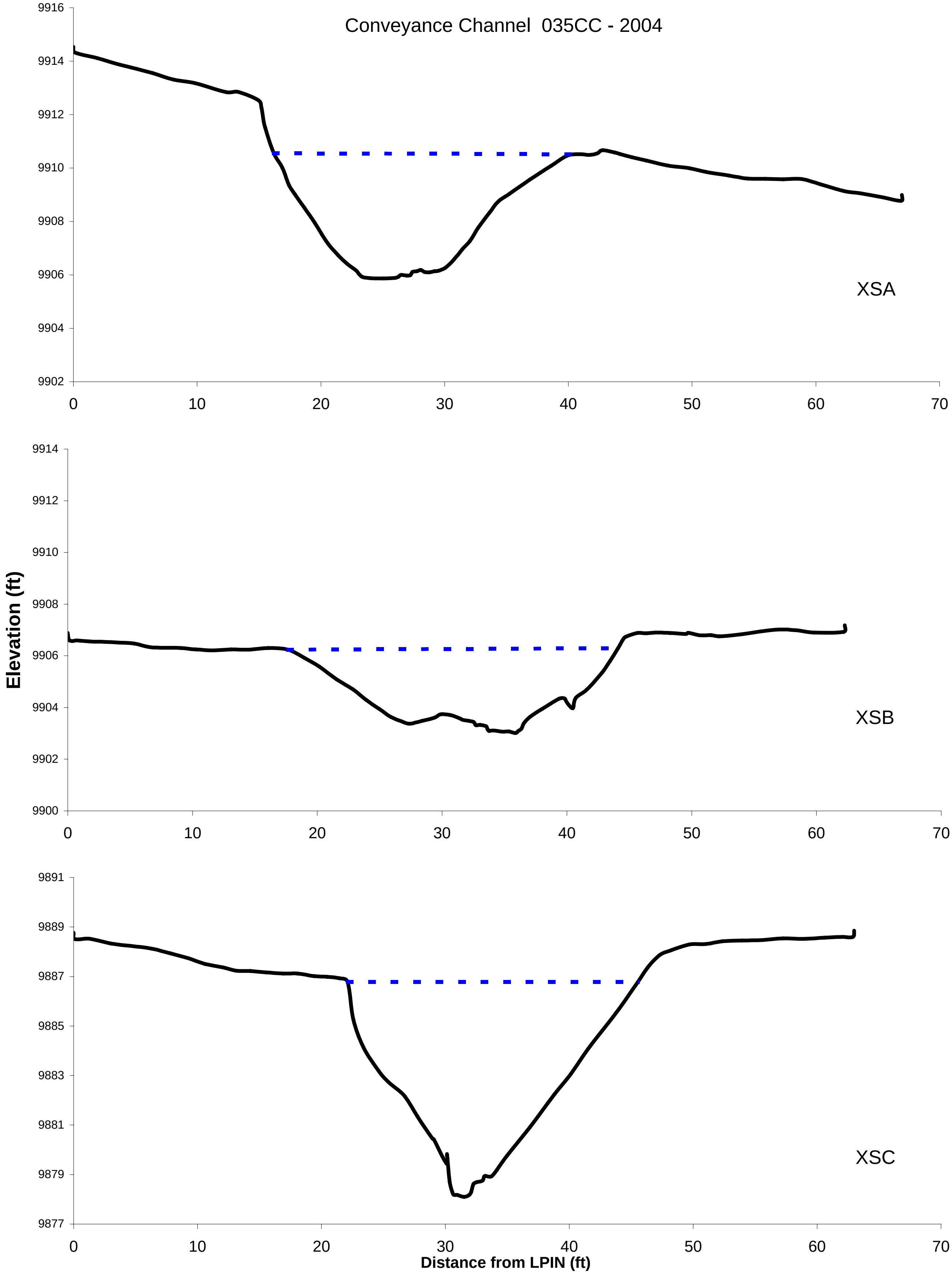


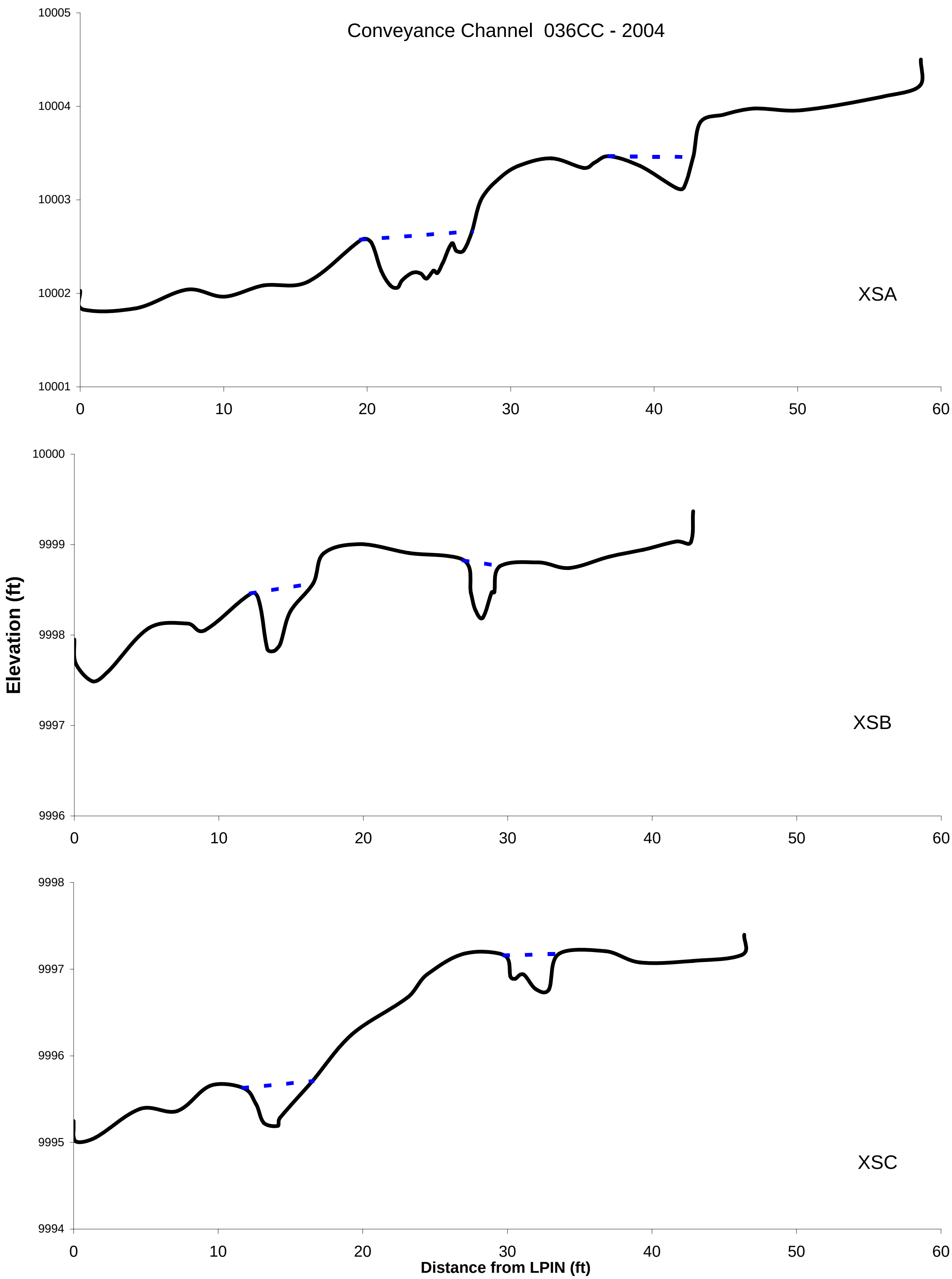
Conveyance Channel 032CC - 2004
Elevation (ft)
XSA
XSB
XSC
Distance from LPIN (ft)


Conveyance Channel 033CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
9904
9903
9902
9901
9900
9899
9898
9897
9896
9895
9894
9893
9892
9891
9890
9889
9888
9887
9886
0
5
10
15
20
25
30
35
40
45
50
55

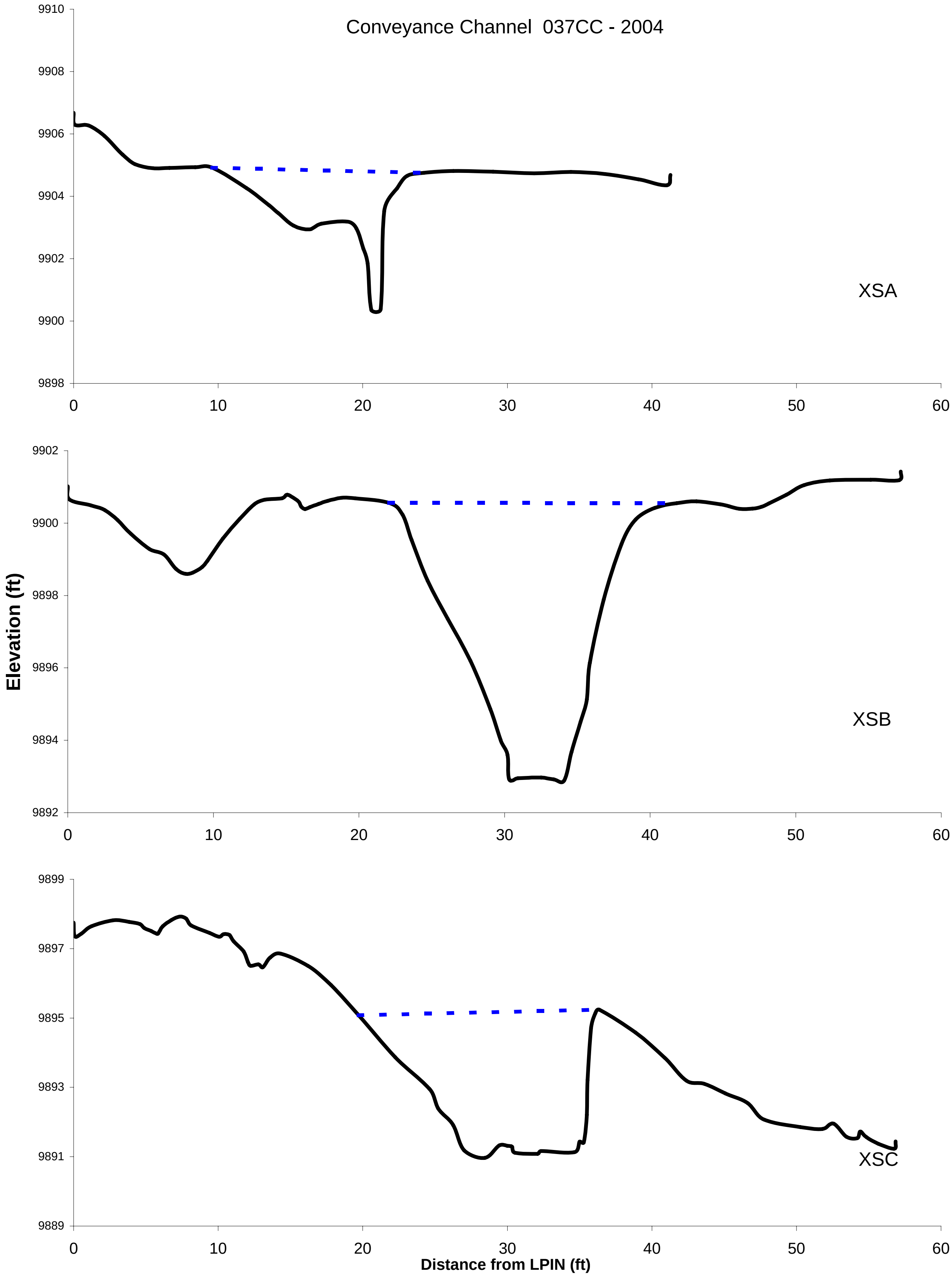


Conveyance Channel 034CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
10109
10108
10107
10106
10105
10104
10103
10102
10101
10100
10099
0
5
10
15
20
25
30
35
40
45
50

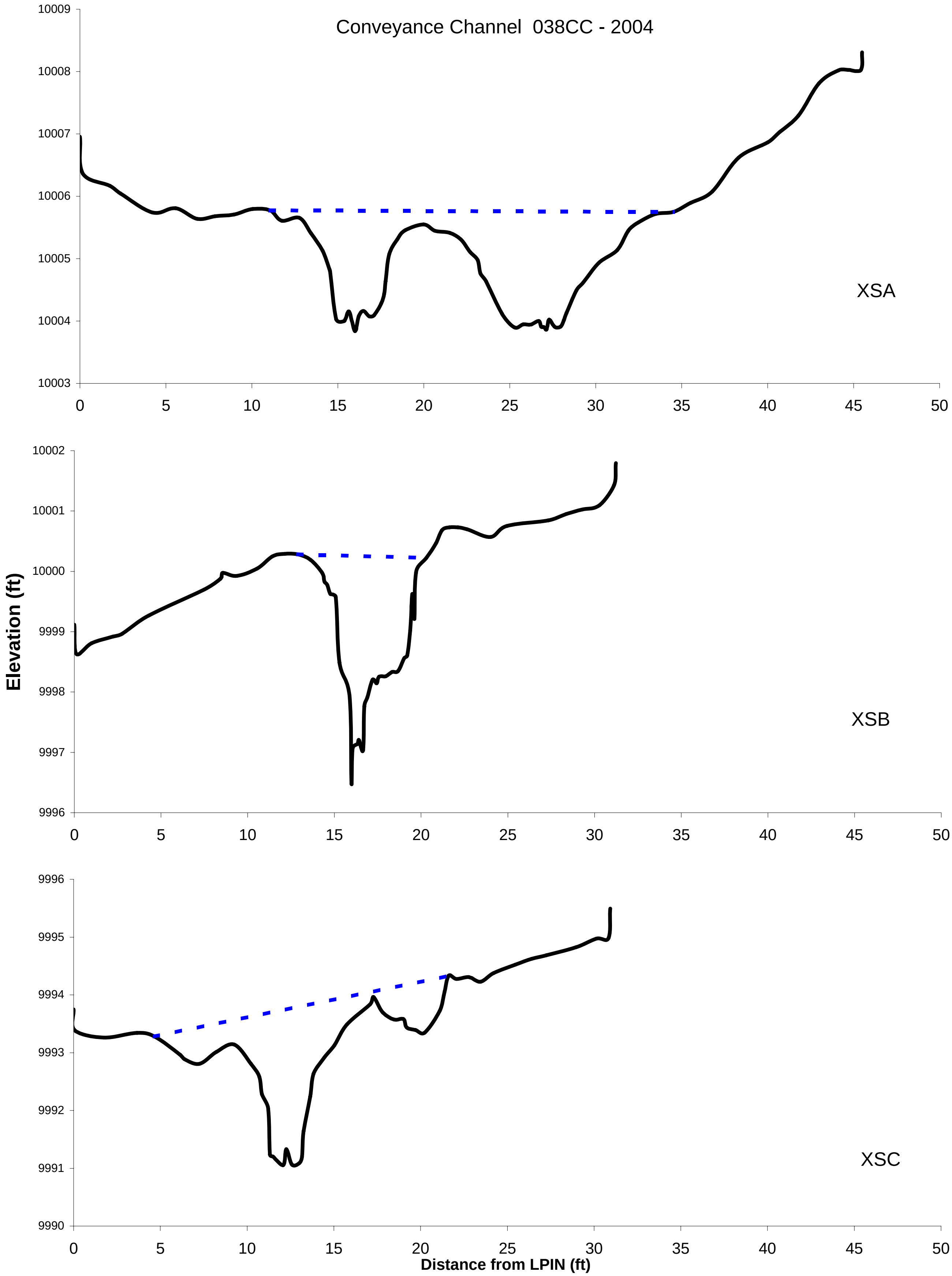

Conveyance Channel 035CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
9916
9914
9912
9910
9908
9906
9904
9902
9900
9891
9889
9887
9885
9883
9881
9879
9877
0
10
20
30
40
50
60
70



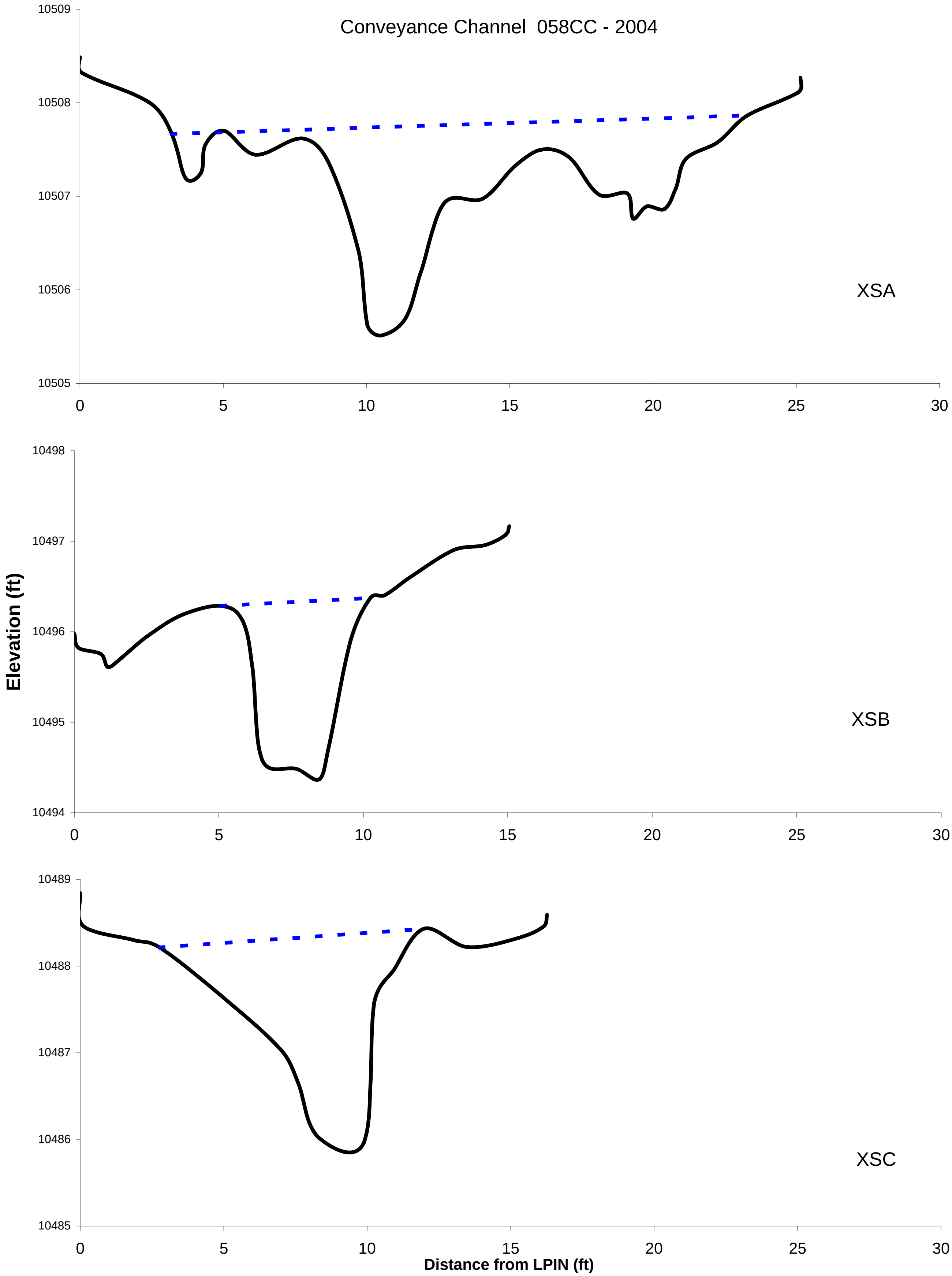
Conveyance Channel 036CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
10005
10004
10003
10002
10001
10000
9999
9998
9997
9996
9995
9994
0
10
20
30
40
50
60



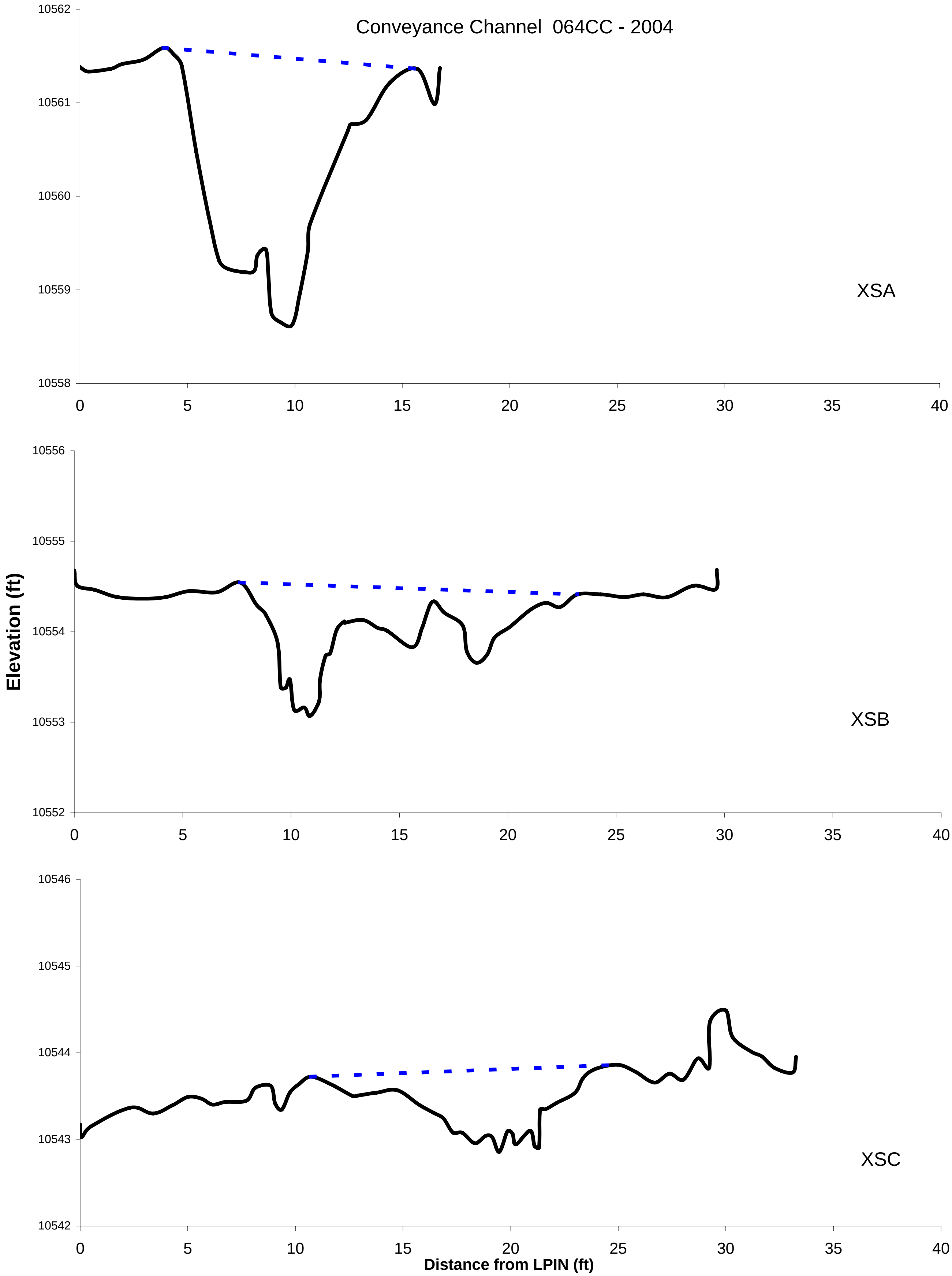
Conveyance Channel 037CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
9910
9908
9906
9904
9902
9900
9898
9902
9900
9898
9896
9894
9892
9899
9897
9895
9893
9891
9889
0
10
20
30
40
50
60



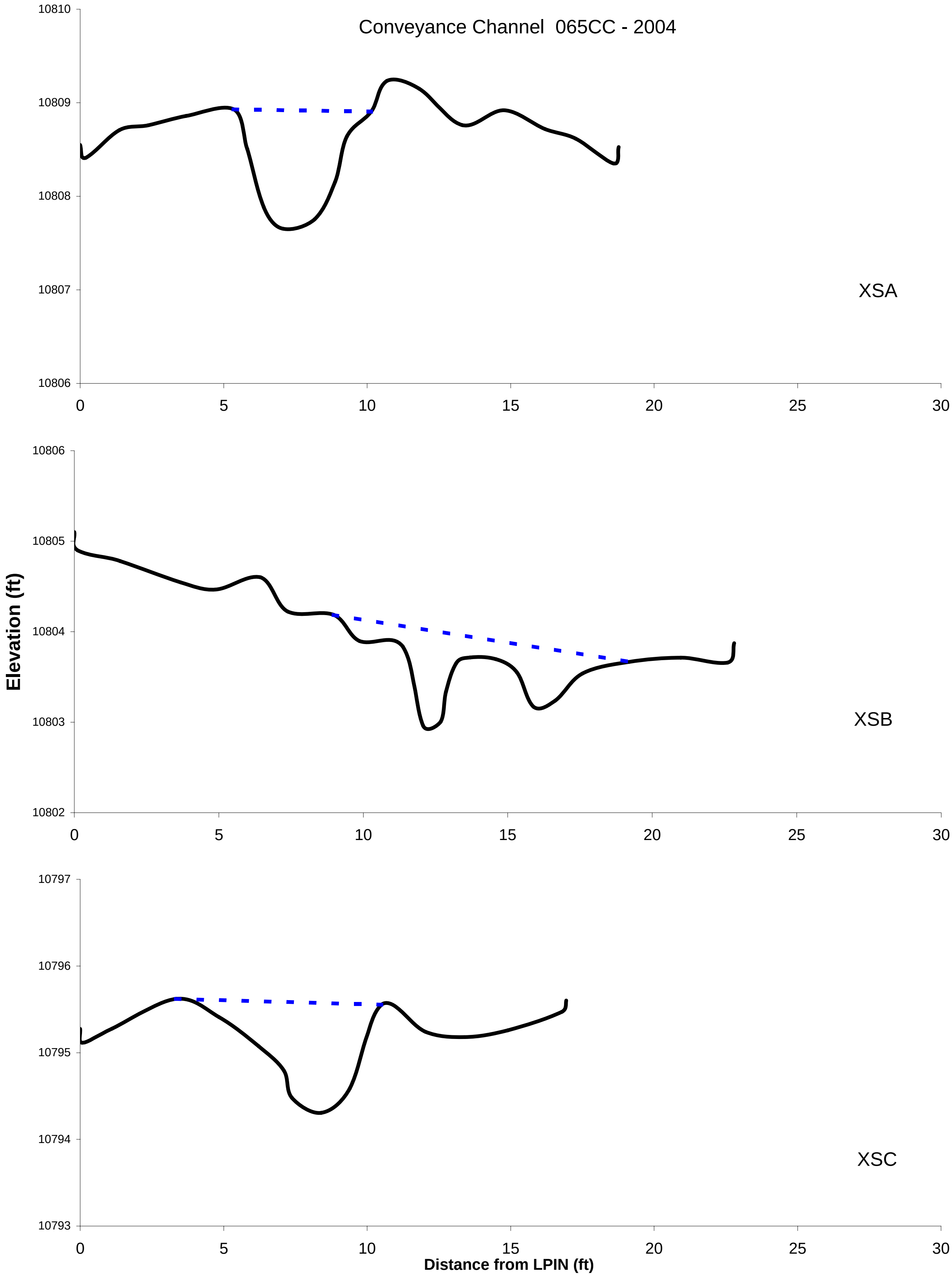
Conveyance Channel 038CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
10009
10008
10007
10006
10005
10004
10003
10002
10001
10000
9999
9998
9997
9996
9995
9994
9993
9992
9991
9990
0
5
10
15
20
25
30
35
40
45
50



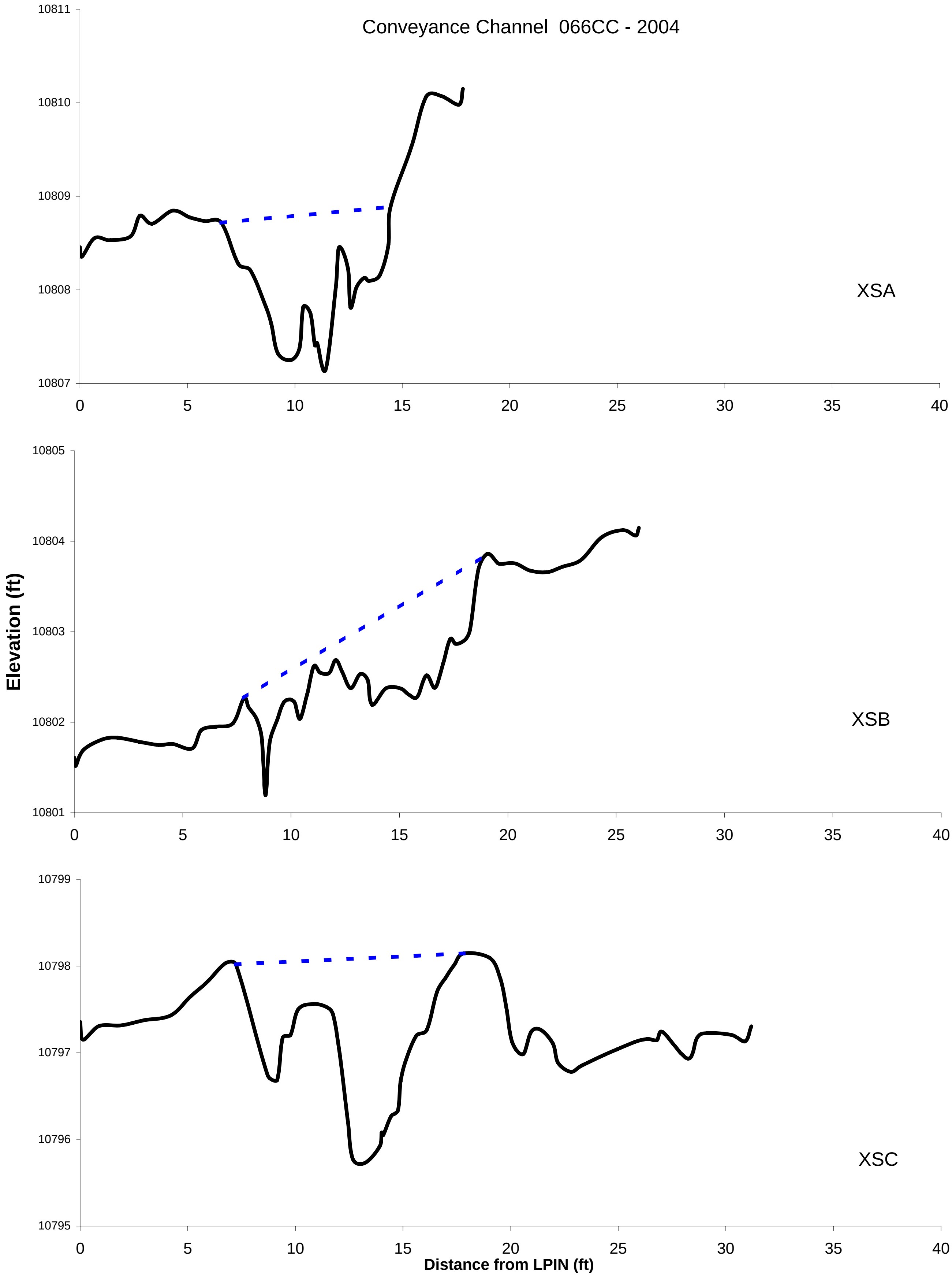
Conveyance Channel 058CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
10509
10508
10507
10506
10505
10498
10497
10496
10495
10494
10489
10488
10487
10486
10485
0
5
10
15
20
25
30



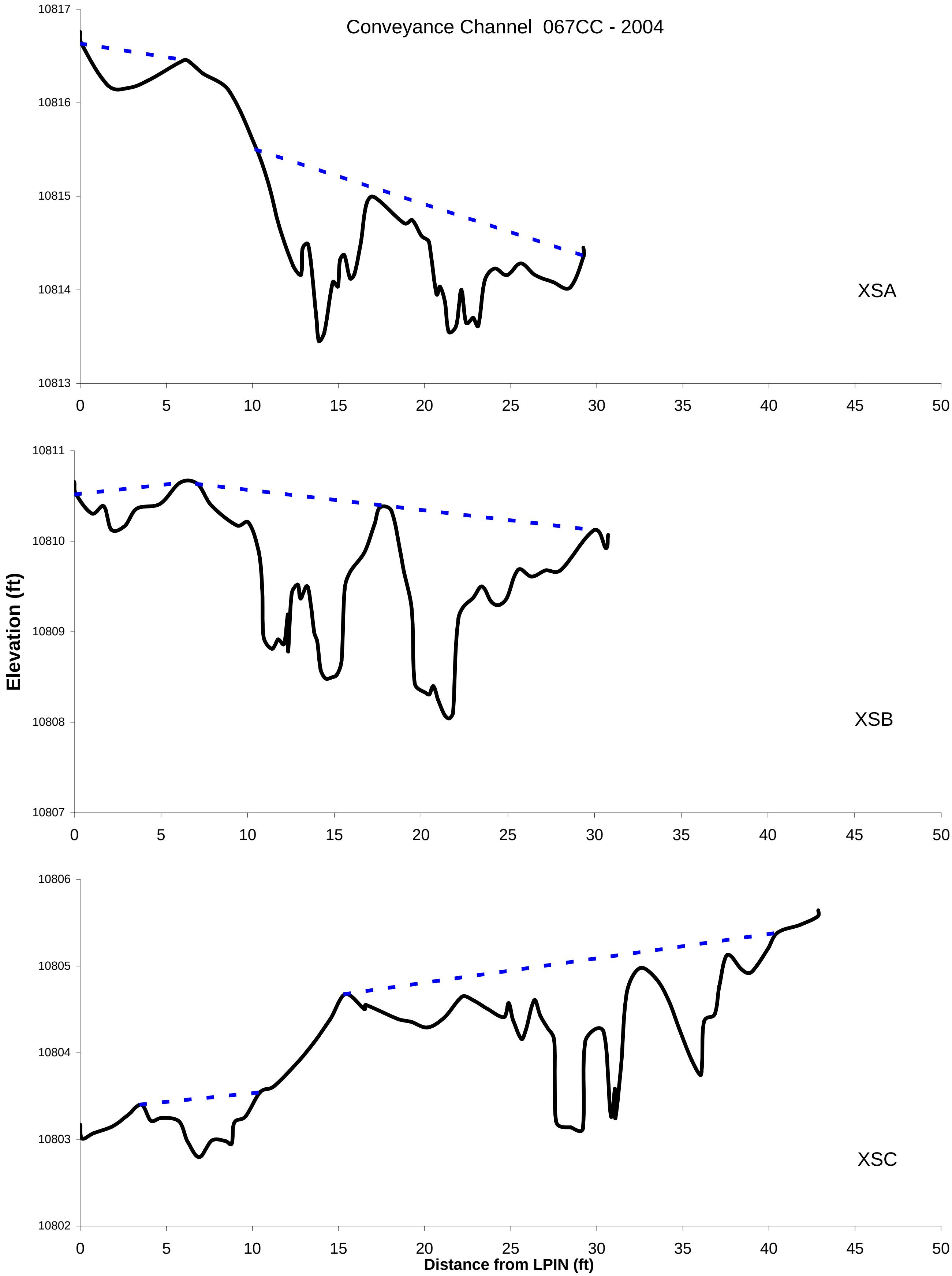
Conveyance Channel 064CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
10562
10561
10560
10559
10558
10556
10555
10554
10553
10552
10546
10545
10544
10543
10542
0
5
10
15
20
25
30
35
40



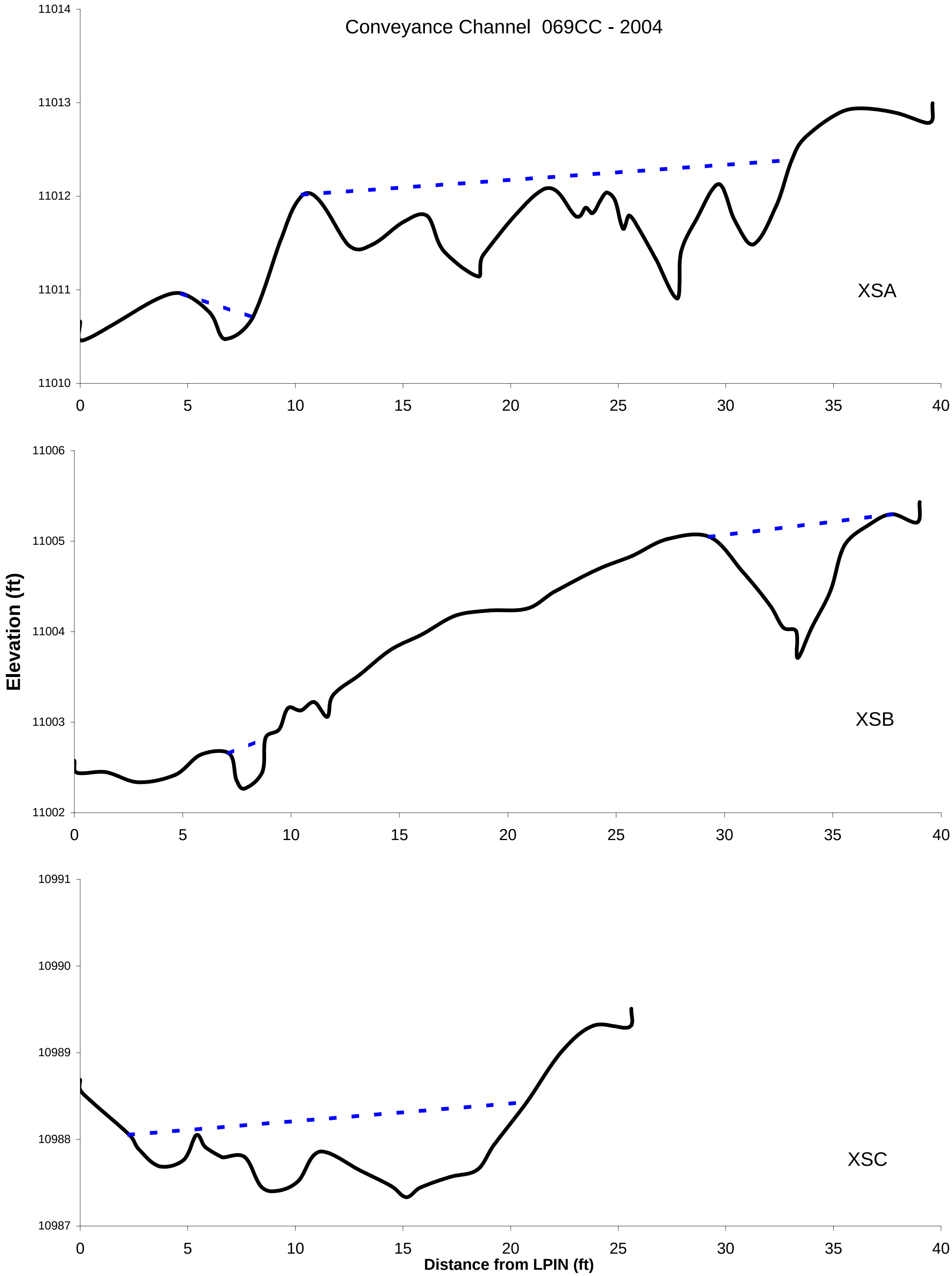
Conveyance Channel 065CC - 2004
10810
10809
10808
10807
10806
0
5
10
15
20
25
30
XSA
10806
10805
10804
10803
10802
Elevation (ft)
XSB
10797
10796
10795
10794
10793
XSC
Distance from LPIN (ft)



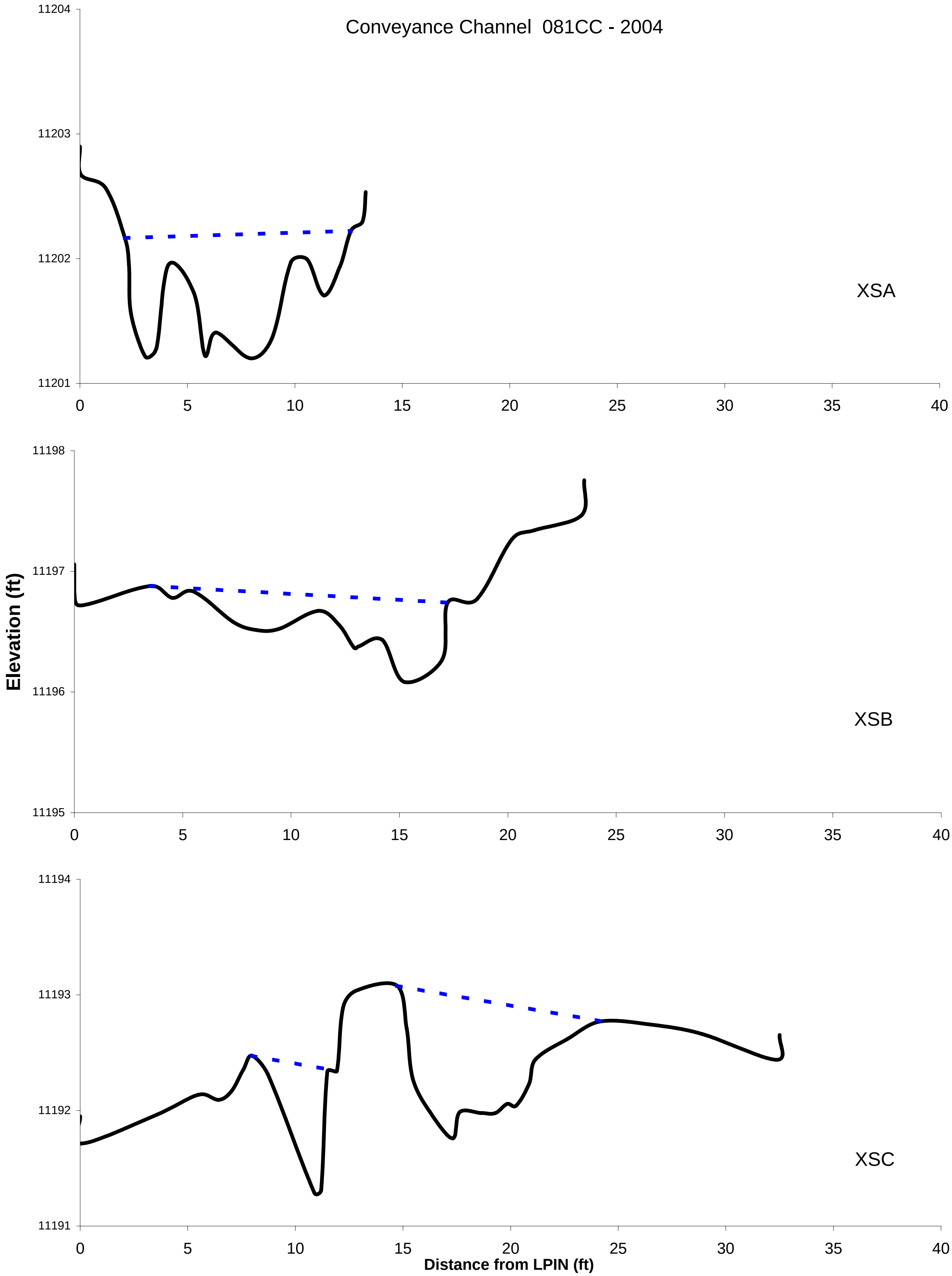
Conveyance Channel 066CC - 2004
Elevation (ft)
XSA
10811
10810
10809
10808
10807
XSB
10805
10804
10803
10802
10801
XSC
10799
10798
10797
10796
10795
0
5
10
15
20
25
30
35
40
Distance from LPIN (ft)



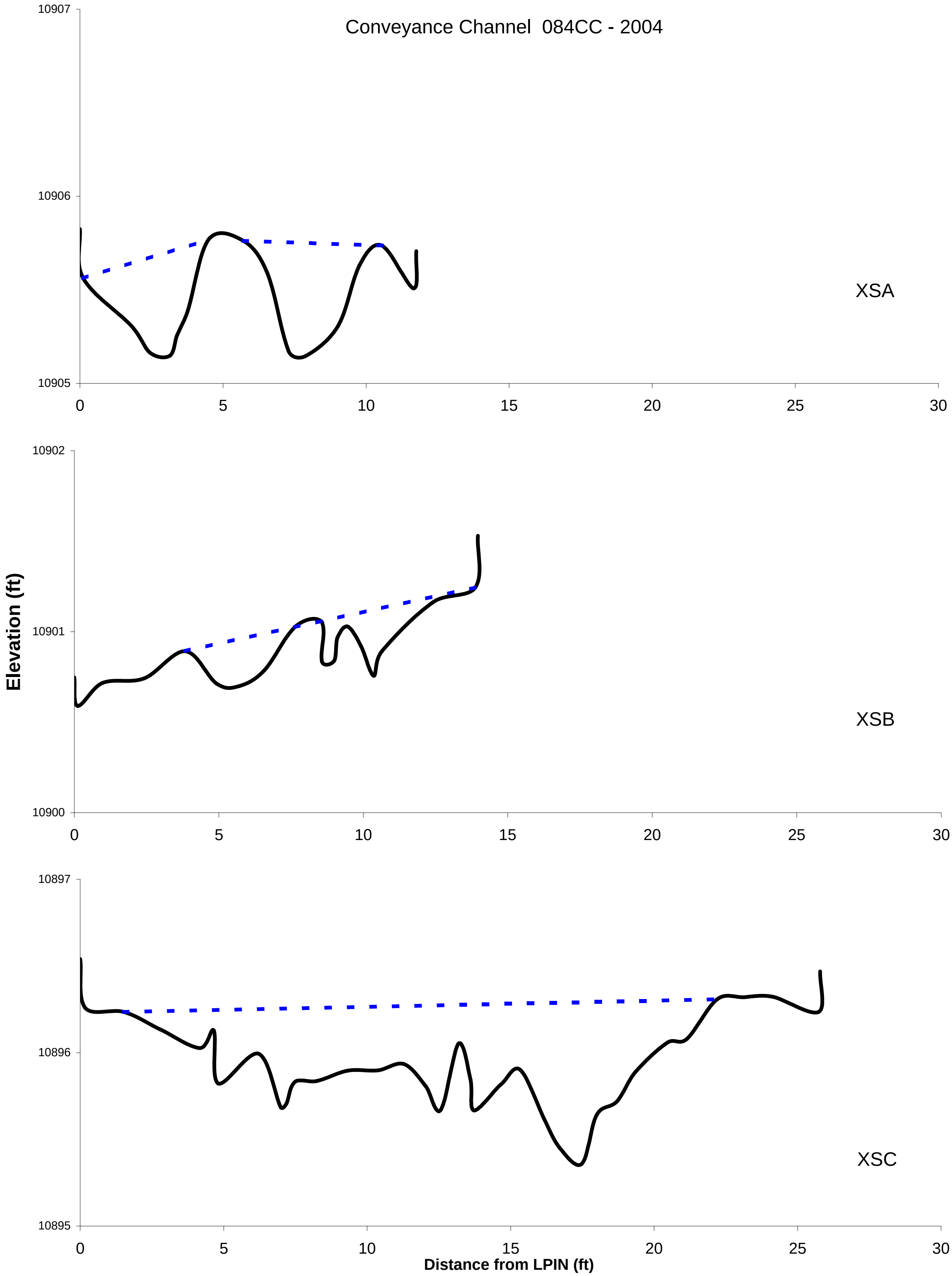
Conveyance Channel 067CC - 2004
Elevation (ft)
XSA
10817
10816
10815
10814
10813
0
5
10
15
20
25
30
35
40
45
50
XSB
10811
10810
10809
10808
10807
0
5
10
15
20
25
30
35
40
45
50
XSC
10806
10805
10804
10803
10802
0
5
10
15
20
25
30
35
40
45
50
Distance from LPIN (ft)



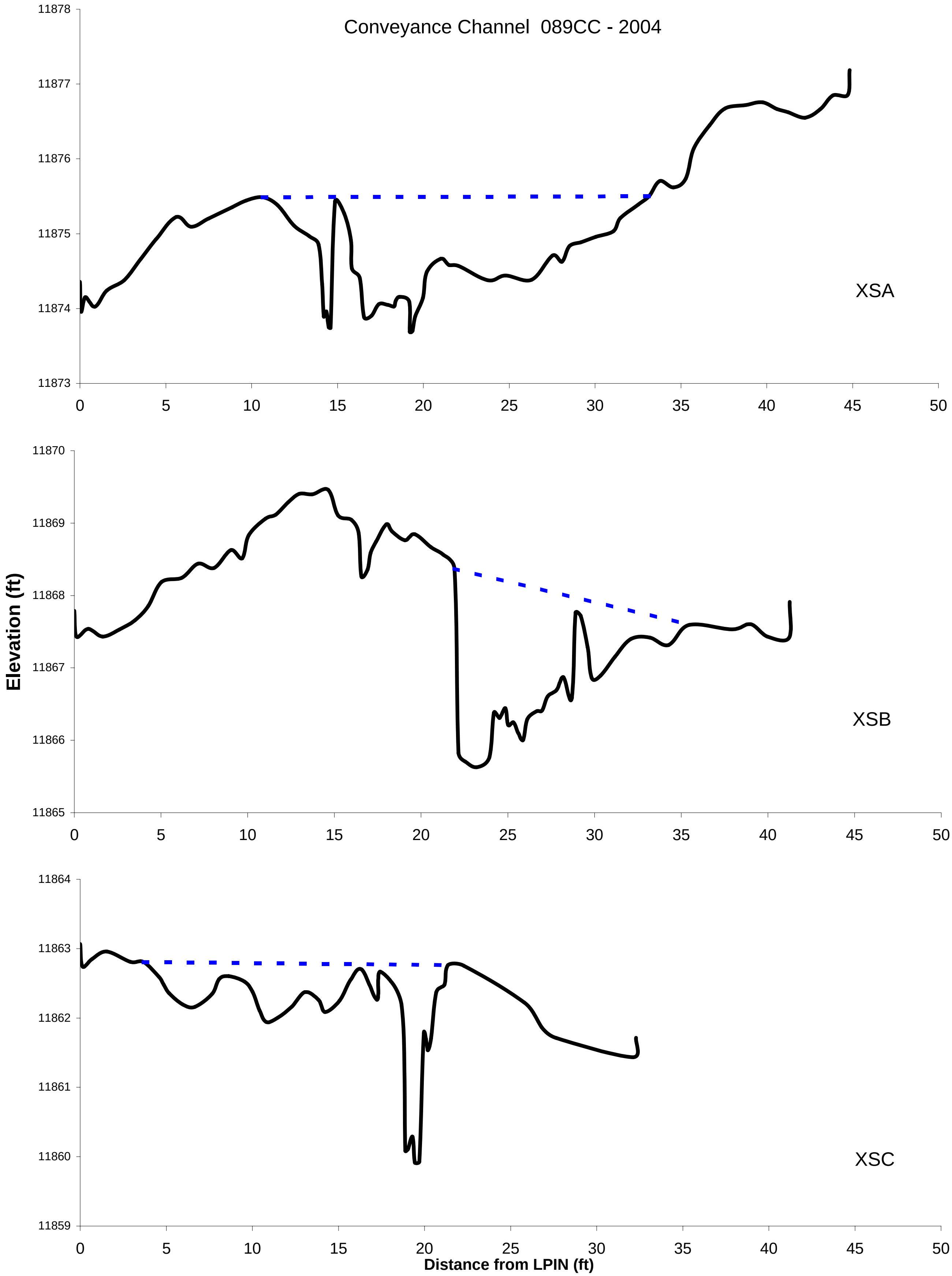
Conveyance Channel 069CC - 2004
Elevation (ft)
11014
11013
11012
11011
11010
0
5
10
15
20
25
30
35
40
XSA
11006
11005
11004
11003
11002
XSB
10991
10990
10989
10988
10987
XSC
Distance from LPIN (ft)



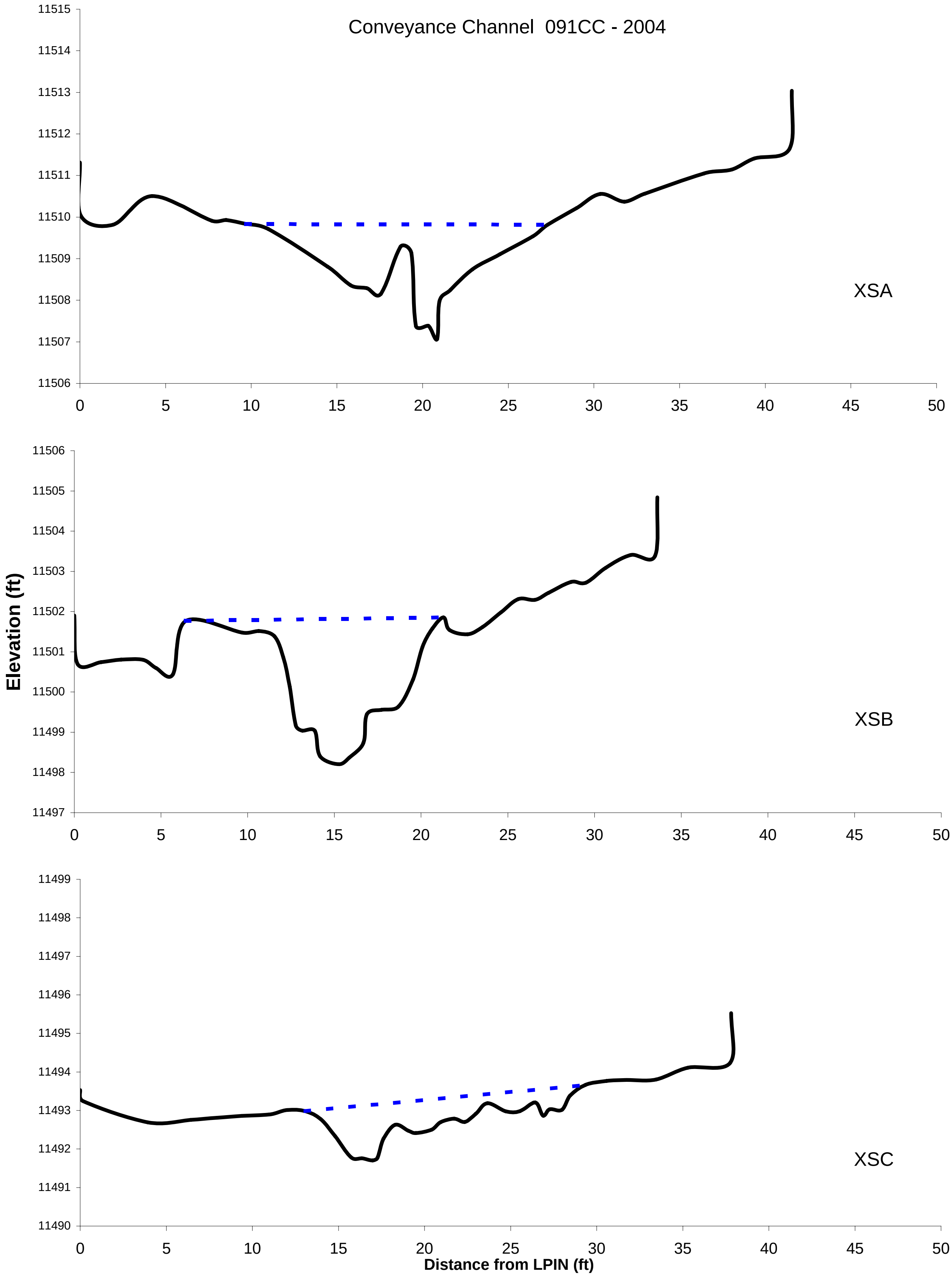
Conveyance Channel 081CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
11204
11203
11202
11201
11198
11197
11196
11195
11194
11193
11192
11191
0
5
10
15
20
25
30
35
40

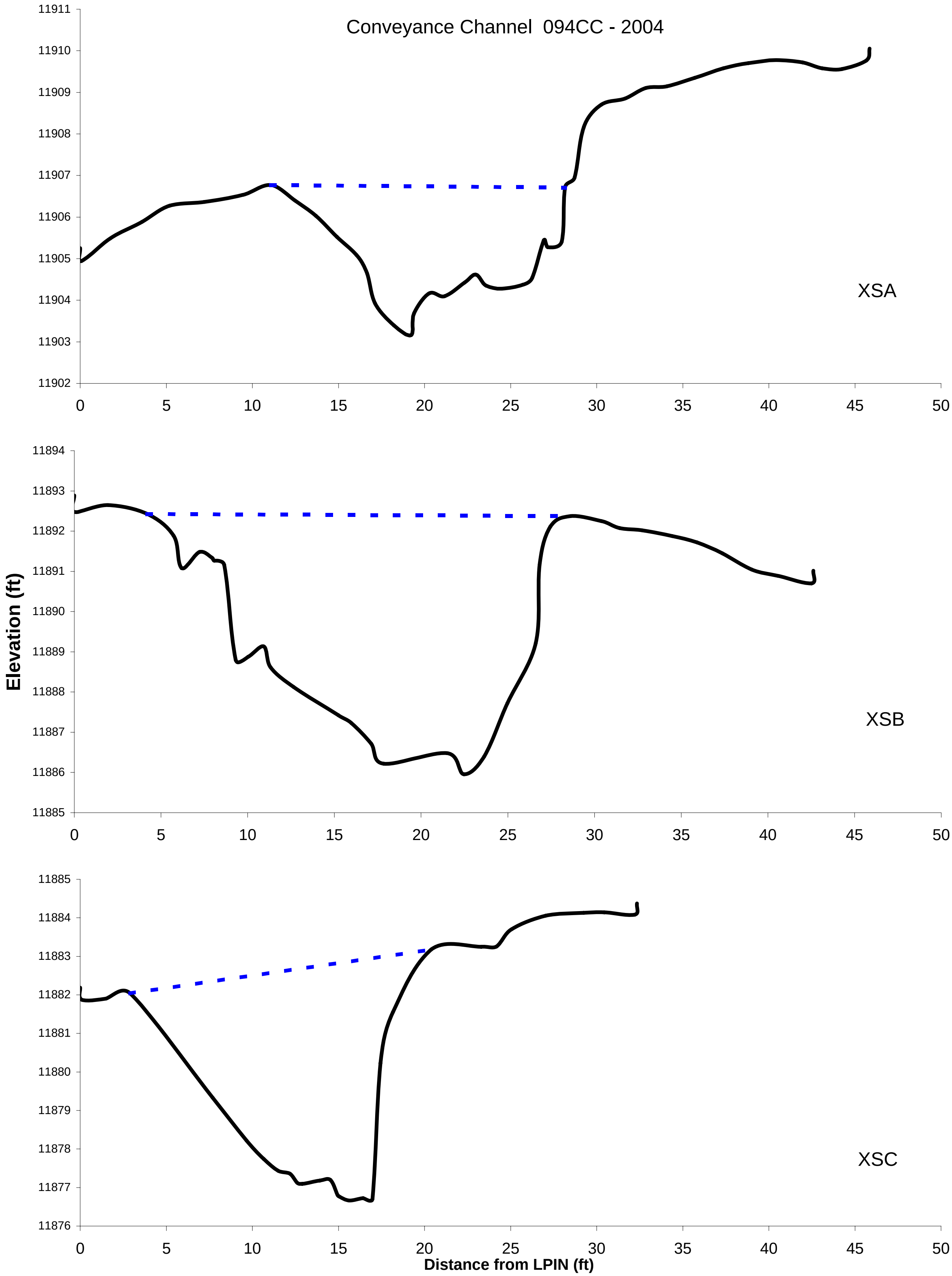


Conveyance Channel 084CC - 2004
10907
10906
10905
0
5
10
15
20
25
30
XSA
10902
10901
10900
0
5
10
15
20
25
30
XSB
Elevation (ft)
10897
10896
10895
0
5
10
15
20
25
30
XSC
Distance from LPIN (ft)

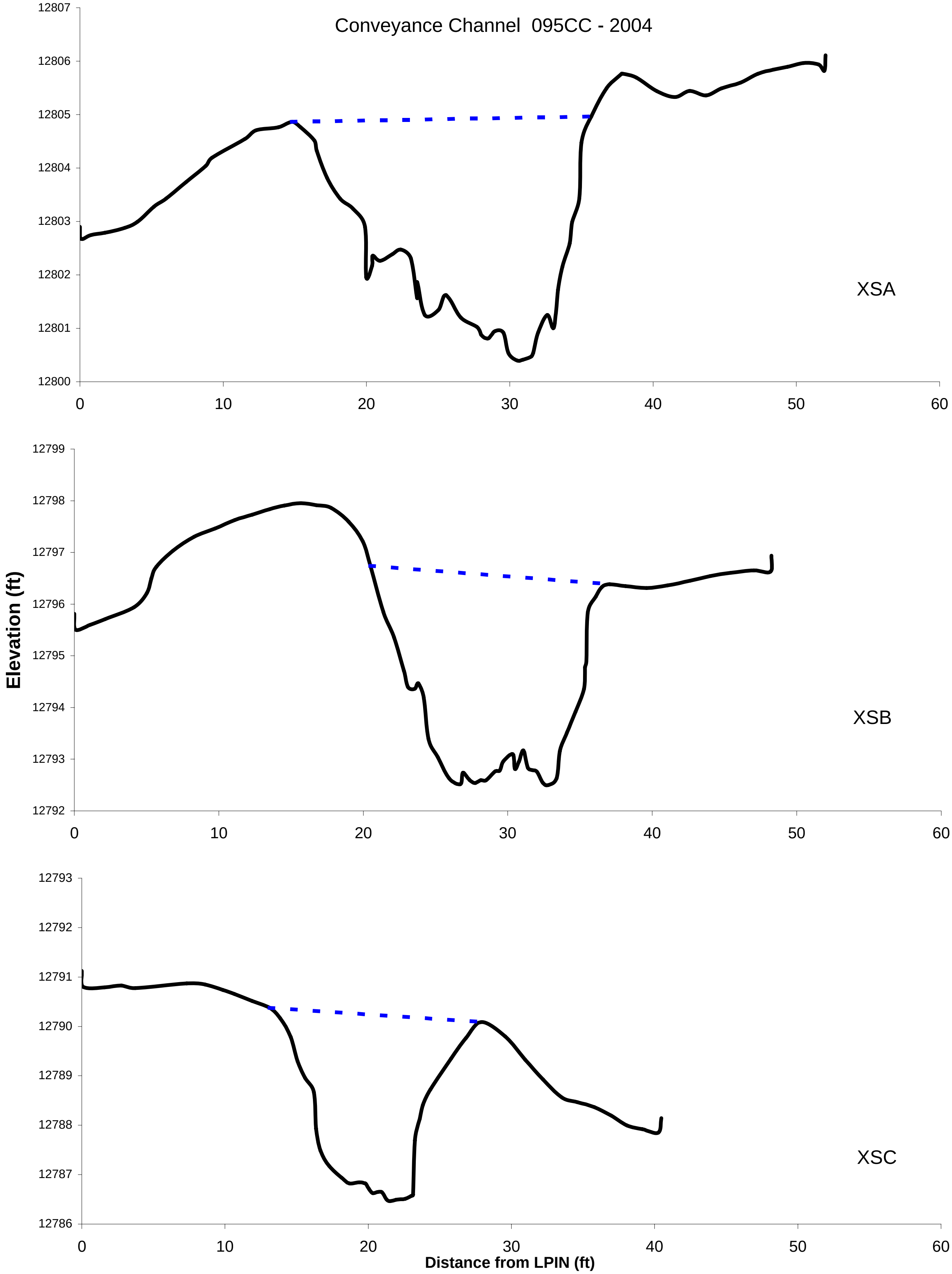


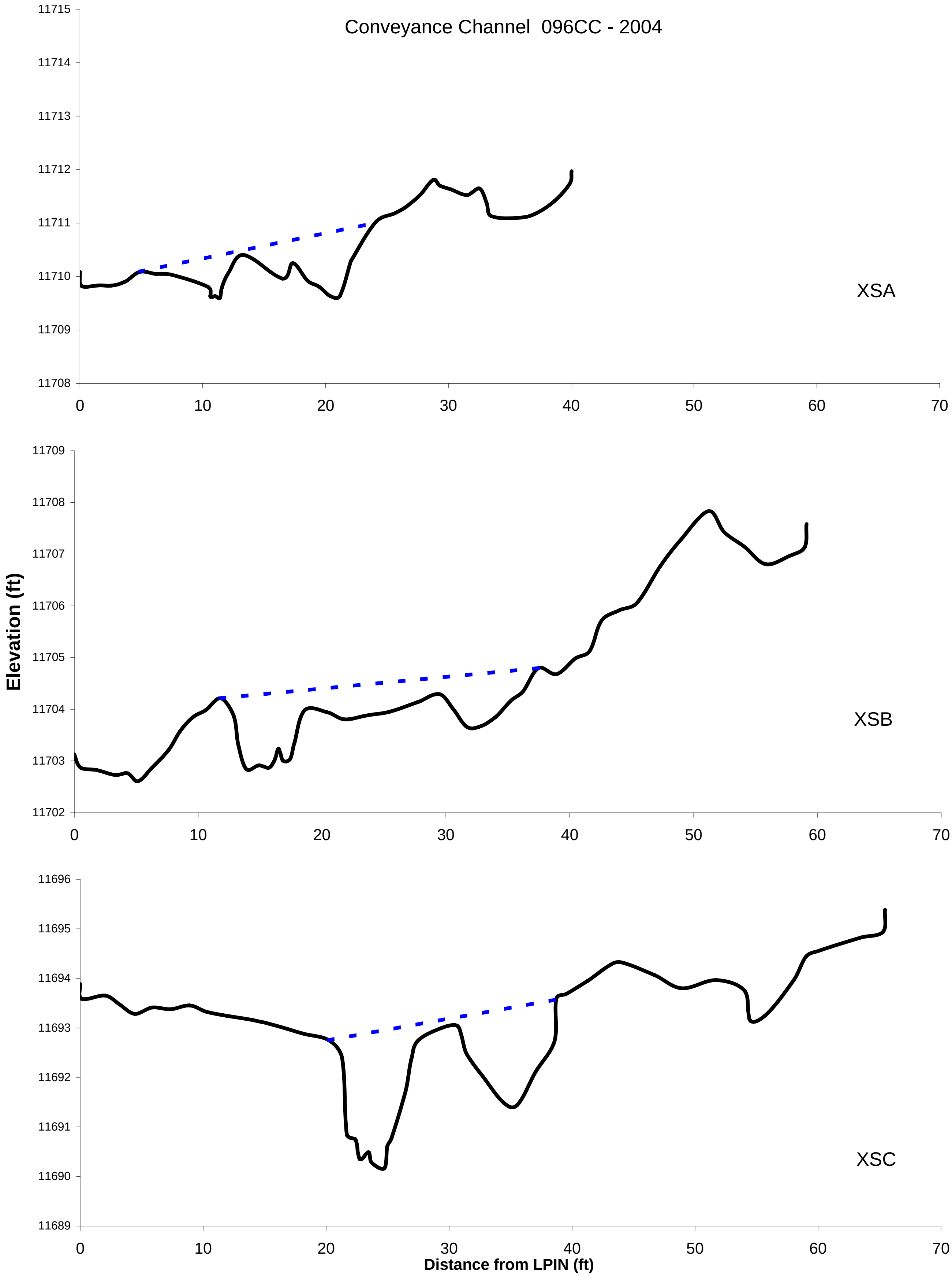
Conveyance Channel 089CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
11878
11877
11876
11875
11874
11873
11870
11869
11868
11867
11866
11865
11864
11863
11862
11861
11860
11859
0
5
10
15
20
25
30
35
40
45
50


Conveyance Channel 091CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
11515
11514
11513
11512
11511
11510
11509
11508
11507
11506
11505
11504
11503
11502
11501
11500
11499
11498
11497
11496
11495
11494
11493
11492
11491
11490
0
5
10
15
20
25
30
35
40
45
50

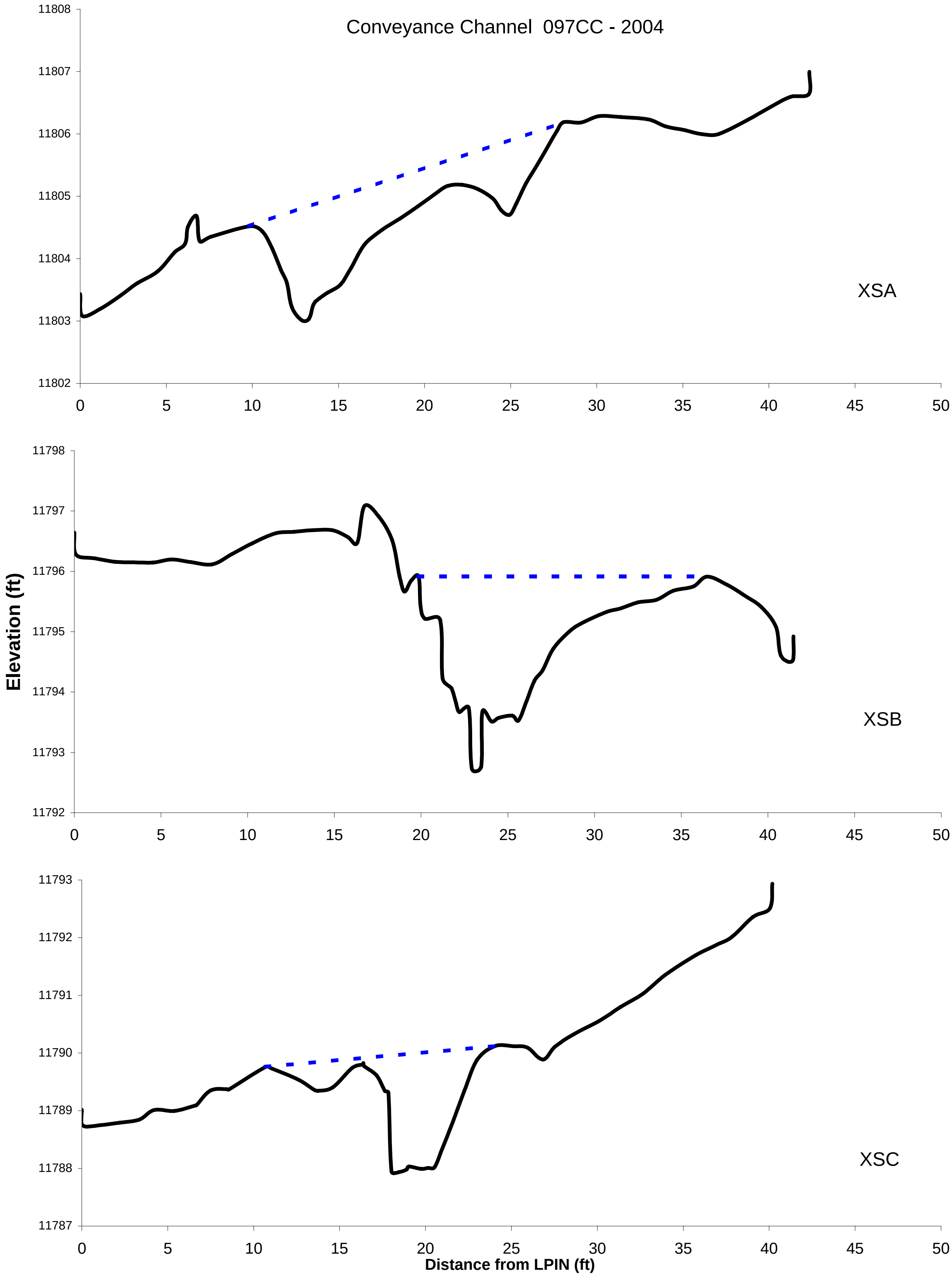


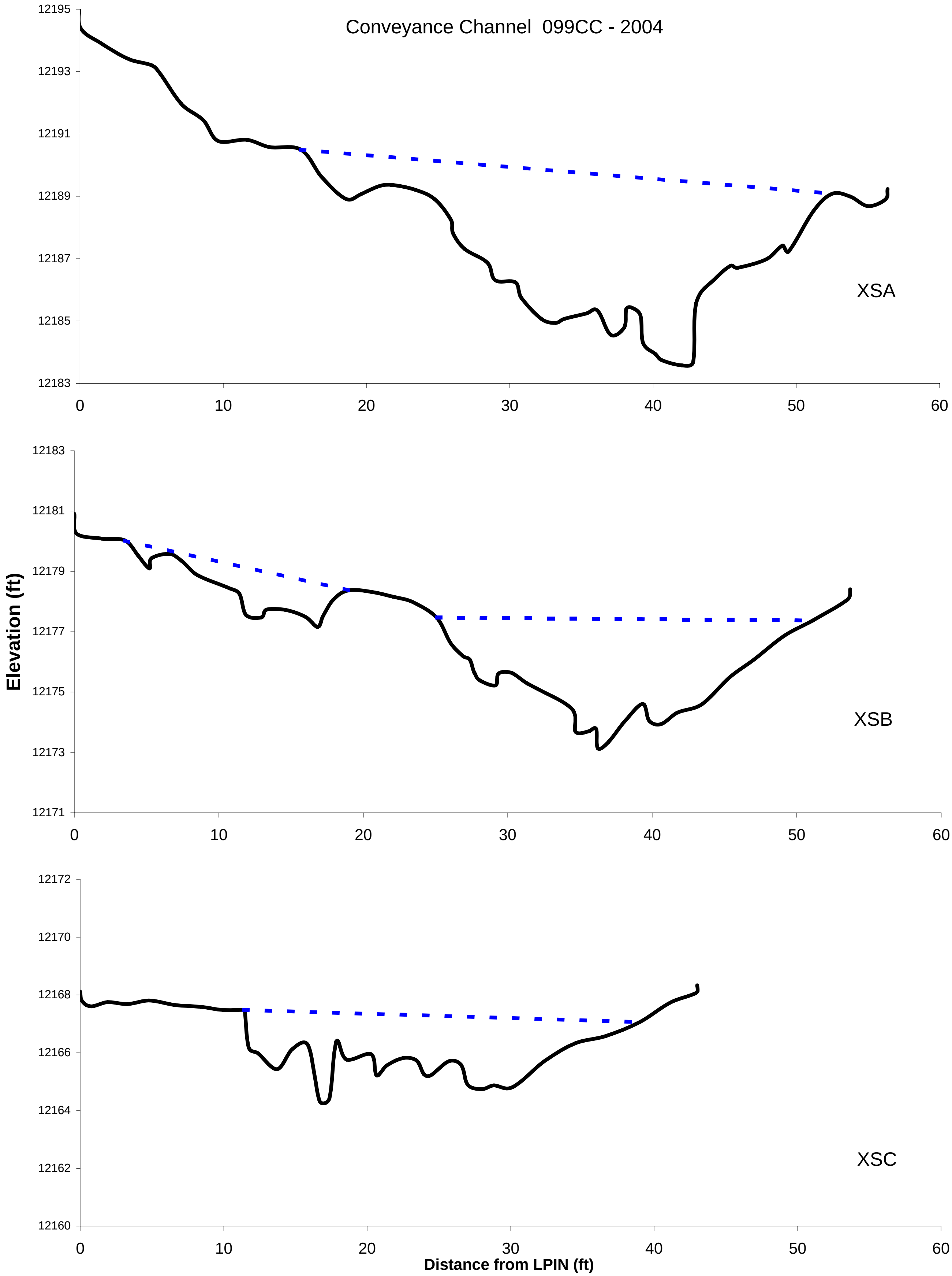
Conveyance Channel 094CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
11911
11910
11909
11908
11907
11906
11905
11904
11903
11902
11894
11893
11892
11891
11890
11889
11888
11887
11886
11885
11884
11883
11882
11881
11880
11879
11878
11877
11876
0
5
10
15
20
25
30
35
40
45
50

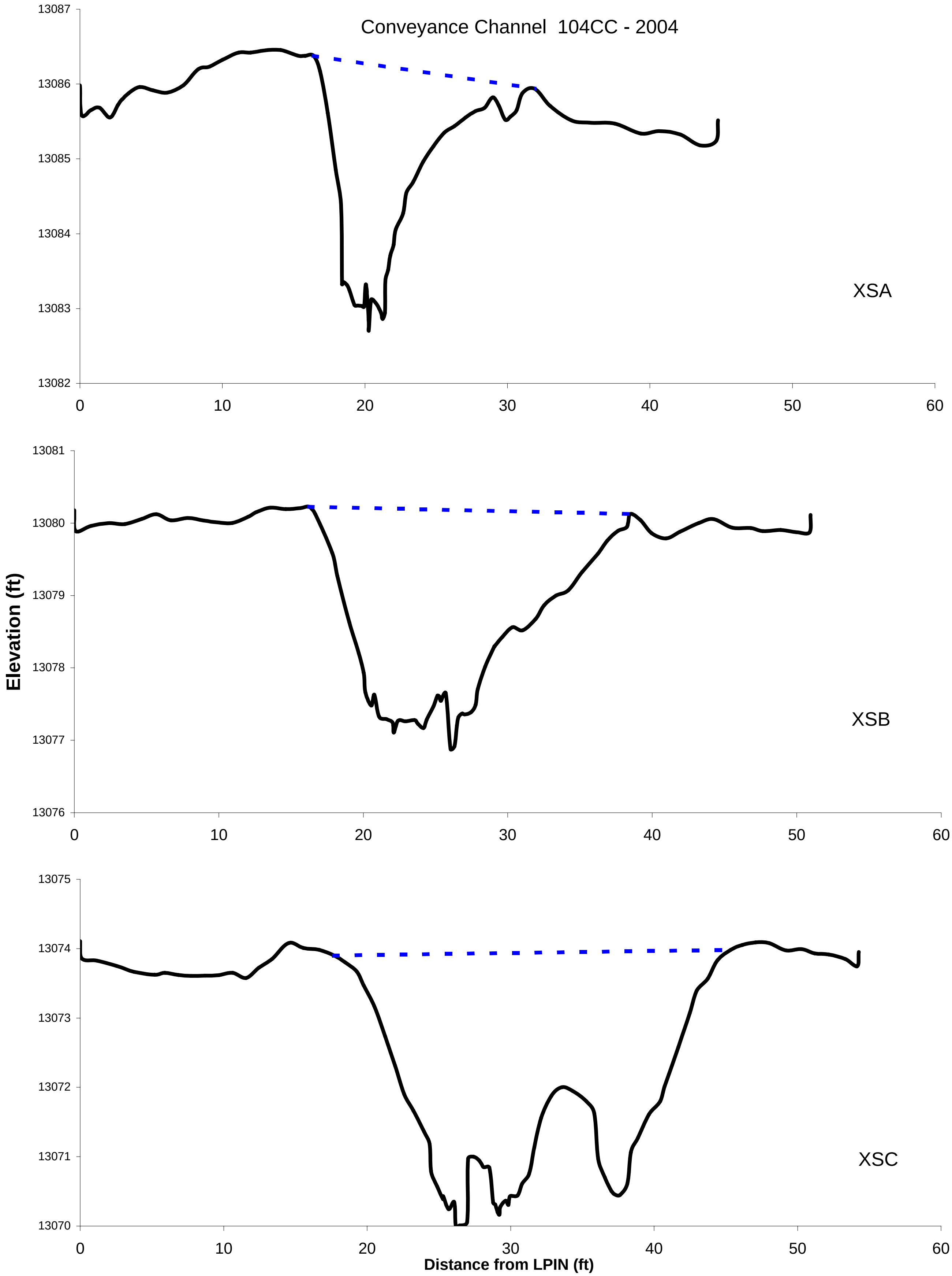

Conveyance Channel 095CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
12807
12806
12805
12804
12803
12802
12801
12800
12799
12798
12797
12796
12795
12794
12793
12792
12793
12792
12791
12790
12789
12788
12787
12786
0
10
20
30
40
50
60

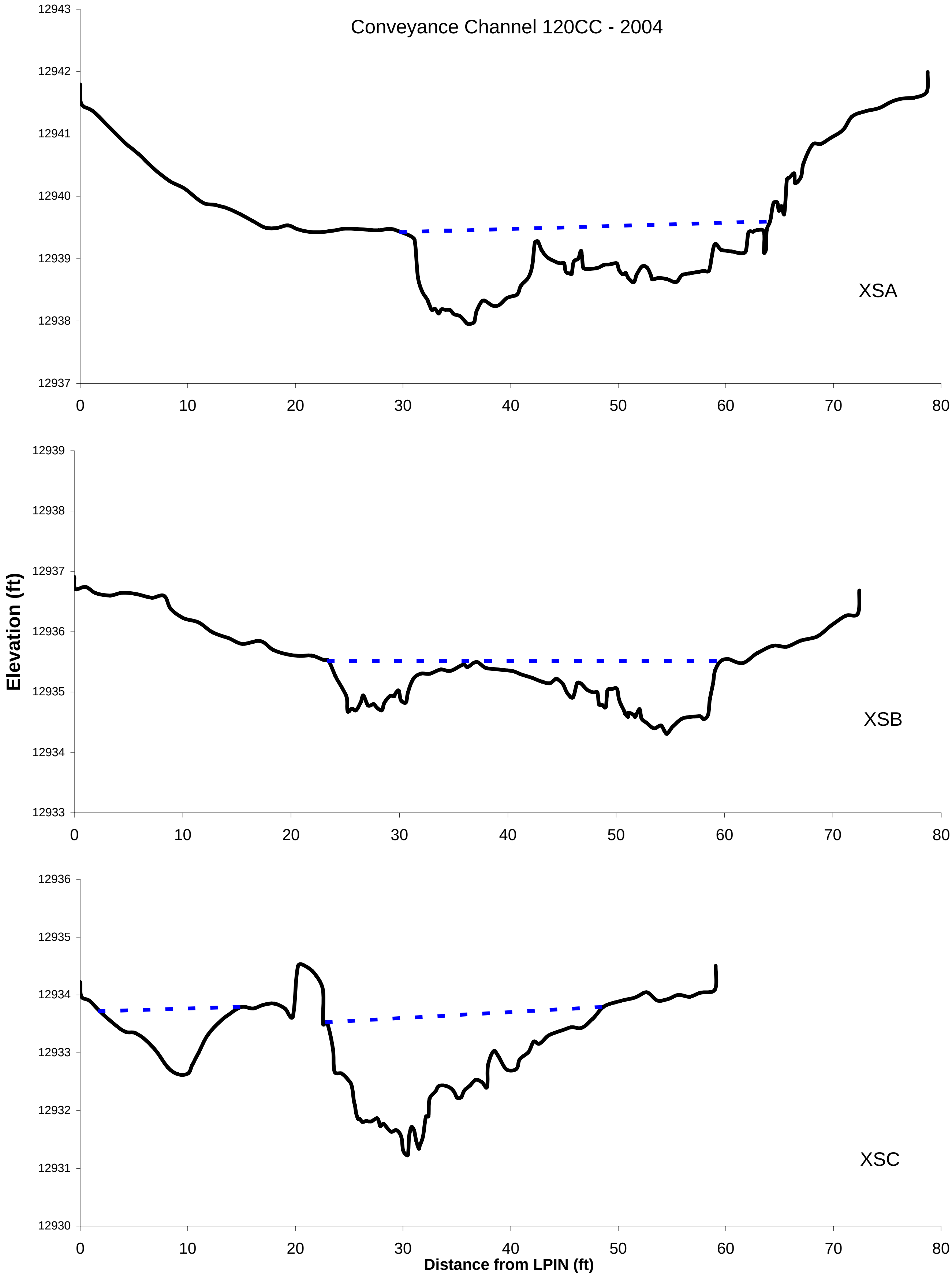


Conveyance Channel 096CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
11715
11714
11713
11712
11711
11710
11709
11708
11709
11708
11707
11706
11705
11704
11703
11702
11696
11695
11694
11693
11692
11691
11690
11689
0
10
20
30
40
50
60
70

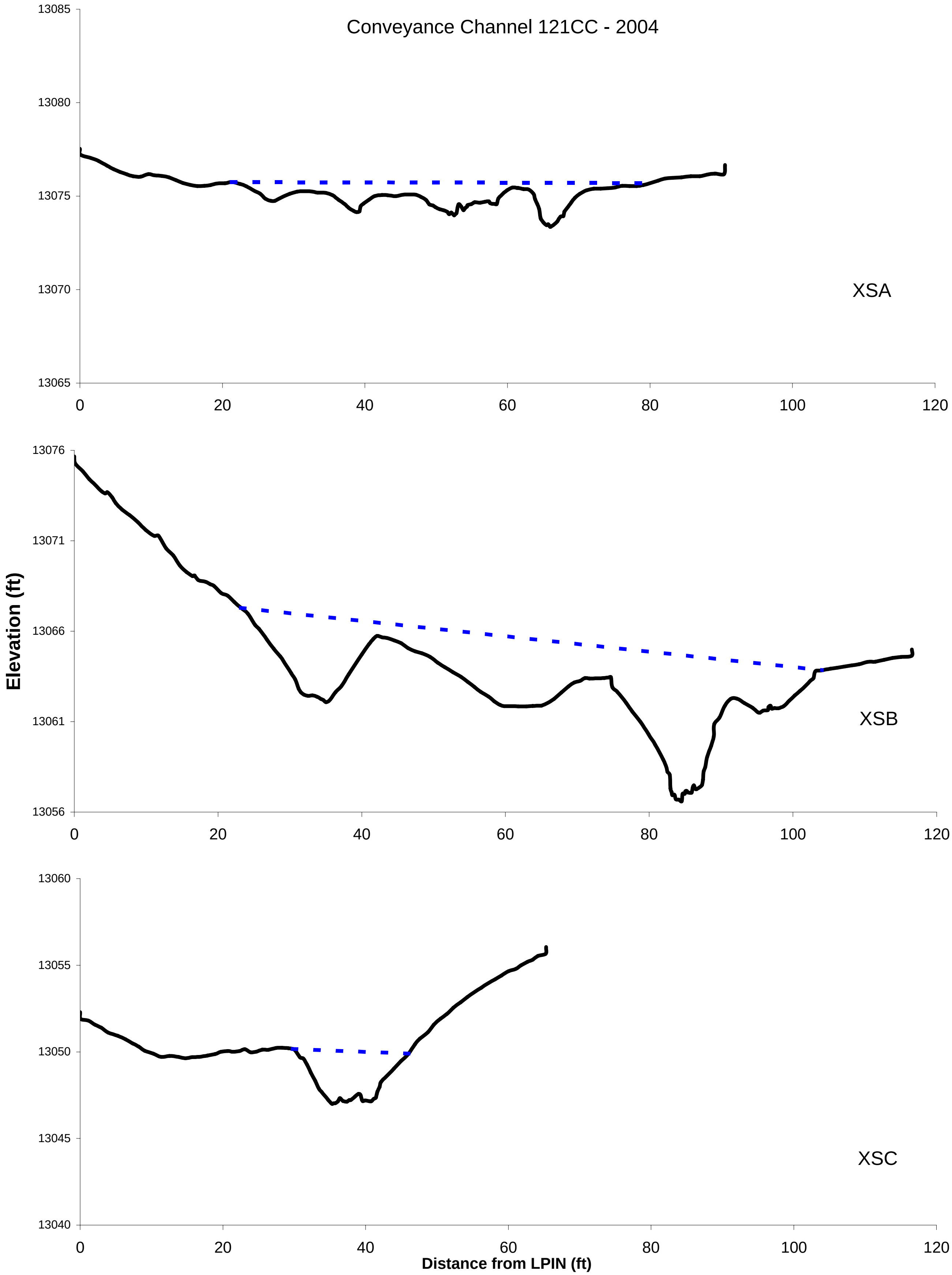

Conveyance Channel 097CC - 2004
11808
11807
11806
11805
11804
11803
11802
0
5
10
15
20
25
30
35
40
45
50
XSA
11798
11797
11796
11795
11794
11793
11792
XSB
Elevation (ft)
11793
11792
11791
11790
11789
11788
11787
XSC
Distance from LPIN (ft)


Conveyance Channel 099CC - 2004
12195
12193
12191
12189
12187
12185
12183
0
10
20
30
40
50
60
XSA
12183
12181
12179
12177
12175
12173
12171
0
10
20
30
40
50
60
XSB
Elevation (ft)
12172
12170
12168
12166
12164
12162
12160
0
10
20
30
40
50
60
XSC
Distance from LPIN (ft)

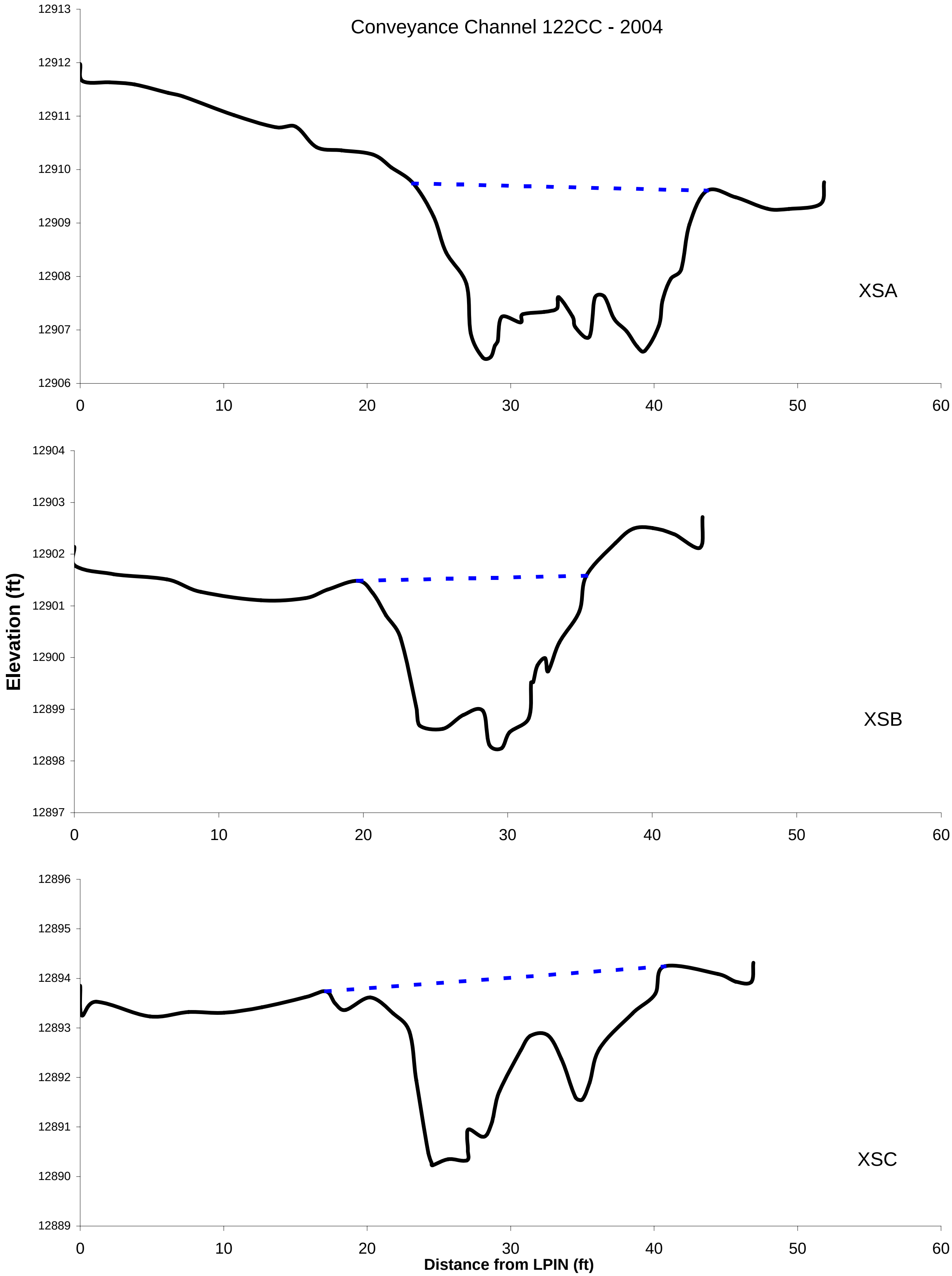

Conveyance Channel 104CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
13087
13086
13085
13084
13083
13082
13081
13080
13079
13078
13077
13076
13075
13074
13073
13072
13071
13070
0
10
20
30
40
50
60



Conveyance Channel 120CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
12943
12942
12941
12940
12939
12938
12937
12936
12935
12934
12933
12932
12931
12930
0
10
20
30
40
50
60
70
80



Conveyance Channel 121CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
13085
13080
13075
13070
13065
13076
13071
13066
13061
13056
13060
13055
13050
13045
13040
0
20
40
60
80
100
120


Conveyance Channel 122CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
12913
12912
12911
12910
12909
12908
12907
12906
12904
12903
12902
12901
12900
12899
12898
12897
12896
12895
12894
12893
12892
12891
12890
12889
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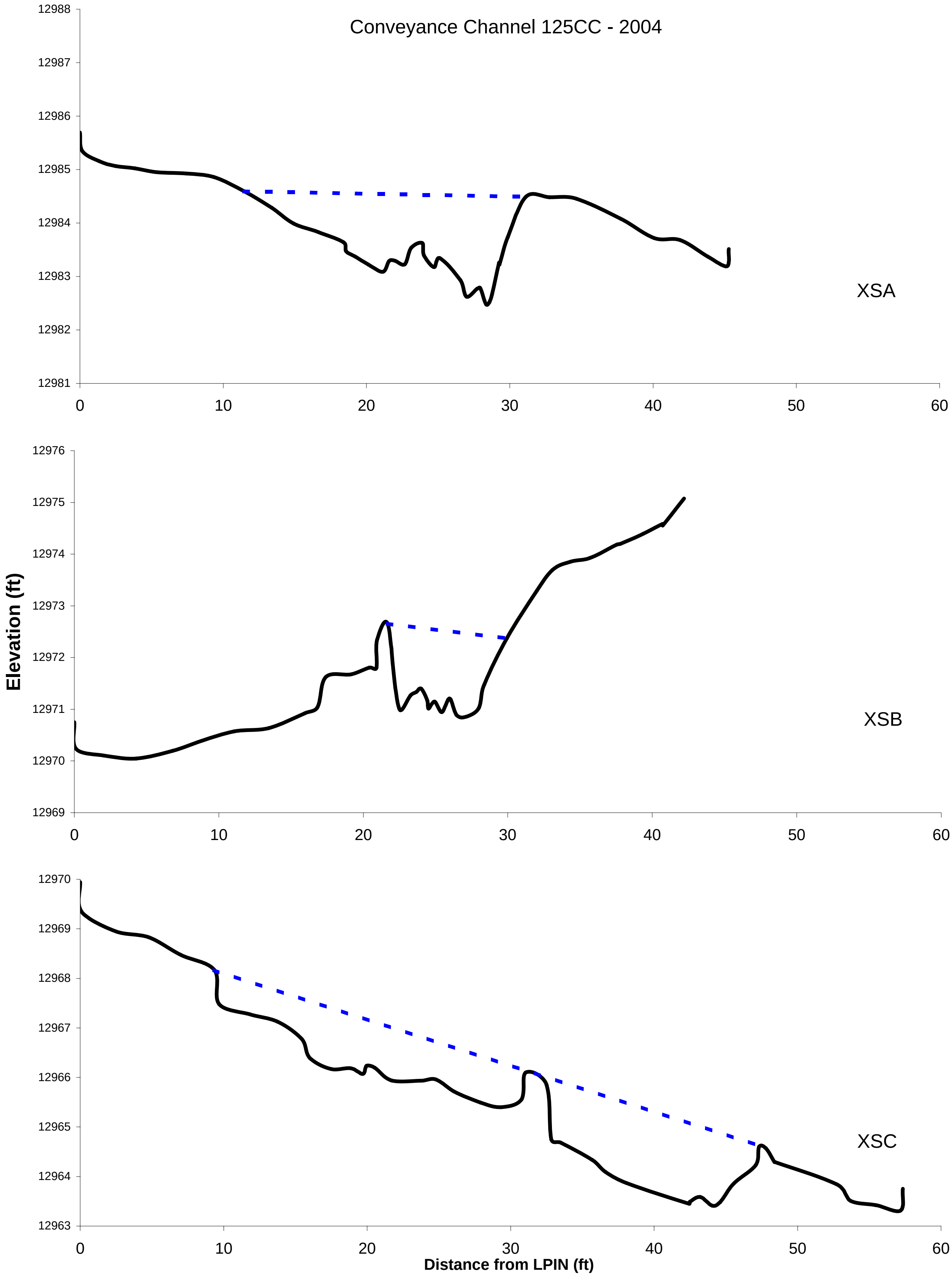
20
30
40
50
60



Conveyance Channel 125CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
12988
12987
12986
12985
12984
12983
12982
12981
12976
12975
12974
12973
12972
12971
12970
12969
12970
12969
12968
12967
12966
12965
12964
12963
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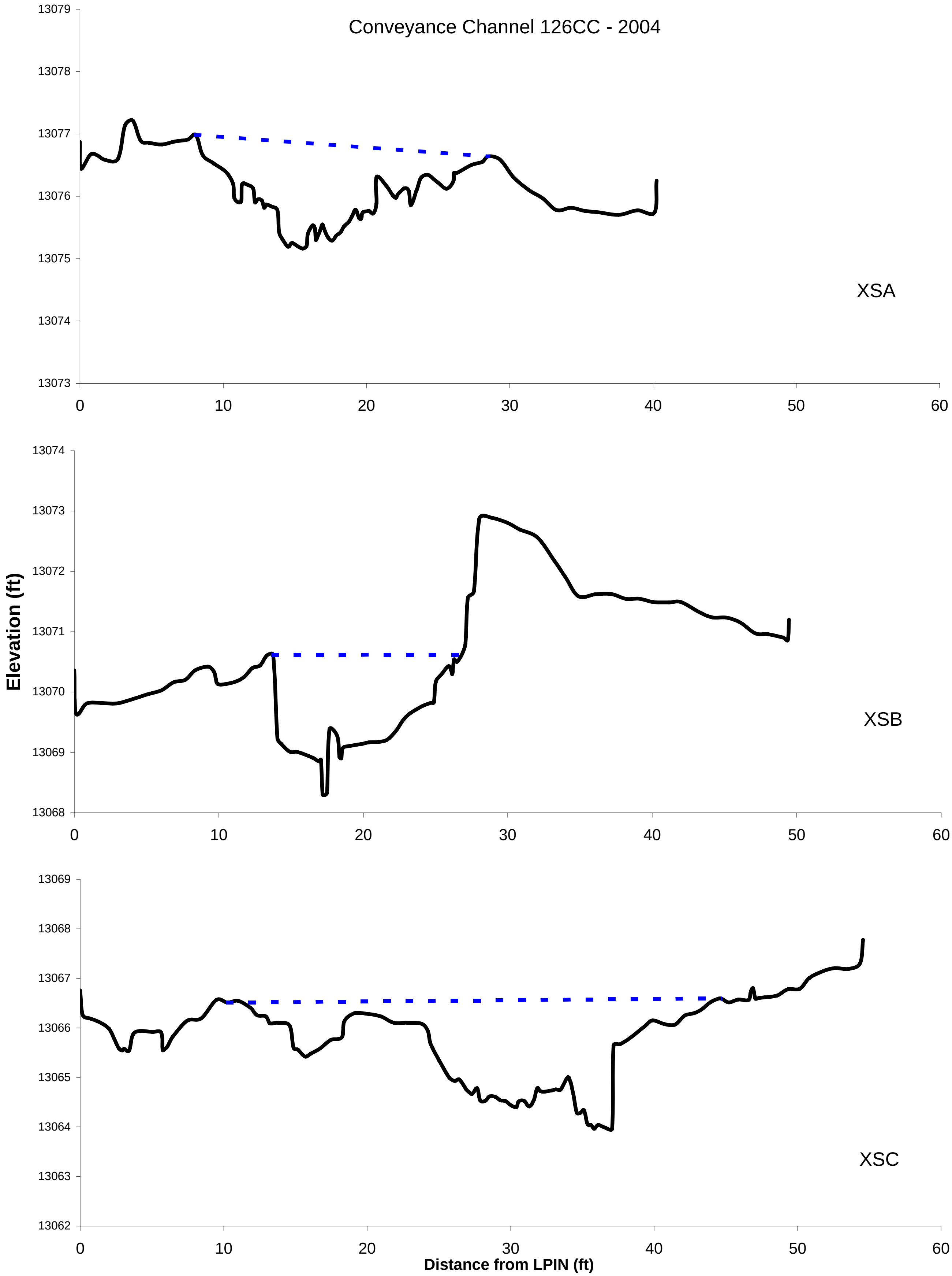
20
30
40
50
60


Conveyance Channel 126CC - 2004
Elevation (ft)
Distance from LPIN (ft)
XSA
XSB
XSC
13079
13078
13077
13076
13075
13074
13073
13074
13073
13072
13071
13070
13069
13068
13069
13068
13067
13066
13065
13064
13063
13062
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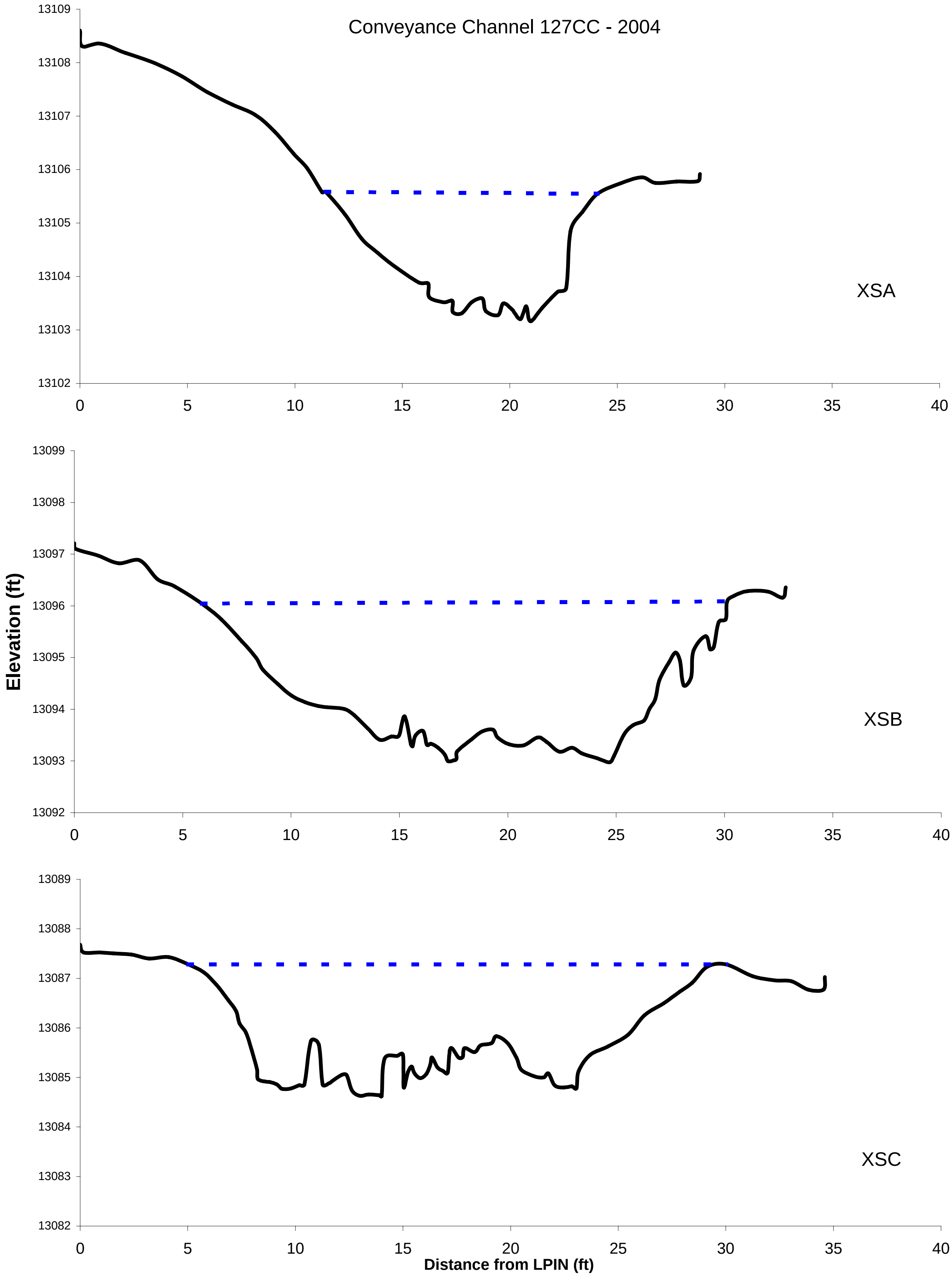
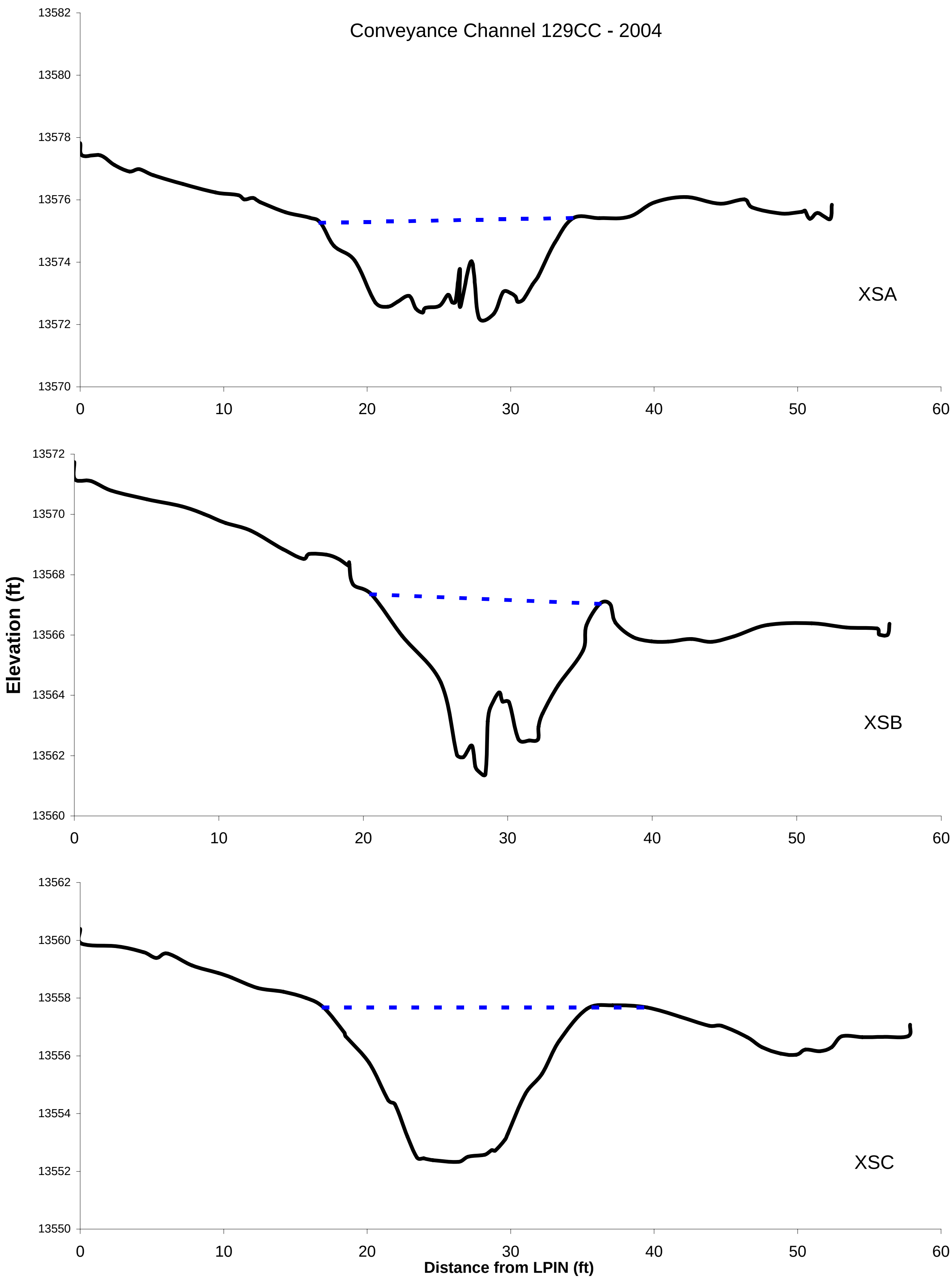
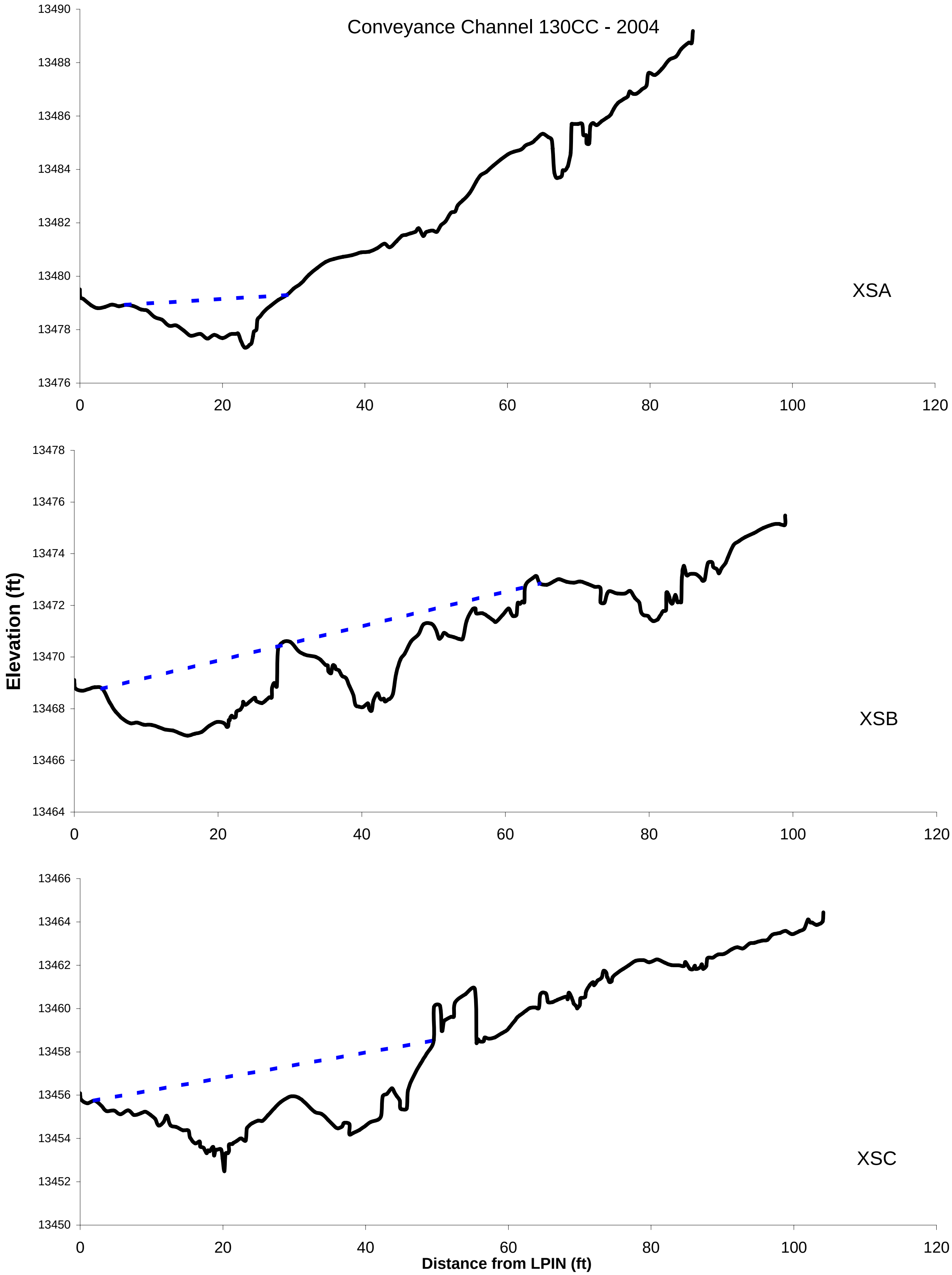
20
30
40
50
60

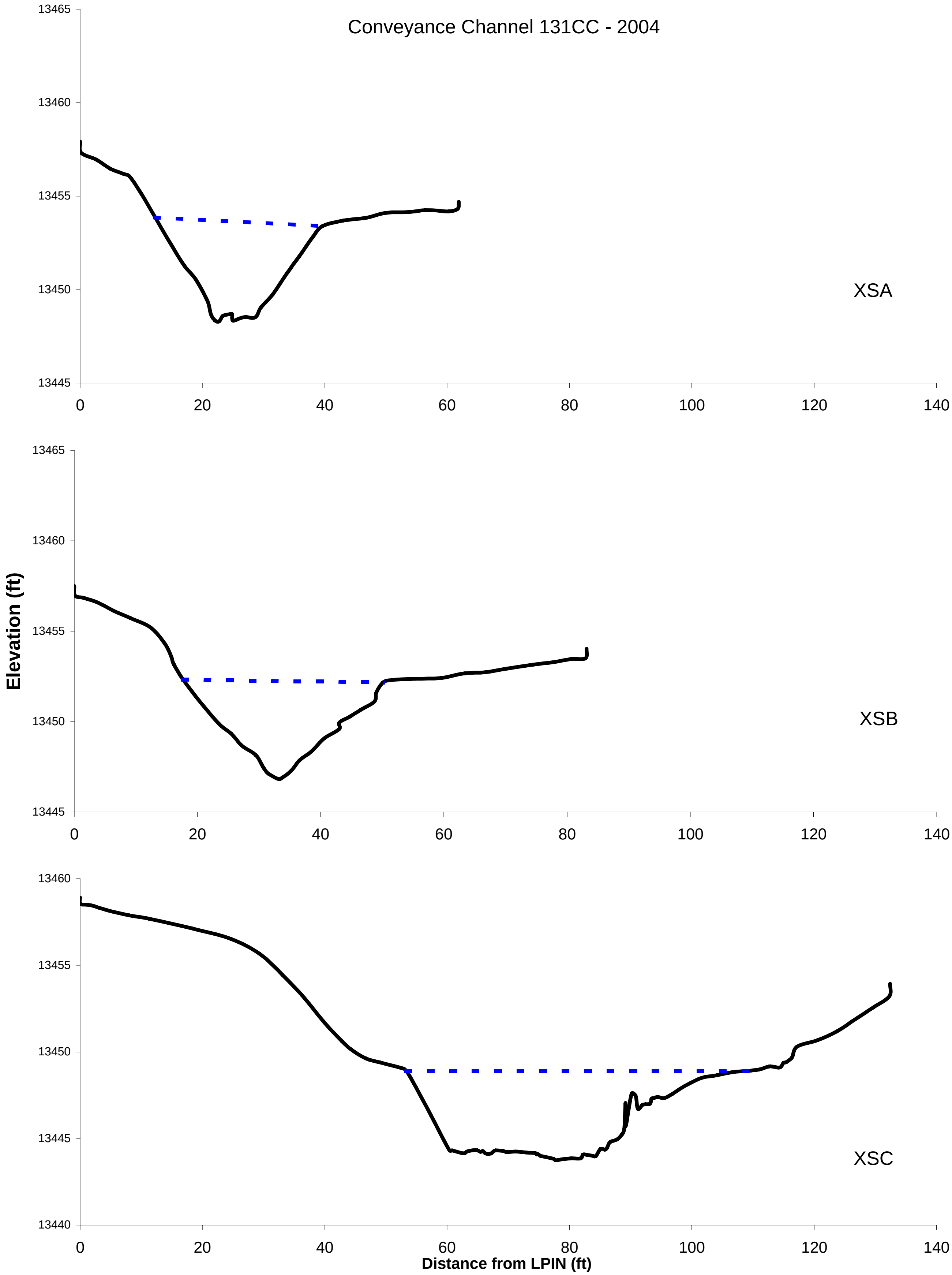

Conveyance Channel 127CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
13109
13108
13107
13106
13105
13104
13103
13102
13099
13098
13097
13096
13095
13094
13093
13092
13089
13088
13087
13086
13085
13084
13083
13082
0
5
10
15
20
25
30
35
40

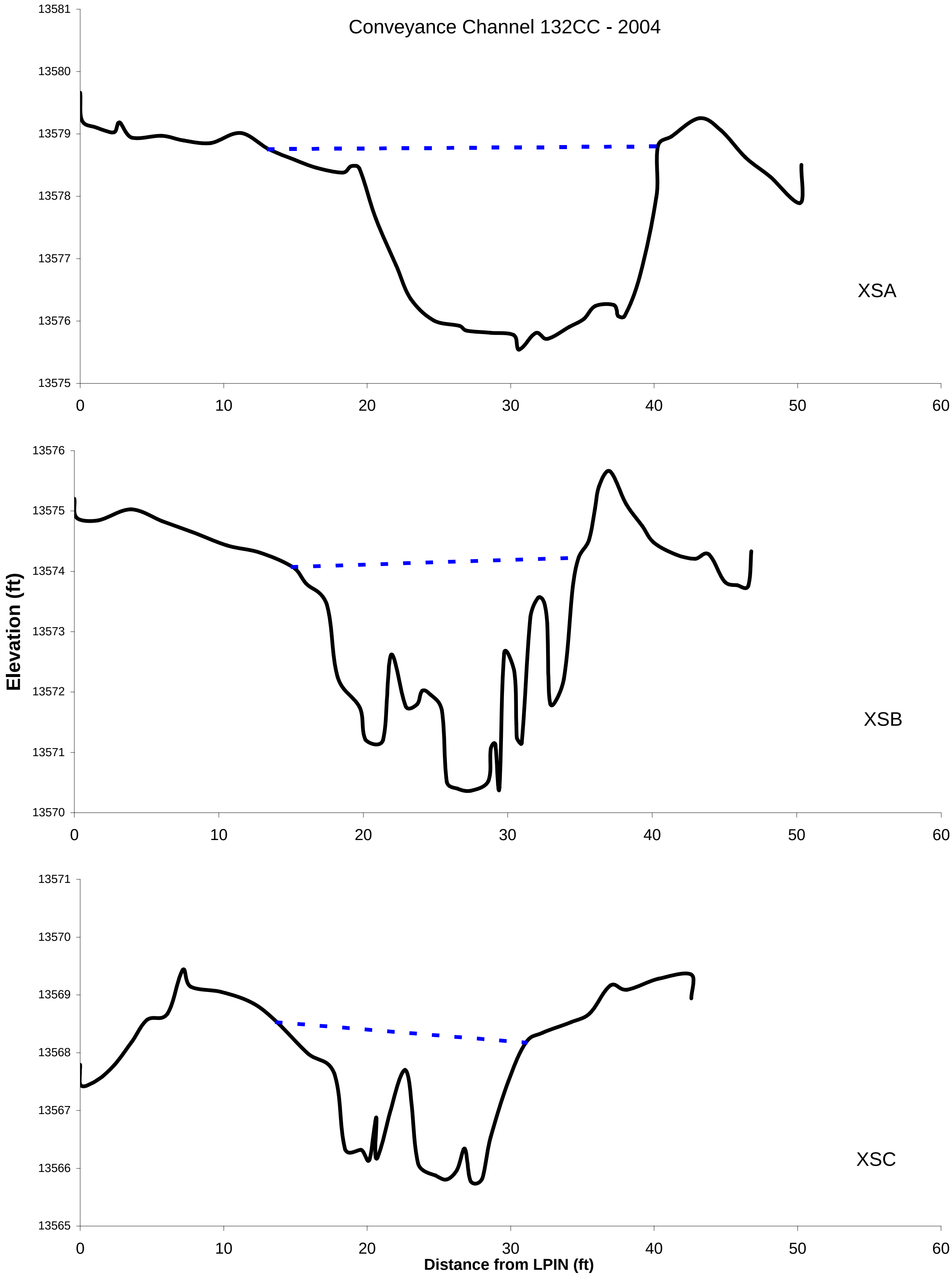


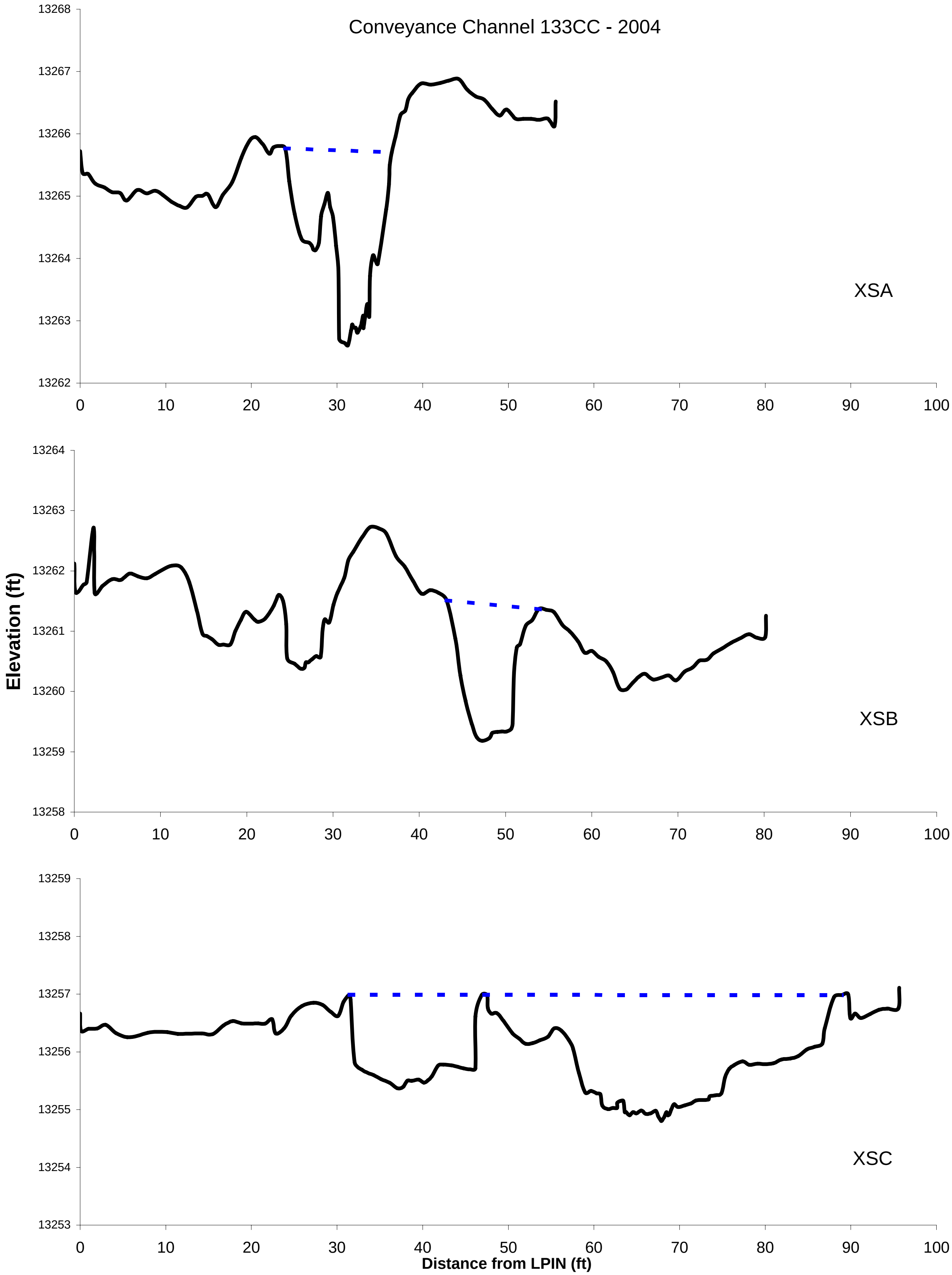
Conveyance Channel 129CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
13582
13580
13578
13576
13574
13572
13570
13568
13566
13564
13562
13560
13558
13556
13554
13552
13550
0
10
20
30
40
50
60

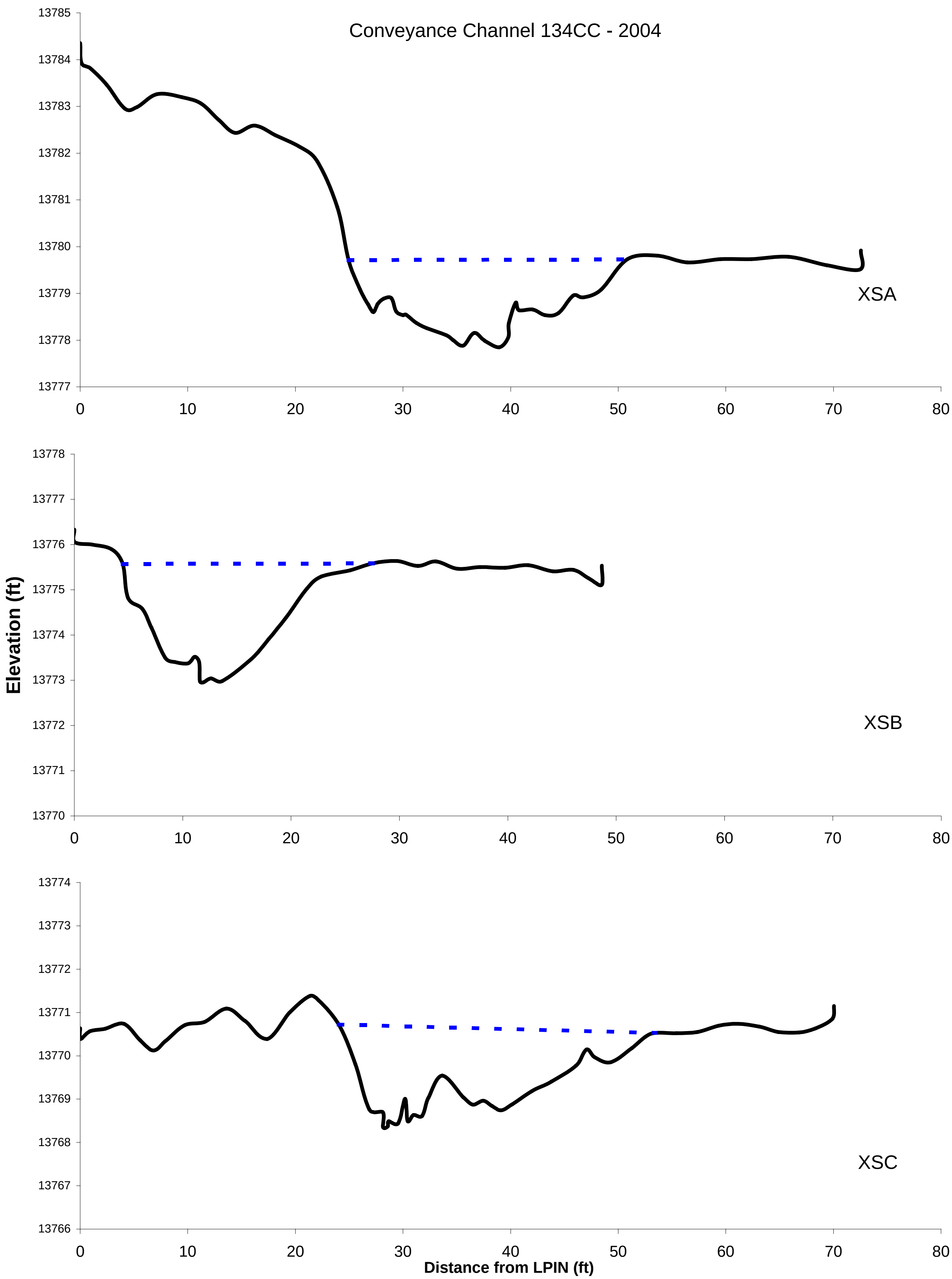


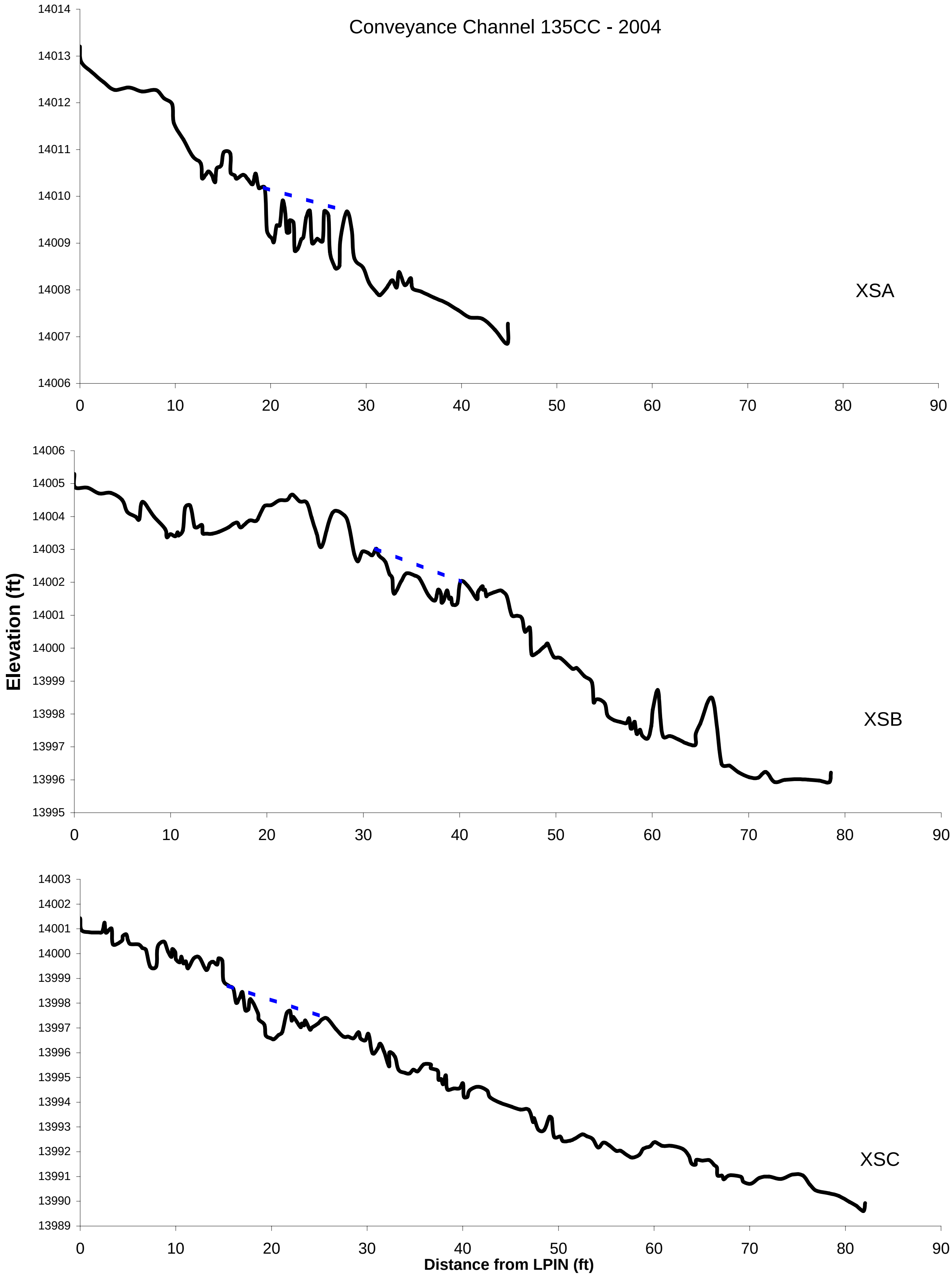
Conveyance Channel 130CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
13490
13488
13486
13484
13482
13480
13478
13476
13474
13472
13470
13468
13466
13464
13462
13460
13458
13456
13454
13452
13450
0
20
40
60
80
100
120


Conveyance Channel 131CC - 2004
Elevation (ft)
Distance from LPIN (ft)
XSA
XSB
XSC
13465
13460
13455
13450
13445
13440
0
20
40
60
80
100
120
140

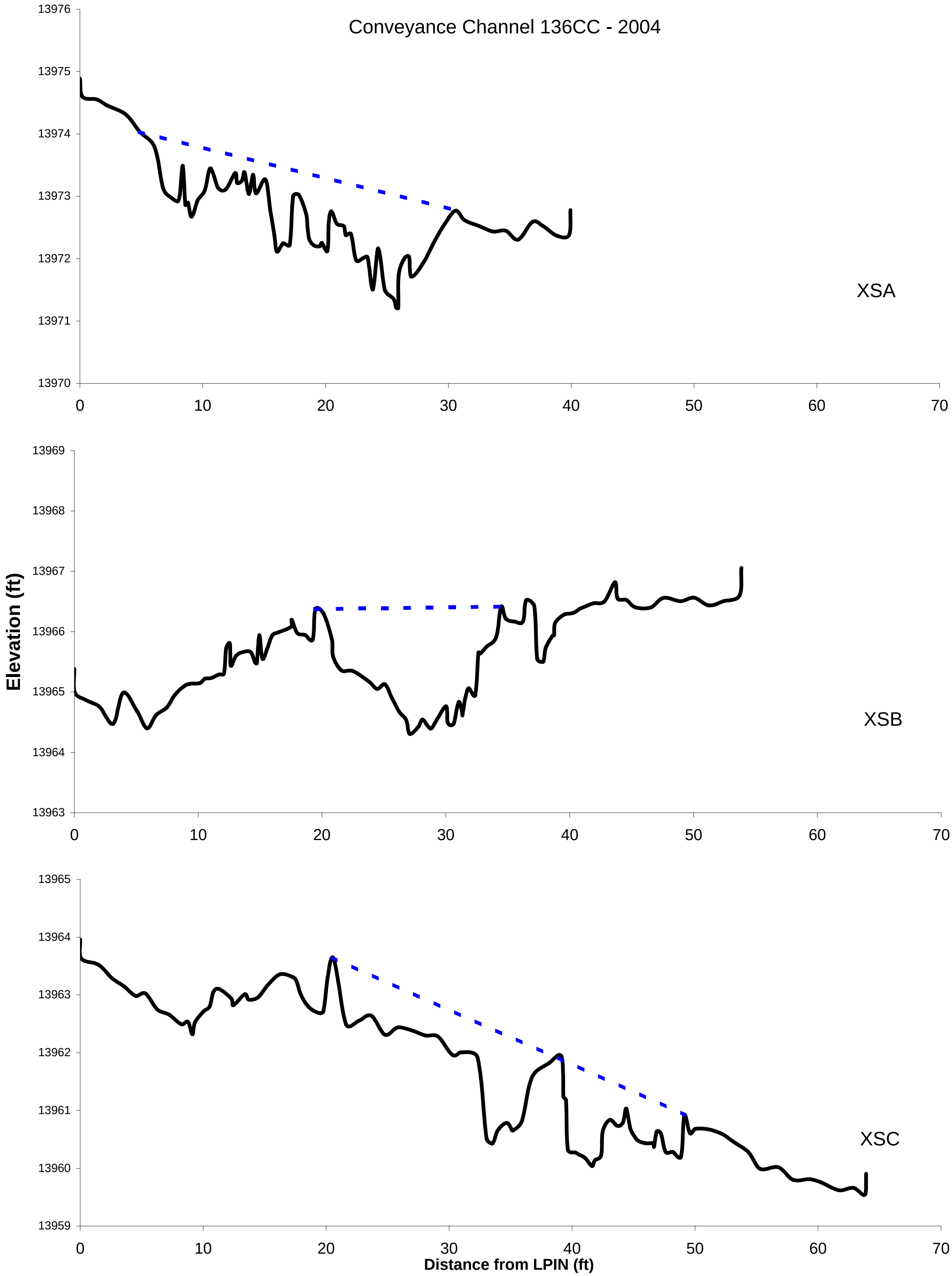

Conveyance Channel 132CC - 2004
Elevation (ft)
Distance from LPIN (ft)
XSA
XSB
XSC
13581
13580
13579
13578
13577
13576
13575
13574
13573
13572
13571
13570
13569
13568
13567
13566
13565
0
10
20
30
40
50
60

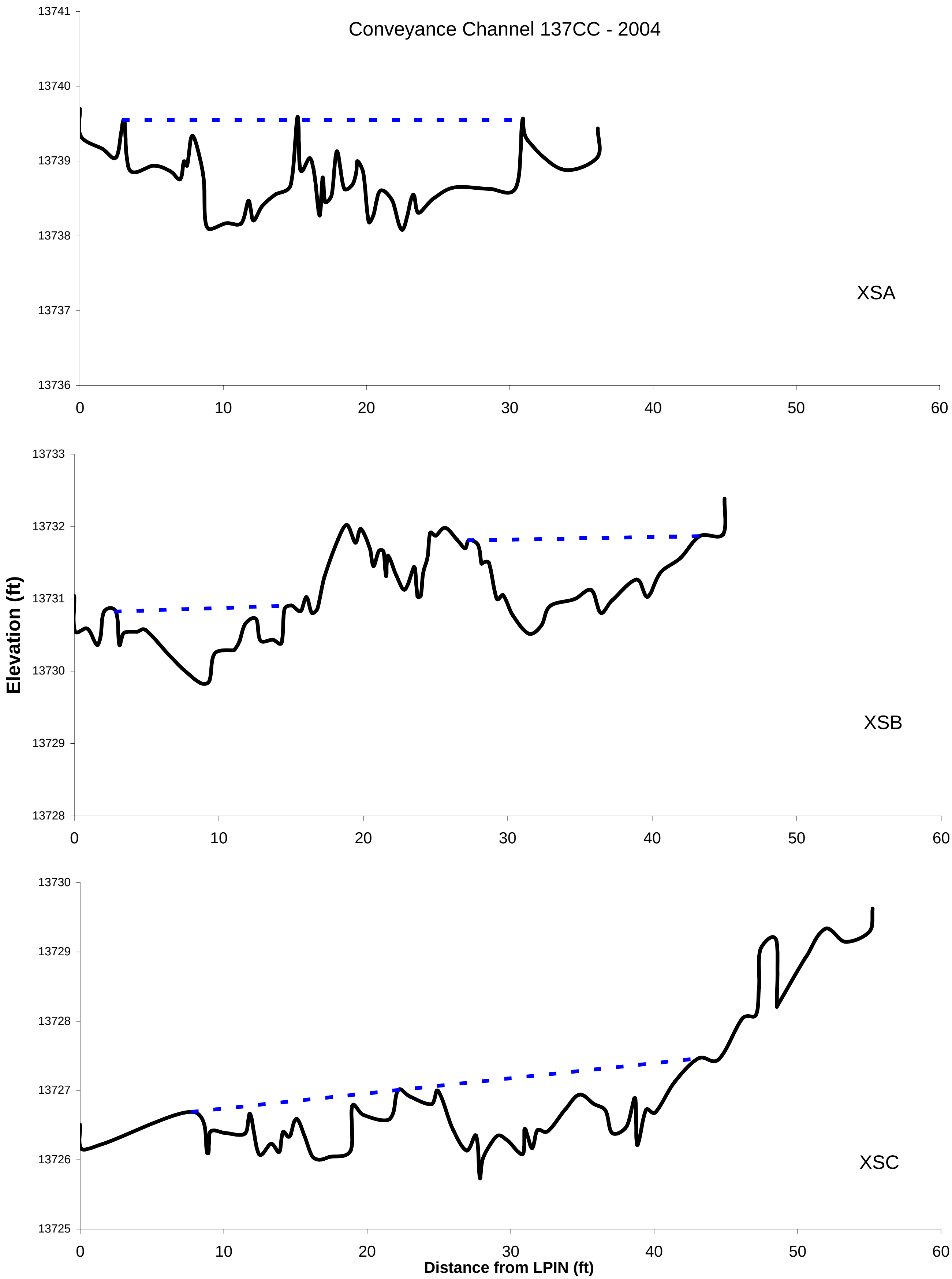

Conveyance Channel 133CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
13268
13267
13266
13265
13264
13263
13262
13259
13258
13257
13256
13255
13254
13253
0
10
20
30
40
50
60
70
80
90
100


Conveyance Channel 134CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
13785
13784
13783
13782
13781
13780
13779
13778
13777
13776
13775
13774
13773
13772
13771
13770
13769
13768
13767
13766
0
10
20
30
40
50
60
70
80

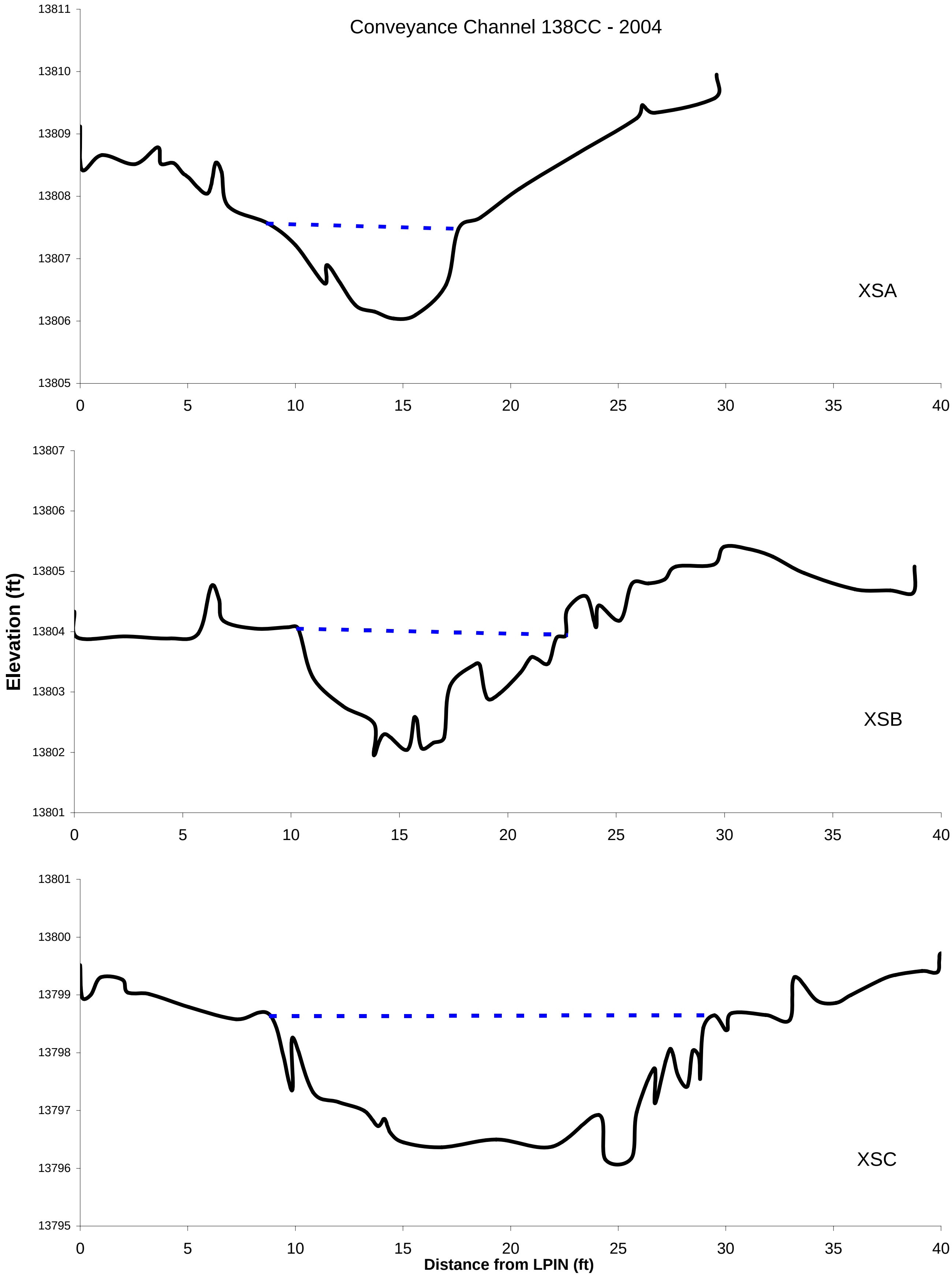


Conveyance Channel 135CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
14014
14013
14012
14011
14010
14009
14008
14007
14006
14005
14004
14003
14002
14001
14000
13999
13998
13997
13996
13995
13994
13993
13992
13991
13990
13989
0
10
20
30
40
50
60
70
80
90

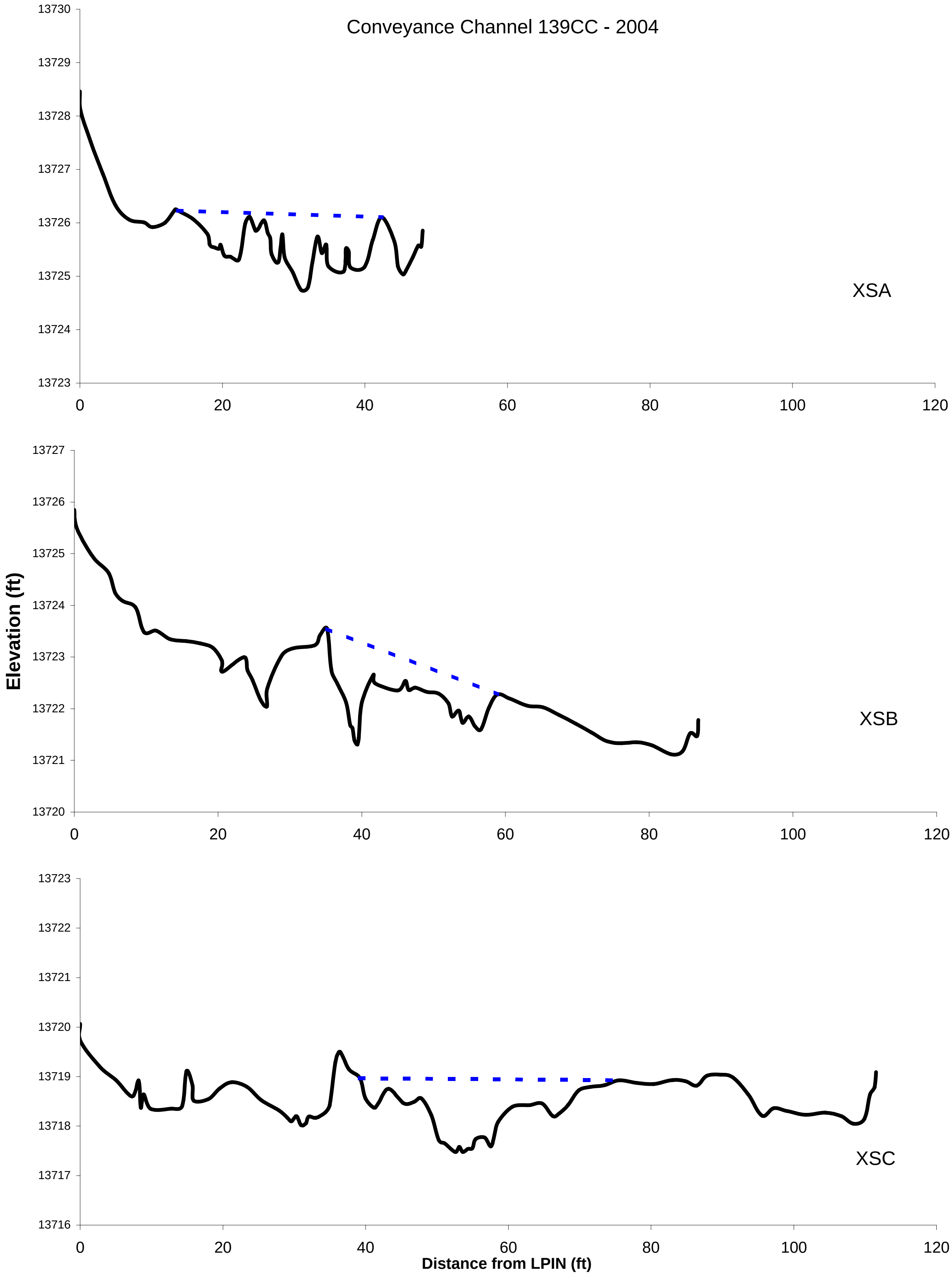

Conveyance Channel 136CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)



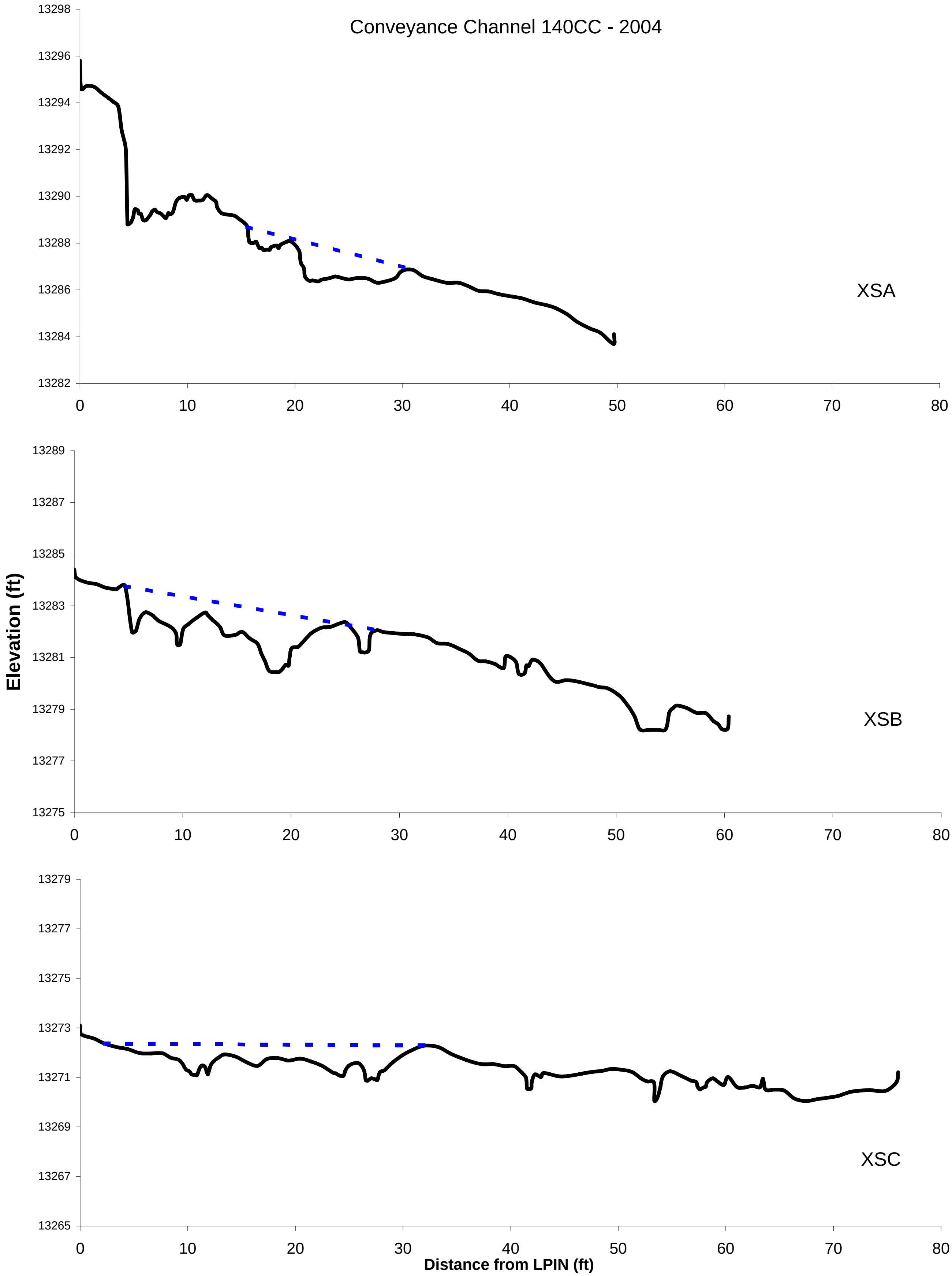
Conveyance Channel 137CC - 2004
13741
13740
13739
13738
13737
13736
0
10
20
30
40
50
60
XSA
13733
13732
13731
13730
13729
13728
XSB
Elevation (ft)
13730
13729
13728
13727
13726
13725
XSC
Distance from LPIN (ft)



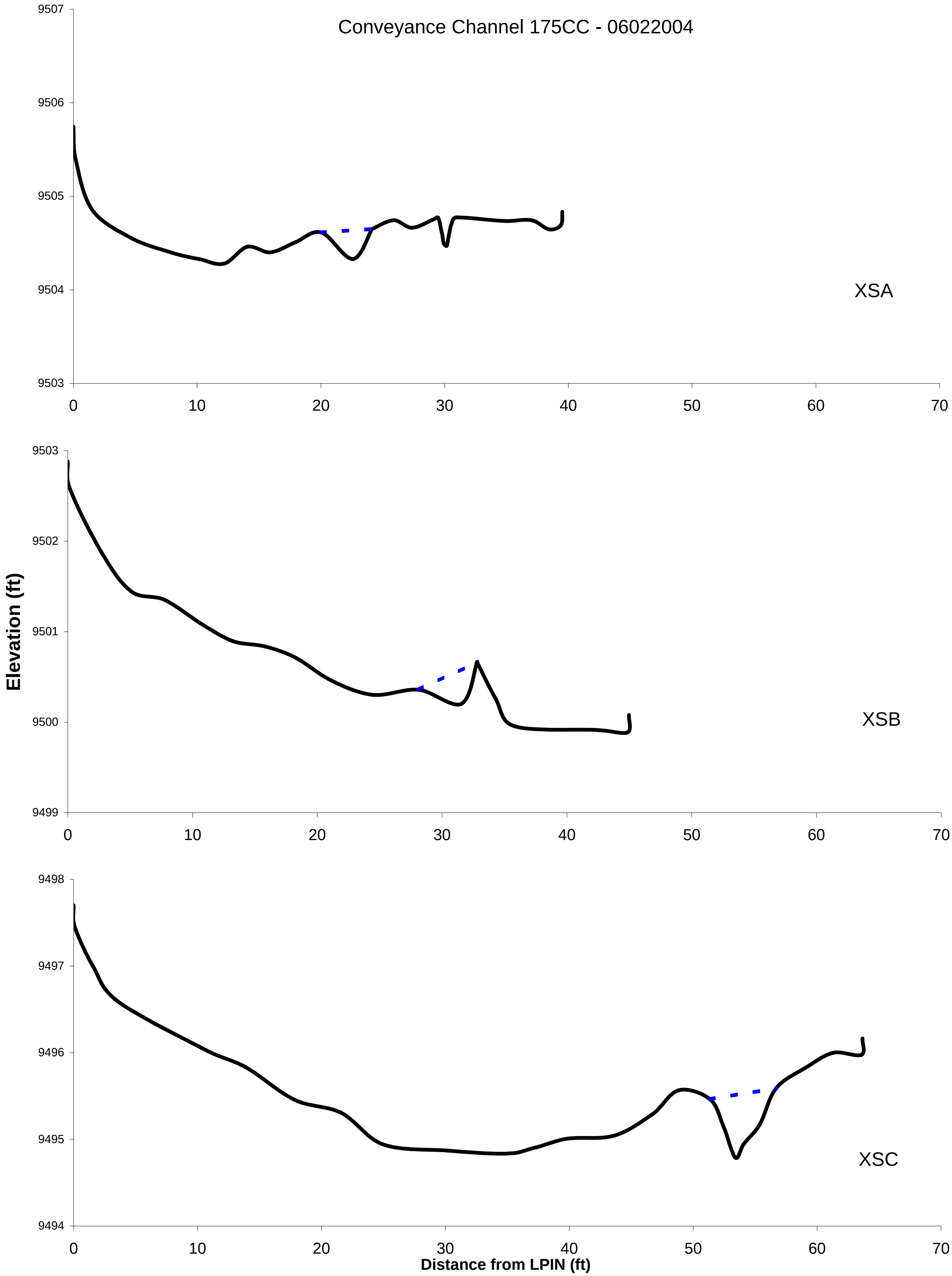
Conveyance Channel 138CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
13811
13810
13809
13808
13807
13806
13805
13804
13803
13802
13801
13800
13799
13798
13797
13796
13795
0
5
10
15
20
25
30
35
40

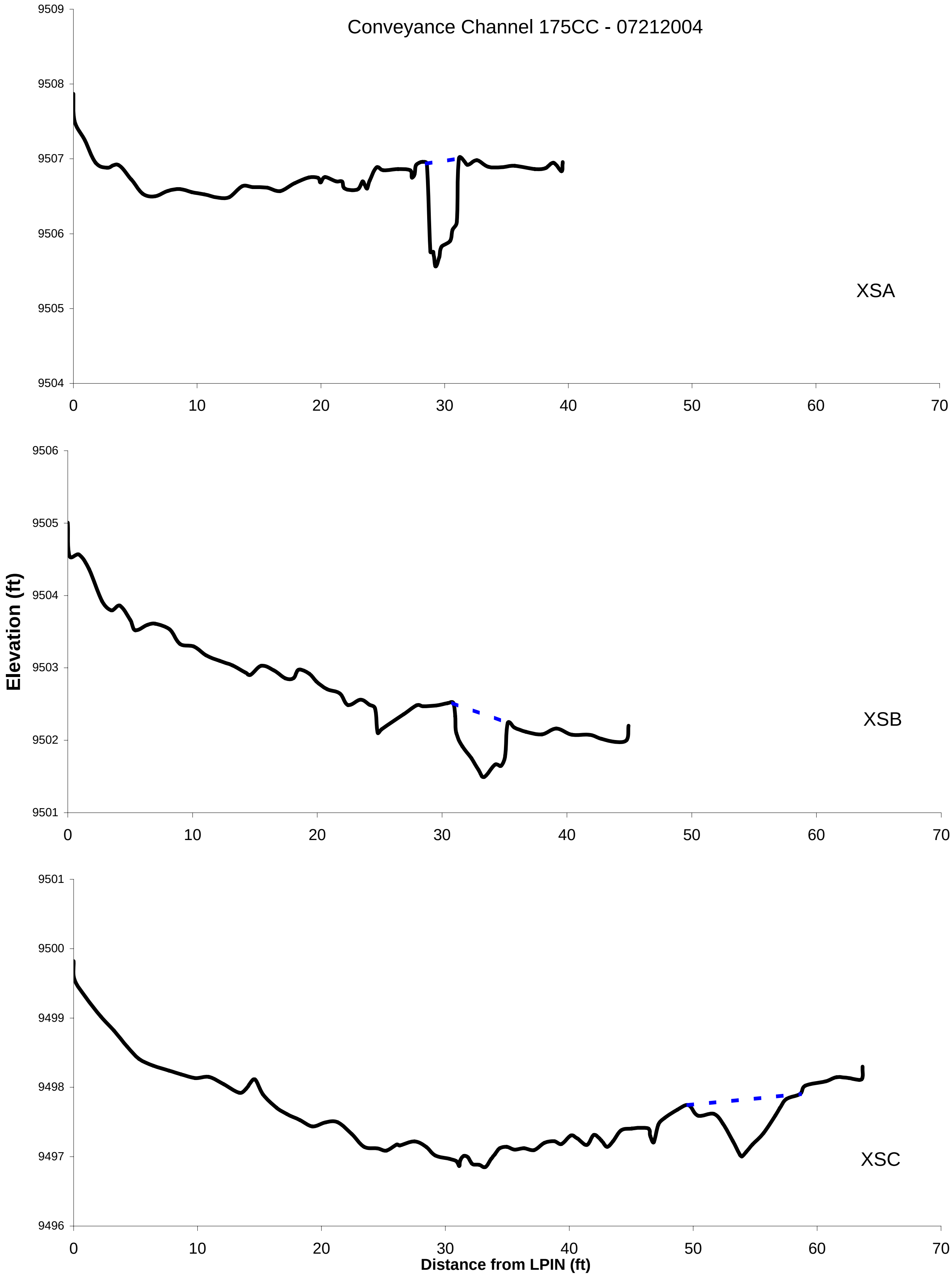


Conveyance Channel 139CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
13730
13729
13728
13727
13726
13725
13724
13723
13722
13721
13720
13719
13718
13717
13716
0
20
40
60
80
100
120

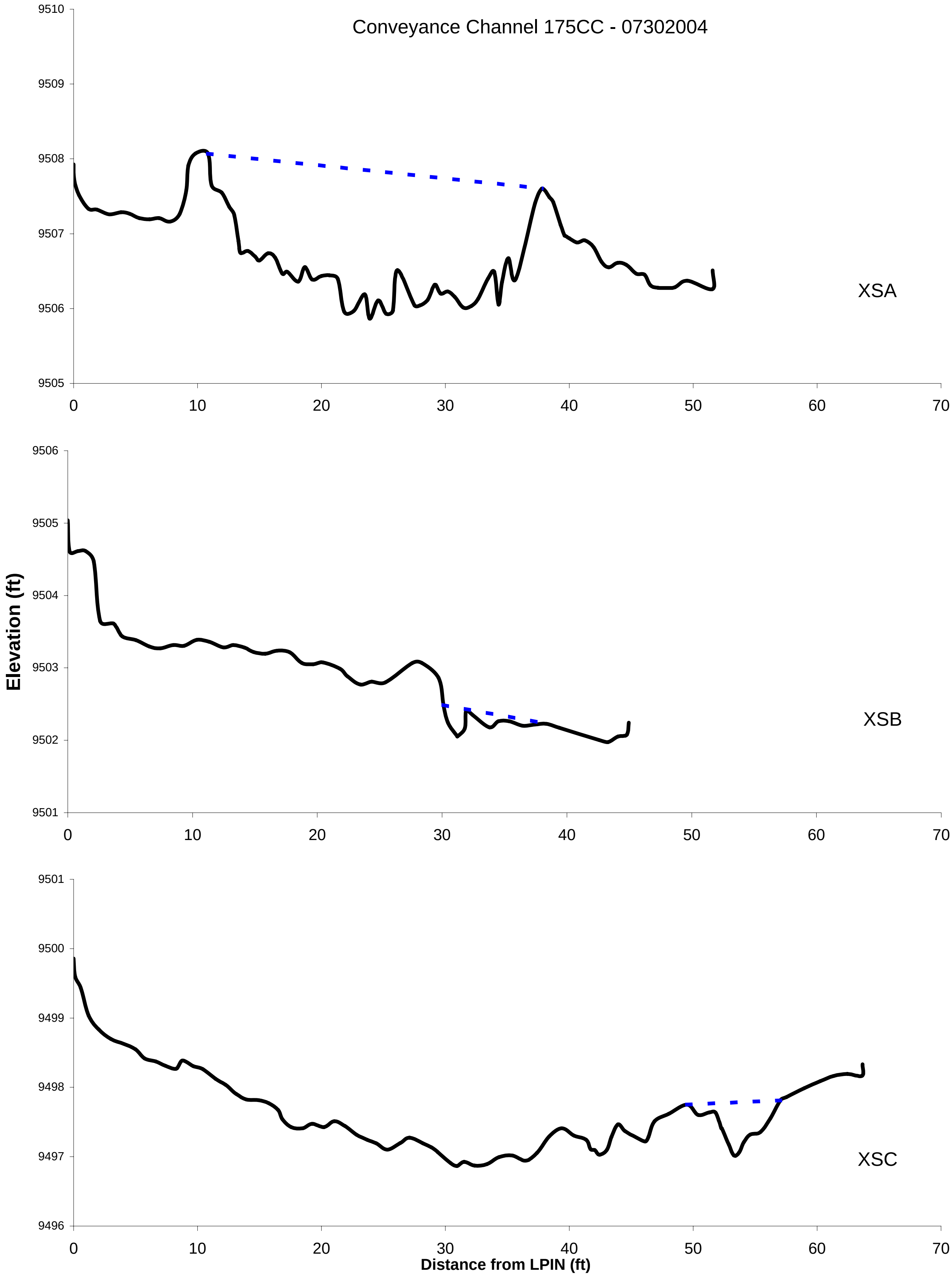


Conveyance Channel 140CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
13298
13296
13294
13292
13290
13288
13286
13284
13282
13289
13287
13285
13283
13281
13279
13277
13275
13279
13277
13275
13273
13271
13269
13267
13265
0
10
20
30
40
50
60
70
80

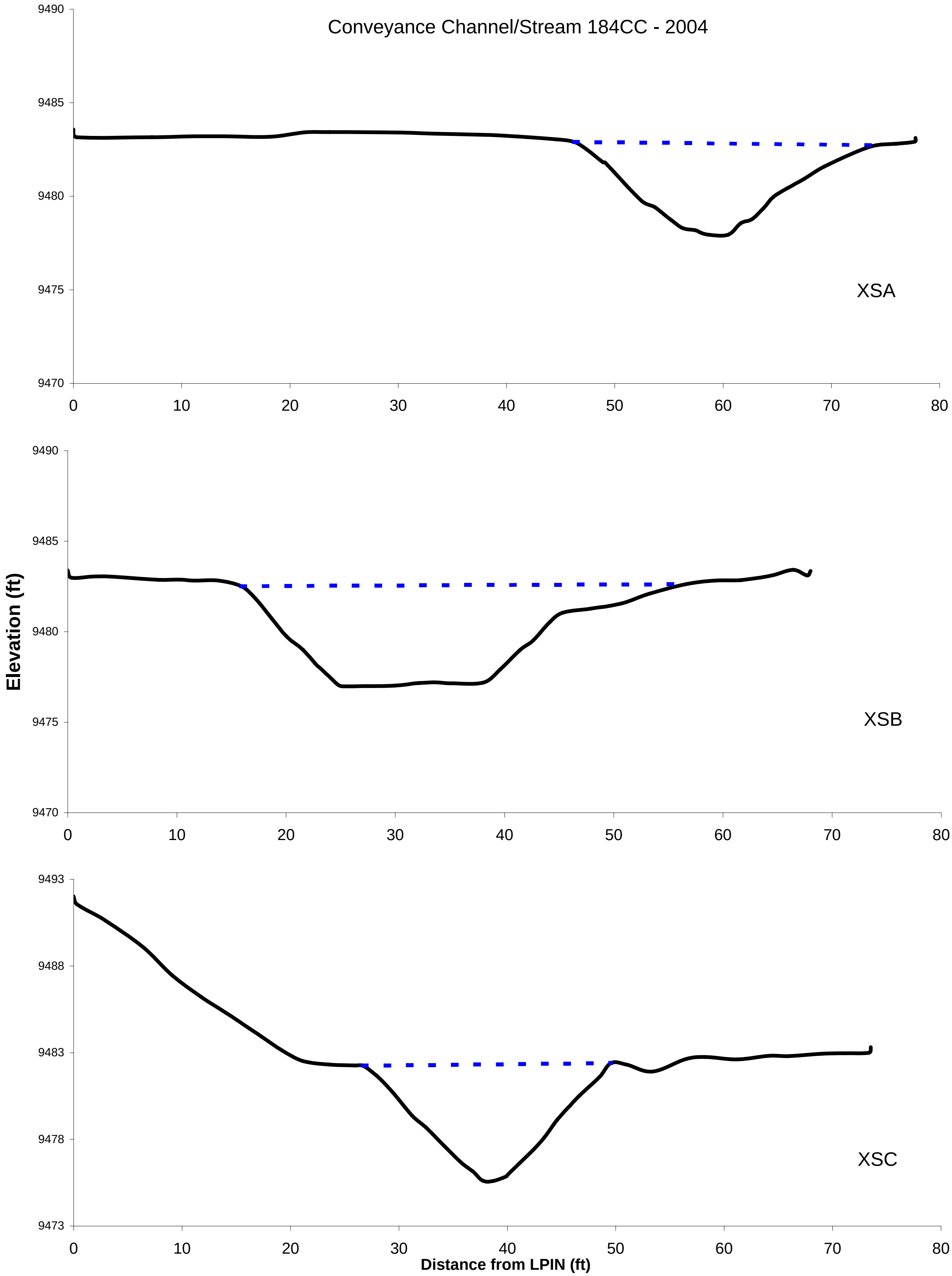

Conveyance Channel 175CC - 06022004
Elevation (ft)
Distance from LPIN (ft)
XSA
XSB
XSC
9507
9506
9505
9504
9503
9502
9501
9500
9499
9498
9497
9496
9495
9494
0
10
20
30
40
50
60
70



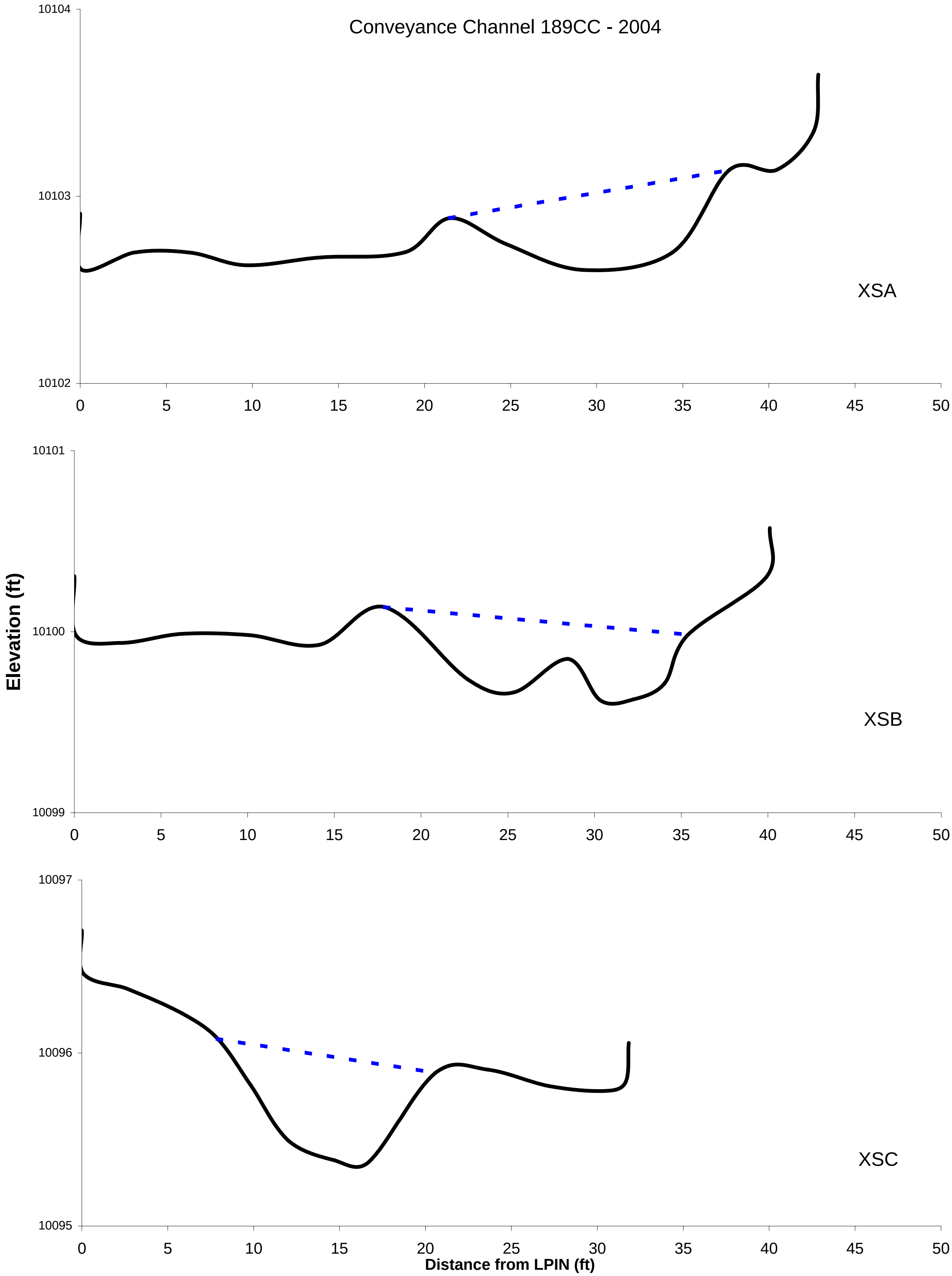
Conveyance Channel 175CC - 07212004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
9509
9508
9507
9506
9505
9504
9506
9505
9504
9503
9502
9501
9501
9500
9499
9498
9497
9496
0
10
20
30
40
50
60
70



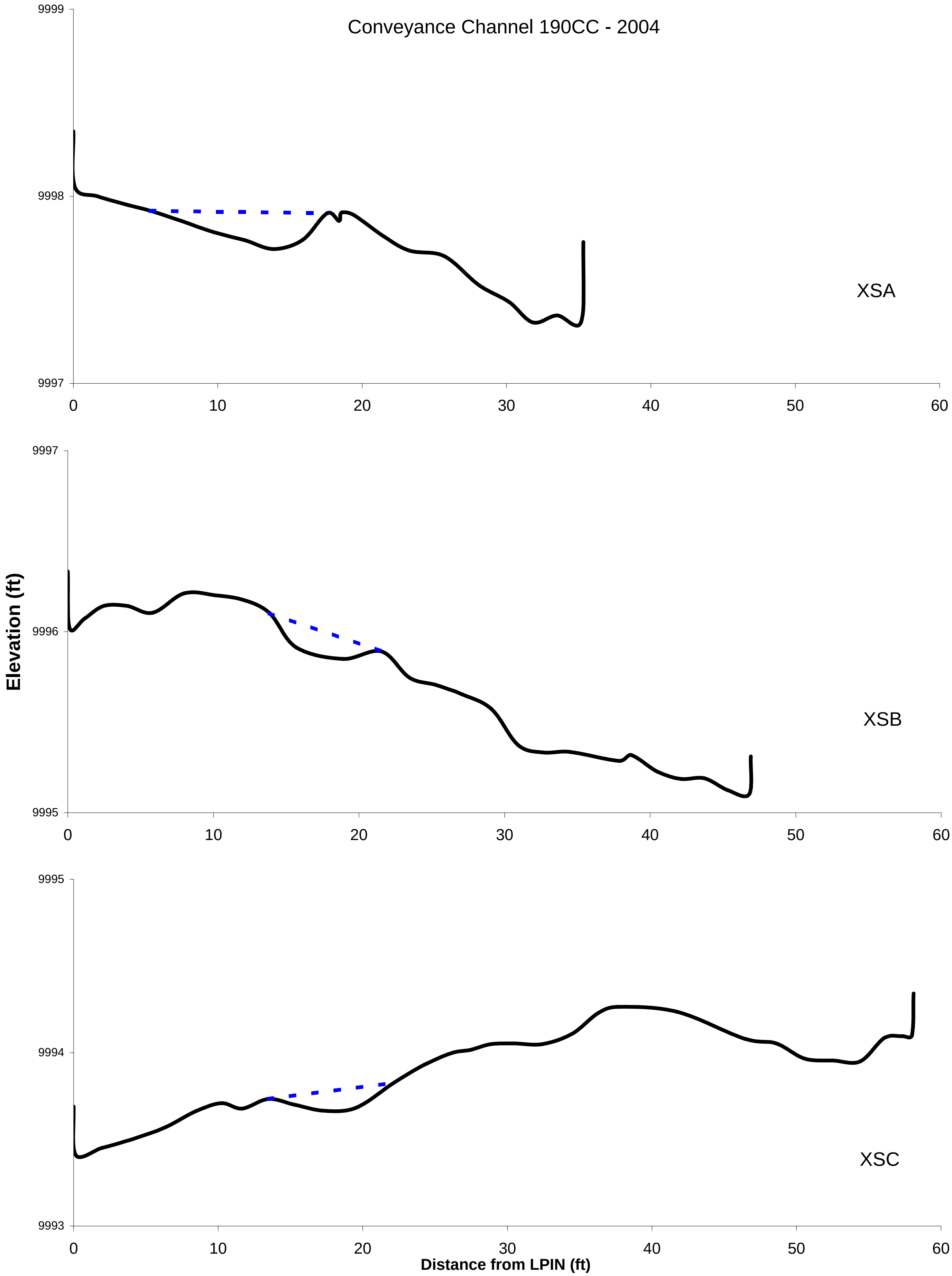
Conveyance Channel 175CC - 07302004
Elevation (ft)
9510
9509
9508
9507
9506
9505
XSA
9506
9505
9504
9503
9502
9501
XSB
9501
9500
9499
9498
9497
9496
XSC
0
10
20
30
40
50
60
70
Distance from LPIN (ft)



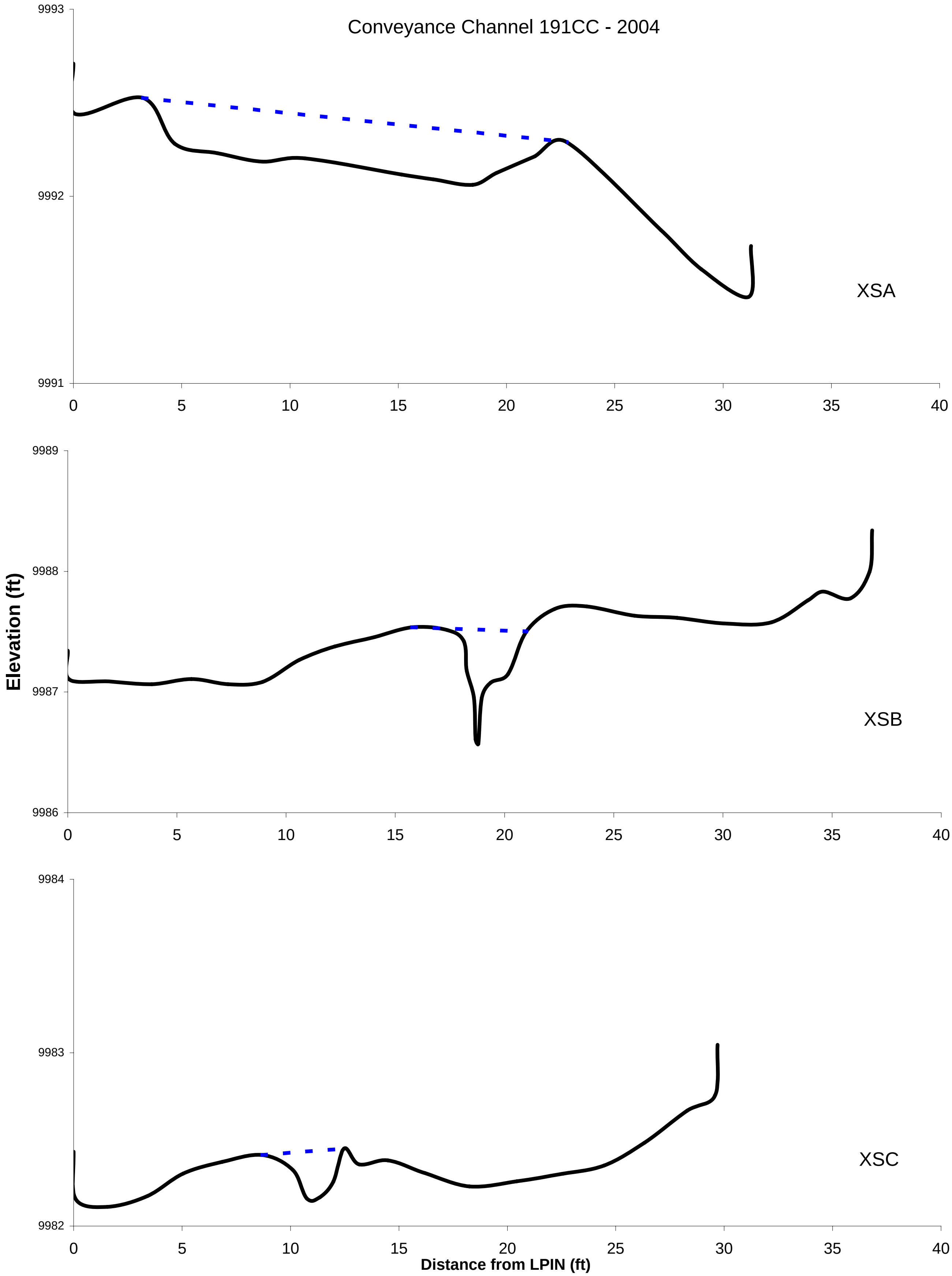
Conveyance Channel/Stream 184CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
9490
9485
9480
9475
9470
9493
9488
9483
9478
9473
0
10
20
30
40
50
60
70
80



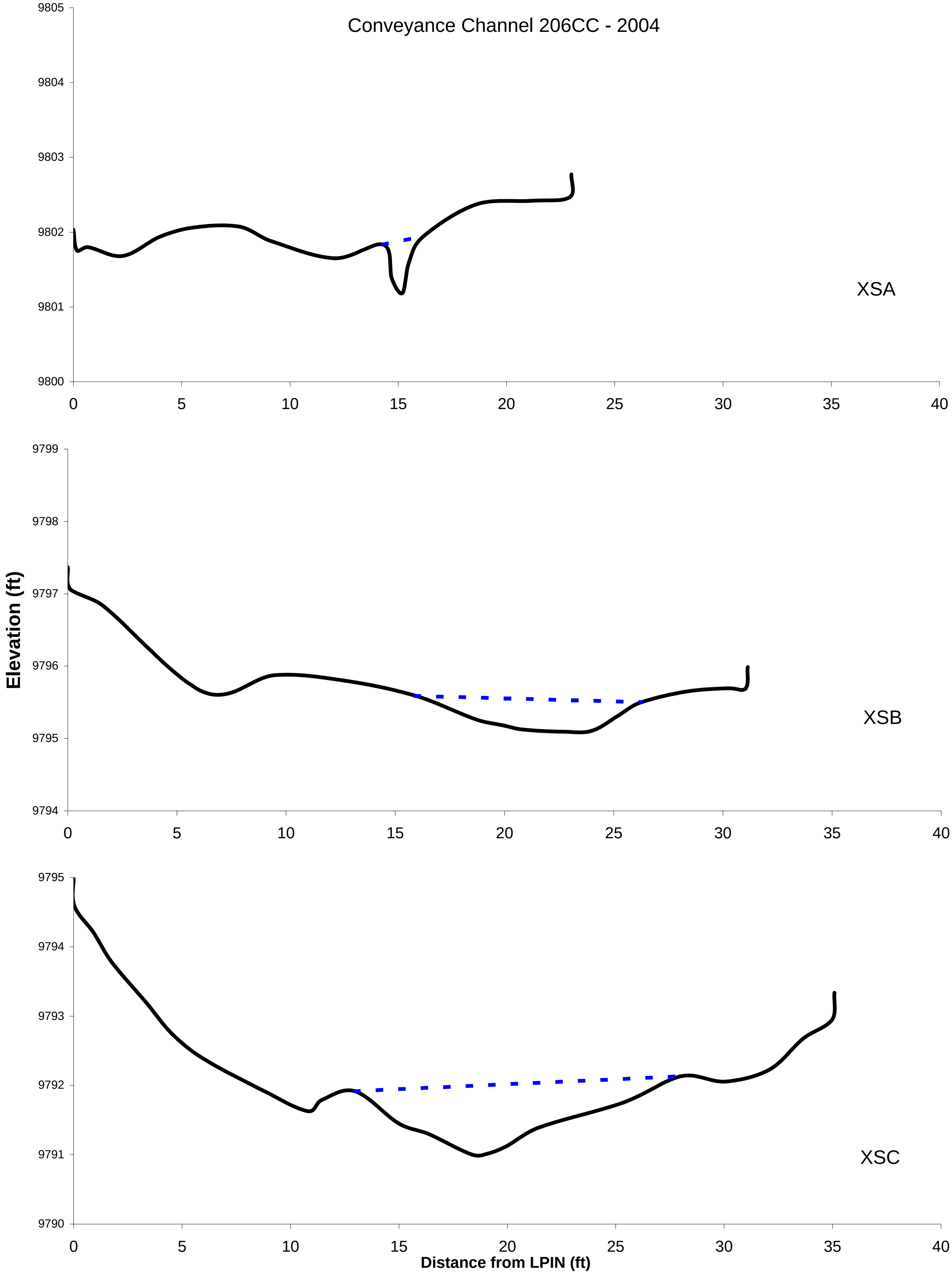
Conveyance Channel 189CC - 2004
Elevation (ft)
10104
10103
10102
XSA
10101
10100
10099
XSB
10097
10096
10095
XSC
0
5
10
15
20
25
30
35
40
45
50
Distance from LPIN (ft)



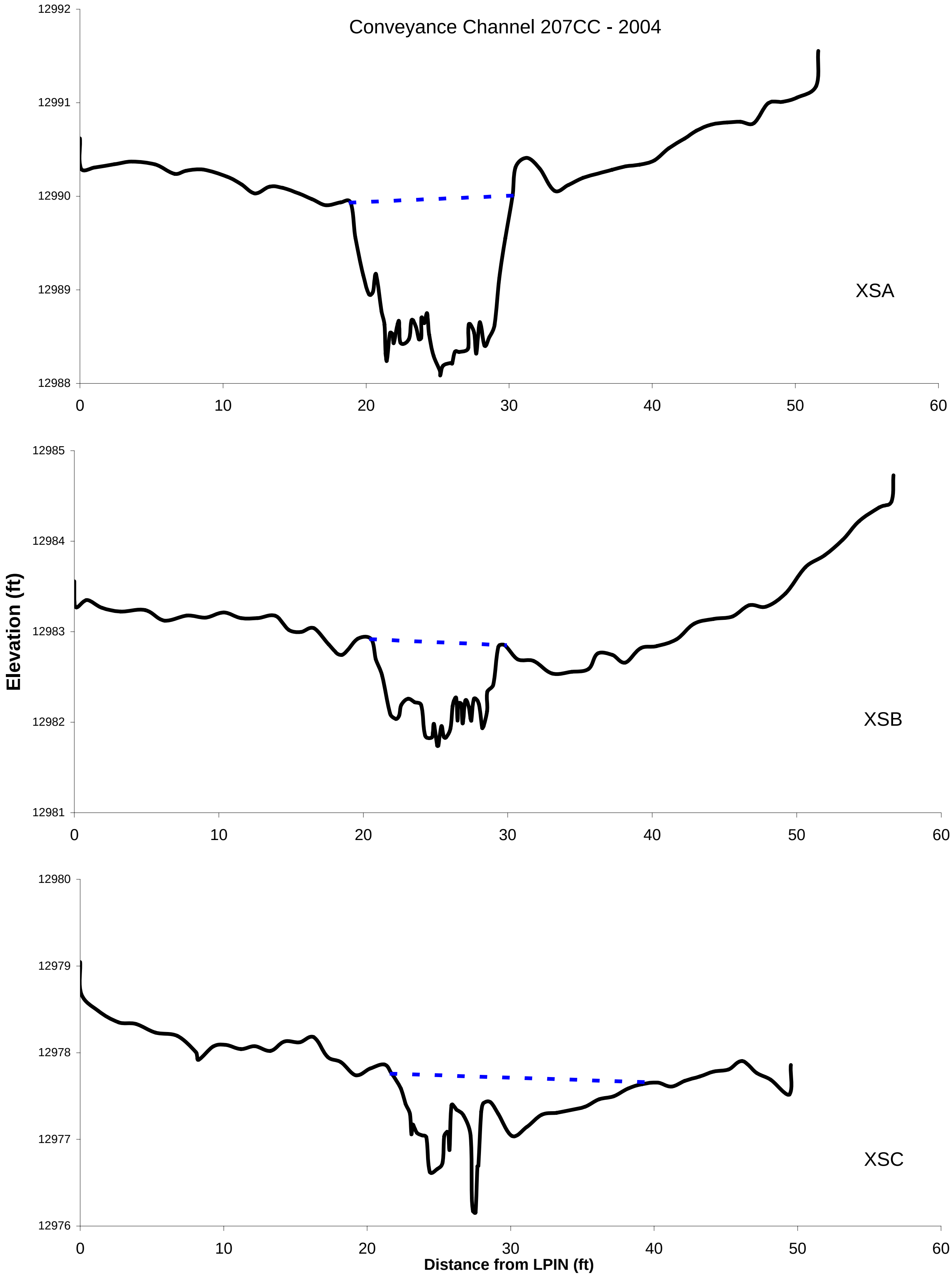
Conveyance Channel 190CC - 2004
Elevation (ft)
9999
9998
9997
XSA
0
10
20
30
40
50
60
9997
9996
9995
XSB
9995
9994
9993
XSC
Distance from LPIN (ft)



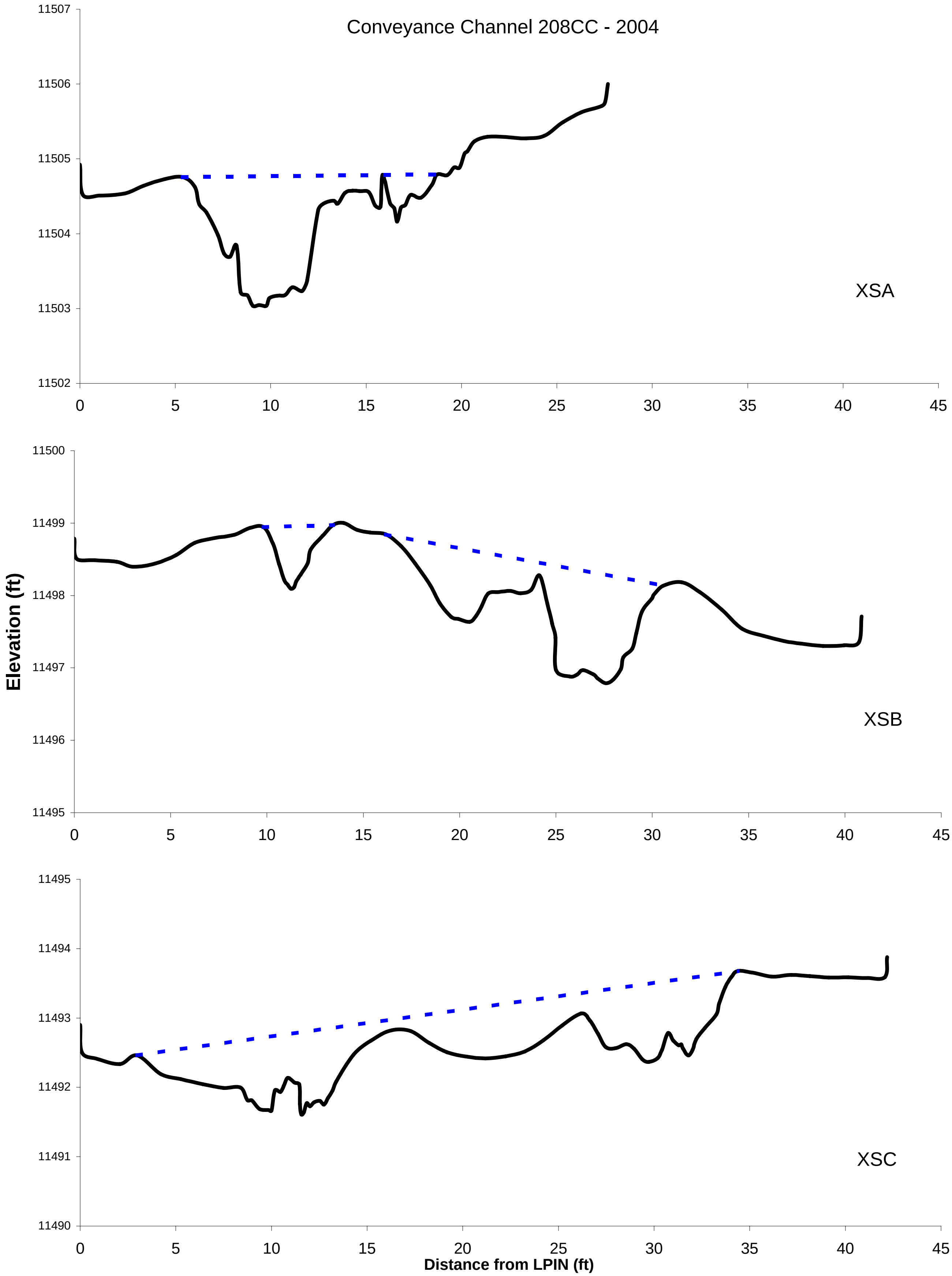
Conveyance Channel 191CC - 2004
Elevation (ft)
9993
9992
9991
0
5
10
15
20
25
30
35
40
XSA
9989
9988
9987
9986
XSB
9984
9983
9982
XSC
Distance from LPIN (ft)

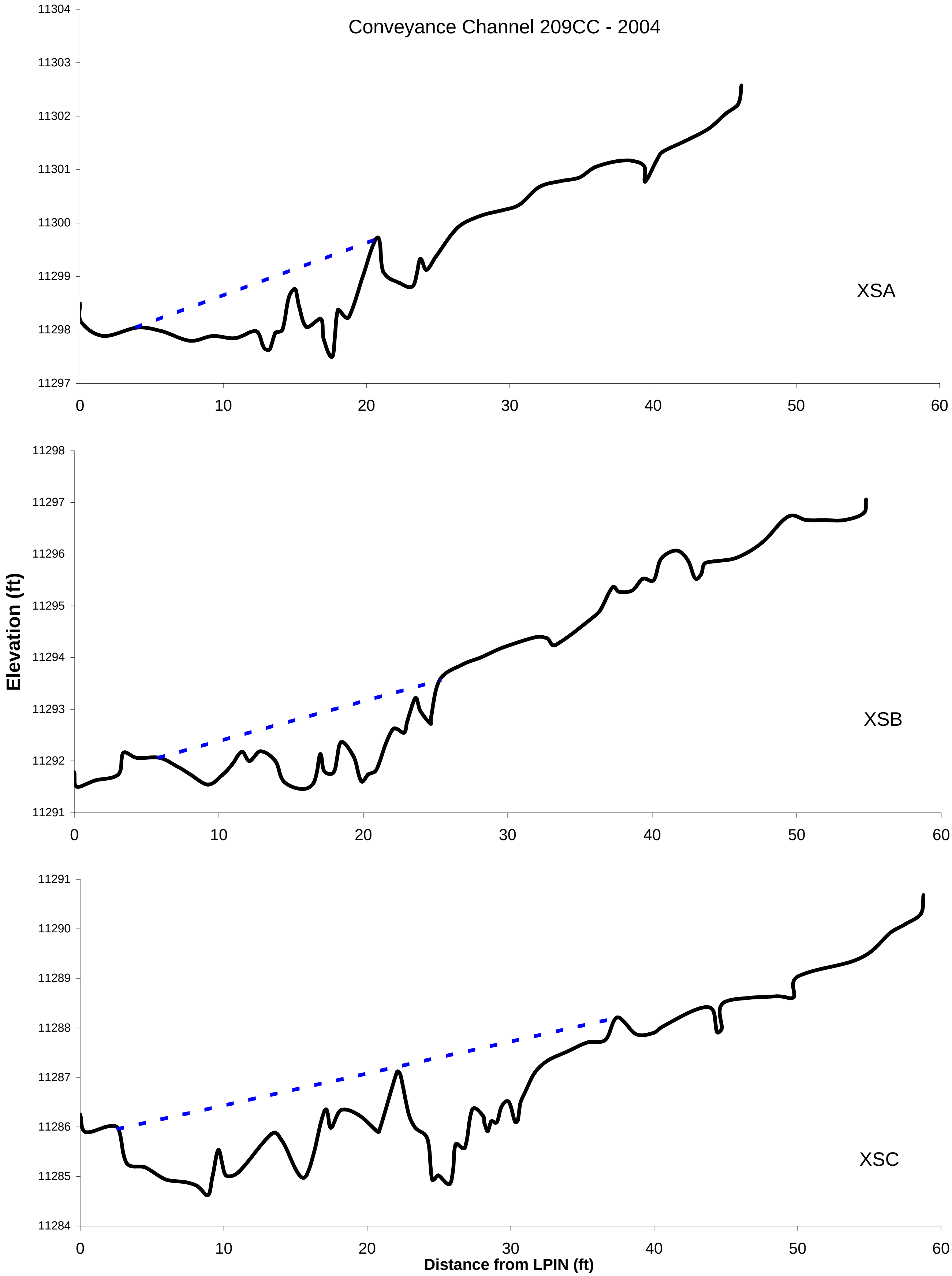


Conveyance Channel 206CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
9805
9804
9803
9802
9801
9800
9799
9798
9797
9796
9795
9794
9793
9792
9791
9790
0
5
10
15
20
25
30
35
40

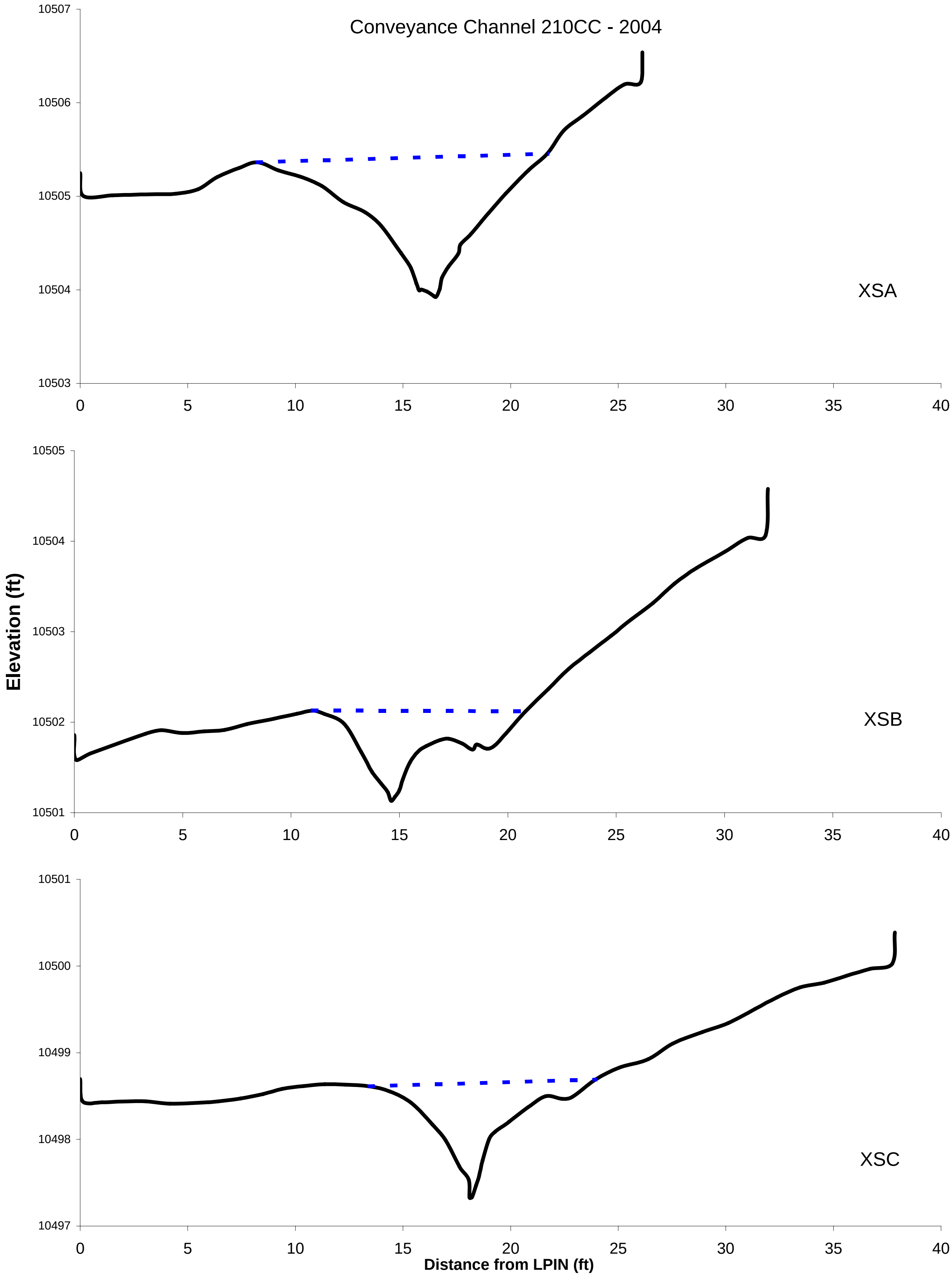


Conveyance Channel 207CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
12992
12991
12990
12989
12988
12985
12984
12983
12982
12981
12980
12979
12978
12977
12976
0
10
20
30
40
50
60

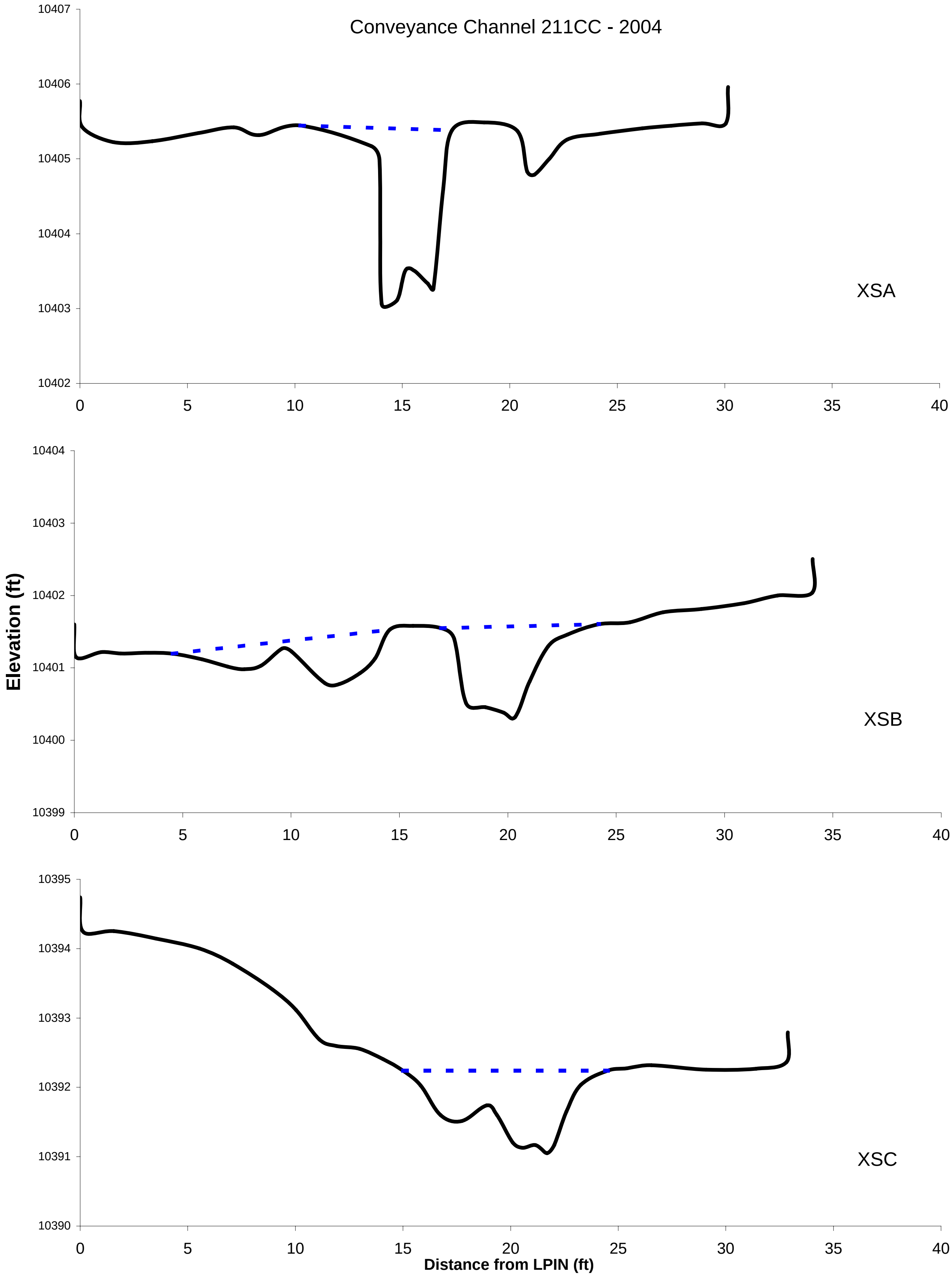

Conveyance Channel 208CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
11507
11506
11505
11504
11503
11502
11500
11499
11498
11497
11496
11495
11494
11493
11492
11491
11490
0
5
10
15
20
25
30
35
40
45



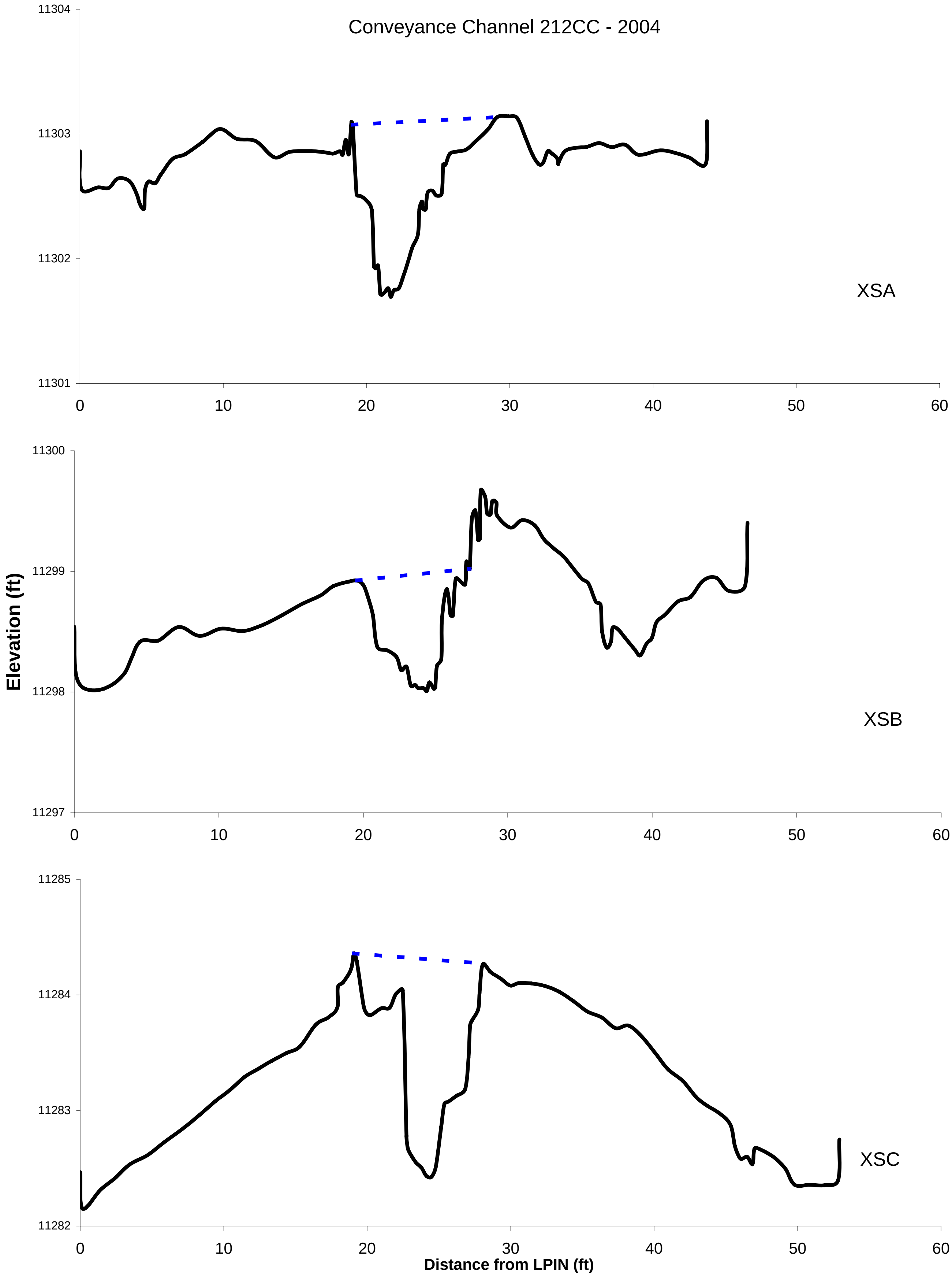
Conveyance Channel 209CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
11304
11303
11302
11301
11300
11299
11298
11297
11298
11297
11296
11295
11294
11293
11292
11291
11291
11290
11289
11288
11287
11286
11285
11284
0
10
20
30
40
50
60

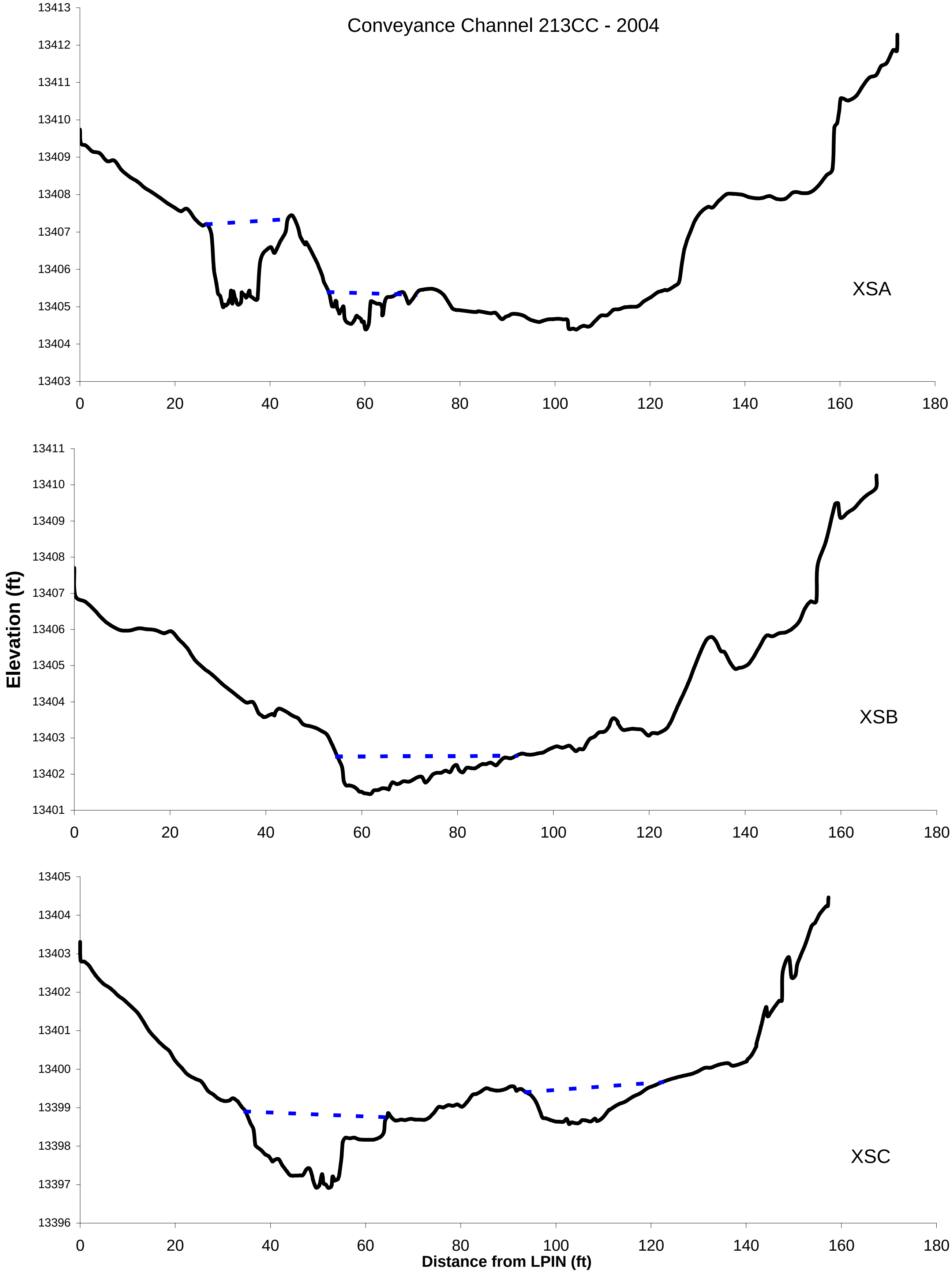


Conveyance Channel 210CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
10507
10506
10505
10504
10503
10505
10504
10503
10502
10501
10501
10500
10499
10498
10497
0
5
10
15
20
25
30
35
40



Conveyance Channel 211CC - 2004
Elevation (ft)
10407
10406
10405
10404
10403
10402
XSA
0
5
10
15
20
25
30
35
40
10404
10403
10402
10401
10400
10399
XSB
0
5
10
15
20
25
30
35
40
10395
10394
10393
10392
10391
10390
XSC
0
5
10
15
20
25
30
35
40
Distance from LPIN (ft)


Conveyance Channel 212CC - 2004
Elevation (ft)
XSA
XSB
XSC
Distance from LPIN (ft)
11304
11303
11302
11301
11300
11299
11298
11297
11285
11284
11283
11282
0
10
20
30
40
50
60


Conveyance Channel 213CC - 2004
XSA
XSB
XSC
Elevation (ft)
Distance from LPIN (ft)
13413
13412
13411
13410
13409
13408
13407
13406
13405
13404
13403
13401
13402
13396
13397
13398
13399
13400
0
20
40
60
80
100
120
140
160
180

Appendix G

Particle Size Distributions of Grab Samples Taken From Rock Weirs and Associated Silt Fences

and

Sediment Pond Cross Section Geometry and Graphs

2004

Summary of Particle Size Distribution from Sieve Analysis of Grab Samples - 2004

			Particle Size Distribution - Grab Samples 2003/2004					
Stream/Site Name	ID	Date	D15	D35	D50	D84	D95	D100
Pike's Peak Highway - Rock Weir	002RW	091603	0.474	1.19	2.04	7.3	14.0	32
Pike's Peak Highway - Rock Weir	002RW	092304	0.420	1.26	2.23	6.3	10.6	24
Pike's Peak Highway - Rock Weir	003RW	091603	0.243	0.62	1.03	3.8	5.6	13
Pike's Peak Highway - Rock Weir	003RW	092304	0.389	0.97	1.58	4.4	7.1	19
Pike's Peak Highway - Rock Weir	006RW	091603	0.661	1.59	2.59	7.0	10.6	20
Pike's Peak Highway - Rock Weir	006RW	092304	0.560	1.42	2.30	5.7	9.9	23
Pike's Peak Highway - Rock Weir	008RW	091603	0.504	1.17	1.64	6.0	9.5	24
Pike's Peak Highway - Rock Weir	008RW	092304	0.218	0.72	1.42	4.8	8.2	24
Pike's Peak Highway - Rock Weir	009RA	091603	0.802	1.61	2.40	5.6	9.4	18
Pike's Peak Highway - Rock Weir	009RA	092304	0.957	2.10	3.07	7.5	11.4	30

			Particle Size Distribution - Grab Samples 2004					
Stream/Site Name	ID	Date	D15	D35	D50	D84	D95	D100
Pike's Peak Highway - Rock Weir	152RW	092304	0.494	1.31	2.33	7.8	12.3	32
Pike's Peak Highway - Rock Weir	153RW	092104	0.064	0.50	1.79	7.6	12.8	32
Pike's Peak Highway - Rock Weir	161RW	092104	0.284	0.95	1.62	4.8	8.8	22
Pike's Peak Highway - Rock Weir	176RW	091704	0.146	1.28	2.93	9.0	12.8	22
Pike's Peak Highway - Rock Weir	181RW	091704	0.094	1.45	3.56	10.2	14.2	25
Pike's Peak Highway - Rock Weir	201RW	092104	0.138	0.60	1.29	5.2	10.8	31

			Particle Size Distribution - Grab Samples 2004					
Stream/Site Name	ID	Date	D15	D35	D50	D84	D95	D100
Pike's Peak Highway - Rock Weir	162RW	092104	0.238	1.02	1.96	5.8	9.2	30
Pike's Peak Highway - Assoctiated Silt Fence	162RW	092104	0.018	0.13	0.17	0.8	3.8	21
Pike's Peak Highway - Rock Weir	178RW	091704	0.748	2.26	3.40	8.1	11.5	24
Pike's Peak Highway - Assoctiated Silt Fence	178RW	091704	0.282	1.13	2.28	6.2	10.3	29
Pike's Peak Highway - Rock Weir	179RW	091704	0.383	1.20	2.09	6.7	11.2	19
Pike's Peak Highway - Assoctiated Silt Fence	179RW	091704	0.031	0.24	0.66	3.5	6.9	15
Pike's Peak Highway - Rock Weir	180RW	091704	0.302	1.17	2.11	6.4	11.0	19
Pike's Peak Highway - Assoctiated Silt Fence	180RW	091704	0.213	0.94	1.80	6.1	11.6	32
Pike's Peak Highway - Rock Weir	200RW	092104	0.303	0.92	1.70	5.7	10.3	29
Pike's Peak Highway - Assoctiated Silt Fence	200RW	092104	0.140	0.50	1.01	3.7	6.8	15
Pike's Peak Highway - Rock Weir	202RW	091704	0.336	1.03	1.82	5.9	10.3	25
Pike's Peak Highway - Assoctiated Silt Fence	202RW	091704	0.502	1.36	2.30	6.6	11.1	22

Sieve Analysis Worksheet

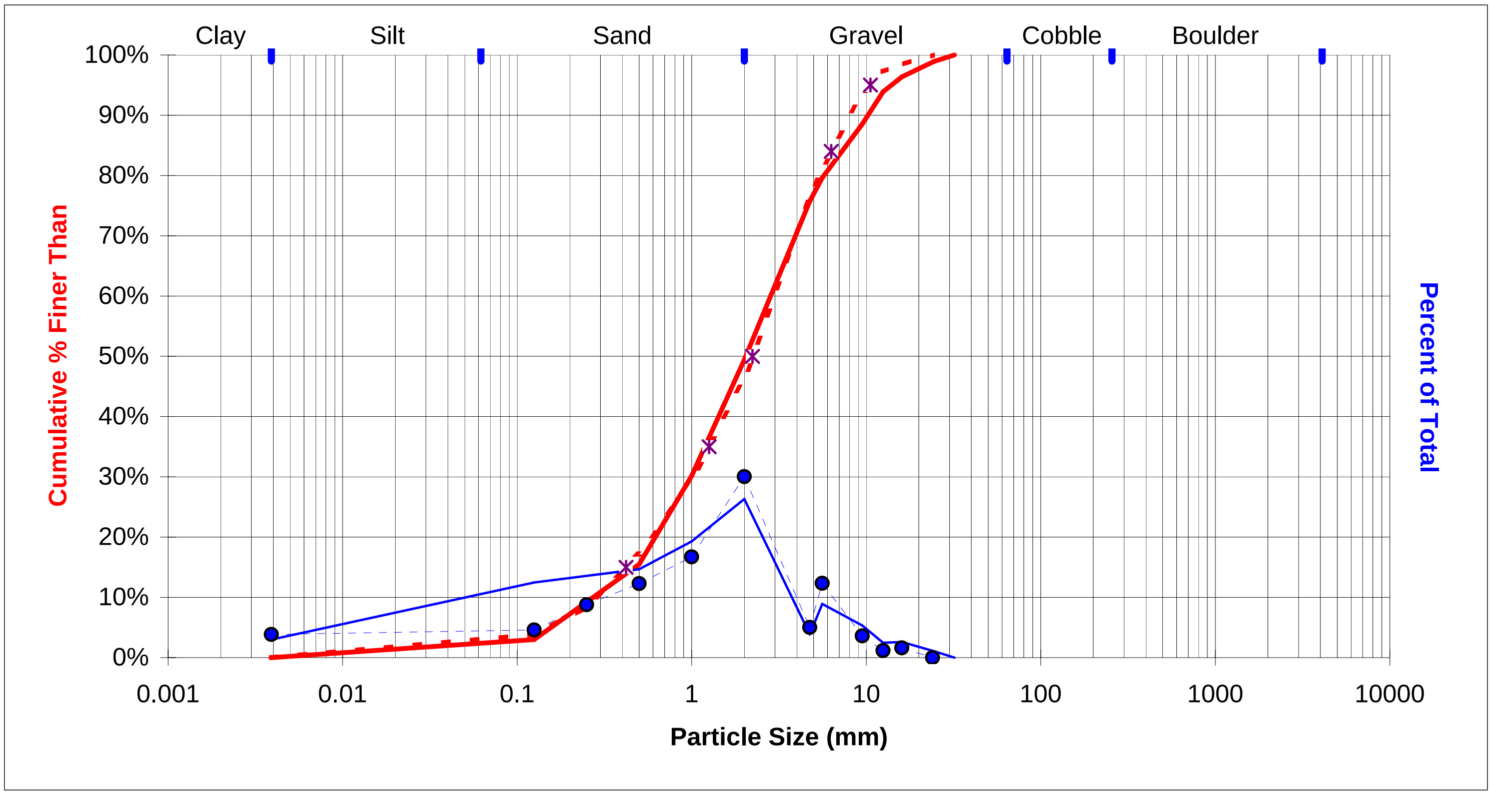
Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	**0.0%**	136.30
0.125	3.8%	162.90
0.25	8.4%	312.10
0.5	17.2%	436.70
1.0	29.5%	594.50
2.0	46.2%	1067.20
4.8	76.2%	178.40
5.6	81.3%	438.40
9.5	93.6%	128.70
12.5	97.2%	41.30
16.0	98.4%	57.80
24.0	100.0%	
32.0		
45.0		
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Comparison Grab Sample 2003 vs 2004 Sediment Accumulation

SITE NAME: Pike's Peak Highway - Rock Weir
ID NUMBER: 002RW
DATE: 9/23/2004
CREW: lh, kg

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart	Year	Graph
0.42	**1.26**	**2.23**	**6.3**	**10.6**	**24.0**	**2004**	**Dashed**
0.47	**1.19**	**2.04**	**7.3**	**14.0**	**32.0**	**2003**	**Solid**



Sieve Analysis Worksheet

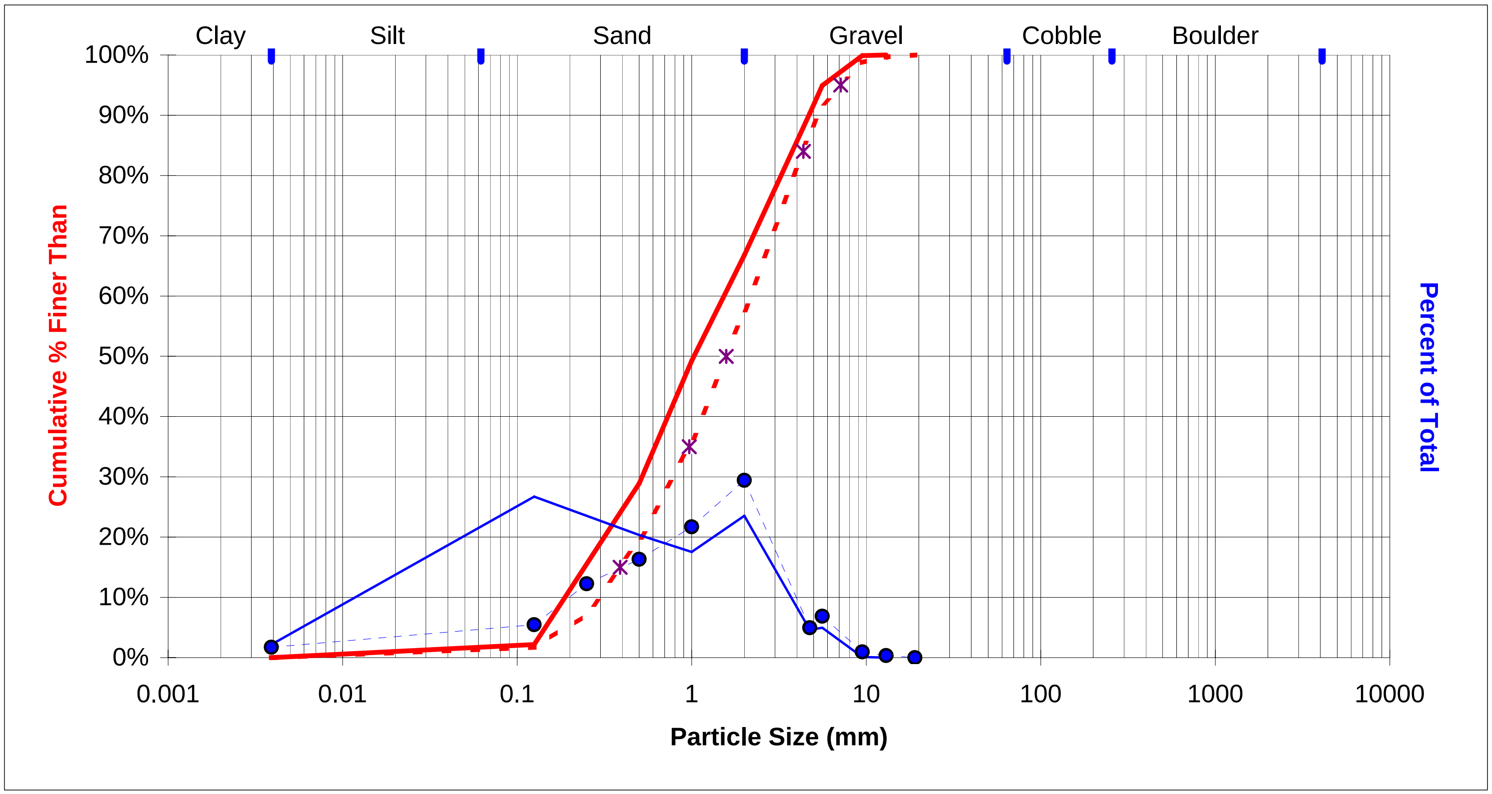
Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	**0.0%**	56.20
0.125	1.7%	178.20
0.25	7.2%	399.10
0.5	19.4%	531.50
1.0	35.7%	707.70
2.0	57.5%	959.00
4.8	86.9%	161.50
5.6	91.8%	223.70
9.5	98.7%	30.7
13.0	99.7%	11.2
19.0	100.0%	
24.5		
37.5		
45.0		
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Comparison Grab Sample 2003 vs 2004 Sediment Accumulation

SITE NAME: Pike's Peak Highway - Rock Weir
ID NUMBER: 003RW
DATE: 9/23/2004
CREW: lh, kg

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart	Year	Graph
0.39	0.97	1.58	4.36	7.14	19.0	2004	Dashed
0.24	0.62	1.03	3.77	5.64	13.0	2003	Solid



Sieve Analysis Worksheet

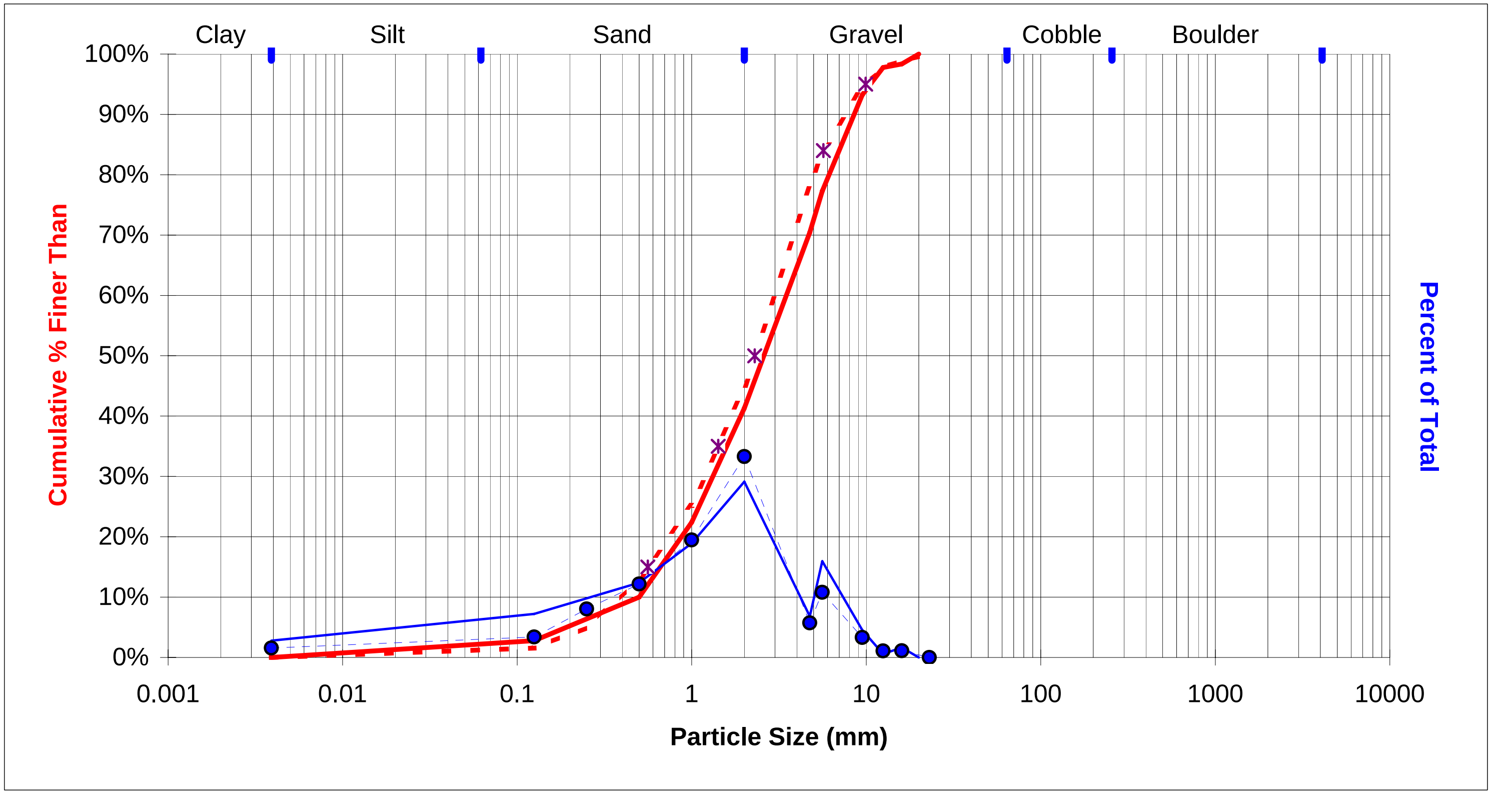
Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	**0.0%**	51.80
0.125	1.6%	113.00
0.25	5.0%	266.70
0.5	13.0%	403.80
1.0	25.2%	646.40
2.0	44.7%	1104.50
4.8	78.0%	190.00
5.6	83.7%	357.80
9.5	94.5%	110.10
12.5	97.8%	36.20
16.0	98.9%	37
23.0	100.0%	
37.5		
45.0		
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Comparison Grab Sample 2003 vs 2004 Sediment Accumulation

SITE NAME: Pike's Peak Highway - Rock Weir
ID NUMBER: 006RW
DATE: 9/23/2004
CREW: lh, kg

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart	Year	Graph
0.56	1.42	2.30	5.69	9.9	23.0	2004	Dashed
0.66	1.59	2.59	7.00	10.6	20.0	2003	Solid



Sieve Analysis Worksheet

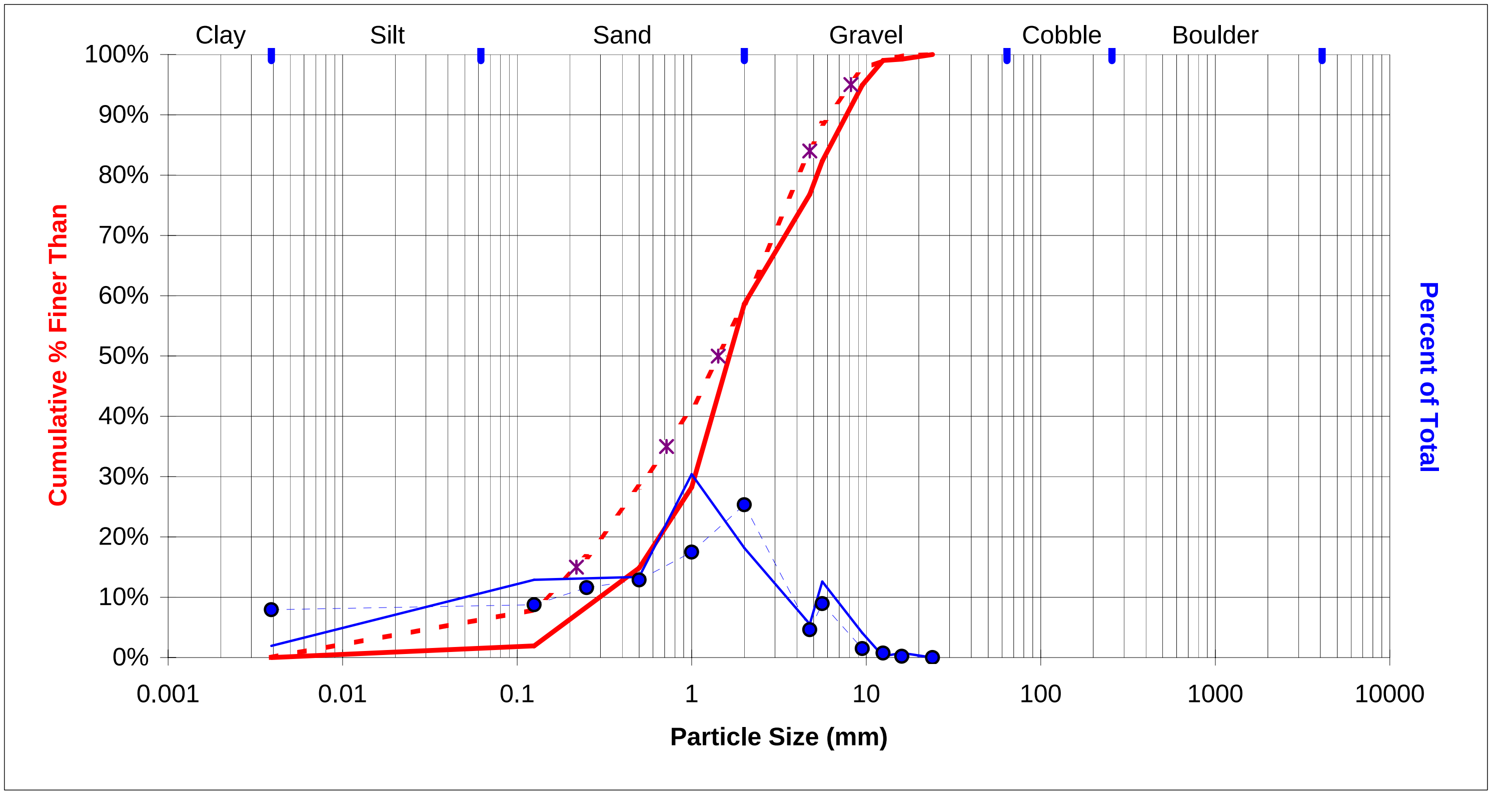
Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	**0.0%**	255.80
0.125	7.9%	282.30
0.25	16.7%	373.00
0.5	28.3%	414.40
1.0	41.2%	562.90
2.0	58.6%	816.40
4.8	84.0%	148.40
5.6	88.6%	288.20
9.5	97.5%	48.00
12.5	99.0%	24.30
16.0	99.8%	6.7
24.0	100.0%	
37.5		
45.0		
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Comparison Grab Sample 2003 vs 2004 Sediment Accumulation

SITE NAME: Pike's Peak Highway - Rock Weir
ID NUMBER: 008RW
DATE: 9/23/2004
CREW: lh, kg

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart	Year	Graph
0.22	0.72	1.42	4.75	8.2	24.0	2004	Dashed
0.50	1.17	1.64	6.01	9.5	24.0	2003	Solid



Sieve Analysis Worksheet

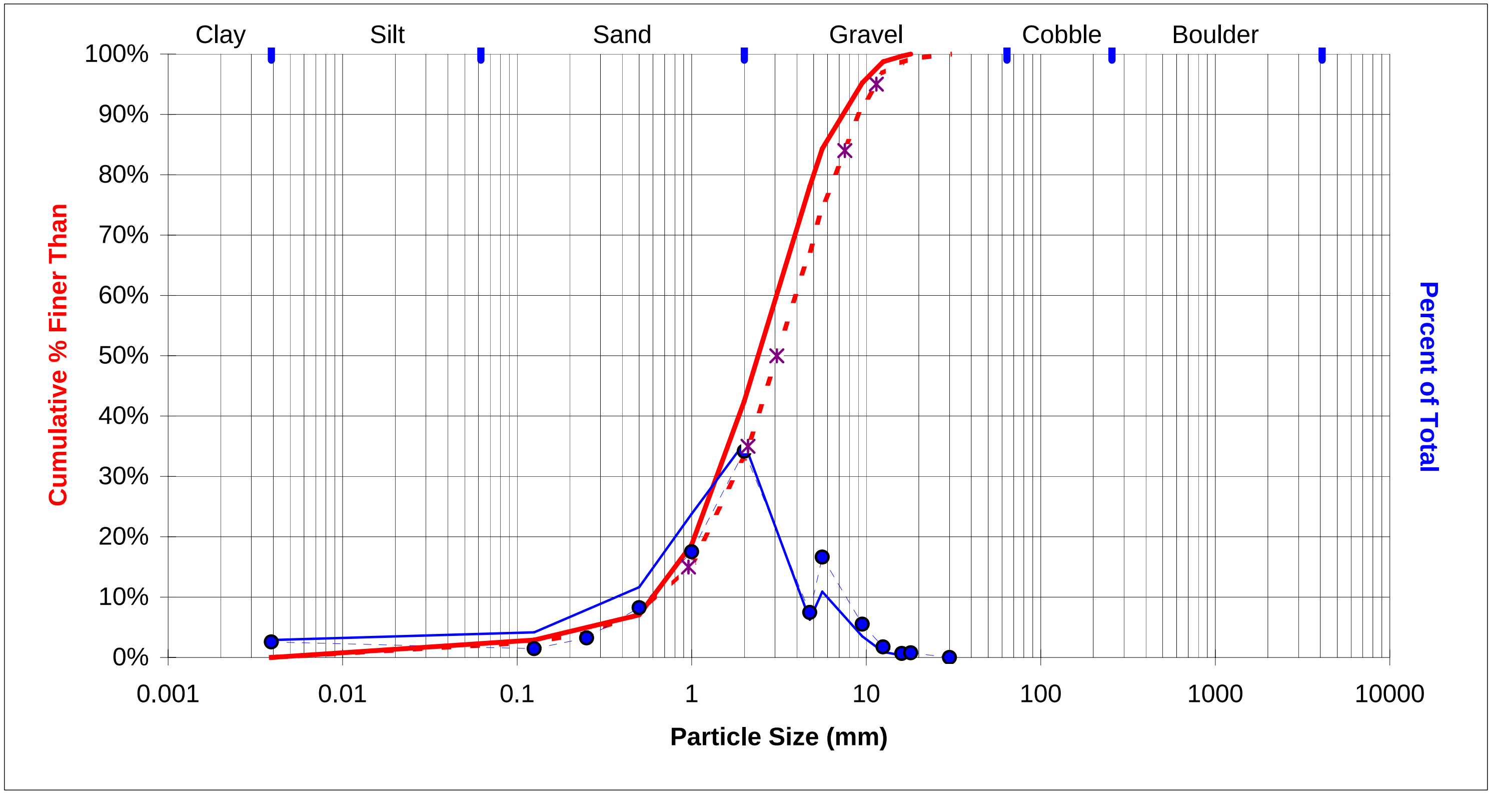
Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	**0.0%**	81.90
0.125	2.6%	46.80
0.25	4.0%	102.80
0.5	7.3%	261.90
1.0	15.5%	556.70
2.0	33.0%	1086.40
4.8	67.2%	237.00
5.6	74.7%	528.50
9.5	91.3%	175.80
12.5	96.8%	55.70
16.0	98.6%	21
18.0	99.2%	24.5
30.0	100.0%	
45.0		
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Comparison Grab Sample 2003 vs 2004 Sediment Accumulation

SITE NAME: Pike's Peak Highway - Rock Weir
ID NUMBER: 009RA
DATE: 9/23/2004
CREW: lh, kg

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart	Year	Graph
0.96	2.10	3.07	7.54	11.42	30.0	2004	Dashed
0.80	1.61	2.40	5.55	9.40	18.0	2003	Solid



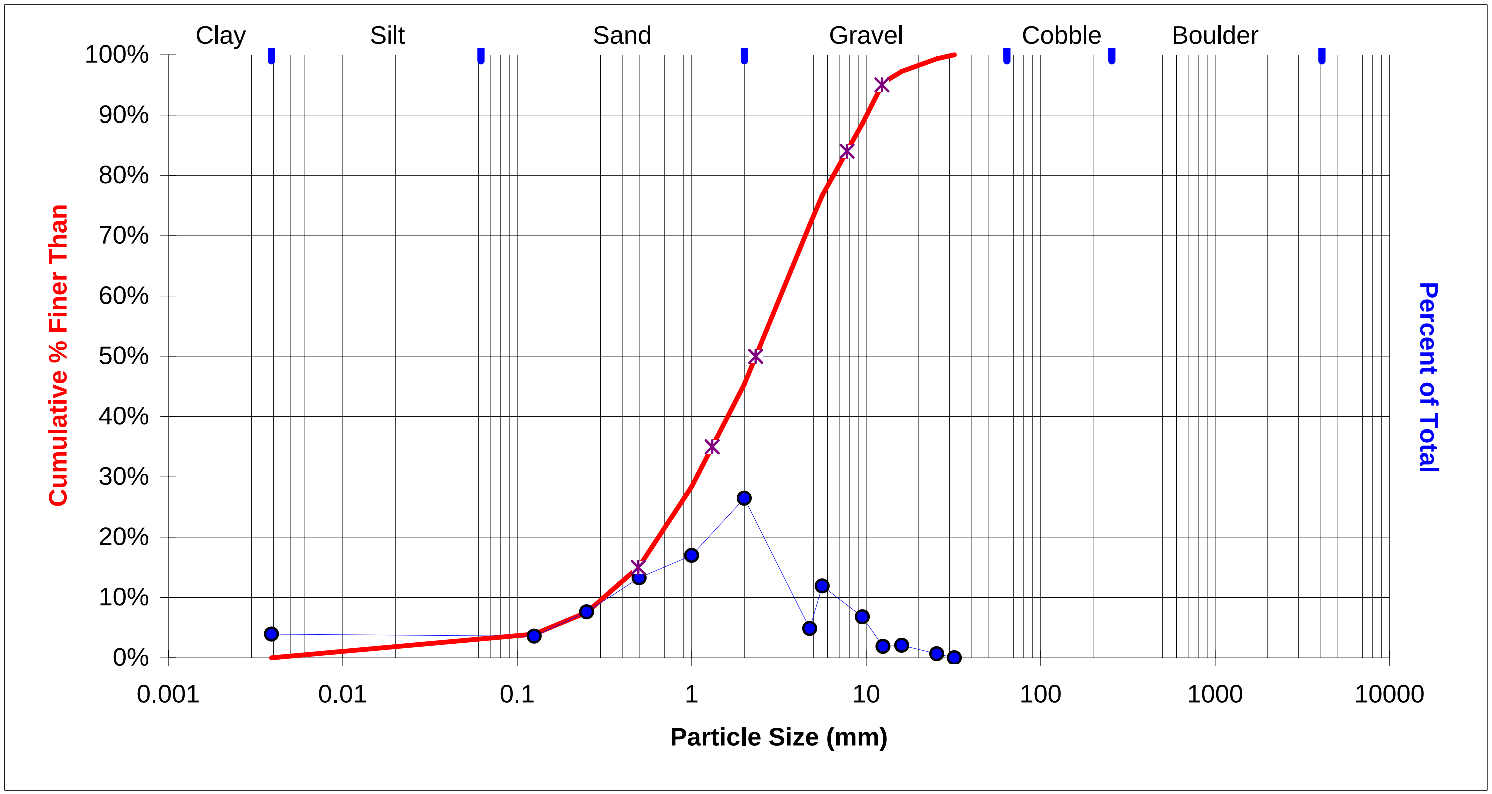
Sieve Analysis Worksheet

Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	**0.0%**	121.30
0.125	3.9%	110.50
0.25	7.5%	234.50
0.5	15.1%	408.50
1.0	28.4%	523.00
2.0	45.4%	814.40
4.8	71.8%	149.60
5.6	76.7%	366.70
9.5	88.6%	208.90
12.5	95.4%	57.90
16.0	97.2%	64.10
25.4	99.3%	20.7
32.0	100.0%	
45.0		
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Grab Sample of 2004 Sediment Accumulation
Note no sediment in associated silt fence

SITE NAME: Pike's Peak Highway - Rock Weir
ID NUMBER: 152RW
DATE: 9/23/2004
CREW: lh, kg

Particle Size Distribution (mm)	D15	D35	D50	D84	D95	Lpart
	0.494	**1.309**	**2.326**	**7.761**	**12.317**	**32.0**



Sieve Analysis Worksheet

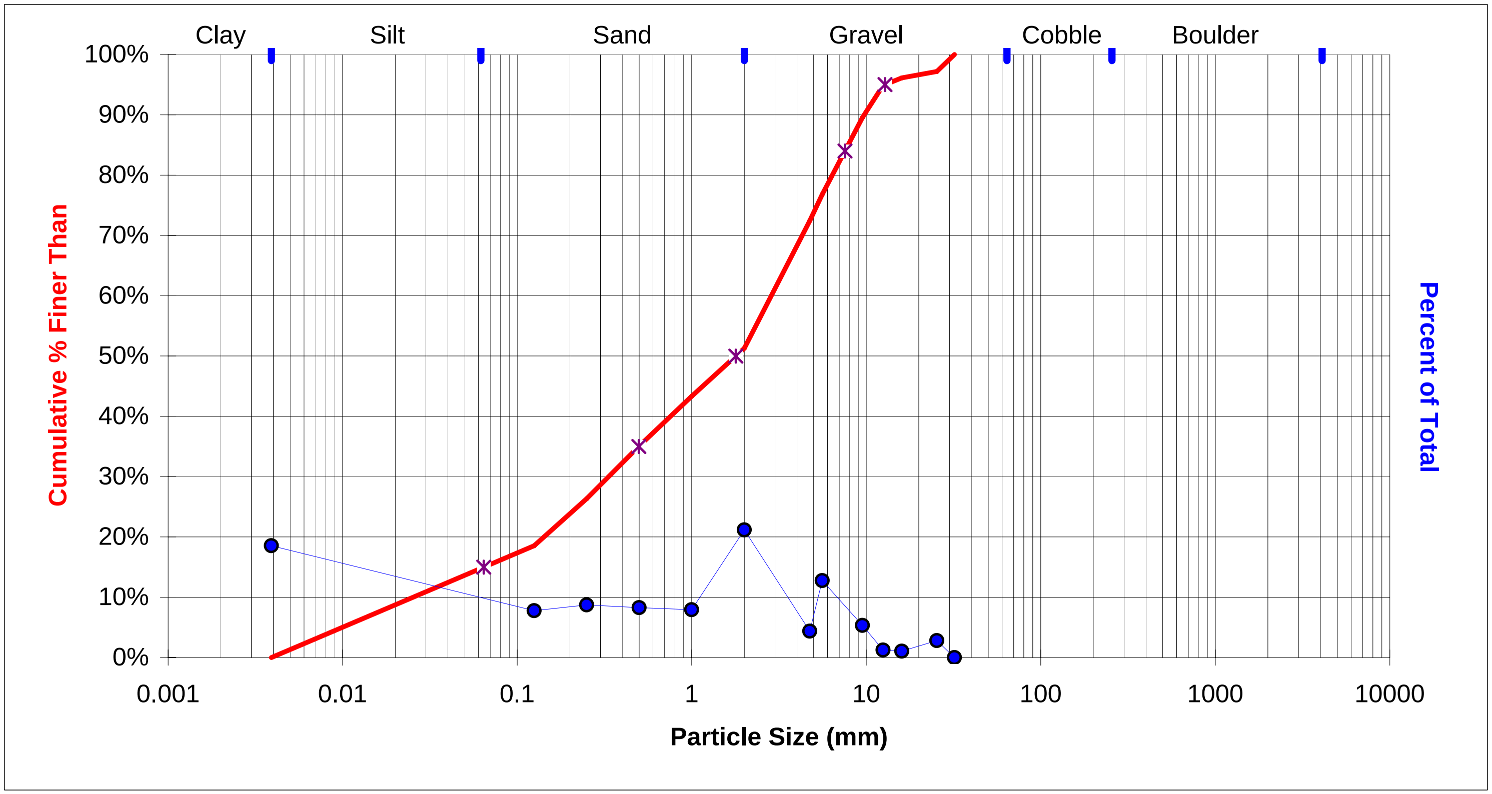
Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	**0.0%**	573.40
0.125	18.6%	240.40
0.3	26.3%	269.70
0.5	35.1%	255.70
1.0	43.3%	245.30
2.0	51.3%	653.90
4.8	72.4%	135.00
5.6	76.8%	394.00
9.5	89.6%	164.4
12.5	94.9%	38.8
16.0	96.1%	33.1
25.4	97.2%	86.5
32.0	100.0%	
45.0		
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Grab Sample of 2004 Sediment Accumulation
Note no sediment in associated silt fence

SITE NAME: Pike's Peak Highway - Rock Weir
ID NUMBER: 153RW
DATE: 9/21/2004
CREW: lh, kg

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart
0.064	**0.498**	**1.789**	**7.555**	**12.813**	**32.0**



Sieve Analysis Worksheet

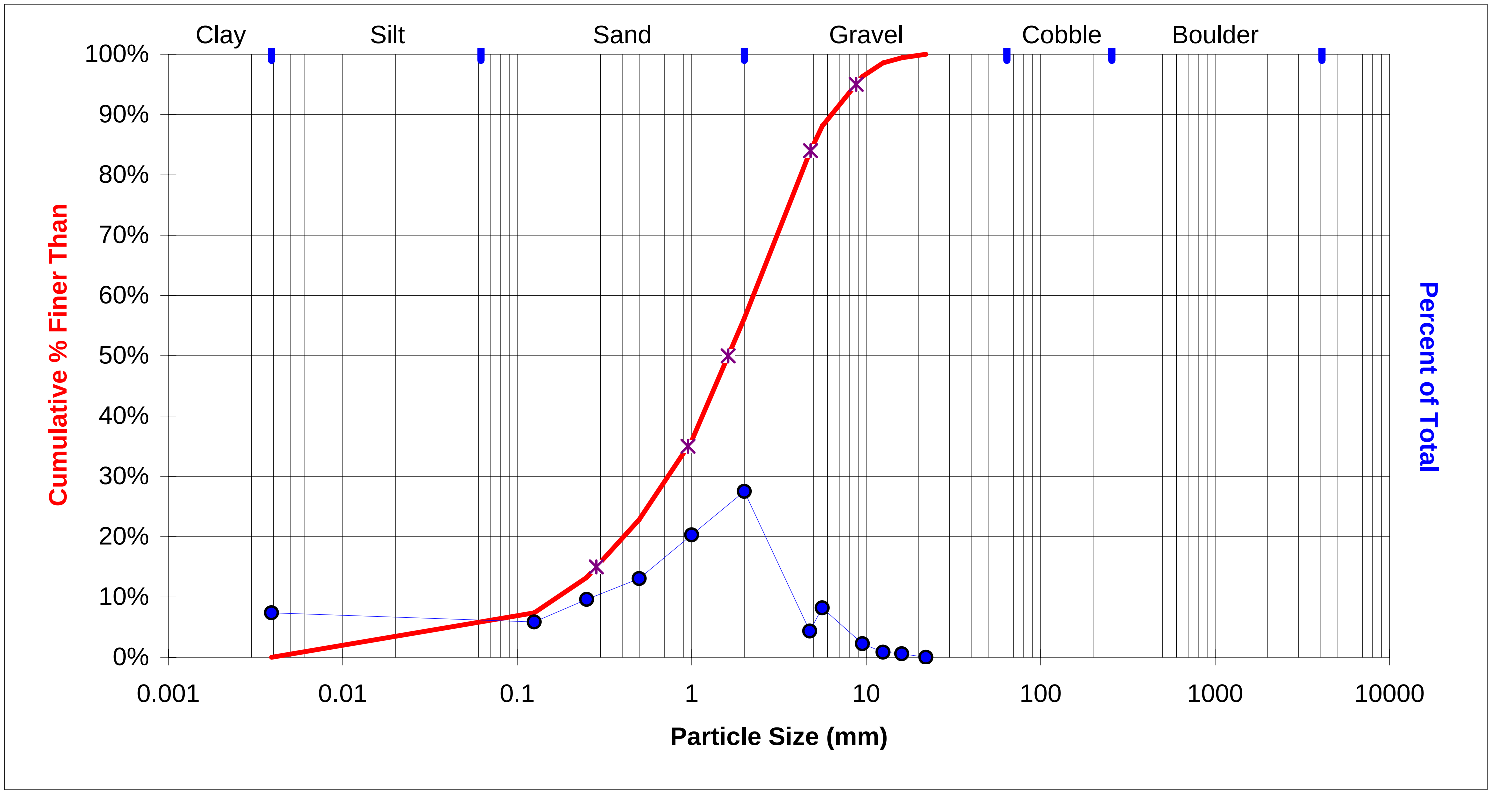
Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	**0.0%**	218.90
0.125	7.4%	173.50
0.3	13.2%	284.70
0.5	22.9%	386.90
1.0	35.9%	601.80
2.0	56.2%	815.30
4.8	83.7%	129.10
5.6	88.1%	243.30
9.5	96.3%	67.00
12.5	98.6%	25.20
16.0	99.4%	17.4
22.0	100.0%	
37.5		
45.0		
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Grab Sample of 2004 Sediment Accumulation
Note no sediment in associated silt fence

SITE NAME: Pike's Peak Highway - Rock Weir
ID NUMBER: 161RW
DATE: 9/21/2004
CREW: lh, kg

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart
0.284	0.953	1.618	4.798	8.752	22.0



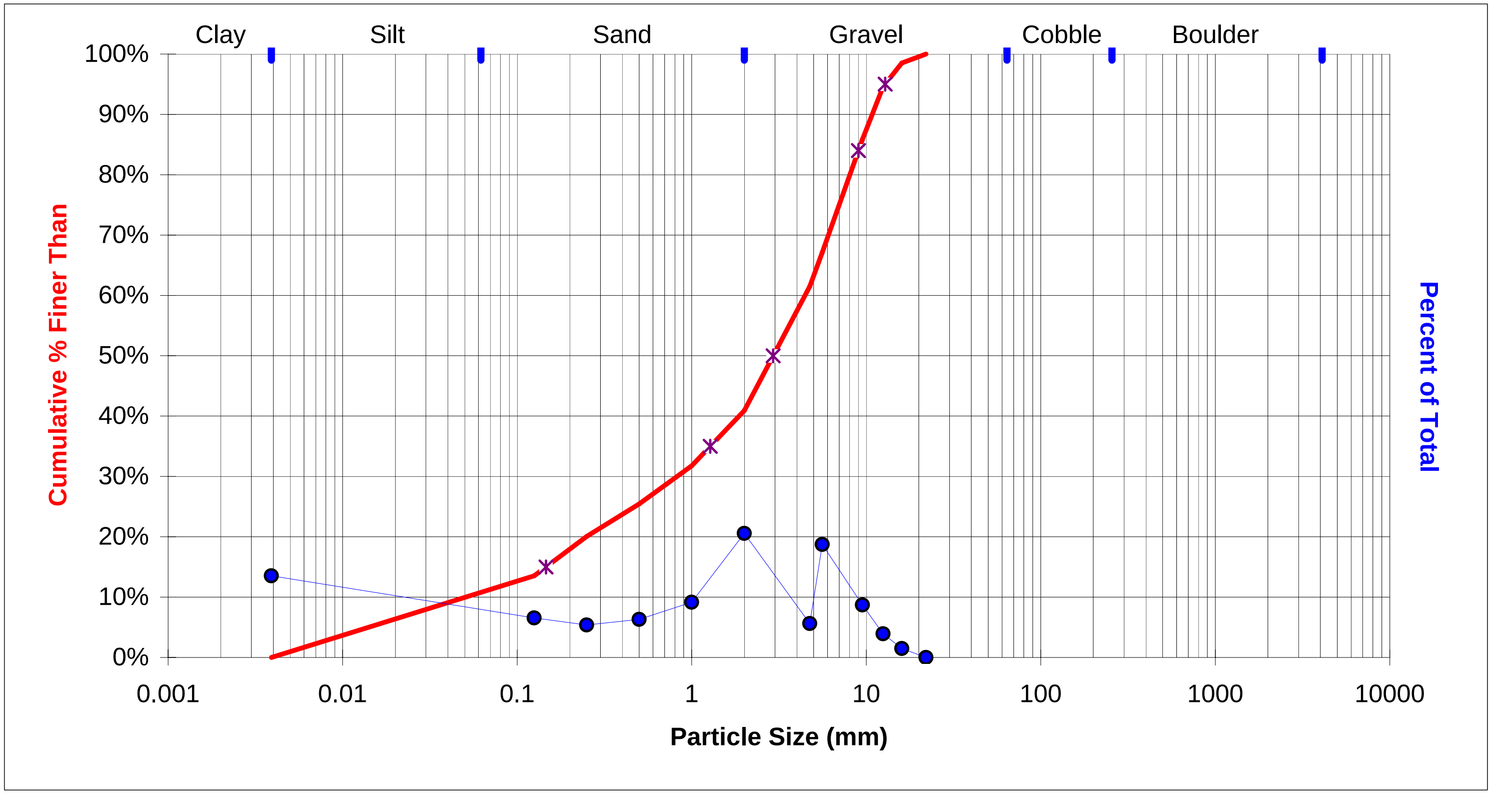
Sieve Analysis Worksheet

Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	**0.0%**	431.70
0.125	13.5%	209.00
0.3	20.1%	172.10
0.5	25.5%	201.30
1.0	31.8%	292.70
2.0	40.9%	656.70
4.8	61.5%	180.00
5.6	67.1%	598.40
9.5	85.9%	278.20
12.5	94.6%	125.70
16.0	98.5%	47.3
22.0	100.0%	
37.5		
45.0		
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Grab Sample of 2004 Sediment Accumulation
Note no sediment in associated silt fence

SITE NAME: Pike's Peak Highway - Rock Weir
ID NUMBER: 176RW
DATE: 9/17/2004
CREW: lh, kg

Particle Size Distribution (mm)	D15	D35	D50	D84	D95	Lpart
	0.146	1.278	2.929	9.029	12.832	22.0



Sieve Analysis Worksheet

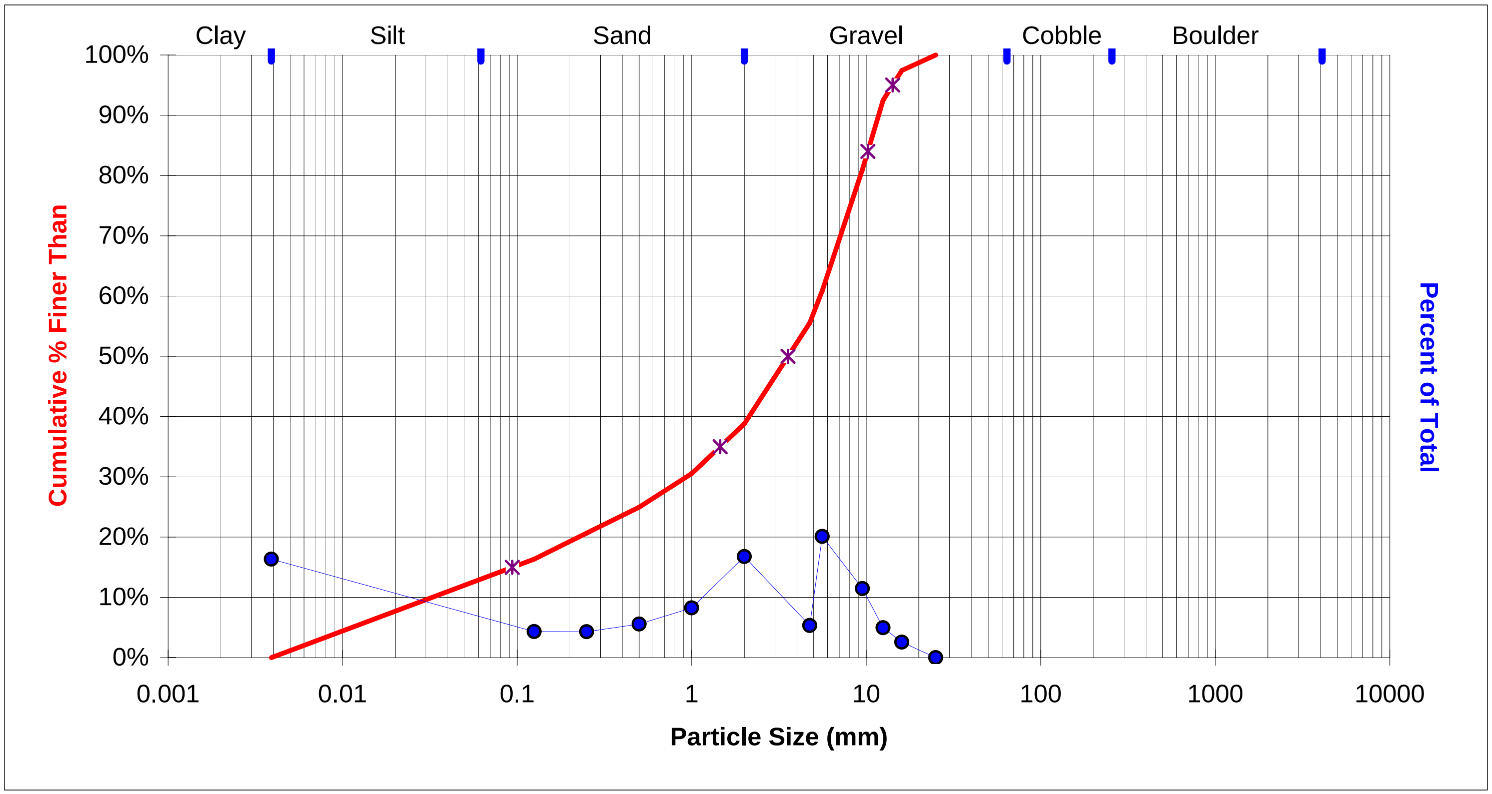
Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	**0.0%**	495.80
0.125	16.4%	130.70
0.3	20.7%	130.50
0.5	25.0%	168.90
1.0	30.5%	250.10
2.0	38.8%	508.30
4.8	55.6%	161.90
5.6	60.9%	609.50
9.5	81.0%	347.80
12.5	92.5%	150.10
16.0	97.4%	77.7
25.0	100.0%	
37.5		
45.0		
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Grab Sample of 2004 Sediment Accumulation
Note no sediment in associated silt fence

SITE NAME: Pike's Peak Highway - Rock Weir
ID NUMBER: 181RW
DATE: 9/17/2004
CREW: lh, kg

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart
0.094	**1.454**	**3.565**	**10.220**	**14.170**	**25.0**



Sieve Analysis Worksheet

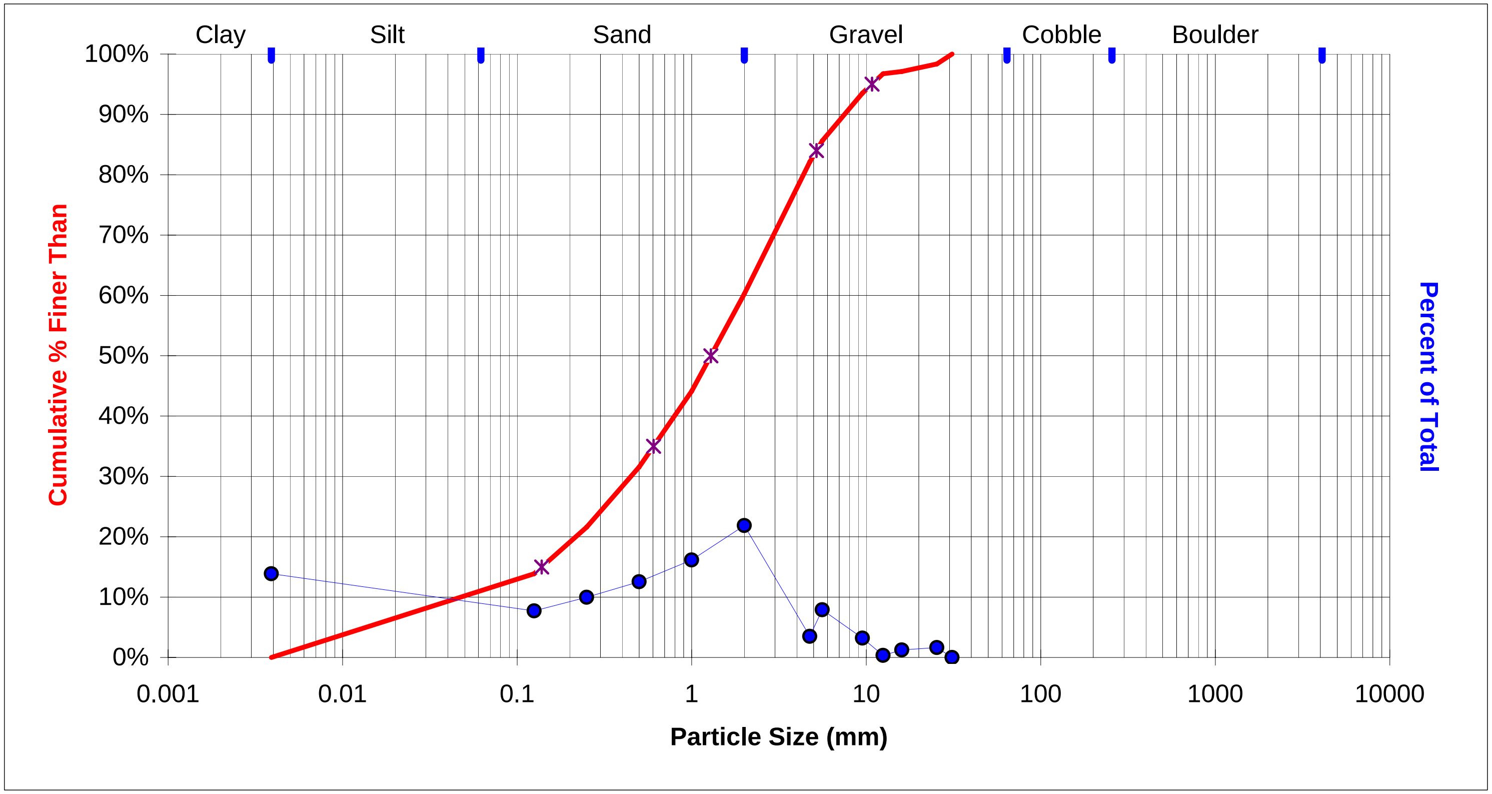
Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	**0.0%**	306.20
0.125	13.9%	170.50
0.3	21.6%	220.10
0.5	31.6%	276.90
1.0	44.1%	356.40
2.0	60.3%	482.30
4.8	82.1%	77.10
5.6	85.6%	174.60
9.5	93.5%	70.90
12.5	96.7%	7.90
16.0	97.1%	27.7
25.4	98.4%	36.4
31.0	100.0%	
45.0		
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Grab Sample of 2004 Sediment Accumulation
Note no sediment in associated silt fence

SITE NAME: Pike's Peak Highway - Rock Weir
ID NUMBER: 201RW
DATE: 9/21/2004
CREW: lh, kg

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart
0.138	0.604	1.287	5.190	10.788	31.0



Sieve Analysis Worksheet

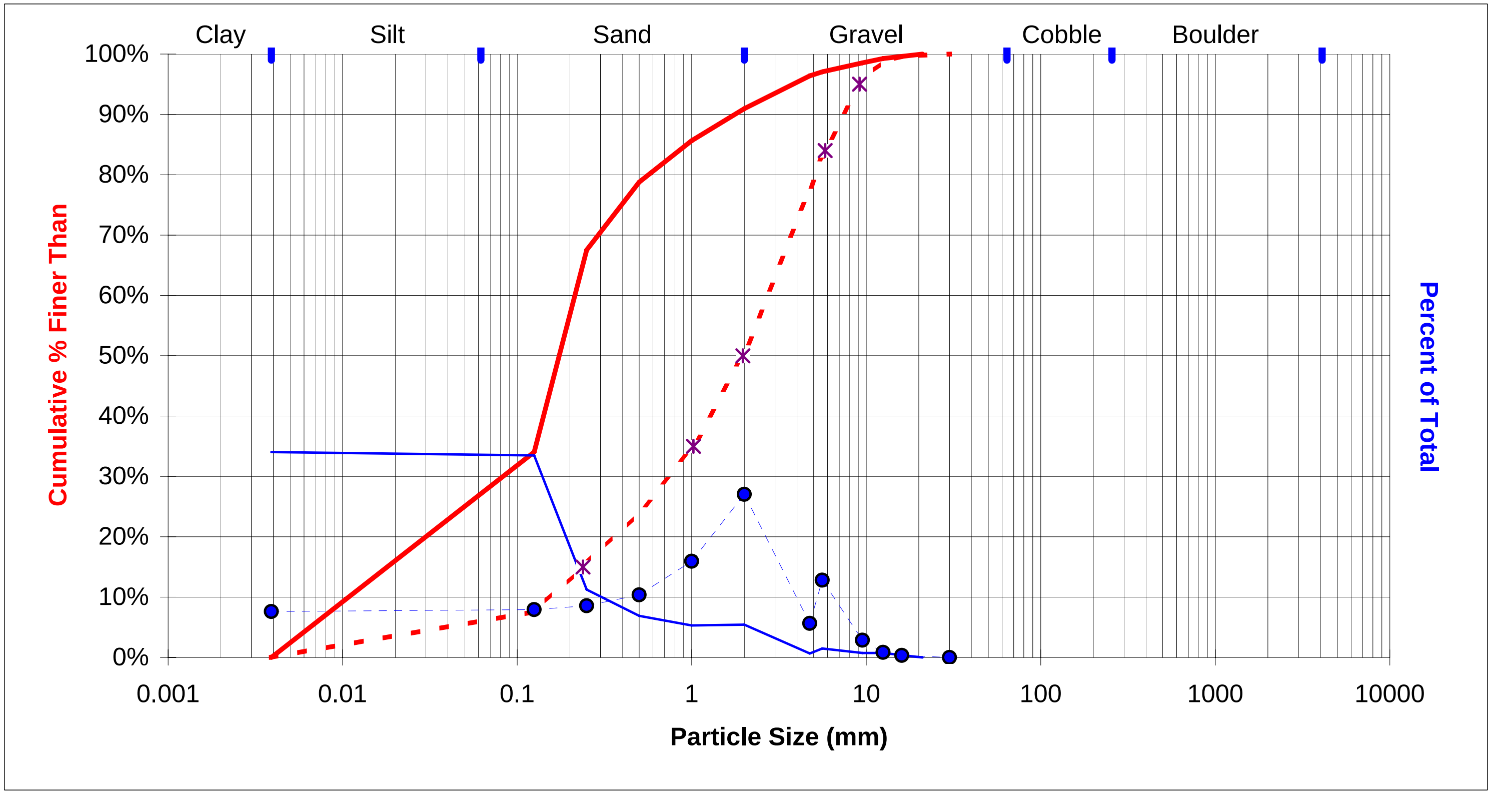
Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	**0.0%**	209.10
0.125	7.6%	217.20
0.25	15.6%	234.70
0.5	24.1%	284.10
1.0	34.5%	436.80
2.0	50.4%	741.40
4.8	77.5%	154.90
5.6	83.1%	351.20
9.5	95.9%	78.60
12.5	98.8%	23.50
16.0	99.6%	9.8
30.0	100.0%	
37.5		
45.0		
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Comparison Grab Sample of Sediment Accumulation in Weir vs in Associtated Silt Fence 2004

SITE NAME: Pike's Peak Highway - Rock Weir
ID NUMBER: 162RW
DATE: 9/21/2004
CREW: lh, kg

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart	Year	Graph
0.24	1.02	1.96	5.81	9.16	30.0	Weir	Dashed
0.018	0.128	0.174	0.847	3.81	21.0	Fence	Solid



Sieve Analysis Worksheet

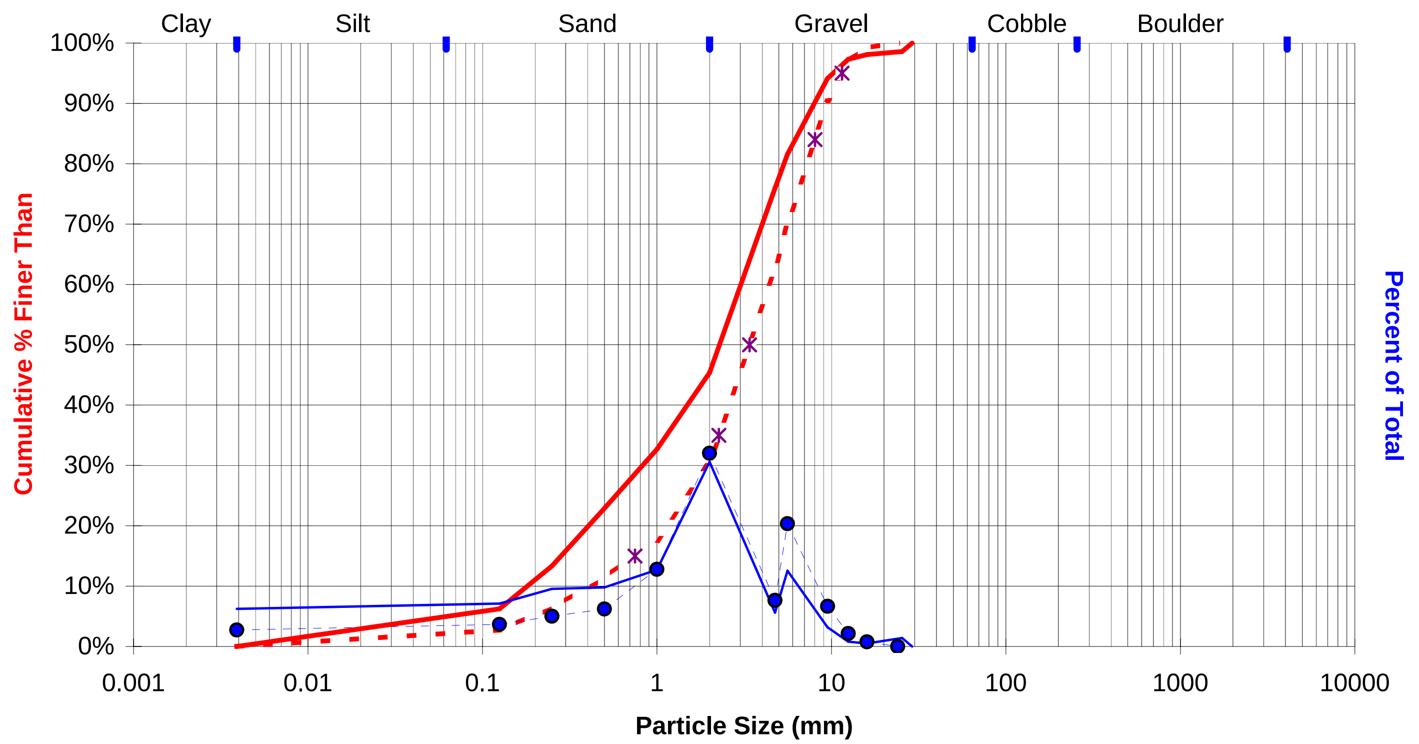
Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	**0.0%**	94.70
0.125	2.7%	126.40
0.25	6.4%	173.40
0.5	11.4%	215.00
1.0	17.6%	443.00
2.0	30.4%	1108.60
4.8	62.4%	264.50
5.6	70.1%	704.40
9.5	90.4%	230.70
12.5	97.1%	74.80
16.0	99.2%	27.1
24.0	100.0%	
37.5		
45.0		
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Comparison Grab Sample of Sediment Accumulation in Weir vs in Associtated Silt Fence 2004

SITE NAME: Pike's Peak Highway - Rock Weir
ID NUMBER: 178RW
DATE: 9/17/2004
CREW: lh, kg

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart	Year	Graph
0.75	**2.26**	**3.40**	**8.06**	**11.5**	**24.0**	**Weir**	**Dashed**
0.28	**1.13**	**2.28**	**6.20**	**10.3**	**29.0**	**Fence**	**Solid**



Sieve Analysis Worksheet

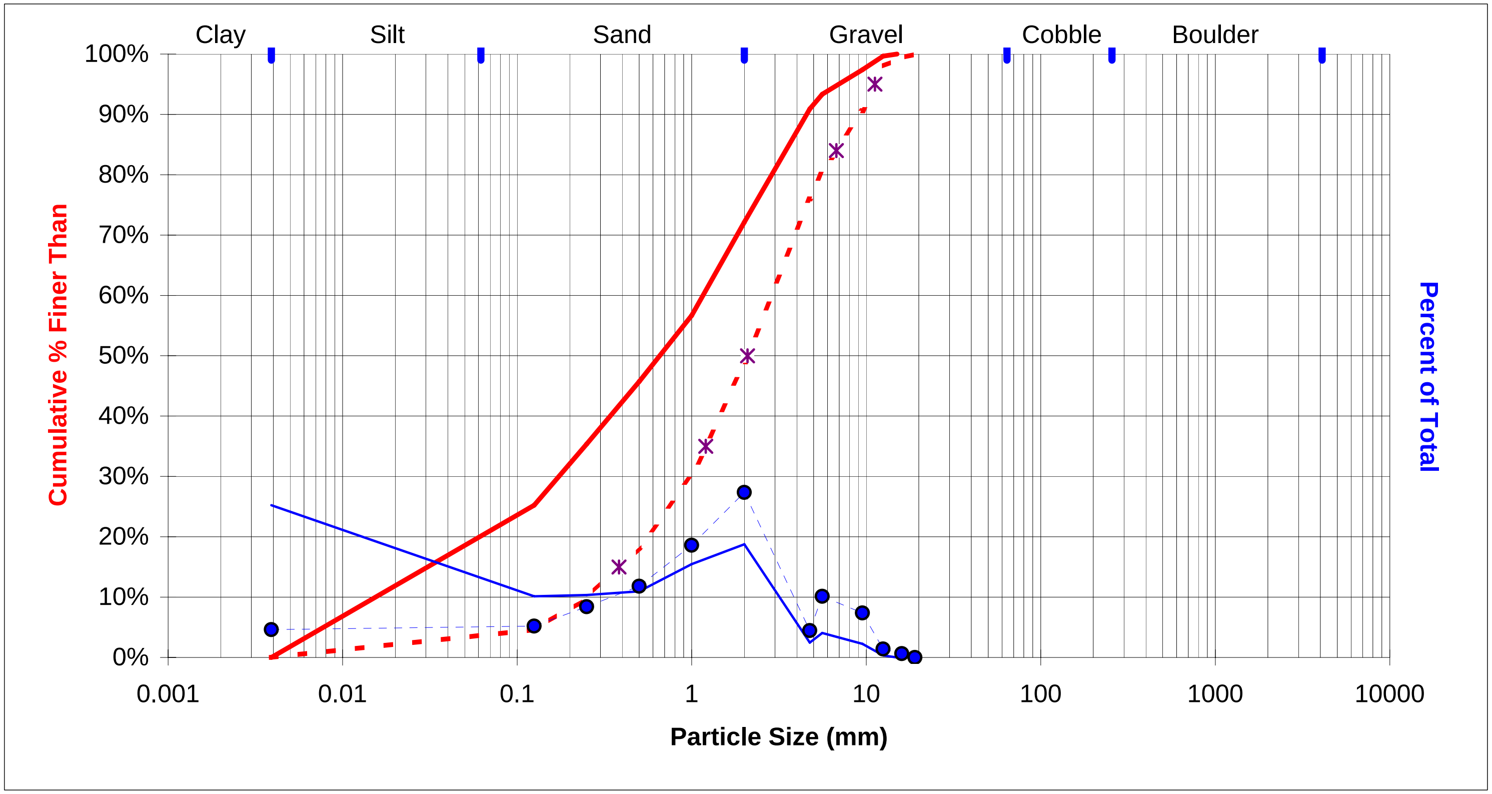
Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	**0.0%**	147.40
0.125	4.6%	166.50
0.25	9.8%	268.70
0.5	18.2%	377.00
1.0	30.0%	594.60
2.0	48.6%	873.50
4.8	76.0%	142.40
5.6	80.4%	323.50
9.5	90.6%	236.00
12.5	98.0%	44.90
16.0	99.4%	20.2
19.0	100.0%	
37.5		
45.0		
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Comparison Grab Sample of Sediment Accumulation in Weir vs in Associtated Silt Fence 2004

SITE NAME: Pike's Peak Highway - Rock Weir
ID NUMBER: 179RW
DATE: 9/17/2004
CREW: lh, kg

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart	Year	Graph
0.38	1.20	2.09	6.75	11.2	19.0	Weir	Dashed
0.031	0.244	0.656	3.46	6.95	15.0	Fence	Solid



Sieve Analysis Worksheet

Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	**0.0%**	252.90
0.125	7.6%	174.40
0.25	12.8%	266.10
0.5	20.8%	344.00
1.0	31.1%	569.50
2.0	48.2%	921.90
4.8	75.9%	169.30
5.6	81.0%	390.80
9.5	92.7%	143.8
12.5	97.0%	50.2
16.0	98.5%	49.7
22.0	100.0%	
37.5		
45.0		
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Comparison Grab Sample of Sediment Accumulation in Weir vs in Associtated Silt Fence 2004

SITE NAME: Pike's Peak Highway - Rock Weir

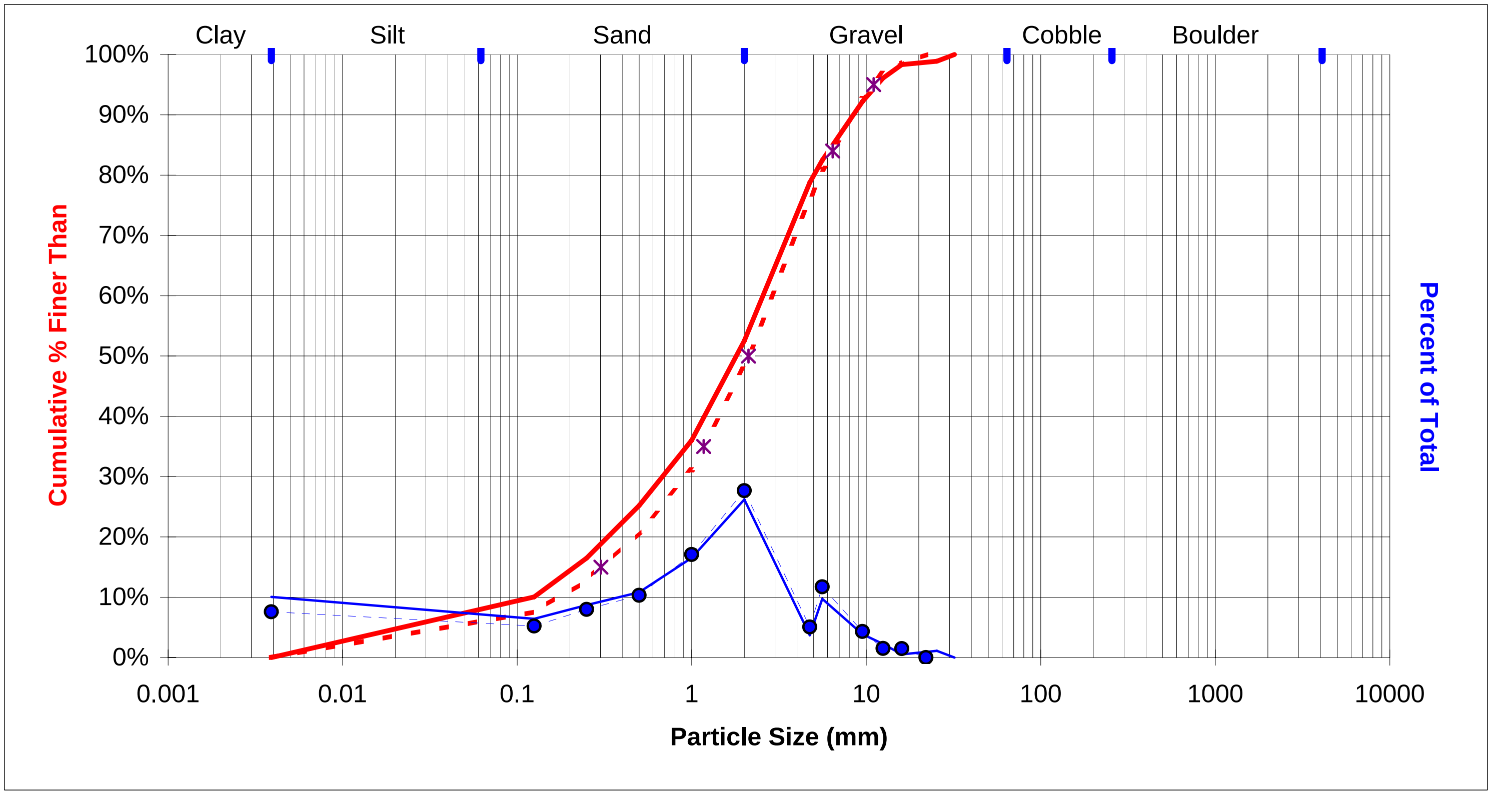
ID NUMBER: 180RW

DATE: 9/17/2004

CREW: lh, kg

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart	Year	Graph
0.30	1.17	2.11	6.43	11.02	19.0	Weir	Dashed
0.21	0.94	1.80	6.09	11.58	32.0	Fence	Solid



Sieve Analysis Worksheet

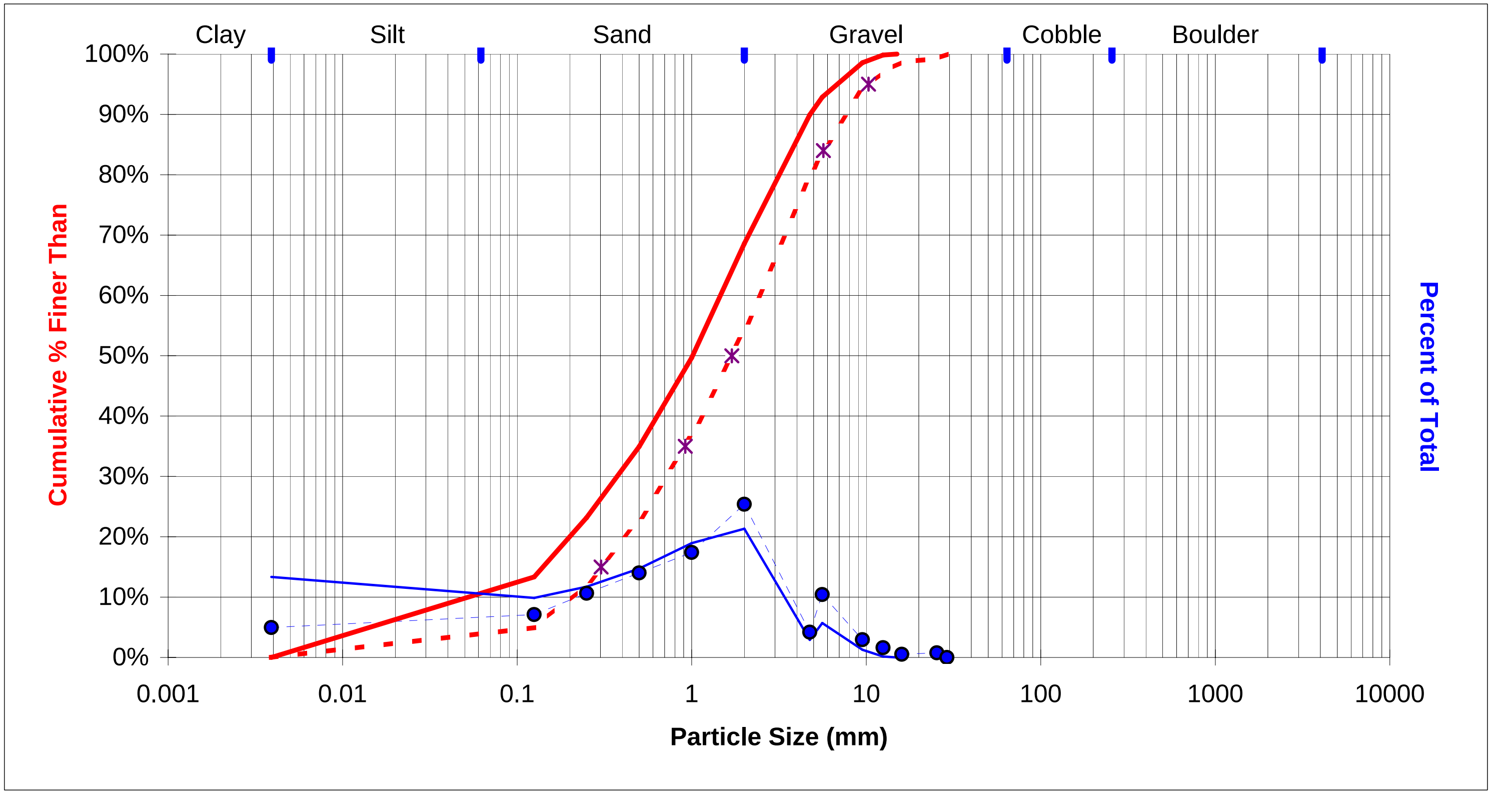
Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	**0.0%**	164.20
0.125	5.0%	234.80
0.25	12.1%	352.00
0.5	22.7%	463.20
1.0	36.7%	575.90
2.0	54.1%	839.80
4.8	79.5%	138.70
5.6	83.7%	344.40
9.5	94.1%	97.20
12.5	97.1%	53.40
16.0	98.7%	17.40
25.4	99.2%	25.7
29.0	100.0%	
45.0		
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Comparison Grab Sample of Sediment Accumulation in Weir vs in Associtated Silt Fence 2004

SITE NAME: Pike's Peak Highway - Rock Weir
ID NUMBER: 200RW
DATE: 9/21/2004
CREW: lh, kg

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart	Year	Graph
0.30	0.92	1.70	5.7	10.3	29.0	Weir	Dashed
0.14	0.50	1.01	3.7	6.8	15.0	Fence	Solid



Sieve Analysis Worksheet

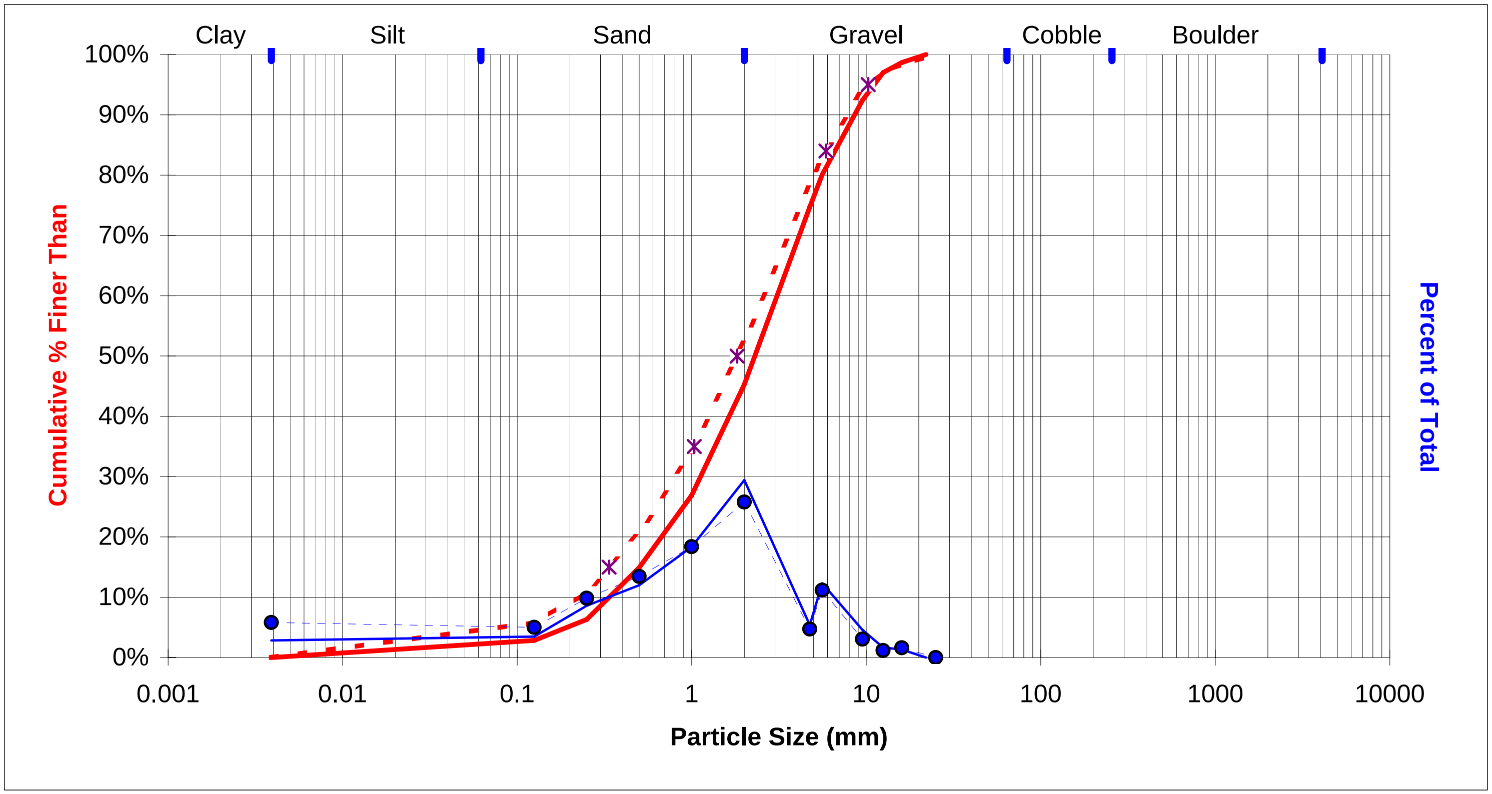
Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	**0.0%**	156.00
0.125	5.8%	134.50
0.25	10.8%	264.40
0.5	20.6%	361.90
1.0	34.1%	494.00
2.0	52.5%	692.90
4.8	78.3%	126.60
5.6	83.0%	300.20
9.5	94.1%	82.00
12.5	97.2%	31.60
16.0	98.4%	43.7
25.0	100.0%	
37.5		
45.0		
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Comparison Grab Sample of Sediment Accumulation in Weir vs in Associtated Silt Fence 2004

SITE NAME: Pike's Peak Highway - Rock Weir
ID NUMBER: 202RW
DATE: 9/17/2004
CREW: lh, kg

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart	Year	Graph
0.34	1.03	1.82	5.88	10.3	25.0	Weir	Dashed
0.50	1.36	2.30	6.63	11.1	22.0	Fence	Solid



Cross Section Geometry for Sediment Pond 199RW 2004

21-May Survey

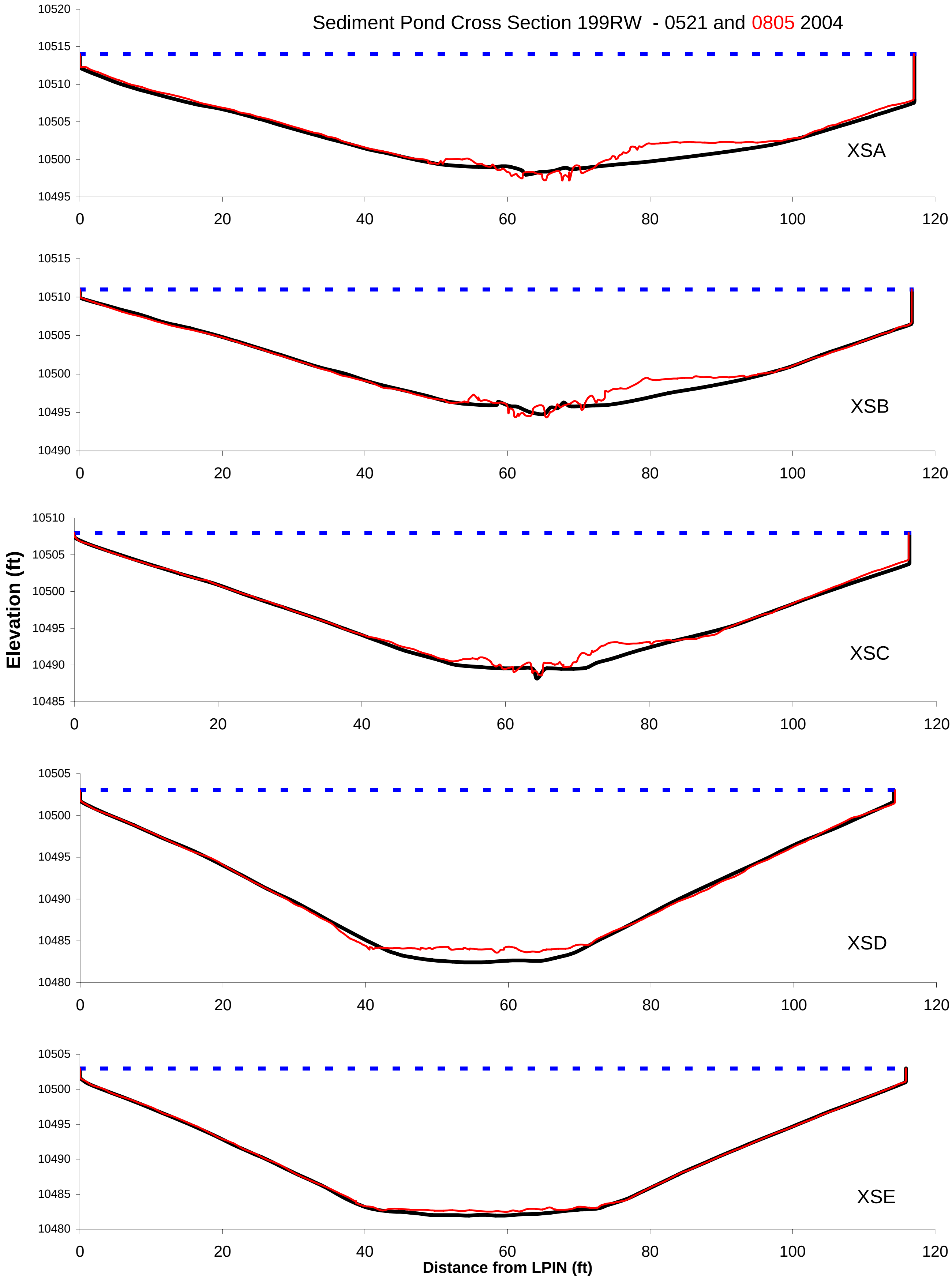
Cross Section	Width (ft)	Cross Sectional Area (ft^2)	Mean Depth (ft)	Maximum Depth (ft)	Wetted Perimeter (ft)	Hydraulic Radius (ft)
A	117.11	1298.63	11.09	16.03	128.35	10.12
B	116.75	1198.79	10.27	16.23	126.56	9.47
C	116.23	1354.01	11.65	19.79	127.46	10.62
D	114.02	1408.30	12.35	20.57	123.89	11.37
E	115.91	1560.65	13.46	21.06	127.04	12.28

5-Aug Survey

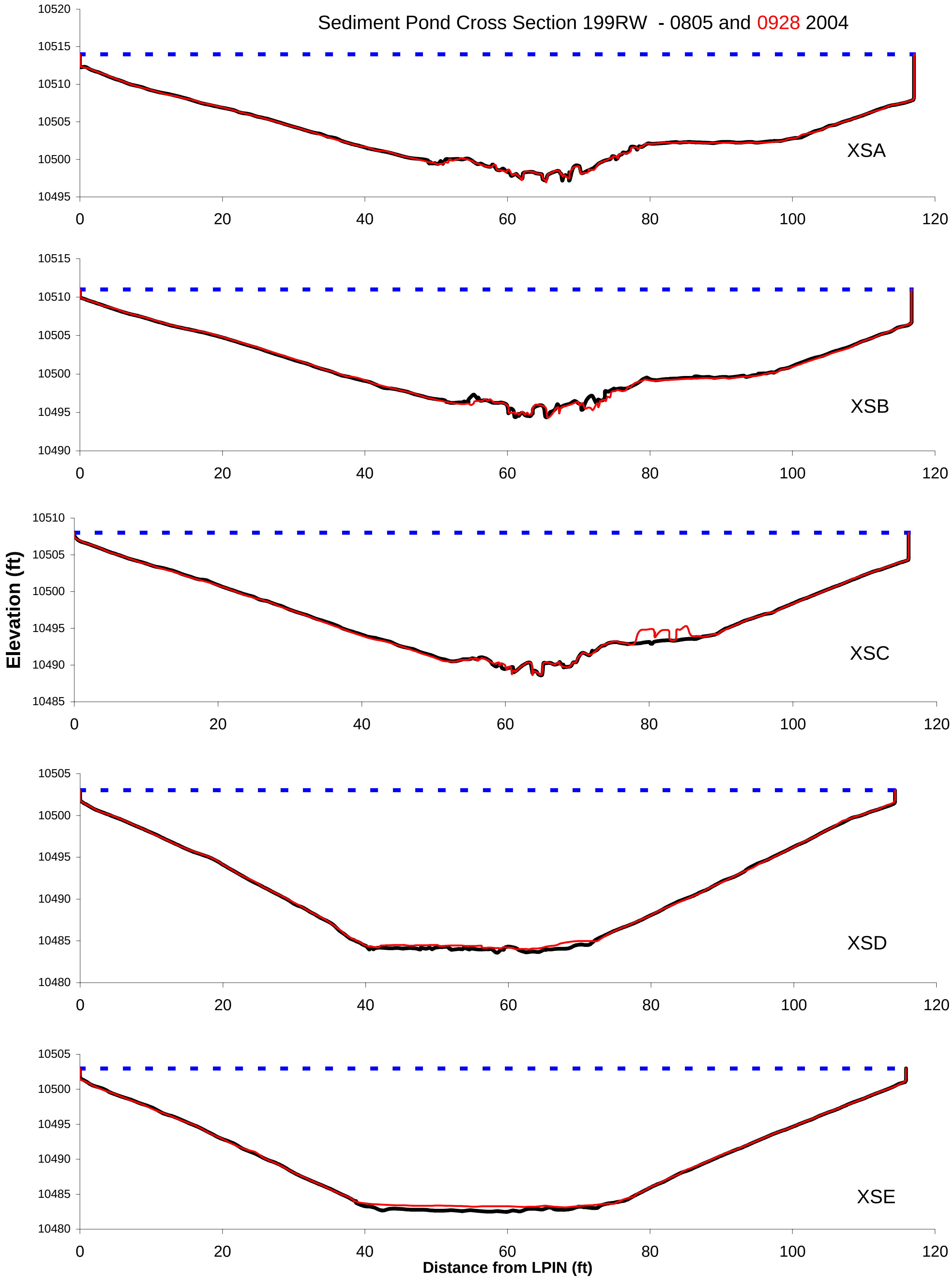
Cross Section	Width (ft)	Cross Sectional Area (ft^2)	Mean Depth (ft)	Maximum Depth (ft)	Wetted Perimeter (ft)	Hydraulic Radius (ft)	Area Difference May-July(ft^2)
A	117.05	1242.40	10.61	16.82	139.34	8.92	56.23
B	116.70	1170.81	10.03	16.56	136.30	8.59	27.98
C	116.08	1317.95	11.35	19.31	132.42	9.95	36.06
D	114.20	1384.31	12.12	19.38	125.56	11.02	23.99
E	115.93	1541.41	13.30	20.52	127.46	12.09	19.24

28-Sep Survey

Cross Section	Width (ft)	Cross Sectional Area (ft^2)	Mean Depth (ft)	Maximum Depth (ft)	Wetted Perimeter (ft)	Hydraulic Radius (ft)	Area Difference July-Sept (ft^2)	Area Difference May-Sept (ft^2)
A	117.04	1244.55	10.63	17.05	136.60	9.11	-2.15	54.09
B	116.69	1176.54	10.08	16.66	134.81	8.73	-5.74	22.24
C	116.10	1311.68	11.30	19.33	140.85	9.31	6.27	42.33
D	114.20	1372.55	12.02	19.04	124.10	11.06	11.76	35.76
E	115.88	1522.44	13.14	19.89	127.18	11.97	18.97	38.21



Sediment Pond Cross Section 199RW - 0521 and 0805 2004
XSA
XSB
XSC
XSD
XSE
Elevation (ft)
Distance from LPIN (ft)
10520
10515
10510
10505
10500
10495
10490
10485
10480
0
20
40
60
80
100
120


Sediment Pond Cross Section 199RW - 0805 and 0928 2004
10520
10515
10510
10505
10500
10495
0
20
40
60
80
100
120
XSA
XSB
10490
XSC
10485
XSD
10480
XSE
Elevation (ft)
Distance from LPIN (ft)

Appendix H

Stream Cross Sections
Cross Section Geometry
Relative Geometry Change 2003 to 2004
and Graphs

2004

Summary of Stream Channel Geometry 2004

Stream	Identifier /Reach	Cross Section	Width (ft)	Cross Sectional Area (ft^2)	Mean Depth (ft)	Maximum Depth (ft)	Wetted Perimeter (ft)	Hydraulic Radius (ft)	Width /Depth Ratio
Boehmer Ck	BHMR1	A	2.4	0.96	0.41	0.63	3.13	0.31	5.82
Boehmer Ck	BHMR1	B	10.6	4.93	0.46	1.19	11.42	0.43	22.86
Boehmer Ck	BHMR1	C	4.4	2.47	0.56	1.65	6.73	0.37	7.93
Boehmer Ck	BHMR1	D	5.0	2.41	0.49	0.91	6.24	0.39	10.20
Boehmer Ck	BHMR1	E	6.2	2.81	0.46	0.95	6.78	0.41	13.55
Boehmer Ck	BHMR2	A	4.3	3.53	0.82	1.23	5.54	0.64	5.29
Boehmer Ck	BHMR2	B	2.8	1.75	0.62	0.80	4.36	0.40	4.52
Boehmer Ck	BHMR2	C	4.5	4.70	1.05	1.87	7.59	0.62	4.30
Boehmer Ck	BHMR2	D	3.1	1.99	0.65	0.92	5.19	0.38	4.72
Boehmer Ck	BHMR2	E	3.8	2.41	0.64	1.05	5.03	0.48	5.88
E.F. Beaver Ck	EBVR1	A	15.7	25.47	1.62	2.13	17.77	1.43	9.65
E.F. Beaver Ck	EBVR1	B	10.9	10.46	0.96	1.54	12.34	0.85	11.38
E.F. Beaver Ck	EBVR1	C	11.3	10.25	0.90	1.40	13.07	0.78	12.53
E.F. Beaver Ck	EBVR1	D	9.7	12.98	1.34	2.15	11.08	1.17	7.22
E.F. Beaver Ck	EBVR1	E	8.5	9.23	1.09	1.71	9.80	0.94	7.76
E.F. Beaver Ck	EBVR2	A	4.0	5.42	1.34	1.78	6.84	0.79	3.00
E.F. Beaver Ck	EBVR2	B	4.4	5.43	1.24	2.22	7.80	0.70	3.54
E.F. Beaver Ck	EBVR2	C	3.3	3.85	1.15	2.01	7.05	0.55	2.91
E.F. Beaver Ck	EBVR2	D	4.7	5.07	1.08	1.62	7.88	0.64	4.36
E.F. Beaver Ck	EBVR2	E	4.6	5.60	1.23	1.82	6.85	0.82	3.71
N. Catamount Ck	NCAT1	A	2.3	1.52	0.65	0.95	3.63	0.42	3.59
N. Catamount Ck	NCAT1	B	2.9	1.63	0.57	0.83	3.89	0.42	5.08
N. Catamount Ck	NCAT1	C	12.5	4.62	0.37	0.95	13.03	0.35	33.77
N. Catamount Ck	NCAT1	D	6.2	3.67	0.59	1.12	7.14	0.51	10.45
N. Catamount Ck	NCAT1	E	4.0	2.74	0.69	1.39	5.44	0.50	5.72
N. Catamount Ck	NCAT2	A	4.2	4.69	1.12	1.41	5.83	0.80	3.72
N. Catamount Ck	NCAT2	B	3.2	2.06	0.65	0.79	4.17	0.49	4.89
N. Catamount Ck	NCAT2	C	4.0	3.31	0.83	1.46	6.33	0.52	4.75
N. Catamount Ck	NCAT2	D	3.3	3.23	0.98	1.27	5.14	0.63	3.37
N. Catamount Ck	NCAT2	E	2.9	2.47	0.86	1.38	4.45	0.56	3.33
N.F. Crystal Ck	NCRY1	Al	25.3	9.19	0.36	0.76	25.41	0.36	69.50
N.F. Crystal Ck	NCRY1	Ar	9.5	4.59	0.48	1.02	10.45	0.44	19.73
N.F. Crystal Ck	NCRY1	Bl	25.6	9.58	0.37	0.65	25.79	0.37	68.63
N.F. Crystal Ck	NCRY1	Br	10.8	1.94	0.18	0.39	10.94	0.18	60.37
N.F. Crystal Ck	NCRY1	Cl	21.4	9.14	0.43	0.82	21.65	0.42	50.31
N.F. Crystal Ck	NCRY1	Cr	15.0	3.84	0.26	0.60	15.27	0.25	58.40
N.F. Crystal Ck	NCRY1	D	22.6	12.43	0.55	1.18	23.18	0.54	41.23
N.F. Crystal Ck	NCRY1	E	31.5	13.12	0.42	0.79	31.94	0.41	75.47
N.F. Crystal Ck	NCRY2	A	10.0	11.11	1.1	1.6	10.80	1.03	9.01
N.F. Crystal Ck	NCRY2	B	10.2	9.94	1.0	1.5	11.23	0.88	10.40
N.F. Crystal Ck	NCRY2	C	22.4	9.23	0.4	0.9	22.85	0.40	54.14
N.F. Crystal Ck	NCRY2	D	19.6	12.57	0.6	1.7	20.54	0.61	30.58
N.F. Crystal Ck	NCRY2	E	29.2	13.47	0.5	1.2	30.29	0.44	63.41
Oil Ck	OILC1	A	5.7	5.15	0.9	1.6	7.60	0.68	6.31
Oil Ck	OILC1	B	5.4	3.94	0.7	1.0	6.63	0.59	7.35
Oil Ck	OILC1	C	4.0	4.14	1.0	1.4	5.76	0.72	3.97
Oil Ck	OILC1	D	9.2	8.54	0.9	1.6	10.78	0.79	10.00
Oil Ck	OILC1	E	8.0	5.67	0.7	1.2	8.87	0.64	11.39

Summary of Stream Channel Geometry 2004

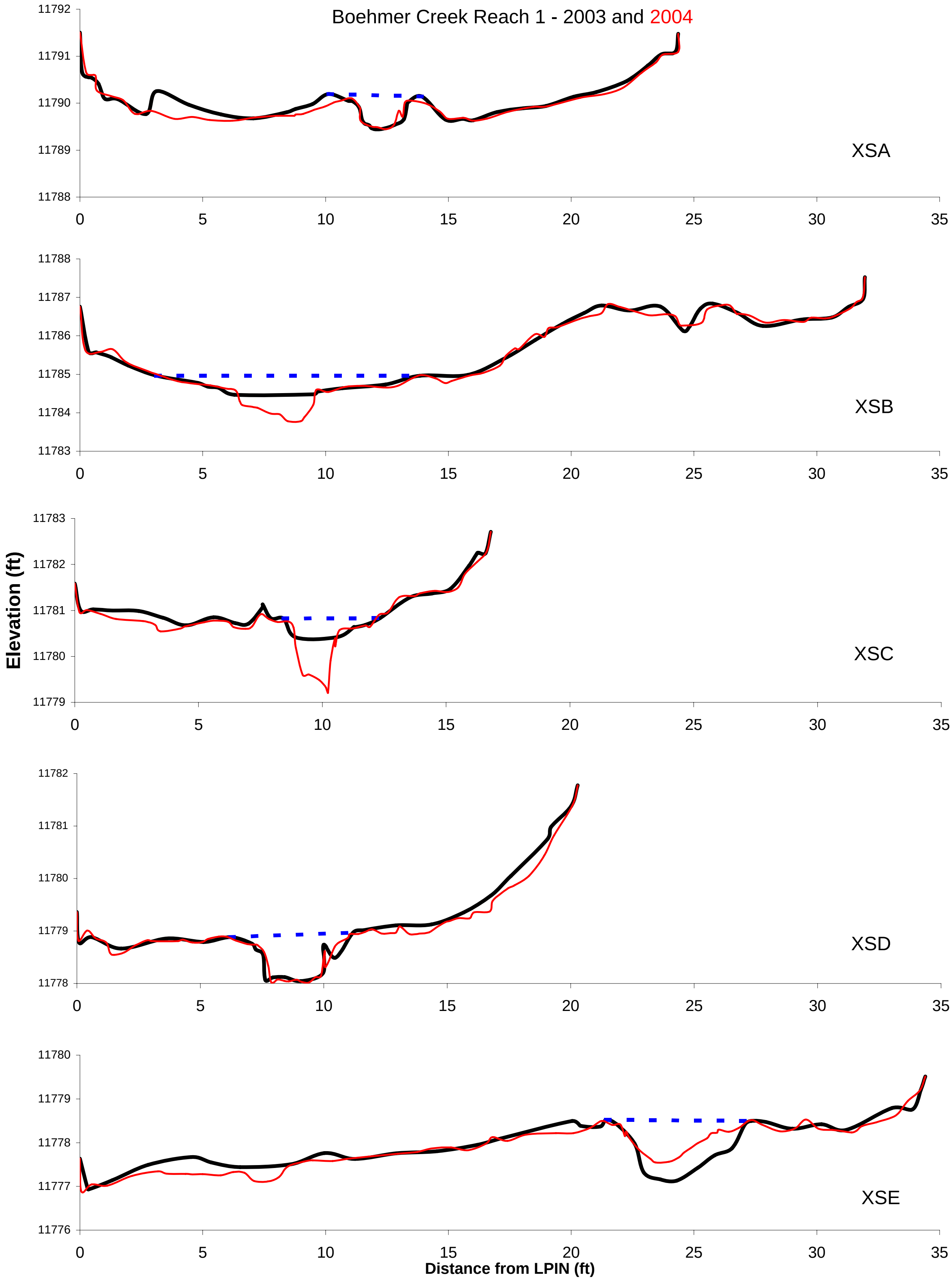
Stream	Identifier /Reach	Cross Section	Width (ft)	Cross Sectional Area (ft^2)	Mean Depth (ft)	Maximum Depth (ft)	Wetted Perimeter (ft)	Hydraulic Radius (ft)	Width /Depth Ratio
Severy Ck	SVRY1	A	4.2	4.90	1.2	1.7	6.41	0.76	3.59
Severy Ck	SVRY1	B	3.7	3.79	1.0	1.5	5.85	0.65	3.69
Severy Ck	SVRY1	C	3.1	3.31	1.1	1.6	5.52	0.60	2.98
Severy Ck	SVRY1	D	4.6	5.03	1.1	1.7	6.75	0.74	4.27
Severy Ck	SVRY1	E	3.7	3.49	0.9	1.6	5.47	0.64	4.01
Severy Ck	SVRY2	A	17.7	53.80	3.0	4.0	23.31	2.31	5.80
Severy Ck	SVRY2	B	23.2	88.84	3.8	5.3	30.22	2.94	6.08
Severy Ck	SVRY2	C	25.5	53.54	2.1	3.5	30.31	1.77	12.19
Severy Ck	SVRY2	D	16.2	39.64	2.4	4.1	20.83	1.90	6.63
Severy Ck	SVRY2	E	20.9	32.48	1.6	2.7	23.85	1.36	13.47
Ski Ck	SKIC1	A	10.0	8.03	0.8	1.4	11.81	0.68	12.48
Ski Ck	SKIC1	B	5.4	6.31	1.2	1.5	7.80	0.81	4.55
Ski Ck	SKIC1	C	11.9	6.44	0.5	1.0	12.48	0.52	22.13
Ski Ck	SKIC1	D	16.9	6.46	0.4	1.0	17.63	0.37	44.04
Ski Ck	SKIC1	E	13.6	9.64	0.7	1.5	15.09	0.64	19.18
Ski Ck	SKIC1,FS	FS	9.9	21.77	2.2	3.0	13.14	1.66	4.46
Ski Ck	SKIC2	A	13.8	16.66	1.2	2.6	16.18	1.03	11.40
Ski Ck	SKIC2	B	15.5	12.42	0.8	1.8	17.53	0.71	19.30
Ski Ck	SKIC2	C	8.3	17.21	2.1	2.7	11.74	1.47	4.01
Ski Ck	SKIC2	D	11.8	16.85	1.4	3.7	18.47	0.91	8.21
Ski Ck	SKIC2	E	6.3	12.90	2.0	3.3	11.44	1.13	3.08
S. Catamount Ck	SCAT1	A	6.1	5.51	0.9	1.4	7.44	0.74	6.79
S. Catamount Ck	SCAT1	B	7.6	7.96	1.0	1.8	9.59	0.83	7.25
S. Catamount Ck	SCAT1	C	9.0	12.18	1.4	2.0	10.89	1.12	6.60
S. Catamount Ck	SCAT1	D	5.6	4.12	0.7	1.1	6.92	0.60	7.71
S. Catamount Ck	SCAT1	E	7.7	9.07	1.2	1.6	9.22	0.98	6.54
S. Catamount Ck	SCAT2	A	10.7	12.79	1.2	1.6	12.15	1.05	9.03
S. Catamount Ck	SCAT2	B	8.3	7.76	0.9	1.5	10.02	0.77	8.94
S. Catamount Ck	SCAT2	C	11.8	7.74	0.7	1.0	12.22	0.63	18.04
S. Catamount Ck	SCAT2	D	10.6	10.88	1.0	1.6	11.91	0.91	10.31
S. Catamount Ck	SCAT2	E	8.4	9.03	1.1	1.5	10.01	0.90	7.90
W.F. Beaver Ck	WBVR1	A	14.6	32.98	2.3	3.6	22.79	1.45	6.45
W.F. Beaver Ck	WBVR1	B	11.7	21.60	1.8	2.7	16.15	1.34	6.33
W.F. Beaver Ck	WBVR1	C	13.7	29.57	2.2	3.1	22.12	1.34	6.39
W.F. Beaver Ck	WBVR1	D	22.2	40.83	1.8	3.4	28.26	1.44	12.11
W.F. Beaver Ck	WBVR1	E	13.6	27.29	2.0	2.7	16.73	1.63	6.82
W.F. Beaver Ck	WBVR2	A	28.8	91.73	3.2	5.6	33.08	2.77	9.03
W.F. Beaver Ck	WBVR2	B	34.4	89.88	2.6	5.4	37.50	2.40	13.19
W.F. Beaver Ck	WBVR2	C	39.2	104.83	2.7	4.8	43.23	2.42	14.69
W.F. Beaver Ck	WBVR2	D	56.1	119.69	2.1	4.0	58.75	2.04	26.27
W.F. Beaver Ck	WBVR2	E	43.2	90.05	2.1	4.5	46.50	1.94	20.68

Relative Change in Stream Channel Geometry Between 2003 and 2004

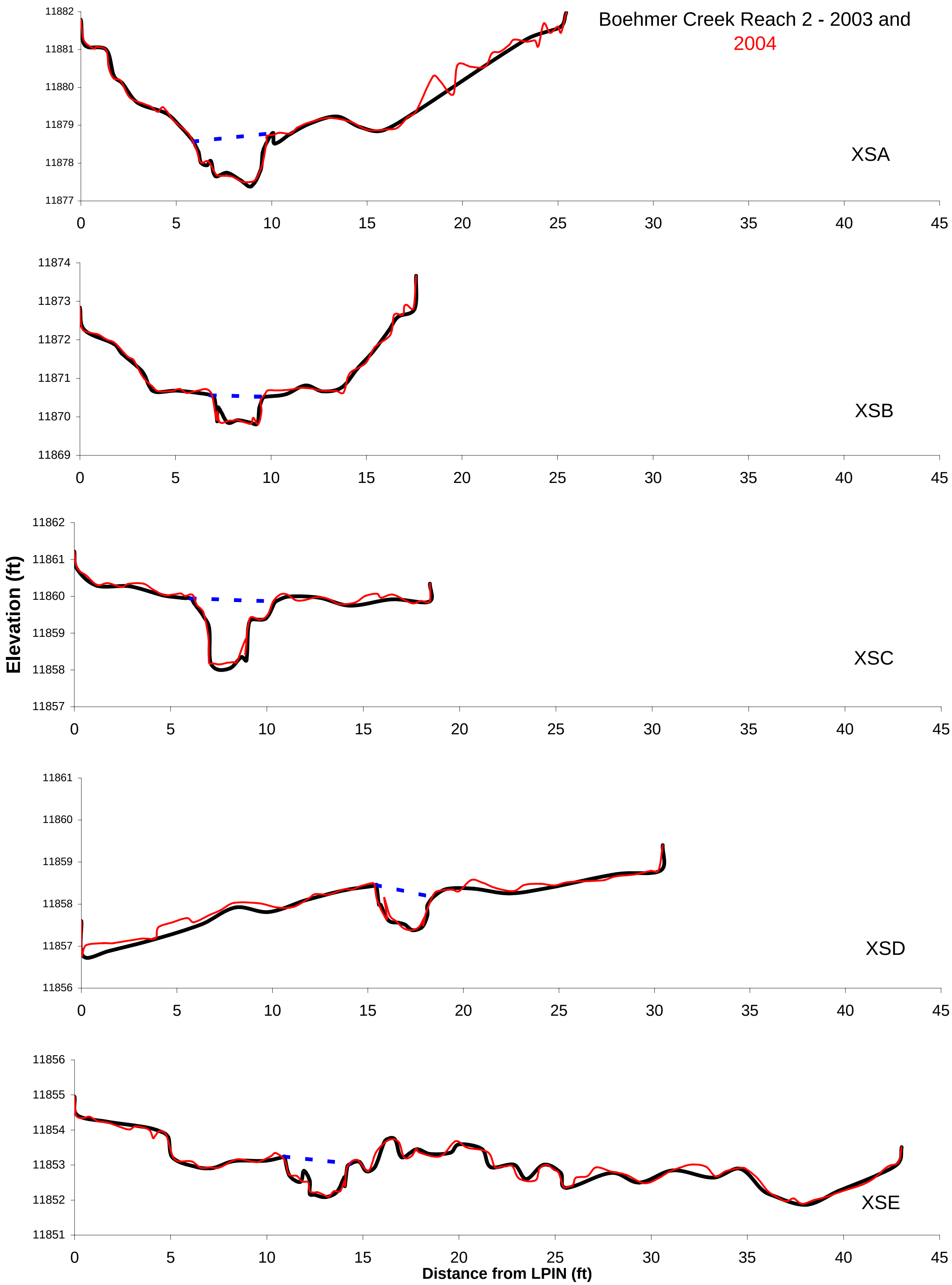
Stream	Identifier /Reach	Cross Section	Width (ft)	Cross Sectional Area (ft^2)	Mean Depth (ft)	Maximum Depth (ft)	Wetted Perimeter (ft)	Hydraulic Radius (ft)	Width /Depth Ratio
Boehmer Ck	BHMR1	A	0.38	0.29	-0.14	0.13	0.28	0.02	0.45
Boehmer Ck	BHMR1	B	0.01						
Boehmer Ck	BHMR1	C	-0.13						
Boehmer Ck	BHMR1	D	0.00	0.04	0.03	-0.02	-0.01	0.05	-0.03
Boehmer Ck	BHMR1	E	-0.05	0.41	0.43	0.31	0.00	0.41	-0.84
Boehmer Ck	BHMR2	A	-0.04	-0.05	-0.01	0.09	0.00	-0.04	-0.02
Boehmer Ck	BHMR2	B	0.01	-0.20	-0.21	-0.15	-0.03	-0.17	0.18
Boehmer Ck	BHMR2	C	-0.02	-0.06	-0.04	0.01	-0.12	0.05	0.02
Boehmer Ck	BHMR2	D	-0.04	-0.02	0.02	-0.03	-0.34	0.24	-0.06
Boehmer Ck	BHMR2	E	-0.10	-0.03	0.07	-0.01	0.06	-0.09	-0.18
E.F. Beaver Ck	EBVR1	A	0.00	0.02	0.02	0.10	0.01	0.01	-0.03
E.F. Beaver Ck	EBVR1	B	-0.03	0.05	0.08	-0.02	-0.03	0.08	-0.11
E.F. Beaver Ck	EBVR1	C	-0.01	0.04	0.05	-0.07	-0.03	0.06	-0.06
E.F. Beaver Ck	EBVR1	D	-0.01	0.00	0.01	0.11	0.03	-0.03	-0.03
E.F. Beaver Ck	EBVR1	E	-0.01	-0.03	-0.02	-0.06	-0.02	-0.01	0.01
E.F. Beaver Ck	EBVR2	A	-0.03	0.06	0.08	0.07	0.12	-0.07	-0.12
E.F. Beaver Ck	EBVR2	B	0.03	0.20	0.17	0.23	0.09	0.12	-0.17
E.F. Beaver Ck	EBVR2	C	0.00	0.05	0.05	0.16	-0.04	0.09	-0.06
E.F. Beaver Ck	EBVR2	D	0.01	0.16	0.15	0.13	0.11	0.05	-0.17
E.F. Beaver Ck	EBVR2	E	0.00	0.17	0.17	0.20	0.16	0.00	-0.20
N. Catamount Ck	NCAT1	A	-0.09	-0.08	0.01	0.09	-0.06	-0.02	-0.11
N. Catamount Ck	NCAT1	B	0.08	0.29	0.23	0.13	0.07	0.24	-0.20
N. Catamount Ck	NCAT1	C	-0.14	-0.32	-0.16	-0.15	-0.12	-0.17	0.01
N. Catamount Ck	NCAT1	D	0.05	0.23	0.19	-0.03	0.01	0.22	-0.17
N. Catamount Ck	NCAT1	E	-0.12	-0.07	0.05	-0.06	-0.13	0.06	-0.17
N. Catamount Ck	NCAT2	A	0.01	0.00	-0.01	-0.01	-0.01	0.01	0.01
N. Catamount Ck	NCAT2	B	-0.02	-0.08	-0.06	-0.14	-0.04	-0.04	0.04
N. Catamount Ck	NCAT2	C	-0.02	-0.01	0.01	-0.17	-0.19	0.15	-0.03
N. Catamount Ck	NCAT2	D	0.00	-0.02	-0.02	-0.02	0.03	-0.05	0.01
N. Catamount Ck	NCAT2	E	-0.05	-0.10	-0.05	-0.07	0.02	-0.13	0.00
N.F. Crystal Ck	NCRY1	Al	0.01	-0.13	-0.14	0.05	0.01	-0.14	0.13
N.F. Crystal Ck	NCRY1	Ar	0.09	-0.16	-0.28	-0.77	0.03	-0.19	0.29
N.F. Crystal Ck	NCRY1	Bl	-0.03	0.00	0.03	0.03	-0.03	0.03	-0.07
N.F. Crystal Ck	NCRY1	Br	-0.10	-0.37	-0.24	-0.69	-0.11	-0.24	0.11
N.F. Crystal Ck	NCRY1	Cl	0.01	0.04	0.03	0.07	0.01	0.03	-0.03
N.F. Crystal Ck	NCRY1	Cr	-0.01	0.03	0.03	0.15	0.00	0.03	-0.04
N.F. Crystal Ck	NCRY1	D	-0.01	0.13	0.14	0.15	0.00	0.13	-0.18
N.F. Crystal Ck	NCRY1	E	-0.03	-0.15	-0.12	0.13	-0.02	-0.13	0.08
N.F. Crystal Ck	NCRY2	A	-0.02	0.01	0.03	0.12	0.01	0.00	-0.05
N.F. Crystal Ck	NCRY2	B	-0.06	0.08	0.13	0.18	-0.03	0.11	-0.22
N.F. Crystal Ck	NCRY2	C	0.00	0.22	0.22	0.30	0.01	0.21	-0.28
N.F. Crystal Ck	NCRY2	D	0.01	-0.07	-0.08	-0.06	0.01	-0.08	0.09
N.F. Crystal Ck	NCRY2	E	0.01	-0.07	-0.08	-0.04	0.00	-0.07	0.09
Oil Ck	OILC1	A	-0.01	0.05	0.06	-0.02	-0.02	0.06	-0.07
Oil Ck	OILC1	B	0.03	-0.04	-0.07	-0.10	0.04	-0.08	0.10
Oil Ck	OILC1	C	0.01	0.06	0.04	-0.02	0.09	-0.04	-0.03
Oil Ck	OILC1	D	-0.01	-0.04	-0.03	-0.03	-0.07	0.03	0.02
Oil Ck	OILC1	E	0.00	-0.12	-0.12	-0.13	-0.01	-0.11	0.11

Relative Change in Stream Channel Geometry Between 2003 and 2004

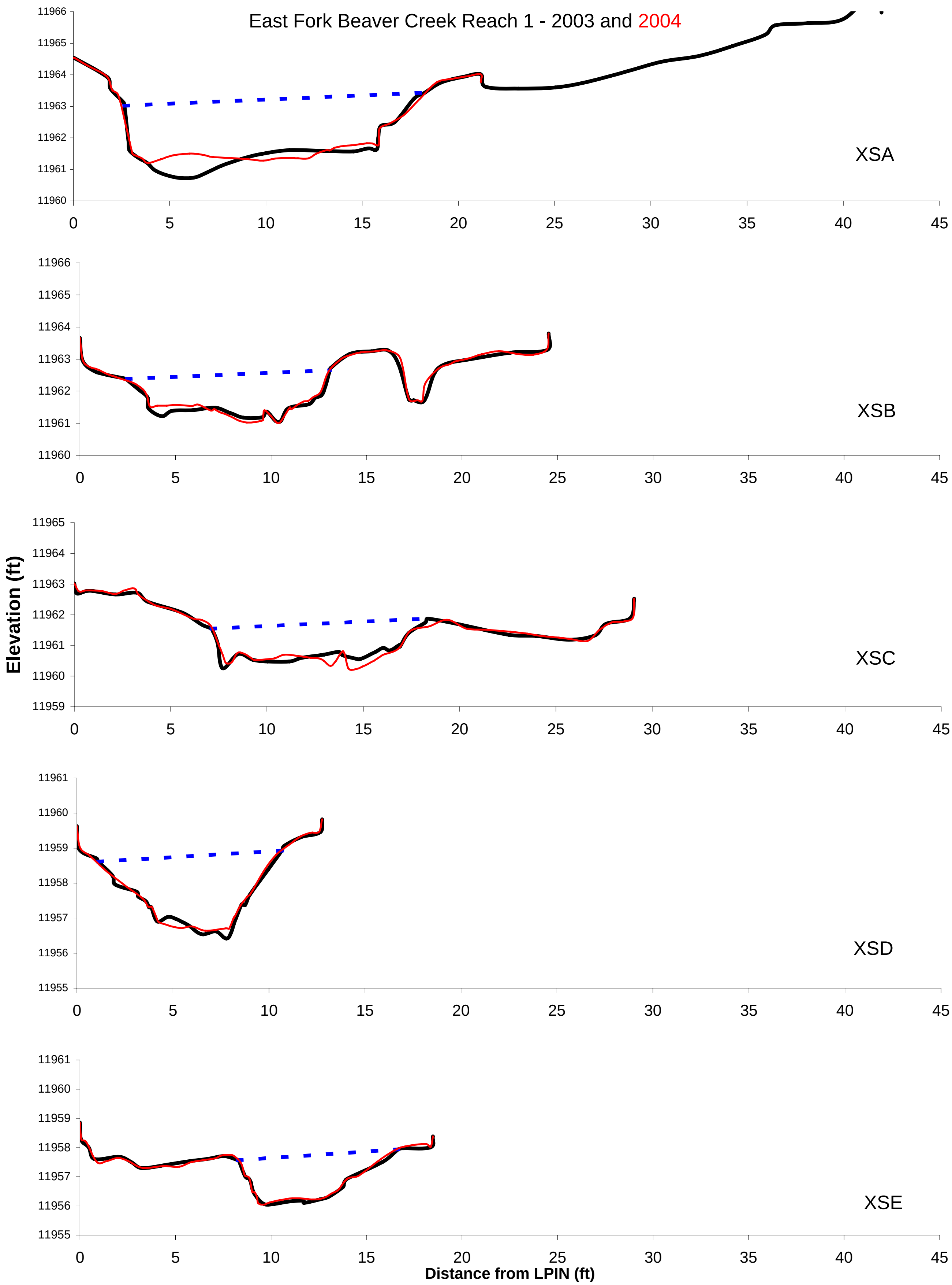
Stream	Identifier /Reach	Cross Section	Width (ft)	Cross Sectional Area (ft^2)	Mean Depth (ft)	Maximum Depth (ft)	Wetted Perimeter (ft)	Hydraulic Radius (ft)	Width /Depth Ratio
Severy Ck	SVRY1	A	0.02	-0.03	-0.06	-0.12	-0.08	0.05	0.08
Severy Ck	SVRY1	B	-0.01	0.06	0.07	0.10	0.17	-0.13	-0.09
Severy Ck	SVRY1	C	-0.16	-0.19	-0.03	-0.12	0.06	-0.27	-0.12
Severy Ck	SVRY1	D	-0.04	-0.06	-0.02	-0.06	0.10	-0.17	-0.02
Severy Ck	SVRY1	E	-0.03	-0.01	0.01	-0.11	0.04	-0.06	-0.04
Severy Ck	SVRY2	A	0.34	0.28	-0.09	0.17	0.23	0.06	0.39
Severy Ck	SVRY2	B	0.17	-0.01	-0.21	0.05	0.08	-0.10	0.32
Severy Ck	SVRY2	C	-0.23	-0.36	-0.10	0.19	-0.14	-0.19	-0.12
Severy Ck	SVRY2	D	-0.10	-1.40	-1.18	-1.07	-0.28	-0.88	0.49
Severy Ck	SVRY2	E	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
Ski Ck	SKIC1	A	-0.02	-0.04	-0.01	0.02	-0.06	0.02	-0.01
Ski Ck	SKIC1	B	-0.05	-0.05	0.00	0.01	-0.11	0.05	-0.05
Ski Ck	SKIC1	C	0.03	0.27	0.24	0.23	0.11	0.17	-0.27
Ski Ck	SKIC1	D	0.02	0.18	0.16	-0.23	0.00	0.17	-0.17
Ski Ck	SKIC1	E	0.00	0.09	0.09	0.22	0.02	0.07	-0.09
Ski Ck	SKIC1,FS	FS	-0.01	-0.04	-0.03	-0.05	-0.03	0.00	0.02
Ski Ck	SKIC2	A	0.01	0.08	0.08	-0.04	-0.03	0.10	-0.08
Ski Ck	SKIC2	B	0.02	0.17	0.15	0.06	-0.02	0.19	-0.15
Ski Ck	SKIC2	C	-0.01	-0.08	-0.07	-0.09	-0.05	-0.03	0.05
Ski Ck	SKIC2	D	0.00	-0.12	-0.12	-0.29	-0.20	0.07	0.11
Ski Ck	SKIC2	E	0.03	-0.28	-0.32	-0.16	-0.07	-0.19	0.26
S. Catamount Ck	SCAT1	A	-0.01	-0.10	-0.09	-0.10	-0.04	-0.06	0.08
S. Catamount Ck	SCAT1	B	-0.01	-0.14	-0.13	-0.13	0.07	-0.23	0.10
S. Catamount Ck	SCAT1	C	0.02	-0.18	-0.20	-0.17	-0.05	-0.12	0.18
S. Catamount Ck	SCAT1	D	0.06	0.19	0.14	0.18	0.07	0.13	-0.10
S. Catamount Ck	SCAT1	E	-0.04	0.02	0.05	0.11	-0.03	0.04	-0.10
S. Catamount Ck	SCAT2	A	0.02	-0.04	-0.05	-0.01	0.06	-0.10	0.07
S. Catamount Ck	SCAT2	B	-0.04	-0.12	-0.08	-0.12	-0.13	0.00	0.04
S. Catamount Ck	SCAT2	C	-0.03	-0.10	-0.07	-0.07	-0.03	-0.07	0.04
S. Catamount Ck	SCAT2	D	-0.03	0.02	0.05	0.07	-0.02	0.05	-0.09
S. Catamount Ck	SCAT2	E	0.04	0.05	0.01	0.03	0.00	0.05	0.03
W.F. Beaver Ck	WBVR1	A	-0.01	0.01	0.02	0.00	-0.10	0.10	-0.04
W.F. Beaver Ck	WBVR1	B	-0.01	-0.01	0.00	-0.01	-0.07	0.06	0.00
W.F. Beaver Ck	WBVR1	C	-0.02	-0.05	-0.02	0.00	-0.04	-0.01	0.00
W.F. Beaver Ck	WBVR1	D	0.00	-0.01	-0.01	-0.02	0.00	-0.01	0.02
W.F. Beaver Ck	WBVR1	E	0.01	0.00	-0.01	-0.02	-0.04	0.05	0.02
W.F. Beaver Ck	WBVR2	A	0.00	0.02	0.02	-0.01	0.05	-0.03	-0.02
W.F. Beaver Ck	WBVR2	B	-0.03	0.04	0.06	0.02	-0.03	0.06	-0.10
W.F. Beaver Ck	WBVR2	C	0.02	0.08	0.06	0.18	0.03	0.05	-0.04
W.F. Beaver Ck	WBVR2	D	-0.03	-0.03	0.00	-0.03	-0.03	0.00	-0.03
W.F. Beaver Ck	WBVR2	E	0.01	0.00	-0.01	0.01	-0.01	0.01	0.01

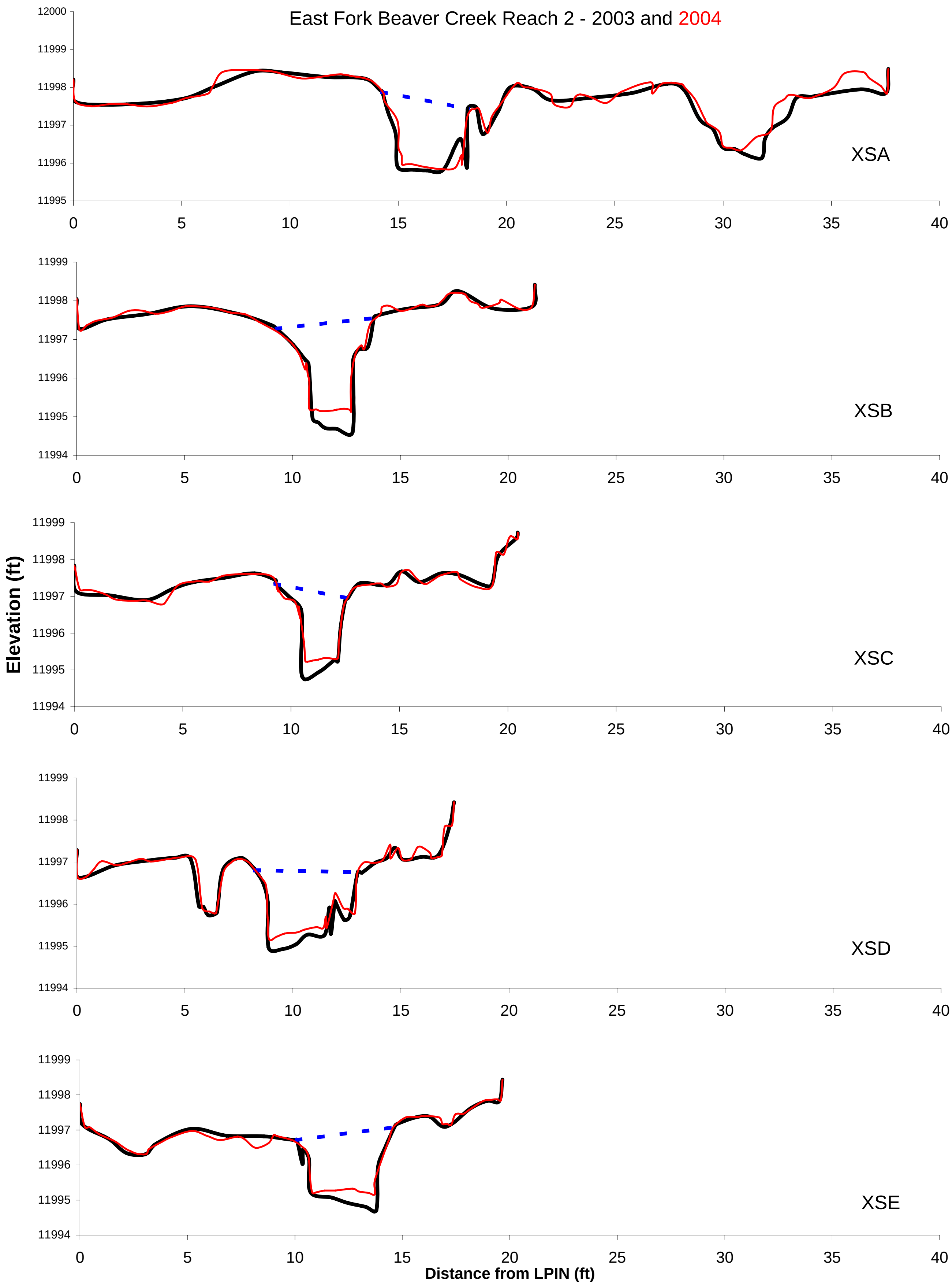


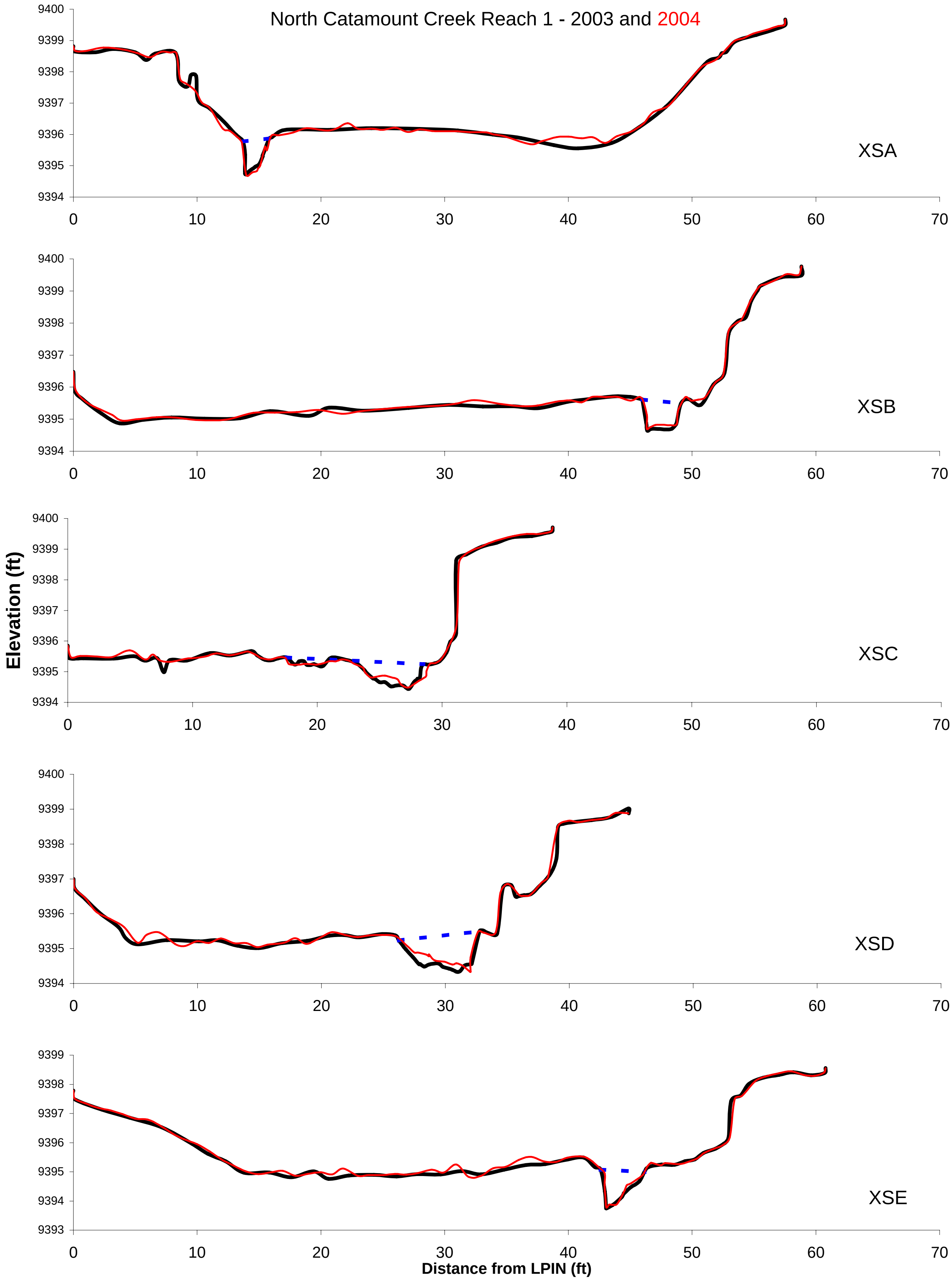
Boehmer Creek Reach 1 - 2003 and 2004
XSA
XSB
XSC
XSD
XSE
Elevation (ft)
Distance from LPIN (ft)
11792
11791
11790
11789
11788
11787
11786
11785
11784
11783
11782
11781
11780
11779
11778
11777
11776
0
5
10
15
20
25
30
35

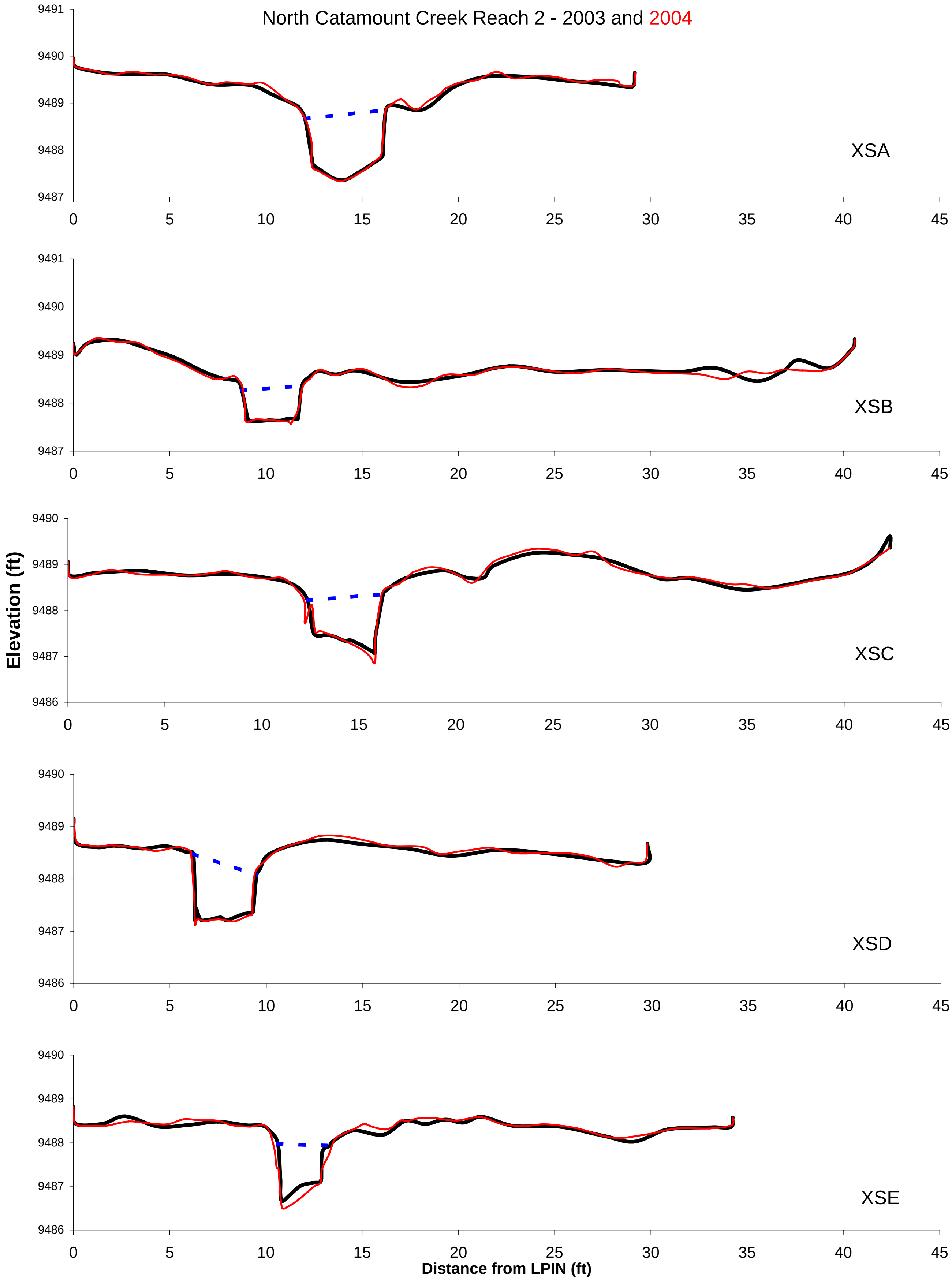


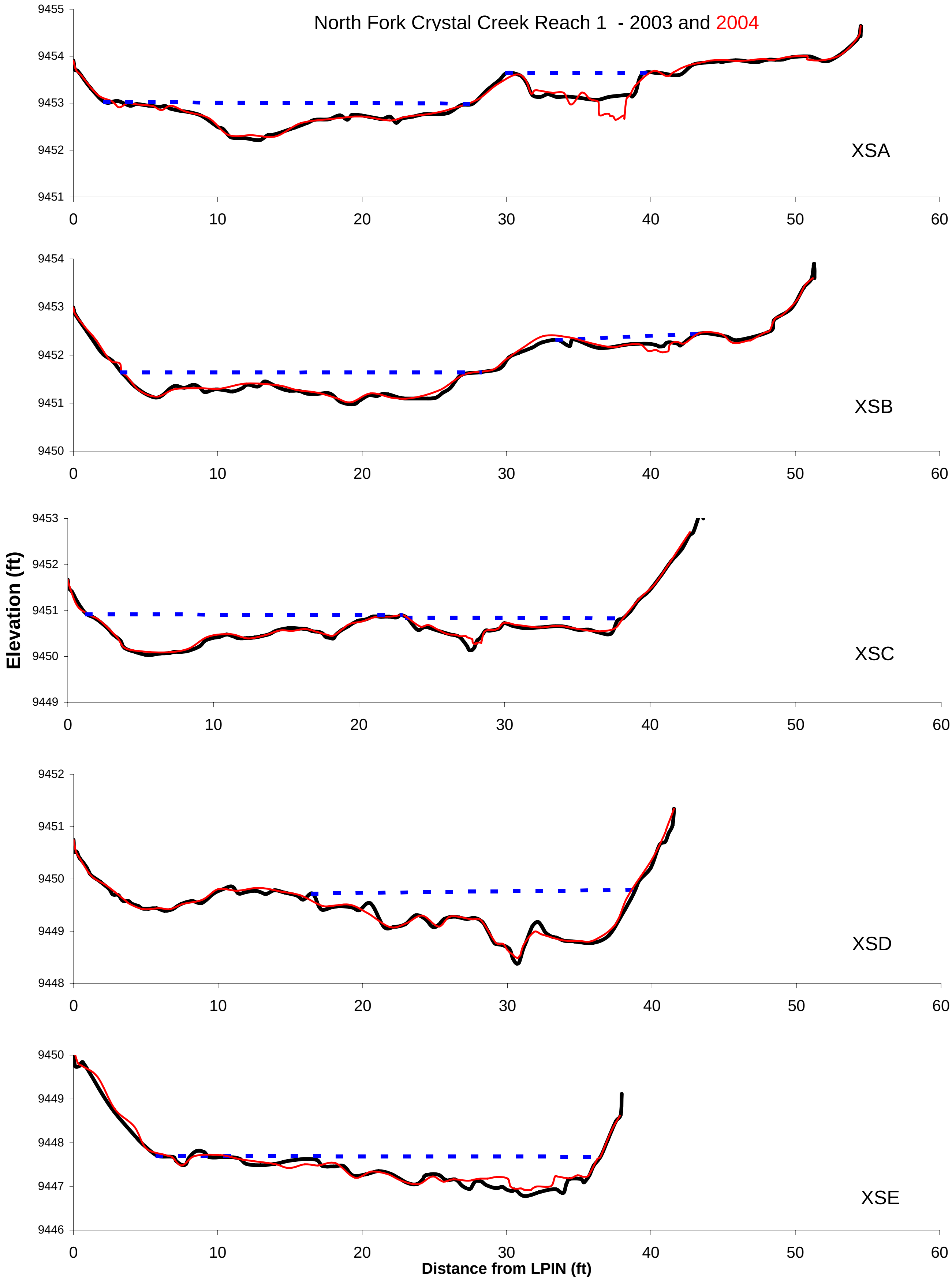
Boehmer Creek Reach 2 - 2003 and
2004
XSA
XSB
XSC
XSD
XSE
Elevation (ft)
Distance from LPIN (ft)


East Fork Beaver Creek Reach 1 - 2003 and 2004
XSA
XSB
XSC
XSD
XSE
Elevation (ft)
Distance from LPIN (ft)
11966
11965
11964
11963
11962
11961
11960
11959
11958
11957
11956
11955
0
5
10
15
20
25
30
35
40
45

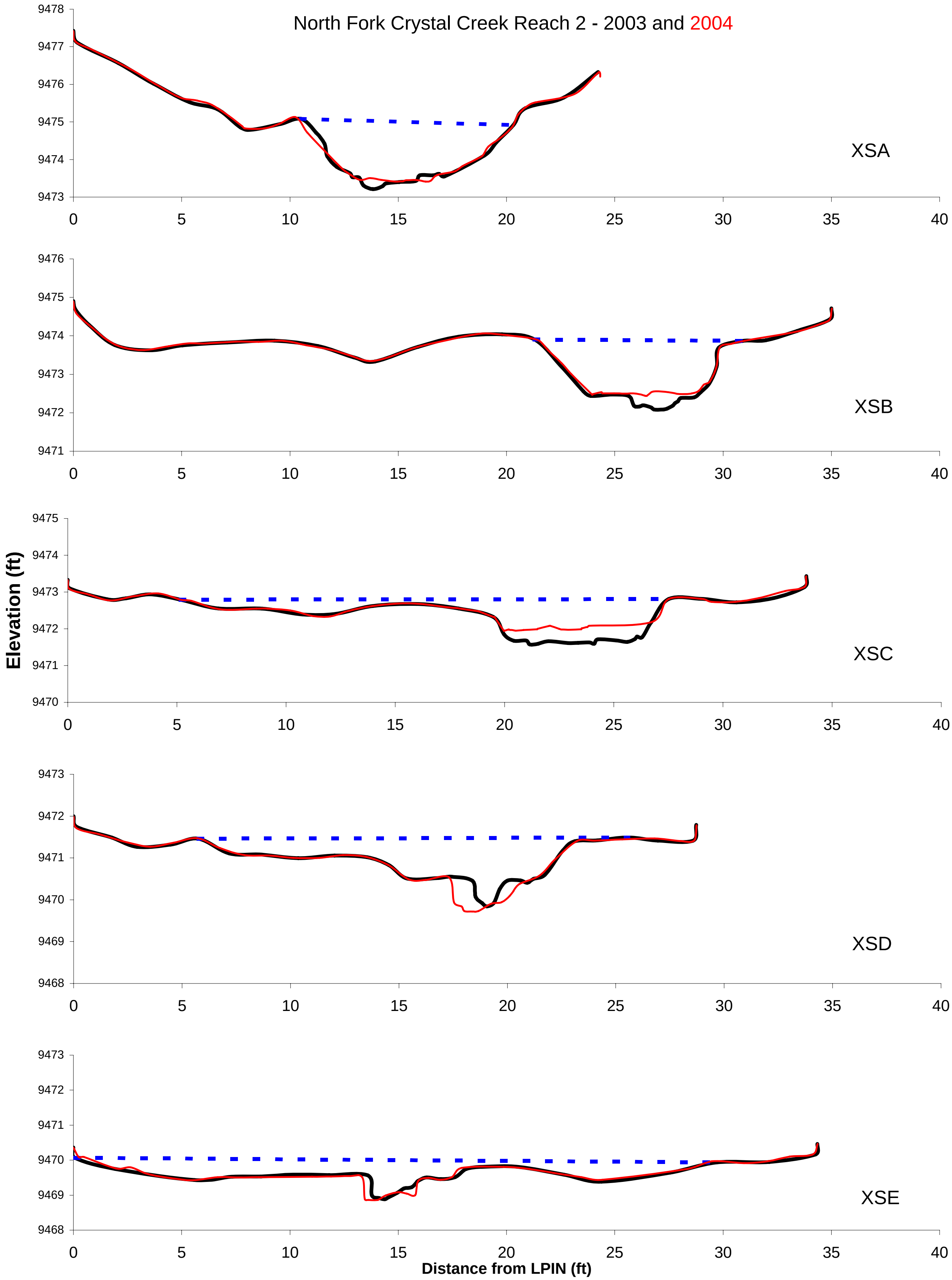

East Fork Beaver Creek Reach 2 - 2003 and 2004
XSA
XSB
XSC
XSD
XSE
Elevation (ft)
Distance from LPIN (ft)
12000
11999
11998
11997
11996
11995
11994
0
5
10
15
20
25
30
35
40

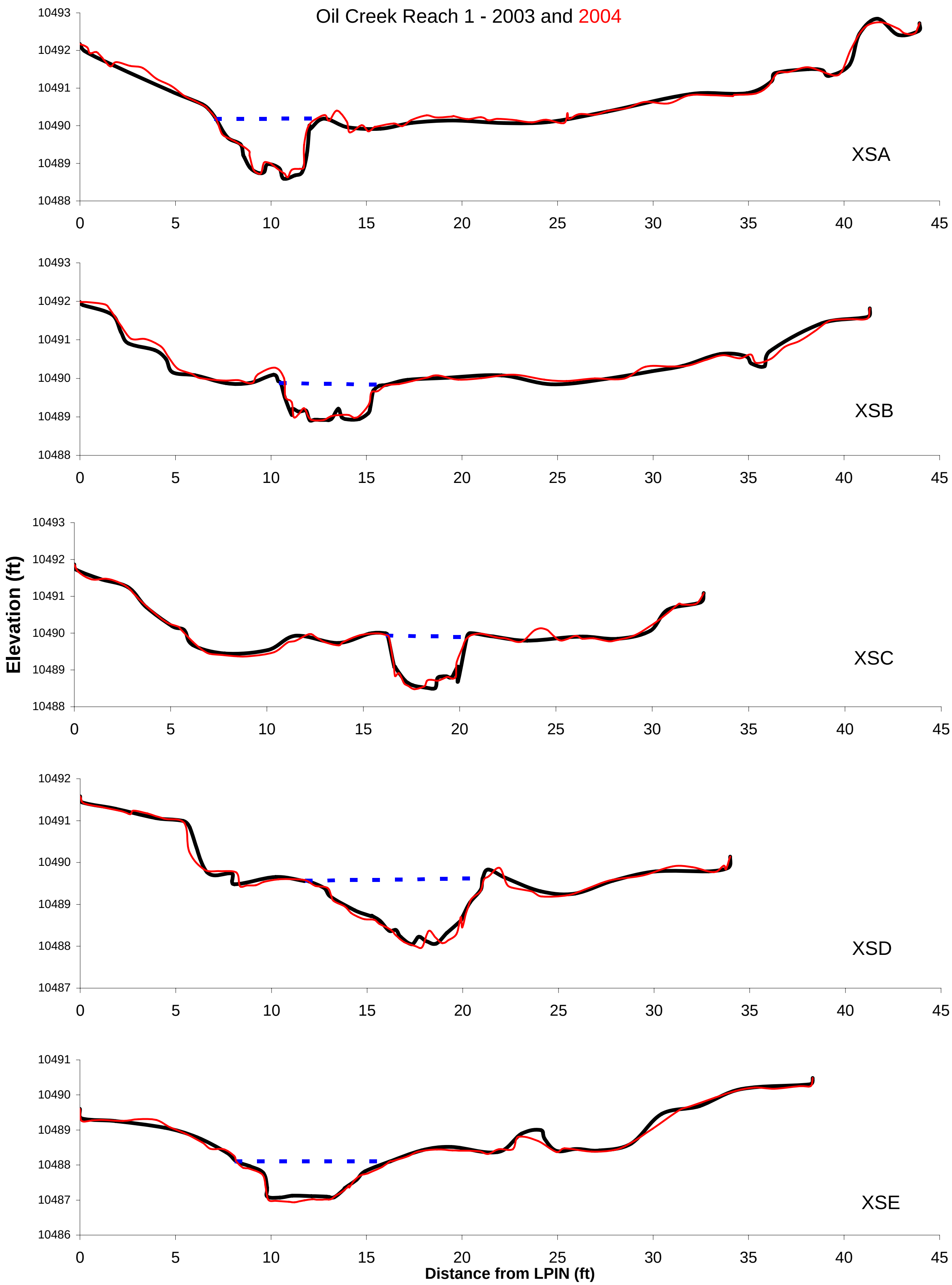

North Catamount Creek Reach 1 - 2003 and 2004
Elevation (ft)
Distance from LPIN (ft)
XSA
XSB
XSC
XSD
XSE
9400
9399
9398
9397
9396
9395
9394
9393
0
10
20
30
40
50
60
70


North Catamount Creek Reach 2 - 2003 and 2004
XSA
XSB
XSC
XSD
XSE
Elevation (ft)
Distance from LPIN (ft)
9491
9490
9489
9488
9487
9486
0
5
10
15
20
25
30
35
40
45

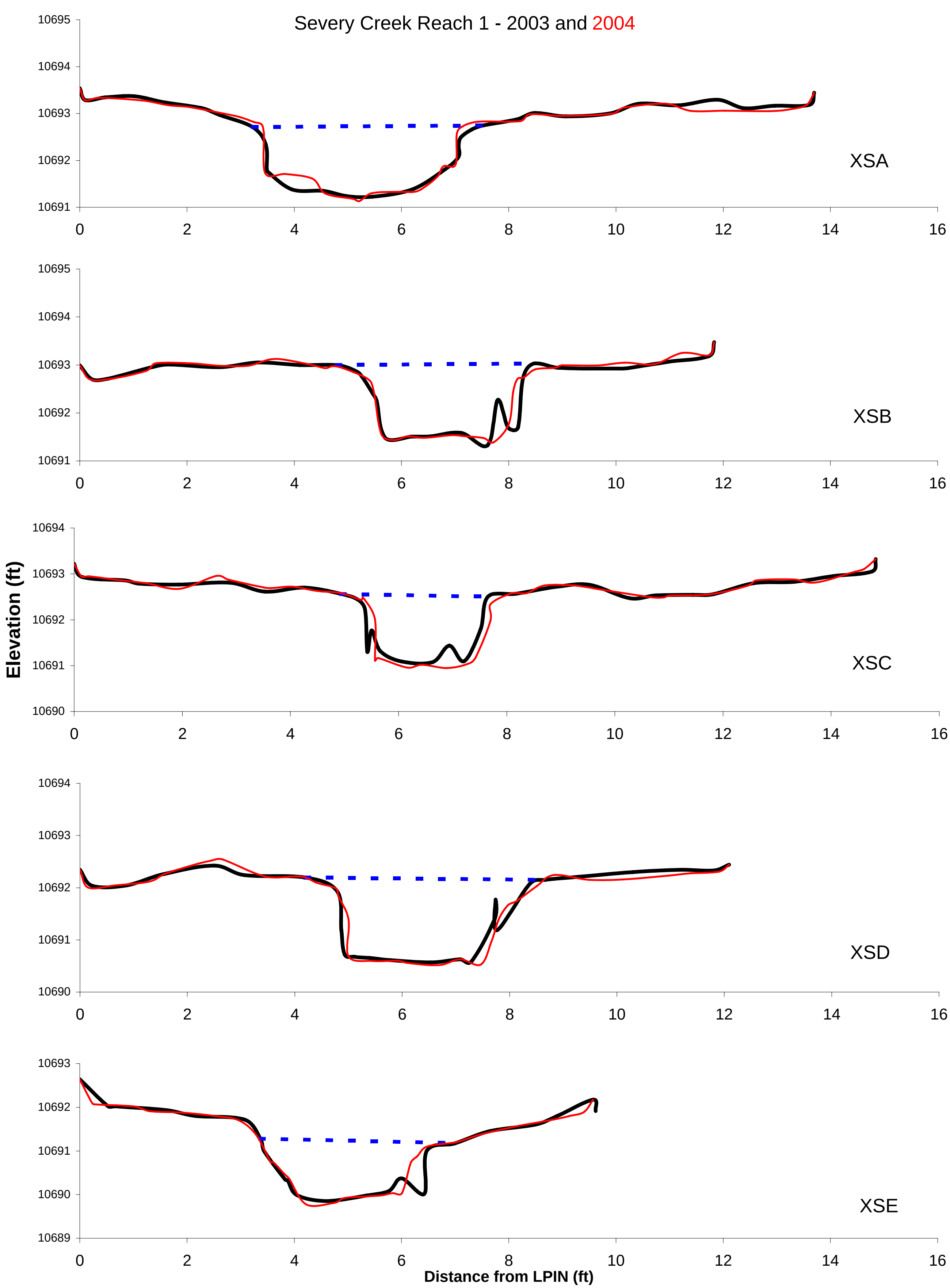


North Fork Crystal Creek Reach 1 - 2003 and 2004
XSA
XSB
XSC
XSD
XSE
Elevation (ft)
Distance from LPIN (ft)
9455
9454
9453
9452
9451
9450
9449
9448
9447
9446
0
10
20
30
40
50
60

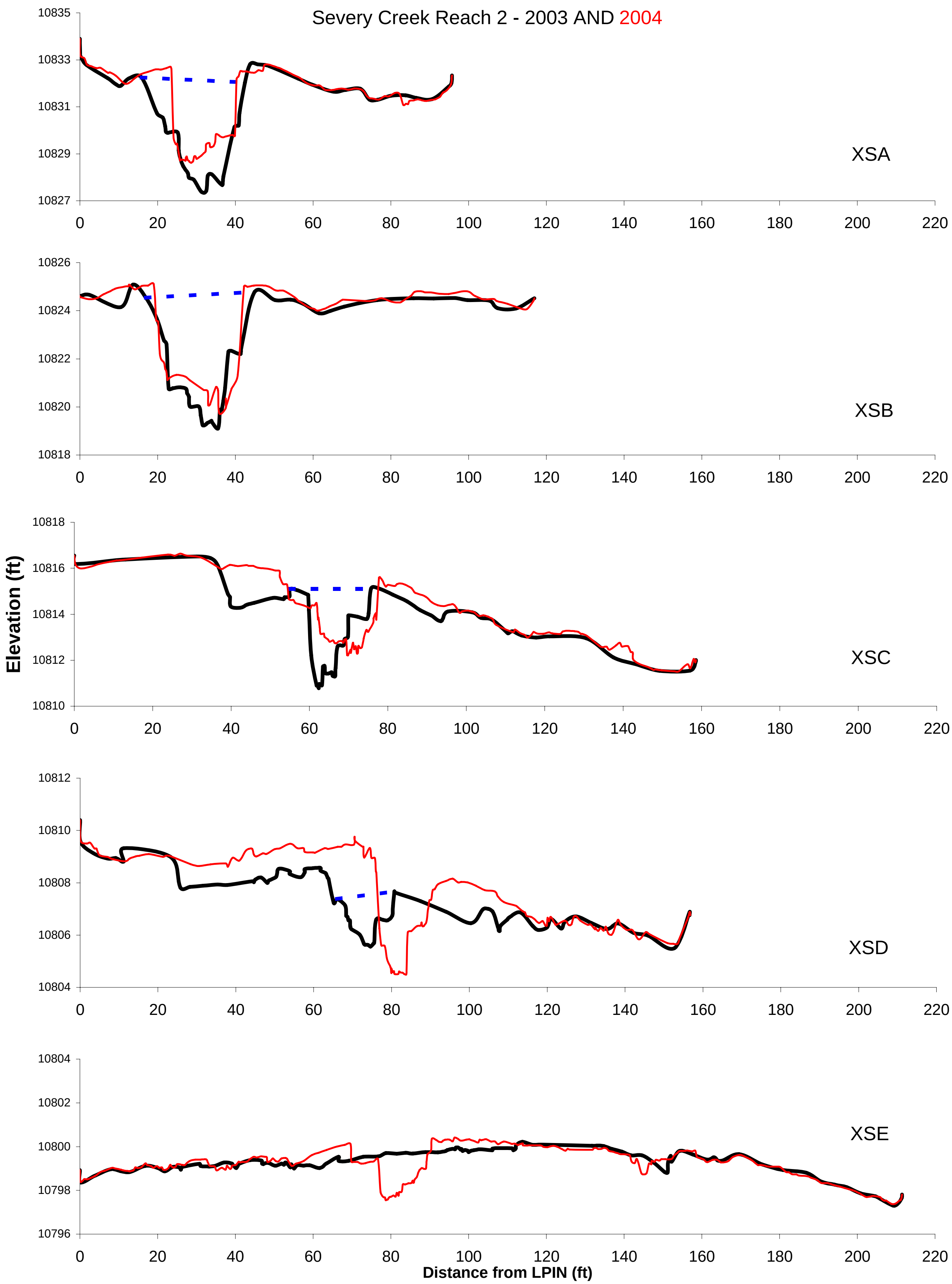

North Fork Crystal Creek Reach 2 - 2003 and 2004
Elevation (ft)
Distance from LPIN (ft)
XSA
XSB
XSC
XSD
XSE
9478
9477
9476
9475
9474
9473
9472
9471
9470
9469
9468
0
5
10
15
20
25
30
35
40

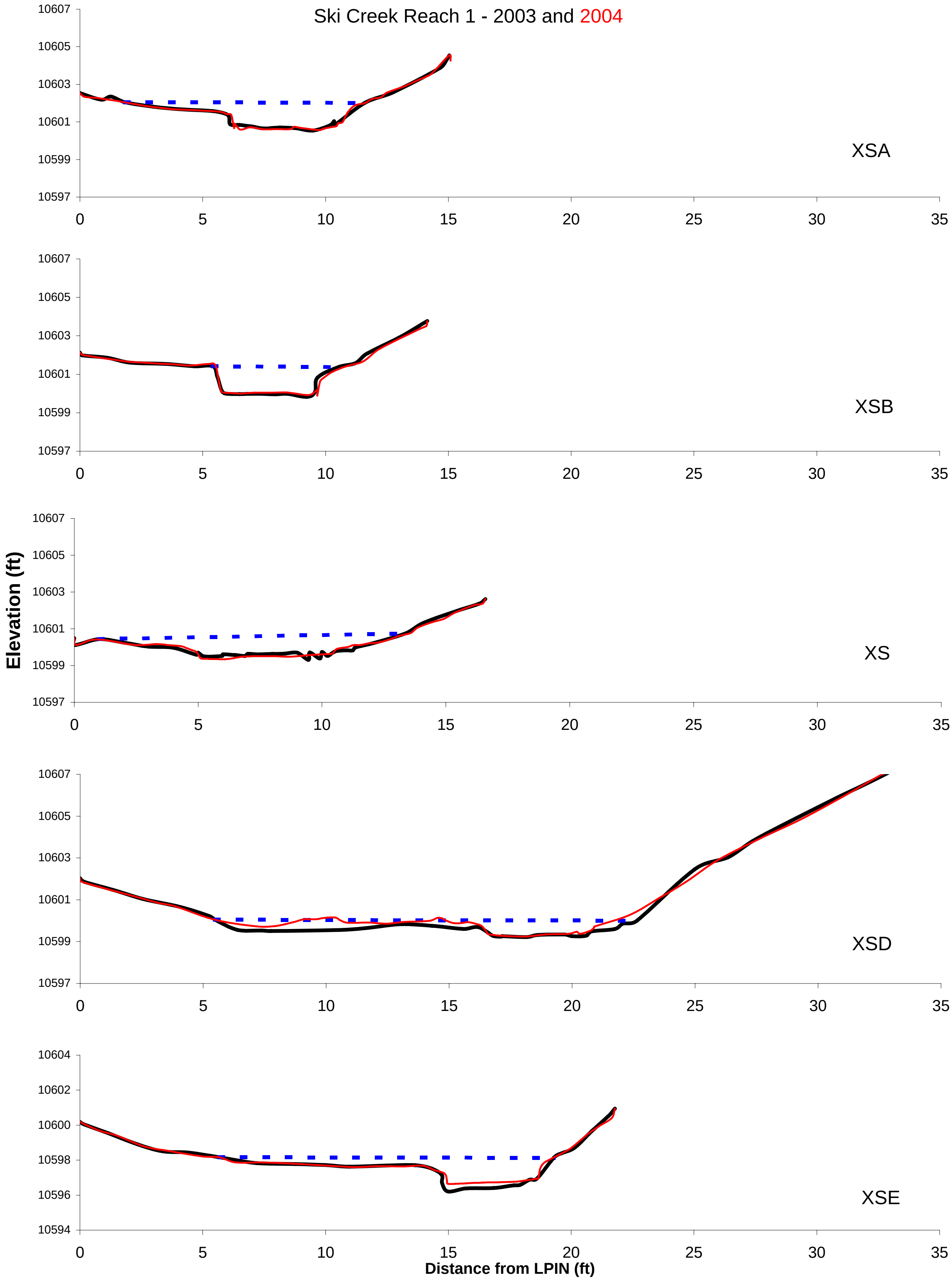


Oil Creek Reach 1 - 2003 and 2004
XSA
XSB
XSC
XSD
XSE
Elevation (ft)
Distance from LPIN (ft)
10493
10492
10491
10490
10489
10488
10487
10486
0
5
10
15
20
25
30
35
40
45

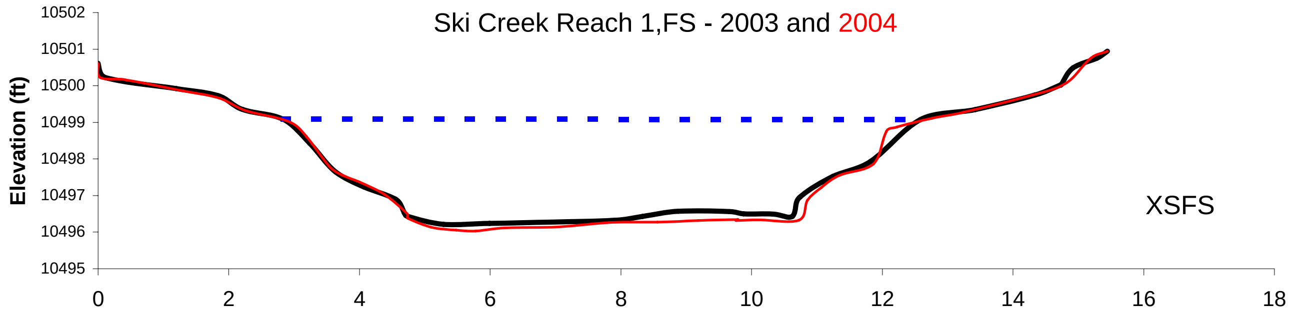


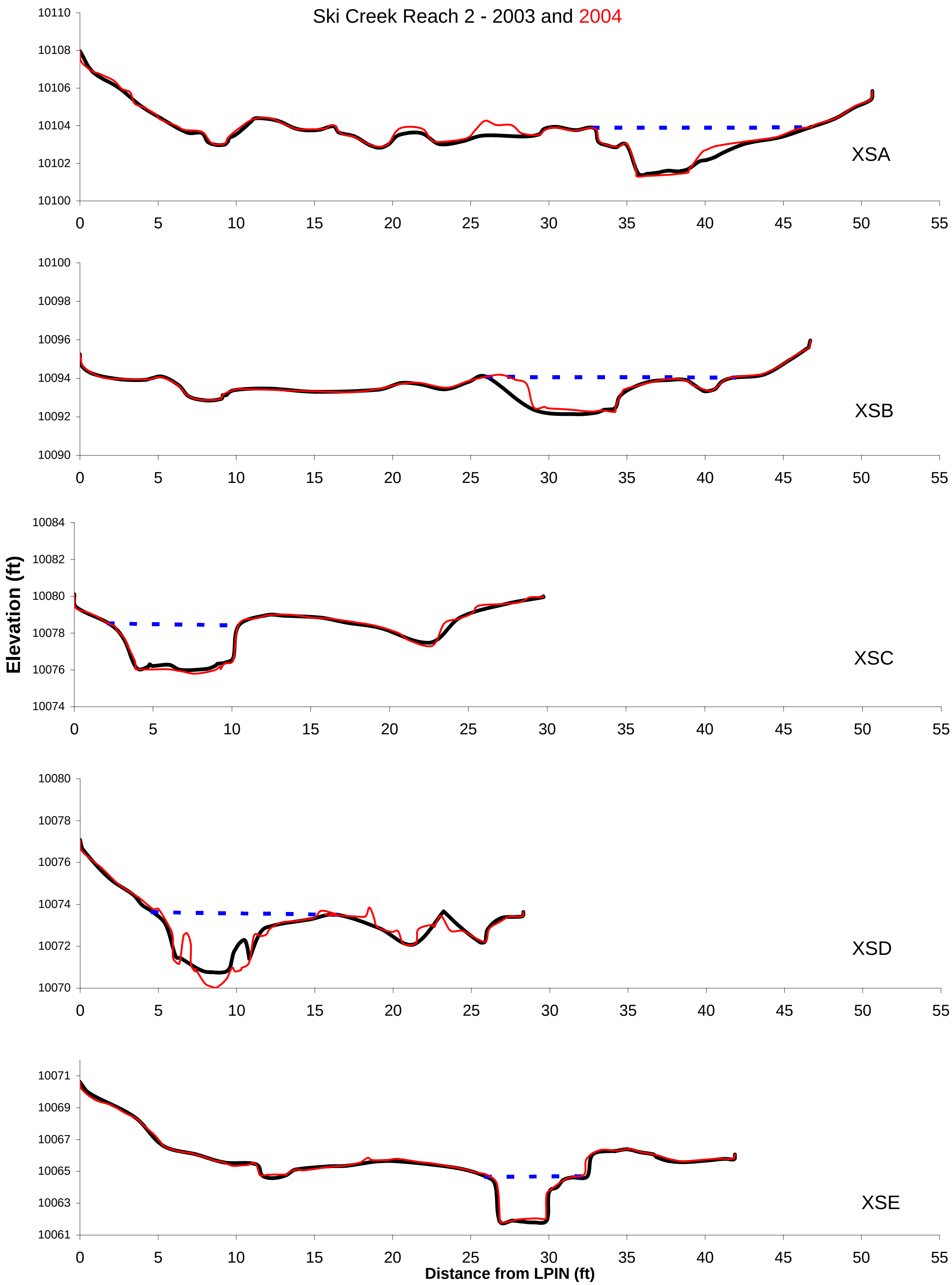
Severy Creek Reach 1 - 2003 and 2004
XSA
XSB
XSC
XSD
XSE
Elevation (ft)
Distance from LPIN (ft)
10695
10694
10693
10692
10691
10690
10689
0
2
4
6
8
10
12
14
16


Severy Creek Reach 2 - 2003 AND 2004
XSA
XSB
XSC
XSD
XSE
Elevation (ft)
Distance from LPIN (ft)
10835
10833
10831
10829
10827
10826
10824
10822
10820
10818
10816
10814
10812
10810
10808
10806
10804
10802
10800
10798
10796
0
20
40
60
80
100
120
140
160
180
200
220

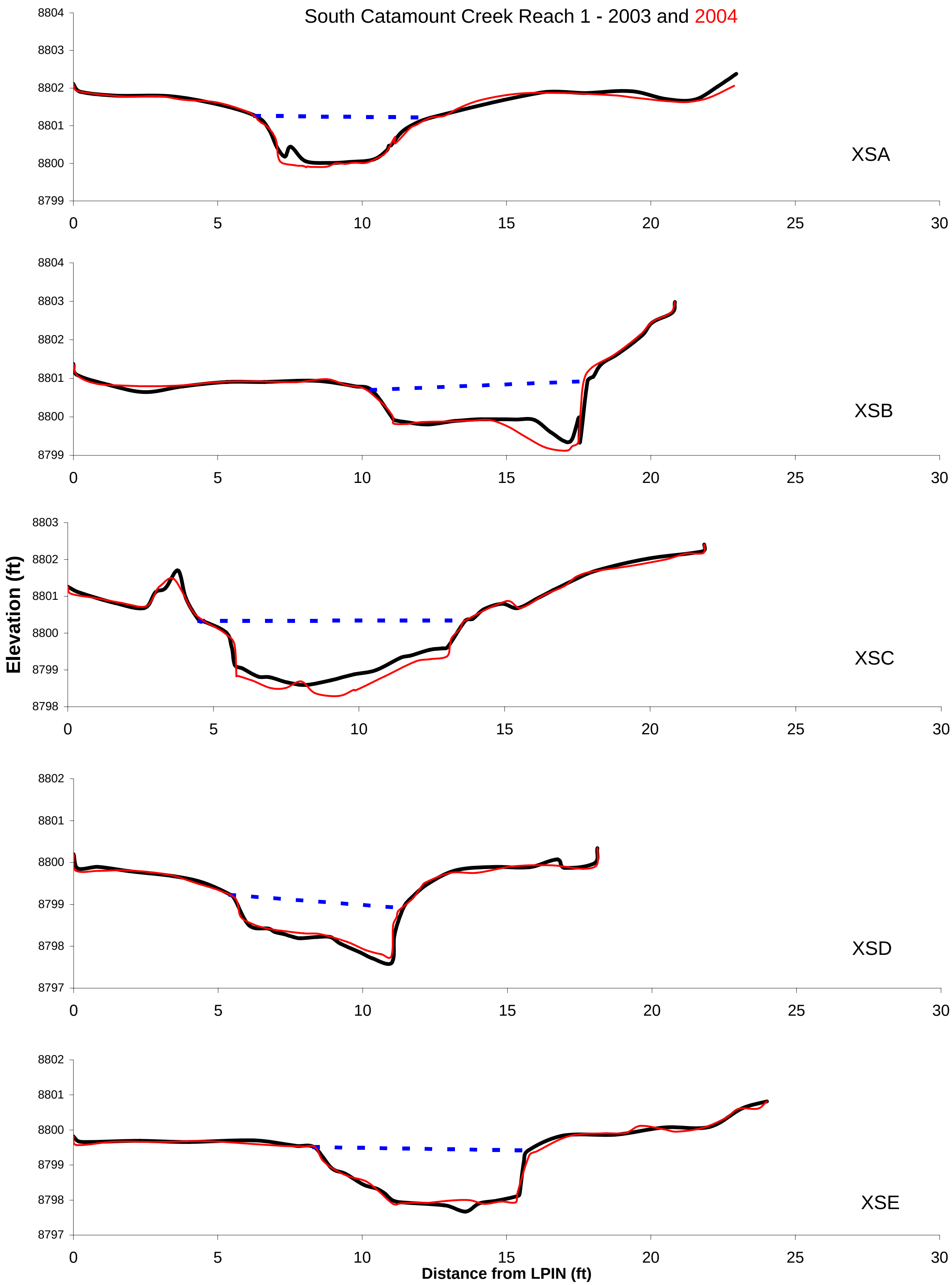


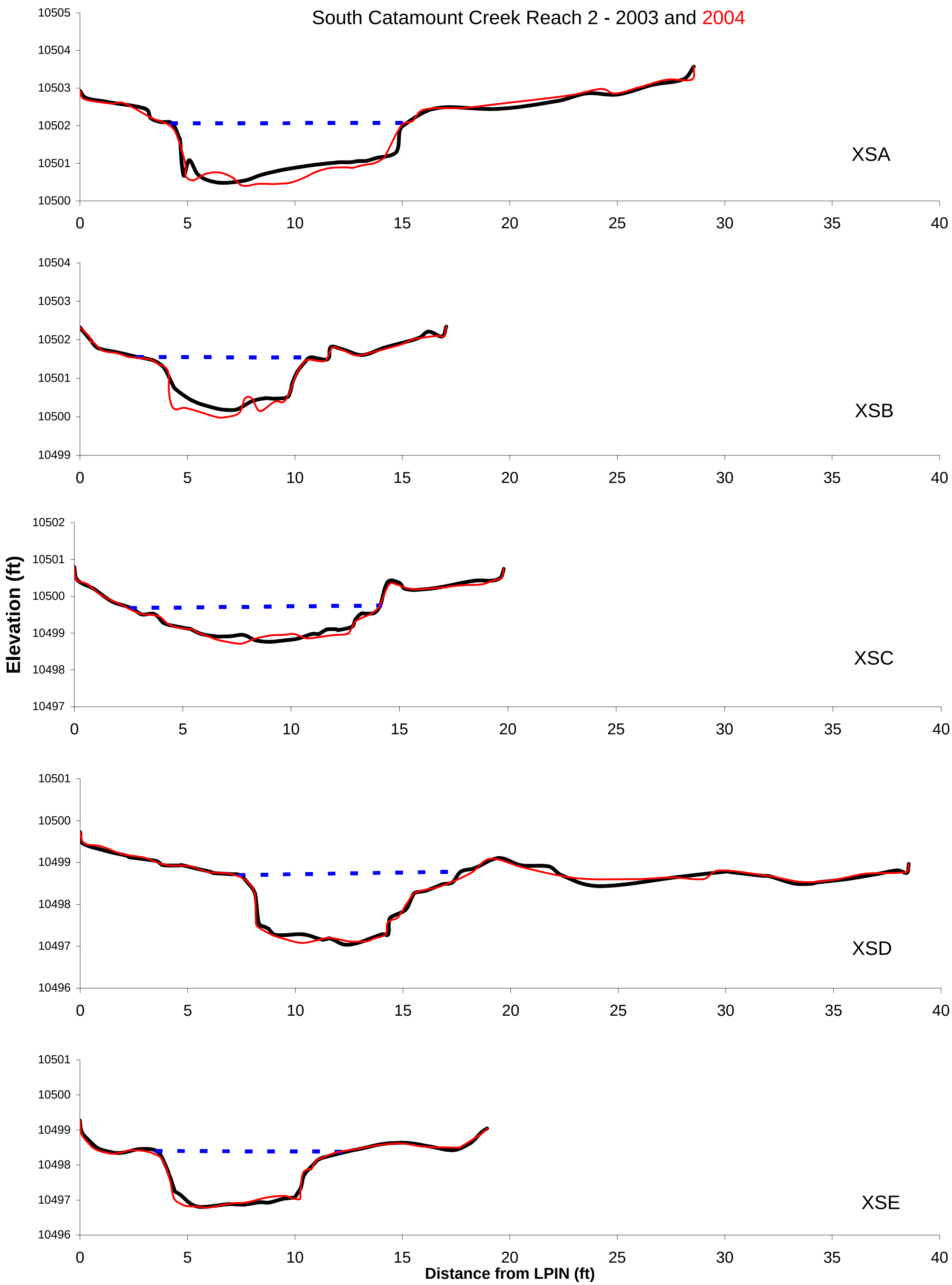
Ski Creek Reach 1 - 2003 and 2004
Elevation (ft)
Distance from LPIN (ft)
XSA
XSB
XS
XSD
XSE
10607
10605
10603
10601
10599
10597
10604
10602
10600
10598
10596
10594
0
5
10
15
20
25
30
35


Ski Creek Reach 1,FS - 2003 and 2004
Elevation (ft)
10502
10501
10500
10499
10498
10497
10496
10495
0
2
4
6
8
10
12
14
16
18
XSFS

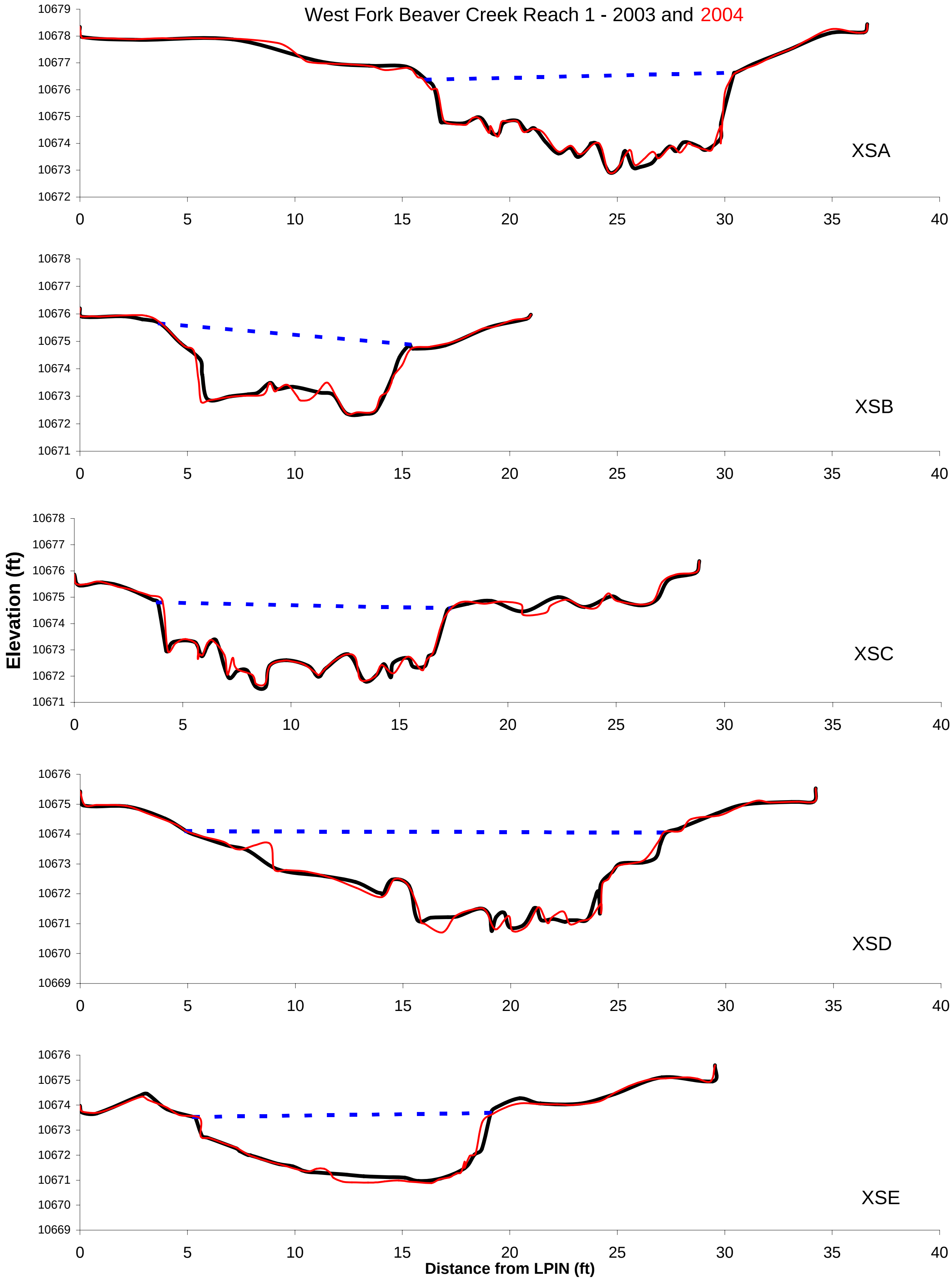


Ski Creek Reach 2 - 2003 and 2004
XSA
XSB
XSC
XSD
XSE
Elevation (ft)
Distance from LPIN (ft)
10110
10108
10106
10104
10102
10100
10098
10096
10094
10092
10090
10084
10082
10080
10078
10076
10074
10072
10070
10071
10069
10067
10065
10063
10061
0
5
10
15
20
25
30
35
40
45
50
55

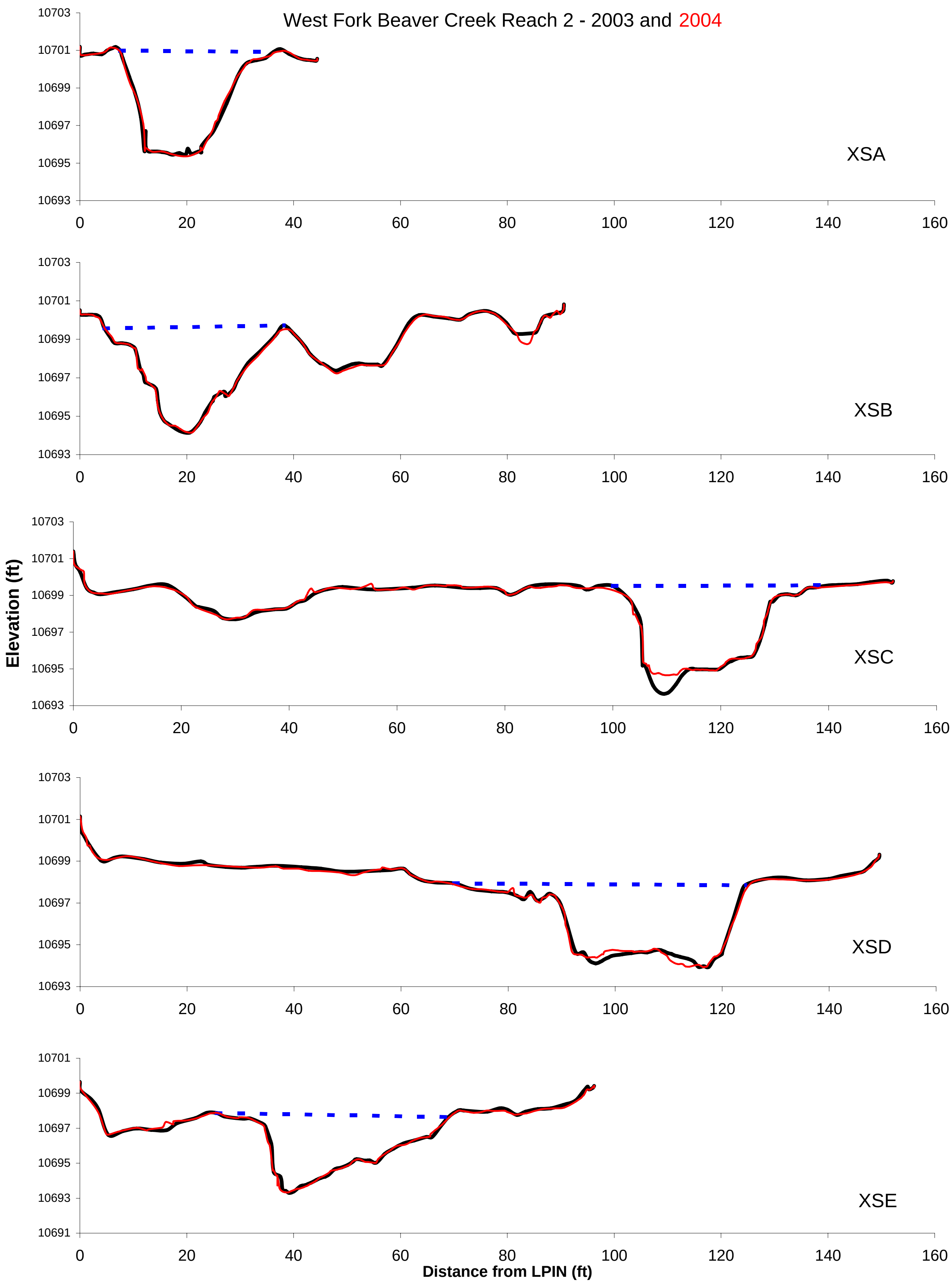

South Catamount Creek Reach 1 - 2003 and 2004
XSA
XSB
XSC
XSD
XSE
Elevation (ft)
Distance from LPIN (ft)
8804
8803
8802
8801
8800
8799
8798
8797
0
5
10
15
20
25
30



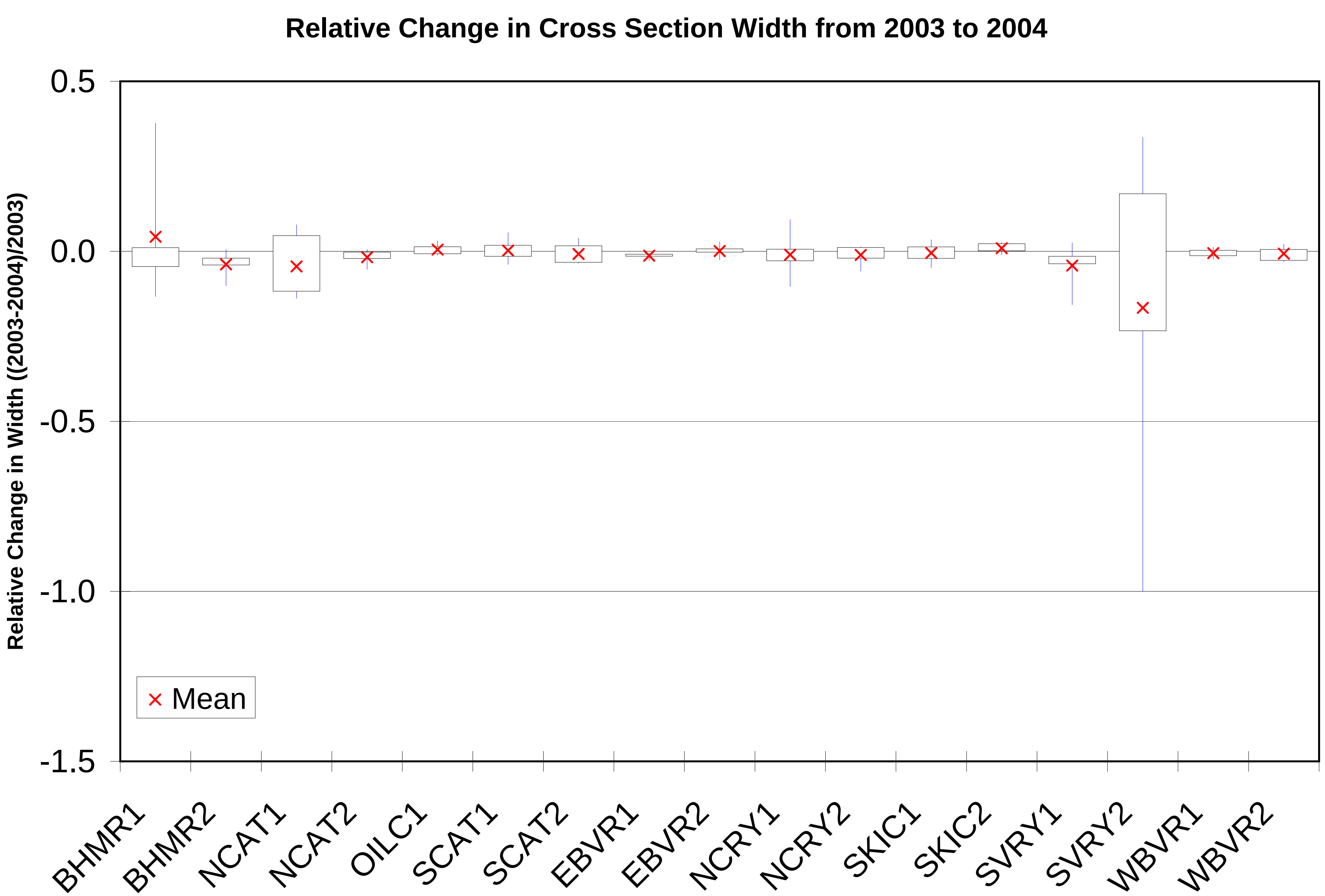
South Catamount Creek Reach 2 - 2003 and 2004
Elevation (ft)
Distance from LPIN (ft)
XSA
XSB
XSC
XSD
XSE
10505
10504
10503
10502
10501
10500
10499
10498
10497
10496
0
5
10
15
20
25
30
35
40



West Fork Beaver Creek Reach 1 - 2003 and 2004
Elevation (ft)
XSA
XSB
XSC
XSD
XSE
Distance from LPIN (ft)

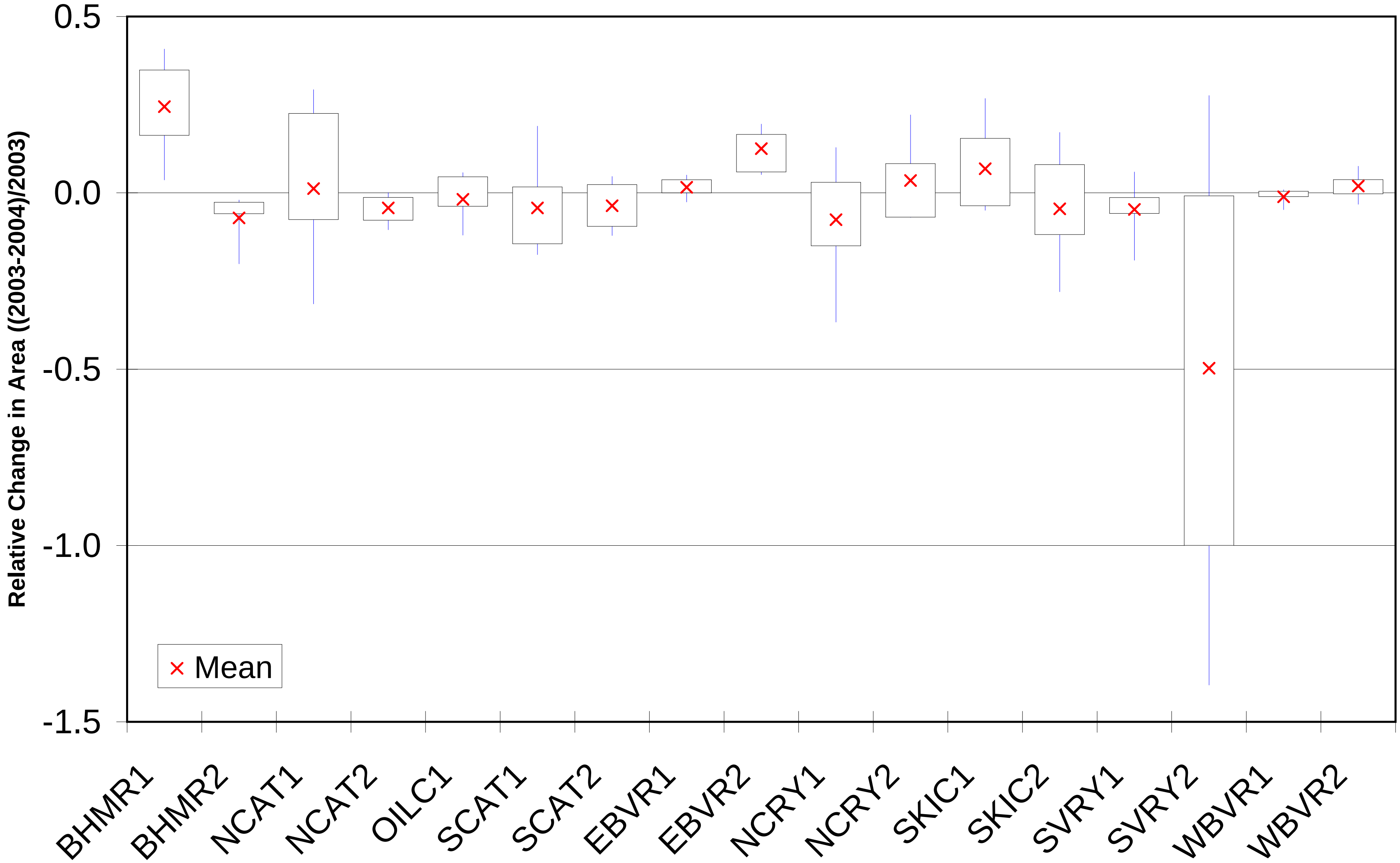


West Fork Beaver Creek Reach 2 - 2003 and 2004
XSA
XSB
XSC
XSD
XSE
Elevation (ft)
Distance from LPIN (ft)
10703
10701
10699
10697
10695
10693
10691
0
20
40
60
80
100
120
140
160



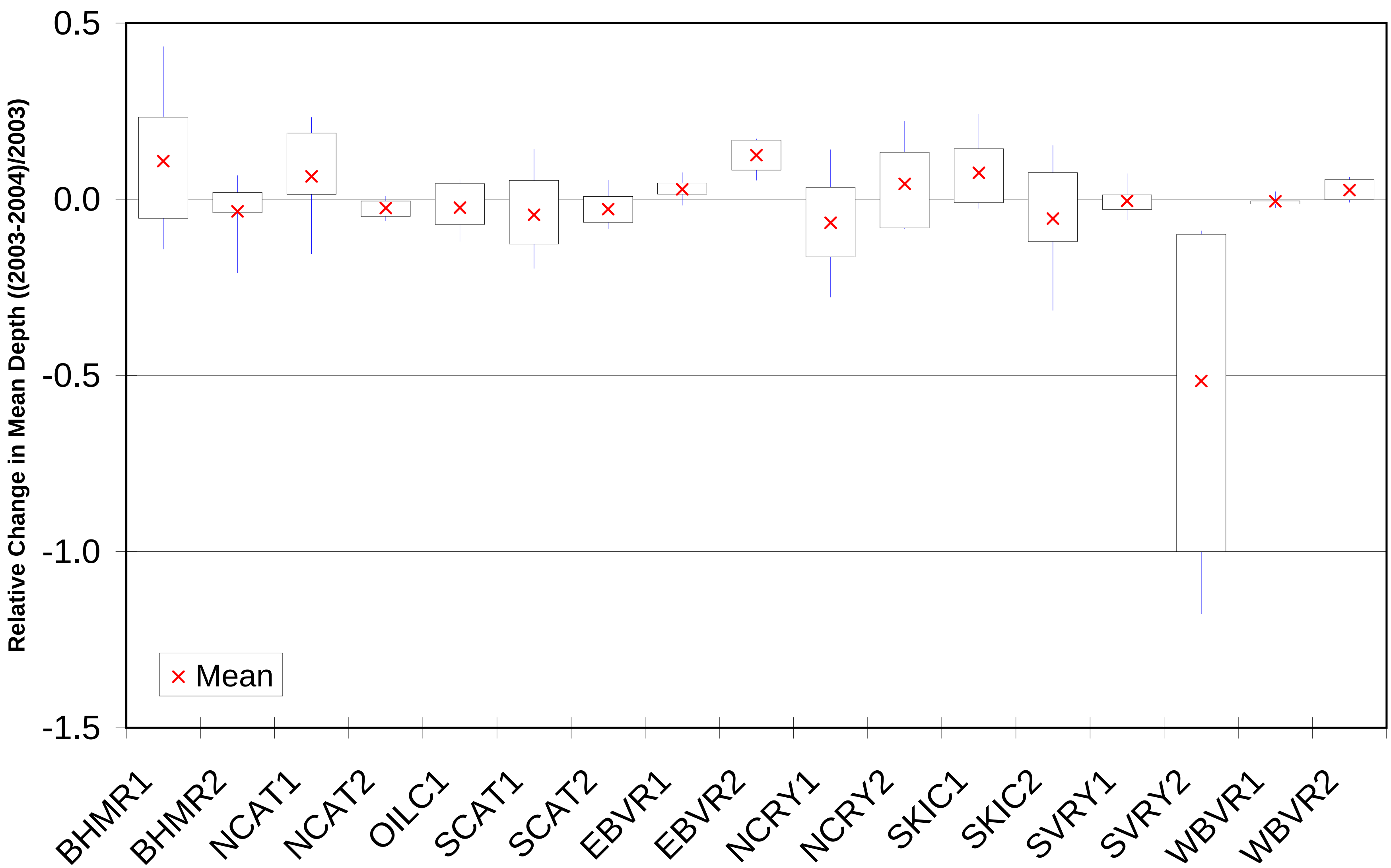
Blue Line = Range, Box Represents 25th and 75th Percentile

Relative Change in Cross Sectional Area from 2003 to 2004



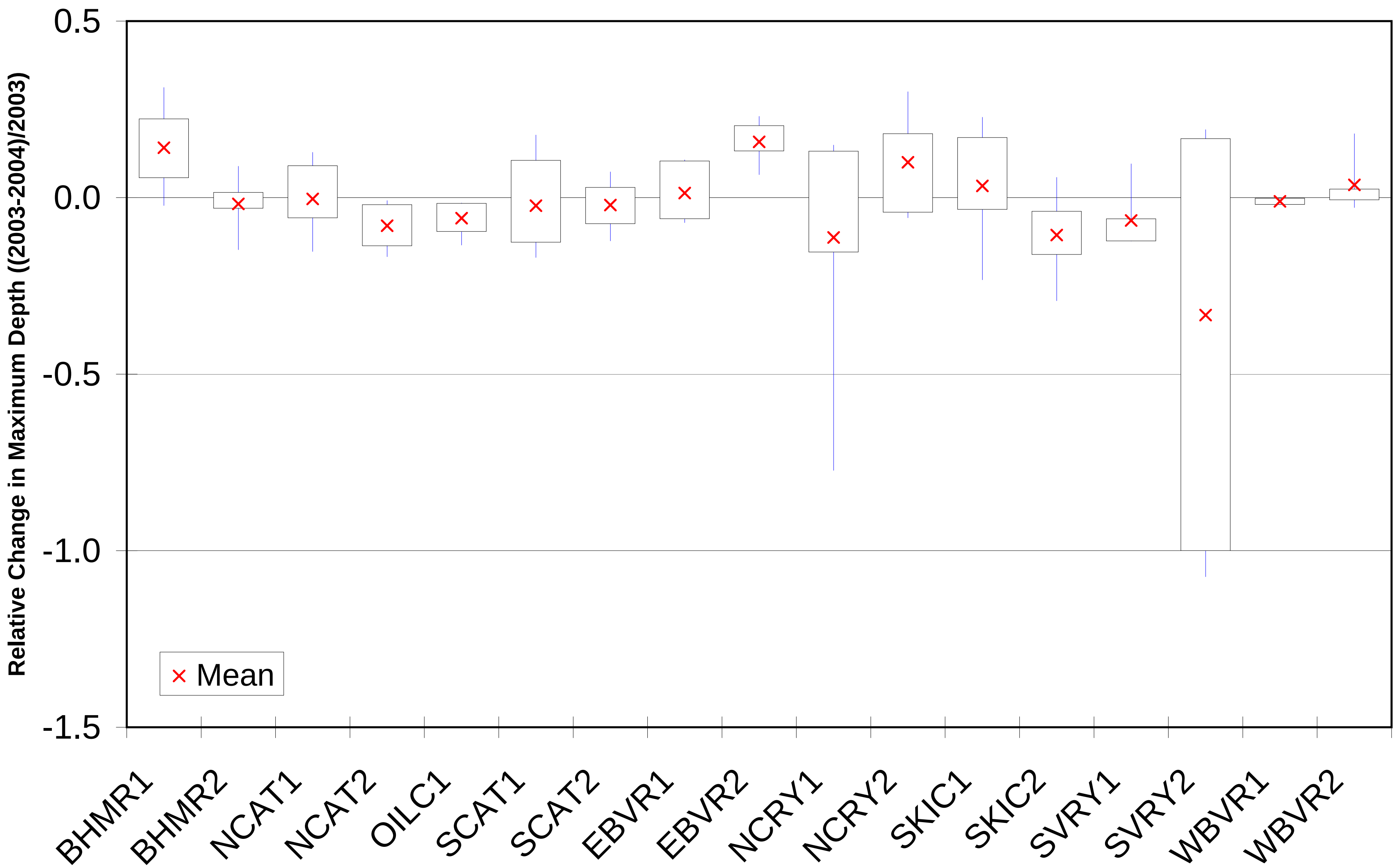
Blue Line = Range, Box Represents 25th and 75th Percentile

Relative Change in Mean Depth from 2003 to 2004

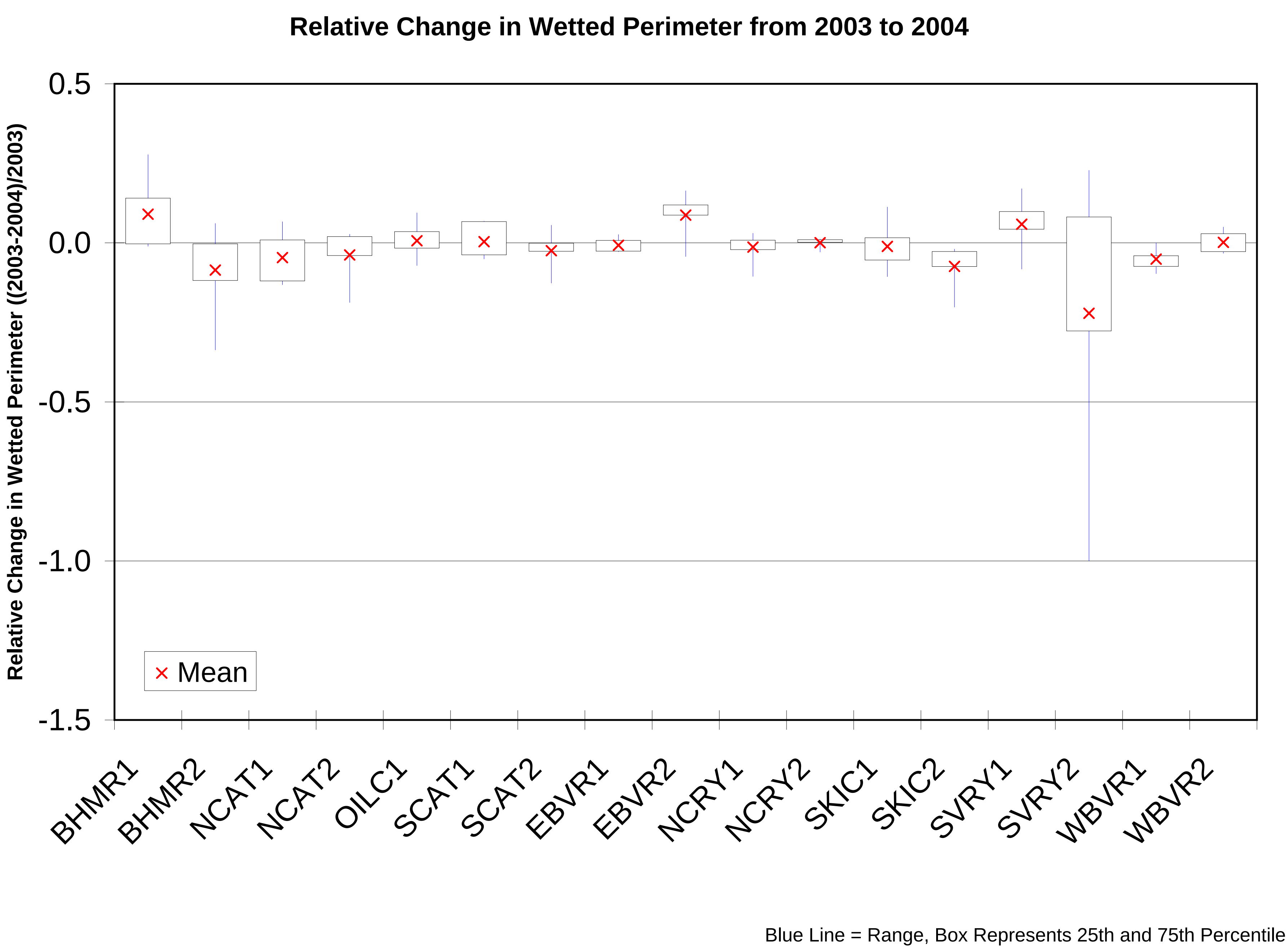


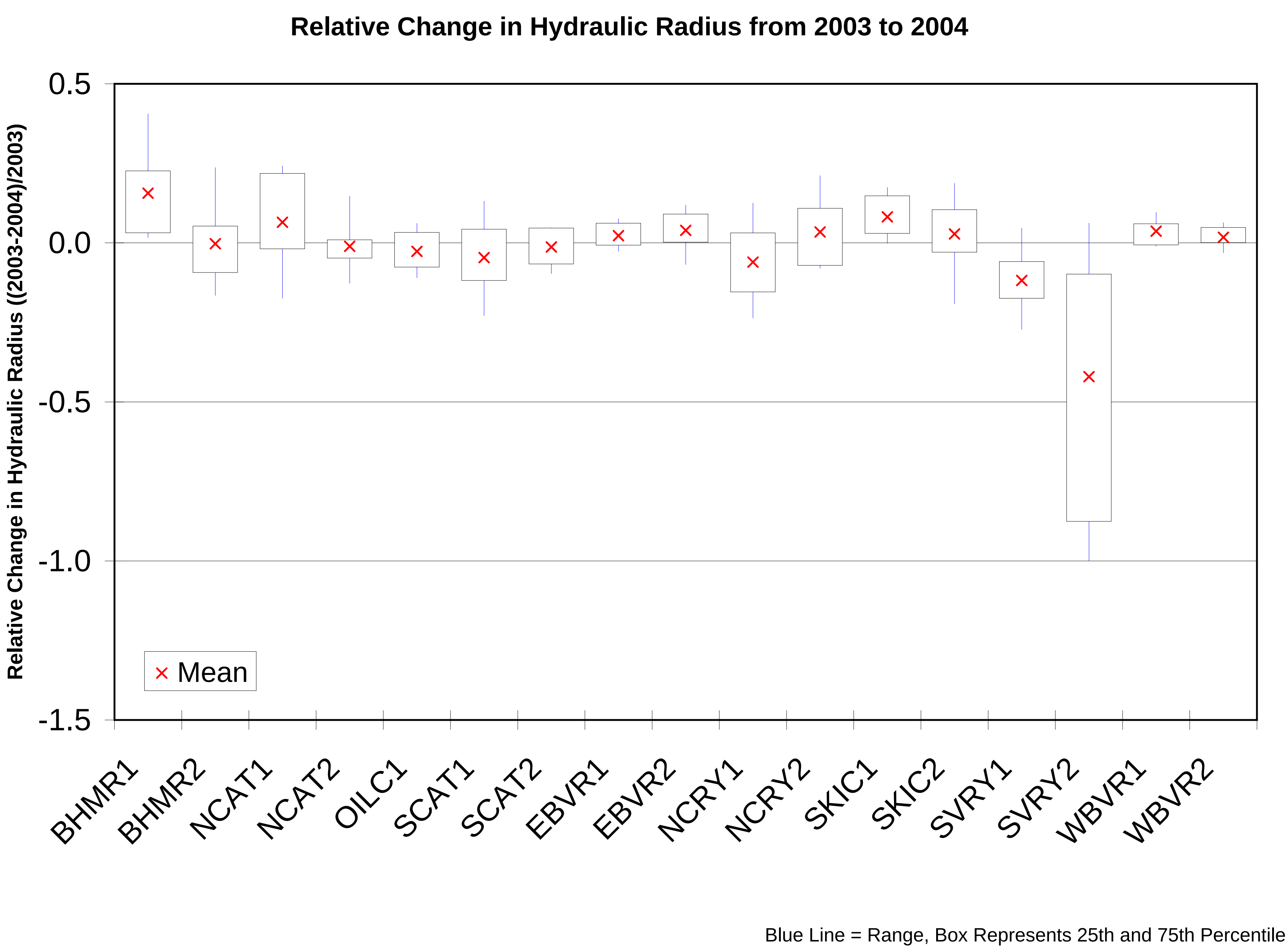
Blue Line = Range, Box Represents 25th and 75th Percentile

Relative Change in Maximum Depth from 2003 to 2004

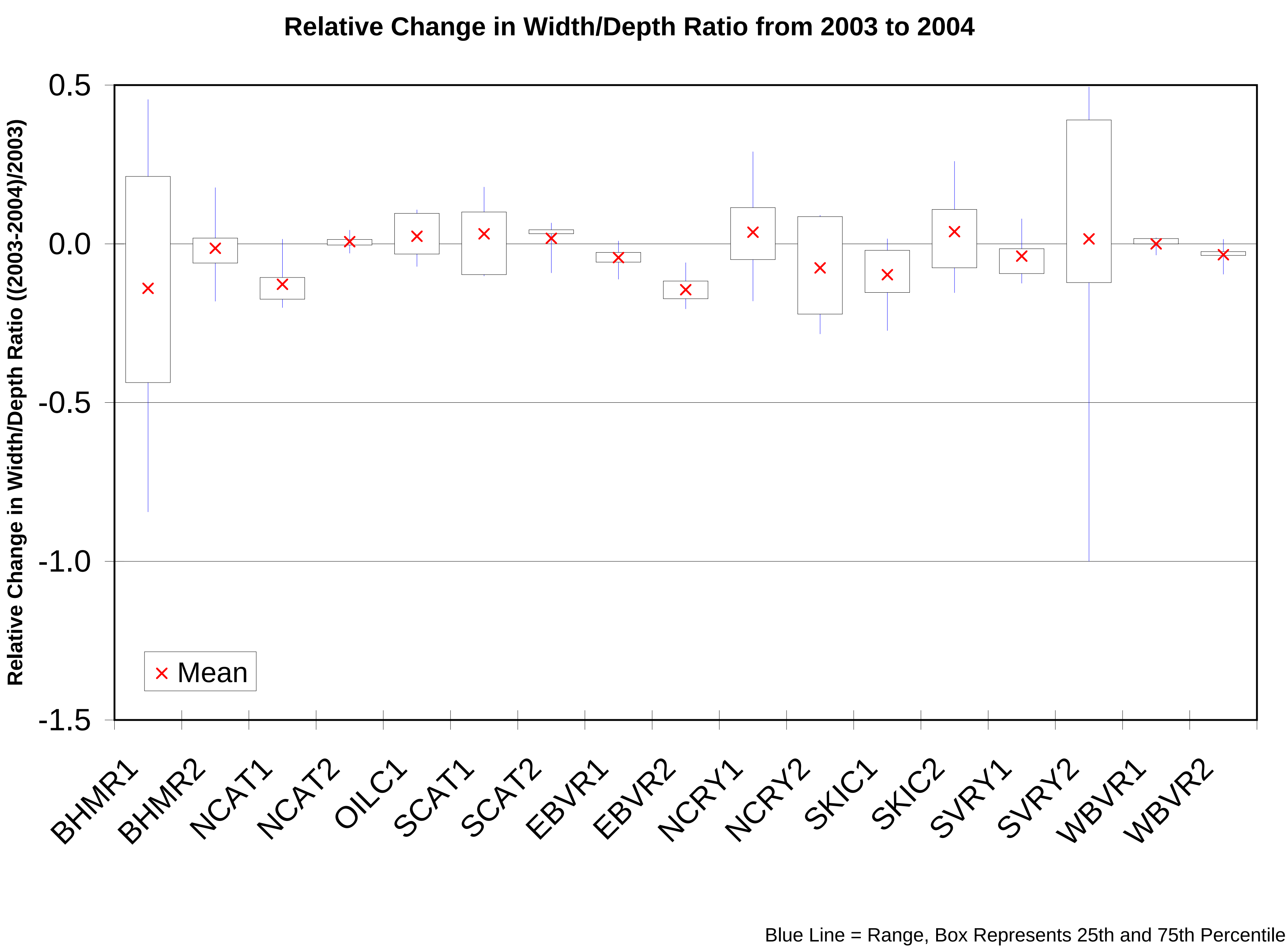


Blue Line = Range, Box Represents 25th and 75th Percentile


Relative Change in Wetted Perimeter from 2003 to 2004
Relative Change in Wetted Perimeter ((2003-2004)/2003)
0.5
0.0
-0.5
-1.0
-1.5
Mean
BHMR1
BHMR2
NCAT1
NCAT2
OILC1
SCAT1
SCAT2
EBVR1
EBVR2
NCRY1
NCRY2
SKIC1
SKIC2
SVRY1
SVRY2
WBVR1
WBVR2
Blue Line = Range, Box Represents 25th and 75th Percentile



Relative Change in Hydraulic Radius from 2003 to 2004
Relative Change in Hydraulic Radius ((2003-2004)/2003)
0.5
0.0
-0.5
-1.0
-1.5
Mean
BHMR1
BHMR2
NCAT1
NCAT2
OILC1
SCAT1
SCAT2
EBVR1
EBVR2
NCRY1
NCRY2
SKIC1
SKIC2
SVRY1
SVRY2
WBVR1
WBVR2
Blue Line = Range, Box Represents 25th and 75th Percentile



Relative Change in Width/Depth Ratio from 2003 to 2004
Relative Change in Width/Depth Ratio ((2003-2004)/2003)
0.5
0.0
-0.5
-1.0
-1.5
Mean
BHMR1
BHMR2
NCAT1
NCAT2
OILC1
SCAT1
SCAT2
EBVR1
EBVR2
NCRY1
NCRY2
SKIC1
SKIC2
SVRY1
SVRY2
WBVR1
WBVR2
Blue Line = Range, Box Represents 25th and 75th Percentile

Appendix I

Particle Size Distributions of Stream Pebble Counts, Bar Grab Samples and Graphs

2004

Summary of Particle Size Distributions From Pebble Counts 2004

		Particle Size Distribution (mm) Pebble Counts - 2004					
Stream	Reach	D15	D35	D50	D84	D95	D100
Boehmer Creek	BHMR1	0.126	0.21	0.32	10	111	230
Boehmer Creek	BHMR2	0.137	0.29	0.53	132	352	750
East Fork Beaver Creek	EBVR1	0.130	0.69	1.95	269	624	900
East Fork Beaver Creek	EBVR2	0.140	0.59	1.59	8	19	710
North Catamount Creek	NCAT1	0.525	2.51	4.18	10	13	22
North Catamount Creek	NCAT2	0.370	2.20	3.81	10	15	25
North Fork Crystal Creek	NCRY1	0.115	0.49	1.79	13	27	125
North Fork Crystal Creek	NCRY2	0.187	0.54	1.26	7	16	44
Oil Creek	OILC1	0.182	1.41	4.6	58	165	370
Severy Creek	SVRY1		0.16	0.37	13	443	600
Severy Creek	SVRY2	0.321	0.67	2.16	39	153	446
Ski Creek	SKIC1	0.114	0.96	2.83	12	19	380
Ski Creek	SKIC2	0.129	0.53	4.76	355	927	1270
South Catamount Creek	SCAT1	0.198	1.26	4.33	15	29	104
South Catamount Creek	SCAT2	0.189	0.74	2.48	19	128	562
West Fork Beaver Creek	WBVR1	0.289	2.07	11	339	835	2000
West Fork Beaver Creek	WBVR2	0.364	1.06	3.17	18	43	988

		Relative Change in Particle Size Distribution 2003-2004					
Stream	Reach	D15	D30	D50	D84	D95	D100
Boehmer Creek	BHMR1	-0.97	-0.64	-0.49	-1.49	-0.24	0.28
Boehmer Creek	BHMR2		-0.34	0.36	0.26	0.03	-0.07
East Fork Beaver Creek	NCAT1	-4.31	-2.21	-0.49	-0.13	-0.03	-0.10
East Fork Beaver Creek	NCAT2	-2.31	-0.10	-0.07	-0.05	0.01	0.11
North Catamount Creek	OILC1	0.27	0.75	0.66	0.28	0.04	-0.09
North Catamount Creek	SCAT1		-1.98	-1.01	-0.65	-0.49	-0.89
North Fork Crystal Creek	SCAT2	-1.10	-0.09	-0.02	-0.48	-0.48	0.38
North Fork Crystal Creek	EBVR1	0.11	0.16	0.45	-0.05	0.18	0.14
Oil Creek	EBVR2		-0.55	-0.38	0.28	0.85	-0.08
Severy Creek	NCRY1	0.11	-0.40	-1.60	-1.34	-1.23	-2.38
Severy Creek	NCRY2	-0.46	-0.20	-0.20	-0.17	-0.14	0.20
Ski Creek	SVRY1		-1.45	-0.74	-3.43	0.33	0.85
Ski Creek	SVRY2	0.18	0.53	0.67	0.44	0.48	-0.12
South Catamount Creek	SKIC1	-0.05	0.14	-0.03	-0.11	0.13	0.33
South Catamount Creek	SKIC2	0.12	0.83	0.35	-0.33	-0.09	0.69
West Fork Beaver Creek	WBVR1	0.42	0.74	0.90	0.23	-0.03	0.17
West Fork Beaver Creek	WBVR2	0.44	0.71	0.60	0.32	0.23	0.53

Negative values indicate 2004 was coarser than 2003

Summary of Particle Size Distributions from Bar Grab Samples 2004

			Particle Size Distribution (mm) - Grab Samples 2004					
Stream/Site Name	ID	Date	D15	D35	D50	D84	D95	D100
Boehmer Creek	BHMR1	090804	0.263	0.40	0.53	0.9	1.5	4
Boehmer Creek	BHMR2	090804	0.276	0.47	0.65	1.5	2.4	5
East Fork Beaver Creek	EBVR1	090804	0.242	0.84	3.01	7.9	10.4	16
East Fork Beaver Creek	EBVR2	090804	0.446	1.86	3.21	8.1	11.0	17
North Catamount Creek	NCAT2	090604	1.292	3.01	4.61	10.6	15.7	28
North Catamount Creek	NACT1	090604	0.520	1.98	2.99	7.3	10.3	20
North Fork Crystal Creek	NCRY1	090704	0.254	1.58	4.38	13.2	45.0	45
North Fork Crystal Creek	NCRY2	090704	0.238	0.70	1.31	4.2	7.6	21
Oil Creek	OILC1	090904	1.026	3.15	5.67	16.3	23.3	36
Severy Creek	SVRY2	091004	0.749	2.28	4.25	23.1	43.0	57
Ski Creek	SKIC1	090704	0.302	1.35	2.52	7.4	11.2	22
Ski Creek	SKIC2	090704	0.291	1.44	3.03	9.2	14.1	30
South Catamount Creek	SCAT1	090604	0.655	3.90	6.53	13.9	23.2	31
South Catamount Creek	SCAT2	090604	0.308	1.74	4.28	11.6	16.6	26
West Fork Beaver Creek	WBVR1	090904	0.796	2.90	5.13	10.8	14.9	23
West Fork Beaver Creek	WBVR2	090904	1.636	3.70	5.74	11.7	19.2	36

			Relative Change in Particle Size Distribution 2003-2004					
Stream/Site Name	ID	Impact	D15	D35	D50	D84	D95	D100
East Fork Beaver Creek	EBVR1	Y	0.40	0.33	-0.40	-0.32	-0.15	0.06
North Catamount Creek	NCAT2	N	0.28	0.19	0.15	0.06	0.04	-0.22
North Fork Crystal Creek	NCRY2	Y	-0.07	-0.08	-0.14	-0.14	-0.25	-0.11
Oil Creek	OILC1	N	-0.45	0.17	0.16	0.12	0.14	-0.03
Severy Creek	SVRY2	Y	-1.98	0.07	0.28	-0.58	-0.71	-0.58
Ski Creek	SKIC2	Y	0.64	0.46	0.29	0.09	0.00	-0.11
South Catamount Creek	SCAT1	N	-1.13	-3.10	-2.85	-1.46	-0.14	0.03
West Fork Beaver Creek	WBVR2	Y	-0.48	-0.50	-0.65	-0.47	-0.65	-0.64

Negative values indicate 2004 was coarser than 2003

Pebble Count Worksheet

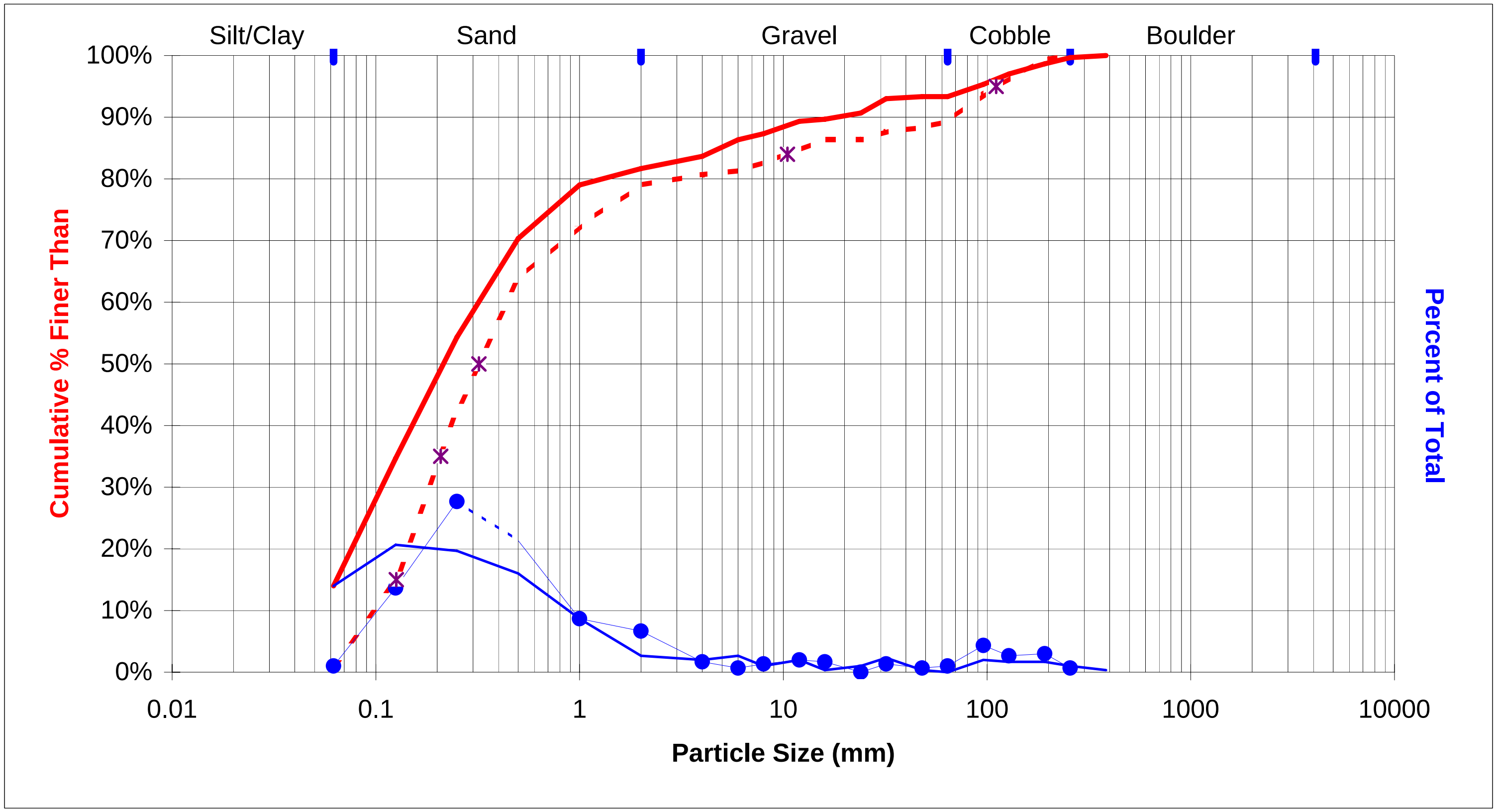
Particle Size (mm)	% finer than	Total Count
<0.062	1%	3
0.062 - 0.125	15%	41
0.125 - 0.25	42%	83
0.25 - 0.5	64%	64
0.5 - 1.0	72%	26
1 - 2	79%	20
2 - 4	81%	5
4 - 6	81%	2
6 - 8	83%	4
8 - 12	85%	6
12 - 16	86%	5
16 - 24	86%	0
24 - 32	88%	4
32 - 48	88%	2
48 - 64	89%	3
64 - 96	94%	13
96 - 128	96%	8
128 - 192	99%	9
192 - 256	100%	2
256 - 384		
384 - 512		
512 - 1024		
1024 - 2048		
2048 - 4096		

COMMENTS: ERO Reach

STREAM NAME: Boehmer Ck
ID NUMBER: BHMR1
DATE: 9/8/2004
CREW: J.Nankervis, S. Belz, K. Grimes, L. Howell

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart	Year	Graph
0.13	0.21	0.32	10.5	110.9	230.0	2004	Dashed
0.06	0.13	0.21	4.2	89.7	320.0	2003	Solid



Pebble Count Worksheet

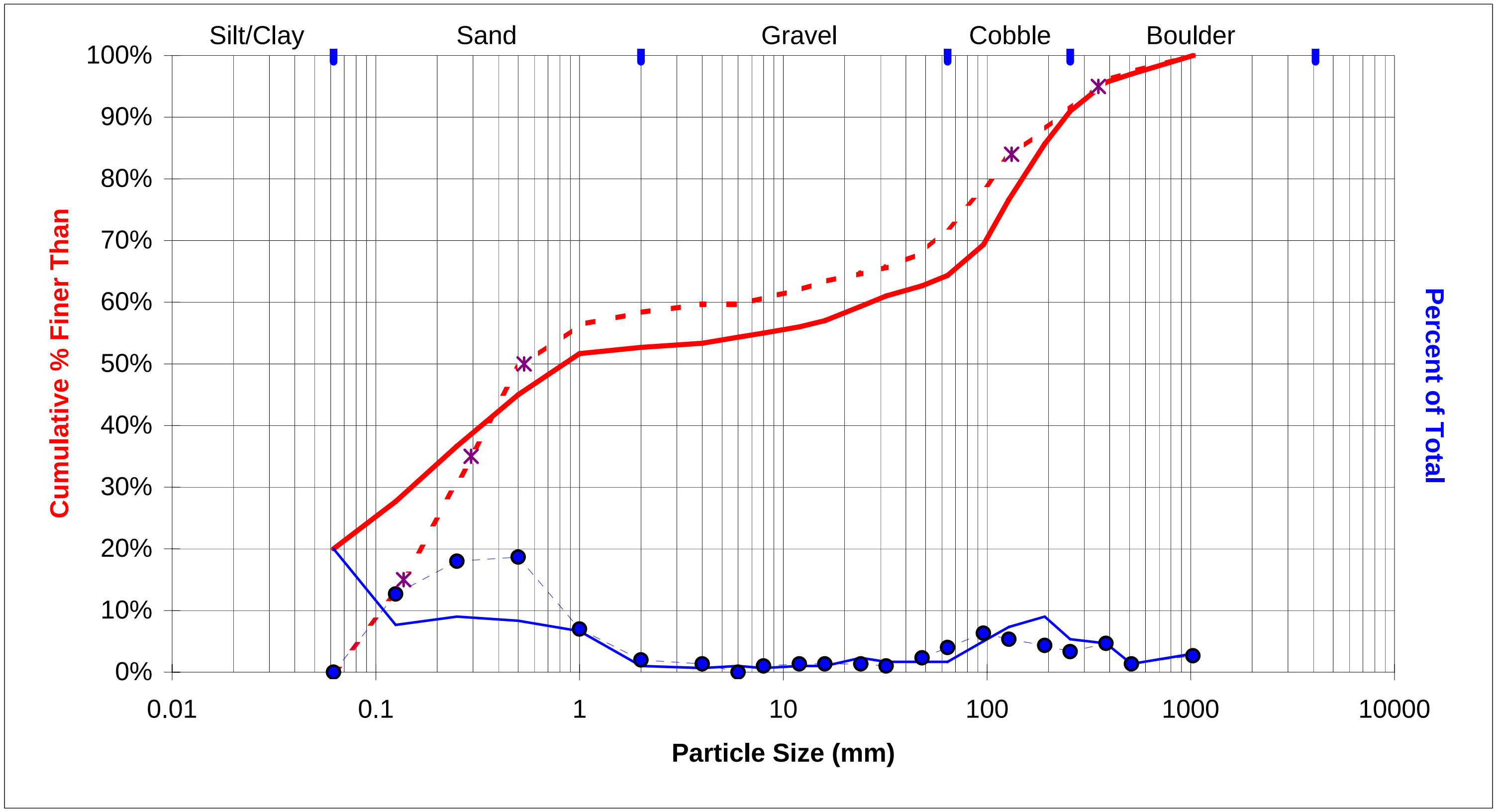
Particle Size (mm)	% finer than	Total Count
<0.062	0%	0
0.062 - 0.125	13%	38
0.125 - 0.25	31%	54
0.25 - 0.5	49%	56
0.5 - 1.0	56%	21
1 - 2	58%	6
2 - 4	60%	4
4 - 6	60%	0
6 - 8	61%	3
8 - 12	62%	4
12 - 16	63%	4
16 - 24	65%	4
24 - 32	66%	3
32 - 48	68%	7
48 - 64	72%	12
64 - 96	78%	19
96 - 128	84%	16
128 - 192	88%	13
192 - 256	91%	10
256 - 384	96%	14
384 - 512	97%	4
512 - 1024	100%	8
1024 - 2048		
2048 - 4096		

COMMENTS: Second reach 500 ft upstream of ERO reach

STREAM NAME: Boehmer Ck
ID NUMBER: BHMR2
DATE: 9/8/2004
CREW: J.Nankervis, S. Belz, K. Grimes, L. Howell

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart	Year	Graph
0.1	0.29	0.53	132.1	352.0	750.0	2004	Dashed
	0.22	0.84	178.1	362.4	700.0	2003	Solid



Pebble Count Worksheet

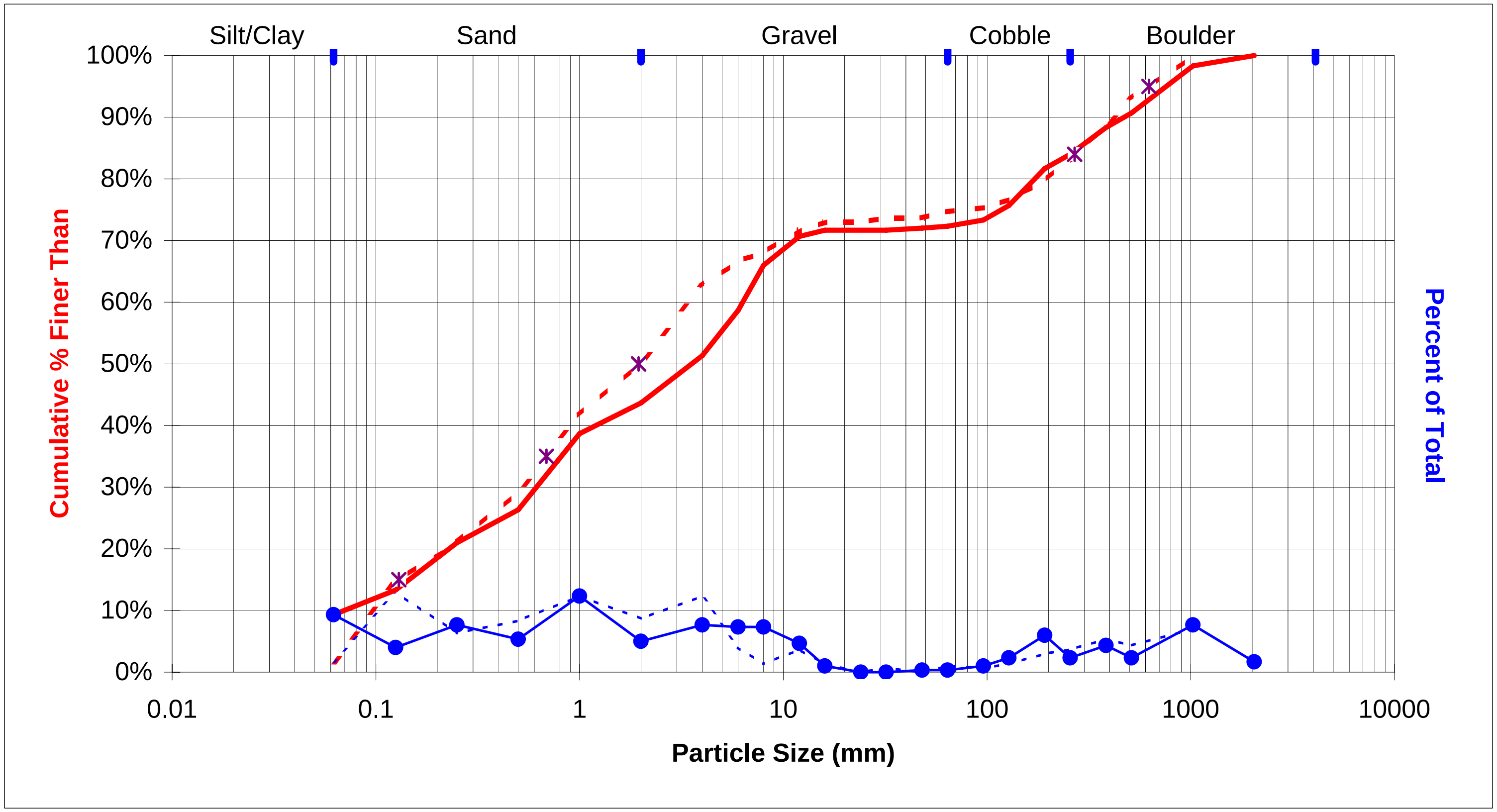
Particle Size (mm)	% finer than	Total Count
<0.062	2%	5
0.062 - 0.125	15%	39
0.125 - 0.25	21%	19
0.25 - 0.5	29%	25
0.5 - 1.0	42%	37
1 - 2	50%	26
2 - 4	63%	37
4 - 6	67%	12
6 - 8	68%	4
8 - 12	72%	11
12 - 16	73%	4
16 - 24	73%	0
24 - 32	74%	2
32 - 48	74%	0
48 - 64	75%	3
64 - 96	75%	2
96 - 128	77%	4
128 - 192	80%	9
192 - 256	83%	11
256 - 384	89%	16
384 - 512	93%	13
512 - 1024	100%	21
1024 - 2048		
2048 - 4096		

COMMENTS: ERO Reach

STREAM NAME: East Fork Beaver Ck
ID NUMBER: EBVR1
DATE: 9/8/2004
CREW: J.Nankervis, S. Belz, K. Grimes, L. Howell

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart	Year	Graph
0.13	0.69	1.95	269.3	624.1	900.0	2004	Dashed
0.15	0.81	3.55	256.0	757.6	1050.0	2003	Solid



Pebble Count Worksheet

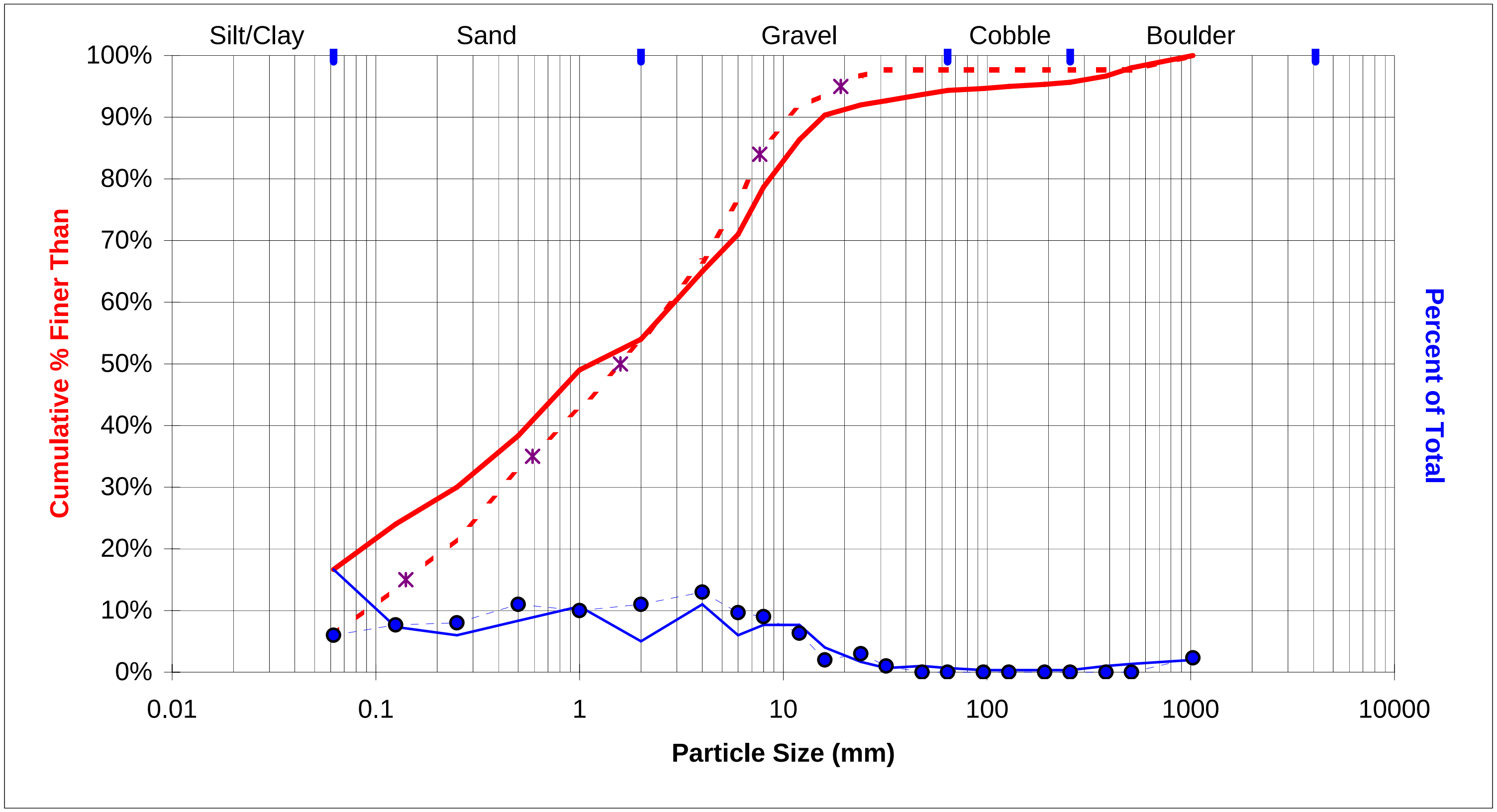
Particle Size (mm)	% finer than	Total Count
<0.062	6%	18
0.062 - 0.125	14%	23
0.125 - 0.25	22%	24
0.25 - 0.5	33%	33
0.5 - 1.0	43%	30
1 - 2	54%	33
2 - 4	67%	39
4 - 6	76%	29
6 - 8	85%	27
8 - 12	92%	19
12 - 16	94%	6
16 - 24	97%	9
24 - 32	98%	3
32 - 48	98%	0
48 - 64	98%	0
64 - 96	98%	0
96 - 128	98%	0
128 - 192	98%	0
192 - 256	98%	0
256 - 384	98%	0
384 - 512	98%	0
512 - 1024	100%	7
1024 - 2048		
2048 - 4096		

COMMENTS: Second reach 500 ft upstream of ERO reach

STREAM NAME: East Fork Beaver Ck
ID NUMBER: EBVR2
DATE: 9/8/2004
CREW: J.Nankervis, S. Belz, K. Grimes, L. Howell

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart	Year	Graph
0.14	0.59	1.59	7.7	19.2	710.0	2004	Dashed
	0.38	1.15	10.6	128.0	660.0	2003	Solid



Pebble Count Worksheet

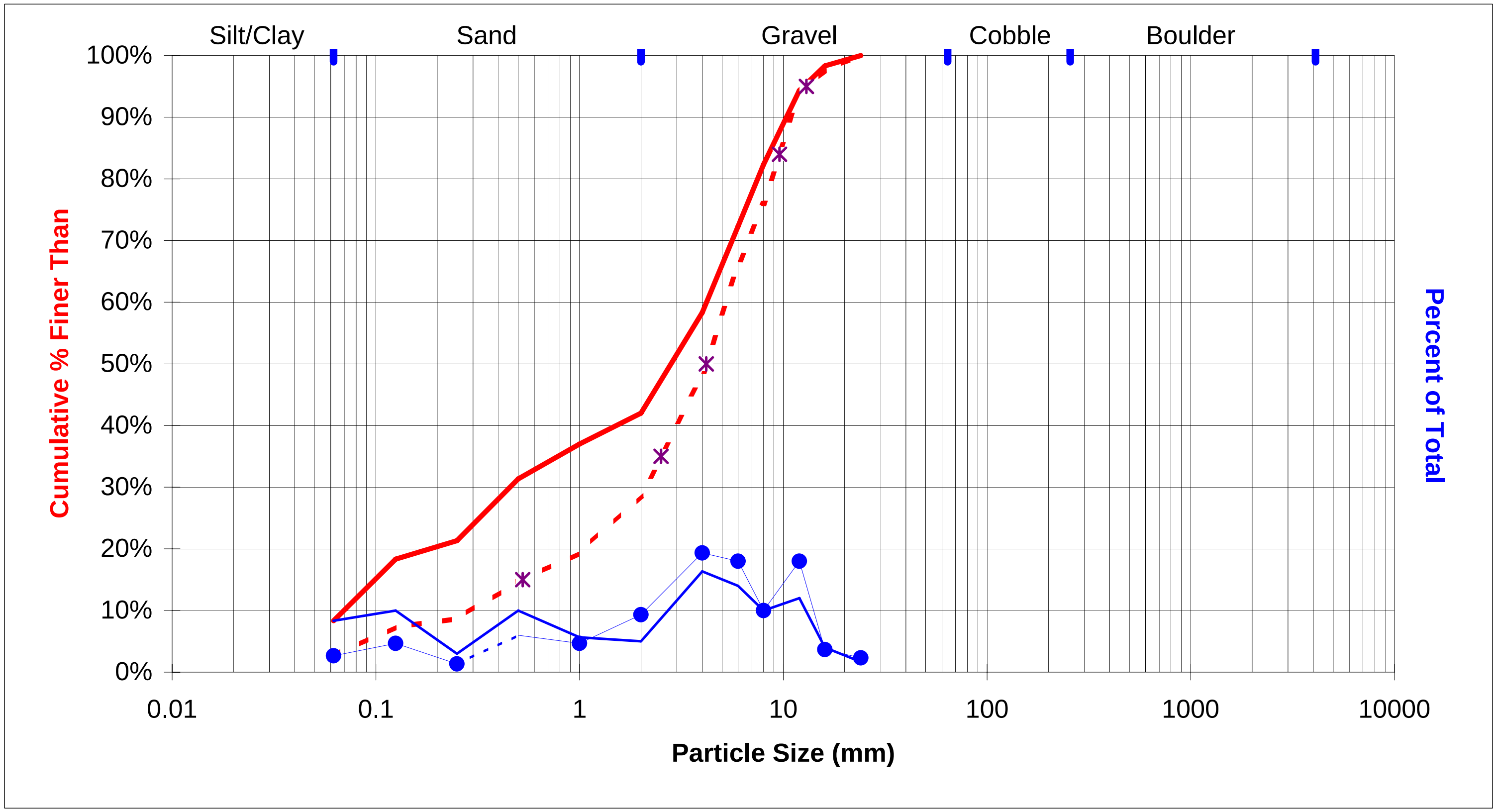
Particle Size (mm)	% finer than	Total Count
<0.062	3%	8
0.062 - 0.125	7%	14
0.125 - 0.25	9%	4
0.25 - 0.5	15%	18
0.5 - 1.0	19%	14
1 - 2	29%	28
2 - 4	48%	58
4 - 6	66%	54
6 - 8	76%	30
8 - 12	94%	54
12 - 16	98%	11
16 - 24	100%	7
24 - 32		
32 - 48		
48 - 64		
64 - 96		
96 - 128		
128 - 192		
192 - 256		
256 - 384		
384 - 512		
512 - 1024		
1024 - 2048		
2048 - 4096		

COMMENTS: ERO Reach

STREAM NAME: North Catamount Ck
ID NUMBER: NCAT1
DATE: 9/6/2004
CREW: J.Nankervis, S. Belz, K. Grimes, L. Howell

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart	Year	Graph
0.53	2.51	4.18	9.6	13.0	22.0	2004	Dashed
0.10	0.78	2.81	8.5	12.6	20.0	2003	Solid



Pebble Count Worksheet

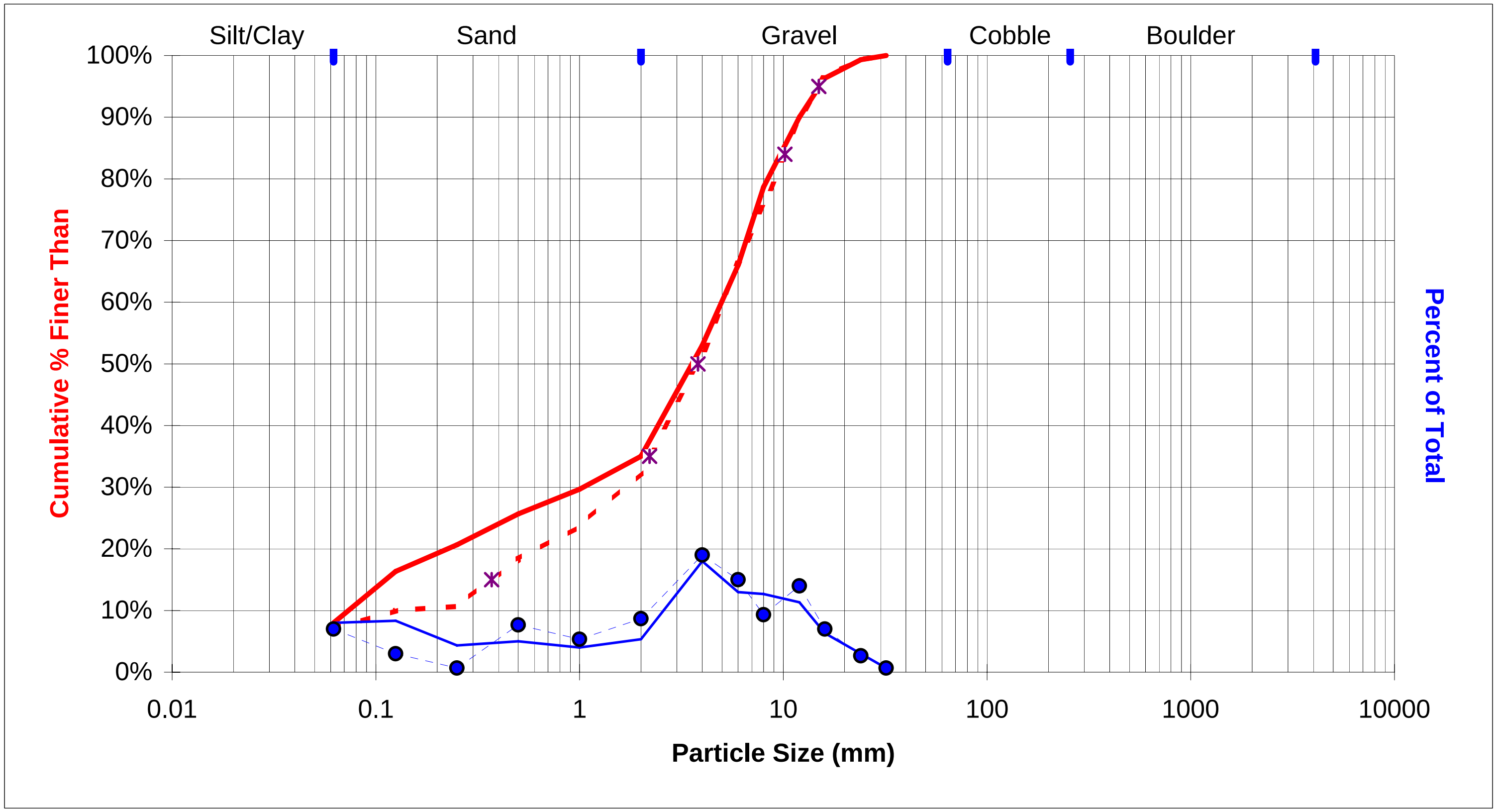
Particle Size (mm)	% finer than	Total Count
<0.062	7%	21
0.062 - 0.125	10%	9
0.125 - 0.25	11%	2
0.25 - 0.5	18%	23
0.5 - 1.0	24%	16
1 - 2	32%	26
2 - 4	51%	57
4 - 6	66%	45
6 - 8	76%	28
8 - 12	90%	42
12 - 16	97%	21
16 - 24	99%	8
24 - 32	100%	2
32 - 48		
48 - 64		
64 - 96		
96 - 128		
128 - 192		
192 - 256		
256 - 384		
384 - 512		
512 - 1024		
1024 - 2048		
2048 - 4096		

COMMENTS: Second reach 500 ft upstream of ERO reach

STREAM NAME: North Catamount Ck
ID NUMBER: NCAT2
DATE: 9/6/2004
CREW: J.Nankervis, S. Belz, K. Grimes, L. Howell

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart	Year	Graph
0.37	2.20	3.81	10.2	14.9	25.0	2004	Dashed
0.11	2.00	3.56	9.7	15.1	28.0	2003	Solid



Pebble Count Worksheet

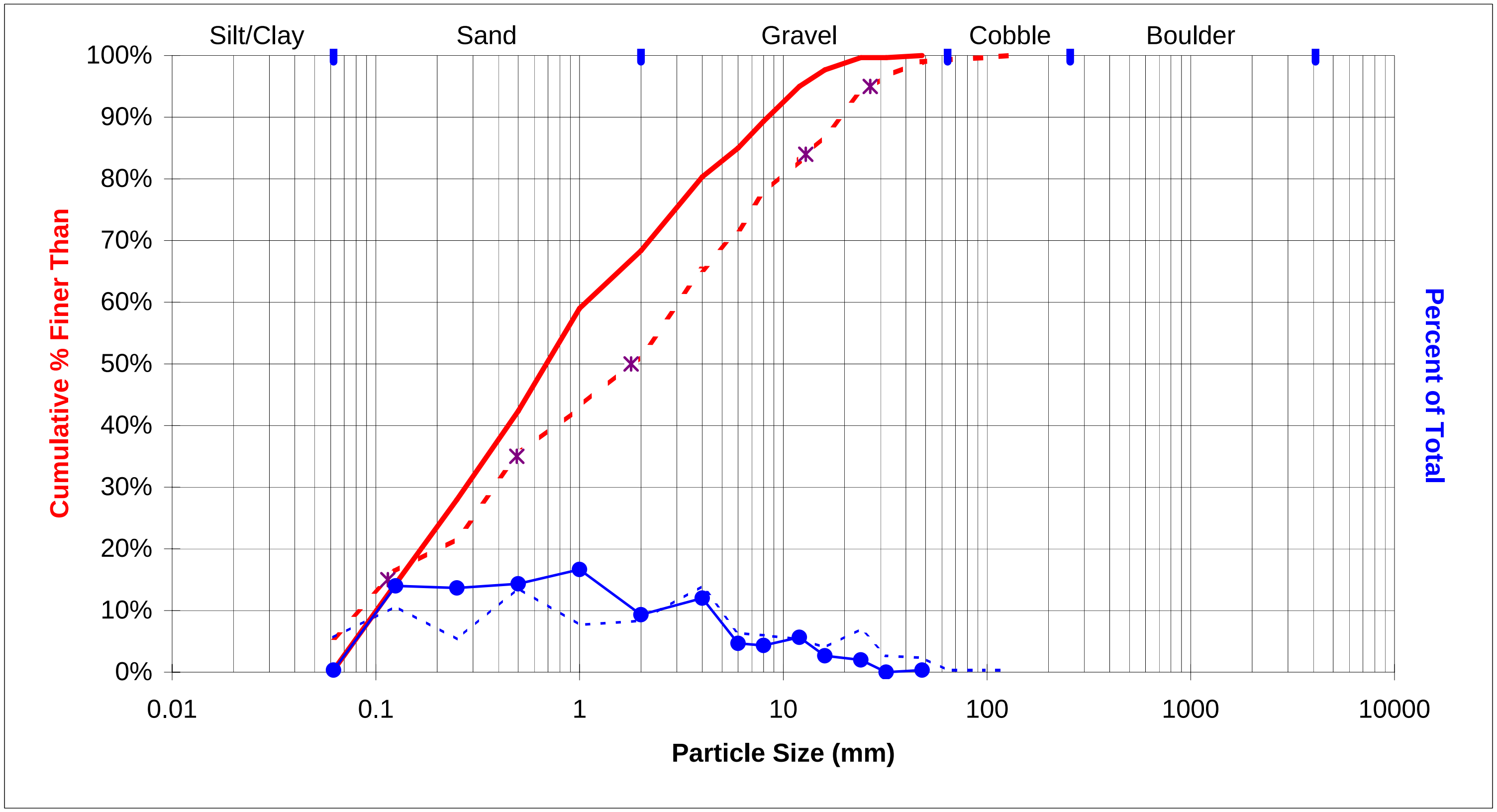
Particle Size (mm)	% finer than	Total Count
<0.062	6%	17
0.062 - 0.125	16%	32
0.125 - 0.25	22%	16
0.25 - 0.5	35%	41
0.5 - 1.0	43%	23
1 - 2	51%	25
2 - 4	65%	42
4 - 6	72%	19
6 - 8	78%	18
8 - 12	83%	16
12 - 16	87%	12
16 - 24	94%	21
24 - 32	97%	8
32 - 48	99%	7
48 - 64	99%	1
64 - 96	100%	1
96 - 128	100%	1
128 - 192		
192 - 256		
256 - 384		
384 - 512		
512 - 1024		
1024 - 2048		
2048 - 4096		

COMMENTS: ERO Study Site

STREAM NAME: North Fork Crystal Ck
ID NUMBER: NCRY1
DATE: 9/7/2004
CREW: J.Nankervis, S. Belz, K. Grimes, L. Howell

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart	Year	Graph
0.11	0.49	1.79	12.9	26.7	125.0	2004	Dashed
0.13	0.35	0.69	5.5	12.0	37.0	2003	Solid



Pebble Count Worksheet

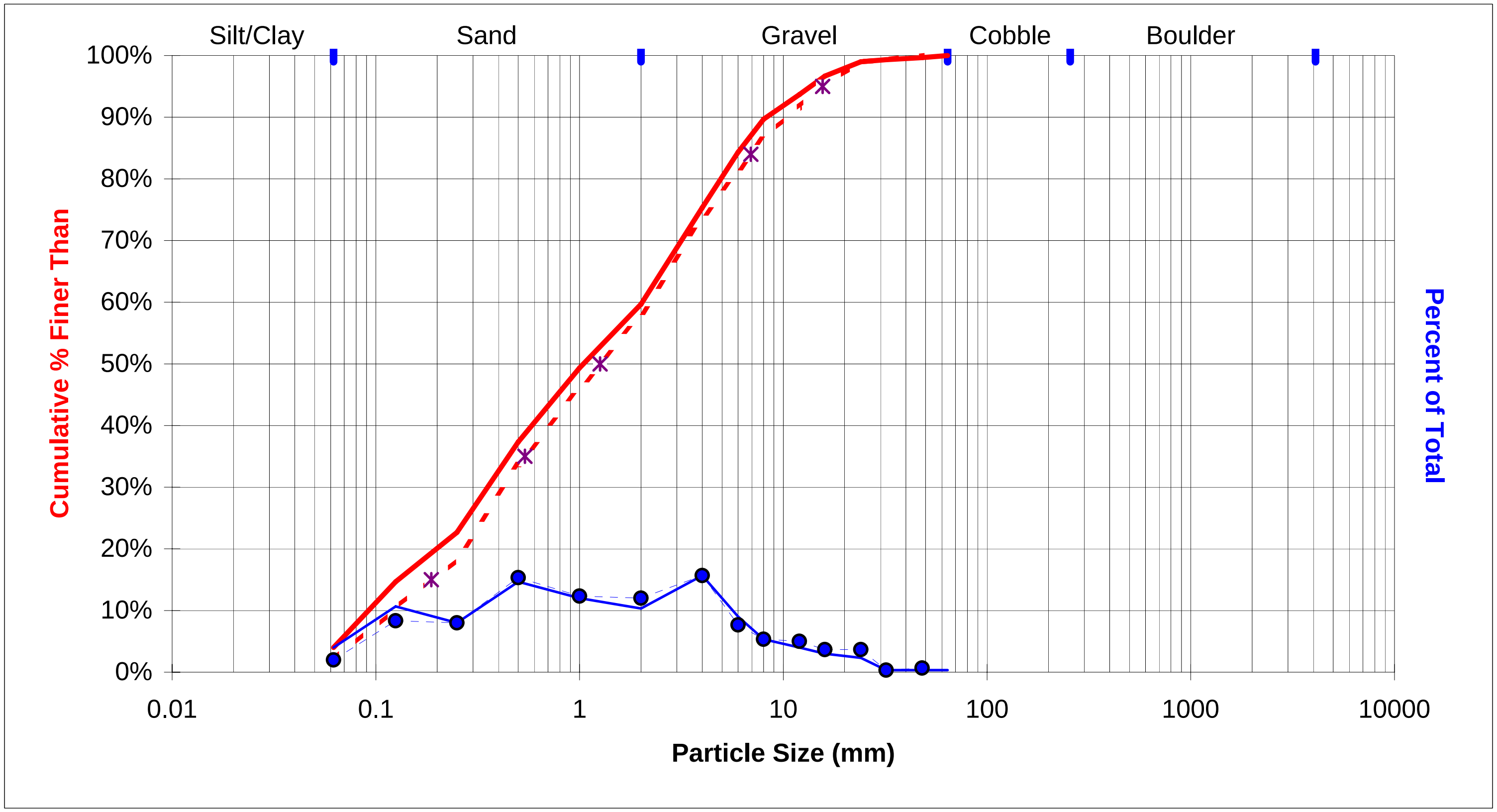
Particle Size (mm)	% finer than	Total Count
<0.062	2%	6
0.062 - 0.125	10%	25
0.125 - 0.25	18%	24
0.25 - 0.5	34%	46
0.5 - 1.0	46%	37
1 - 2	58%	36
2 - 4	74%	47
4 - 6	81%	23
6 - 8	87%	16
8 - 12	92%	15
12 - 16	95%	11
16 - 24	99%	11
24 - 32	99%	1
32 - 48	100%	2
48 - 64		
64 - 96		
96 - 128		
128 - 192		
192 - 256		
256 - 384		
384 - 512		
512 - 1024		
1024 - 2048		
2048 - 4096		

COMMENTS: Second reach 500 ft upstream from ERO study site

STREAM NAME: North Fork Crystal Ck
ID NUMBER: NCRY2
DATE: 9/7/2004
CREW: J.Nankervis, S. Belz, K. Grimes, L. Howell

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart	Year	Graph
0.19	0.54	1.26	6.9	15.6	44.0	2004	Dashed
0.13	0.45	1.05	5.9	13.6	55.0	2003	Solid



Pebble Count Worksheet

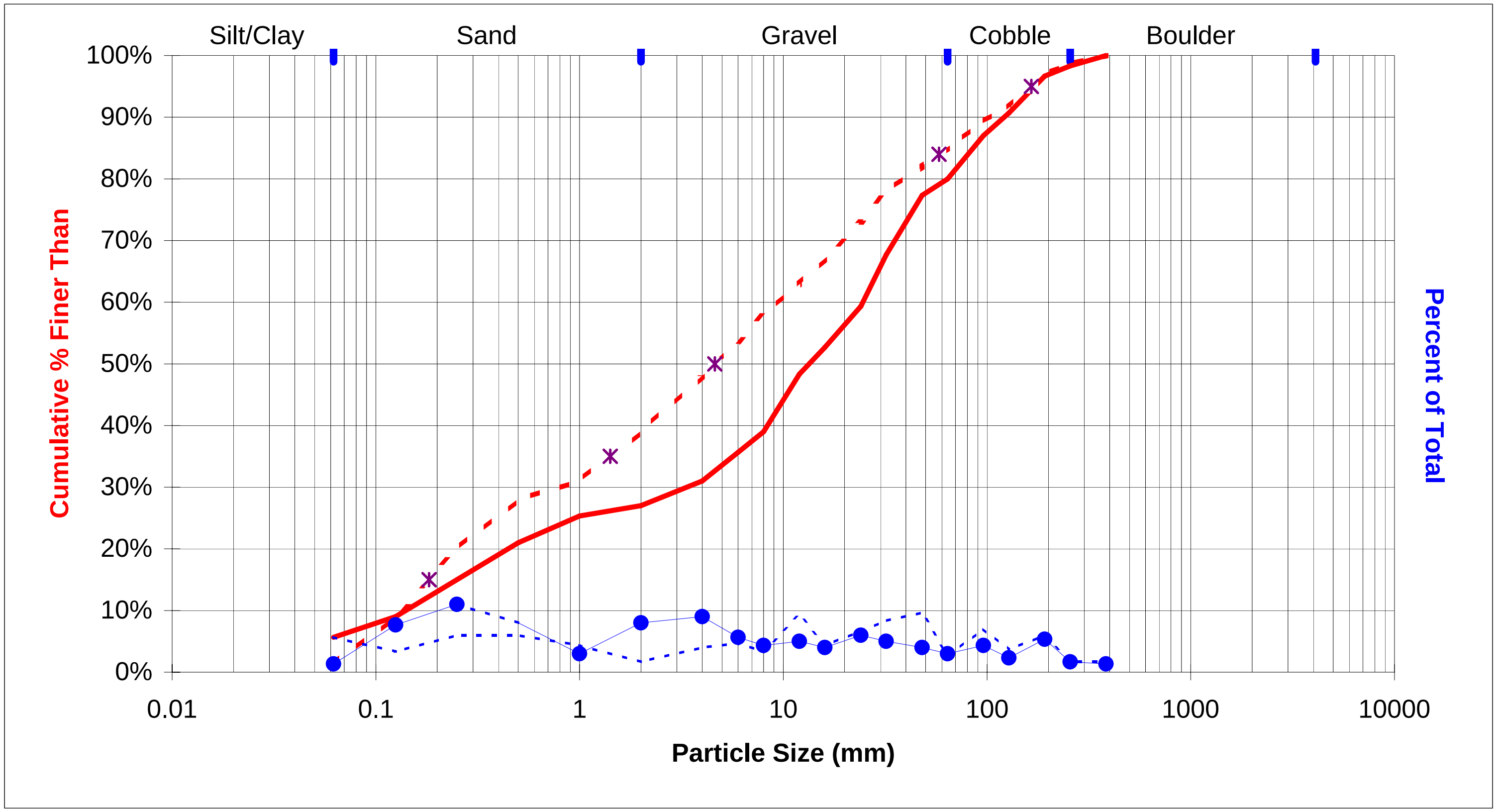
Particle Size (mm)	% finer than	Total Count
<0.062	1%	4
0.062 - 0.125	9%	23
0.125 - 0.25	20%	33
0.25 - 0.5	28%	24
0.5 - 1.0	31%	9
1 - 2	39%	24
2 - 4	48%	27
4 - 6	54%	17
6 - 8	58%	13
8 - 12	63%	15
12 - 16	67%	12
16 - 24	73%	18
24 - 32	78%	15
32 - 48	82%	12
48 - 64	85%	9
64 - 96	89%	13
96 - 128	92%	7
128 - 192	97%	16
192 - 256	99%	5
256 - 384	100%	4
384 - 512		
512 - 1024		
1024 - 2048		
2048 - 4096		

COMMENTS: ERO Reach

STREAM NAME: Oil Ck
ID NUMBER: OILC1
DATE: 9/9/2004
CREW: J.Nankervis, S. Belz, K. Grimes, L. Howell

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart	Year	Graph
0.18	1.41	4.62	58.1	164.9	370.0	2004	Dashed
0.25	5.66	13.40	80.7	171.5	340.0	2003	Solid



Pebble Count Worksheet

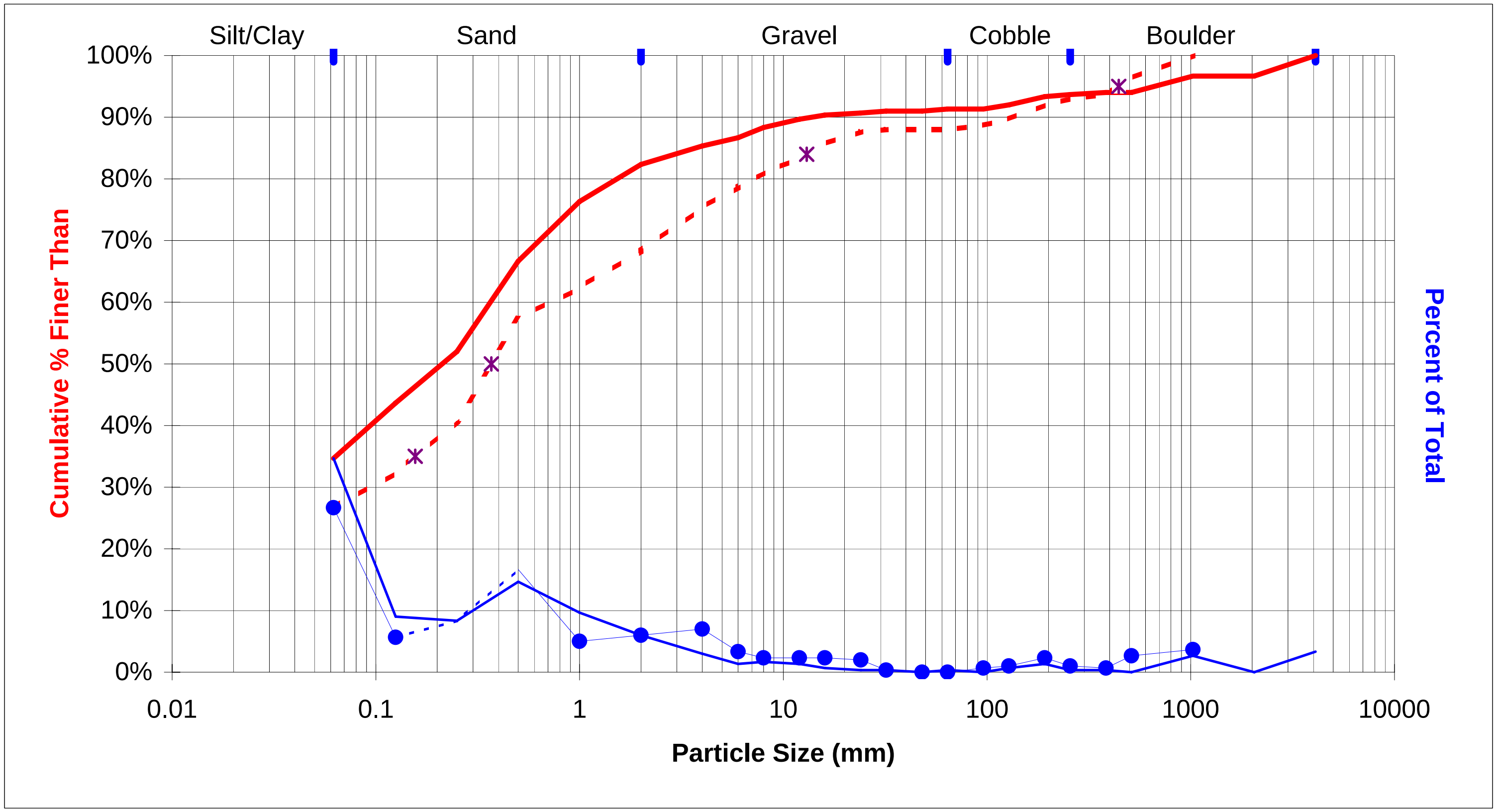
Particle Size (mm)	% finer than	Total Count
<0.062	27%	80
0.062 - 0.125	32%	17
0.125 - 0.25	41%	25
0.25 - 0.5	57%	50
0.5 - 1.0	62%	15
1 - 2	68%	18
2 - 4	75%	21
4 - 6	79%	10
6 - 8	81%	7
8 - 12	83%	7
12 - 16	86%	7
16 - 24	88%	6
24 - 32	88%	1
32 - 48	88%	0
48 - 64	88%	0
64 - 96	89%	2
96 - 128	90%	3
128 - 192	92%	7
192 - 256	93%	3
256 - 384	94%	2
384 - 512	96%	8
512 - 1024	100%	11
1024 - 2048		
2048 - 4096		

COMMENTS: ERO Reach

STREAM NAME: Severy Ck
ID NUMBER: SVRY1
DATE: 9/10/2004
CREW: J.Nankervis, S. Belz, K. Grimes, L. Howell

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart	Year	Graph
	0.16	0.37	13.0	443.4	600.0	2004	Dashed
	0.06	0.21	2.9	664.0	4097.0	2003	Solid



Pebble Count Worksheet

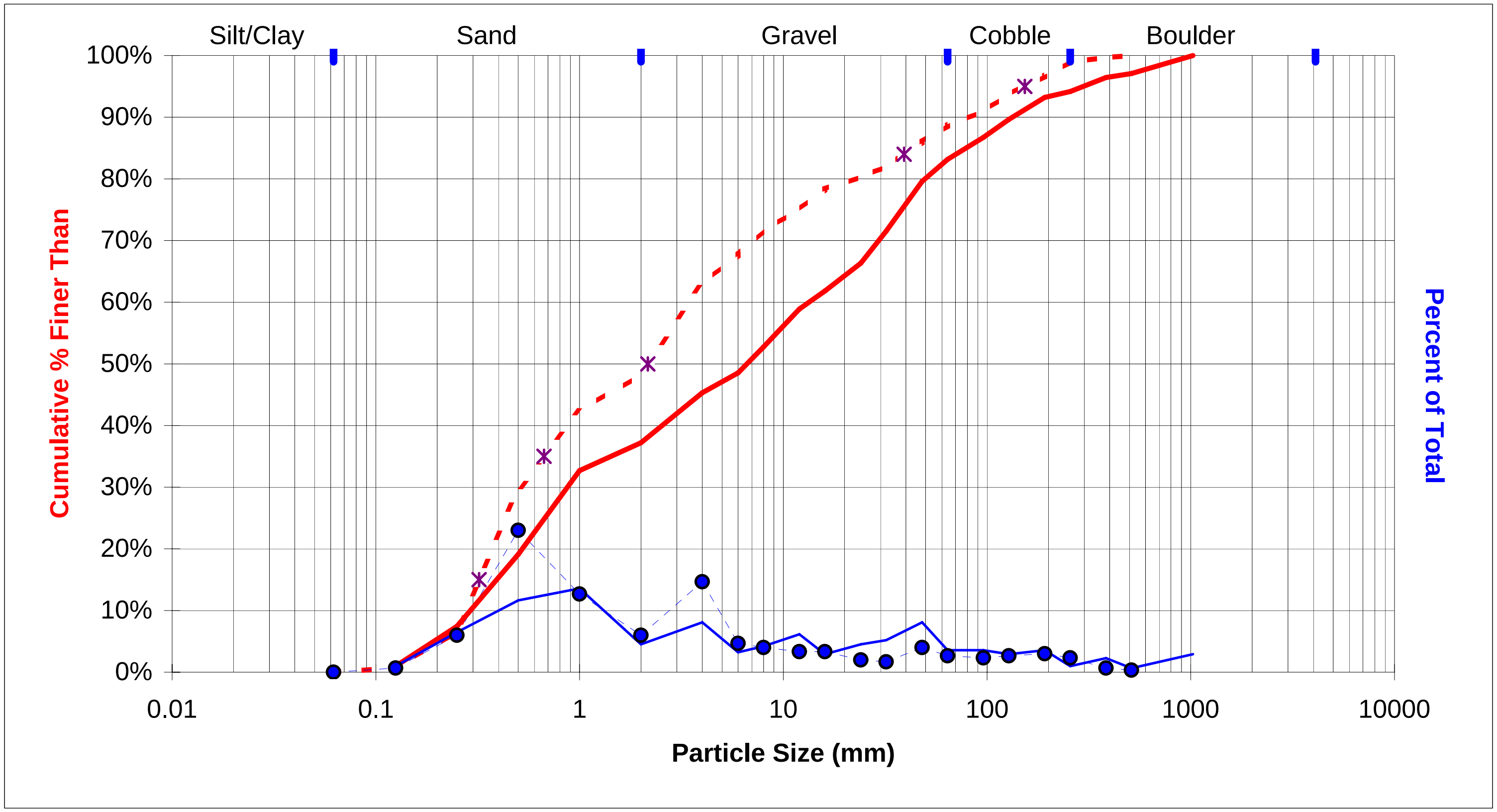
Particle Size (mm)	% finer than	Total Count
<0.062	0%	0
0.062 - 0.125	1%	2
0.125 - 0.25	7%	18
0.25 - 0.5	30%	69
0.5 - 1.0	42%	38
1 - 2	48%	18
2 - 4	63%	44
4 - 6	68%	14
6 - 8	72%	12
8 - 12	75%	10
12 - 16	78%	10
16 - 24	80%	6
24 - 32	82%	5
32 - 48	86%	12
48 - 64	89%	8
64 - 96	91%	7
96 - 128	94%	8
128 - 192	97%	9
192 - 256	99%	7
256 - 384	100%	2
384 - 512	100%	1
512 - 1024		
1024 - 2048		
2048 - 4096		

COMMENTS: Second reach 1000 ft upstream of ERO reach

STREAM NAME: Severy Ck
ID NUMBER: SVRY2
DATE: 9/10/2004
CREW: J.Nankervis, S. Belz, K. Grimes, L. Howell

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart	Year	Graph
0.3	0.67	2.16	39.2	153.3	446.0	2004	Dashed
0.4	1.42	6.63	70.3	296.7	400.0	2003	Solid



Pebble Count Worksheet

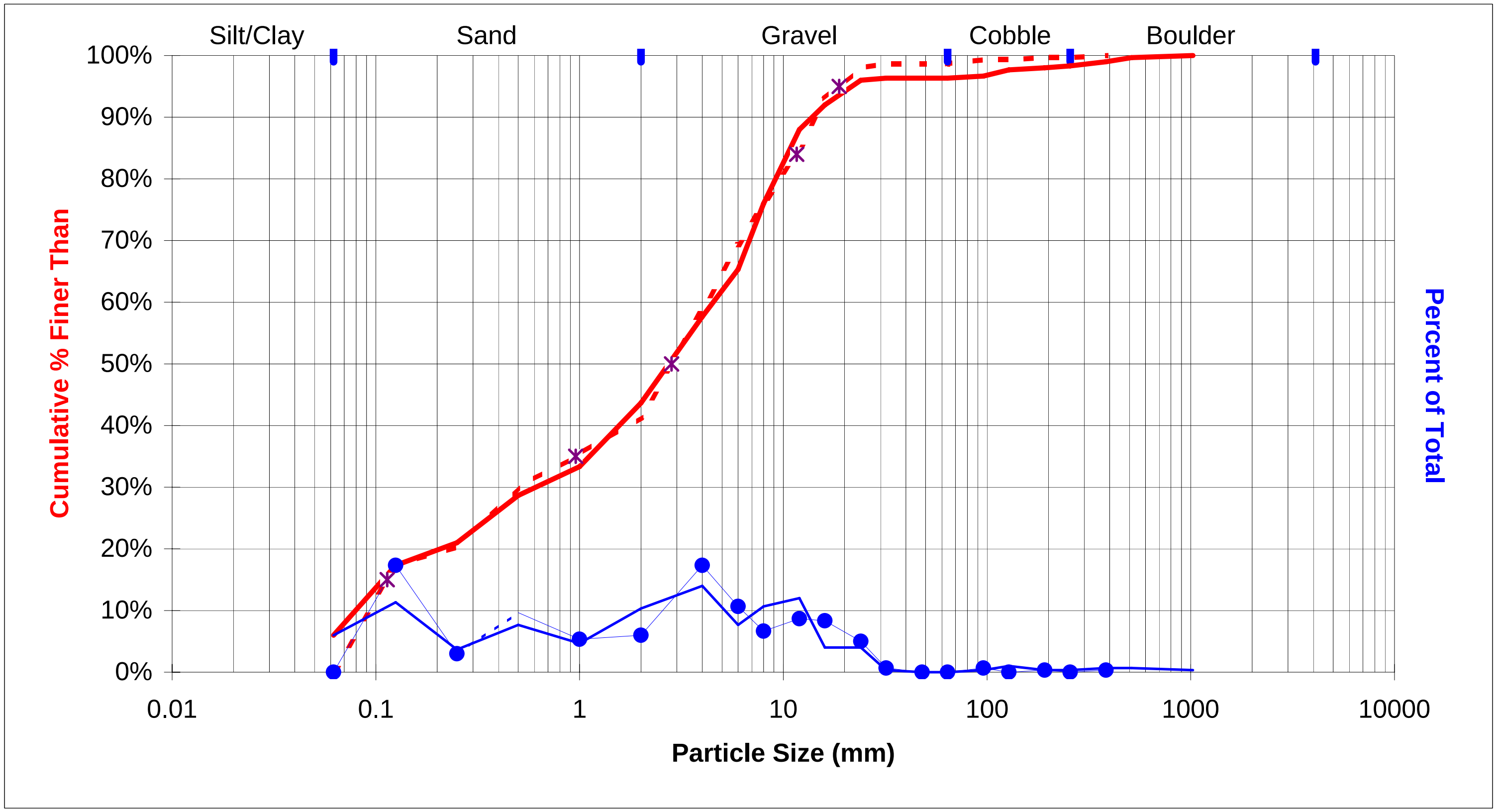
Particle Size (mm)	% finer than	Total Count
<0.062	0%	0
0.062 - 0.125	17%	52
0.125 - 0.25	20%	9
0.25 - 0.5	30%	29
0.5 - 1.0	35%	16
1 - 2	41%	18
2 - 4	59%	52
4 - 6	69%	32
6 - 8	76%	20
8 - 12	85%	26
12 - 16	93%	25
16 - 24	98%	15
24 - 32	99%	2
32 - 48	99%	0
48 - 64	99%	0
64 - 96	99%	2
96 - 128	99%	0
128 - 192	100%	1
192 - 256	100%	0
256 - 384	100%	1
384 - 512		
512 - 1024		
1024 - 2048		
2048 - 4096		

COMMENTS: About 0.2 miles upstream from ERO Study Site

STREAM NAME: Ski Ck
ID NUMBER: SKIC1
DATE: 9/7/2004
CREW: J.Nankervis, S. Belz, K. Grimes, L. Howell

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart	Year	Graph
0.11	0.96	2.83	11.6	18.8	380.0	2004	Dashed
0.11	1.12	2.74	10.5	21.7	570.0	2003	Solid



Pebble Count Worksheet

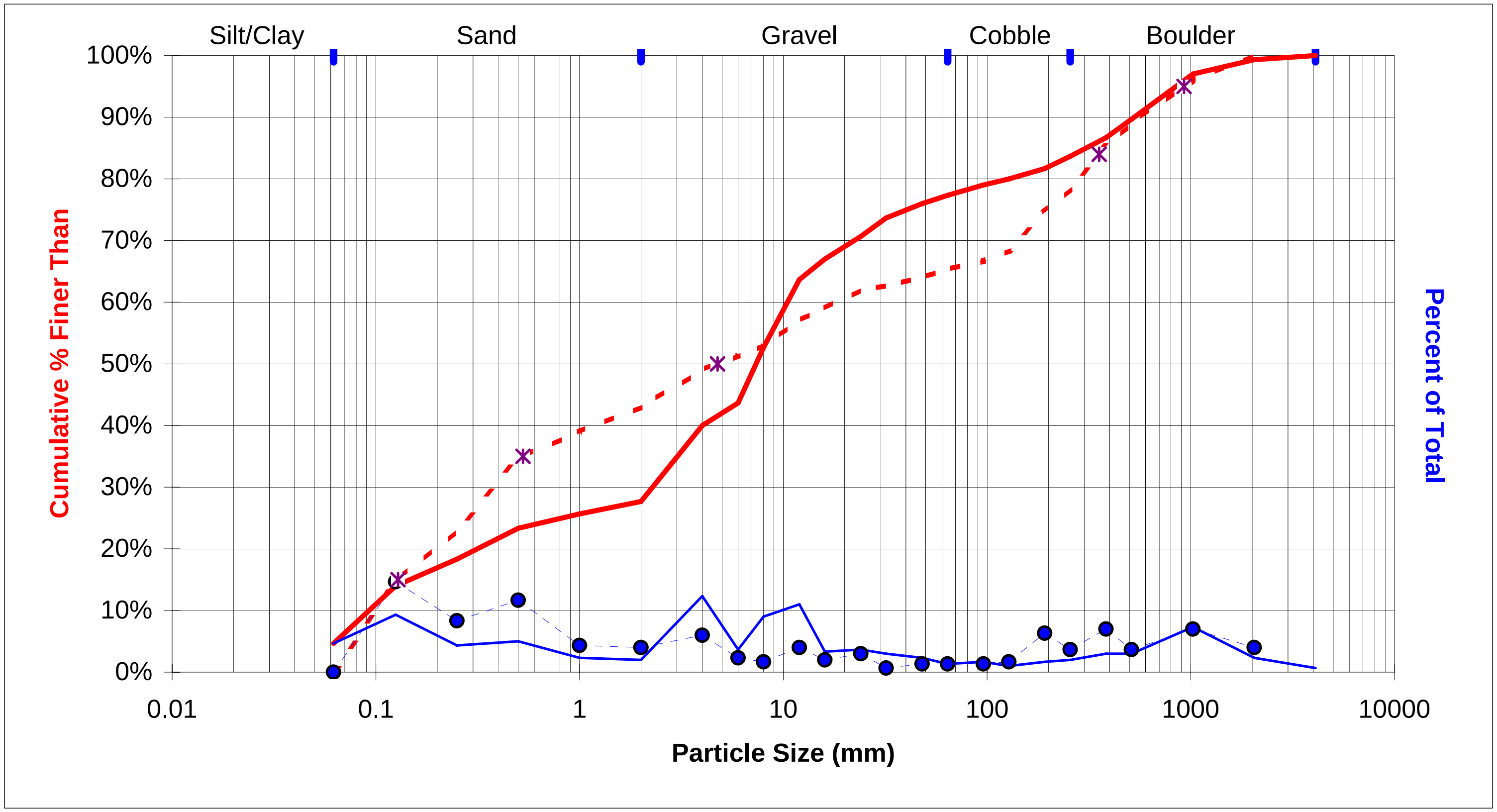
Particle Size (mm)	% finer than	Total Count
<0.062	0%	0
0.062 - 0.125	15%	44
0.125 - 0.25	23%	25
0.25 - 0.5	35%	35
0.5 - 1.0	39%	13
1 - 2	43%	12
2 - 4	49%	18
4 - 6	51%	7
6 - 8	53%	5
8 - 12	57%	12
12 - 16	59%	6
16 - 24	62%	9
24 - 32	63%	2
32 - 48	64%	4
48 - 64	65%	4
64 - 96	67%	4
96 - 128	68%	5
128 - 192	75%	19
192 - 256	78%	11
256 - 384	85%	21
384 - 512	89%	11
512 - 1024	96%	21
1024 - 2048	100%	12
2048 - 4096		

COMMENTS: Second reach near mile marker 10 on PPH and Rain Guage #1

STREAM NAME: Ski Ck
ID NUMBER: SKIC2
DATE: 9/7/2004
CREW: J.Nankervis, S. Belz, K. Grimes, L. Howell

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart	Year	Graph
0.13	0.53	4.76	355.5	927.5	1270.0	2004	Dashed
0.15	3.02	7.35	267.8	847.6	4097.0	2003	Solid



Pebble Count Worksheet

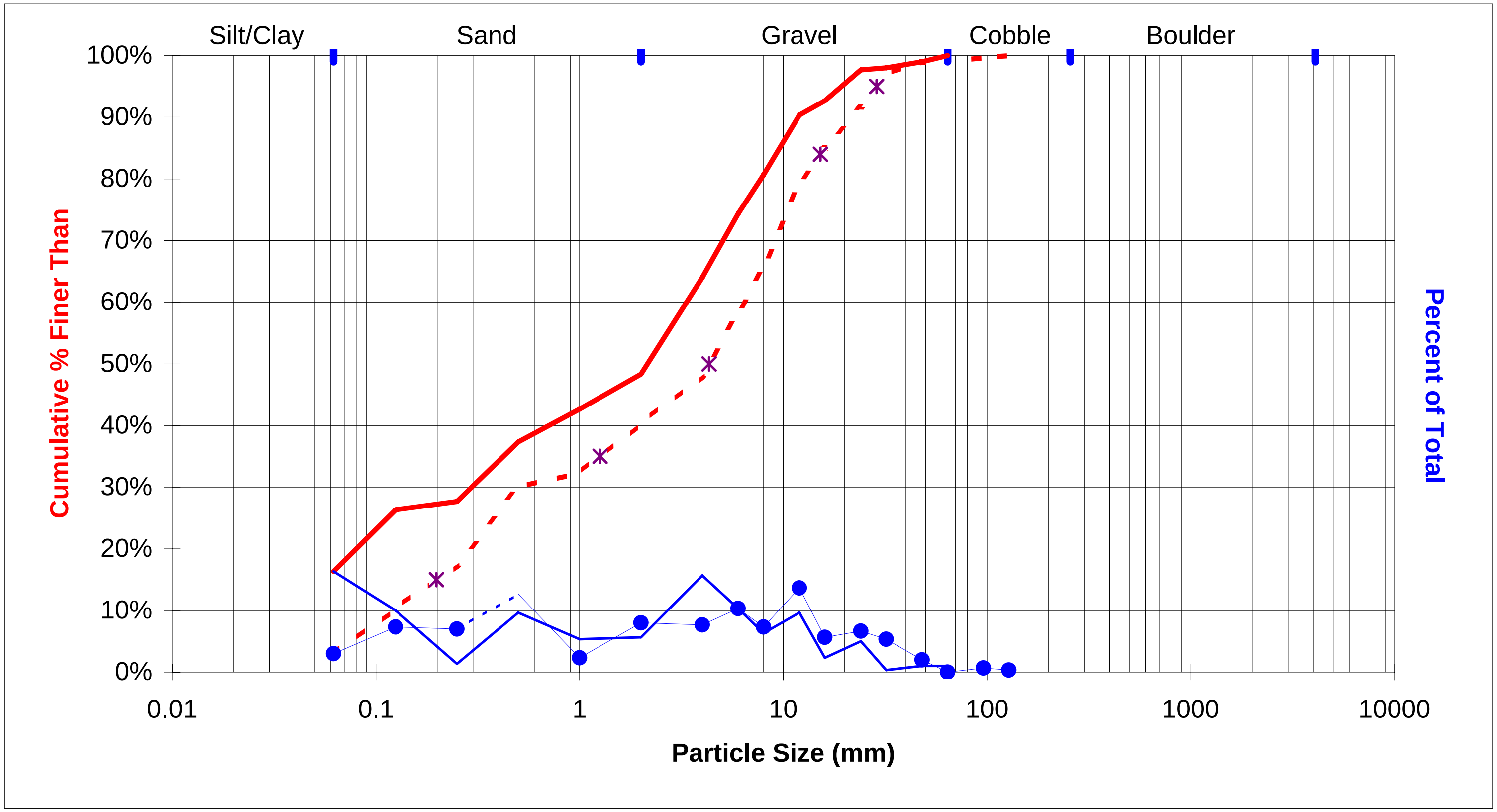
Particle Size (mm)	% finer than	Total Count
<0.062	3%	9
0.062 - 0.125	10%	22
0.125 - 0.25	17%	21
0.25 - 0.5	30%	38
0.5 - 1.0	32%	7
1 - 2	40%	24
2 - 4	48%	23
4 - 6	58%	31
6 - 8	66%	22
8 - 12	79%	41
12 - 16	85%	17
16 - 24	92%	20
24 - 32	97%	16
32 - 48	99%	6
48 - 64	99%	0
64 - 96	100%	2
96 - 128	100%	1
128 - 192		
192 - 256		
256 - 384		
384 - 512		
512 - 1024		
1024 - 2048		
2048 - 4096		

COMMENTS: ERO Study Site

STREAM NAME: South Catamount Ck
ID NUMBER: SCAT1
DATE: 9/6/2004
CREW: J.Nankervis, S. Belz, K. Grimes, L. Howell

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart	Year	Graph
0.20	1.26	4.33	15.2	28.7	104.0	2004	Dashed
	0.42	2.15	9.2	19.3	55.0	2003	Solid



Pebble Count Worksheet

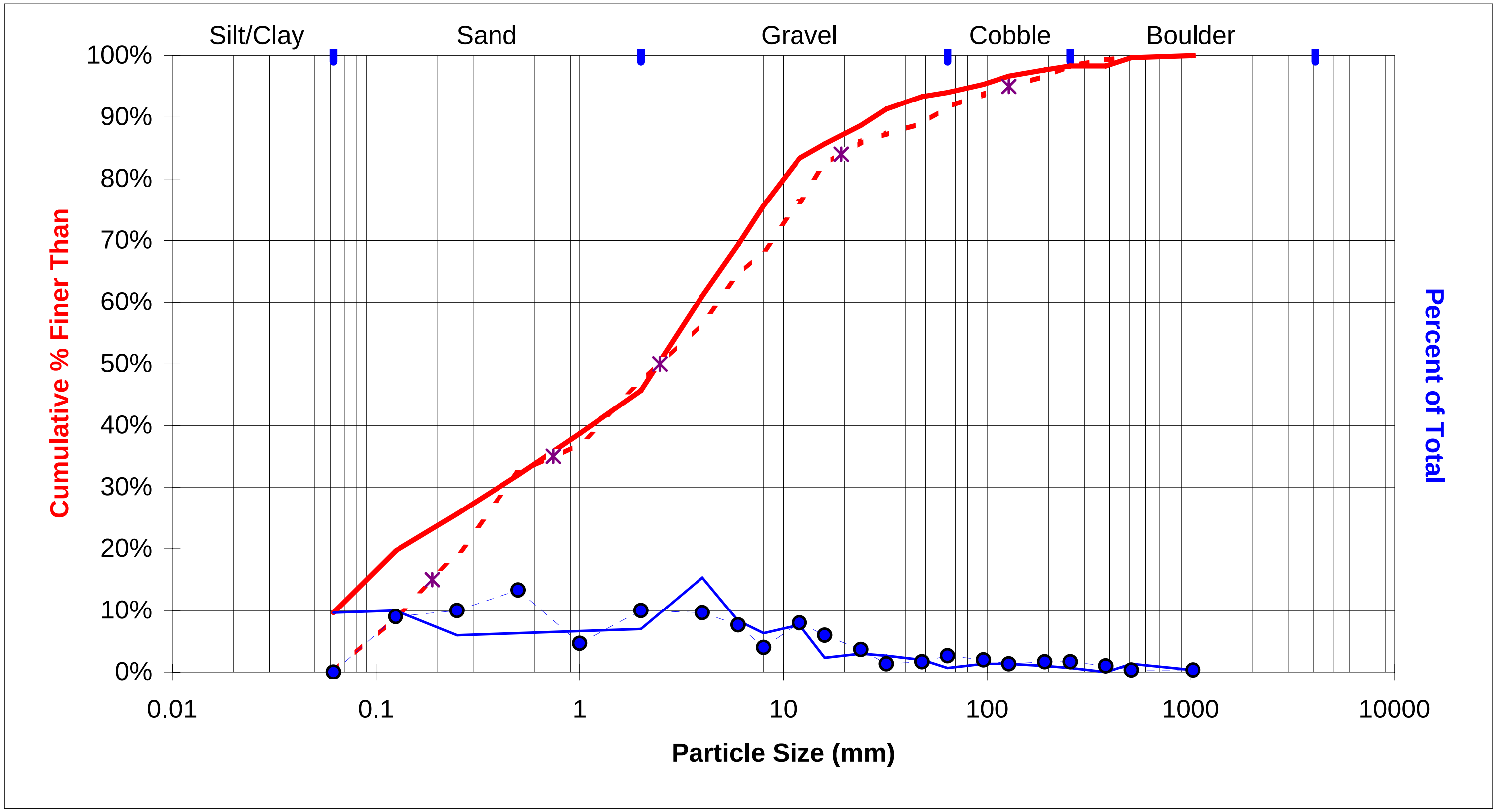
Particle Size (mm)	% finer than	Total Count
<0.062	0%	0
0.062 - 0.125	9%	27
0.125 - 0.25	19%	30
0.25 - 0.5	32%	40
0.5 - 1.0	37%	14
1 - 2	47%	30
2 - 4	57%	29
4 - 6	64%	23
6 - 8	68%	12
8 - 12	76%	24
12 - 16	82%	18
16 - 24	86%	11
24 - 32	87%	4
32 - 48	89%	5
48 - 64	92%	8
64 - 96	94%	6
96 - 128	95%	4
128 - 192	97%	5
192 - 256	98%	5
256 - 384	99%	3
384 - 512	100%	1
512 - 1024	100%	1
1024 - 2048		
2048 - 4096		

COMMENTS: Second reach 500 ft upstream from ERO study site

STREAM NAME: South Catamount Ck
ID NUMBER: SCAT2
DATE: 9/6/2004
CREW: J.Nankervis, S. Belz, K. Grimes, L. Howell

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart	Year	Graph
0.19	0.74	2.48	19.2	128.0	562.0	2004	Dashed
0.09	0.68	2.43	13.0	86.7	900.0	2003	Solid



Pebble Count Worksheet

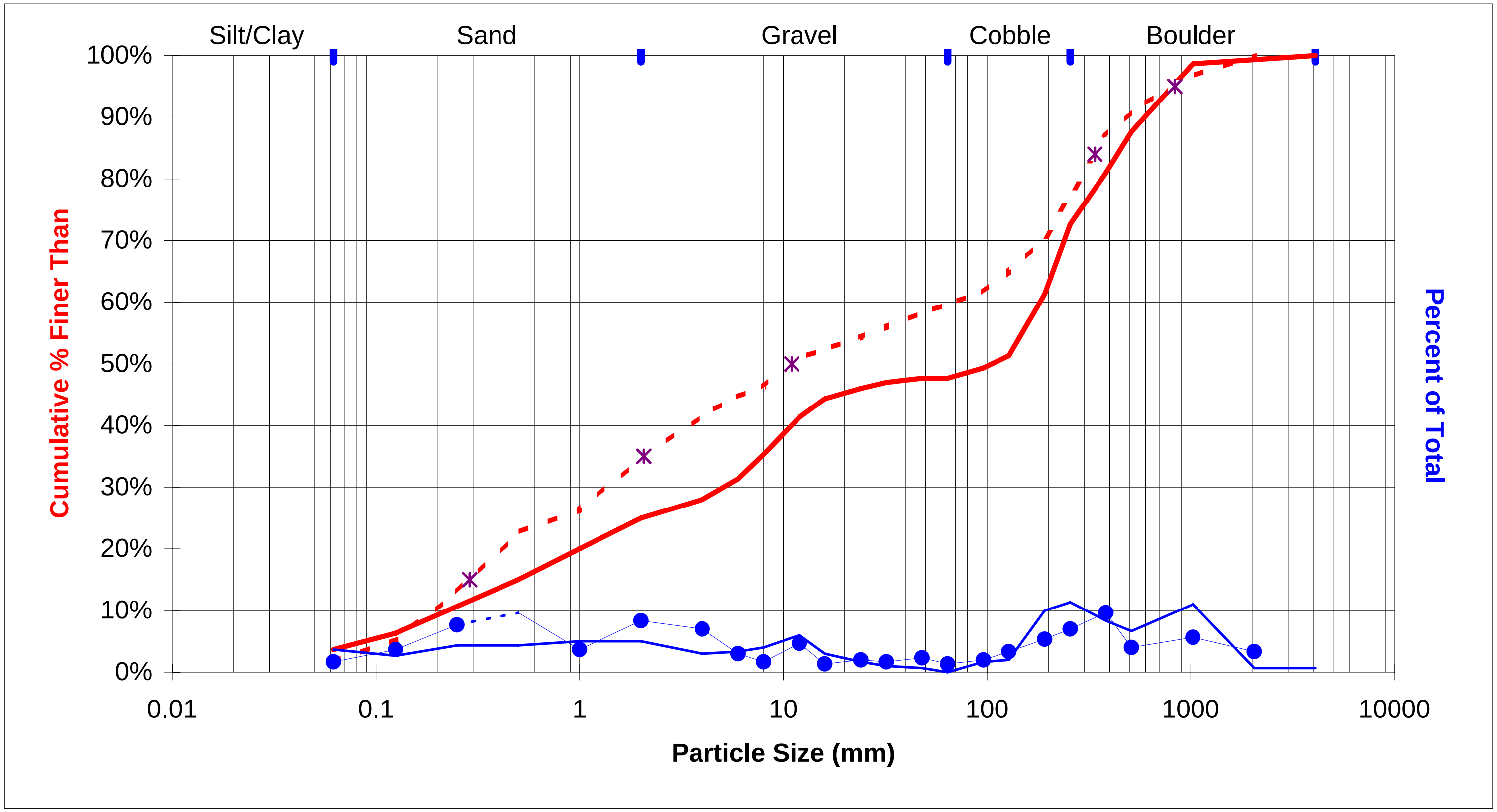
Particle Size (mm)	% finer than	Total Count
<0.062	2%	5
0.062 - 0.125	5%	11
0.125 - 0.25	13%	23
0.25 - 0.5	23%	29
0.5 - 1.0	26%	11
1 - 2	35%	25
2 - 4	42%	21
4 - 6	45%	9
6 - 8	46%	5
8 - 12	51%	14
12 - 16	52%	4
16 - 24	54%	6
24 - 32	56%	5
32 - 48	58%	7
48 - 64	60%	4
64 - 96	62%	6
96 - 128	65%	10
128 - 192	70%	16
192 - 256	77%	21
256 - 384	87%	29
384 - 512	91%	12
512 - 1024	97%	17
1024 - 2048	100%	10
2048 - 4096		

COMMENTS: ERO Study Site

STREAM NAME: West Fork Beaver Ck
ID NUMBER: WBVR1
DATE: 9/9/2004
CREW: J.Nankervis, S. Belz, K. Grimes, L. Howell

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart	Year	Graph
0.29	2.07	11.00	338.6	835.1	2000.0	2004	Dashed
0.50	7.81	105.66	437.1	812.7	2400.0	2003	Solid



Pebble Count Worksheet

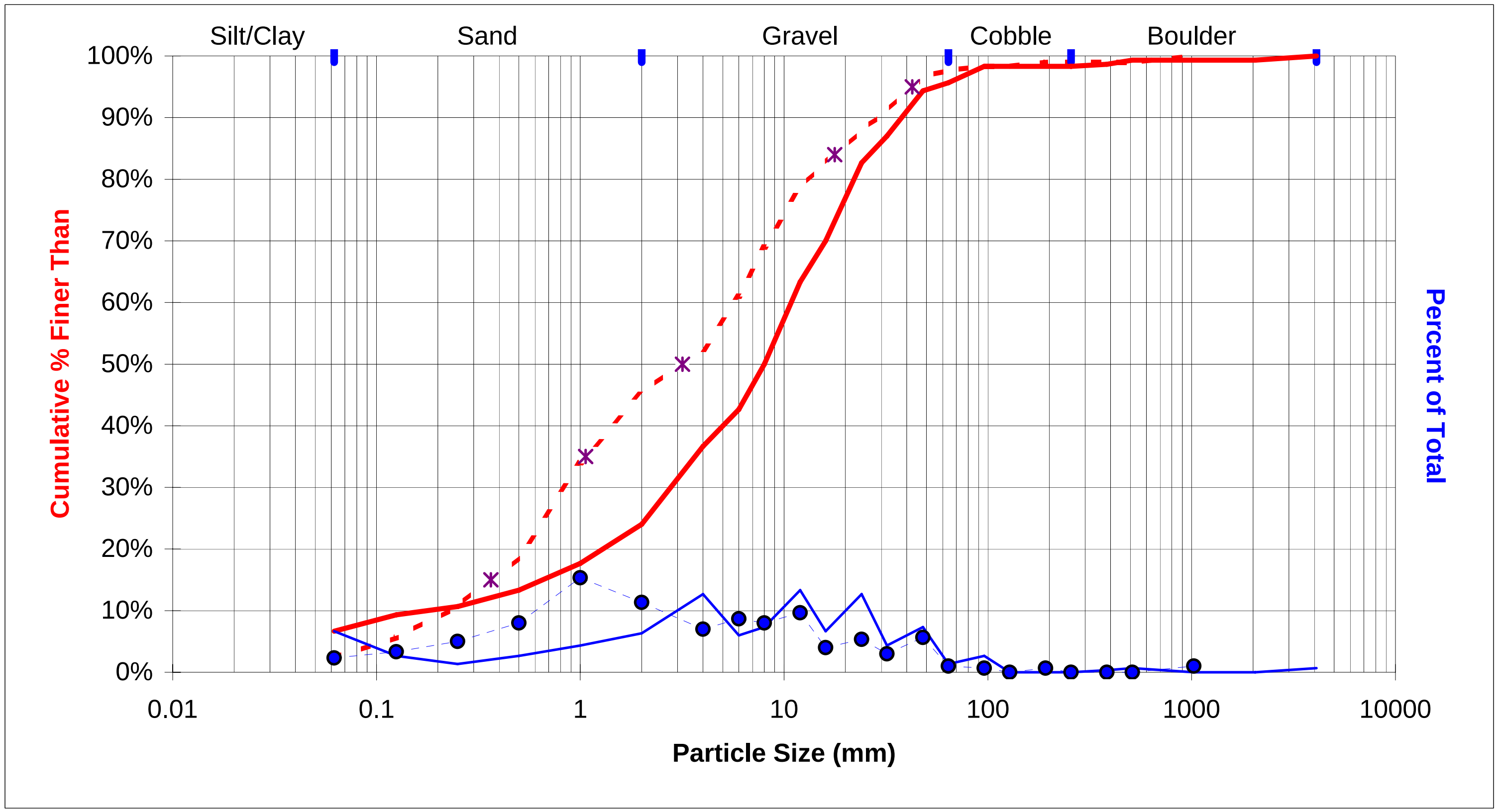
Particle Size (mm)	% finer than	Total Count
<0.062	2%	7
0.062 - 0.125	6%	10
0.125 - 0.25	11%	15
0.25 - 0.5	19%	24
0.5 - 1.0	34%	46
1 - 2	45%	34
2 - 4	52%	21
4 - 6	61%	26
6 - 8	69%	24
8 - 12	79%	29
12 - 16	83%	12
16 - 24	88%	16
24 - 32	91%	9
32 - 48	97%	17
48 - 64	98%	3
64 - 96	98%	2
96 - 128	98%	0
128 - 192	99%	2
192 - 256	99%	0
256 - 384	99%	0
384 - 512	99%	0
512 - 1024	100%	3
1024 - 2048		
2048 - 4096		

COMMENTS: Second reach 0.5 miles upstream of ERO reach

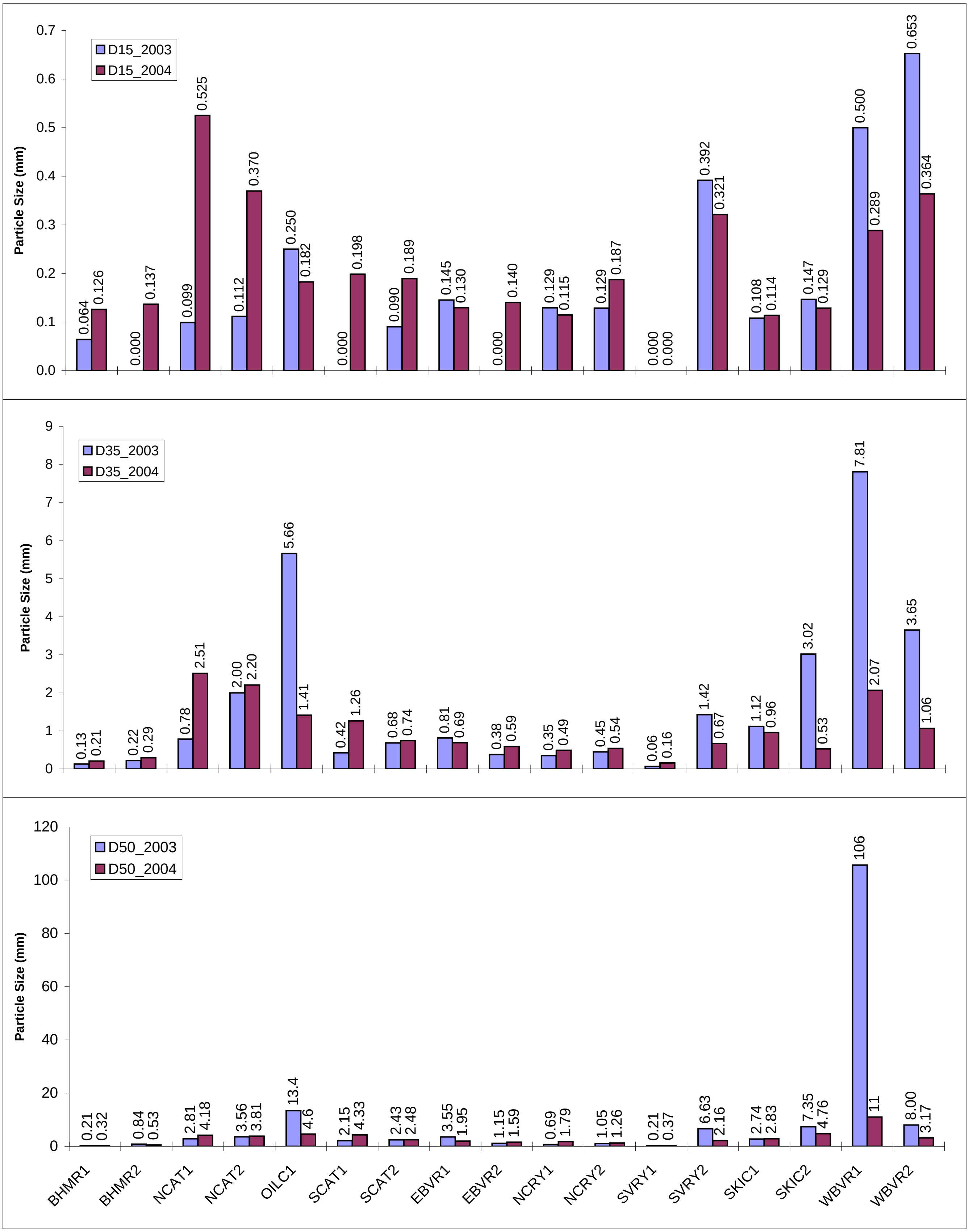
STREAM NAME: West Fork Beaver Ck
ID NUMBER: WBVR2
DATE: 9/9/2004
CREW: J.Nankervis, S. Belz, K. Grimes, L. Howell

Particle Size Distribution (mm)

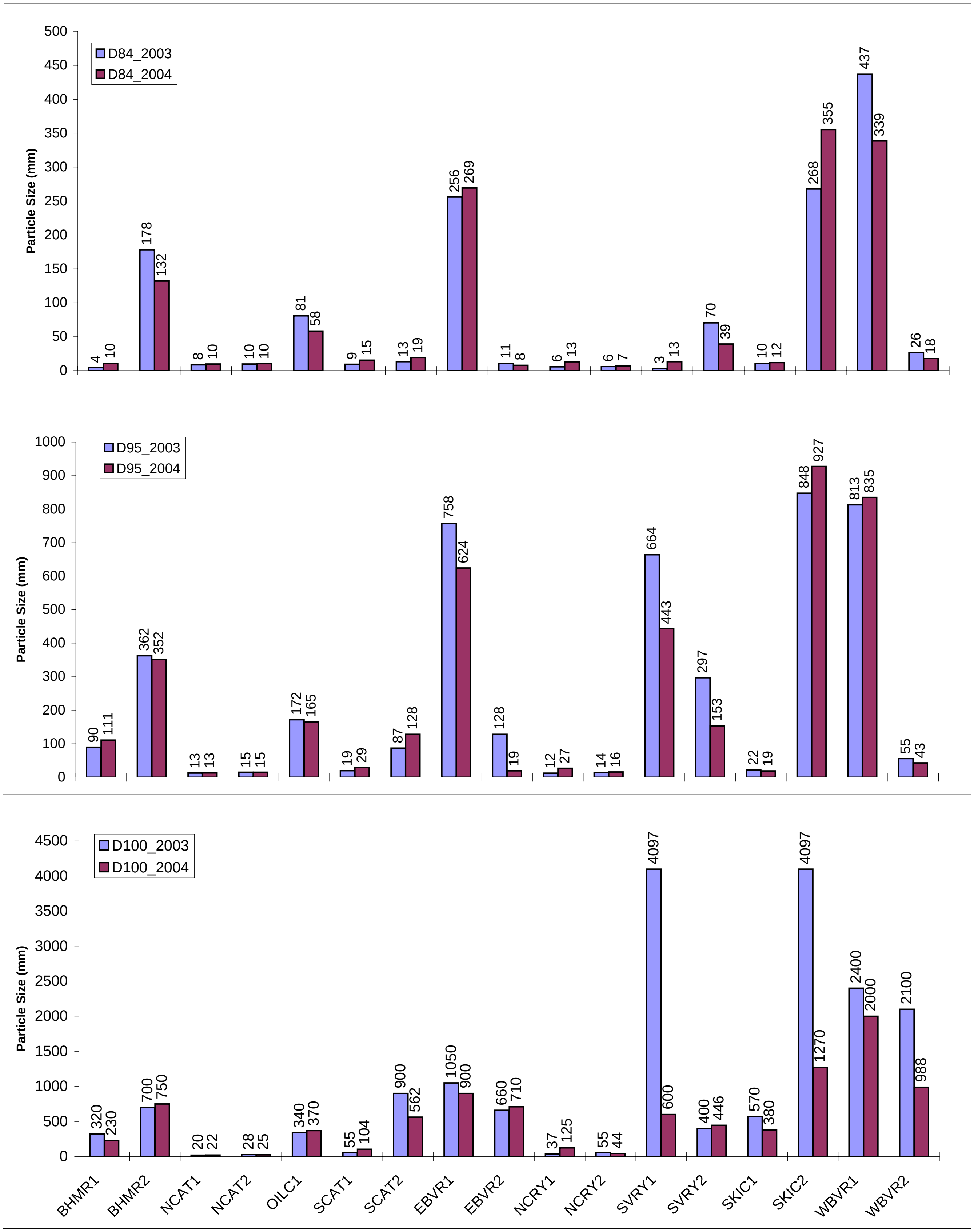
D15	D35	D50	D84	D95	Lpart	Year	Graph
0.36	1.06	3.17	17.7	42.6	988.0	2004	Dashed
0.65	3.65	8.00	26.2	55.4	2100.0	2003	Solid



Comparison of Particle Size Distributions from Pebble Counts in 2003 and 2004



Comparison of Particle Size Distributions from Pebble Counts in 2003 and 2004



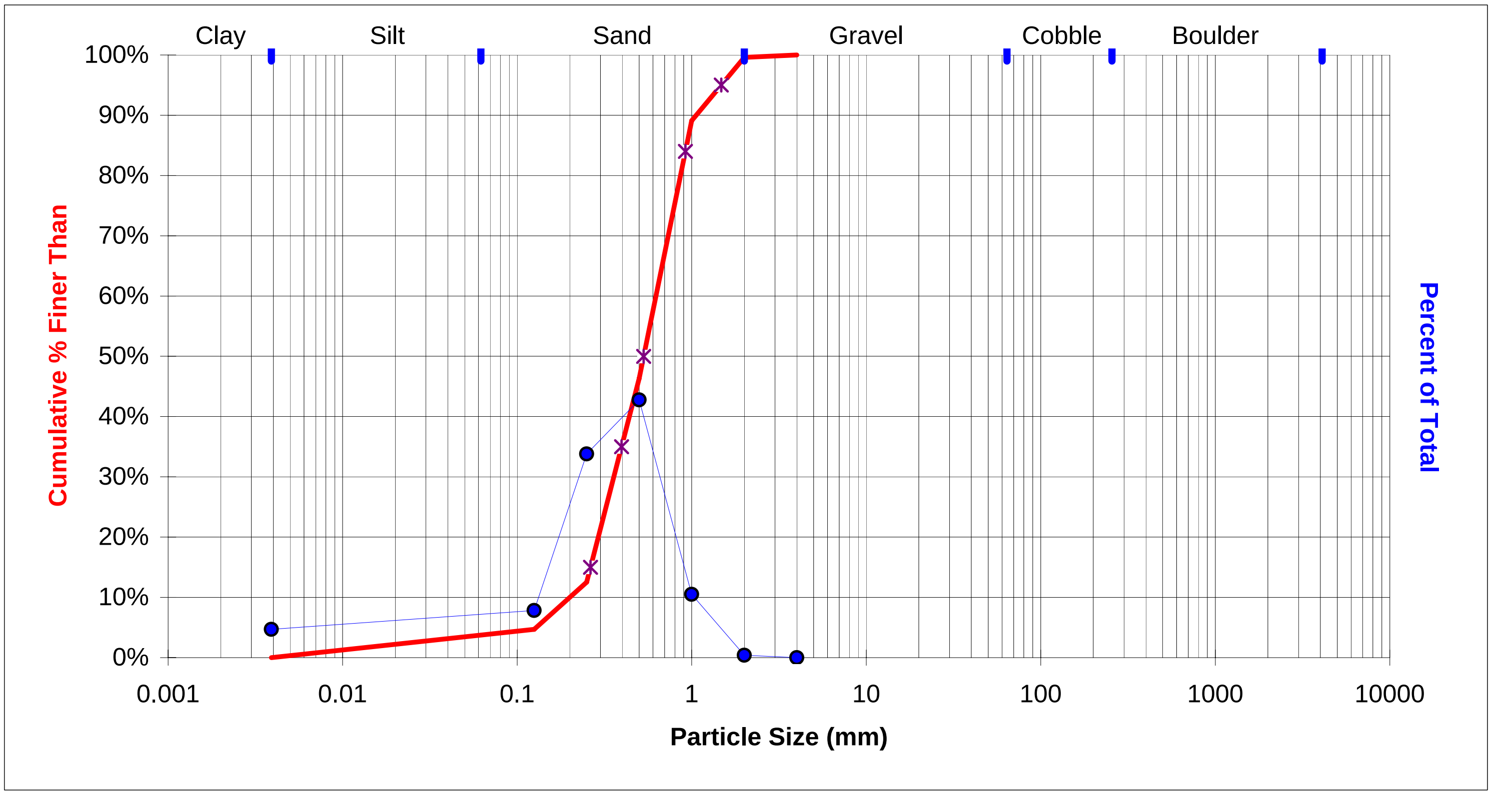
Sieve Analysis Worksheet

Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	**0.0%**	75.60
0.125	4.7%	126.20
0.25	12.5%	544.70
0.5	46.3%	689.20
1.0	89.1%	169.10
2.0	99.6%	6.60
4.0	100.0%	
5.6		
9.5		
12.5		
17.0		
24.5		
37.5		
45.0		
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Bar sample taken just upstream of Cross Section E

STREAM NAME: Boehmer Ck Reach 1
ID NUMBER: BHMR1
DATE: 9/8/2004
CREW: J.Nankervis, S. Belz, K. Grimes, L. Howell

Particle Size Distribution (mm)	D15	D35	D50	D84	D95	Lpart
	0.263	**0.396**	**0.531**	**0.921**	**1.477**	**4.0**



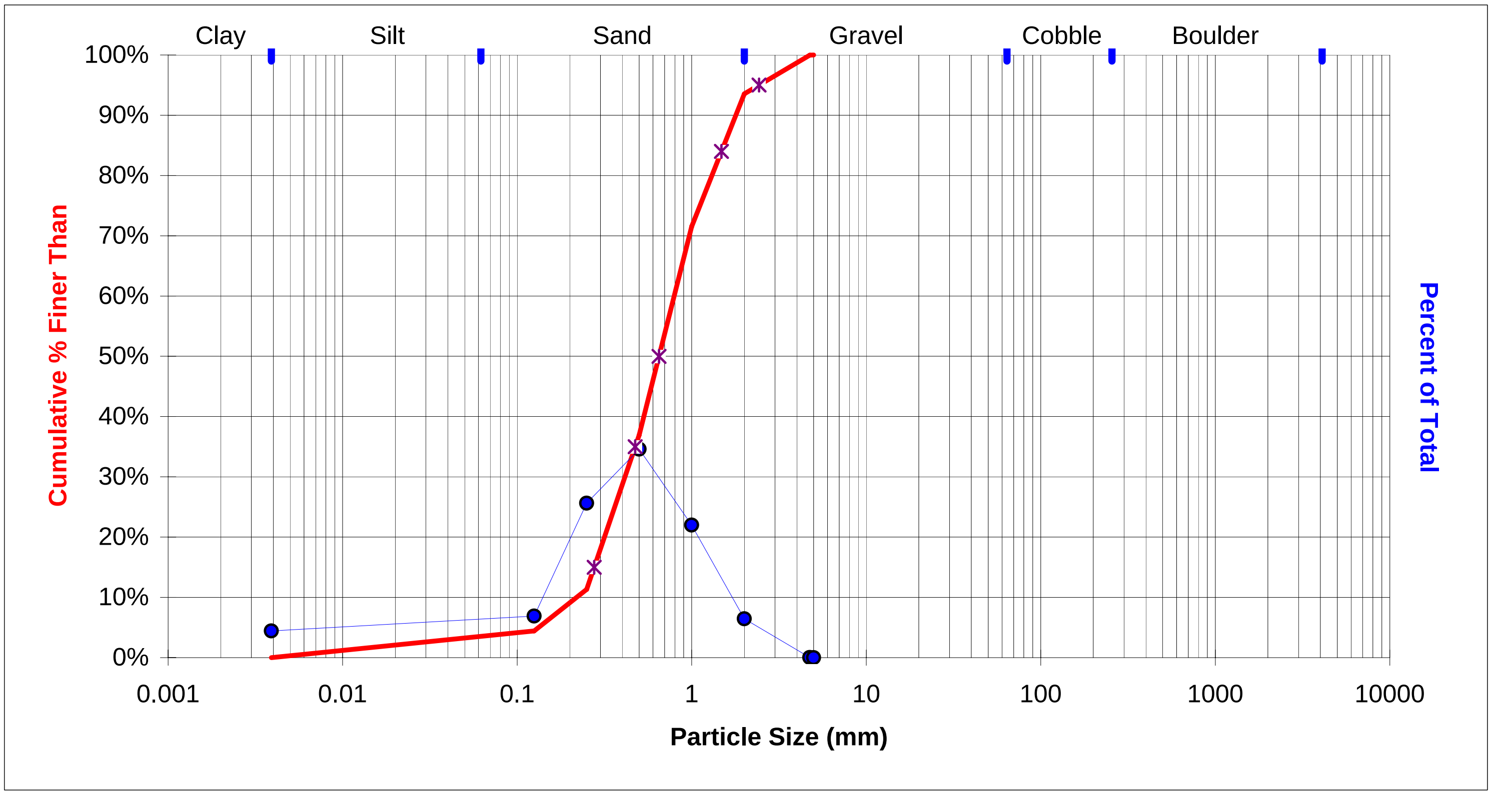
Sieve Analysis Worksheet

Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	**0.0%**	64.80
0.125	4.4%	100.90
0.25	11.3%	374.90
0.5	36.9%	506.30
1.0	71.5%	321.90
2.0	93.5%	94.30
4.75	100.0%	0.20
5.0	100.0%	
9.5		
12.5		
17.0		
24.5		
37.5		
45.0		
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Bar sample taken15-20' upstream of Cross Section B

STREAM NAME: Boehmer Ck Reach 2
ID NUMBER: BHMR2
DATE: 9/8/2004
CREW: J.Nankervis, S. Belz, K. Grimes, L. Howell

Particle Size Distribution (mm)	**D15**	**D35**	**D50**	**D84**	**D95**	**Lpart**
	0.276	**0.474**	**0.649**	**1.481**	**2.432**	**5.0**



Sieve Analysis Worksheet

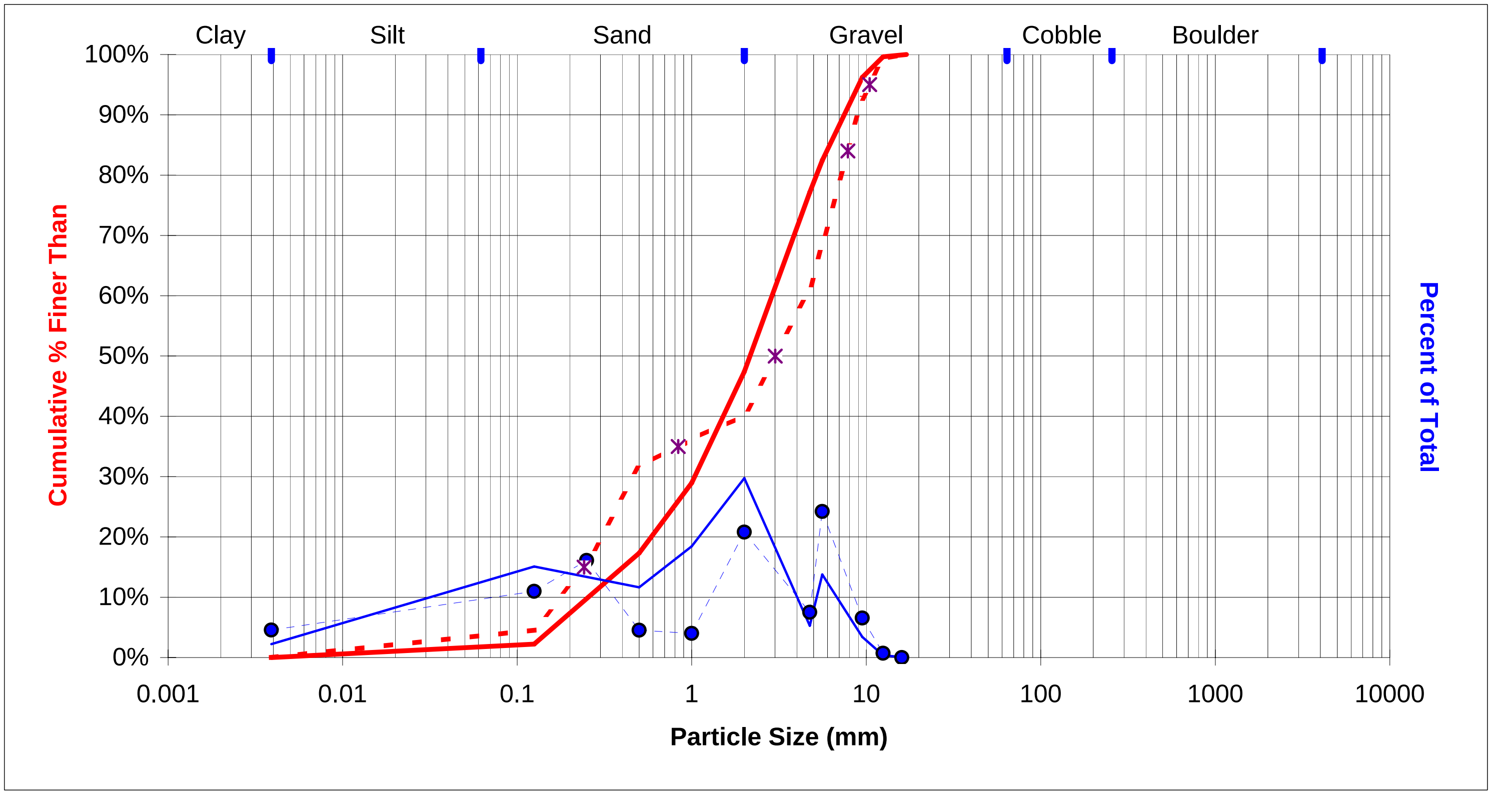
Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	**0.0%**	115.90
0.125	4.6%	279.20
0.25	15.5%	409.60
0.5	31.6%	115.10
1.0	36.2%	101.70
2.0	40.2%	529.20
4.8	61.0%	191.20
5.6	68.5%	616.30
9.5	92.7%	166.70
12.5	99.3%	18.3
16.0	100.0%	
24.5		
37.5		
45.0		
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Bar sample taken just upstream of Cross Section A

STREAM NAME: East Fork Beaver Creek: Reach 1
ID NUMBER: EBVR1
DATE: 9/8/2004
CREW: J.Nankervis, S. Belz, K. Grimes, L. Howell

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart	Year	Graph
0.24	0.84	3.01	7.9	10.4	16.0	2004	Dashed
0.40	1.25	2.16	5.9	9.1	17.0	2003	Solid



Sieve Analysis Worksheet

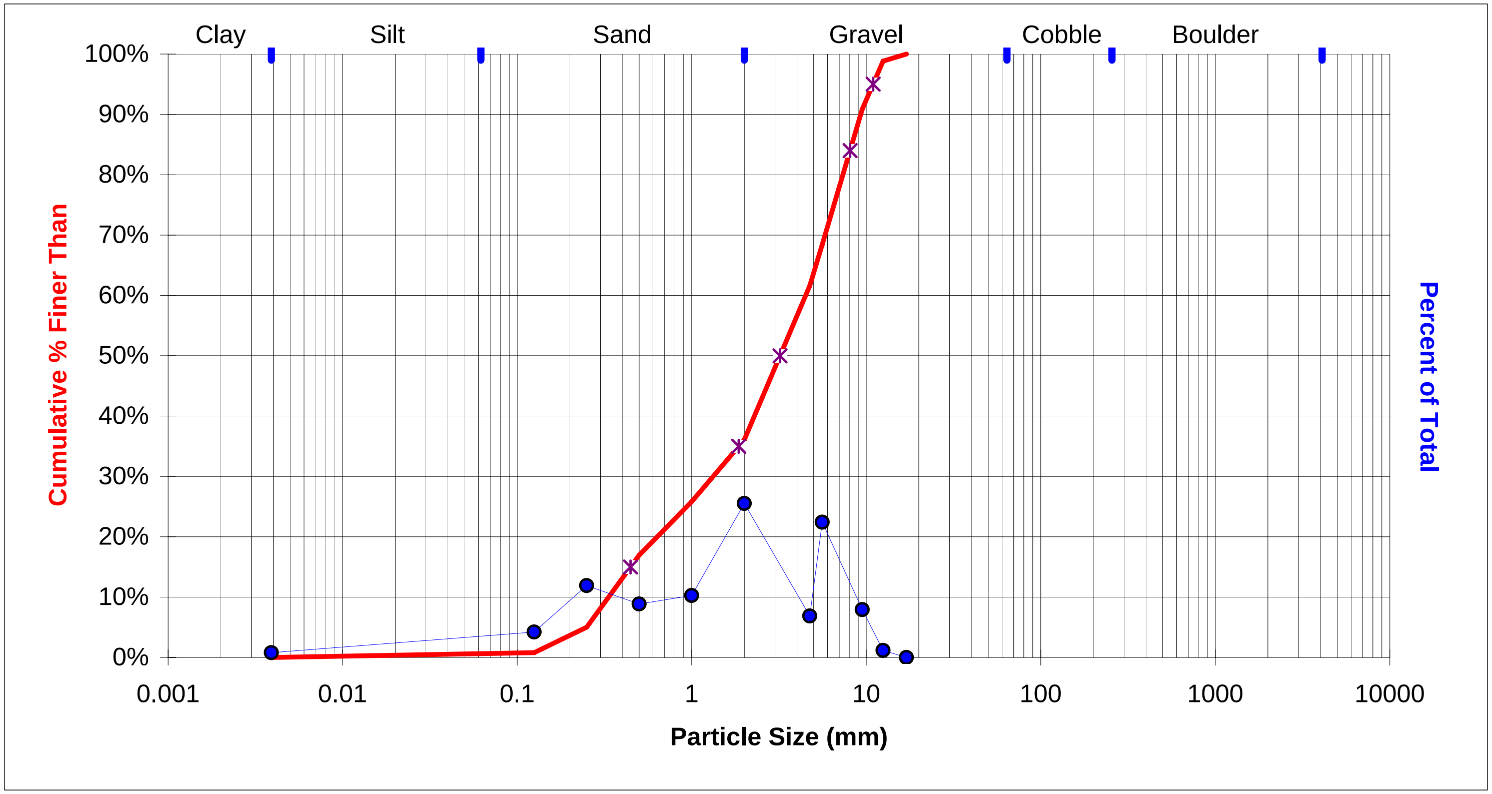
Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	**0.0%**	16.50
0.125	0.8%	86.40
0.25	5.0%	244.10
0.5	17.0%	181.30
1.0	25.8%	210.20
2.0	36.1%	522.40
4.8	61.6%	140.50
5.6	68.5%	458.80
9.5	90.9%	162.60
12.5	98.8%	24.1
17.0	100.0%	
24.5		
37.5		
45.0		
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Bar sample taken 6 ft upstream of Cross Section E
No bar sampled in 2003

STREAM NAME: East Fork Beaver Creek: Reach 2
ID NUMBER: EBVR2
DATE: 9/8/2004
CREW: J.Nankervis, S. Belz, K. Grimes, L. Howell

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart
0.45	1.86	3.21	8.1	11.0	17.0



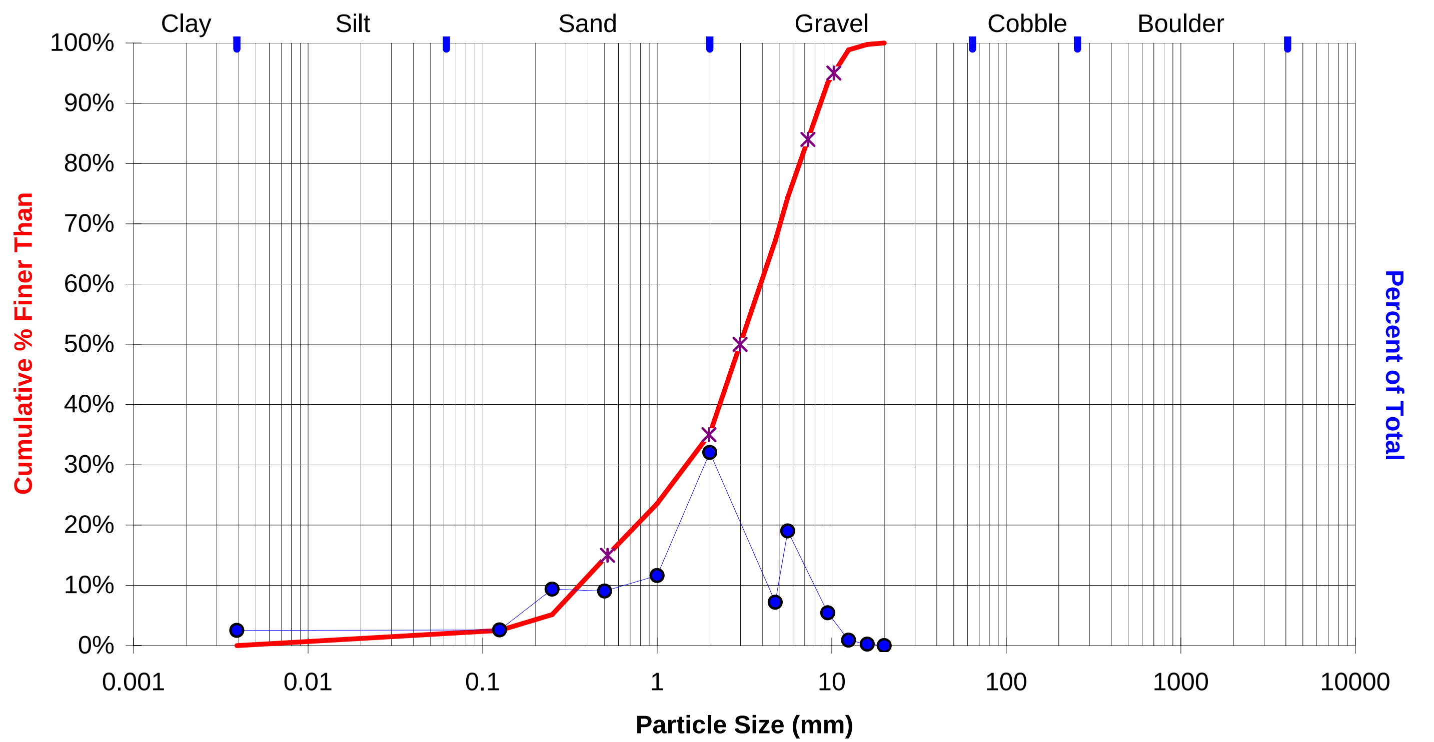
Sieve Analysis Worksheet

Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	**0.0%**	90.90
0.125	2.5%	93.60
0.25	5.1%	336.50
0.5	14.5%	325.20
1.0	23.6%	417.20
2.0	35.2%	1151.40
4.8	67.2%	258.60
5.6	74.4%	683.50
9.5	93.4%	195.30
12.5	98.9%	32.50
16.0	99.8%	8.4
20.0	100.0%	
37.5		
45.0		
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Bar sample taken 20 ft from LPIN near of Cross Section C
No sample taken in 2003

STREAM NAME: North Catamount Creek: Reach 1
ID NUMBER: NCAT1
DATE: 9/6/2004
CREW: J.Nankervis, S. Belz, K. Grimes, L. Howell

Particle Size Distribution (mm)	D15	D35	D50	D84	D95	Lpart
	0.52	**1.98**	**2.99**	**7.3**	**10.3**	**20.0**



Sieve Analysis Worksheet

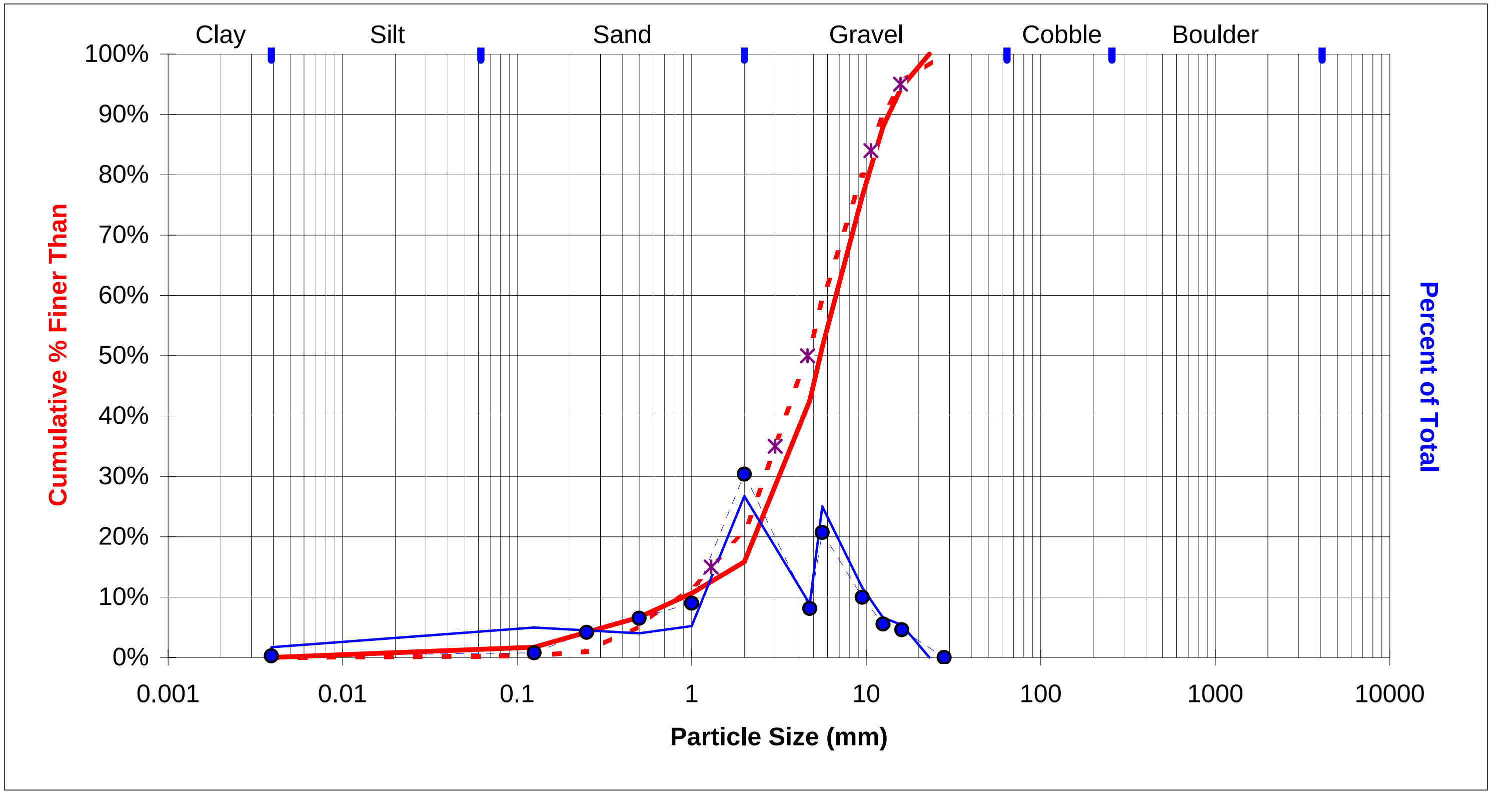
Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	**0.0%**	6.90
0.125	0.3%	20.00
0.25	1.0%	109.40
0.5	5.2%	171.30
1.0	11.7%	236.80
2.0	20.7%	800.30
4.8	51.0%	213.90
5.6	59.2%	545.70
9.5	79.9%	262.90
12.5	89.9%	146.10
16.0	95.4%	120.8
28.0	100.0%	
37.5		
45.0		
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Bar sample taken 3 ft downstream of Cross Section D

STREAM NAME: North Catamount Creek: Reach 2
ID NUMBER: NCAT2
DATE: 9/6/2004
CREW: J.Nankervis, S. Belz, K. Grimes, L. Howell

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart	Year	Graph
1.29	3.01	4.61	10.6	15.7	28.0	2004	Dashed
1.79	3.72	5.46	11.4	16.4	23.0	2003	Solid



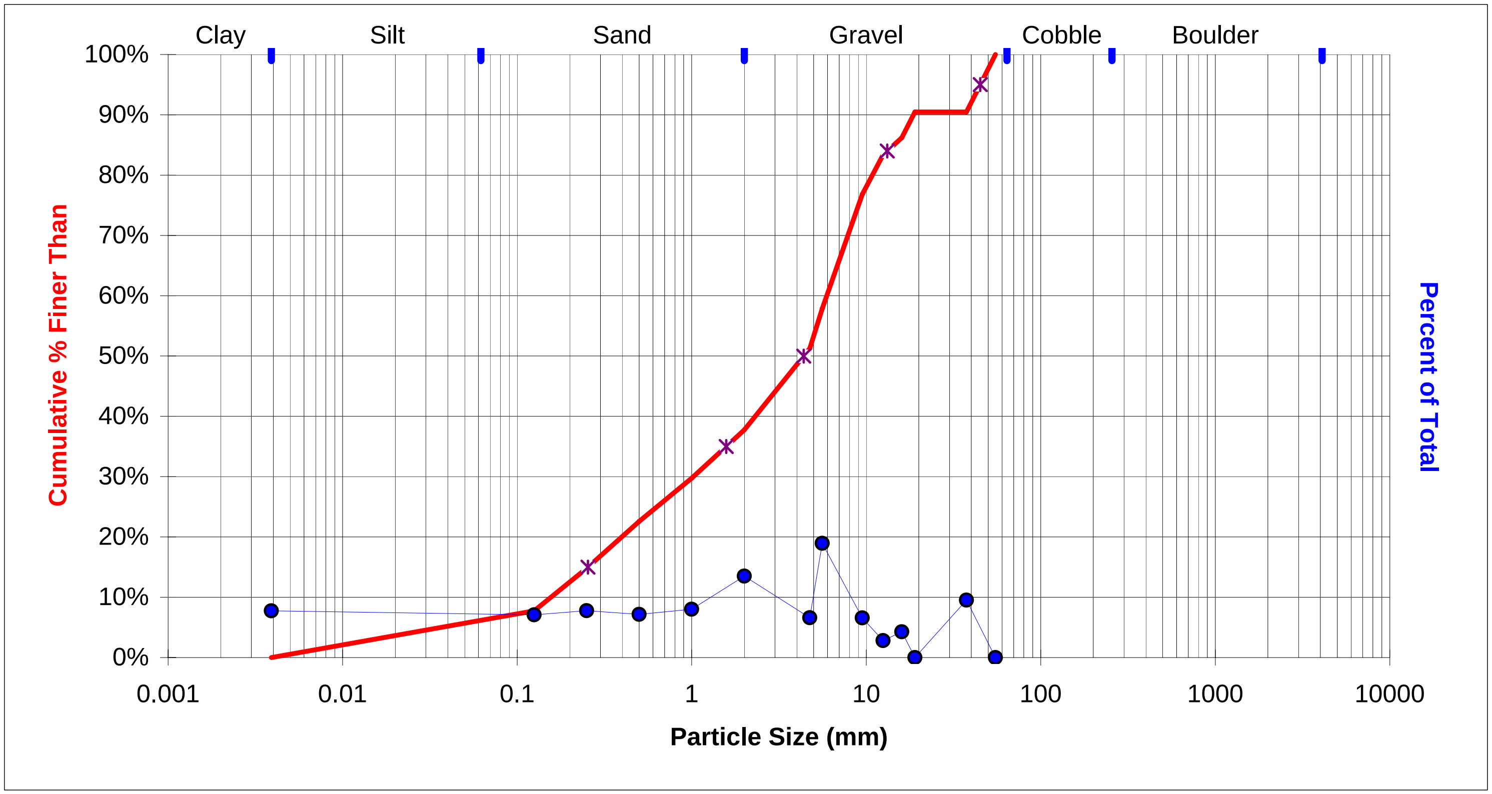
Sieve Analysis Worksheet

Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	**0.0%**	243.90
0.125	7.7%	223.20
0.25	14.8%	245.00
0.5	22.6%	225.70
1.0	29.7%	252.50
2.0	37.8%	425.90
4.8	51.3%	208.10
5.6	57.9%	597.10
9.5	76.8%	207.40
12.5	83.4%	89.00
16.0	86.2%	134.4
19.0	90.5%	0
37.5	90.5%	300.7
55.0	100.0%	
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Bar sample taken 6 ft upstream of Cross Section C
No sample taken in 2003

STREAM NAME: North Fork Crystal Creek: Reach 1
ID NUMBER: NCRY1
DATE: 9/7/2004
CREW: J.Nankervis, S. Belz, K. Grimes, L. Howell

Particle Size Distribution (mm)	D15	D35	D50	D84	D95	Lpart
	0.25	**1.58**	**4.38**	**13.2**	**45.0**	**45.0**



Sieve Analysis Worksheet

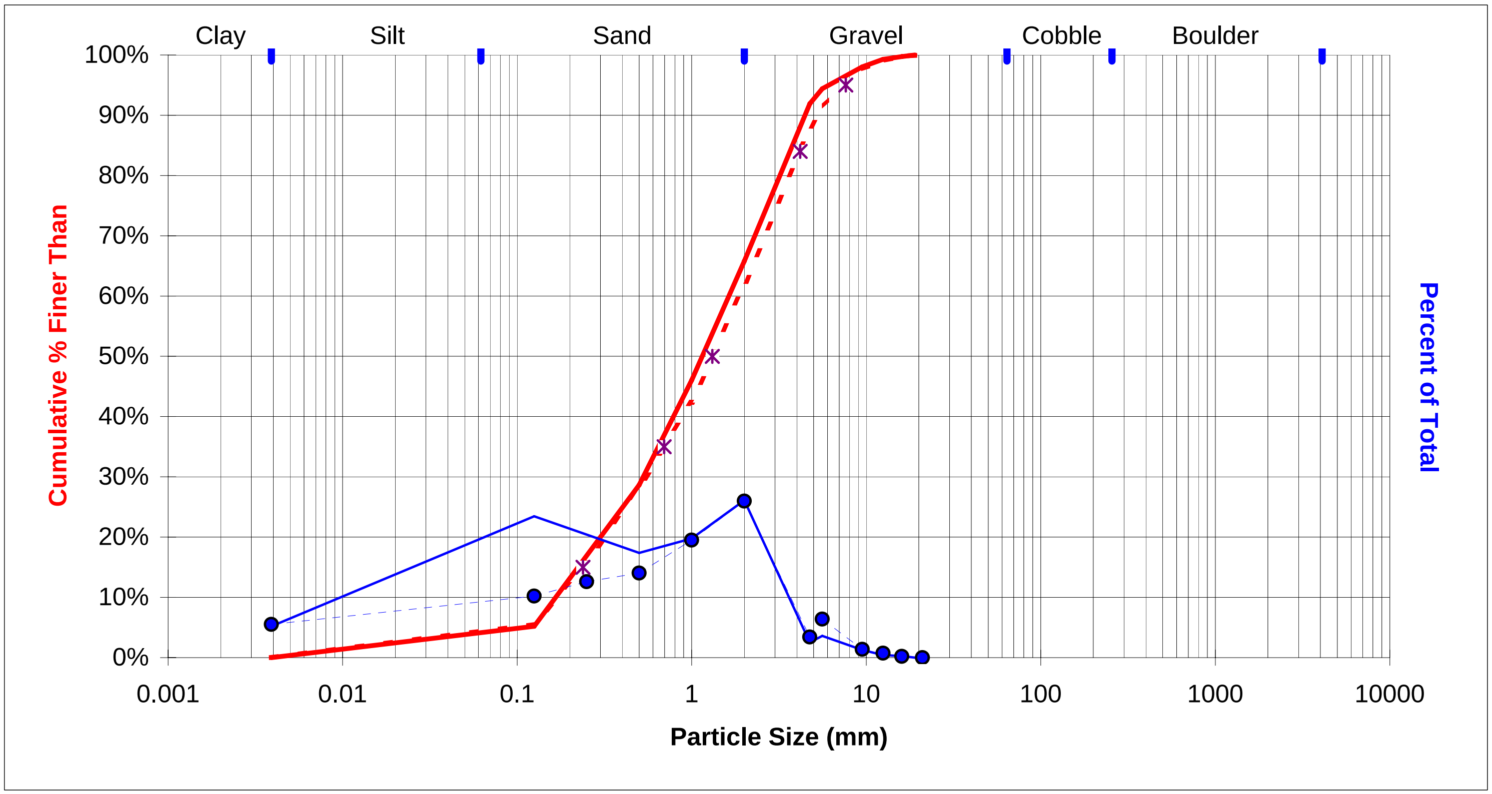
Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	**0.0%**	164.50
0.125	5.5%	304.80
0.25	15.7%	376.10
0.5	28.3%	419.50
1.0	42.4%	582.30
2.0	61.9%	775.70
4.8	87.8%	102.20
5.6	91.3%	191.00
9.5	97.6%	41.50
12.5	99.0%	22.50
16.0	99.8%	6.2
21.0	100.0%	
37.5		
45.0		
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Bar sample taken just upstream of Cross Section E (right bank side)
2003 sample taken on left bank side

STREAM NAME: North Fork Crystal Ck
ID NUMBER: NCRY2
DATE: 9/7/2004
CREW: J.Nankervis, S. Belz, K. Grimes, L. Howell

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart	Year	Graph
0.24	0.70	1.31	4.2	7.6	21.0	2004	Dashed
0.22	0.64	1.15	3.7	6.1	19.0	2003	Solid



Sieve Analysis Worksheet

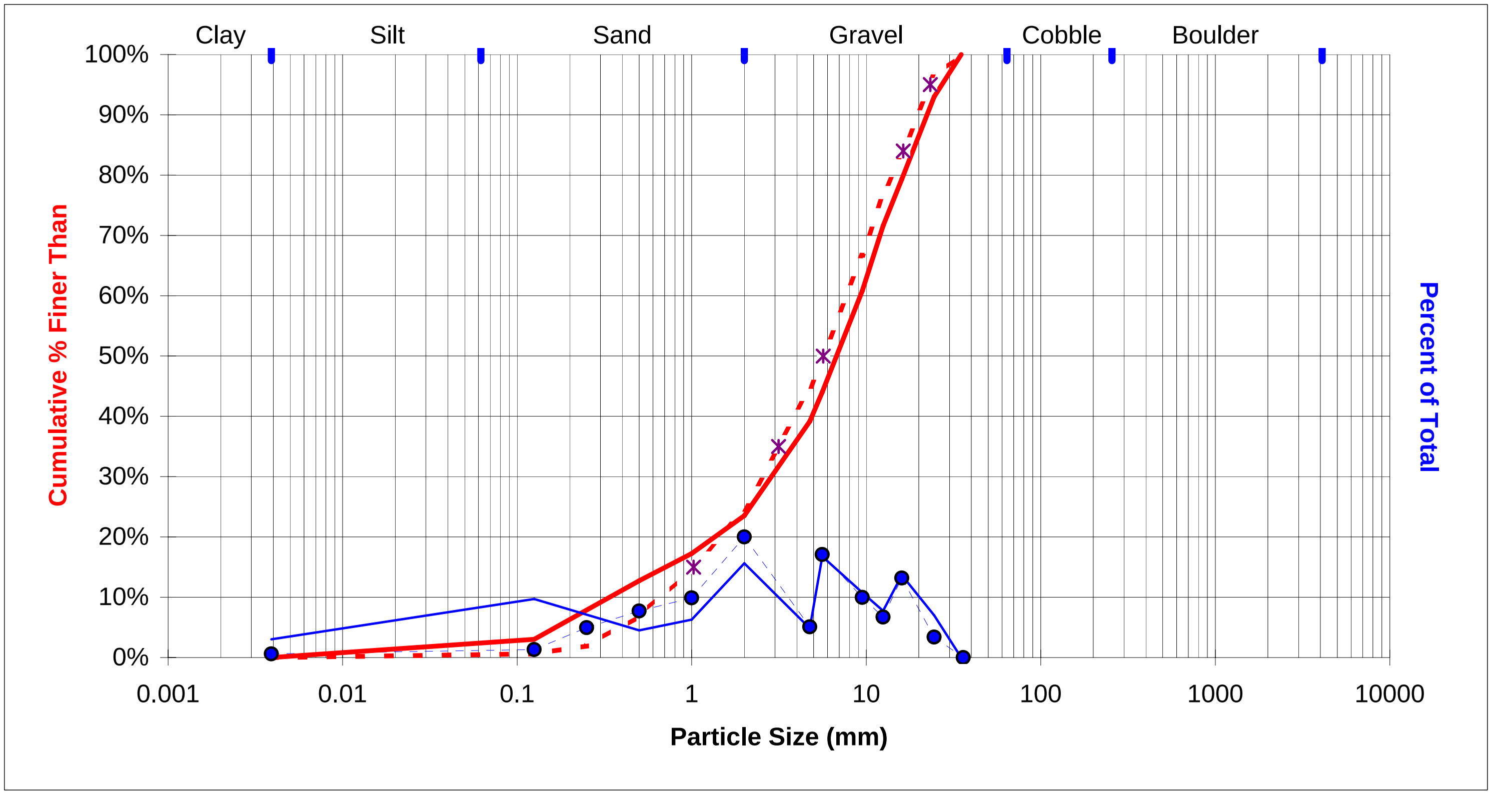
Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	**0.0%**	15.90
0.125	0.6%	34.50
0.25	1.9%	130.00
0.5	6.9%	202.10
1.0	14.6%	258.60
2.0	24.5%	522.50
4.8	44.5%	133.10
5.6	49.6%	446.90
9.5	66.7%	260.80
12.5	76.7%	175.60
16.0	83.4%	344.40
24.5	96.6%	89.1
36.0	100.0%	
45.0		
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Bar sample taken near Cross Section D

STREAM NAME: Oil Ck
ID NUMBER: OILC1
DATE: 9/9/2004
CREW: J.Nankervis, S. Belz, K. Grimes, L. Howell

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart	Year	Graph
1.03	3.15	5.67	16.3	23.3	36.0	2004	Dashed
0.71	3.77	6.76	18.5	27.1	35.0	2003	Solid



Sieve Analysis Worksheet

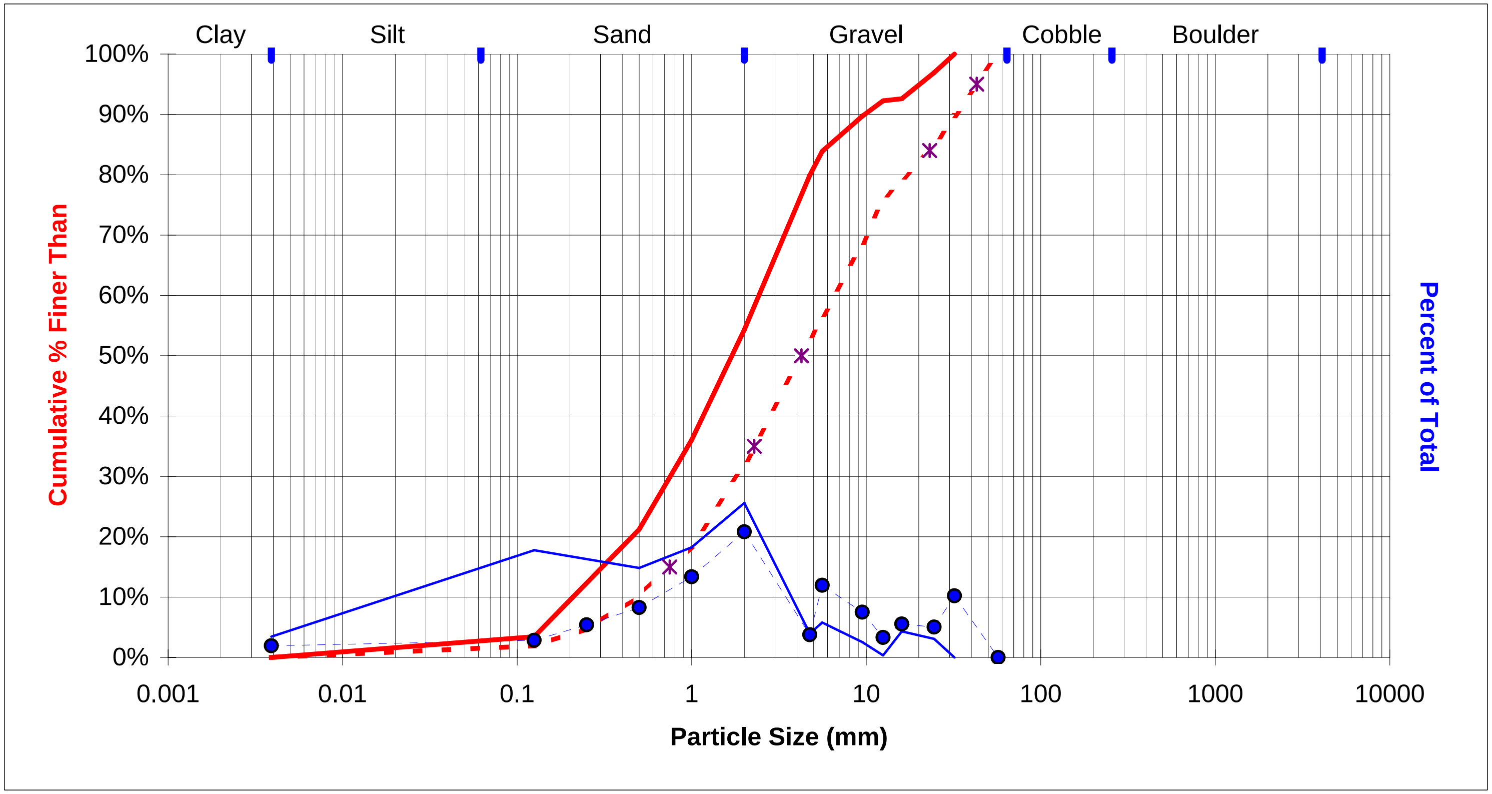
Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	**0.0%**	51.70
0.125	1.9%	75.90
0.25	4.8%	145.40
0.5	10.2%	221.90
1.0	18.4%	359.00
2.0	31.8%	559.10
4.8	52.7%	100.80
5.6	56.4%	321.10
9.5	68.4%	201.50
12.5	75.9%	88.90
16.0	79.2%	148.80
24.5	84.8%	134.9
32.0	89.8%	273.7
57.0	100.0%	
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Bar sample taken just upstream of Cross Section E

STREAM NAME: Severy Ck
ID NUMBER: SVRY2
DATE: 9/10/2004
CREW: J.Nankervis, S. Belz, K. Grimes, L. Howell

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart	Year	Graph
0.7	2.28	4.25	23.1	43.0	57.0	2004	Dashed
0.31	0.95	1.70	5.65	20.3	32.0	2003	Solid



Sieve Analysis Worksheet

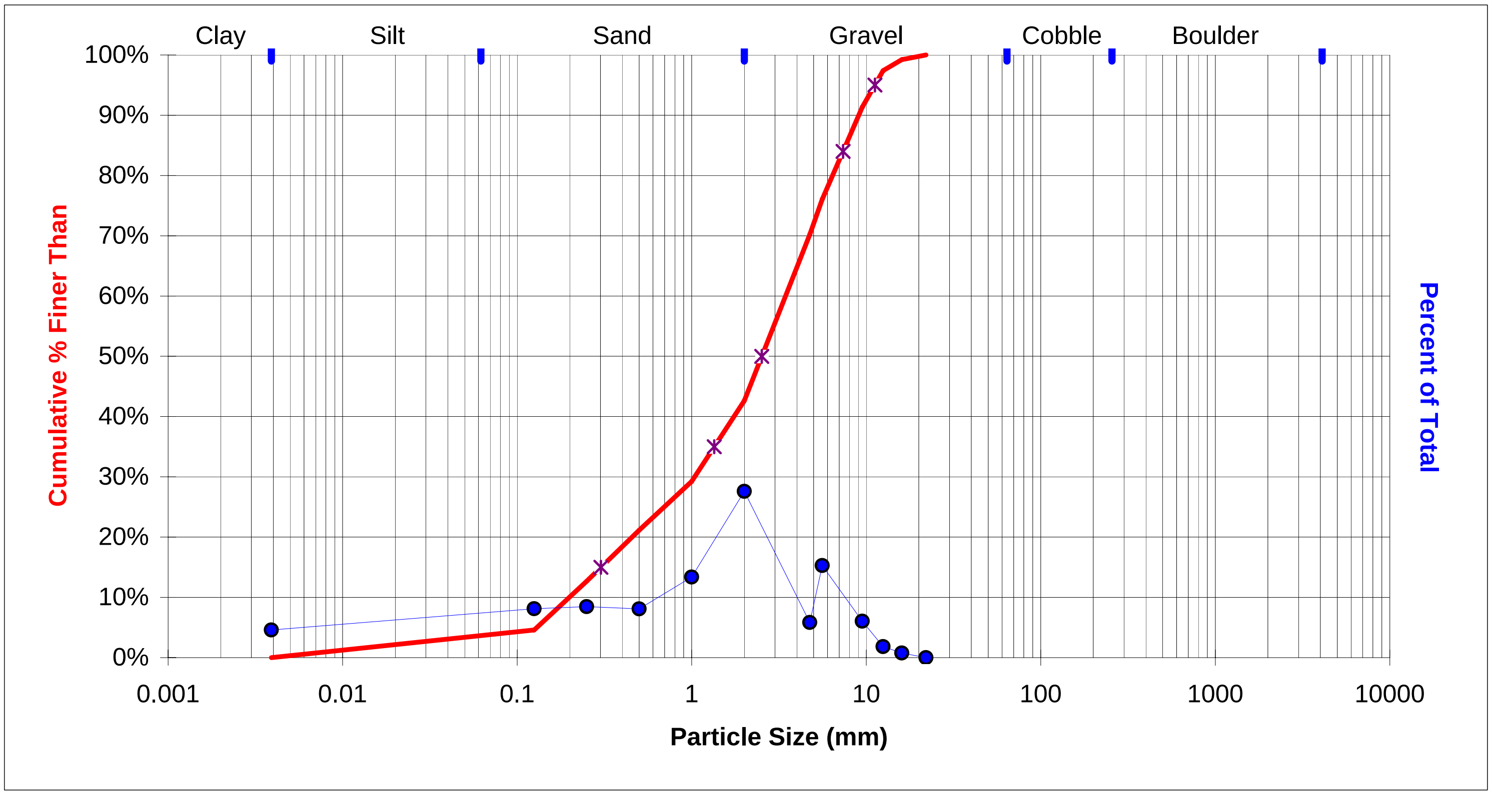
Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	**0.0%**	180.80
0.125	4.6%	319.70
0.25	12.7%	333.70
0.5	21.2%	319.10
1.0	29.2%	527.80
2.0	42.6%	1088.00
4.8	70.2%	230.30
5.6	76.1%	602.80
9.5	91.3%	238.50
12.5	97.4%	72.40
16.0	99.2%	30.6
22.0	100.0%	
37.5		
45.0		
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Bar sample taken 10 ft downstream of Cross Section D
not sampled in 2003, lots of newly deposited gravel on floodplain

STREAM NAME: Ski Ck
ID NUMBER: SKIC1
DATE: 9/7/2004
CREW: J.Nankervis, S. Belz, K. Grimes, L. Howell

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart
0.30	1.35	2.52	7.37	11.2	22.0



Sieve Analysis Worksheet

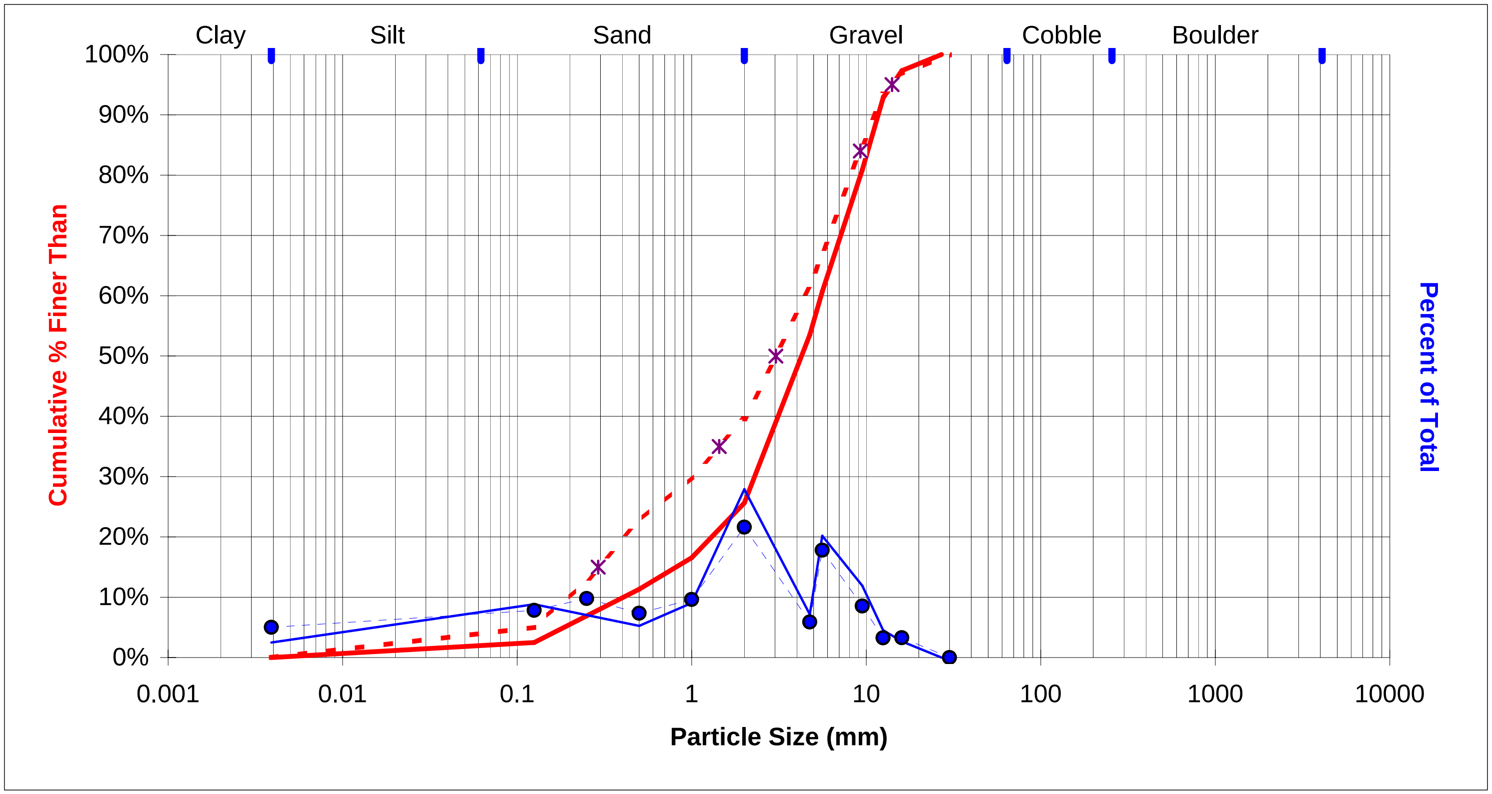
Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	**0.0%**	153.60
0.125	5.0%	240.60
0.25	12.8%	300.20
0.5	22.6%	225.40
1.0	30.0%	295.70
2.0	39.6%	663.70
4.8	61.2%	181.00
5.6	67.1%	546.40
9.5	84.9%	262.40
12.5	93.4%	100.50
16.0	96.7%	100.6
30.0	100.0%	
37.5		
45.0		
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Bar sample taken just upstream of Cross Section B

STREAM NAME: Ski Ck
ID NUMBER: SKIC2
DATE: 9/7/2004
CREW: J.Nankervis, S. Belz, K. Grimes, L. Howell

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart	Year	Graph
0.29	1.44	3.03	9.2	14.1	30.0	2004	Dashed
0.81	2.67	4.26	10.2	14.1	27.0	2003	Solid



Sieve Analysis Worksheet

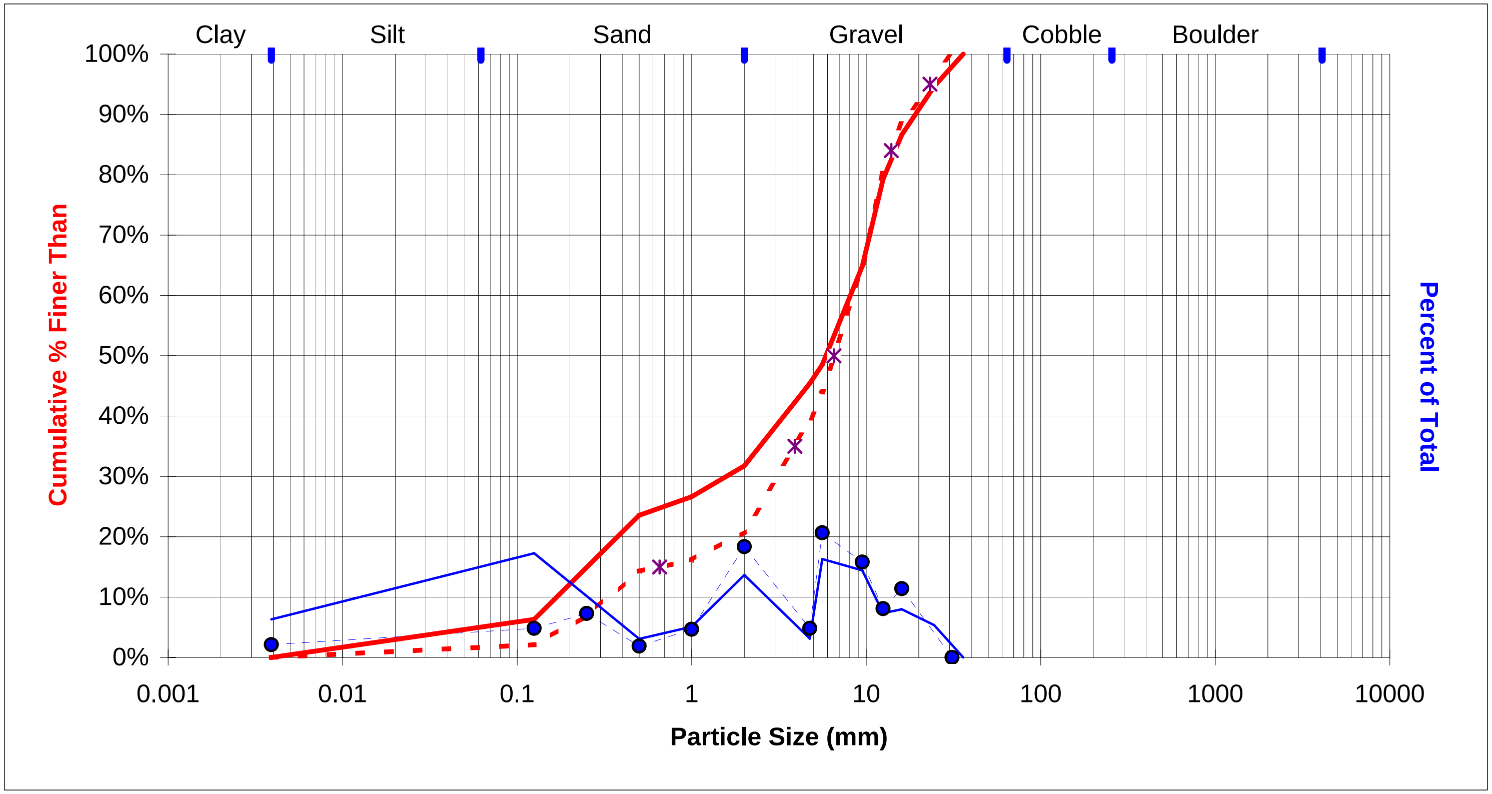
Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	**0.0%**	72.70
0.125	2.1%	164.90
0.25	7.0%	249.50
0.5	14.3%	64.10
1.0	16.1%	159.50
2.0	20.8%	626.40
4.8	39.2%	165.00
5.6	44.0%	705.40
9.5	64.7%	540.10
12.5	80.5%	276.70
16.0	88.6%	389.80
31.0	100.0%	
36.0		
45.0		
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Bar sample taken 40 ft downstream of Cross Section A

STREAM NAME: South Catamount Creek: Reach 1
ID NUMBER: SCAT1
DATE: 9/6/2004
CREW: J.Nankervis, S. Belz, K. Grimes, L. Howell

Particle Size Distribution (mm)

Distribution (mm)	D15	D35	D50	D84	D95	Lpart	Year	Graph
	0.66	3.90	6.53	13.9	23.2	31.0	2004	Dashed
	0.25	2.46	5.87	14.6	25.1	36.0	2003	Solid



Sieve Analysis Worksheet

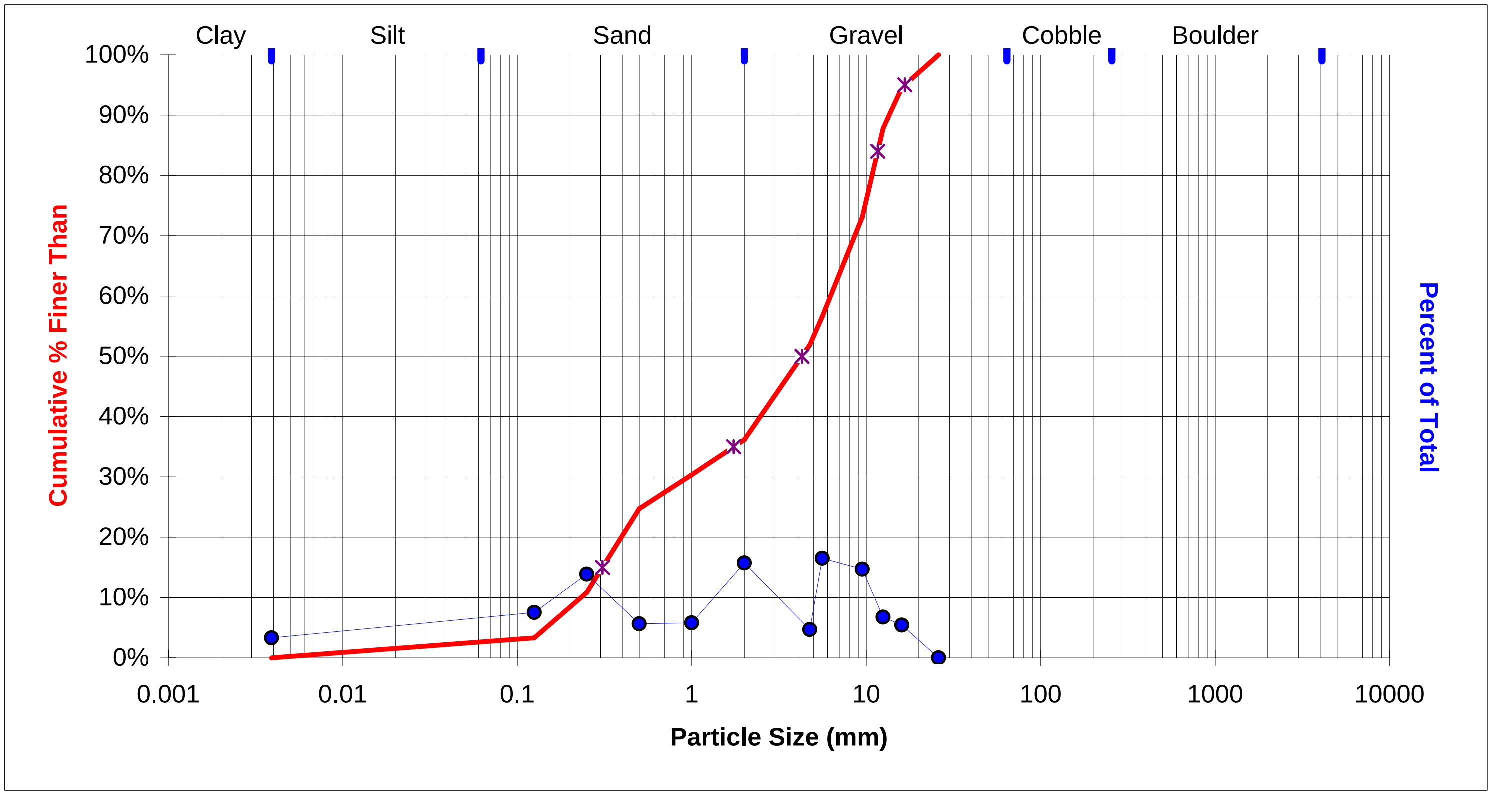
Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	**0.0%**	102.80
0.125	3.3%	234.60
0.25	10.8%	431.40
0.5	24.7%	175.50
1.0	30.4%	180.60
2.0	36.2%	489.00
4.8	51.9%	146.40
5.6	56.6%	512.90
9.5	73.1%	457.10
12.5	87.8%	210.70
16.0	94.6%	168.90
26.0	100.0%	
36.0		
45.0		
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Bar sample taken 10 ft upstream of Cross Section E (Left Bank)
No sample taken in 2003

STREAM NAME: South Catamount Creek: Reach 2
ID NUMBER: SCAT2
DATE: 9/6/2004
CREW: J.Nankervis, S. Belz, K. Grimes, L. Howell

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart
0.31	1.74	4.28	11.6	16.6	26.0



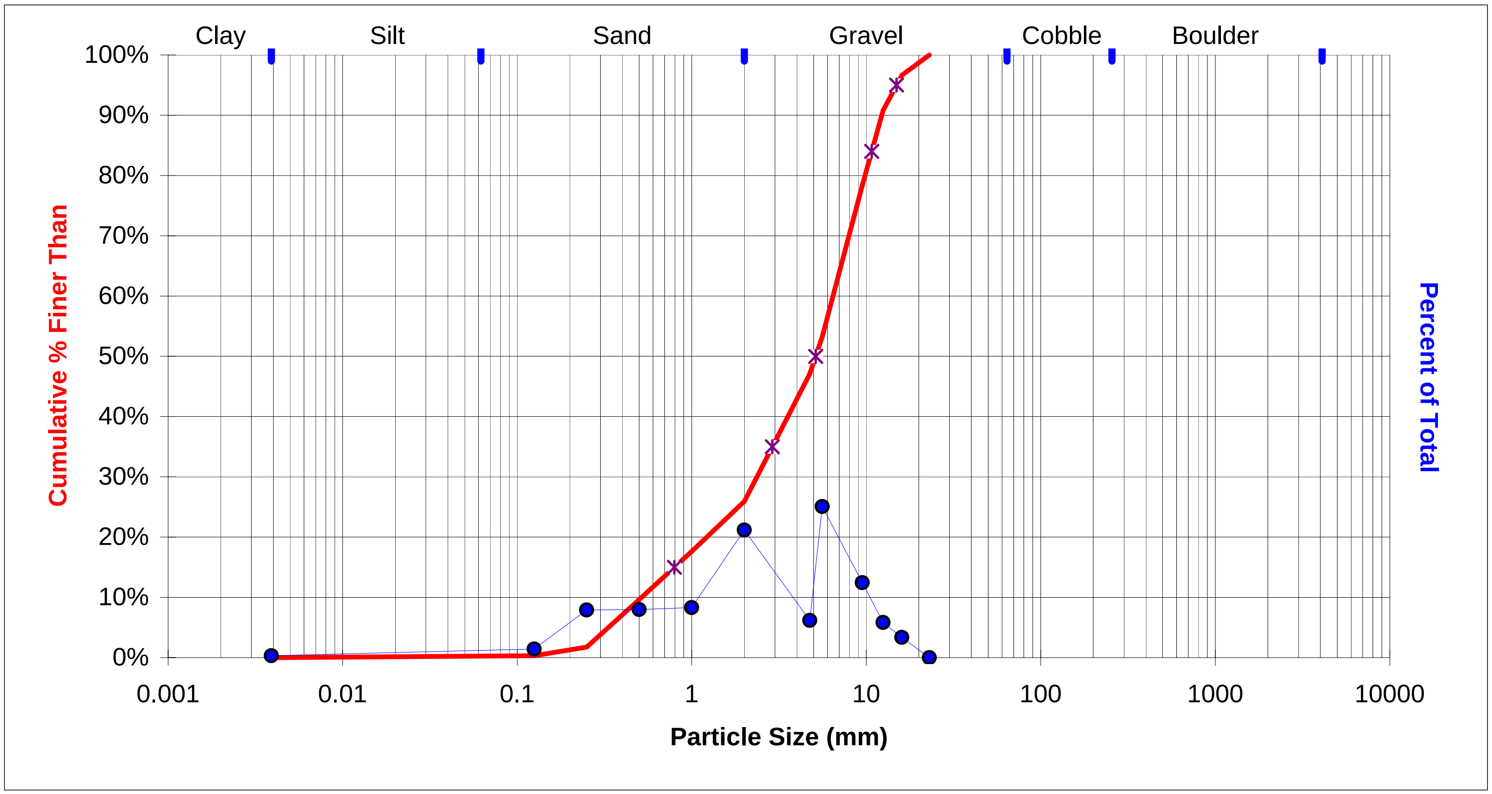
Sieve Analysis Worksheet

Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	**0.0%**	9.70
0.125	0.3%	42.90
0.25	1.7%	238.40
0.5	9.6%	241.20
1.0	17.6%	250.40
2.0	25.9%	639.40
4.8	47.1%	186.70
5.6	53.3%	756.90
9.5	78.4%	375.30
12.5	90.8%	176.50
16.0	96.6%	101.4
23.0	100.0%	
37.5		
45.0		
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Bar sample taken between Cross Section D and E
Note in 2003 there was a pool in this location

STREAM NAME: West Fork Beaver Creek: Reach 1
ID NUMBER: WBVR1
DATE: 9/9/2003
CREW: J.Nankervis, S. Belz, K. Grimes, L. Howell

Particle Size Distribution (mm)	D15	D35	D50	D84	D95	Lpart
	0.796	**2.90**	**5.13**	**10.8**	**14.9**	**23.0**



Sieve Analysis Worksheet

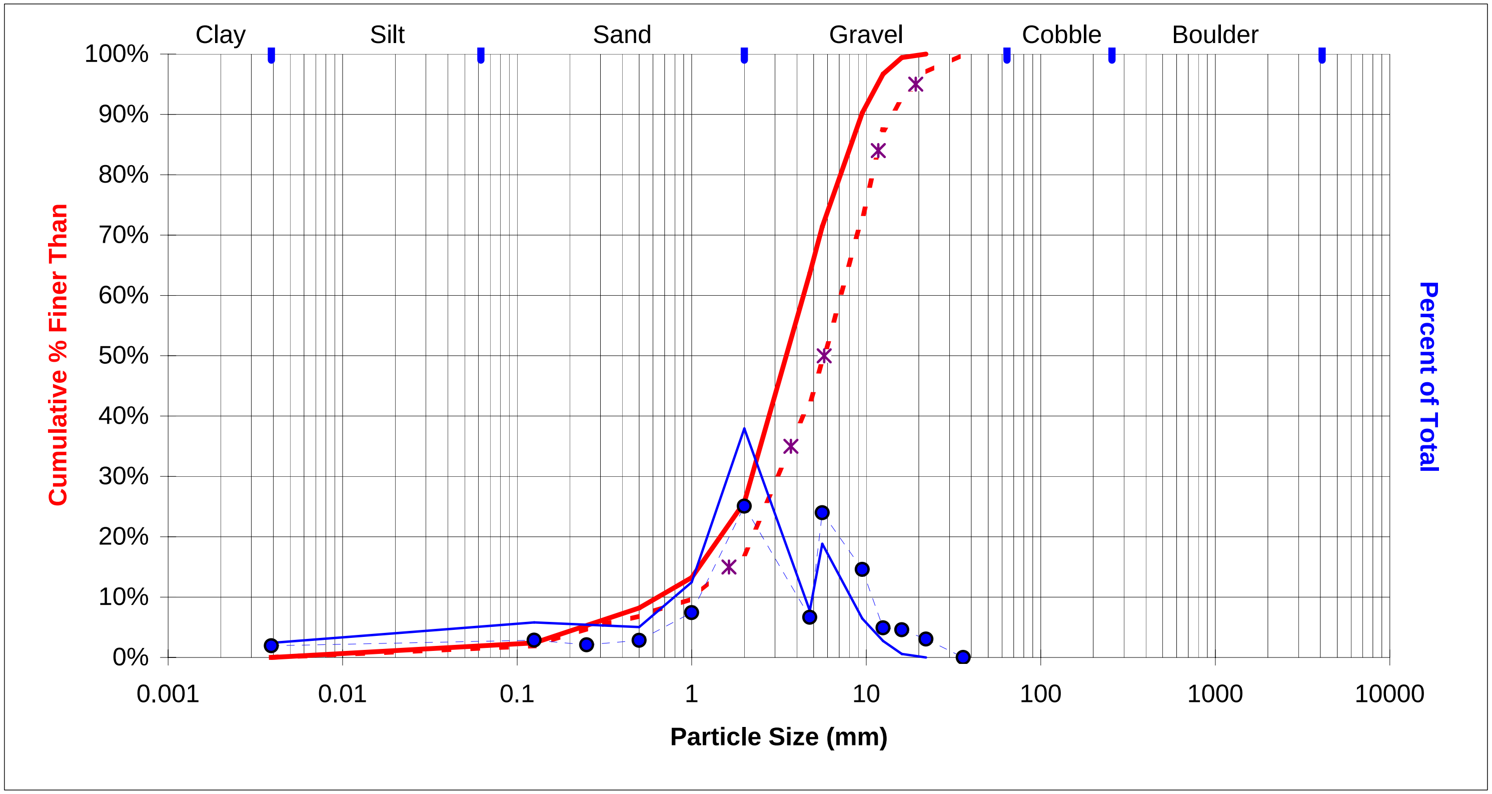
Sieve Size (mm)	% finer than	Wt. on Sieve
Pan	**0.0%**	69.60
0.125	1.9%	102.80
0.25	4.8%	75.10
0.5	6.9%	102.00
1.0	9.7%	266.90
2.0	17.2%	900.90
4.8	42.2%	239.10
5.6	48.9%	861.60
9.5	72.9%	524.40
12.5	87.5%	175.90
16.0	92.4%	164.8
22.0	96.9%	110
36.0	100.0%	
45.0		
64		
90		
128		
256		
362		
512		
1024		
2048		

COMMENTS: Bar sample taken (near) downstream of Cross Section E

STREAM NAME: West Fork Beaver Creek: Reach 2
ID NUMBER: WBVR2
DATE: 9/9/2004
CREW: J.Nankervis, S. Belz, K. Grimes, L. Howell

Particle Size Distribution (mm)

D15	D35	D50	D84	D95	Lpart	Year	Graph
1.64	3.70	5.74	11.7	19.2	36.0	2004	Dashed
1.10	2.47	3.48	8.0	11.6	22.0	2003	Solid



Appendix J

Riparian Vegetation
Description and Bank Photographs
Comparing 2003 and 2004 Sites

Summary of Riparian Vegetation Description and Photo Points 2004

					Photo Points				
Site	Date	Camera	Cross Section	Bank	Bank - Distance from LPIN (ft)	Camera - Distance from LPIN (ft)	Percent Cover	Change in Percent Cover 2003-2004	Comments
BHMR1	090804	Olympus Stylus 400	A	Left	11.2	14.0	90	-0.50	grass,forb,sedge
BHMR1	090804	Olympus Stylus 400	A	Right	13.4	10.5	100	-1.86	grass,sedge
BHMR1	090804	Olympus Stylus 400	B	Left	6.0	10.8	80	-1.00	grass,forb
BHMR1	090804	Olympus Stylus 400	B	Right	9.9	5.8	80	-0.33	grass,forb
BHMR1	090804	Olympus Stylus 400	C	Left	8.2	13.0	95	-1.38	grass,sedge
BHMR1	090804	Olympus Stylus 400	C	Right	11.8	7.5	75	-2.75	forb,shrub
BHMR1	090804	Olympus Stylus 400	D	Left	7.4	11.0	90	-0.50	grass,forb,sedge
BHMR1	090804	Olympus Stylus 400	D	Right	11.2	7.0	100	-0.25	grass,forb,sedge
BHMR1	090804	Olympus Stylus 400	E	Left	21.8	27.0	65	0.24	grass,forb,sedge
BHMR1	090804	Olympus Stylus 400	E	Right	27.6	22.3	100	-0.67	grass,forb,sedge
BHMR2	090804	Olympus Stylus 400	A	Left	6.0	11.5	45	-0.50	grass,forb
BHMR2	090804	Olympus Stylus 400	A	Right	10.0	4.9	45	0.00	grass,forb
BHMR2	090804	Olympus Stylus 400	B	Left	6.8	9.5	90	-0.06	grass,forb
BHMR2	090804	Olympus Stylus 400	B	Right	10.1	7.7	100	-0.05	grass,forb
BHMR2	090804	Olympus Stylus 400	C	Left	6.0	10.0	95	-0.36	grass,forb
BHMR2	090804	Olympus Stylus 400	C	Right	10.3	6.0	100	-0.54	grass,forb
BHMR2	090804	Olympus Stylus 400	D	Left	15.5	19.0	90	-0.06	grass,forb
BHMR2	090804	Olympus Stylus 400	D	Right	22.0	17.0	70	0.00	grass,forb
BHMR2	090804	Olympus Stylus 400	E	Left	11.0	16.0	100	-0.11	grass,forb
BHMR2	090804	Olympus Stylus 400	E	Right	16.1	11.5	90	0.00	grass,forb
EBVR1	090804	Olympus Stylus 400	A	Left	1.3	0.0	0	0.00	bedrock
EBVR1	090804	Olympus Stylus 400	A	Right	17.1	13.0	10	0.80	forb,shrub
EBVR1	090804	Olympus Stylus 400	B	Left	3.0	1.5	100	-0.05	sedge,shrub
EBVR1	090804	Olympus Stylus 400	B	Right	13.5	14.9	85	-0.06	grass,sedge,forb
EBVR1	090804	Olympus Stylus 400	C	Left	6.8	7.0	90	0.00	grass,sedge,forb
EBVR1	090804	Olympus Stylus 400	C	Right	17.0	12.0	50	0.00	forb,shrub
EBVR1	090804	Olympus Stylus 400	D	Left	1.9	6.5	50	-0.67	grass,forb
EBVR1	090804	Olympus Stylus 400	D	Right	10.1	5.0	0	1.00	gravel
EBVR1	090804	Olympus Stylus 400	E	Left	8.3	7.5	40	0.53	grass,forb
EBVR1	090804	Olympus Stylus 400	E	Right	14.2	10.0	20	0.33	shrub

Red values denote distance change from 2003

Summary of Riparian Vegetation Description and Photo Points 2004

					Photo Points				
Site	Date	Camera	Cross Section	Bank	Bank - Distance from LPIN (ft)	Camera - Distance from LPIN (ft)	Percent Cover	Change in Percent Cover 2003-2004	Comments
EBVR2	090804	Olympus Stylus 400	A	Left	14.3	19.0	100	-0.05	grass,sedge,forb
EBVR2	090804	Olympus Stylus 400	A	Right	20.0	20.5	85	0.06	grass,sedge,forb
EBVR2	090804	Olympus Stylus 400	B	Left	9.2	14.0	70	0.26	grass,sedge,forb
EBVR2	090804	Olympus Stylus 400	B	Right	14.3	15.0	85	0.11	grass,sedge,forb
EBVR2	090804	Olympus Stylus 400	C	Left	9.2	13.0	45	0.50	grass,sedge,forb
EBVR2	090804	Olympus Stylus 400	C	Right	13.4	14.0	90	0.05	grass,sedge,forb
EBVR2	090804	Olympus Stylus 400	D	Left	7.7	12.5	85	0.11	grass,sedge,forb
EBVR2	090804	Olympus Stylus 400	D	Right	13.2	14.5	85	0.11	grass,sedge,forb
EBVR2	090804	Olympus Stylus 400	E	Left	9.8	14.0	50	0.44	grass,sedge,forb
EBVR2	090804	Olympus Stylus 400	E	Right	14.6	15.6	70	0.26	grass,sedge,forb
NCAT1	090604	Olympus Stylus 400	A	Left	12.5	17.0	30	0.40	grass,forb,shrub
NCAT1	090604	Olympus Stylus 400	A	Right	16.5	12.0	50	0.50	grass,sedge
NCAT1	090604	Olympus Stylus 400	B	Left	46.0	50.0	40	0.60	grass,sedge
NCAT1	090604	Olympus Stylus 400	B	Right	48.8	45.0	35	0.65	grass,sedge
NCAT1	090604	Olympus Stylus 400	C	Left	16.7	21.5	60	0.33	grass,sedge
NCAT1	090604	Olympus Stylus 400	C	Right	30.3	26.0	0	0.00	dirt,gravel
NCAT1	090604	Olympus Stylus 400	D	Left	26.0	30.0	25	0.75	sedge,shrub
NCAT1	090604	Olympus Stylus 400	D	Right	32.5	29.3	30	0.70	sedge
NCAT1	090604	Olympus Stylus 400	E	Left	42.8	47.0	20	0.78	sedge
NCAT1	090604	Olympus Stylus 400	E	Right	45.1	41.0	60	0.40	sedge
NCAT2	090604	Olympus Stylus 400	A	Left	12.0	16.5	30	0.70	grass,sedge,shrub
NCAT2	090604	Olympus Stylus 400	A	Right	16.2	12.0	45	0.55	grass,sedge
NCAT2	090604	Olympus Stylus 400	B	Left	8.8	13.0	75	0.25	grass,sedge
NCAT2	090604	Olympus Stylus 400	B	Right	11.8	8.0	70	0.30	grass,sedge
NCAT2	090604	Olympus Stylus 400	C	Left	12.4	17.0	30	0.70	grass,forb,shrub
NCAT2	090604	Olympus Stylus 400	C	Right	16.0	11.5	30	0.70	grass,sedge,forb
NCAT2	090604	Olympus Stylus 400	D	Left	6.4	10.5	60	0.40	grass,sedge
NCAT2	090604	Olympus Stylus 400	D	Right	9.7	5.0	30	0.70	grass,sedge,forb
NCAT2	090604	Olympus Stylus 400	E	Left	10.5	14.0	40	0.60	grass,sedge,shrub
NCAT2	090604	Olympus Stylus 400	E	Right	13.1	9.5	75	0.25	grass,sedge,forb

Red values denote distance change from 2003

Summary of Riparian Vegetation Description and Photo Points 2004

					Photo Points				
Site	Date	Camera	Cross Section	Bank	Bank - Distance from LPIN (ft)	Camera - Distance from LPIN (ft)	Percent Cover	Change in Percent Cover 2003-2004	Comments
NCRY1	090704	Olympus Stylus 400	A	Left	31.7	35.0	5	0.94	grass,sedge
NCRY1	090704	Olympus Stylus 400	A	Right	38.8	36.0	10	0.86	grass
NCRY1	090704	Olympus Stylus 400	B	Left	36.8	39.5	35	0.42	grass
NCRY1	090704	Olympus Stylus 400	B	Right	42.5	39.0	5	0.92	grass,shrub
NCRY1	090704	Olympus Stylus 400	C	Left	26.7	29.0	0	0.00	gravel
NCRY1	090704	Olympus Stylus 400	C	Right	28.7	25.0	1	0.00	grass
NCRY1	090704	Olympus Stylus 400	D	Left	30.0	32.8	5	0.75	grass
NCRY1	090704	Olympus Stylus 400	D	Right	31.5	29.5	0	1.00	gravel
NCRY1	090704	Olympus Stylus 400	E	Left	30.5	33.7	10	0.85	grass
NCRY1	090704	Olympus Stylus 400	E	Right	34.3	31.0	1	0.98	grass,forb
NCRY2	090704	Olympus Stylus 400	A	Left	11.0	15.5	5	0.00	moss
NCRY2	090704	Olympus Stylus 400	A	Right	20.6	15.0	10	-1.00	moss,grass,forb,shrub
NCRY2	090704	Olympus Stylus 400	B	Left	21.4	25.0	20	0.50	grass,forb,shrub
NCRY2	090704	Olympus Stylus 400	B	Right	30.0	26.0	10	0.33	moss,forb,shrub
NCRY2	090704	Olympus Stylus 400	C	Left	19.3	24.0	20	-3.00	grass
NCRY2	090704	Olympus Stylus 400	C	Right	27.4	23.0	5	0.50	moss,forb
NCRY2	090704	Olympus Stylus 400	D	Left	14.5	18.3	0	0.00	gravel
NCRY2	090704	Olympus Stylus 400	D	Right	22.9	19.3	0	0.00	gravel
NCRY2	090704	Olympus Stylus 400	E	Left	5.3	7.1	0	1.00	sand,gravel
NCRY2	090704	Olympus Stylus 400	E	Right	18.4	15.6	5	0.00	moss
OILC1	090904	Olympus Stylus 400	A	Left	7.2	9.0	80	-0.33	grass,forb,shrub
OILC1	090904	Olympus Stylus 400	A	Right	11.7	8.5	70	0.00	grass,shrub
OILC1	090904	Olympus Stylus 400	B	Left	9.8	8.5	50	0.44	grass,shrub
OILC1	090904	Olympus Stylus 400	B	Right	15.6	16.6	75	0.17	grass
OILC1	090904	Olympus Stylus 400	C	Left	15.7	14.5	40	0.50	grass,shrub
OILC1	090904	Olympus Stylus 400	C	Right	20.7	22.2	55	0.21	grass,forb,shrub
OILC1	090904	Olympus Stylus 400	D	Left	12.6	11.0	20	-3.00	grass,forb
OILC1	090904	Olympus Stylus 400	D	Right	21.0	22.5	30	0.57	grass,shrub
OILC1	090904	Olympus Stylus 400	E	Left	8.9	7.0	70	0.13	grass
OILC1	090904	Olympus Stylus 400	E	Right	16.7	18.5	40	-1.67	grass

Red values denote distance change from 2003

Summary of Riparian Vegetation Description and Photo Points 2004

					Photo Points				
Site	Date	Camera	Cross Section	Bank	Bank - Distance from LPIN (ft)	Camera - Distance from LPIN (ft)	Percent Cover	Change in Percent Cover 2003-2004	Comments
SVRY1	091004	Olympus Stylus 400	A	Left	3.0	2.0	70	0.00	sedge,shrub
SVRY1	091004	Olympus Stylus 400	A	Right	7.8	4.0	50	0.41	sedge,shrub
SVRY1	091004	Olympus Stylus 400	B	Left	5.0	3.5	80	0.00	sedge,shrub
SVRY1	091004	Olympus Stylus 400	B	Right	8.9	10.0	90	-0.38	sedge,shrub
SVRY1	091004	Olympus Stylus 400	C	Left	4.9	4.0	80	-0.07	sedge,shrub
SVRY1	091004	Olympus Stylus 400	C	Right	7.8	5.0	70	-0.17	sedge,forb,shrub
SVRY1	091004	Olympus Stylus 400	D	Left	4.6	3.0	70	-0.08	sedge,forb,shrub
SVRY1	091004	Olympus Stylus 400	D	Right	8.6	5.2	40	0.00	forb,shrub
SVRY1	091004	Olympus Stylus 400	E	Left	2.7	7.0	40	0.43	sedge,forb,shrub
SVRY1	091004	Olympus Stylus 400	E	Right	6.6	4.0	30	0.25	sedge,forb,shrub
SVRY2	091004	Olympus Stylus 400	A	Left	23.5	21.5	0	0.00	gravel,sand
SVRY2	091004	Olympus Stylus 400	A	Right	41.3	44.5	0	0.00	gravel,sand
SVRY2	091004	Olympus Stylus 400	B	Left	19.1	17.5	0	0.00	gravel,sand
SVRY2	091004	Olympus Stylus 400	B	Right	42.1	44.5	0	0.00	gravel,sand
SVRY2	091004	Olympus Stylus 400	C	Left	52.2	49.4	0	0.00	gravel,sand
SVRY2	091004	Olympus Stylus 400	C	Right	77.4	79.3	0	0.00	gravel,sand
SVRY2	091004	Olympus Stylus 400	D	Left	75.9	72.8	0	0.00	gravel,sand
SVRY2	091004	Olympus Stylus 400	D	Right	90.1	92.5	0	0.00	gravel,sand
SVRY2	091004	Olympus Stylus 400	E	Left	69.3	67.8	0	0.00	gravel,sand
SVRY2	091004	Olympus Stylus 400	E	Right	90.5	92.5	0	0.00	gravel,sand
SKIC1	090704	Olympus Stylus 400	A	Left	6.2	8.0	35	-2.50	moss,forb
SKIC1	090704	Olympus Stylus 400	A	Right	11.1	8.5	40	-1.67	moss,grass,forb
SKIC1	090704	Olympus Stylus 400	B	Left	4.9	4.0	5	0.00	moss,forb
SKIC1	090704	Olympus Stylus 400	B	Right	10.5	7.5	20	-3.00	moss,forb
SKIC1	090704	Olympus Stylus 400	C	Left	4.1	3.0	5	0.94	grass,forb
SKIC1	090704	Olympus Stylus 400	C	Right	12.2	9.0	25	0.58	moss,grass,forb
SKIC1	090704	Olympus Stylus 400	D	Left	16.4	19.5	5	0.93	grass,forb
SKIC1	090704	Olympus Stylus 400	D	Right	23.2	19.5	5	0.75	grass,forb
SKIC1	090704	Olympus Stylus 400	E	Left	14.5	17.5	60	0.37	grass,forb
SKIC1	090704	Olympus Stylus 400	E	Right	19.2	15.0	90	-2.00	moss,grass,forb

Red values denote distance change from 2003

Summary of Riparian Vegetation Description and Photo Points 2004

					Photo Points				
Site	Date	Camera	Cross Section	Bank	Bank - Distance from LPIN (ft)	Camera - Distance from LPIN (ft)	Percent Cover	Change in Percent Cover 2003-2004	Comments
SKIC2	090704	Olympus Stylus 400	A	Left	32.8	36.0	10	0.00	grass,forb
SKIC2	090704	Olympus Stylus 400	A	Right	40.7	35.0	20	0.33	moss,grass,forb
SKIC2	090704	Olympus Stylus 400	B	Left	28.4	34.5	5	0.00	moss,shrub
SKIC2	090704	Olympus Stylus 400	B	Right	34.1	31.5	40	-7.00	moss,forb
SKIC2	090704	Olympus Stylus 400	C	Left	2.6	1.0	40	0.20	grass,forb,shrub
SKIC2	090704	Olympus Stylus 400	C	Right	10.2	12.0	1	0.90	grass
SKIC2	090704	Olympus Stylus 400	D	Left	4.3	11.0	5	0.00	moss,forb
SKIC2	090704	Olympus Stylus 400	D	Right	11.5	12.0	3	0.70	moss
SKIC2	090704	Olympus Stylus 400	E	Left	24.9	31.0	60	-1.00	moss,forb
SKIC2	090704	Olympus Stylus 400	E	Right	31.1	26.0	40	-3.00	moss,forb
SCAT1	090604	Olympus Stylus 400	A	Left	6.4	11.5	40	0.60	moss,grass,shrub
SCAT1	090604	Olympus Stylus 400	A	Right	11.7	8.9	80	0.11	moss,grass,shrub
SCAT1	090604	Olympus Stylus 400	B	Left	10.5	14.0	25	0.72	grass,sedge,forb
SCAT1	090604	Olympus Stylus 400	B	Right	18.3	14.0	30	0.63	moss,grass,forb
SCAT1	090604	Olympus Stylus 400	C	Left	5.5	10.0	75	0.00	moss,grass,sedge,forb
SCAT1	090604	Olympus Stylus 400	C	Right	13.7	9.6	60	0.40	grass,sedge,forb
SCAT1	090604	Olympus Stylus 400	D	Left	5.5	12.0	45	0.55	grass,forb
SCAT1	090604	Olympus Stylus 400	D	Right	11.7	6.0	40	0.60	grass,sedge
SCAT1	090604	Olympus Stylus 400	E	Left	8.2	16.0	50	0.50	moss,grass,sedge
SCAT1	090604	Olympus Stylus 400	E	Right	15.5	10.0	65	0.35	moss,grass,sedge
SCAT2	090604	Olympus Stylus 400	A	Left	3.9	9.0	10	0.75	grass
SCAT2	090604	Olympus Stylus 400	A	Right	15.0	9.5	50	-0.25	moss,forb,shrub
SCAT2	090604	Olympus Stylus 400	B	Left	3.6	7.0	50	0.00	grass,forb
SCAT2	090604	Olympus Stylus 400	B	Right	11.3	7.0	55	-0.38	moss,grass,forb
SCAT2	090604	Olympus Stylus 400	C	Left	2.2	6.0	10	0.80	grass,forb
SCAT2	090604	Olympus Stylus 400	C	Right	13.2	9.0	20	0.00	moss,grass,forb
SCAT2	090604	Olympus Stylus 400	D	Left	7.6	11.0	25	0.72	grass,forb
SCAT2	090604	Olympus Stylus 400	D	Right	15.9	12.7	50	-0.25	grass,forb
SCAT2	090604	Olympus Stylus 400	E	Left	3.8	7.0	45	0.53	grass,forb,shrub
SCAT2	090604	Olympus Stylus 400	E	Right	11.2	8.0	40	0.33	grass,forb

Red values denote distance change from 2003

Summary of Riparian Vegetation Description and Photo Points 2004

					Photo Points				
Site	Date	Camera	Cross Section	Bank	Bank - Distance from LPIN (ft)	Camera - Distance from LPIN (ft)	Percent Cover	Change in Percent Cover 2003-2004	Comments
WBVR1	090904	Olympus Stylus 400	A	Left	15.9	14.5	60	-0.50	grass
WBVR1	090904	Olympus Stylus 400	A	Right	31.0	32.5	20	-1.00	grass,forb
WBVR1	090904	Olympus Stylus 400	B	Left	4.3	3.0	55	-0.10	grass,forb,shrub
WBVR1	090904	Olympus Stylus 400	B	Right	15.5	17.5	40	0.00	grass,shrub
WBVR1	090904	Olympus Stylus 400	C	Left	4.0	2.7	85	-1.13	grass,forb,shrub
WBVR1	090904	Olympus Stylus 400	C	Right	17.0	18.0	50	0.23	grass,sedge,shrub
WBVR1	090904	Olympus Stylus 400	D	Left	9.7	14.0	40	0.00	shrub
WBVR1	090904	Olympus Stylus 400	D	Right	25.0	27.0	50	0.17	grass,shrub
WBVR1	090904	Olympus Stylus 400	E	Left	6.0	12.0	5	0.75	grass,shrub
WBVR1	090904	Olympus Stylus 400	E	Right	20.0	21.5	50	0.38	grass
WBVR2	090904	Olympus Stylus 400	A	Left	9.0	15.0	0	1.00	gravel
WBVR2	090904	Olympus Stylus 400	A	Right	29.7	22.0	0	0.00	gravel
WBVR2	090904	Olympus Stylus 400	B	Left	108.0	16.5	0	0.00	gravel
WBVR2	090904	Olympus Stylus 400	B	Right	33.0	23.0	0	0.00	gravel
WBVR2	090904	Olympus Stylus 400	C	Left	103.2	102.0	0	0.00	gravel
WBVR2	090904	Olympus Stylus 400	C	Right	130.5	132.0	0	0.00	gravel
WBVR2	090904	Olympus Stylus 400	D	Left	90.3	88.0	50	0.00	grass
WBVR2	090904	Olympus Stylus 400	D	Right	124.0	125.0	0	0.00	gravel
WBVR2	090904	Olympus Stylus 400	E	Left	35.2	33.5	20	-3.00	grass
WBVR2	090904	Olympus Stylus 400	E	Right	65.8	63.0	35	0.13	grass,shrub

Red values denote distance change from 2003

Boehmer Creek 1: BHMR1-left bank

2003 | 2004

01 BHMR1_001.JPG

XSA

02 BHMR1_005.JPG

03 BHMR1_008.JPG

XSB

04 BHMR1_011.JPG

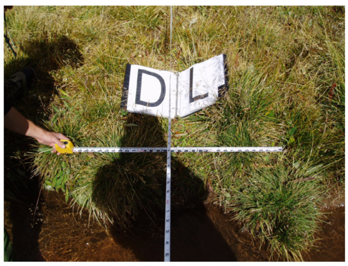
05 BHMR1_014.JPG

XSC

06 BHMR1_023.JPG

07 BHMR1_020.JPG

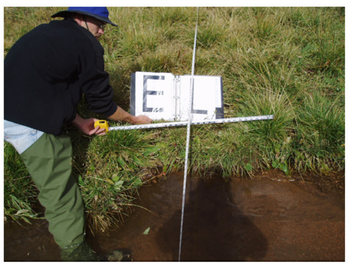
XSD



08 BHMR1_017.JPG

09 BHMR1_026.JPG

XSE



10 BHMR1_029.JPG

Boehmer Creek 1: BHMR1-right bank

2003

2004

01 BHMR1_002.JPG

XSA

02 BHMR1_006.JPG

03 BHMR1_007.JPG

XSB

04 BHMR1_012.JPG

05 BHMR1_013.JPG

XSC

06 BHMR1_024.JPG

07 BHMR1_019.JPG

XSD

08 BHMR1_018.JPG

09 BHMR1_025.JPG

XSE

10 BHMR1_030.JPG

Boehmer Creek 2: BHMR2-left bank

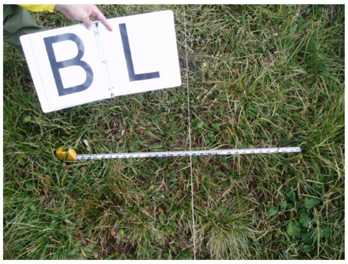
2003

2004

01 BHMR2_026.JPG

XSA

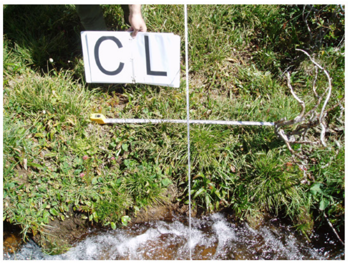
02 BMR2_006.JPG



03 BHMR2_001.JPG

XSB

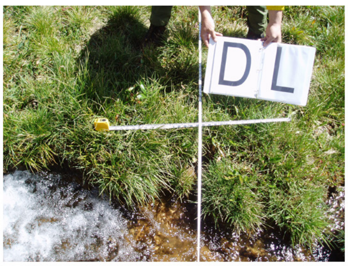
04 BMR2_012.JPG



05 BHMR2_007.JPG

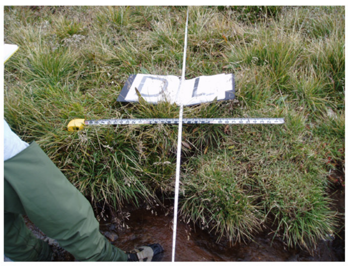
XSC

06 BMR2_018.JPG

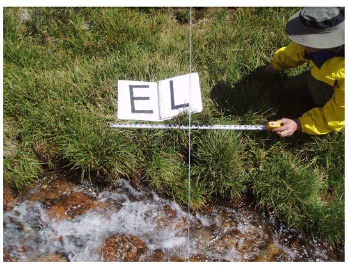


07 BHMR2_013.JPG

XSD

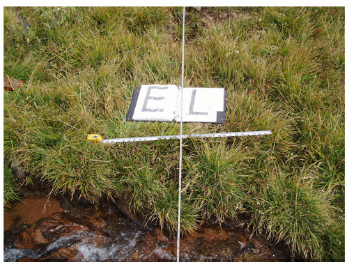


08 BMR2_024.JPG



09 BHMR2_020.JPG

XSE



10 BMR2_032.JPG

Boehmer Creek 2: BHMR2-right bank

2003		2004

01 BHMR2_015.JPG

XSA

02 BMR2_007.JPG

03 BHMR2_001.JPG

XSB

04 BMR2_013.JPG

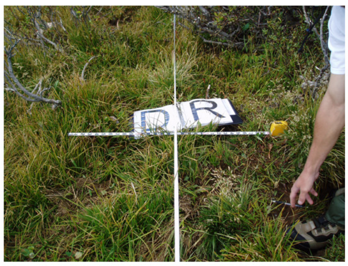
05 BHMR2_007.JPG

XSC

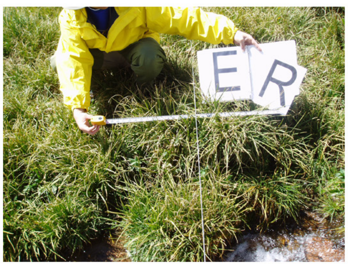
06 BMR2_019.JPG

07 BHMR2_013.JPG

XSD



08 BMR2_025.JPG



09 BHMR2_019.JPG

XSE

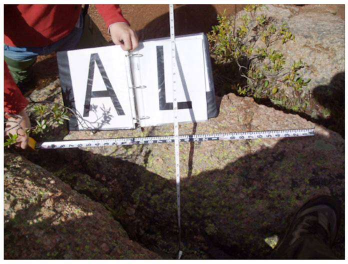
10 BMR2_033.JPG

East Fork Beaver Creek 1: EBVR1-left bank

2003 | 2004

01 EBVR1_026.JPG

XSA



02 EBVR1_006.JPG

03 EBVR1_020.JPG

XSB

04 EBVR1_012.JPG

05 EBVR1_014.JPG

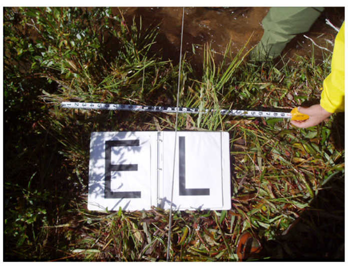
XSC

06 EBVR1_018.JPG

07 EBVR1_008.JPG

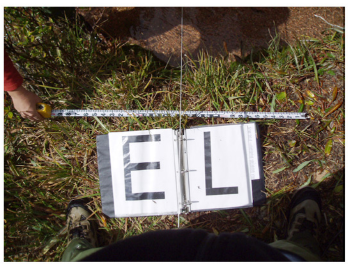
XSD

08 EBVR1_024.JPG



09 EBVR1_002.JPG

XSE



10 EBVR1_030.JPG

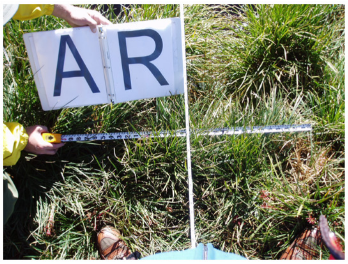
East Fork Beaver Creek 1: EBVR1 right bank

2003		2004
 01 EBVR1_028.JPG	XSA	 02 EBVR1_007.JPG
 03 EBVR1_021.JPG	XSB	 04 EBVR1_013.JPG
 05 EBVR1_015.JPG	XSC	 06 EBVR1_019.JPG
 07 EBVR1_009.JPG	XSD	 08 EBVR1_025.JPG
 09 EBVR1_003.JPG	XSE	 10 EBVR1_031.JPG

East Fork Beaver Creek 2: EBVR2 left bank

2003		2004
 01 EBVR2_001.JPG	XSA	 02 EBvr2_031.JPG
 03 EBVR2_003.JPG	XSB	 04 EBvr2_025.JPG
 05 EBVR2_005.JPG	XSC	 06 EBvr2_023.JPG
 07 EBVR2_007.JPG	XSD	 08 EBvr2_013.JPG
 09 EBVR2_009.JPG	XSE	 10 EBvr2_007.JPG

East Fork Beaver Creek 2: EBVR2 right bank

2003		2004
 01 EBVR2_002.JPG	XSA	 02 EBvr2_030.JPG
 03 EBVR2_004.JPG	XSB	 04 EBvr2_024.JPG
 05 EBVR2_006.JPG	XSC	 06 EBvr2_022.JPG
 08 EBVR2_008.JPG	XSD	 08 EBvr2_012.JPG
 09 EBVR2_010.JPG	XSE	 10 EBvr2_006.JPG

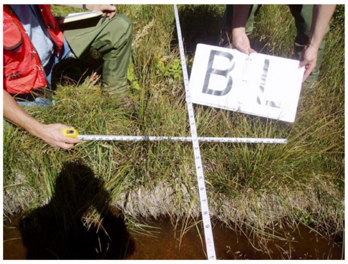
North Catamount Creek 1: NCAT1-left bank

2003 | 2004

01 NCAT1_001.JPG

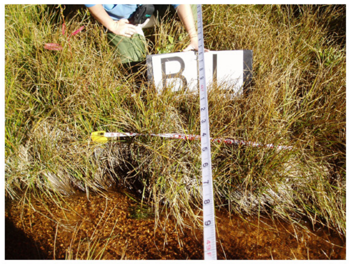
XSA

02 NCat1_005.JPG

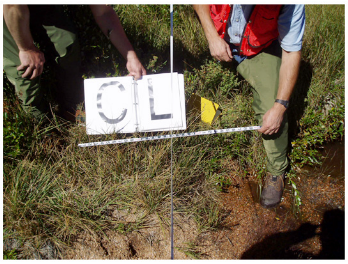


03 NCAT1_005.JPG

XSB



04 NCat1_011.JPG



05 NCAT1_007.JPG

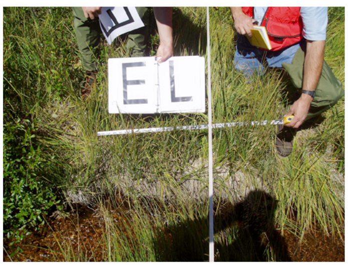
XSC

06 NCat1_019.JPG

07 NCAT1_009.JPG

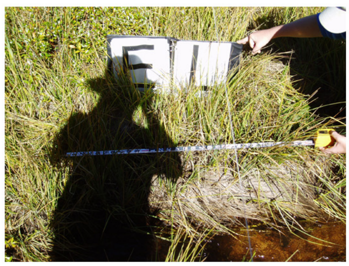
XSD

08 NCat1_025.JPG



09 NCAT1_031.JPG

XSE



10 NCat1_032.JPG

North Catamount Creek 1: NCAT1-right bank

2003

2004

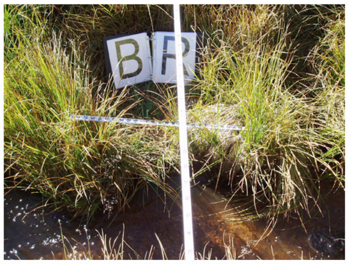
01 NCAT1_004.JPG

XSA

02 NCat1_006.JPG

03 NCAT1_006.JPG

XSB



04 NCat1_012.JPG

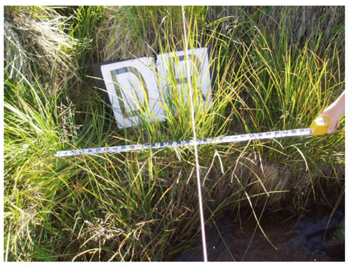
05 NCAT1_008.JPG

XSC

06 NCat1_020.JPG

08 NCAT1_010.JPG

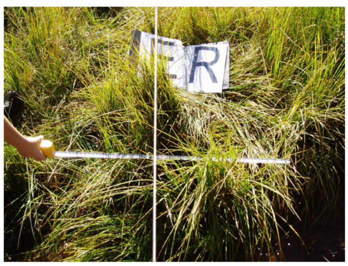
XSD



08 NCat1_026.JPG

09 NCAT1_032.JPG

XSE



10 NCat1_033.JPG

North Catamount Creek 2: NCAT2-left bank

2003

2004

01 NCAT2_001.JPG

XSA

02 NCAT2_005.JPG

03 NCAT2_003.JPG

XSB

04 NCAT2_011.JPG

05 NCAT2_005.JPG

XSC

06 NCAT2_017.JPG

07 NCAT2_009.JPG

XSD

08 NCAT2_023.JPG

09 NCAT2_007.JPG

XSE

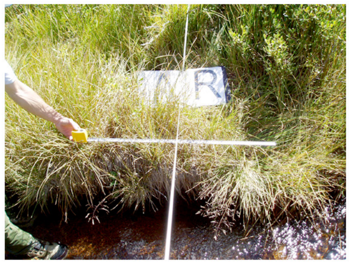
10 NCAT2_029.JPG

North Catamount Creek 2: NCAT2-right bank

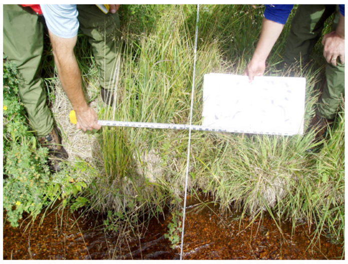
2003		2004

01 NCAT2_002.JPG

XSA



02 NCAT2_006.JPG



03 NCAT2_004.JPG

XSB

04 NCAT2_012.JPG

05 NCAT2_006.JPG

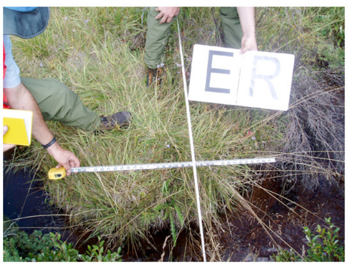
XSC

06 NCAT2_018.JPG

07 NCAT2_010.JPG

XSD

08 NCAT2_024.JPG



09 NCAT2_008.JPG

XSE

10 NCAT2_030.JPG

North Crystal Creek 1: NCRY1-left bank

2003 | 2004

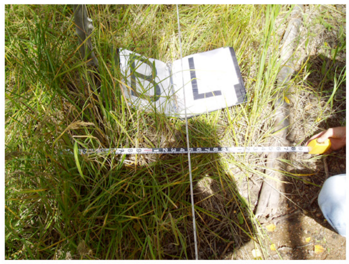
XSA

01 NCRY1_007.JPG

02 NCRY1_007.JPG

XSB

03 NCRY1_009.JPG



04 NCRY1_013.JPG

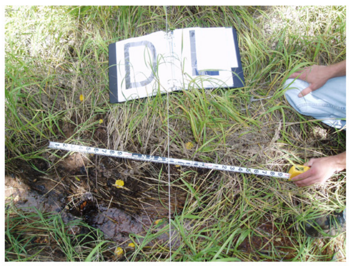
XSC

05 NCRY1_006.JPG

06 NCRY1_019.JPG

XSD

07 NCRY1_003.JPG



08 NCRY1_025.JPG

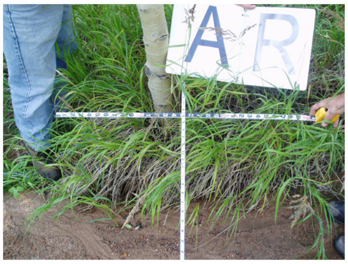
XSE

09 NCRY1_001.JPG

10 NCRY1_031.JPG

North Crystal Creek 1: NCRY1-right bank

2003		2004



01 NCRY1_008.JPG

XSA

02 NCRY1_008.JPG

03 NCRY1_010.JPG

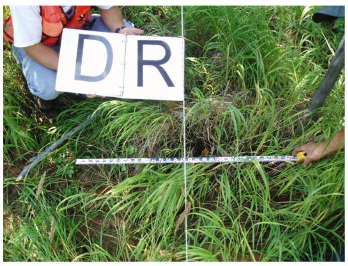
XSB

04 NCRY1_014.JPG

05 NCRY1_005.JPG

XSC

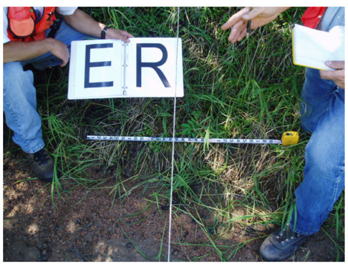
06 NCRY1_020.JPG



08 NCRY1_004.JPG

XSD

08 NCRY1_026.JPG



09 NCRY1_002.JPG

XSE

10 NCRY1_032.JPG

North Crystal Creek 2: NCRY2-left bank

2003 | 2004

01 NCRY2_021.JPG

XSA

02 NCRY2_030.JPG

03 NCRY2_029.JPG

XSB

04 NCRY2_024.JPG

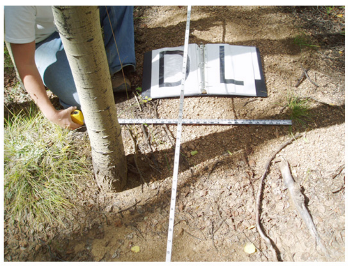
05 NCRY2_023.JPG

XSC

06 NCRY2_018.JPG

07 NCRY2_025.JPG

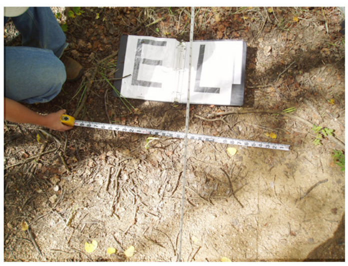
XSD



08 NCRY2_012.JPG

09 NCRY2_027.JPG

XSE



10 NCRY2_006.JPG

North Crystal Creek 2: NCRY2-right bank

2003		2004
 01 NCRY2_022.JPG	XSA	 02 NCRY2_031.JPG
 03 NCRY2_030.JPG	XSB	 04 NCRY2_025.JPG
 05 NCRY2_024.JPG	XSC	 06 NCRY2_019.JPG
 07 NCRY2_026.JPG	XSD	 08 NCRY2_013.JPG
 09 NCRY2_028.JPG	XSE	 10 NCRY2_007.JPG

Oil Creek 1: OILC1-left bank

2003

2004

01 OILC1_030.JPG

XSA

02 OilCr_026.JPG

03 OILC1_020.JPG

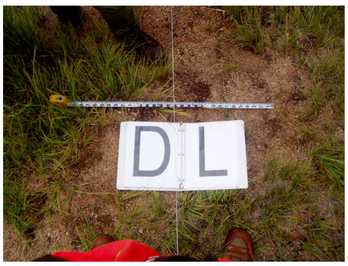
XSB

04 OilCr_032.JPG

05 OILC1_014.JPG

XSC

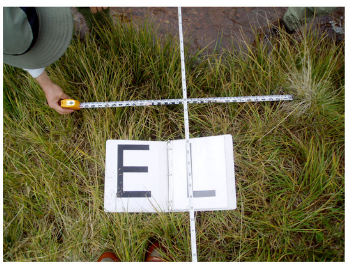
06 OilCr_020.JPG



07 OILC1_010.JPG

XSD

08 OilCr_013.JPG



09 OILC1_004.JPG

XSE

10 OilCr_007.JPG

Oil Creek 1: OILC1-right bank

2003 | 2004

01 OILC1_029.JPG

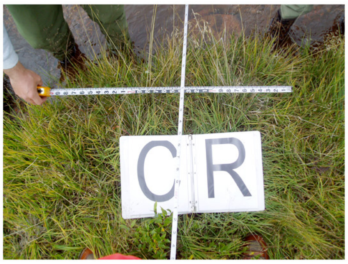
XSA

02 OilCr_027.JPG

03 OILC1_022.JPG

XSB

04 OilCr_033.JPG



05 OILC1_017.JPG

XSC

06 OilCr_021.JPG

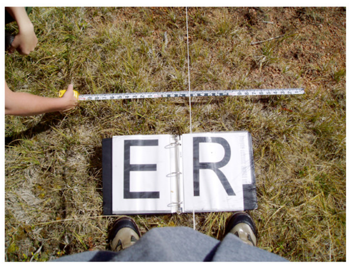
07 OILC1_008.JPG

XSD

08 OilCr_015.JPG

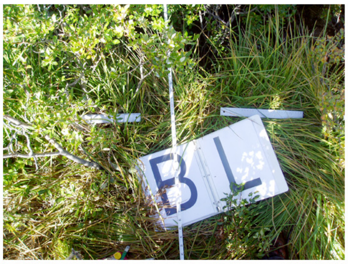
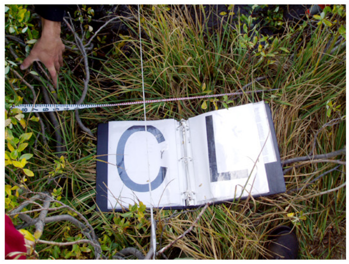
09 OILC1_002.JPG

XSE



10 OilCr_008.JPG

Severy Creek 1: SVRY1-left bank

2003		2004
 01 SVRY1_002.JPG	XSA	 02 SVRY1_017.JPG
 03 SVRY1_007.JPG	XSB	 04 SVRY1_011.JPG
 05 SVRY1_013.JPG	XSC	 06 SVRY1_005.JPG
 07 SVRY1_019.JPG	XSD	 08 SVRY1_024.JPG
 09 SVRY1_025.JPG	XSE	 10 SVRY1_029.JPG

Severy Creek 1: SVRY1-right bank

2003		2004
 01 SVRY1_001.JPG	XSA	 02 SVRY1_018.JPG
 03 SVRY1_008.JPG	XSB	 04 SVRY1_012.JPG
 05 SVRY1_015.JPG	XSC	 06 SVRY1_006.JPG
 07 SVRY1_021.JPG	XSD	 08 SVRY1_023.JPG
 09 SVRY1_027.JPG	XSE	 10 SVRY1_030.JPG

Severy Creek 2: SVRY2-left bank

2003 | 2004

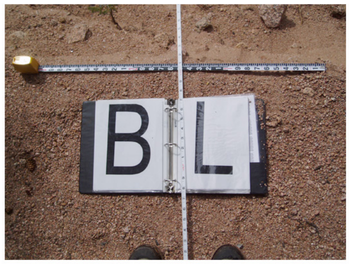
01 SVRY2_031.JPG

XSA

02 SVRY2_030.JPG

03 SVRY2_024.JPG

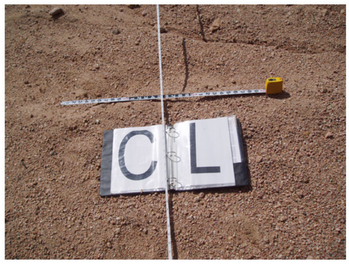
XSB



04 SVRY2_024.JPG

05 SVRY2_014.JPG

XSC

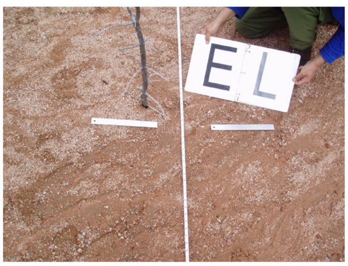


06 SVRY2_016.JPG

07 SVRY2_008DL.JPG

XSD

08 SVRY2_009.JPG



09 SVRY2_002.JPG

XSE

10 SVRY2_002.JPG

Severy Creek 2: SVRY2-right bank

2003		2004

01 SVRY2_028.JPG

XSA

02 SVRY2_029.JPG

03 SVRY2_021.JPG

XSB

04 SVRY2_023.JPG

05 SVRY2_015.JPG

XSC

06 SVRY2_015.JPG

07 SVRY2_007.JPG

XSD

08 SVRY2_007.JPG

09 SVRY2_001.JPG

XSE

10 SVRY2_001.JPG

Ski Creek 1: SKIC1-left bank

2003		2004

01 SKIC1_001.JPG

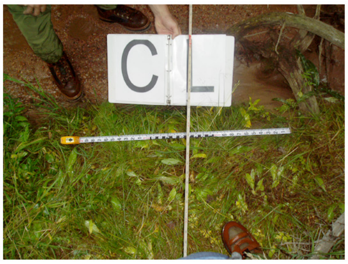
XSA

02 SKI1_029.JPG

03 SKIC1_003.JPG

XSB

04 SKI1_023.JPG



05 SKIC1_005.JPG

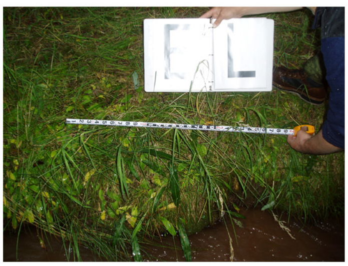
XSC

06 SKI1_017.JPG

07 SKIC1_019.JPG

XSD

08 SKI1_011.JPG



09 SKIC1_022.JPG

XSE

10 SKI1_005.JPG

Ski Creek 1: SKIC1-right bank

2003		2004

01 SKIC1_002.JPG

XSA

02 SKI1_030.JPG

03 SKIC1_004.JPG

XSB

04 SKI1_024.JPG

05 SKIC1_006.JPG

XSC

06 SKI1_018.JPG

07 SKIC1_020.JPG

XSD

08 SKI1_012.JPG

09 Skic1 XSE RB Veg mislabeled.JPG

XSE

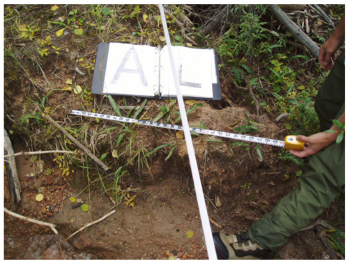
10 SKI1_006.JPG

Ski Creek 2: SKIC2-left bank

2003 | 2004

XSA

01 SKIC2_007.JPG



02 SKI2_021.JPG

XSB

03 SKIC2_001.JPG

04 SKI2_015.JPG

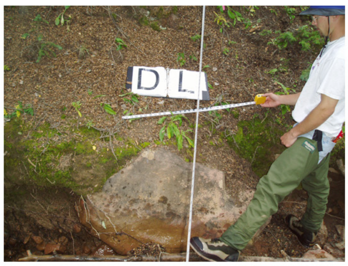
XSC

05 SKIC2_013.JPG

06 SKI2_027.JPG

XSD

07 SKIC2_019.JPG



08 SKI2_009.JPG

XSE

09 SKIC2_025.JPG

10 SKI2_003.JPG

Ski Creek 2: SKIC2-right bank

2003 | 2004

01 SKIC2_008.JPG

XSA

02 SKI2_022.JPG

03 SKIC2_002.JPG

XSB

04 SKI2_016.JPG

05 SKIC2_014.JPG

XSC

06 SKI2_028.JPG

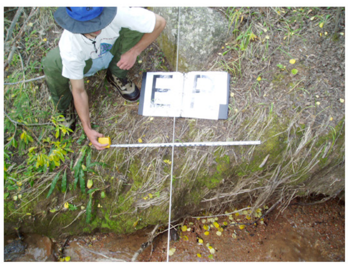
07 SKIC2_020.JPG

XSD

08 SKI2_010.JPG

09 SKIC2_026.JPG

XSE



10 SKI2_004.JPG

South Catamount Creek 1: SCAT1-left bank

2003 | 2004

XSA

01 SCAT1_001.JPG

02 SCat1_023.JPG

XSB

03 SCAT1_003.JPG

04 SCat1_025.JPG

XSC

05 SCAT1_005.JPG

06 SCat1_027.JPG

XSD

07 SCAT1_010.JPG

08 SCat1_028.JPG

XSE

09 SCAT1_007.JPG

10 SCat1_030.JPG

South Catamount Creek 1: SCAT1-right bank

2003 | 2004

01 SCAT1_002.JPG

XSA

02 SCat1_022.JPG

03 SCAT1_004.JPG

XSB

04 SCat1_024.JPG

05 SCAT1_006.JPG

XSC

06 SCat1_026.JPG

07 SCAT1_011.JPG

XSD

08 SCat1_029.JPG

09 SCAT1_009.JPG

XSE

10 SCat1_031.JPG

South Catamount Creek 2: SCAT2-left bank

2003

2004

XSA

01 SCAT2_025.JPG

02 SCAT2_027.JPG

XSB

03 SCAT2_016.JPG

04 SCAT2_021.JPG

XSC

05 SCAT2_013.JPG

06 SCAT2_015.JPG

XSD

07 SCAT2_004.JPG

08 SCAT2_009.JPG

XSE

09 SCAT2_001.JPG

10 SCAT2_003.JPG

South Catamount Creek 2: SCAT2-right bank

2003 | 2004

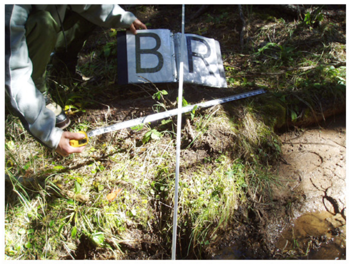
01 SCAT2_026.JPG

XSA

02 SCAT2_028.JPG

03 SCAT2_015.JPG

XSB



04 SCAT2_022.JPG

05 SCAT2_014.JPG

XSC

06 SCAT2_016.JPG

07 SCAT2_003.JPG

XSD

08 SCAT2_010.JPG

09 SCAT2_002.JPG

XSE

10 SCAT2_004.JPG

West Fork Beaver Creek 1: WBVR1-left bank

2003

2004

01 WBVR1_024.JPG

XSA

02 WBVR1_031.JPG

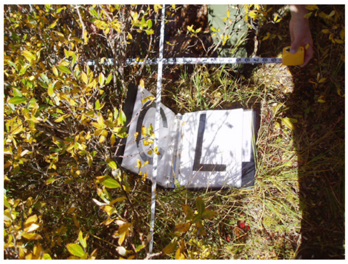
03 WBVR1_021.JPG

XSB

04 WBVR1_025.JPG

05 WBVR1_013.JPG

XSC



06 WBVR1_018.JPG

07 WBVR1_006.JPG

XSD

08 WBVR1_012.JPG

09 WBVR1_004.JPG

XSE

10 WBVR1_006.JPG

West Fork Beaver Creek 1: WBVR1-right bank

2003		2004
 01 WBVR1_027.JPG	XSA	 02 WBVR1_032.JPG
 03 WBVR1_018.JPG	XSB	 04 WBVR1_026.JPG
 05 WBVR1_015.JPG	XSC	 06 WBVR1_020.JPG
 07 WBVR1_009.JPG	XSD	 08 WBVR1_013.JPG
 09 WBVR1_029.JPG	XSE	 10 WBVR1_007.JPG

West Fork Beaver Creek 2: WBVR2-left bank

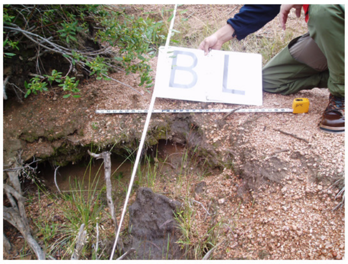
2003

2004

01 WBVR2_032.JPG

XSA

02 WBVR2_005.JPG



03 WBVR2_003.JPG

XSB

04 WBVR2_011.JPG

05 WBVR2_012.JPG

XSC

06 WBVR2_017.JPG

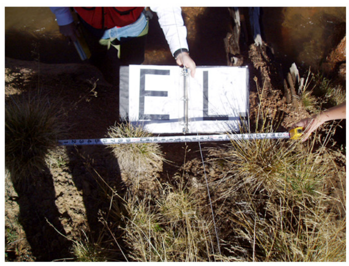
07 WBVR2_018.JPG

XSD

08 WBVR2_023.JPG

09 WBVR2_025.JPG

XSE



10 WBVR2_029.JPG

West Fork Beaver Creek 2: WBVR2-right bank

2003 | 2004

01 WBVR2_001.JPG

XSA

02 WBVR2_006.JPG

03 WBVR2_002.JPG

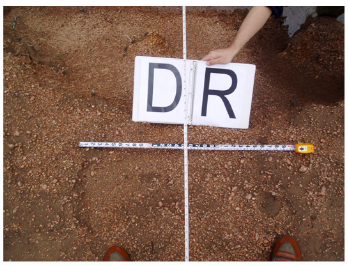
XSB

04 WBVR2_012.JPG

05 WBVR2_013.JPG

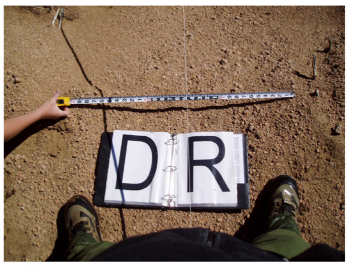
XSC

06 WBVR2_018.JPG



07 WBVR2_019.JPG

XSD



08 WBVR2_024.JPG

09 WBVR2_024.JPG

XSE

10 WBVR2_030.JPG