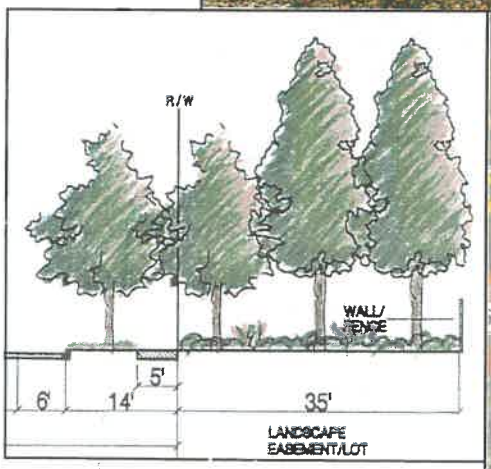
NOBLE CREEK VISTAS SPECIFIC PLAN

CONSOLIDATED ENVIRONMENTAL IMPACT REPORT

TECHNICAL APPENDICES

MAY 2004







Applied Planning Inc.

B. GEOTECHNICAL INVESTIGATIONS

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GEOTECHNICAL INVESTIGATION
TENTATIVE TRACT NO. 29267
RIVERSIDE COUNTY, CALIFORNIA
PREPARED FOR
NOBEL CREEK MEADOWS, LLC
JOB NO. 99510-3

C·H·J· INCORPORATED

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August 3, 1999

Nobel Creek Meadows, LLC
c/o Gabel, Cook & Becklund
125 West La Cadena Boulevard
Riverside, California 92501
Attention: Mr. Grant Becklund

Job No. 99510-3

Dear Mr. Becklund:

Attached herewith is the Geotechnical Investigation report, prepared for the proposed residential development (Tentative Tract No. 29267) to be located northwest of the intersection of 14th Street and Elm Street, in the Beaumont area of Riverside County, California.

This report was based upon a scope of services generally outlined in our proposal letter dated June 29, 1999, and other written and verbal communications.

We appreciate this opportunity to provide geotechnical services for this project. If you have questions or comments concerning this report, please contact this firm at your convenience.

Respectfully submitted,
C.H.J., INCORPORATED

Ben Williams, Senior Staff Engineer

BW/RJJ:sp
Distribution: Nobel Creek Meadows (4)
Gabel, Cook & Becklund, Inc (2)
Mr. Jack VanderWoude (1)

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GEOTECHNICAL INVESTIGATION
TENTATIVE TRACT NO. 29267
RIVERSIDE COUNTY, CALIFORNIA
PREPARED FOR
NOBEL CREEK MEADOWS, LLC
JOB NO. 99510-3

INTRODUCTION

During July and August of 1999, a geotechnical investigation for Tentative Tract No. 29267, to be located north of the intersection of 14th Avenue and Elm Drive, in the Beaumont area of Riverside County, California, was performed by this firm. The purpose of this investigation was to explore and evaluate the soils engineering/geologic conditions at the subject site and to provide appropriate geotechnical engineering recommendations for design of the proposed structures and infrastructure.

To orient our investigation at the site, a 1:1200 scale Grading Plan, prepared by Gabel, Cook and Becklund was furnished for our use. The Grading Plan included a tentative development scheme including 333 residential lots. The approximate location of the site is shown on the attached Index Map (Appendix "A").

The results of our investigation, together with our conclusions and recommendations, are presented in this report.

SCOPE OF SERVICES

The scope of services provided during this geotechnical investigation included the following:

- Review of published and unpublished literature and maps.
- Review and analysis of stereoscopic aerial photographs flown in 1974, 1980, 1984, 1990, and 1995.
- A geologic field reconnaissance of the site and surrounding area, and geologic mapping of the site.
- Placement of 20 exploratory borings on the site.
- Logging and sampling of exploratory borings for testing and evaluation.

- Laboratory testing on selected samples.
- Evaluation of the soils engineering data to develop site-specific recommendations for site grading, conventional static foundation design, and mitigation of potential geologic constraints.

PROJECT CONSIDERATIONS

Information furnished this office indicates that 80± acres of the subject 100± acre site will be developed with 333 residential structures and related infrastructure. The remaining 20 acres of the site is to be dedicated as park land and was not a part of our investigation. It is our understanding that the proposed structures will be one to two stories in height and of wood frame and stucco or similar type construction. Light to moderate foundation loads are normally associated with such structures.

The project grading plan indicates that development of this site will entail maximum cuts on the order of 10 feet deep and maximum fill on the order of 25 feet high; however, cuts and fills will generally be much less. The final project grading plan should be reviewed by the geotechnical engineer.

In addition to the proposed structures, site infrastructure improvements such as buried utility lines and streets are proposed.

SITE DESCRIPTION

The subject site is an irregularly shaped parcel located north of the intersection of 14th Avenue and Elm Drive in the Beaumont Area of Riverside County, California. Noble Creek Park exists to the southwest, Noble Creek borders the site on the north and northwest and 14th Avenue borders the site on the south. The sites to the east, and north and to the northwest of Noble Creek, as well as south of 14th Avenue are vacant at this time.

At the time of this investigation, the topography of the site consisted of a topographically lower area on the north and a higher plateau area on the south. The two areas are separated by moderately steep (approximately 10 to 18 percent slope) hillsides and incised drainages. The site is vacant with the exception of high voltage overhead power lines crossing the southern portion of the site in the area of the steep hillsides. Small corral structures exist on the southern portion of the site and the site is fenced. An earthen dam has been constructed in a ravine on the southern portion of the site and it appears that the area upstream of the dam has experienced some siltation. Two unpaved roads cross the ravine in the center and along the eastern border of the site. The central road is on fill material (earthen dam) built up above the natural channel bottom.

Trees exist in the area of the corral structures and the site is covered with a moderately dense growth of weeds and seasonal grasses. It appears that previous site usage has been for cattle grazing and dry farming. A high pressure gas line exists along 14th Avenue and the southern border of the site.

No other surface features pertinent to this investigation were noted.

AERIAL PHOTOGRAPH REVIEW

As part of this investigation, aerial photographs dating back to 1974 were reviewed for past land usage and evidence of geotechnical hazards.

The 1974 aerial photographs show the site as vacant land, apparently used for grazing or dry farming purposes. The site is bordered to the northwest by Noble Creek and to the south by 14th Street. The surrounding areas were vacant except for a residential type structure adjacent to the western border of the site. A northeast trending ravine is located in the southern portion of the site. Two linear drainages are located in the southern portion of the site perpendicular to the ravine. No other significant features were noted.

Aerial photographs flown in 1980 show graded pads existed off-site adjacent to the site's southwest border. Development of Noble Creek Park was also visible to the west. No other significant features were noted.

1984 aerial photographs indicate the development of an earthen dam on the southwestern edge of the ravine and road construction near the center of the ravine. Graded areas, indicating possible fill, along the southern edge of the site near 14th Street are visible. More extensive development of the adjacent Noble Creek Park is visible on the aerial photographs. No other significant features were noted.

No significant changes to the site are visible on the 1990 aerial photographs. A commercial type structure is located off-site on the photographs near the southwestern corner of the site. No other significant changes were noted.

The 1995 aerial photographs show no significant changes to the site or surrounding areas.

FIELD INVESTIGATION

The soil conditions underlying the subject site were explored by means of 20 exploratory borings drilled to a maximum depth of 51.5 feet below the existing ground surface with a truck-mounted CME 55 drill rig equipped for soil sampling. The approximate locations of our exploratory borings are indicated on the attached Geologic Map (Appendix "A").

Continuous logs of the subsurface conditions, as encountered within the exploratory borings, were recorded at the time of drilling by a staff geologist from this firm. Relatively undisturbed samples were obtained by driving a split spoon ring sampler ahead of the borings at selected levels. In addition, the standard penetration sampler was driven ahead of the boring at selected levels within some of the borings. After the required seating of the sampler, the number of hammer blows required to advance the sampler a total of 12 inches was converted to Standard Penetration Test

(SPT) data and recorded on the boring logs. Undisturbed as well as bulk samples of typical soil types obtained were returned to the laboratory in sealed containers for testing and evaluation.

Our exploratory boring logs, together with our SPT data, are presented in Appendix "B". The stratification lines presented on the boring logs represent approximate boundaries between soil types, which may include gradual transitions.

LABORATORY INVESTIGATION

Included in the laboratory testing program were field moisture content determinations on all samples returned to the laboratory and field dry densities on all undisturbed samples. The results are included on the boring logs. Optimum moisture content - maximum dry density relationships were established for typical soil types. Direct shear and consolidation testing was performed on selected samples in order to provide shear strength and consolidation parameters for bearing capacity, earth pressure and settlement evaluations. An expansion index determination was performed on a selected sample of clay-bearing material. Selected samples of material were delivered to Del Mar Analytical Laboratory for soluble sulfate analysis.

Summaries of the laboratory test results appear in Appendix "C".

SITE GEOLOGY AND SUBSURFACE SOIL CONDITIONS

The site is located on the south portion of the Beaumont Plain, a portion of the Peninsular Ranges Geomorphic Province. The Beaumont Plain is a older, partially dissected geomorphic surface in part formed by coalesced alluvial fans (Reynolds and others, 1992) although in the south portion the depth of alluvium appears to be minimal (Matti and others, 1992). Dibblee (1982, Enclosure "A-3") shows the area of the site as underlain by Quatenary alluvium. Matti (1985) shows the site as Holocene and Pleistocene-age alluvium. Geologic mapping of the site is included in Enclosure "A-2".

The surficial older alluvium at the site (map unit "Qoa") consists of reddish-brown sands and silty sands. Based on the degree of soil development and other characteristics, the older alluvium is considered to be Late Pleistocene in age. Younger alluvium at the site (map unit "Qya") is composed of sands and silty sands and is considered to be Holocene in age. The younger alluvium is associated with Noble Creek.

Data from our exploratory borings indicates that the younger alluvium underlying the topographically lower area of the subject site typically consists of surficial silty sands (SM) and poorly graded sands with silt (SP-SM) underlain at a relatively shallow depth by poorly graded sands (SP) to the maximum depths attained. Density testing and SPT data from our exploratory borings indicates that the surficial material is in place in loose to medium dense states, and the underlying alluvium is in place in medium dense to dense states generally grading denser with depth.

The older alluvium which underlies the topographically higher area of the subject site typically consists of surficial silty sands (SM) underlain by poorly graded sands (SP) and poorly graded sands with silt (SM-SP) with interbedded sandy silt (ML) to the maximum depths attained. Density testing and SPT data from our exploratory borings indicates that the surficial material and underlying alluvium are in place in medium dense to dense states, generally grading denser with depth.

Certain samples of the older alluvial soils (SM and ML) encountered in the plateau area contained appreciable amounts of clay. These soils had a "low" expansion potential when tested as per Uniform Building Code Test Method 18-2.

Results of soluble sulfate testing indicate a "negligible" anticipated exposure to sulfate attack.

Refusal to further advancement of the augers was not experienced within any of the exploratory borings utilized for this investigation.

No bedrock or free groundwater was encountered within any of the exploratory boring to the maximum depths attained.

All of the exploratory borings experienced moderate caving upon removal of the drilling augers.

A more detailed description of the subsurface soil conditions encountered within our exploratory borings is presented on the attached boring logs.

FAULTING

The tectonics of the Southern California area are dominated by the interaction of the North American Plate and the Pacific Plate, which are apparently sliding past each other in a translational motion. The San Andreas fault is thought to represent the major surface expression of the tectonic boundary between the Pacific Plate and the North American Plate, although some of the motion is partitioned out to the related northwest-trending strike-slip faults such as the San Jacinto fault and faults associated with the East Mojave shear zone. Local compressional or extensional strain resulting from the translational motion along this boundary is accommodated by left-lateral, reverse and normal faults such as the San Gorgonio Pass fault zone and the Beaumont Plains fault zone (Matti and others, 1992).

The site does not lie within or immediately adjacent to an Alquist-Priolo Earthquake Fault Zone designated by the State of California to include traces of suspected active faulting. No active faults are shown on or in the immediate vicinity of the site on published geologic maps. No evidence for active faulting on or immediately adjacent to the site was observed during the geologic field reconnaissance or on the aerial photographs reviewed.

Fault scarps and other lineaments associated with the Beaumont Plains fault zone have been mapped on the subject site by Matti and others (1985) and Treiman (1994). The Beaumont Plains fault zone is a system of normal faults that are apparently the result of local extensional strain. Traces of this

fault zone are observed as muted scarps expressed in the older alluvium (see Geologic Map, Enclosure "A-2"). Quaternary activity is evident for the fault zone but where investigated, evidence of Holocene (Recent) activity has so far been uncertain or doubtful (Treiman, 1994). Traces of the Beaumont Plains fault zone across Noble Creek, west of the site, were trenched by others in the late 1980's. That investigation concluded that the faults that were trenched were inactive and not considered to be a ground rupture hazard (Wessly Reeder, Personel Communication, July 13, 1999).

The Banning fault is located approximately 1 1/2 miles northeast of the site. The Banning fault places granitic and metamorphic bedrock over Plio - Pleistocene age sediments. The Banning fault is an ancient strike-slip fault that was initially abandoned in early Pliocene time and partially reactivated in response to compressional strain early in the Quaternary (Matti and others, 1992). It appears the local compressional strain has since shifted to the San Gorgonio Pass fault zone and the Banning fault north of the site is considered to be inactive (Treiman, 1994). East of Cabazon, the structure referred to as the Banning fault represents a branch of the Coachella Valley segment of the San Andreas fault and is considered active. The Banning fault north of the site is apparently not a continuation of the active Banning branch of the Coachella Valley segment of the San Andreas fault (Rasmussen and Reeder, 1986).

A system of reverse, thrust and strike slip faults known as the San Gorgonio Pass fault zone is located approximately 3 1/2 miles east of the site. Apparently the result of local compressional strain, this fault system exhibits evidence of late Holocene activity and has recently been included within an Alquist Priolo Earthquake Fault Zone (Smith, 1979; Treiman 1994).

The San Andreas fault zone in the San Gorgonio Pass region is poorly expressed at the surface. A through-going fault trace connecting the San Bernardino Mountains segment with the Coachella Valley segment has not been discovered and how the translational deformation is accommodated in this area is presently a subject of controversy (Allen, 1957; Rasmussen and Reeder, 1986; Matti and others, 1992; Treiman, 1994). The San Bernardino strand can be traced with confidence

through the Burro Flats region approximately 6 miles northeast of the site. The Working Group on California Earthquake Probabilities (1995) tentatively assigned a 28 percent (± 13 percent) probability to a major earthquake occurring on the San Bernardino Mountains segment of the San Andreas fault between 1994 and 2024.

The San Jacinto fault zone, a system of northwest-trending right-lateral strike-slip faults, is present as two parallel main strands across the San Jacinto Valley southwest of the site. At a closest distance of approximately 6 1/2 miles, the eastern trace or Claremont fault is well expressed in the northern San Jacinto Valley and is locally coincident with the southwest margin of the San Jacinto mountains and San Timoteo Badlands. More large historic earthquakes have occurred on the San Jacinto fault than any other fault in Southern California (Working Group on California Earthquake Probabilities, 1988). Based on the data of Matti and others (1992), This portion of the San Jacinto fault may be accommodating much of the motion between the Pacific Plate and the North American Plate in this area. Matti and others (1992) suggest this motion is transferred to the San Andreas fault in the Cajon Pass region by "stepping over" to parallel fault strands. The Working Group on California Earthquake Probabilities (1995) tentatively assigned a 43 percent (±17 percent) probability of a major earthquake on the San Jacinto Valley segment of the San Jacinto fault for the 30 year interval from 1994 to 2024.

HISTORICAL EARTHQUAKES

A map of recorded earthquake epicenters is included as Enclosure "A-4" (Goter and others, 1994). The epicenters and magnitudes that are shown are based on data from historical records and recording instruments. This enclosure presents small dots as epicenters of earthquakes with magnitude of less than 5.5 that were recorded from 1980 through January 1994. The circles represent earthquake epicenters with magnitudes equal to or greater than 5.5 that were recorded from 1836 to January 1994.

The San Jacinto fault is the most seismically active fault in Southern California, although it has no record of producing great events comparable to those that occurred on the San Andreas fault during

the Fort Tejon earthquake of 1857 and the San Francisco earthquake of 1906 (Working Group on California Earthquake Probabilities, 1988). Between 1899 and 1990, seven earthquakes of M_L 6.0 or greater have occurred along the San Jacinto fault. Two of these earthquakes, an estimated M_L 6.7 1 in 1899 and a M_L 6.8 in 1918, took place in the San Jacinto Valley, south of the site. Two others, an estimated M_L 6.5 in 1899 and a M_L 6.2 in 1923, took place in the San Bernardino Valley, north of the site (Working Group on California Earthquake Probabilities, 1988).

No large earthquakes have occurred on the San Bernardino Mountains segment of the San Andreas fault within the regional historical time frame. Using dendrochronological evidence Jacoby and others (1987) inferred that a great earthquake on December 8, 1812 ruptured the northern reaches of this segment. Recent trenching studies have revealed evidence of rupture on the San Andreas fault at Wrightwood occurred within this time frame (Fumal and others, 1993). Comparison of rupture events at the Wrightwood site and Pallett Creek and analysis of reported intensities at the coastal missions led Fumal and others (1993) to conclude that the December 8, 1812 event ruptured the San Bernardino Mountains segment of the San Andreas fault largely to the southeast of Wrightwood, possibly extending into the San Bernardino Valley, north of the site.

Surface rupture occurred on the Mojave segment of the San Andreas fault in the great 1857 Fort Tejon earthquake. The Coachella Valley segment of the San Andreas fault was responsible for the 1948 M_L 6.5 earthquake in the Desert Hot Springs area and for the 1986 M_L 5.6 earthquake in the North Palm Springs area.

No significant historical earthquakes have been specifically attributed to the Beaumont Plains fault zone, the San Gorgonio Pass fault zone, or the Banning fault in the general area of the site.

SEISMIC ANALYSIS

The precise relationship between magnitude and recurrence interval of large earthquakes for a given fault is not known due to the relatively short time span of recorded seismic activity. As a result,

a number of assumptions must be made to quantify the ground shaking hazard at a particular site. The probabilistic method is prescribed by current codes and was utilized during this investigation.

PROBABILISTIC HAZARD ANALYSIS:

The probabilistic analysis of seismic hazard is a statistical analysis of seismicity of all known regional faults attenuated to a particular geographic location. The results of a probabilistic seismic hazard analysis are presented as the annual probability of exceedance of a given strong motion parameter for a particular exposure time (Johnson and others, 1992).

For this report the probabilistic analysis computer program FRISKSP (Blake, 1998) was used to analyze the location of the site under the criteria for soil sites by Campbell (1997) in relation to seismogenic faults within a 62-mile (100km) radius of the site. This program assumes that significant earthquakes occur on mappable faults and that the occurrence rate of earthquakes on a fault is proportional to the estimated slip rate of that fault. Potential earthquake magnitudes are correlated to expected fault rupture areas and the resultant maximum ground acceleration at the site is computed. From the summation of the accelerations from all the potential sources, the total average annual expected number of occurrences of an acceleration greater than each of the values requested is calculated (Blake, 1998). The resultant graph of probability of exceedance vs. acceleration (Enclosure "E-1") indicates that a peak ground acceleration of 0.73g has a 10 percent probability of exceedance in 50 years. This corresponds to the Design Basis Earthquake as defined in the California Building Code (International Conference of Building Officials, 1995) and has a statistical return period of 475 years.

SEISMIC ZONE:

Figure 16A-2 presented in the 1998 California Building Code places all of western San Bernardino County, including the site, within Seismic Zone 4. Table 16-I of the 1997 Uniform Building Code assigns a Seismic Zone Factor "Z" of 0.40 to Seismic Zone 4.

SOIL PROFILE CHARACTERIZATION:

Based on review of SPT blow counts from the exploratory borings, the appropriate classification for this site is soil profile type S_D, stiff soil.

NEAR-SOURCE EFFECTS:

The seismic hazard to this site is dominated by the adjacent San Andreas and San Jacinto faults. Therefore, the site is subject to near-source effects of strong motion. For the purpose of near source effect evaluation, maps of near source zones in California including a classification table for the faults involved were prepared by the California Division of Mines and Geology (Petersen and others, 1998) to be used with the 1997 Uniform Building Code (International Conference of Building Officials, 1997). The San Andreas fault is classified as a type "A" fault and the San Jacinto fault is classified as a type "B" fault by the California Division of Mines and Geology (Petersen and others, 1998). The applicable near-source acceleration factor N_A, as defined in the 1997 Uniform Building Code, would be 1.00 and the near-source velocity factor N_V would be 1.20.

GROUNDWATER AND LIQUEFACTION

No free groundwater was encountered within any of our exploratory borings to the maximum depths attained (51.5 feet). No evidence of shallow groundwater was observed during our field investigation. The current depth to groundwater below the site is not known but is estimated to be approximately 350 feet based on recent data from State Well Nos. T2S/R1W 33L and T1S/R1W 32A01S (Western Municipal Water District, 1999). All of these wells are located less than 1 mile from the site. Surface water from nearby Noble Creek can periodically create temporary perched groundwater conditions. Due to the temporary nature of perched groundwater, the density of the underlying soils and other factors, liquefaction and other groundwater hazards are not anticipated.

FLOODING AND EROSION

No evidence of recent significant flooding of the site was observed during the geologic field reconnaissance or on the aerial photographs reviewed. However, there was minor flooding of the

western portion of the site at the time of this investigation. An evaluation of the flood potential of the site falls under the purview of others.

The upper soils encountered within the site consist of silty sands and poorly graded sands that are moderately susceptible to erosion by wind and water. Positive drainage should be provided and water should not be allowed to pond anywhere on the site. Water should not be allowed to flow over any graded or natural areas in such a way as to cause erosion.

CONCLUSIONS

On the basis of our field and laboratory investigations, it is the opinion of this firm that the proposed development is feasible from a soil engineering standpoint, provided the recommendations contained in this report are implemented during grading and construction.

The site does not lie within or immediately adjacent to an Alquist-Priolo Earthquake Fault Zone designated by the State of California to include traces of suspected active faulting. No active or potentially active faults are shown on or in the immediate vicinity of the site on published geologic maps. No evidence for active faulting on or immediately adjacent to the site was observed during the geologic field reconnaissance or on the aerial photographs reviewed.

Severe seismic shaking of the site can be expected during the lifetime of the proposed structures.

No evidence of significant slope failures was observed on the site. Surficial materials are highly susceptible to erosion, particularly when runoff is concentrated onto slopes.

The close proximity of Noble Creek can create a temporary perched groundwater table, but due to the density of the underlying soils and other factors, liquefaction is not anticipated.

No evidence of recent significant flooding of the site was observed during the geologic field reconnaissance or on the aerial photographs reviewed. Minor flooding did occur during this investigation. Recommendations for flood hazard mitigation fall under the purview of others.

Based upon our field investigation and test data, it is our opinion that the upper soils will not, in their present condition, provide uniform or adequate support for the proposed structures. Our density and SPT testing indicated variable in-situ conditions of the upper soils, ranging from loose to medium dense states. The younger alluvial soils in the lower planar area to a depth of approximately 5 feet exhibited significant potential for hydroconsolidation. These conditions may cause unacceptable differential and/or overall settlement upon application of the anticipated foundation loads.

Because of site conditions in the lower planar area, it is our recommendation that as a minimum, the upper 48 inches of the younger alluvial soils in the building pad areas and 24 inches of existing soil in other areas to be graded be removed with the bottom of the excavations scarified 12 inches and compacted prior to replacement of the excavated soils as properly compacted fill.

Within the upper plateau area, it is our recommendation that as a minimum, the upper 12 inches of the alluvial soils in the building pad areas and other areas to be graded be removed, the bottom of the excavation scarified, compacted and the excavated soils replaced as properly compacted fill.

To provide adequate support for the proposed structures, it is our recommendation that the building areas be further subexcavated as necessary and recompacted to provide a compacted fill mat beneath footings and slabs. A compacted fill mat will provide a dense, uniform, high-strength soil layer to distribute the foundation loads over the underlying soils. In addition, the removal of the upper existing alluvial soils and the construction of a compacted fill mat should ensure removal and recompaction or densification of loose and disturbed soils and allow for the removal of any roots that may remain. Conventional spread foundations, either individual spread footings and/or continuous wall footings, may be utilized in conjunction with a compacted fill mat.

All fill encountered during this investigation and any fill encountered during the grading operation, should be removed and replaced as properly compacted fill. The area upstream of the existing earthen dam contains relatively young unconsolidated sediments. All such soil should be considered undocumented man-made fill and treated as such.

Our preliminary slope stability calculations indicate that both the anticipated 2(h):1(v) cut and fill slopes should be grossly stable to heights up to 30 feet.

RECOMMENDATIONS

SEISMIC DESIGN CONSIDERATIONS:

Severe seismic shaking of the site can be expected during the lifetime of the proposed structures. Therefore, the proposed structures should be designed accordingly.

A soil profile type S_D, stiff soil, is appropriate for the site.

The site is subject to near-source acceleration and velocity factors (N_A and N_V) of 1.00 and 1.20, respectively, as defined in the 1997 Uniform Building Code.

GENERAL SITE GRADING:

It is imperative that no clearing and/or grading operations be performed without the presence of a representative of the soils engineer. An on-site pre-job meeting with the developer, the contractor and the soils engineer should occur prior to all grading related operations. Operations undertaken at the site without the soils engineer present may result in exclusions of affected areas from the final compaction report for the project.

Grading of the subject site should be performed, at a minimum, in accordance with these recommendations and with applicable portions of the Uniform Building Code. The following recommendations are presented for your assistance in establishing proper grading criteria.

INITIAL SITE PREPARATION:

All areas to be graded should be stripped of significant vegetation and other deleterious materials. These materials should be removed from the site for disposal.

Any existing pockets of fill or loose disturbed soils encountered during construction should be completely removed, cleaned of significant deleterious materials and may be reused as compacted fill. Any roots or other deleterious materials encountered at this time should be removed prior to replacing the soil.

In order to remediate the collapse potential of the younger alluvial soils in the lower planar area, it is our opinion that a mandatory removal of 48 and 24 inches below the existing ground surface in the building pad areas and areas to be graded, respectively, should be performed. A representative of the soils engineer should be present during the subexcavation operation prior to scarification and refilling in order to identify any potentially collapsible soils that may extend below that zone. All such soils should be removed at that time.

In the upper plateau area and adjacent hillsides, the depth of mandatory removal should be 12 inches for all areas to be graded.

Cavities created by removal of subsurface obstructions such as root stocks should be thoroughly cleaned of loose soil, organic matter and other deleterious materials, shaped to provide access for construction equipment, and backfilled as recommended for site fill.

PREPARATION OF FILL AREAS:

Prior to placing fill, after the mandatory subexcavation operation, the surfaces of all areas to receive fill should be scarified to a depth of approximately 12 inches. The scarified soils should be brought to at least 2 percent above optimum moisture content and recompacted to a relative compaction of at least 90 percent in accordance with ASTM D 1557-91.

PREPARATION OF FOOTING AREAS:

All footings should rest upon at least 12 inches of properly compacted fill material. In areas where the required thickness of compacted fill is not accomplished by the mandatory subexcavation operation and by site rough grading, the footing areas should be subexcavated to a depth of at least 12 inches below the proposed footing base grade, with the subexcavation extending at least 5 feet beyond the footing lines. The bottom of this excavation should then be scarified to a depth of at least 12 inches, brought to at least 2 percent above optimum moisture content, and recompacted to at least 90 percent relative compaction in accordance with ASTM D 1557-91 prior to refilling the excavation to grade as properly compacted fill. In areas where the thickness of fill to be placed exceeds 8 feet, the required relative composition should be at least 95 percent.

COMPACTED FILLS:

The on-site soils should provide adequate quality fill material provided they are free from roots, other organic matter and deleterious materials. Unless approved by the soils engineer, rock or similar irreducible material with a maximum dimension greater than 6 inches should not be buried or placed in fills.

Import fill, if required, should be inorganic, non-expansive granular soils free from rocks or lumps greater than 6 inches in maximum dimension. Sources for import fill should be observed and approved by the soils engineer prior to their use.

Fill should be spread in near-horizontal layers, approximately 8 inches in thickness. Thicker lifts may be approved by the soils engineer if testing indicates that the grading procedures are adequate to achieve the required compaction. Each lift shall be spread evenly, thoroughly mixed during spreading to attain uniformity of the material and moisture in each layer, brought to between optimum moisture content and 2 percent above, and compacted to a minimum relative compaction of 90 percent (95 percent if the thickness of fill to be placed exceeds 8 feet) in accordance with ASTM D 1557-91.

Based upon the relative compaction of the soils determined during this investigation and the relative compaction anticipated for compacted fill soils, we estimate a compaction shrinkage of approximately 10 to 15 percent in the lower planar area and 5 to 10 percent in the upper plateau area. Therefore, 1.10 cubic yards to 1.15 cubic yards of in-place soil material derived from the lower planar area and 1.05 cubic yards to 1.10 cubic yards of material derived from the upper plateau area would be necessary to yield one cubic yard of properly compacted fill material. In addition, we would anticipate subsidence of approximately 0.15 and 0.10 feet in the lower and upper areas, respectively. These values are exclusive of losses due to stripping, or the removal of other subsurface obstructions, if encountered, and may vary due to differing conditions within the project boundaries and the limitations of this investigation.

Values presented for shrinkage and subsidence are estimates only. Final grades should be adjusted, and/or contingency plans to import or export material should be made to accommodate possible variations in actual quantities during site grading.

SLOPE CONSTRUCTION:

Cut and fill slopes should be constructed no steeper than two horizontal to one vertical [2(h):1(v)] to a maximum height of 30 feet. Cut slopes should be constructed in accordance with current Uniform Building Code Requirements in regard to benching and drainage and should be constructed no steeper than 2(h):1(v). It is expected most slopes will expose relatively competent older alluvium material. The construction of cut slopes should be observed by the engineering geologist as to the expected performance of the exposed material at the planned height and inclination. Cut slopes higher than the above allowed limits should be evaluated and approved by the engineering geologist and geotechnical engineer prior to and during construction.

Fill slopes should be overfilled during construction and then cut back to expose fully compacted soil. A suitable alternative would be to compact the slopes during construction and then roll the final slopes to provide dense, erosion-resistant surfaces.

Where fills are to be placed against existing slopes steeper than 5(h):1(v) the existing slopes should be benched into competent native materials to provide a series of level benches to seat the fill and to remove the compressive and permeable topsoils. The benches should be a minimum of 8 feet in width, constructed at approximately 2 foot vertical intervals. In addition, a shear key should be a constructed across the toe of the slope. The shear key should be a minimum of 15 feet wide and should penetrate a minimum of 4 feet beneath the toe of the slope into firm competent soils (Appendix "D").

SLOPE PROTECTION:

Inasmuch as the native materials are susceptible to erosion by running water, it is our recommendation that the slopes at the project be planted as soon as possible after completion. The use of succulent ground covers, such as iceplant or sedum is not recommended. If watering is necessary to sustain plant growth on slopes, then the watering operation should be monitored to assure proper operation of the water system and to prevent overwatering.

Surficial materials are highly susceptible to erosion. Therefore, measures should be provided to prevent surface water from flowing over slope faces.

EXPANSIVE SOILS:

Since the materials tested during this investigation exhibited a "low" potential for expansion in accordance with UBC Standard Test Method 18-2, specialized construction procedures, such as the inclusion of steel reinforcement in footings and slabs and the moisture-treatment of the slab subgrade soils, will be necessary (See Appendix "D"). The clay bearing soils were encountered in the upper plateau area. As a result of mixing with more granular material during the grading operation the expansion potential of the clay bearing soils may be reduced. As such, the expansion potential should be evaluated on a lot by lot basis during and immediately following the grading operation.

FOUNDATION DESIGN:

If the site is prepared as recommended, the proposed structures may be safely founded on conventional spread foundations, either individual spread footings and/or continuous wall footings, bearing on a minimum of 12 inches of compacted fill. Footings should be a minimum of 12 inches wide and should be established at a minimum depth of 12 inches below lowest adjacent final subgrade level. For the minimum width and depth, footings may be designed for a maximum safe soil bearing pressure of 1,600 pounds per square foot for dead plus live loads. This allowable bearing pressure may be increased by 400 pounds per square foot for each additional foot of width and by 900 pounds per square foot for each additional foot of depth to a maximum safe soil bearing pressure of 3,000 pounds per square foot for dead plus live loads. These bearing values may be increased by one-third for wind or seismic loading.

For footings thus designed and constructed, we would anticipate a maximum settlement of less than 1/2 inch. Differential settlement between similarly loaded adjacent footings is expected to be approximately half the total settlement.

Clay-bearing older alluvial soils on the site have a "low" potential for expansion. If such soils are utilized within the upper 36 inches of the building pad, it will be necessary to design the foundation to resist the effects of expansion (See Appendix "D"),

LATERAL LOADING:

Resistance to lateral loads will be provided by passive earth pressure and base friction. For footings bearing against compacted fill, passive earth pressure may be considered to be developed at a rate of 400 pounds per square foot per foot of depth. Base friction may be computed at 0.42 times the normal load. Base friction and passive earth pressure may be combined without reduction.

For preliminary retaining wall design purposes, a lateral active earth pressure developed at a rate of 40 pounds per square foot per foot of depth should be utilized for unrestrained conditions. This

value should be verified prior to construction when the backfill materials and conditions have been determined and is applicable only to level, properly drained backfill with no additional surcharge loadings. If inclined backfills are proposed, this firm should be contacted to develop appropriate active earth pressure parameters.

Foundation concrete should be placed in neat excavations with vertical sides, or the concrete should be formed and the excavations properly backfilled as recommended for site fill.

SLABS-ON-GRADE:

To provide adequate support, concrete slabs-on-grade should bear on a minimum of 12 inches of compacted soil. The soil should be compacted to 90 percent relative compaction. The final pad surfaces should be rolled to provide smooth, dense surfaces upon which to place the concrete.

Clay-bearing older alluvial soils on the site have a "low" potential for expansion. If such soils are utilized within the upper 36 inches of the building pad, it will be necessary to design the concrete slab to resist the effects of expansion (See Appendix "D"),

Slabs to receive moisture-sensitive coverings should be provided with a moisture vapor barrier. This barrier may consist of an impermeable membrane. Two inches of sand over the membrane will reduce punctures and aid in obtaining a satisfactory concrete cure. The sand should be moistened just prior to placing of concrete.

POTENTIAL EROSION:

The potential for erosion should be mitigated by proper drainage design. Water should not be allowed to flow over graded areas or natural areas so as to cause erosion. Graded areas should be planted or otherwise protected from erosion by wind or water. Some system should be employed to prevent water from flowing over the street to the north and eroding into the slope.

CONSTRUCTION OBSERVATION:

All grading operations, including site clearing and stripping, should be observed by a representative of the soils engineer. The presence of the soils engineer's field representative will be for the purpose of providing observation and field testing, and will not include any supervising or directing of the actual work of the contractor, his employees or agents. Neither the presence of the soils engineer's field representative nor the observations and testing by the soils engineer shall excuse the contractor in any way for defects discovered in his work. It is understood that the soils engineer will not be responsible for job or site safety on this project, which will be the sole responsibility of the contractor.

LIMITATIONS

C.H.J., Incorporated has striven to perform our services within the limits prescribed by our client, and in a manner consistent with the usual thoroughness and competence of reputable soils engineers and engineering geologists practicing under similar circumstances. No other representation, express or implied, and no warranty or guarantee is included or intended by virtue of the services performed or reports, opinion, documents, or otherwise supplied.

This report reflects the testing conducted on the site as the site existed during the investigation, which is the subject of this report. However, changes in the conditions of a property can occur with the passage of time, due to natural processes or the works of man on this or adjacent properties. Changes in applicable or appropriate standards may also occur whether as a result of legislation, application, or the broadening of knowledge. Therefore, this report is indicative of only those conditions tested at the time of the subject investigation, and the findings of this report may be invalidated fully or partially by changes outside of the control of C.H.J., Incorporated. This report is therefore subject to review and should not be relied upon after a period of one year.

The conclusions and recommendations in this report are based upon observations performed and data collected at separate locations, and interpolation between these locations, carried out for the project and the scope of services described. It is assumed and expected that the conditions between

locations observed and/or sampled are similar to those encountered at the individual locations where observation and sampling was performed. However, conditions between these locations may vary significantly. Should conditions be encountered in the field, by the client or any firm performing services for the client or the client's assign, that appear different than those described herein, this firm should be contacted immediately in order that we might evaluate their effect.

If this report or portions thereof are provided to contractors or included in specifications, it should be understood by all parties that they are provided for information only and should be used as such.

The report and its contents resulting from this investigation are not intended or represented to be suitable for reuse on extensions or modifications of the project, or for use on any other project.

CLOSURE

We appreciate this opportunity to be of service and trust this report provides the information desired at this time. Should questions arise, please do not hesitate to contact this office.

Respectfully submitted,
C.H.J., INCORPORATED

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Senior Staff Engineer

Terrance A. Davis
Staff Geologist

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Senior Vice President

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ROBERT J. JOHNSON
No. 443
EXPIRATION DATE
3-31-01
GEOTECHNICAL
STATE OF CALIFORNIA

BW/TAD/JJM/RJJ:sp/jm

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AERIAL PHOTOGRAPHS REVIEWED

Riverside County Flood Control and Water Conservation District, May 24, 1974, Black and white aerial photograph numbers 177 and 178.

Riverside County Flood Control and Water Conservation District, February 1, 1980, Black and white aerial photograph numbers 180 and 181.

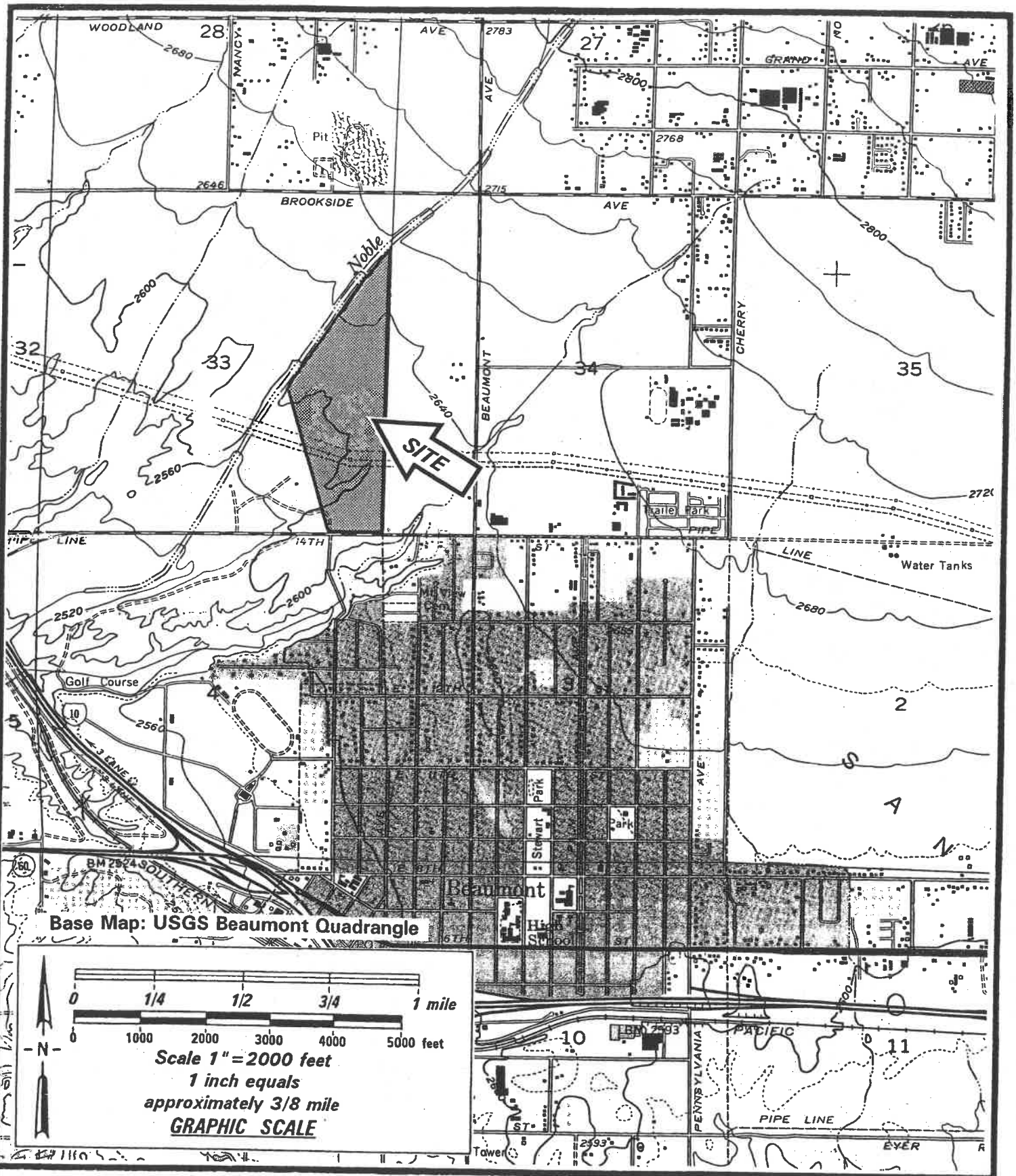
Riverside County Flood Control and Water Conservation District, February 1, 1984, Black and white aerial photograph numbers 1540 and 1541.

Riverside County Flood Control and Water Conservation District, February 22, 1990, Black and white aerial photograph numbers 4-39 and 4-40.

Riverside County Flood Control and Water Conservation District, January 28, 1995, Black and white aerial photograph numbers 4-38 and 4-39.

APPENDIX "A"

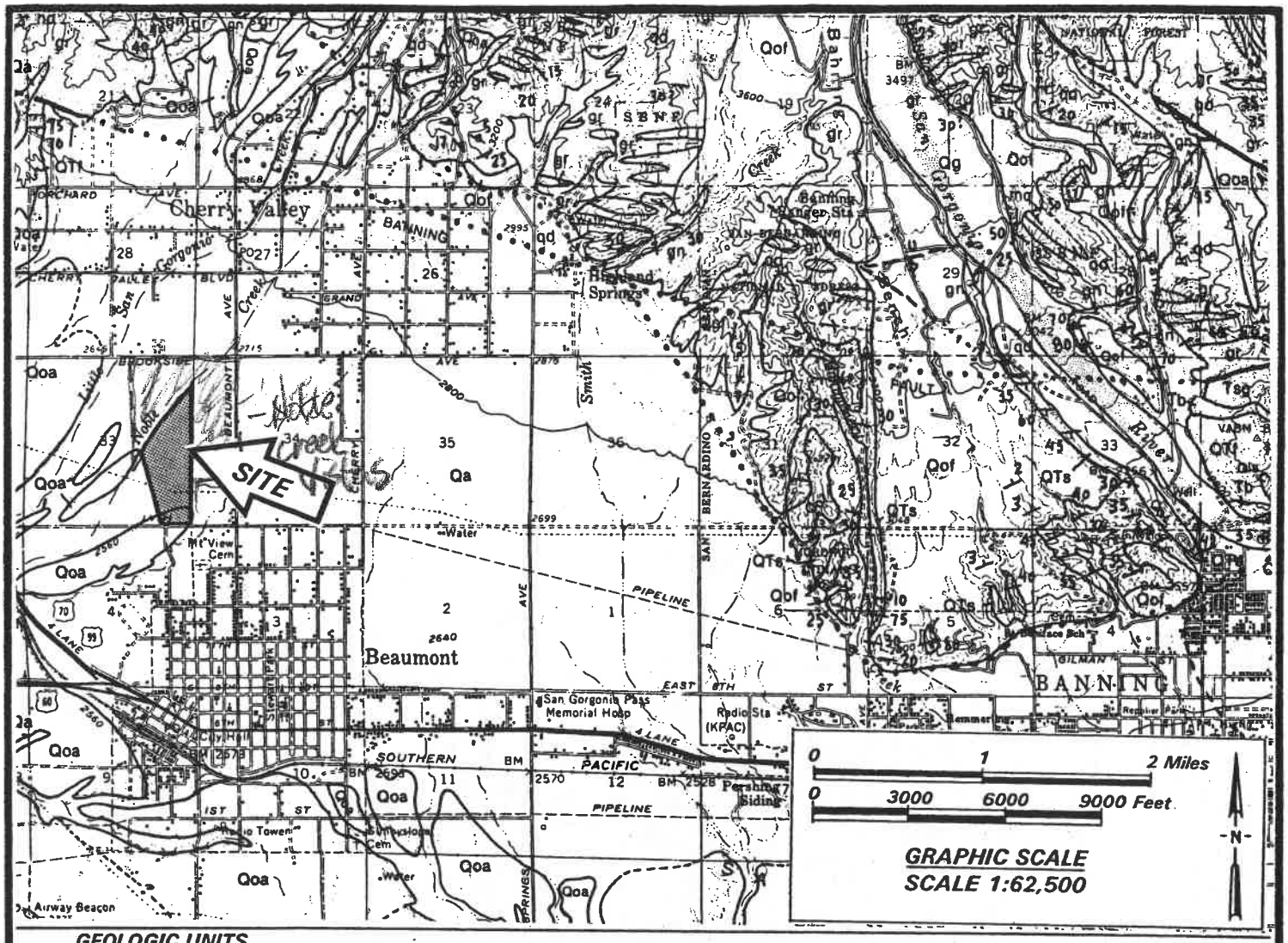
GEOTECHNICAL MAPS



INDEX MAP

FOR: NOBEL CREEK MEADOWS LLC	TRACT NO. 29267 BEAUMONT, CALIFORNIA	ENCLOSURE "A-1"
DATE: JULY 1999		JOB NUMBER 99510-3

C·H·J· INCORPORATED



GEOLOGIC UNITS

QTs Upper terrestrial sedimentary deposits
San Timoteo (?) Form. Of Fraser, 1931

gr Granitic rocks
(granite to quartz monzonite)

gd Dioritic rocks
(biotite-rich diorite to gabbro)

gn Gneissic rocks
(gneiss and gneissoid quartz diorite)

gqd Granitic rocks
granodiorite to quartz diorite (locally faintly gneissoid and with few xenoliths)

Base Map by: T.W. Dibblee Jr. (1982)

Qa Surficial deposits
alluvium (sand and gravel)

Qoa Older surficial deposits
alluvial sand and gravels

Qof Older surficial deposits
alluvial fan gravels

Contact dashed where gradational or approximately located

Fault dashed where inferred; dotted where concealed

30 Inclined — Strike and dip of strata

Inclined — Strike and dip of foliation

GEOLOGIC INDEX MAP

FOR: NOBEL CREEK MEADOWS LLC

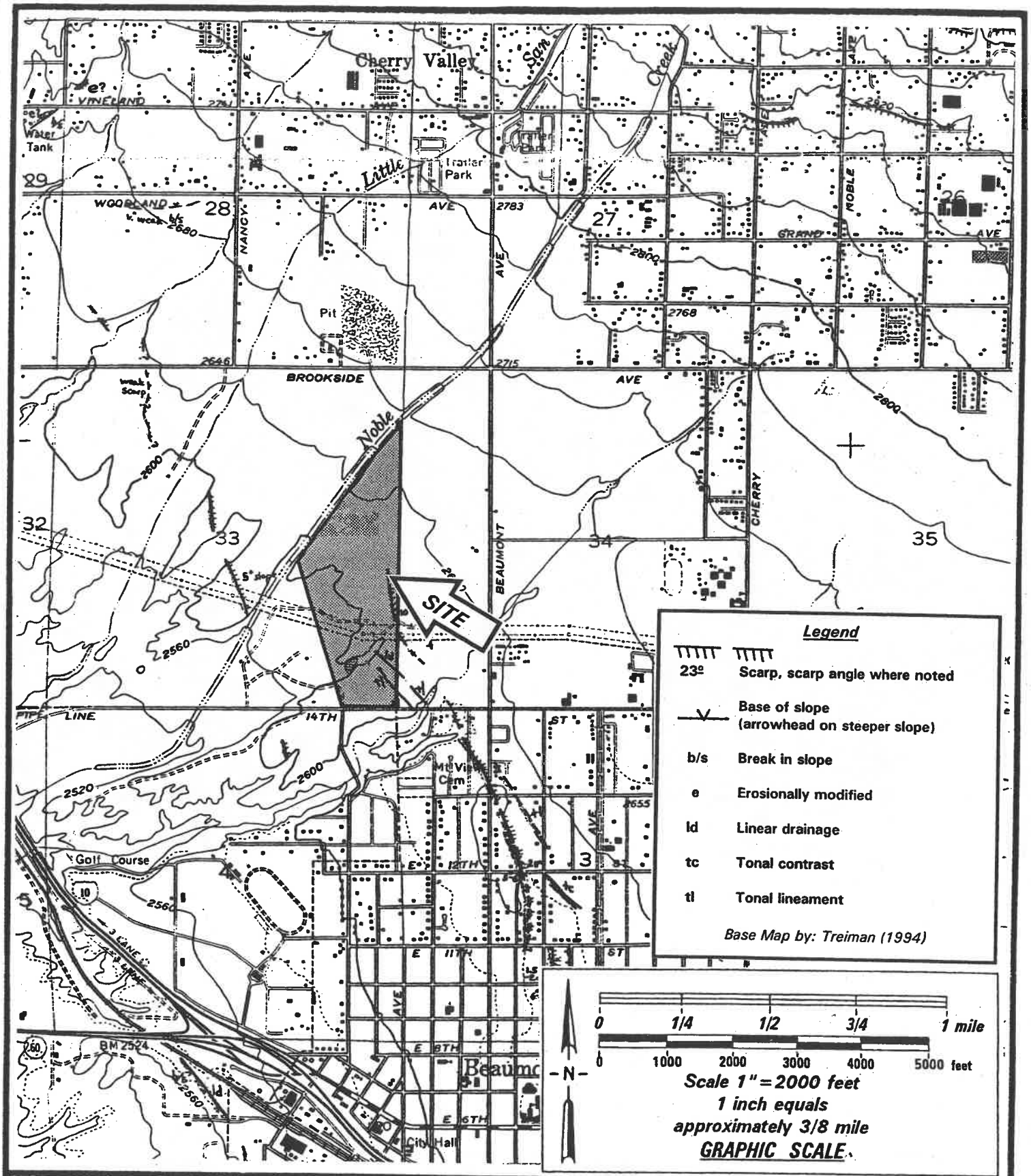
TRACT NO. 29267
BEAUMONT, CALIFORNIA

ENCLOSURE "A-3"

DATE AUGUST 1999

JOB NUMBER 99510-3

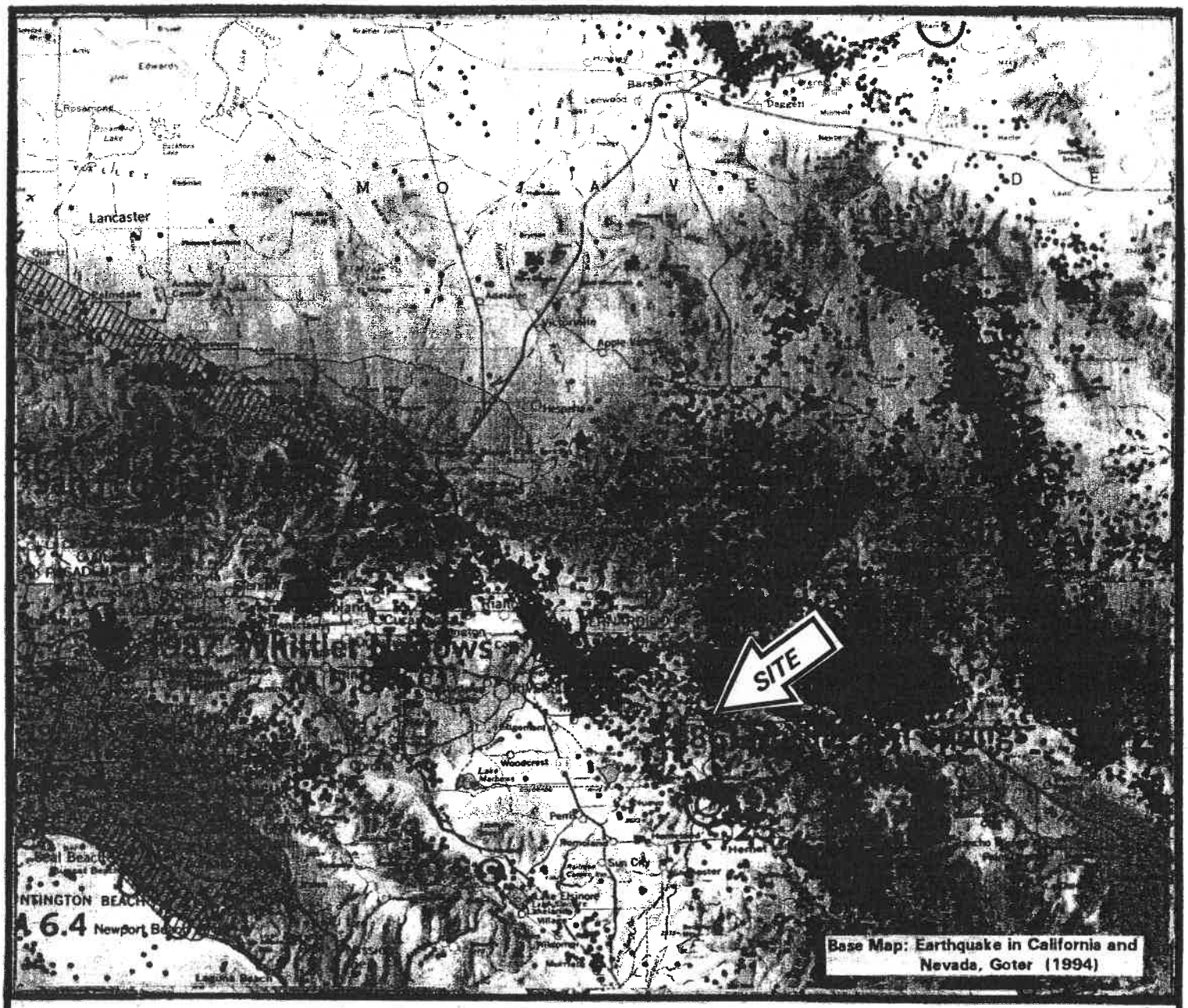
C·M·J· INCORPORATED



FAULT MAP

FOR: NOBEL CREEK MEADOWS LLC	TRACT NO. 29267 BEAUMONT, CALIFORNIA	ENCLOSURE "A-4"
DATE: AUGUST 1999		JOB NUMBER 99510-3

C·M·J· INCORPORATED



Magnitude			Earthquakes
<5.5	5.5-6.4	≥6.5	Date
	○	◯	1 January 1836 — 31 January 1994
•			1 January 1980 — 31 January 1994

Rupture Zones

Vertical, strike/slip faults

Dipping faults

Note: rupture zone patterns are angled so that areas of overlap can be portrayed clearly. The pattern angles do not denote any characteristic.

10 0 10 20 30 40 50 Miles

10 0 10 20 30 40 50 Kilometers

Lambert Conformal Conic Projection
Scale: 1:1,000,000
1 inch equals approximately 16 miles
1 centimeter equals 10 kilometers

EARTHQUAKE EPICENTER MAP

FOR: **NOBEL CREEK MEADOWS LLC**

DATE: **AUGUST 1999**

TRACT NO. 29267
BEAUMONT, CALIFORNIA

ENCLOSURE **"A-5"**

JOB NUMBER **99510-3**

C·M·J· INCORPORATED

APPENDIX "B"

EXPLORATORY LOGS

KEY TO LOGS

SAMPLE TYPE:

Ring	Indicates Undisturbed Ring Sample. Undisturbed Ring Samples are obtained with a C.H.J. Sampler (3.00" O.D. and 2.42" I.D.) driven with a 140 pound weight falling 30 inches. The blows per foot are converted to equivalent SPT values.
SPT	Indicates Standard Penetration Test. The SPT N-value is the number of blows required to drive an SPT sampler 12 inches using a 140 pound weight falling 30 inches. The SPT sampler is 2" O.D. and 1-3/8" I.D.
MDC	Maximum Density Optimum Moisture Determination (ASTM D 1557)
DS	Direct Shear Test (ASTM D 3080)
SS	Soluble Sulfate (CA-DOT 417)
N.R.	Indicates No Recovery of Sample
Consol	Consolidation Test (ASTM D 2435)

ENGINEERING PROPERTIES FROM SPT BLOWS

Relationship of Penetration Resistance to Relative Density for Cohesionless Soils*
(After Mitchell and Katti, 1981)

No. of SPT Blows (N_{60})	Descriptive Relative Density	Approximate Relative Density (%)
<4	Very Loose	0-15
4-10	Loose	15-35
10-30	Medium Dense	35-65
30-50	Dense	65-85
>50	Very Dense	85-100

* At an effective overburden pressure of 1 ton per square foot (100 Kpa)

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			GRAPH SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS — MORE THAN 50% OF MATERIAL IS LARGER THAN NO 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS — MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SAND AND SANDY SOILS — MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	CLEAN SAND (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND-SILT MIXTURES
				SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE GRAINED SOILS — MORE THAN 50% OF MATERIAL IS SMALLER THAN NO 200 SIEVE SIZE	SILTS AND CLAYS — LIQUID LIMIT LESS THAN 50			ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS — LIQUID LIMIT GREATER THAN 50			MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

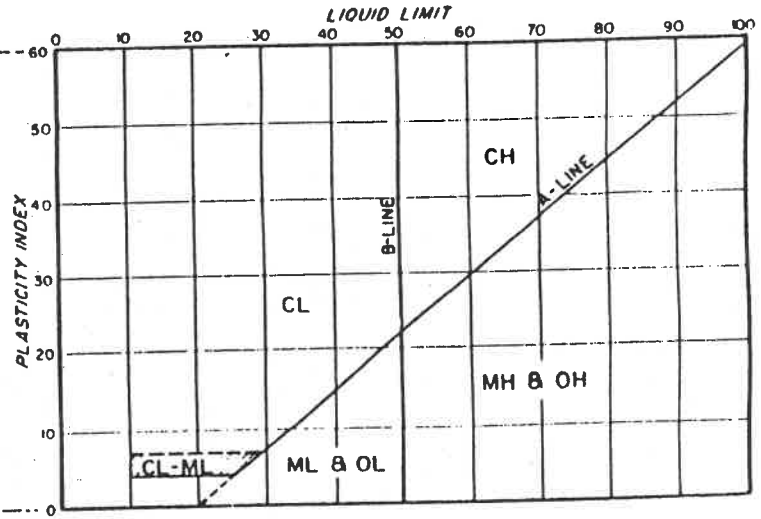
FOR LABORATORY CLASSIFICATION OF FINE-GRAINED SOILS

GRADATION CHART

MATERIAL SIZE	PARTICLE SIZE			
	LOWER LIMIT		UPPER LIMIT	
	MILLIMETERS	SIEVE SIZE	MILLIMETERS	SIEVE SIZE
SAND				
FINE	.074	#200‡	0.42	#40‡
MEDIUM	0.42	#40 ‡	2.00	#10 ‡
COARSE	2.00	#10 ‡	4.76	#4 ‡
GRAVEL				
FINE	4.76	#4 ‡	19.1	3/4"●
COARSE	19.1	3/4"●	76.2	3"●
COBBLES	76.2	3"	304.8	12"
BOULDERS	304.8	12	914.4	36"

‡US STANDARD ● CLEAR SQUARE OPENINGS

PLASTICITY CHART



UNIFIED SOIL CLASSIFICATION SYSTEM

C·M·J· INCORPORATED

Enclosure "B" (2of2)
Job No. 99510-3

LOG OF BORING 1

Date Drilled: 7/12/99 | Client: Nobel Creek Meadows, LLC

Equipment: CME 55 Drill Rig | Driving Weight / Drop: 140 lb/30 in

Surface Elevation(ft): N/A | Logged by: T.D. | Measured Depth to Water(ft): N/A

DEPTH (ft)	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
	(SM) Silty Sand, fine with gravel to 1", brown	Qya		▩		3.2		
			☒		10	1.9	106	Ring
	(SP-SM) Sand, fine with silt and gravel to 1", light brown			▩		2.0		
5			☒		7	2.3	108	Ring
	(SP) Sand, fine with medium, light brown			▩		1.5		
10			☒		22	2.7	116	Ring
	(SP-SM) Sand, fine with silt, light brown			▩		7.1		
15			☒		13	10.6	112	Ring
20			☒	▩	28	6.8 2.7	107	Ring
	(SP) Sand, fine with medium, coarse and gravel to 2", light brown							
25			☒		72	3.0	123	Ring
30			☒		35	3.7		SPT

BOREHOLE_LOG 99510-3.GPJ CHJ.GDT 8/3/99

C·H·J

TRACT NO. 29267
BEAUMONT, CALIFORNIA

Job No. 99510-3

Enclosure B-1a

LOG OF BORING 1

Date Drilled: 7/12/99

Client: Nobel Creek Meadows, LLC

Equipment: CME 55 Drill Rig

Driving Weight / Drop: 140 lb/30 in

Surface Elevation(ft): N/A

Logged by: T.D.

Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SP) Sand, fine with medium, coarse and gravel to 2", light brown		X		76	3.1		SPT
40				X		49	2.9		SPT
45				X		58	3.6		SPT
50				X		85	2.9		SPT
		END OF BORING							
55									
60		NO BEDROCK NO REFUSAL NO FILL NO FREE GROUNDWATER							
65									

BOREHOLE_LOG 99510-3.GPJ CHJ.GDT 8/3/99

C·H·J

TRACT NO. 29267
BEAUMONT, CALIFORNIA

Job No. 99510-3

Enclosure B-1b

LOG OF BORING 2

Date Drilled: 7/12/99

Client: Nobel Creek Meadows, LLC

Equipment: CME 55 Drill Rig

Driving Weight / Drop: 140 lb/30 in

Surface Elevation(ft): N/A

Logged by: T.D.

Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		(SP-SM) Sand, fine with silt, light brown	Qya						
				X	▨	10	1.5 2.3	112	Ring
5					▨		2.0		
		(SP) Sand, fine to coarse with gravel to 2", light brown		X		20	2.0	115	Ring
10									
				X		26	2.4	114	Ring
15									
				X		48	3.1	125	Ring
20									
				X		22	3.6	113	Ring
25									
				X		22	5.2	118	Ring
30									
				X		90	6.4		SPT

BOREHOLE_LOG 99510-3.GPJ CHJ.GDT 8/3/99

C•H•J•

TRACT NO. 29267
BEAUMONT, CALIFORNIA

Job No. 99510-3

Enclosure B-2a

LOG OF BORING 2

Date Drilled: 7/12/99

Client: Nobel Creek Meadows, LLC

Equipment: CME 55 Drill Rig

Driving Weight / Drop: 140 lb/30 in

Surface Elevation(ft): N/A

Logged by: T.D.

Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SP) Sand, fine to coarse with gravel to 2", light brown		☒		56	2.0		SPT
40				☒		66	3.1		SPT
45				☒		61	2.5		SPT
50		END OF BORING							
55									
60		NO BEDROCK NO REFUSAL NO FILL NO FREE GROUNDWATER							
65									

BOREHOLE_LOG 99510-3.GPJ CHJ.GDT 8/3/99

C·H·J·

TRACT NO. 29267
BEAUMONT, CALIFORNIA

Job No. 99510-3

Enclosure B-2b

LOG OF BORING 3

Date Drilled: 7/12/99 | Client: Nobel Creek Meadows, LLC

Equipment: CME 55 Drill Rig | Driving Weight / Drop: 140 lb/30 in

Surface Elevation(ft): N/A | Logged by: T.D. | Measured Depth to Water(ft): N/A

DEPTH (ft)	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
	(SP-SM) Sand, fine with silt, light brown	Qya				1.8		MDC, DS
					7	--	N.R.	Ring
	(SP) Sand, fine with medium and coarse, light brown					3.2		
5					14	1.5	126	Ring
10					20	5.3	120	Ring
15					25	3.7	119	Ring
20					33	2.4	121	Ring
	(SP-SM) Sand, fine with medium and silt, light brown					6.8		
25					17	7.6	102	Ring
	(SP) Sand, fine with medium, coarse and gravel to 2", light brown					2.7		
30					58	8.2	118	Ring
	END OF BORING NO BEDROCK, NO REFUSAL, NO FILL NO FREE GROUNDWATER							

BOREHOLE_LOG 99510-3.GPJ CHJ.GDT 8/3/99

C·H·J

TRACT NO. 29267
BEAUMONT, CALIFORNIA

Job No. 99510-3

Enclosure B-3

LOG OF BORING 4

Date Drilled: 7/12/99

Client: Nobel Creek Meadows, LLC

Equipment: CME 55 Drill Rig

Driving Weight / Drop: 140 lb/30 in

Surface Elevation(ft): N/A

Logged by: T.D.

Measured Depth to Water(ft): N/A

DEPTH (ft)	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
	(SP-SM) Sand, fine with silt and gravel to 2", light brown	Qya				9.1		
					10	2.5	108	Ring
5					7	3.2	111	Ring
10					8	12.6	111	Ring, Consol
15	(SP) Sand, fine with medium, coarse and gravel to 1", light brown					2.3		
					31	8.4	118	Ring
20					41	7.3	116	Ring
25	(SP-SM) Sand, fine with silt, light brown					7.1		
					20	16.3	112	Ring
30	END OF BORING NO BEDROCK NO REFUSAL NO FILL NO FREE GROUNDWATER							

BOREHOLE_LOG 99510-3.GPJ CHJ.GDT 8/3/99

C•M•J•

TRACT NO. 29267
BEAUMONT, CALIFORNIA

Job No. 99510-3

Enclosure B-4

LOG OF BORING 3

Date Drilled: 7/12/99

Client: Nobel Creek Meadows, LLC

Equipment: CME 55 Drill Rig

Driving Weight / Drop: 140 lb/30 in

Surface Elevation(ft): N/A

Logged by: T.D.

Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SP-SM) Sand, fine with silt, light brown	Qya				1.8		MDC, DS
						7	--	N.R.	Ring
		(SP) Sand, fine with medium and coarse, light brown					3.2		
5						14	1.5	126	Ring
10						20	5.3	120	Ring
15						25	3.7	119	Ring
20						33	2.4	121	Ring
		(SP-SM) Sand, fine with medium and silt, light brown					6.8		
25						17	7.6	102	Ring
		(SP) Sand, fine with medium, coarse and gravel to 2", light brown					2.7		
30						58	8.2	118	Ring
		END OF BORING NO BEDROCK, NO REFUSAL, NO FILL NO FREE GROUNDWATER							

BOREHOLE_LOG 99510-3.GPJ CHJ.GDT 8/3/99

C·M·J·

TRACT NO. 29267
BEAUMONT, CALIFORNIA

Job No. 99510-3

Enclosure B-3

LOG OF BORING 4

Date Drilled: 7/12/99

Client: Nobel Creek Meadows, LLC

Equipment: CME 55 Drill Rig

Driving Weight / Drop: 140 lb/30 in

Surface Elevation(ft): N/A

Logged by: T.D.

Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		(SP-SM) Sand, fine with silt and gravel to 2", light brown	Qya				9.1		
				X		10	2.5	108	Ring
5				X		7	3.2	111	Ring
10				X		8	12.6	111	Ring, Consol
15		(SP) Sand, fine with medium, coarse and gravel to 1", light brown					2.3		
				X		31	8.4	118	Ring
20				X		41	7.3	116	Ring
		(SP-SM) Sand, fine with silt, light brown					7.1		
25				X		20	16.3	112	Ring
30		END OF BORING NO BEDROCK NO REFUSAL NO FILL NO FREE GROUNDWATER							

BOREHOLE_LOG 99510-3.GPJ CHJ.GDT 8/3/99

C·H·J

TRACT NO. 29267
BEAUMONT, CALIFORNIA

Job No. 99510-3

Enclosure B-4

LOG OF BORING 5

Date Drilled: 7/12/99 | Client: Nobel Creek Meadows, LLC

Equipment: CME 55 Drill Rig | Driving Weight / Drop: 140 lb/30 in

Surface Elevation(ft): N/A | Logged by: T.D. | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SP-SM) Sand, fine with silt and gravel to 1", light brown	Qya				2.3		
				X		11	1.8	112	Ring
5				X		10	1.9	113	Ring
		(SP) Sand, fine with medium, coarse and gravel to 1", light brown					3.7		
10				X		14	4.7	120	Ring
15				X		28	2.8	111	Ring
20				X		33	2.9	112	Ring
		END OF BORING							
25									
30		NO BEDROCK NO REFUSAL NO FILL NO FREE GROUNDWATER							

BOREHOLE_LOG 99510-3.GPJ CHJ.GDT 8/3/99

C·M·J

TRACT NO. 29267
BEAUMONT, CALIFORNIA

Job No. 99510-3

Enclosure B-5

LOG OF BORING 6

Date Drilled: 7/12/99

Client: Nobel Creek Meadows, LLC

Equipment: CME 55 Drill Rig

Driving Weight / Drop: 140 lb/30 in

Surface Elevation(ft): N/A

Logged by: T.D.

Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		(SP-SM) Sand, fine with silt, light brown	Qya				2.3		
				X		6	2.0	115	Ring
5				X		10	7.1	109	Ring, Consol
							4.8		
10		(SP) Sand, fine with medium, coarse and gravel to 2", light brown		X		26	3.3	119	Ring
15				X		18	3.2	113	Ring
20		END OF BORING							
25									
30		NO BEDROCK NO REFUSAL NO FILL NO FREE GROUNDWATER							

BOREHOLE_LOG 99510-3.GPJ CHJ.GDT 8/3/99

C·M·J·

TRACT NO. 29267
BEAUMONT, CALIFORNIA

Job No. 99510-3

Enclosure B-6

LOG OF BORING 7

Date Drilled: 7/12/99

Client: Nobel Creek Meadows, LLC

Equipment: CME 55 Drill Rig

Driving Weight / Drop: 140 lb/30 in

Surface Elevation(ft): N/A

Logged by: T.D.

Measured Depth to Water(ft): N/A

DEPTH (ft)	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
	(SP-SM) Sand, fine with silt, light brown	Qya				3.7		
			X		9	3.2	99	Ring, Consol
5			X		10	3.5	105	Ring, Consol
	(SP) Sand, fine with medium, coarse and gravel to 2", light brown					2.7		
10			X		26	2.0	118	Ring
15			X		21	3.5	116	Ring
20			X		21	4.7	115	Ring
	END OF BORING							
25								
30	NO BEDROCK NO REFUSAL NO FILL NO FREE GROUNDWATER							

BOREHOLE_LOG 99510-3.GPJ CHJ.GDT 8/3/99

C·M·J·

TRACT NO. 29267
BEAUMONT, CALIFORNIA

Job No. 99510-3

Enclosure B-7

LOG OF BORING 8

Date Drilled: 7/12/99

Client: Nobel Creek Meadows, LLC

Equipment: CME 55 Drill Rig

Driving Weight / Drop: 140 lb/30 in

Surface Elevation(ft): N/A

Logged by: T.D.

Measured Depth to Water(ft): N/A

DEPTH (ft)	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
	(SP-SM) Sand, fine with medium, coarse and silt, light brown	Qya				2.7		
			X		9	1.8	112	Ring
						1.8		
5	(SP) Sand, fine with medium, coarse and gravel to 2", light brown							
			X		18	2.2	115	Ring
10								
			X		19	2.9	115	Ring
15								
			X		32	2.7	118	Ring
20	END OF BORING							
25								
30	NO BEDROCK NO REFUSAL NO FILL NO FREE GROUNDWATER							

BOREHOLE_LOG 99510-3.GPJ CHJ.GDT 8/3/99

C·H·J·

TRACT NO. 29267
BEAUMONT, CALIFORNIA

Job No. 99510-3

Enclosure B-8

LOG OF BORING 9

Date Drilled: 7/13/99 | Client: Nobel Creek Meadows, LLC

Equipment: CME 55 Drill Rig | Driving Weight / Drop: 140 lb/30 in

Surface Elevation(ft): N/A | Logged by: T.D. | Measured Depth to Water(ft): N/A

DEPTH (ft)	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
	(SP-SM) Sand, fine with medium, coarse, silt and gravel to 1", brown	Qya				4.8		
	(SP) Sand, fine to coarse with gravel to 1", light brown		X		16	1.9 2.5	120	Ring
5			X		14	2.3	111	Ring
10			X		24	2.9	119	Ring
15			X		34	2.8	117	Ring
20			X		46	3.1	117	Ring
25			X		38	3.4	112	Ring
30			X		34	2.7		SPT

BOREHOLE_LOG 99510-3.GPJ CHJ.GDT 8/3/99

C·H·J·

TRACT NO. 29267
BEAUMONT, CALIFORNIA

Job No. 99510-3

Enclosure B-9a

LOG OF BORING 9

Date Drilled: 7/13/99

Client: Nobel Creek Meadows, LLC

Equipment: CME 55 Drill Rig

Driving Weight / Drop: 140 lb/30 in

Surface Elevation(ft): N/A

Logged by: T.D.

Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SP) Sand, fine to coarse with gravel to 1", light brown		☒		65	2.3		SPT
40				☒		51	3.2		SPT
45				☒		76	2.9		SPT
50				☒		42	2.9		SPT
		END OF BORING							
55									
60		NO BEDROCK NO REFUSAL NO FILL NO FREE GROUNDWATER							
65									

BOREHOLE_LOG 99510-3.GPJ CHJ.GDT 8/3/99

C·H·J·

TRACT NO. 29267
BEAUMONT, CALIFORNIA

Job No. 99510-3

Enclosure B-9b

LOG OF BORING 10

Date Drilled: 7/13/99

Client: Nobel Creek Meadows, LLC

Equipment: CME 55 Drill Rig

Driving Weight / Drop: 140 lb/30 in

Surface Elevation(ft): N/A

Logged by: T.D.

Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SP-SM) Sand, fine with silt, light brown	Qya				3.7		
				X		6	2.4	106	Ring
5				X		10	2.7	109	Ring
10							2.3		
		(SP) Sand, fine to coarse with gravel to 1", light brown		X		40/6"	N.R.	N.R.	Ring
15				X		28	2.9	120	Ring
20				X		38	2.9	111	Ring
25				X		36	3.3	119	Ring
30				X		57	2.5		SPT

BOREHOLE_LOG 99510-3.GPJ CHJ.GDT 8/3/99

C·H·J

TRACT NO. 29267
BEAUMONT, CALIFORNIA

Job No. 99510-3

Enclosure B-10a

LOG OF BORING 10

Date Drilled: 7/13/99

Client: Nobel Creek Meadows, LLC

Equipment: CME 55 Drill Rig

Driving Weight / Drop: 140 lb/30 in

Surface Elevation(ft): N/A

Logged by: T.D.

Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SP-SM) Sand, fine with medium, coarse and silt, light brown					-		
				X		18	9.4		SPT
40									
		(SP) Sand, fine to coarse with gravel to 1", light brown					2.9		
				X		62/6"	--		SPT
45		(SP-SM) Sand, fine with medium and silt, light brown					--		
				X		38	6.3		SPT
50		END OF BORING							
55									
60		NO BEDROCK NO REFUSAL NO FILL NO FREE GROUNDWATER							
65									

BOREHOLE_LOG 99510-3.GPJ CHJ.GDT 8/3/99

C·H·J·

TRACT NO. 29267
BEAUMONT, CALIFORNIA

Job No. 99510-3

Enclosure B-10b

LOG OF BORING 11

Date Drilled: 7/13/99

Client: Nobel Creek Meadows, LLC

Equipment: CME 55 Drill Rig

Driving Weight / Drop: 140 lb/30 in

Surface Elevation(ft): N/A

Logged by: T.D.

Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SP-SM) Sand, fine with silt, light brown	Qya				2.7		
				X		9	2.3	104	Ring
5				X		14	3.4	111	Ring, Consol
10				X		19	2.2	112	Ring
		(SP) Sand, fine to coarse with gravel to 2", light brown					2.3		
15				X		28	2.6	109	Ring
20				X		18	4.0	124	Ring
25				X		50	2.6	119	Ring
30				X		50	3.2	116	Ring
		END OF BORING NO BEDROCK, NO REFUSAL, NO FILL NO FREE GROUNDWATER							

BOREHOLE_LOG 99510-3.GPJ CHJ.GDT 8/3/99

C·M·J

TRACT NO. 29267
BEAUMONT, CALIFORNIA

Job No. 99510-3

Enclosure B-11

LOG OF BORING 12

Date Drilled: 7/13/99

Client: Nobel Creek Meadows, LLC

Equipment: CME 55 Drill Rig

Driving Weight / Drop: 140 lb/30 in

Surface Elevation(ft): N/A

Logged by: T.D.

Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		(SP-SM) Sand, fine to coarse with silt and gravel to 2", light brown	Qya				5.8		
				X		10	4.6	111	Ring
5				X		17	6.3	117	Ring
10				X		14	8.5	113	Ring, Consol
							3.2		
15		(SP) Sand, fine to coarse with gravel to 2", light brown		X		33	2.9	120	Ring
20				X		50	2.5	121	Ring
25				X		48	2.4	118	Ring
30		END OF BORING NO BEDROCK NO REFUSAL NO FILL NO FREE GROUNDWATER							

BOREHOLE_LOG 99510-3.GPJ CHJ.GDT 8/3/99

C·H·J·

TRACT NO. 29267
BEAUMONT, CALIFORNIA

Job No. 99510-3

Enclosure B-12

LOG OF BORING 13

Date Drilled: 7/13/99

Client: Nobel Creek Meadows, LLC

Equipment: CME 55 Drill Rig

Driving Weight / Drop: 140 lb/30 in

Surface Elevation(ft): N/A

Logged by: T.D.

Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SP-SM) Sand, fine with silt, light brown	Qya				2.0		
						13	1.9	117	Ring
5						16	3.2	115	Ring
10						9	12.8	111	Ring
15						26	9.8	116	Ring
		(SP) Sand, fine to coarse with gravel to 1", light brown					4.1		
20						38	3.3	119	Ring
		END OF BORING							
25									
30		NO BEDROCK NO REFUSAL NO FILL NO FREE GROUNDWATER							

BOREHOLE_LOG 99510-3.GPJ CHJ.GDT 8/3/99

C·M·J

TRACT NO. 29267
BEAUMONT, CALIFORNIA

Job No. 99510-3

Enclosure B-13

LOG OF BORING 14

Date Drilled: 7/13/99

Client: Nobel Creek Meadows, LLC

Equipment: CME 55 Drill Rig

Driving Weight / Drop: 140 lb/30 in

Surface Elevation(ft): N/A

Logged by: T.D.

Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
0		(SP-SM) Sand, fine with silt, light brown	Qya				4.6		
				X		6	2.1	108	Ring
5							4.8		
		(SP) Sand, fine to coarse with gravel to 2", light brown		X		24	1.7	124	Ring
10									
				X		22	2.7	113	Ring
15									
				X		42	2.5	118	Ring
20		END OF BORING							
25									
30		NO BEDROCK NO REFUSAL NO FILL NO FREE GROUNDWATER							

BOREHOLE_LOG 99510-3.GPJ CHJ.GDT 8/3/99

C·H·J·

TRACT NO. 29267
BEAUMONT, CALIFORNIA

Job No. 99510-3

Enclosure B-14

LOG OF BORING 15

Date Drilled: 7/13/99

Client: Nobel Creek Meadows, LLC

Equipment: CME 55 Drill Rig

Driving Weight / Drop: 140 lb/30 in

Surface Elevation(ft): N/A

Logged by: T.D.

Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SP-SM) Sand, fine with silt, light brown	Qya				4.4		
				X		7	2.9	100	Ring
5				X		7	4.6	105	Ring
		(SP) Sand, fine with medium, coarse and gravel to 2", light brown					2.3		
10				X		7	3.9	114	Ring
15				X		18	2.5	111	Ring
20				X		12	6.3	108	Ring
		END OF BORING							
25									
30		NO BEDROCK NO REFUSAL NO FILL NO FREE GROUNDWATER							

BOREHOLE_LOG 99510-3.GPJ CHJ.GDT 8/3/99

C·M·J·

TRACT NO. 29267
BEAUMONT, CALIFORNIA

Job No. 99510-3

Enclosure B-15

LOG OF BORING 16

Date Drilled: 7/13/99

Client: Nobel Creek Meadows, LLC

Equipment: CME 55 Drill Rig

Driving Weight / Drop: 140 lb/30 in

Surface Elevation(ft): N/A

Logged by: T.D.

Measured Depth to Water(ft): N/A

DEPTH (ft)	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
	(SM) Silty Sand, fine with clay, red brown	Qoa						SS, EXP
					57/11"	4.8	113	Ring
5								
					73/11"	3.5	116	Ring
10								
	(SP) Sand, fine with medium and gravel to 1", light brown				46	4.1	116	Ring
15								
					28	4.5	115	Ring
20	END OF BORING							
25								
	NO BEDROCK NO REFUSAL NO FILL NO FREE GROUNDWATER							
30								

BOREHOLE_LOG 99510-3.GPJ CHJ.GDT 8/3/99

C•H•J

TRACT NO. 29267
BEAUMONT, CALIFORNIA

Job No. 99510-3

Enclosure B-16

LOG OF BORING 17

Date Drilled: 7/13/99

Client: Nobel Creek Meadows, LLC

Equipment: CME 55 Drill Rig

Driving Weight / Drop: 140 lb/30 in

Surface Elevation(ft): N/A

Logged by: T.D.

Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SM) Silty Sand, fine, red brown	Qoa				7.1		MDC, DS, SS
				X		19	6.6	103	Ring
5				X		29	12.1	111	Ring
		(SP-SM) Sand, fine with silt and gravel to 1", light brown					11.3		
10				X		18	5.5	114	Ring
15				X		32	3.0	114	Ring
		(SP) Sand, fine with medium, coarse and gravel to 2", light brown					2.9		
20				X		45	4.6	110	Ring
25				X		37	7.7	115	Ring
		(SP-SM) Sand, fine to coarse with silt, light brown					7.1		
30				X		34	N.R.		Ring
		END OF BORING NO BEDROCK, NO REFUSAL, NO FILL NO FREE GROUNDWATER							

BOREHOLE_LOG 99510-3.GPJ CHJ.GDT 8/3/99

C·M·J·

TRACT NO. 29267
BEAUMONT, CALIFORNIA

Job No. 99510-3

Enclosure B-17

LOG OF BORING 18

Date Drilled: 7/13/99

Client: Nobel Creek Meadows, LLC

Equipment: CME 55 Drill Rig

Driving Weight / Drop: 140 lb/30 in

Surface Elevation(ft): N/A

Logged by: T.D.

Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SM) Silty Sand, fine, red brown	Qoa				6.6		
				X		25	6.3	108	Ring
5				X		45	7.3	122	Ring
10		(ML) Sandy Silt, fine, brown					8.9		
				X		20	7.4	106	Ring
15				X		22	4.3	119	Ring
		(SP) Sand, fine with medium, coarse and gravel to 2", light brown					3.0		
20				X		53	2.6	110	Ring
25				X		56	3.4	116	Ring
30				X		88	4.7		SPT

BOREHOLE_LOG 99510-3.GPJ CHJ.GDT 8/3/99

C·H·J·

TRACT NO. 29267
BEAUMONT, CALIFORNIA

Job No. 99510-3

Enclosure B-18a

LOG OF BORING 18

Date Drilled: 7/13/99 | Client: Nobel Creek Meadows, LLC

Equipment: CME 55 Drill Rig | Driving Weight / Drop: 140 lb/30 in

Surface Elevation(ft): N/A | Logged by: T.D. | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SP) Sand, fine with medium, coarse and gravel to 2", light brown					3.7		
		(SP-SM) Sand, fine with medium and silt, light brown							
				X		20	11.3		SPT
40									
				X		18	12.4		SPT
45									
				X		19	13.5		SPT
50		END OF BORING							
55									
60		NO BEDROCK NO REFUSAL NO FILL NO FREE GROUNDWATER							
65									

BOREHOLE_LOG 99510-3.GPJ CHJ.GDT 8/3/99

C·H·J

TRACT NO. 29267
BEAUMONT, CALIFORNIA

Job No. 99510-3

Enclosure B-18b

LOG OF BORING 19

Date Drilled: 7/13/99

Client: Nobel Creek Meadows, LLC

Equipment: CME 55 Drill Rig

Driving Weight / Drop: 140 lb/30 in

Surface Elevation(ft): N/A

Logged by: T.D.

Measured Depth to Water(ft): N/A

DEPTH (ft)	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
	(SM) Silty Sand, fine, red brown	Qoa				7.8		
					29	8.5	117	Ring
5					30	12.0	111	Ring
	(SP-SM) Sand, fine with silt, light brown					18.3		
10					12	16.6	100	Ring
15					32	7.5	116	Ring
	(ML) Silt with fine sand and clay, red brown					8.8		
	(SP) Sand, fine with medium, coarse and gravel to 2", light brown					4.1		
20					27	5.4	103	Ring
25					29	9.7	107	Ring
30					50	3.3	110	Ring

BOREHOLE_LOG 99510-3.GPJ CHJ.GDT 8/3/99

C·H·J·

TRACT NO. 29267
BEAUMONT, CALIFORNIA

Job No. 99510-3

Enclosure B-19a

LOG OF BORING 19

Date Drilled: 7/13/99

Client: Nobel Creek Meadows, LLC

Equipment: CME 55 Drill Rig

Driving Weight / Drop: 140 lb/30 in

Surface Elevation(ft): N/A

Logged by: T.D.

Measured Depth to Water(ft): N/A

DEPTH (ft)	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
	(SP) Sand, fine with medium, coarse and gravel to 2", light brown		X		52	3.6		SPT
	(SP-SM) Sand, fine with silt, light brown			X		4.1		
40			X		31	11.1		SPT
45			X		32	8.9		SPT
50			X		29	7.0		SPT
	END OF BORING							
55								
60	NO BEDROCK NO REFUSAL NO FILL NO FREE GROUNDWATER							
65								

BOREHOLE_LOG 99510-3.GPJ CHJ.GDT 8/3/99

C·H·J·

TRACT NO. 29267
BEAUMONT, CALIFORNIA

Job No. 99510-3

Enclosure B-19b

LOG OF BORING 20

Date Drilled: 7/14/99

Client: Nobel Creek Meadows, LLC

Equipment: CME 55 Drill Rig

Driving Weight / Drop: 140 lb/30 in

Surface Elevation(ft): N/A

Logged by: T.D.

Measured Depth to Water(ft): N/A

DEPTH (ft)	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
	(SP-SM) Sand, fine with medium, coarse, gravel to 2" and silt, light brown	Fill				3.2		
					57/11"	6.2	116	Ring
5	(SP-SM) Sand, fine with silt, dark brown	Fill						
	(SP-SM) Sand, fine with silt, light brown	Fill				5.3		
					73/11"	9.4	110	Ring
10					46	7.2	106	Ring
15	(SP) Sand, fine to medium, light brown	Fill				6.6		
					28	6.5	106	Ring
	(SP) Sand, fine with medium and coarse, light brown	Native (Qoa)						
20					46	7.8	107	Ring
25								
					28	3.5	107	Ring
30	END OF BORING NO BEDROCK NO REFUSAL FILL TO 19.0' NO FREE GROUNDWATER							

BOREHOLE_LOG 99510-3.GPJ CHJ.GDT 8/3/99

C·H·J·

TRACT NO. 29267
BEAUMONT, CALIFORNIA

Job No. 99510-3

Enclosure B-20

APPENDIX "C"

LABORATORY TESTING

C·H·J·

Enclosure "C-1"
Job No. 99510-3

TEST DATA SUMMARY

OPTIMUM MOISTURE - MAXIMUM DENSITY RELATION:

ASTM D 1557-91

Boring/ Depth	Classification	Optimum Moisture (Percent)	Maximum Dry Density (PCF)
3/0.0	Sand, fine with silt, light brown (SP-SM)	8.5	129.0
17/0.0	Silty Sand, fine, red brown (SM)	9.5	129.0

DIRECT SHEAR TEST: Remolded to 90% Relative Compaction: (Saturated)

ASTM D 3080

Boring	Depth of Sample (Ft.)	Angle of Internal Friction (^{0})	Apparent Cohesion (PSF)
3	surface	34	-0-
17	surface	32	-0-

C·M·J·

Enclosure "C-2"
Job No. 99510-3

TEST DATA SUMMARY

EXPANSION INDEX :

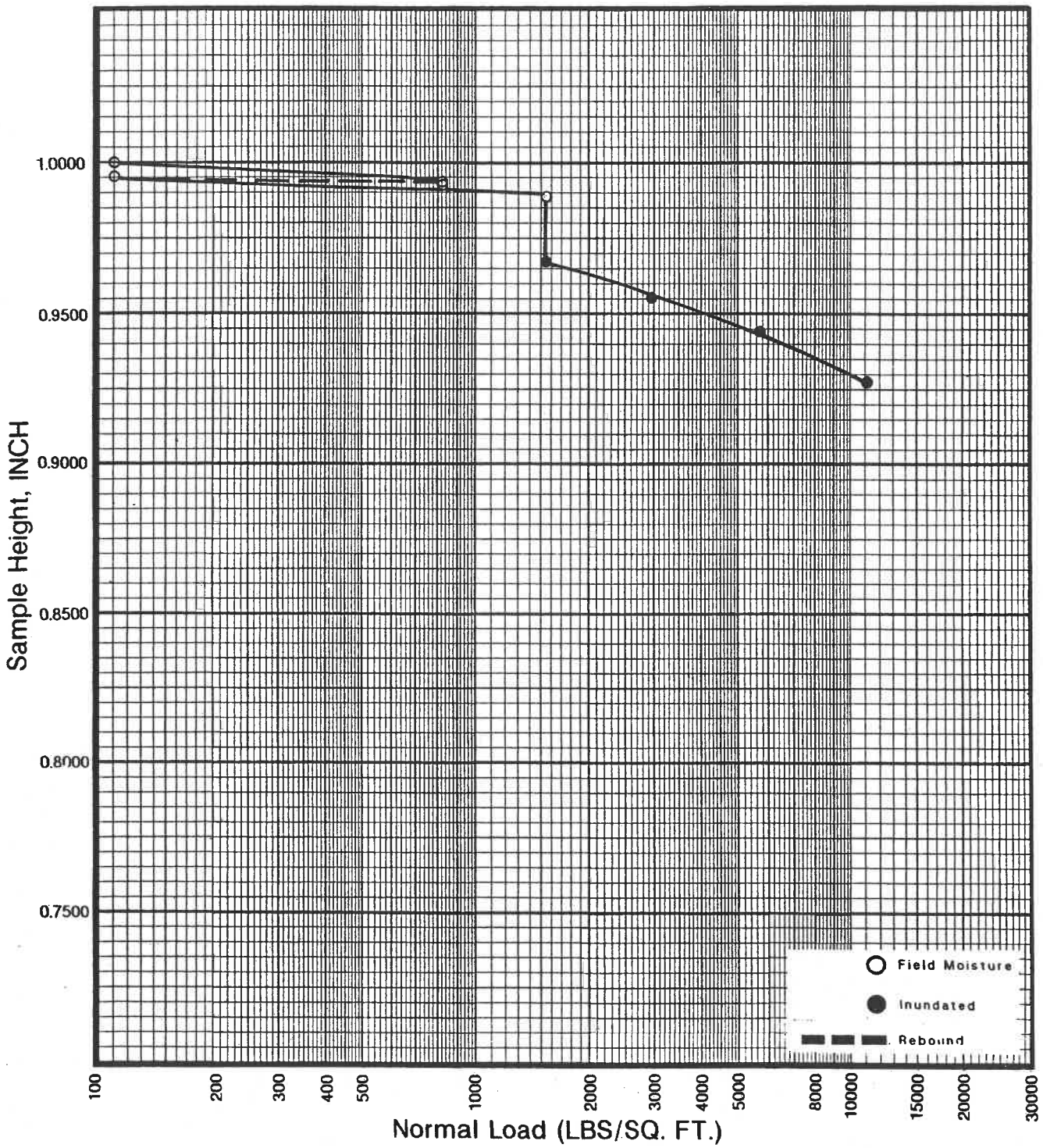
UBC Standard Test Method 18-2

Boring No./ Depth (Ft.)	Initial Moisture (%)	Final Moisture (%)	Degree of Saturation (%)	Expansion Index	Expansion Potential
16/0.0	11.0	18.6	50.5	34	"low"

SOLUBLE SULFATES: EPA METHOD 9038

Boring	Depth (Ft.)	Level	Exposure*
17A	0.0	N.D.[1]	"negligible"
16A	0.0	N.D.[1]	"negligible"

[1] Analysis reported as N.D. were not present above the 0.01 level of detection.



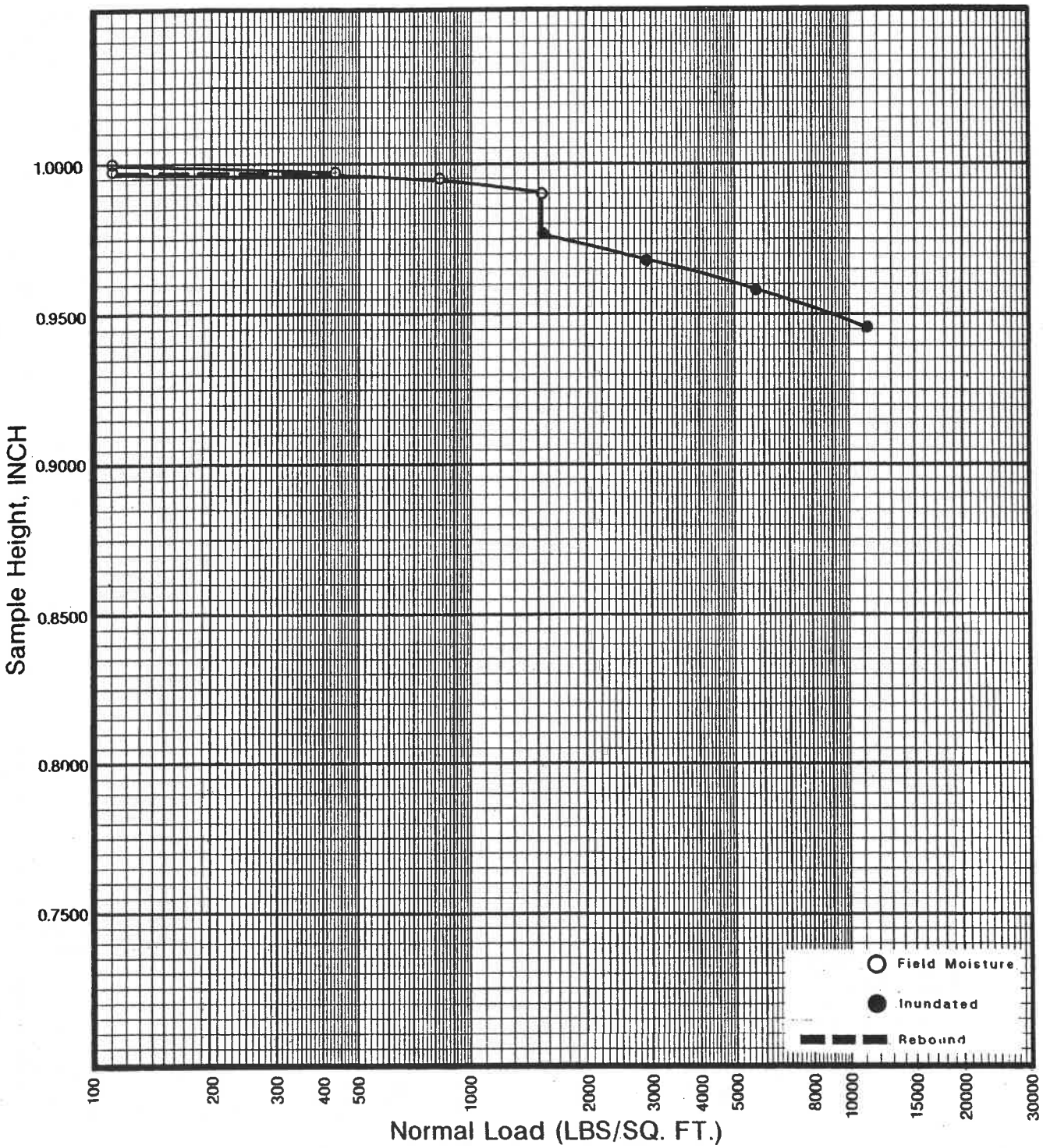
BORING NO.: **4** DEPTH: **12.5 ft.**

MOISTURE CONTENT: **12.6%** DRY DENSITY: **111 pcf.**

CONSOLIDATION TEST DATA (CONSOL.)

FOR: **NOBEL CREEK MEADOWS, LLC**	**TENTATIVE TRACT NO. 29267 RIVERSIDE COUNTY, CALIFORNIA**	ENCLOSURE **"C-3"**
DATE: **AUGUST 1999**		JOB NUMBER **99510-3**

C·H·J· INCORPORATED



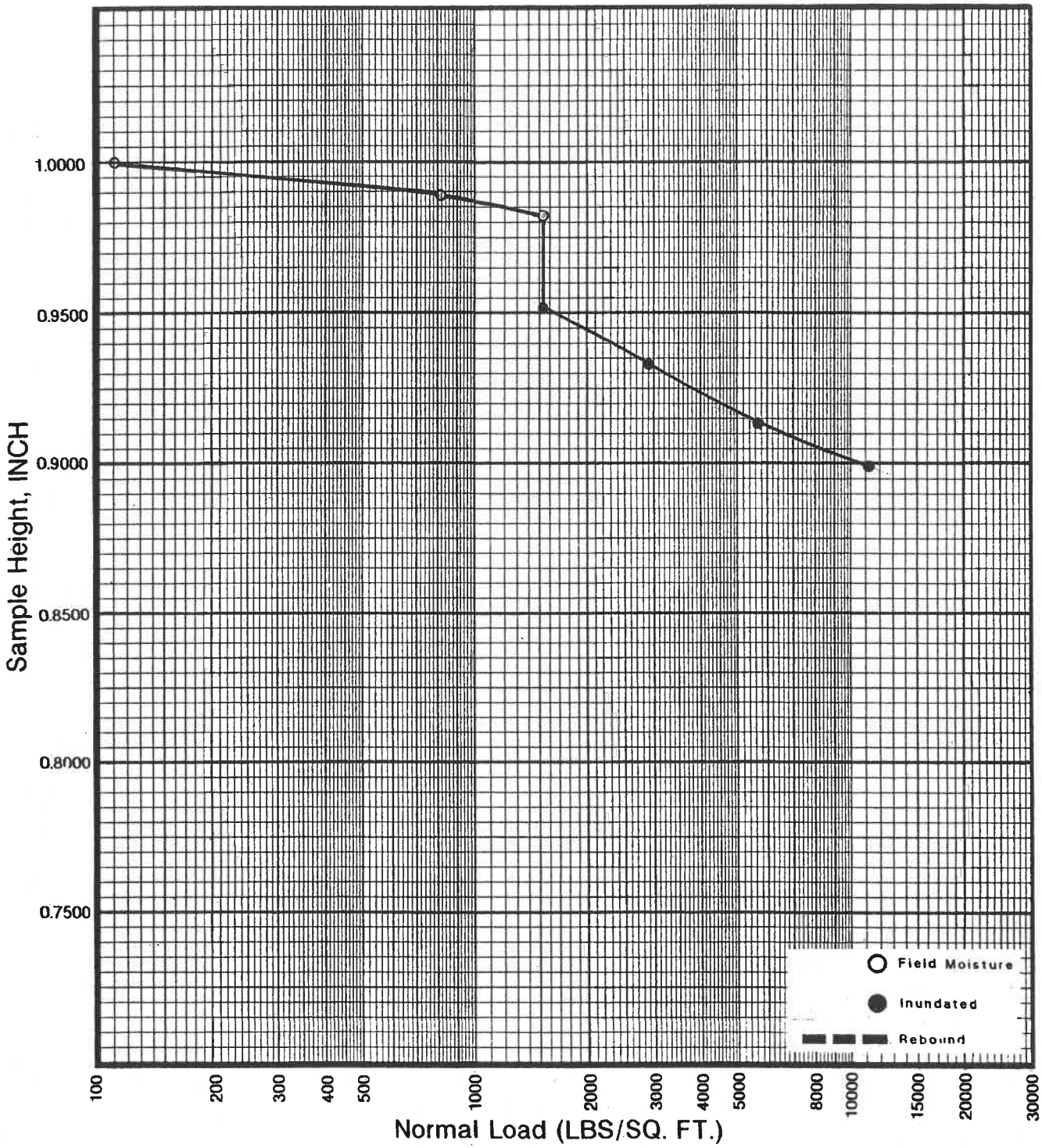
BORING NO.: **6** DEPTH: **7.5ft.**

MOISTURE CONTENT: **7.1%** DRY DENSITY: **109 pcf.**

CONSOLIDATION TEST DATA (CONSOL.)

FOR: **NOBEL CREEK MEADOWS, LLC**	**TENTATIVE TRACT NO. 29267 RIVERSIDE COUNTY, CALIFORNIA**	ENCLOSURE **"C-4"**
DATE: **AUGUST 1999**		JOB NUMBER **99510-3**

C·M·J· INCORPORATED



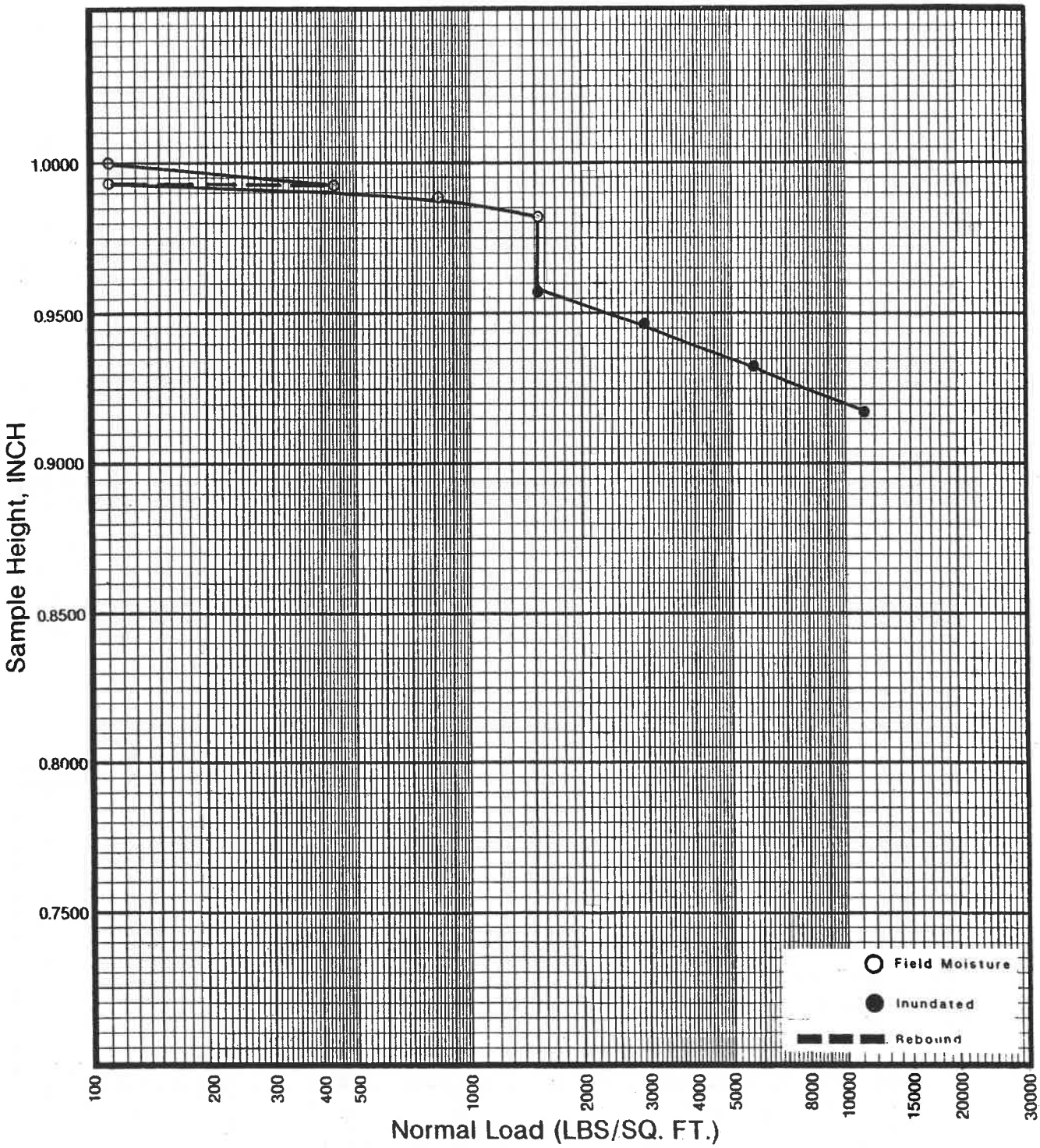
BORING NO.: **7** DEPTH: **1.5ft.**

MOISTURE CONTENT: **3.2%** DRY DENSITY: **99 pcf.**

CONSOLIDATION TEST DATA (CONSOL.)

FOR: **NOBEL CREEK MEADOWS, LLC**	**TENTATIVE TRACT NO. 29267 RIVERSIDE COUNTY, CALIFORNIA**	ENCLOSURE **"C-5"**
DATE: **AUGUST 1999**		JOB NUMBER **99510-3**

C·H·J· INCORPORATED



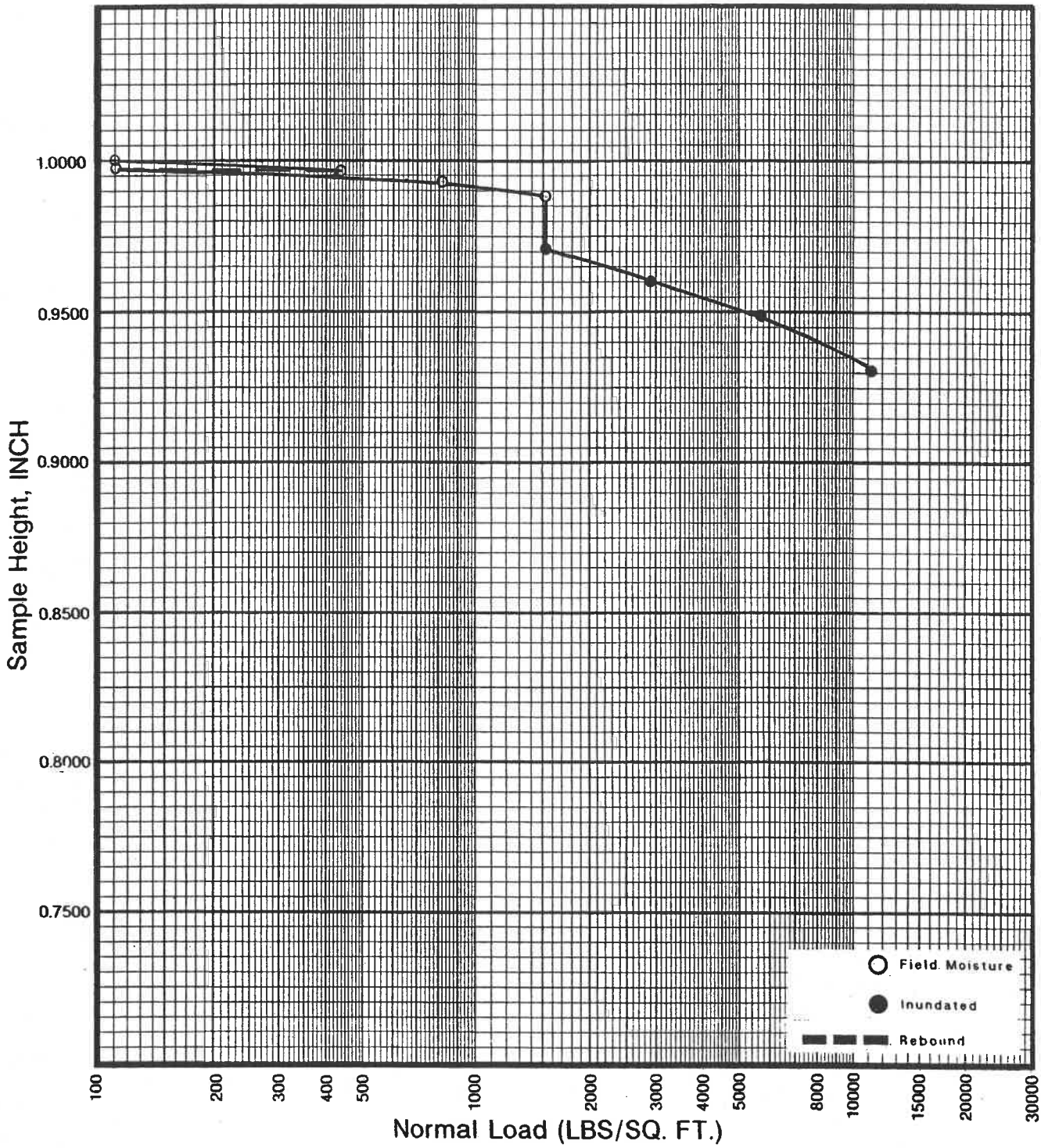
BORING NO.: **7** DEPTH: **5.5 ft.**

MOISTURE CONTENT: **3.5%** DRY DENSITY: **105 pcf.**

CONSOLIDATION TEST DATA (CONSOL.)

FOR: **NOBEL CREEK MEADOWS, LLC**	**TENTATIVE TRACT NO. 29267 RIVERSIDE COUNTY, CALIFORNIA**	ENCLOSURE **"C-6"**
DATE: **AUGUST 1999**		JOB NUMBER **99510-3**

C·M·J· INCORPORATED



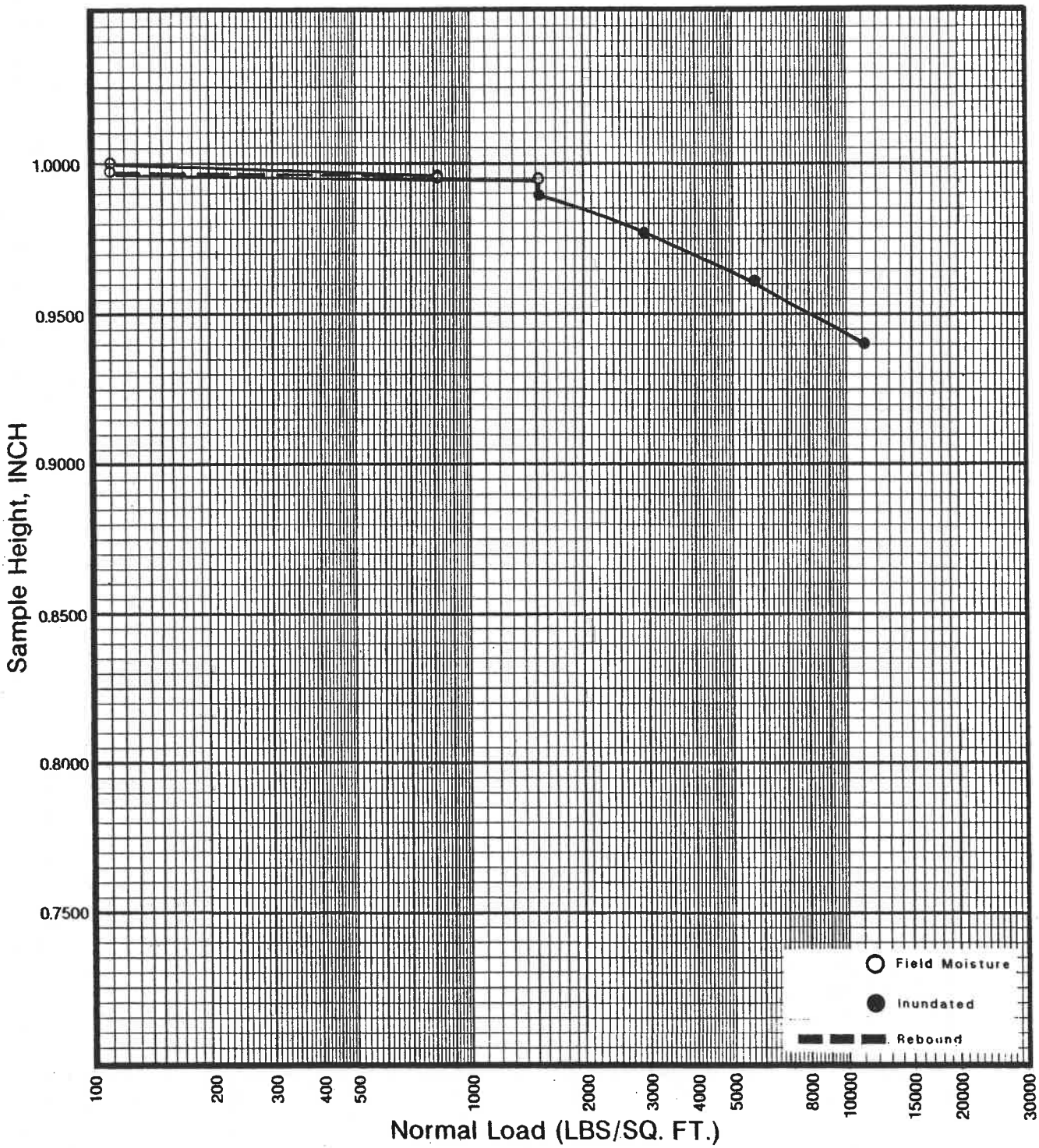
BORING NO.: **11** DEPTH: **5.5 ft.**

MOISTURE CONTENT: **3.4%** DRY DENSITY: **111 pcf.**

CONSOLIDATION TEST DATA (CONSOL.)

FOR: **NOBEL CREEK MEADOWS, LLC**	**TENTATIVE TRACT NO. 29267 RIVERSIDE COUNTY, CALIFORNIA**	ENCLOSURE **"C-7"**
DATE: **AUGUST 1999**		JOB NUMBER **99510-3**

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BORING NO.: **12** DEPTH: **12.5 ft.**

MOISTURE CONTENT: **8.5%** DRY DENSITY: **113 pcf.**

CONSOLIDATION TEST DATA (CONSOL.)

FOR: **NOBEL CREEK MEADOWS, LLC**	**TENTATIVE TRACT NO. 29267 RIVERSIDE COUNTY, CALIFORNIA**	ENCLOSURE **"C-8"**
DATE: **AUGUST 1999**		JOB NUMBER **99510-3**

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APPENDIX "D"

GEOTECHNICAL DETAILS

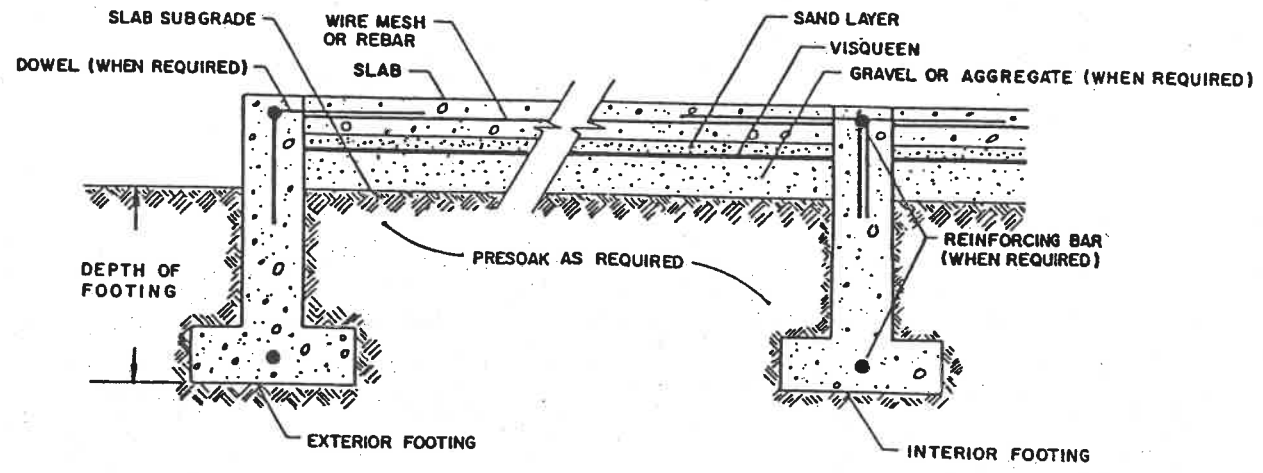
FOUNDATION AND SLAB RECOMMENDATIONS FOR EXPANSIVE SOILS
(Residential Buildings)

	Expansion Index 0 - 20 Very Low Expansion	Expansion Index 21 - 50 Low Expansion	Expansion Index 51 - 90 Medium Expansion	Expansion Index 91 - 130 High Expansion
Footings - 1 & 2 Story	See Soils Report	All Footings minimum 12 inches deep. 1 No. 4 bar continuous top and bottom.	All Footings minimum 18 inches deep. 1 No. 4 bar continuous top and bottom.	All Footings minimum 24 inches deep. 1 No. 5 bar continuous top and bottom.
Garage Door Grade Beam	See Soils Report	12 inches deep, minimum. 1 No. 4 bar continuous top and bottom.	18 inches deep, minimum. 1 No. 4 bar continuous top and bottom.	24 inches deep, minimum. 1 No. 4 bar continuous top and bottom.
Living Area Floor Slabs	See Soils Report	4 inches thick (nominal). 6X6-10/10 wire mesh at mid-height. 6 mil visqueen moisture barrier plus 1 inch sand over barrier.	4 inches thick (nominal). 6X6-10/10 wire mesh or #3 bars at 24 inches each way at mid-height. 4 inches gravel or aggregate base. 6 mil visqueen moisture barrier plus 1 inch sand over barrier.	4 inches thick (nominal). 6X6-6/6 wire mesh or #3 bars at 24 inches each way at mid-height. No. 3 dowels from footing to slab at 36 inches on center. 4 inches gravel or aggregate base. 6 mil visqueen moisture barrier plus 1 inch sand over barrier
Garage Floor Slabs	See Soils Report	4 inches thick (nominal). 6X6-10/10 wire mesh. Isolate from stem wall footings. No moisture barrier required.	4 inches thick (nominal). 6X6-10/10 wire mesh. Isolate from stem wall footings. 4 inches gravel or aggregate base. No moisture barrier required.	4 inches thick (nominal). 6X6-6/6 wire mesh. Isolate from stem wall footings. 4 inches gravel or aggregate base. No moisture barrier required.
Pre-Soaking of Slab Subgrade Soils	See Soils Report	Soak to 12 inch depth to 4% above optimum moisture content.	Soak to 18 inch depth to 5% above optimum moisture content.	Soak to 24 inch depth to 5% above optimum moisture content.

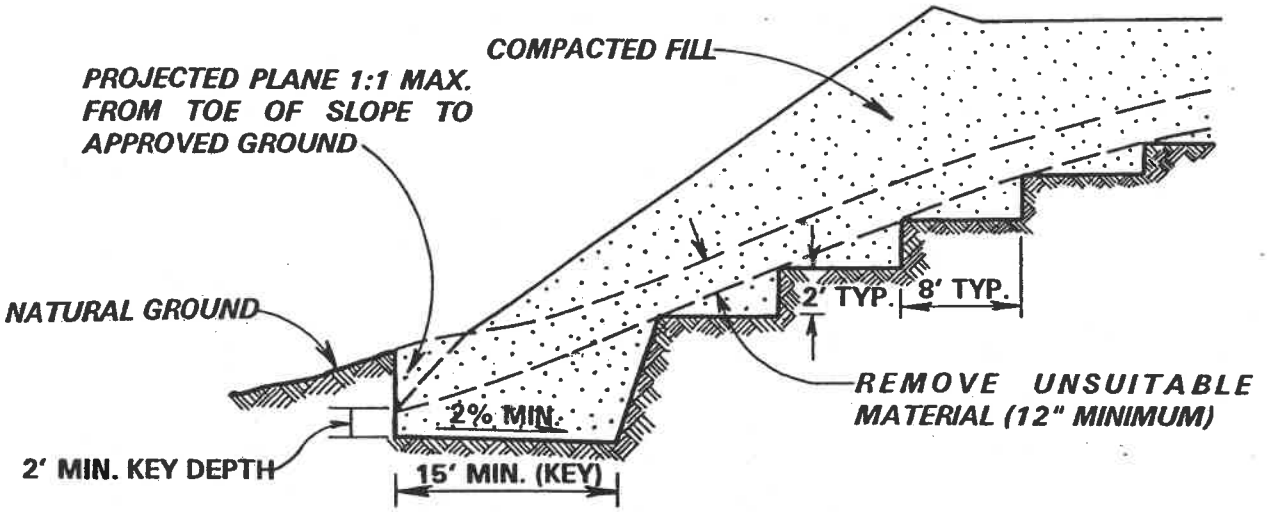
Notes: Expansion index based on UBC Test Method 18-2.

Special Design is required for very highly expansive soils.

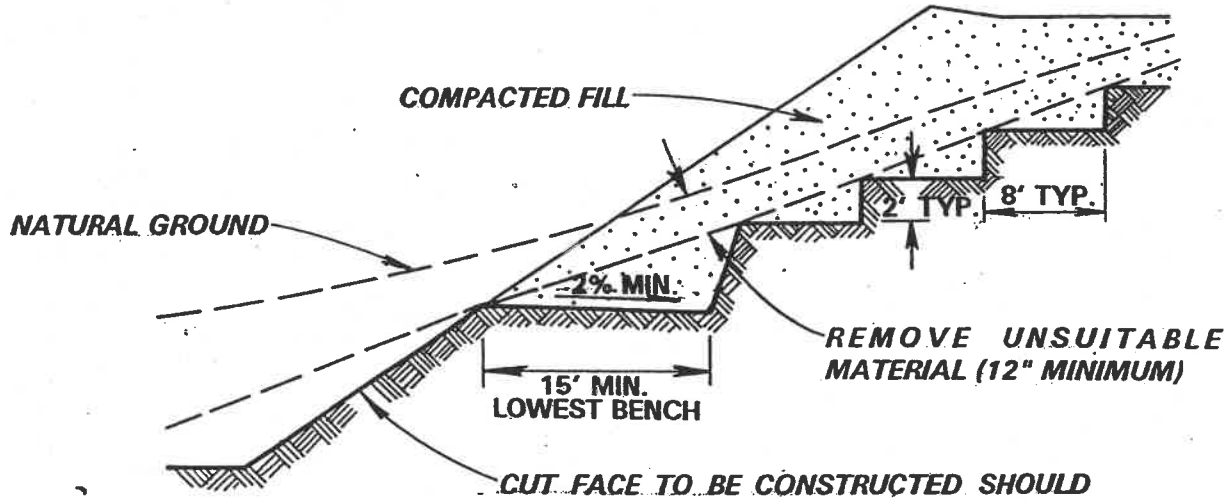
FOUNDATION AND SLAB DETAIL



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FILL SLOPE



FILL OVER CUT SLOPE

NOTES: (1) DIMENSIONS SHOWN SUBJECT TO FIELD CHANGE BASED ON ENGINEER'S JUDGEMENT

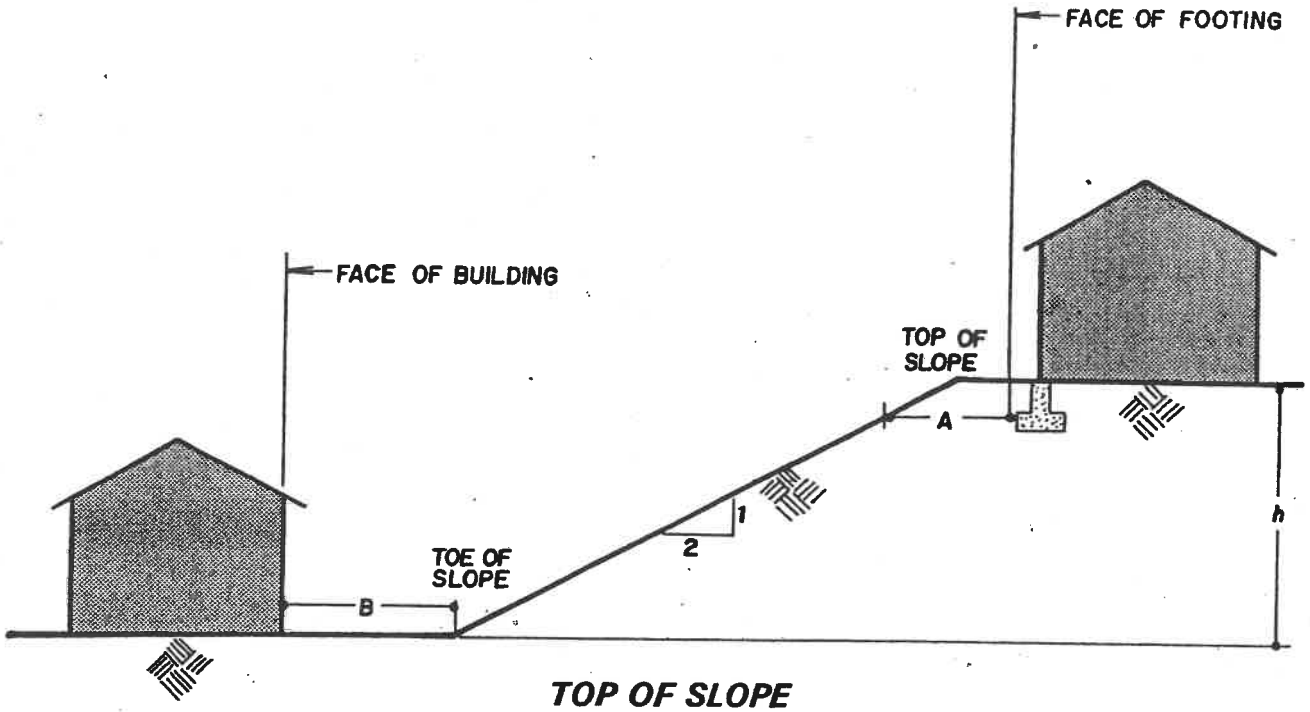
(2) BENCHING REQUIRED WHEN FILLING OVER NATURAL GROUND STEEPER THAN 5H:1V

SLOPE BENCHING DETAIL

FOR: NOBEL CREEK MEADOWS, LLC	TENTATIVE TRACT NO. 29267 RIVERSIDE COUNTY, CALIFORNIA	ENCLOSURE "D-2"
DATE: AUGUST 1999		JOB NUMBER 99510-3

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Building Setback Requirements
(Constructed Slopes)



TOP OF SLOPE

SLOPE HEIGHT (h) (feet)	*SETBACK (A) (feet)*
0-15'	5' Min.
15'-120'	h/3 Min.
120'+	40'*

TOE OF SLOPE

SLOPE HEIGHT (h) (feet)	*SETBACK (B) (feet)*
0-10'	5' Min.
10'-30'	h/2 Min.
30'+	15'

*or as directed by project engineering geologist

BUILDING SETBACK DETAIL

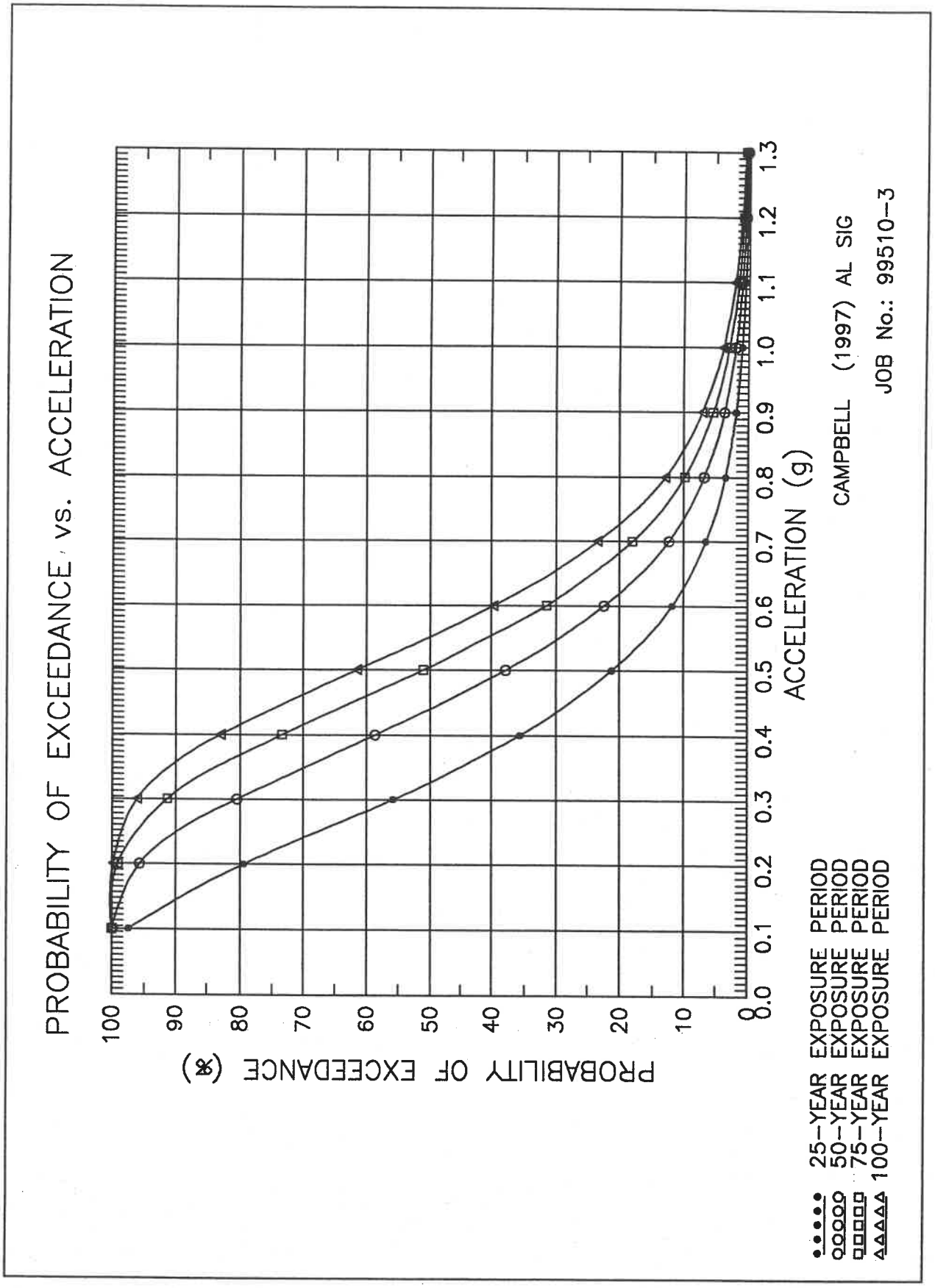
FOR: **NOBEL CREEK MEADOWS, LLC**	**TENTATIVE TRACT NO. 29267 RIVERSIDE COUNTY, CALIFORNIA**	ENCLOSURE **"D-3"**
DATE **AUGUST 1999**		JOB NUMBER **99510-3**

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APPENDIX "E"

SEISMIC DATA

ENCLOSURE: "E-1"
JOB NO.: 99510-3



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GEOTECHNICAL INVESTIGATION
NOBLE CREEK ALIGNMENT
RIVERSIDE COUNTY, CALIFORNIA
PREPARED FOR
NOBEL CREEK MEADOWS, LLC
JOB NO. 99511-3

C·H·J· INCORPORATED

P.O. Box 231, Colton, CA 92324-0231 • 1355 E. Cooley Dr., Colton, CA 92324-3951
Phone (909) 824-7210 • Fax (909) 824-7209

August 6, 1999

Nobel Creek Meadows, LLC
c/o Gabel, Cook & Becklund, Inc.
125 West La Cadena Boulevard, Suite A
Riverside, California 92501
Attention: Mr. Grant Becklund

Job No. 99511-3

Dear Mr. Becklund:

Attached herewith is the Geotechnical Investigation report, prepared for the Noble Creek Alignment, located between Beaumont Avenue and 14th Street, in the Beaumont area of Riverside County, California.

This report was based upon a scope of services generally outlined in our proposal letter dated June 29, 1999, and other written and verbal communications.

We appreciate this opportunity to provide geotechnical services for this project. If you have questions or comments concerning this report, please contact this firm at your convenience.

Respectfully submitted,
C.H.J., INCORPORATED

Ben Williams, Senior Staff Engineer

BW/RJJ:sp
Distribution: Nobel Creek Meadows, LLC (4)
Gabel, Cook & Becklund, Inc. (2)
Mr. Jack VanderWoude (1)

C·H·J·

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PROJECT CONSIDERATIONS	1
SITE DESCRIPTION	2
FIELD INVESTIGATION	3
LABORATORY INVESTIGATION	3
SUBSURFACE SOIL CONDITIONS	4
CONCLUSIONS	4
LIMITATIONS	6
CLOSURE	8

	ENCLOSURE
APPENDIX "A" - GEOTECHNICAL/GEOLOGIC MAPS	
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Plat	"A-2"
APPENDIX "B" - EXPLORATORY LOGS	
Key to Logs	"B" (1of2)
Soil Classification Chart	"B" (2of2)
Exploratory Borings	"B-1"-"B-4"
APPENDIX "C" - LABORATORY TESTING	
Test Data Summary	"C-1"-"C-3"

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GEOTECHNICAL INVESTIGATION
NOBLE CREEK ALIGNMENT
RIVERSIDE COUNTY, CALIFORNIA
PREPARED FOR
NOBEL CREEK MEADOWS, LLC
JOB NO. 99511-3

INTRODUCTION

During July and August of 1999, a geotechnical investigation of the soils underlying the alignment of Noble Creek, located between Beaumont Avenue and 14th Street, in the Beaumont area of Riverside, California was performed by this firm. The purpose of this investigation was to explore and evaluate the soils engineering conditions along the subject alignment.

To orient our investigation at the site, aerial photographs flown in 1995 and a photo-copy of an Army Corps of Engineers Plat, indicating the location of the existing alignment were reviewed. The approximate location of the site is shown on the attached Index Map (Appendix "A").

The results of our investigation, together with our conclusions and recommendations, are presented in this report.

SCOPE OF SERVICES

The scope of services provided during this geotechnical investigation included the following:

- Review of published and unpublished literature and maps.
- Placement of four exploratory borings along the alignment.
- Logging and sampling of exploratory borings for testing and evaluation.
- Laboratory testing on selected samples.

PROJECT CONSIDERATIONS

Neither development plans or the project grading plan were available at the time of our investigation. However, it is our understanding that the channel of the subject alignment will be

further enlarged and developed for flood control purposes. Future development plans are for the adjacent areas to be developed with single family residences. Grading in the adjacent area is anticipated to involve fills on the order of 2 to 4 feet and minimal cuts and fills; however, cuts and fills within the alignment may be significant.

C.H.J., Incorporated has performed a concurrent Geotechnical Investigation (Job No. 99510-3, dated August 2, 1999) for the residential development (Tract No. 29267) located to the south. Information obtained from that investigation including the results of laboratory tests were utilized to the extent applicable.

SITE DESCRIPTION

The alignment of Noble Creek under study begins at Beaumont Avenue and trends southwest crossing over Brookside Avenue and continues southwest to Beaumont Avenue. The area adjacent to the alignment is relatively flat and planar and is generally underlain by younger alluvium deposited over older alluvium.

Although not encountered, it is assumed that utility lines such as gas and water and perhaps a sewer cross the alignment adjacent to Beaumont Avenue and/or 14th Street and perhaps also crosses the alignment at Brookside Avenue. An overhead high voltage power line crosses the alignment approximately midway between Brookside Avenue and 14th Street,

The general area adjacent to the alignment is vacant at this point in time, with the exception of structures at Noble Creek Park (Riverside County Park) and an equipment operators school to the south. Residential development (Tract Nos. 29627 and 28988) are currently proposed for development to the south.

At the time of our field exploration, recent rains had resulted in flowing water in the existing channel.

No other surface features pertinent to the investigation were noted.

FIELD INVESTIGATION

The soil conditions underlying the subject site were explored by means of four exploratory borings drilled to a maximum depth of 21.5 feet below the existing ground surface with a truck-mounted CME 55 drill rig equipped for soil sampling. The approximate locations of our exploratory borings are indicated on the attached Plat (Appendix "A"). In addition to the exploratory borings utilized for this investigation, exploratory borings (as deep as 51.5 feet) were placed for purposes of the concurrent geotechnical investigation performed for Tract No. 29267.

Continuous logs of the subsurface conditions, as encountered within the exploratory borings, were recorded at the time of drilling by a staff geologist from this firm. Relatively undisturbed samples were obtained by driving a split spoon ring sampler ahead of the borings at selected levels. After the required seating of the sampler, the number of hammer blows required to advance the sampler a total of 12 inches was converted to Standard Penetration Test (SPT) data and recorded on the boring logs. Undisturbed as well as bulk samples of typical soil types obtained were returned to the laboratory in sealed containers for testing and evaluation.

Our exploratory boring logs, together with our SPT data, are presented in Appendix "B". The stratification lines presented on the boring logs represent approximate boundaries between soil types, which may include gradual transitions.

LABORATORY INVESTIGATION

Included in our laboratory testing program were field moisture content determinations on all samples returned to the laboratory. The results are included on the logs of the exploratory borings. Sieve analysis and sand equivalency testing were performed as an aid in classification. Additional testing was performed on soils from the adjacent site to the south (See Referenced Investigation). The additional testing was comprised of optimum moisture content - maximum dry density relationships and expansion potential determination, as well as soluble sulfate analysis.

Summaries of the laboratory test results for this investigation as well as testing performed on soils from the adjacent site appear in Appendix "C".

SUBSURFACE SOIL CONDITIONS

Data from our exploratory trenches indicates that the soil profile at the site typically consists of silty sands and poorly graded sands with silt underlain by poorly graded sands to the maximum depths attained. Gravel to a maximum size of 2 inches were encountered within the exploratory borings, However, it is anticipated that isolated areas of gravel and cobbles to 8 inches in diameter may be encountered during grading activities. Density determinations and SPT data indicate that the soils encountered are in loose to dense states, generally becoming more dense with depth.

Fill was not encountered within the exploratory borings utilized for this investigation.

No bedrock on free groundwater was encountered within any of our exploratory borings to the maximum depths attained.

Significant sidewall caving was noted within all exploratory borings utilized for this investigation.

A more detailed description of the subsurface soil conditions encountered within our exploratory borings is presented on the attached logs of the exploratory borings.

CONCLUSIONS AND RECOMMENDATIONS

1. Based upon the soils encountered within our exploratory borings, it appears that the materials can be excavated along the alignment using normal grading equipment, such as loaders, scrapers and backhoes. The type of equipment utilized will be governed more by the depth and location of the excavation rather than the soils.

2. Based on results of the sieve analysis tests and sand equivalent determinations, the soils encountered are generally suitable for use quality fill and backfill material. With the exception of the sample obtained from Exploratory Boring No. 3 the soils tested had sand equivalents greater than 30.

3. Deeper excavations (greater than 5 feet) will require sloping sidewalls or shoring. The excavation operation and necessary shoring should be designed and constructed in accordance with the State of California, California Administrative Code, Title 8, Industrial Relations, Chapter 4, Division of Industrial Safety, Subchapter 4, Construction Safety Orders, Article 6. In accordance with the California Administrative Code, excavations to have sloping sidewalls rather than shoring, should have sidewall inclinations no steeper than 1 horizontal to 1 vertical. Flatter slopes will be required if running soils are encountered during construction.

4. No surcharge loads should be allowed within a horizontal distance measured from the top of the excavation slope, equal to the depth of the excavation.

5. An active lateral earth pressure can be considered to be developed at a rate of 40 pounds per square foot per foot of depth for unrestrained conditions. For restrained conditions, an at-rest pressure of 60 pounds per square foot per foot of depth can be considered to be developed. Base friction may be computed at 0.42 times the normal dead load. The passive resistance bearing against firm native soils or properly compacted fill, may be considered to be developed at a rate of 400 pounds per square foot per foot of depth.

6. Preliminary data indicates that permanent cut and fill slopes should be constructed no steeper than 2 horizontal to 1 vertical to a maximum height of 30 feet. If the slopes are subject to running water, rip-rap or other measures will be necessary to protect against scour or undercutting.

7. Results of the consolidation test conducted between the depths of 1.5 and 12.5 feet on the adjacent site indicates that the soils exhibit a moderate hydro-consolidation potential to a depth of approximately 5 feet when subjected to a surcharge load and inundation with water. However, due to previous inundation the consolidation potential is considered to be minimal in the area of the existing channel. However, in areas outside of the channel, the underlying native soils should be excavated to depths of between 2 and 4 feet (depending on settlement tolerance) prior to construction of fills or structures. See the referenced Geotechnical Investigation report for grading recommendations.

8. Erosion from and meandering of Noble Creek could extend onto future adjacent developments. Appropriate control measures such as rip-rap or other means should be considered to prevent further erosion and under-cutting of the banks onto the adjacent sites. In addition, measures should be provided to prevent surface water from flowing over slope faces.

9. Appropriate measures for scouring within the channel are beyond the scope of this report. However, some method should be utilized to prevent future scouring and undercutting of bridges and other structure foundations which extend into the channel.

10. Since the materials encountered during this investigation were generally granular, specialized construction procedures to specifically resist expansive soil forces are not anticipated. Results of expansion testing conducted on selected samples of older alluvium from the adjacent site indicates that these soils exhibit a "low" potential for expansion in accordance with UBC Standard 18-2. If such soils are encountered during construction, appropriate mitigation measures may be needed.

11. Although not a soils engineering consideration, nearby underground utilities are anticipated in the vicinity of the alignment that should be protected during excavation, grading and construction operations. In addition, care should be exercised while excavating near bridges, and other improvements on, or near the ground surface.

12. Aerial photographs reviewed for the adjacent site did not reveal evidence of recent significant flooding. Although an evaluation for the potential of flooding from Noble Creek is beyond the scope of this investigation, it is our recommendation that the potential be evaluated.

LIMITATIONS

C.H.J., Incorporated has striven to perform our services within the limits prescribed by our client, and in a manner consistent with the usual thoroughness and competence of reputable soils engineers practicing under similar circumstances. No other representation, express or implied, and no

warranty or guarantee is included or intended by virtue of the services performed or reports, opinion, documents, or otherwise supplied.

This report reflects the testing conducted on the site as the site existed during the investigation, which is the subject of this report. However, changes in the conditions of a property can occur with the passage of time, due to natural processes or the works of man on this or adjacent properties. Changes in applicable or appropriate standards may also occur whether as a result of legislation, application, or the broadening of knowledge. Therefore, this report is indicative of only those conditions tested at the time of the subject investigation, and the findings of this report may be invalidated fully or partially by changes outside of the control of C.H.J., Incorporated. This report is therefore subject to review and should not be relied upon after a period of one year.

The conclusions and recommendations in this report are based upon observations performed and data collected at separate locations, and interpolation between these locations, carried out for the project and the scope of services described. It is assumed and expected that the conditions between locations observed and/or sampled are similar to those encountered at the individual locations where observation and sampling was performed. However, conditions between these locations may vary significantly. Should conditions be encountered in the field, by the client or any firm performing services for the client or the client's assign, that appear different than those described herein, this firm should be contacted immediately in order that we might evaluate their effect.

If this report or portions thereof are provided to contractors or included in specifications, it should be understood by all parties that they are provided for information only and should be used as such.

The report and its contents resulting from this investigation are not intended or represented to be suitable for reuse on extensions or modifications of the project, or for use on any other project.

CLOSURE

We appreciate this opportunity to be of service and trust this report provides the information desired at this time. Should questions arise, please do not hesitate to contact this office.

Respectfully submitted,
C.H.J., INCORPORATED

Ben Williams, Senior Staff Engineer

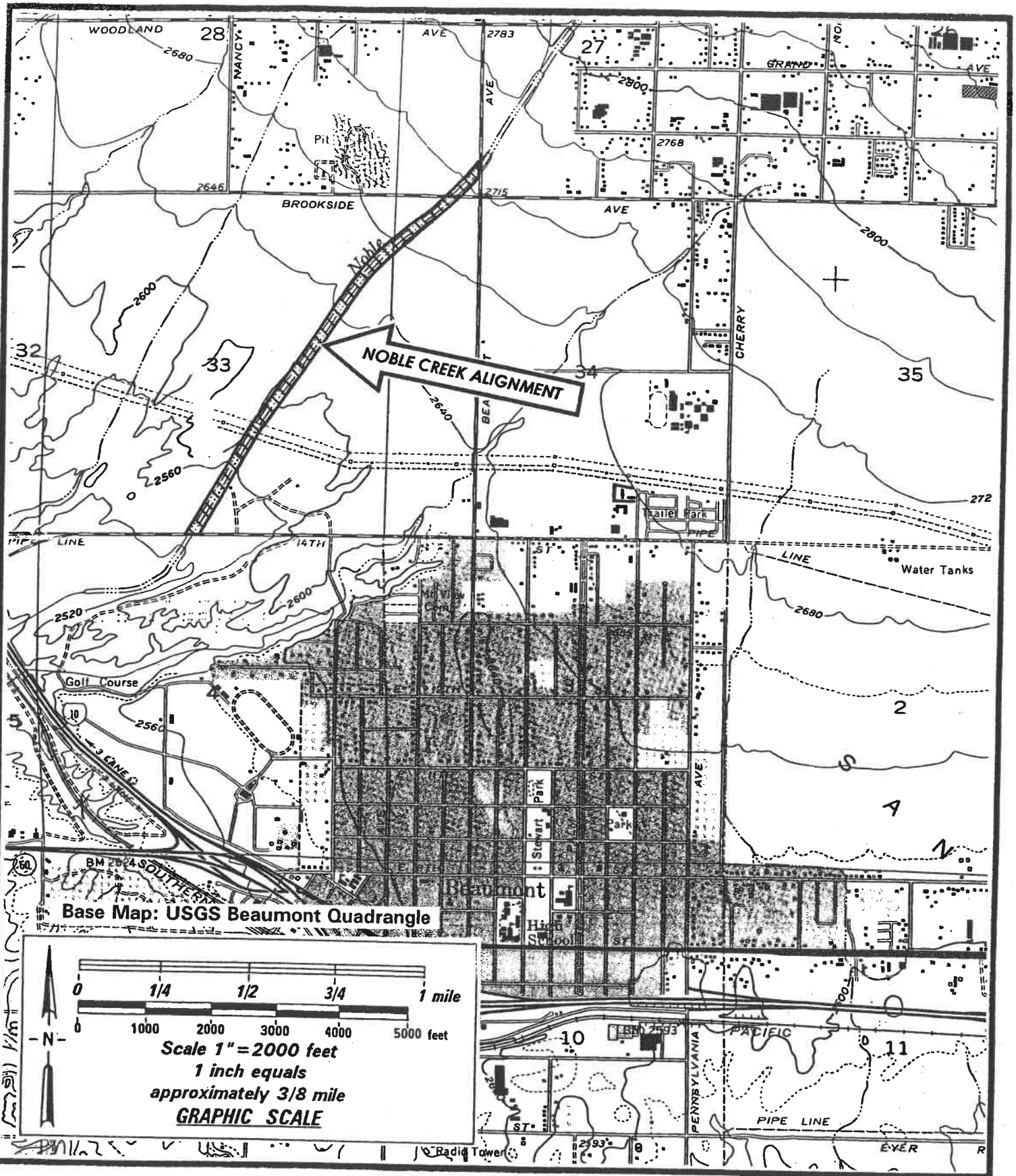


Robert J. Johnson, G.E. 443
Senior Vice President

BW/RJJ:sp

APPENDIX "A"

GEOTECHNICAL MAPS



INDEX MAP

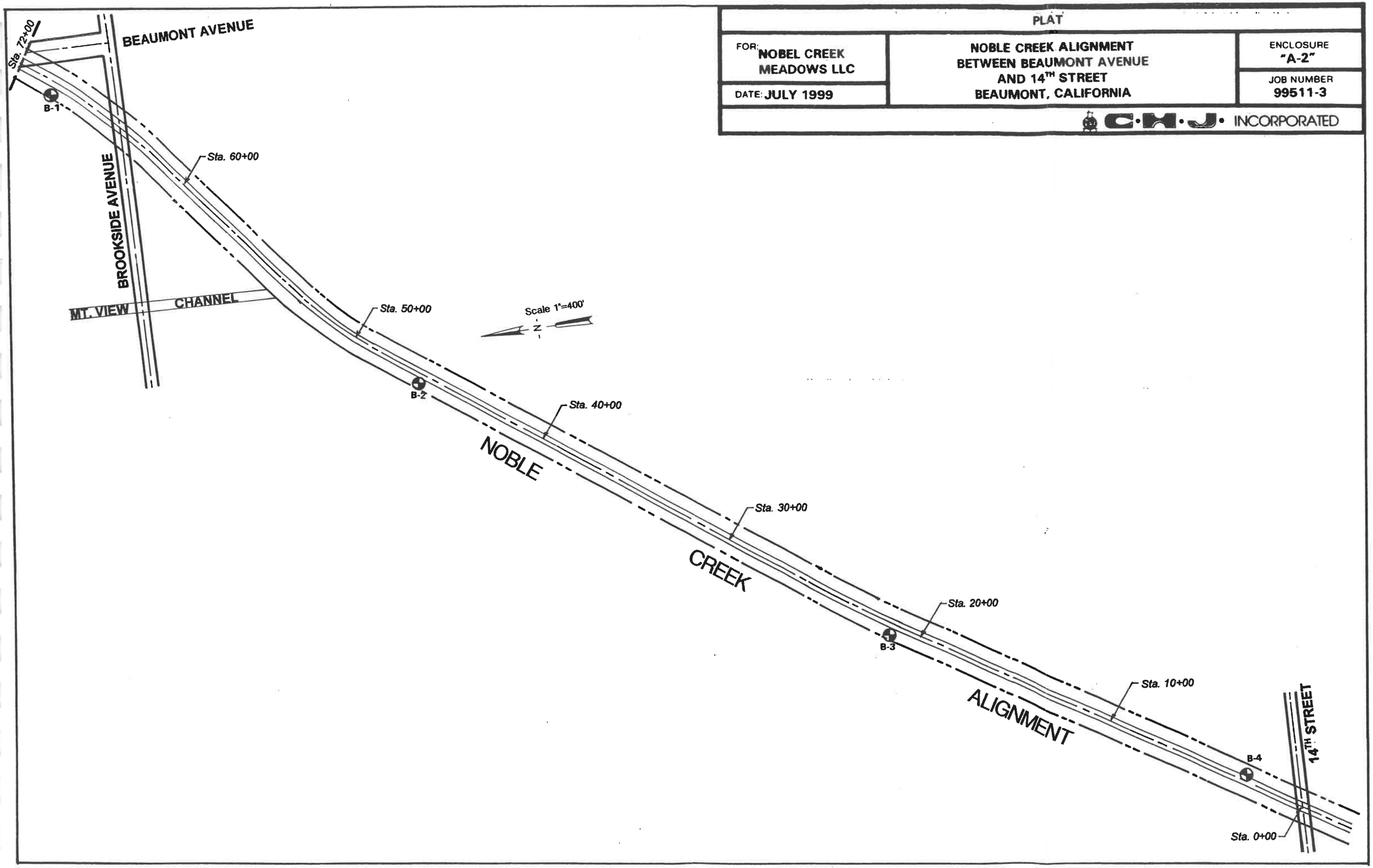
FOR: NOBEL CREEK MEADOWS LLC	NOBLE CREEK ALIGNMENT BETWEEN BEAUMONT AVENUE AND 14TH STREET BEAUMONT, CALIFORNIA	ENCLOSURE "A-1"
DATE: JULY 1999		JOB NUMBER 99511-3

C·H·J· INCORPORATED

PLAT

FOR: NOBEL CREEK MEADOWS LLC	NOBLE CREEK ALIGNMENT BETWEEN BEAUMONT AVENUE AND 14TH STREET BEAUMONT, CALIFORNIA	ENCLOSURE "A-2"
DATE: JULY 1999		JOB NUMBER 99511-3

C·H·J· INCORPORATED



APPENDIX "B"

EXPLORATORY LOGS

C·H·J·

Enclosure "B" (1of2)
Job No. 99510-3

KEY TO LOGS

SAMPLE TYPE:

Ring — Indicates Undisturbed Ring Sample. Undisturbed Ring Samples are obtained with a C.H.J. Sampler (3.00" O.D. and 2.42" I.D.) driven with a 140 pound weight falling 30 inches. The blows per foot are converted to equivalent SPT values.

SPT — Indicates Standard Penetration Test. The SPT N-value is the number of blows required to drive an SPT sampler 12 inches using a 140 pound weight falling 30 inches. The SPT sampler is 2" O.D. and 1-3/8" I.D.

SA — Sieve Analysis (ASTM C-136)

SE — Sand Equivalent (ASTM D-2419)

ENGINEERING PROPERTIES FROM SPT BLOWS

Relationship of Penetration Resistance to Relative Density for Cohesionless Soils*

(After Mitchell and Katti, 1981)

No. of SPT Blows (N_{60})	Descriptive Relative Density	Approximate Relative Density (%)
<4	Very Loose	0-15
4-10	Loose	15-35
10-30	Medium Dense	35-65
30-50	Dense	65-85
>50	Very Dense	85-100

* At an effective overburden pressure of 1 ton per square foot (100 Kpa)

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			GRAPH SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS — MORE THAN 50% OF MATERIAL IS LARGER THAN NO 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS — MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SAND AND SANDY SOILS — MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	CLEAN SAND (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND-SILT MIXTURES
				SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE GRAINED SOILS — MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS — LIQUID LIMIT LESS THAN 50			ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS — LIQUID LIMIT GREATER THAN 50			MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

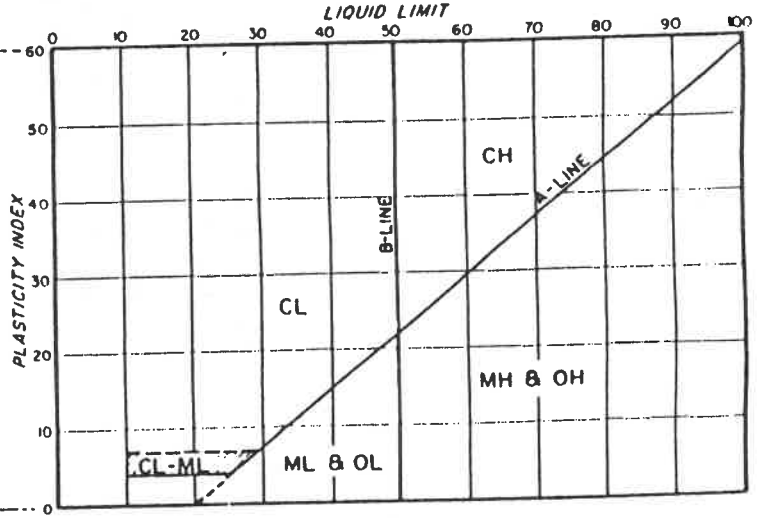
FOR LABORATORY CLASSIFICATION OF FINE-GRAINED SOILS

GRADATION CHART

MATERIAL SIZE	PARTICLE SIZE			
	LOWER LIMIT		UPPER LIMIT	
	MILLIMETERS	SIEVE SIZE	MILLIMETERS	SIEVE SIZE
SAND				
FINE	.074	#200‡	0.42	#40‡
MEDIUM	0.42	#40 ‡	2.00	#10 ‡
COARSE	2.00	#10 ‡	4.76	#4 ‡
GRAVEL				
FINE	4.76	#4 ‡	19.1	3/4"•
COARSE	19.1	3/4"•	76.2	3"•
COBBLES	76.2	3"	304.8	12"
BOULDERS	304.8	12	914.4	36"

‡US STANDARD • CLEAR SQUARE OPENINGS

PLASTICITY CHART



UNIFIED SOIL CLASSIFICATION SYSTEM

C·H·J· INCORPORATED

Enclosure "B" (2of2)
Job No. 99511-3

LOG OF BORING 1

Date Drilled: 7/14/99 | Client: Nobel Creek Meadows, LLC

Equipment: CME 55 Drill Rig | Driving Weight / Drop: 140 lb/30 in

Surface Elevation(ft): N/A | Logged by: T.D. | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SM) Silty Sand, fine with medium to coarse and gravel to 3/4", brown					3.9		Bulk, SA, SE
				X		8	2.5	110	Ring
5				X		6	4.4	104	Ring
		(SP) Sand, fine with medium coarse and gravel to 2", light brown					1.8		Bulk
10				X		26	2.2	112	Ring
15				X		54/9"	N.R.		Ring
20				X		57/5"	N.R.		Ring
		END OF BORING							
25									
30		NO BEDROCK NO REFUSAL NO FILL NO FREE GROUNDWATER							

BOREHOLE_LOG 99511-3.GPJ CHJ.GDT 8/6/99

C·M·J·

NOBLE CREEK ALIGNMENT
BEAUMONT, CALIFORNIA

Job No. 99511-3

Enclosure B-1

LOG OF BORING 2

Date Drilled: 7/14/99

Client: Nobel Creek Meadows, LLC

Equipment: CME 55 Drill Rig

Driving Weight / Drop: 140 lb/30 in

Surface Elevation(ft): N/A

Logged by: T.D.

Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SP-SM) Sand, fine with medium to coarse, gravel to 3/4" and silt, light brown			■		2.3		Bulk
				☒		13	1.9	111	Ring
5		(SP-SM) Sand, fine to coarse with gravel to 3/4" and silt, light brown			■		2.0		Bulk, SA, SE
				☒		15	2.2	120	Ring
10		(SP-SM) Silty Sand, fine with medium to coarse and silt, light brown			■		5.2		Bulk
				☒		12	6.5	113	Ring
15		(SP) Sand, fine to coarse with gravel to 2", light brown			■		3.3		Bulk
				☒		27	N.R.		Ring
20		END OF BORING							
25									
30		NO BEDROCK NO REFUSAL NO FILL NO FREE GROUNDWATER							

BOREHOLE_LOG 99511-3.GPJ CHJ.GDT 8/6/99

C·H·J

NOBLE CREEK ALIGNMENT
BEAUMONT, CALIFORNIA

Job No. 99511-3

Enclosure B-2

LOG OF BORING 3

Date Drilled: 7/14/99

Client: Nobel Creek Meadows, LLC

Equipment: CME 55 Drill Rig

Driving Weight / Drop: 140 lb/30 in

Surface Elevation(ft): N/A

Logged by: T.D.

Measured Depth to Water(ft): N/A

DEPTH (ft)	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
	(SM) Silty Sand, fine with medium to coarse and gravel to 3/4", light brown					3.9		Bulk, SA, SE
			X		11	2.7	108	Ring
	(SP) Sand, fine with medium and coarse, light brown					2.4		Bulk
5			X		16	2.8	114	Ring
	(SP) Sand, fine with medium, coarse and gravel to 2", light brown							
10			X		12	1.9	126	Ring
15			X		26	5.3	114	Ring
20			X		44	N.R.		Ring
	END OF BORING							
25								
30	NO BEDROCK NO REFUSAL NO FILL NO GROUNDWATER							

BOREHOLE_LOG 99511-3.GPJ CHJ.GDT 8/6/99

C·M·J·

NOBLE CREEK ALIGNMENT
BEAUMONT, CALIFORNIA

Job No. 99511-3

Enclosure B-3

LOG OF BORING 4

Date Drilled: 7/14/99

Client: Nobel Creek Meadows, LLC

Equipment: CME 55 Drill Rig

Driving Weight / Drop: 140 lb/30 in

Surface Elevation(ft): N/A

Logged by: T.D.

Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SP-SM) Sand, fine with medium to coarse, gravel to 3/4" and silt, light brown	Fill				3.9		Bulk
		(SP) Sand, fine with medium, coarse and gravel to 1", light brown	Native			17	3.5	116	Ring
							3.3		Bulk, SA, SE
5									
						26	3.3	117	Ring
10									
						27	4.0	123	Ring
15									
						26	N.R.		Ring
20		END OF BORING							
25									
30		NO BEDROCK NO REFUSAL FILL TO 3.0' NO FREE GROUNDWATER							

BOREHOLE_LOG 99511-3.GPJ CHJ.GDT 8/6/99

C·H·J

NOBLE CREEK ALIGNMENT
BEAUMONT, CALIFORNIA

Job No. 99511-3

Enclosure B-4

APPENDIX "C"

LABORATORY TESTING

C·H·J·

Enclosure "C-1"
Job No. 99511-3

TEST DATA SUMMARY

OPTIMUM MOISTURE - MAXIMUM DENSITY RELATION:

ASTM D 1557-91 (From C.H.J., Incorporated, Job No. 99510-3, Tract No. 29267)

Boring/ Depth	Classification	Optimum Moisture (Percent)	Maximum Dry Density (PCF)
3/0.0	Sand, fine with silt, light brown (SP-SM)	8.5	129.0
17/0.0	Silty Sand, fine, red brown (SM)	9.5	129.0

DIRECT SHEAR TEST: Remolded to 90% Relative Compaction: (Saturated)

ASTM D 3080 (From C.H.J., Incorporated, Job No. 99510-3, Tract No. 29267)

Boring	Depth of Sample (Ft.)	Angle of Internal Friction (^{0})	Apparent Cohesion (PSF)
3	surface	34	-0-
17	surface	32	-0-

C·H·J·

Enclosure "C-2"
Job No. 99511-3

TEST DATA SUMMARY

EXPANSION INDEX :

UBC Standard Test Method 18-2 (From C.H.J., Incorporated, Job No. 99510-3, Tract No. 29267)

Boring No./ Depth (Ft.)	Initial Moisture (%)	Final Moisture (%)	Degree of Saturation (%)	Expansion Index	Expansion Potential
16/0.0	11.0	18.6	50.5	34	"low"

SOLUBLE SULFATES: EPA METHOD 9038

(From C.H.J., Incorporated, Job No. 99510-3, Tract No. 29267)

Boring	Depth (Ft.)	Level	Exposure*
17A	0.0	N.D.[1]	"negligible"
16A	0.0	N.D.[1]	"negligible"

[1] Analysis reported as N.D. were not present above the 0.01 level of detection.

C·M·J·

Enclosure "C-3"
Job No. 99511-3

TEST DATA SUMMARY

SAMPLE:	1A	2B	3A	4B
LOCATION:				
SIEVE ANALYSIS:				
SIEVE SIZE	PERCENT PASSING			
3/4"	100	100	100	100
1/2"	95	98	98	92
3/8"	91	92	96	90
No. 4	82	84	93	82
No. 10	73	71	90	68
No. 16	67	60	86	57
No. 40	52	38	72	34
No. 50	45	29	62	25
No. 100	30	16	40	13
No. 200	16	8	23	7
SAND EQUIVALENT: (Caltrans 217)	30	71	27	57

Appendix C
Floodplain Study

NOBLE CREEK
PRELIMINARY FLOODPLAIN STUDY

NOBLE CREEK VISTAS SPECIFIC PLAN

CITY OF BEAUMONT, CA

Prepared for:

THE TAHITI GROUP

Prepared by:

GABEL, COOK & BECKLUND, INC.

125 W. La Cadena Drive, Suite A
Riverside, CA 92501
(909) 788-8092

June 2001

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- PROJECT SITE AND DRAINAGE AREA 3
- HYDROLOGY 3
- FLOODPLAIN ANALYSIS 4
- SCOUR ANALYSIS AND RIP-RAP SIZING 5
- RESULTS 5
- REFERENCES 6

FIGURES

FIGURE A: BEAUMONT MASTER DRAINAGE PLAN AND NOBLE CREEK VISTAS SPECIFIC PLAN

APPENDICES

APPENDIX A: EXISTING CONDITION HEC-RAS CALCULATIONS & CROSS-SECTIONS FROM OAK VALLEY FLOOD STUDY

APPENDIX B: PROPOSED CONDITION HEC-RAS CALCULATIONS & CROSS-SECTIONS

APPENDIX C: HYDRAULIC ANALYSIS SUMMARY TABLE

APPENDIX D: SCOUR CALCULATIONS

EXHIBITS

EXHIBIT A: EXISTING CONDITION FLOODPLAIN MAP

EXHIBIT B: POST CONSTRUCTION FLOODPLAIN MAP

• PURPOSE AND SCOPE

This study has been authorized by The Tahiti Group in support of the Environmental Impact Report (EIR) prepared by Applied Planning for Noble Creek Vistas Specific Plan.

The scope of this study includes the following:

- Determine the existing condition floodplain limits during a 100-year event storm.
- Determine the floodplain limits after construction of the project during a 100-year event storm.
- Evaluation of the result of the floodplain analysis.
- Preparation of the report along with the appropriate exhibits.

• PROJECT SITE AND DRAINAGE AREA

The project is located in County of Riverside, California and lies at the base of the Little San Gorgonio Creek watershed westerly of Beaumont Avenue and southerly of Brookside Avenue and is contiguous with the City of Beaumont on the east and west boundaries. The 332-acre specific plan proposes the construction of 965 single-family residential units with lot sizes ranging from 5,000 to 10,000 square feet on a total of 262 acres. The site is impacted by Noble Creek, which bisects the project and is shown as mapped floodplain at the northerly project limits. The existing creek runs through the middle of the project as a natural earth channel and is contained in a concrete-lined channel north of Brookside Avenue. This project proposes to keep Noble Creek in its current location and provide flood proofing for the proposed adjacent development. This proposal is consistent with the adopted Riverside County Flood Control and Water Conservation District "Master Drainage Plan for the Beaumont Area". The site topography is varied with relatively steep slopes adjacent to the bluffs and ravines found along the southerly portion of the site and the balance of the site consists of fairly flat areas. The overall difference in ground elevations across the project is 130 feet.

• HYDROLOGY

The 100-year runoff values used to determine the pre-project and post-project flood elevations are based upon the Riverside County Flood Control and Water Conservation District (RCFC&WCD) "Master Drainage Plan for the Beaumont Area". The bulked 100-year storm runoff through the project area is 13,530 c.f.s.

- FLOODPLAIN ANALYSIS

The Floodplain Analysis prepared by AEI-CASC Engineering in December 1998, for the Frank Ranch/Oak Valley Specific Plan, was utilized to delineate the limits of the flood flows traversing the project site. This floodplain study analysis utilized the U.S. Army Corps of Engineers HEC-RAS computer program to determine the existing condition for the Noble Creek Floodplain through this site.

The proposed (post construction) condition will consist of re-grading the Noble Creek channel area to establish a uniform channel section and constructing a combination levee/street system along both sides of Noble Creek as it traverses the project site. This system will provide flood proofing of the project by containing the flood flows within the limits of the existing floodplain area. The road system will be elevated a minimum of 3 feet above the floodplain to maintain the required channel free board. The levee/road system is proposed to flare out at the northerly project boundary to accept flood flows from the Mountain View and Noble Creek channels and will act as a collector system to insure that the flood flows remain in the Noble Creek Channel. The southerly end of the levee/road system is also flared out to match the existing floodplain and not change the downstream conditions and will match the existing Noble Creek Channel improvements constructed by the Oak Valley Specific Plan. The northerly and westerly project limits will be flood proofed by constructing a masonry boundary wall along with additional landscaped setback areas to provide barrier protection and flow areas should flows from the north escape from the indicated floodplain limits shown on the Beaumont Master Drainage Plan.

The Riverside County Flood Control District as part of their Flood Control Improvement program will construct the remaining northerly portions of the Beaumont Master Drainage Plan at a future date. The City of Beaumont would pay their pro-rata share of these costs at time of construction. The improvements proposed for construction by the Noble Creek Vistas Specific Plan will be owned by the City of Beaumont once they are constructed and will be maintained by a City of Beaumont Community Facilities District after completion of the improvements.

The existing Mountain View Channel will have to be reconfigured to match the alignment of the new levee/road system and these improvements would have to be approved by the Flood Control District and an encroachment permit issued for this work. The Riverside County Flood Control District currently owns a 100-foot wide drainage easement that parallels the Noble Creek floodplain and provides for a low flow channel from Brookside Avenue to Fourteenth Street. The proposed levee/road system is located outside of this easement with an encroachment permit being required by the Flood Control District for any grading work proposed within this area.

The Noble Creek Channel crossing of Brookside Avenue presently exists as a dip crossing and the Noble Creek Vistas Specific Plan proposes to maintain this condition. The Beaumont Unified School District is proposing to develop the 110 acres northerly of the Noble Creek Vistas Specific Plan as a high school facility. This plan proposes to realign Brookside Avenue to the north and meet Beaumont Avenue approximately 600 feet northerly of the present intersection. This realignment will relocate Brookside Avenue outside of the Noble Creek floodplain and will eliminate the Brookside Avenue dip crossing of the creek. The school district is also proposing to provide flood proofing of the future high school site with a combination channel/berm system to protect the facility and deliver flood flows along their easterly boundary southerly to the Noble Creek Wash. They also propose to construct a channel/berm system of flood proofing along the northerly project boundary. The affect of the construction of the proposed high school will be to further protect the Noble Creek Vistas Specific Plan and deliver flood flows back to the Noble Creek Wash.

• SCOUR ANALYSIS AND RIP-RAP SIZING

The scour analysis and rip-rap sizing is based upon the Los Angeles County Department of Public Works Hydrology/Sediment Manual and the Los Angeles County Flood Control Districts Design Manual. More specifically, for scour determination, the following equation was used:

$$Ztot = Zdeg + Zgs + Zls + Zbs + Zl + ½\ h$$

Where:

Ztot = The total amount of anticipated scour
Zdeg = The amount of scour due to long term degradation
Zgs = The amount of general scour
Zls = The amount of local scour
Zi = The amount of scour due to low flood incisement
Zbs = The amount of scour due to bends in the flood path alignment
h = The bedload height

As a cross check measure, the "Levee Criteria" design guideline table contained within the Los Angeles County Flood Control District Design Manual was utilized. The actual scour calculations and comparison of the two methodologies are included in Appendix D.

• RESULTS

The proposed levee/road system will provide flood proofing for the Noble Creek Vistas Specific Plan. This plan will not have any significant impact on upstream and downstream properties. The affected property owners will be notified to the extent of the change in the stream flow characteristics and their acceptance of the changes will be obtained as required by FEMA guidelines and policies. The proposed slope protection should extend a minimum of 3 feet above the calculated water surface elevation. The recommended erosion protection

systems include riprap and standard concrete slope paving. Non-concreted riprap should be 1/2-ton minimum by 4 feet thick. A filter blanket should be placed beneath the riprap in accordance with Caltrans Standards. The other recommended option is to construct concrete slope paving. The structural section should be designed based upon soil conditions and local agency standards. A cut-off wall should be constructed along the levee limits and should be extended at the north and south project boundary sufficiently beyond the 100-year storm water surface limits. A cut-off wall is required and should extend a minimum of 10 feet below the creek's streambed.

VII REFERENCES

1. Riverside County Flood Control and Water Conservation District "Master Drainage Plan for the Beaumont Area", July 1983.

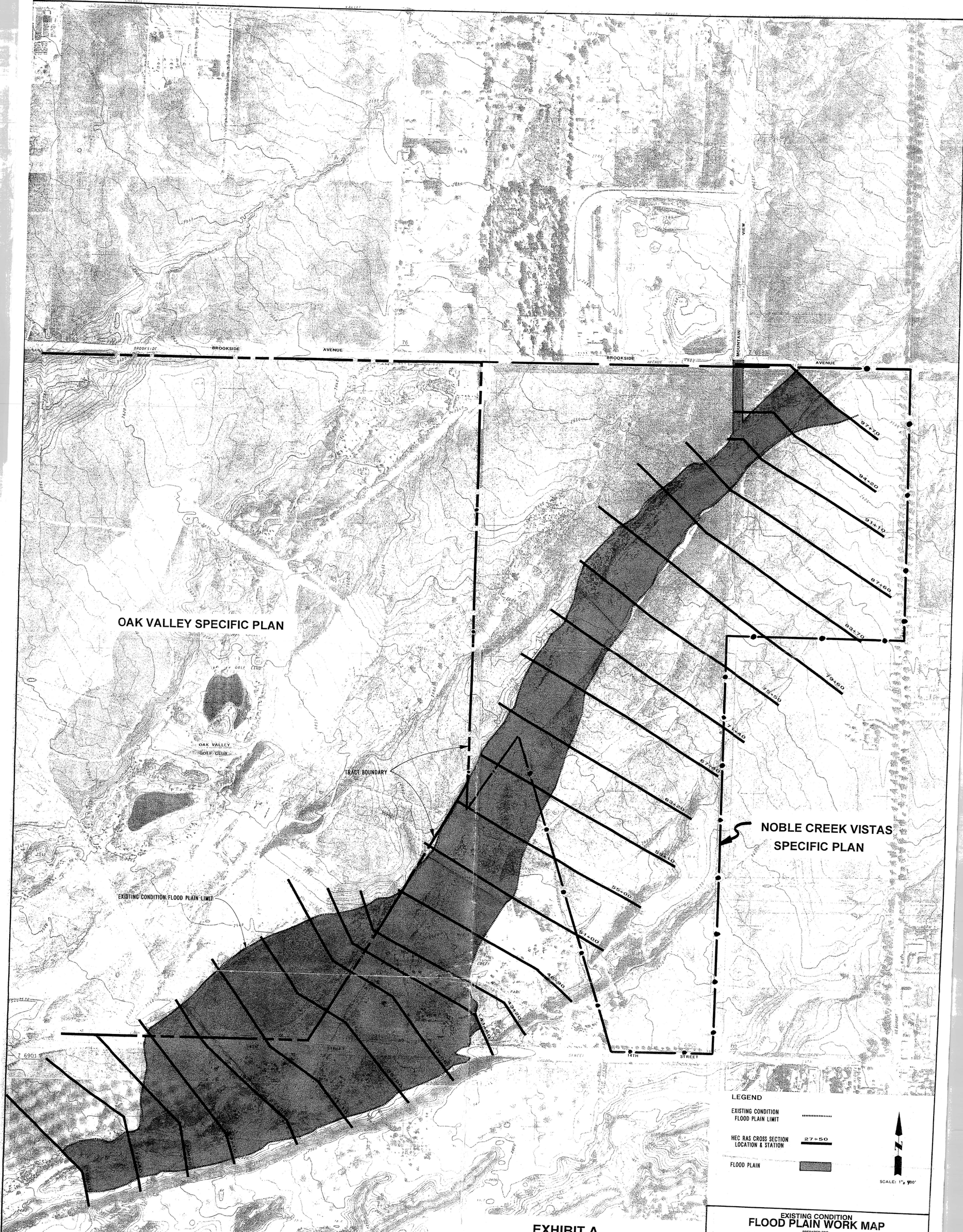
2. Los Angeles County Department of Public Works Hydrology/ Sedimentation Manual.

3. Los Angeles County Flood Control District Design Manual.

4. AEI-CASC Engineering "Noble Creek Preliminary Floodplain Study", December 1998.

EXHIBIT A

EXISTING CONDITION FLOODPLAIN MAP



LEGEND

EXISTING CONDITION FLOOD PLAIN LIMIT .....

HEC RAS CROSS SECTION LOCATION & STATION 27+50

FLOOD PLAIN

N

SCALE: 1" = 900'

EXHIBIT A

EXISTING CONDITION FLOOD PLAIN MAP

EXISTING CONDITION
FLOOD PLAIN WORK MAP
PREPARED FOR:
WESTBROOK OAK VALLEY PROPERTIES, INC.

AEI·CASC ENGINEERING
937 SOUTH VIA LATA
SUITE 500
COLTON, CA 92324
PH. (909) 783-0101 FAX (909) 783-0108

DEC 0 2 1992

EXHIBIT B

POST CONSTRUCTION FLOODPLAIN MAP

ORCHARD ST. CHANNEL

ORCHARD ST.

COLLECTOR DIKES

$22,000
ORCHARD ST. DRAIN

$922,000
LINE 9

72" 790

81" 890

78" 1105

87"

CHERRY VALLEY

$688,000
VIEW CHANNEL

FUTURE HIGH SCHOOL SITE

MOUNTAIN

NANCY

LIMIT OF STUDY

BROOKSIDE

$927,000
LITTLE SAN GORGONIO CREEK CHANNEL

b=VARIES
d=VARIES
SS=VARIES

b=14'
d=10.5'

$1,880,000
CHANNEL

d=4.5'
b=5'
755

d=9.5'
6555

b=9'
7835

b=10'

b=14'

$1,004,000
LINE 16

60" 320

54"

48" 200

63" 425

BLVD.

NOBLE CREEK

60" 440

AVE.

66" 465

BROOKSIDE AVENUE

AVE.

CHANNEL

b=8' d=6' 1560

b=8' d=6' 1505

$4,378,000
CREEK

b=12'
SS=VERT.
2160

d=6.5'

b=8'

NOBLE CREEK FLOOD PLAIN

VISTAS SPECIFIC PLAN

LIMIT OF STUDY

AVE.

OAK VALLEY SPECIFIC PLAN

$144,000
LINE 7

36" 105

39" 95

b=8'
d=7'
2160

b=8'
d=7.5'

$142,000
LINE 6

16th ST.

33" 70

30"

$152,000
LINE IIA

30" 50

39" 105

45" 130

51" 195

MARSHALL

d=7.5'

b=8'
2550

$1,085,000
LINE II

54" 215

$295,000
LINE 5

33" 100

36" 80

33"

d=7.5'

$881,000

57" 240

60" 260

b=10'
d=7.5'
2780

$497,000
LINE 4

NOBLE

14th STREET

42" 175

42" 140

36"

EXHIBIT B

POST CONSTRUCTION FLOOD PLAIN MAP

LIMIT OF STUDY

SCALE : 1" = 500'

$122,000
LINE IIB

36" 80

39" 90

b=5'
d=5'
475

b=7'

C. FLOODPLAIN STUDY

NOBLE CREEK VISTAS SPECIFIC PLAN
DRAFT ENVIRONMENTAL IMPACT REPORT

Floodplain Study
HEC-RAS Calculations & Cross-Sections

Gable, Cook & Becklund, Inc.
125 W. La Cadena Drive, Suite A
Riverside, CA 92501
909.788.8092

June 2001

Existing Condition
HEC-RAS Calculations & Cross-Sections

HEC-RAS Plan: Ex Cond Sub Reach: 1 11/28/98

River Sta.	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
	(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
1000	12270.00	2486.00	2491.75	2491.75	2493.68	0.007990	11.26	1115.46	289.03	0.98
1540	12270.00	2494.00	2498.02	2498.02	2499.71	0.008015	10.95	1222.86	362.77	0.98
1960	12270.00	2500.00	2506.94	2506.94	2509.17	0.008601	13.55	1155.89	346.60	1.06
2310	12270.00	2509.00	2514.24	2514.24	2515.18	0.004889	9.86	2047.06	998.95	0.79
2750	12270.00	2516.00	2519.37	2519.37	2520.25	0.014421	8.99	1646.53	1023.61	1.16
3110	12270.00	2524.00	2529.04	2529.04	2529.71	0.004233	8.41	2512.44	1548.54	0.72
3580	12270.00	2532.00	2538.22	2538.22	2539.07	0.004545	9.36	2175.44	1118.77	0.76
3950	12270.00	2542.00	2546.65	2546.65	2547.40	0.006509	9.35	2117.99	1301.60	0.87
4160	12270.00	2547.30	2553.06	2553.06	2553.79	0.003161	8.43	2541.12	1455.61	0.65
4320	12270.00	2551.50	2555.86	2555.86	2558.87	0.015522	15.04	986.83	405.06	1.36
4690	12270.00	2559.60	2565.71	2565.71	2566.81	0.004718	9.64	1814.10	785.53	0.78
5100	12270.00	2570.30	2575.72	2575.72	2577.04	0.009504	9.26	1330.17	515.88	1.00
5500	12270.00	2579.40	2583.90	2583.90	2585.23	0.006776	10.59	1529.24	587.84	0.91
5910	12270.00	2588.00	2593.17	2593.17	2594.38	0.006023	9.80	1645.97	717.35	0.85
6320	12270.00	2598.00	2602.82	2602.82	2604.42	0.007484	10.80	1378.82	638.33	0.95
6740	12270.00	2607.70	2611.93	2611.93	2613.44	0.009343	10.11	1269.85	442.05	1.02
7140	12270.00	2617.70	2621.80	2621.80	2623.37	0.008620	10.08	1233.59	490.26	0.99
7550	12270.00	2628.00	2632.06	2632.06	2633.39	0.009386	9.28	1322.57	595.42	1.00
7960	12270.00	2637.50	2642.39	2642.39	2643.86	0.008884	9.76	1274.38	566.25	0.99
8370	12270.00	2647.00	2652.02	2652.02	2653.69	0.008737	10.40	1180.15	389.00	1.00
8760	12270.00	2656.00	2660.90	2660.90	2662.82	0.008087	11.11	1108.85	291.27	0.99
9110	12270.00	2664.00	2670.22	2670.22	2672.44	0.006911	12.15	1068.16	249.39	0.95
9420	12270.00	2672.00	2679.77	2679.77	2681.47	0.008406	10.54	1183.49	400.20	0.99
9720	12270.00	2681.60	2692.70	2692.70	2694.04	0.007218	9.95	1447.48	751.63	0.92

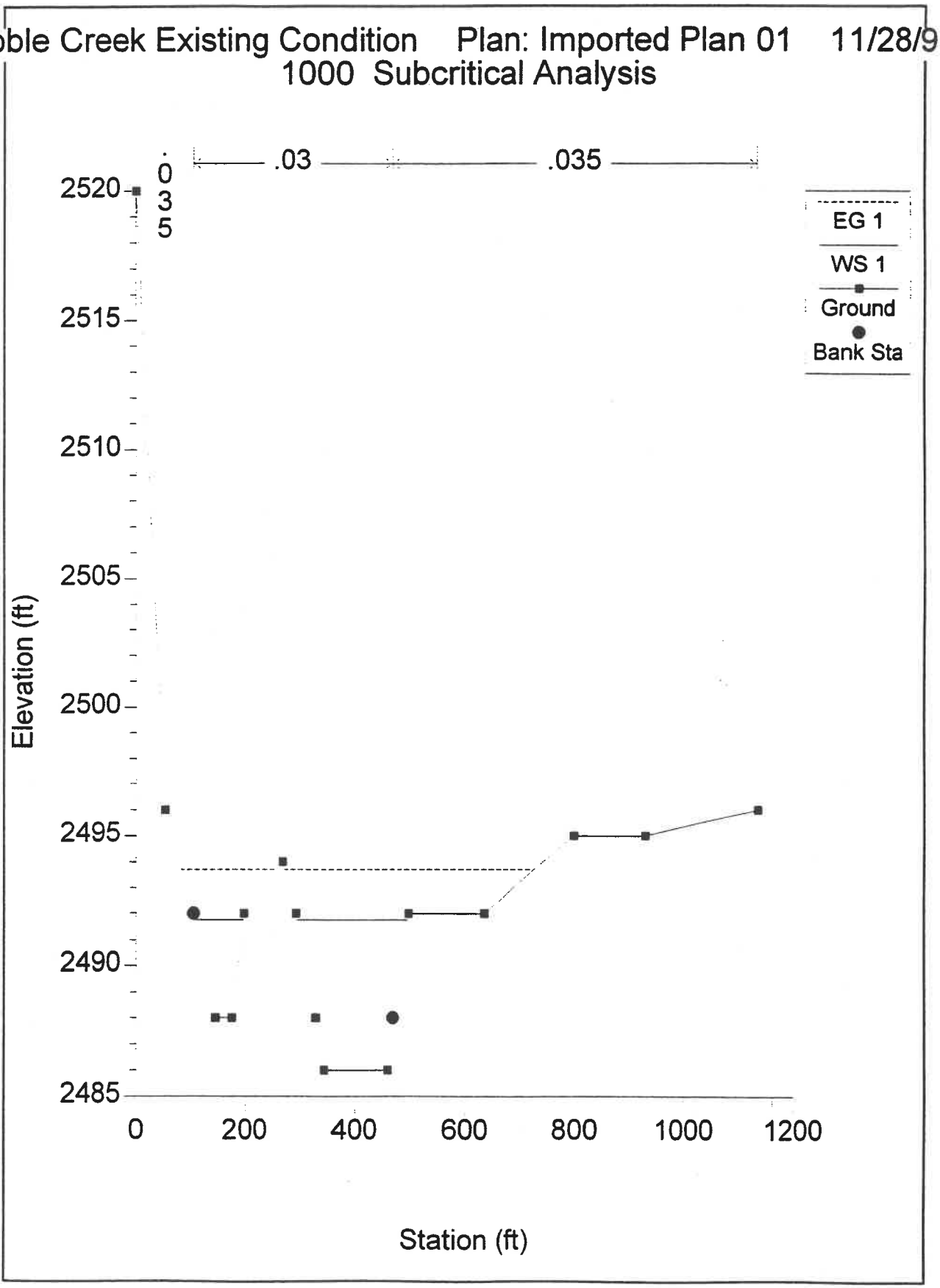
HEC-RAS Plan: Ex Cond Sup Reach: 1 11/28/98

River Sta.	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
	(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
1000	12270.00	2486.00	2491.75	2491.75	2493.68	0.007990	11.26	1115.46	289.03	1.12
1540	12270.00	2494.00	2497.19	2498.02	2500.12	0.018746	14.30	929.97	349.41	1.44
1960	12270.00	2500.00	2505.47	2506.94	2511.61	0.032423	21.66	694.19	280.23	1.96
2310	12270.00	2509.00	2513.94	2514.24	2515.28	0.007143	11.42	1756.51	956.61	0.95
2750	12270.00	2516.00	2518.78	2519.37	2520.74	0.039107	12.56	1098.14	845.89	1.84
3110	12270.00	2524.00	2528.16	2529.04	2531.49	0.021087	16.10	1194.99	1461.51	1.55
3580	12270.00	2532.00	2537.36	2538.22	2540.02	0.015366	15.04	1284.29	950.45	1.35
3950	12270.00	2542.00	2545.66	2546.65	2548.91	0.037149	18.03	1055.57	838.83	1.97
4160	12270.00	2547.30	2551.52	2553.06	2555.83	0.021219	17.38	812.95	381.07	1.58
4320	12270.00	2551.50	2555.36	2555.86	2559.80	0.026772	17.99	798.05	353.41	1.74
4690	12270.00	2559.60	2564.52	2565.71	2568.44	0.020234	16.52	933.87	690.89	1.53
5100	12270.00	2570.30	2575.06	2575.71	2577.37	0.020994	12.20	1006.04	458.86	1.44
5500	12270.00	2579.40	2583.03	2583.90	2586.08	0.019645	15.42	1031.54	551.36	1.49
5910	12270.00	2588.00	2591.95	2593.17	2595.71	0.026643	16.31	892.50	518.13	1.69
6320	12270.00	2598.00	2601.94	2602.82	2605.12	0.019431	14.78	926.63	407.96	1.47
6740	12270.00	2607.70	2611.22	2611.93	2613.81	0.021326	13.21	965.69	413.61	1.48
7140	12270.00	2617.70	2620.72	2621.80	2624.22	0.029902	15.01	817.47	363.82	1.74
7550	12270.00	2628.00	2631.65	2632.06	2633.50	0.016021	10.94	1121.93	486.46	1.27
7960	12270.00	2637.50	2641.06	2642.39	2645.65	0.051097	17.20	713.57	386.34	2.19
8370	12270.00	2647.00	2652.02	2652.02	2653.69	0.008737	10.40	1180.15	389.00	104.73
8760	12270.00	2656.00	2659.59	2660.90	2663.89	0.030111	16.64	737.35	273.41	1.79
9110	12270.00	2664.00	2668.64	2670.22	2673.68	0.024212	18.08	695.04	224.64	1.68
9420	12270.00	2672.00	2677.88	2679.77	2685.13	0.048274	21.60	567.96	214.43	2.27
9720	12270.00	2681.60	2691.19	2692.70	2695.10	0.020007	16.48	819.31	427.26	1.52

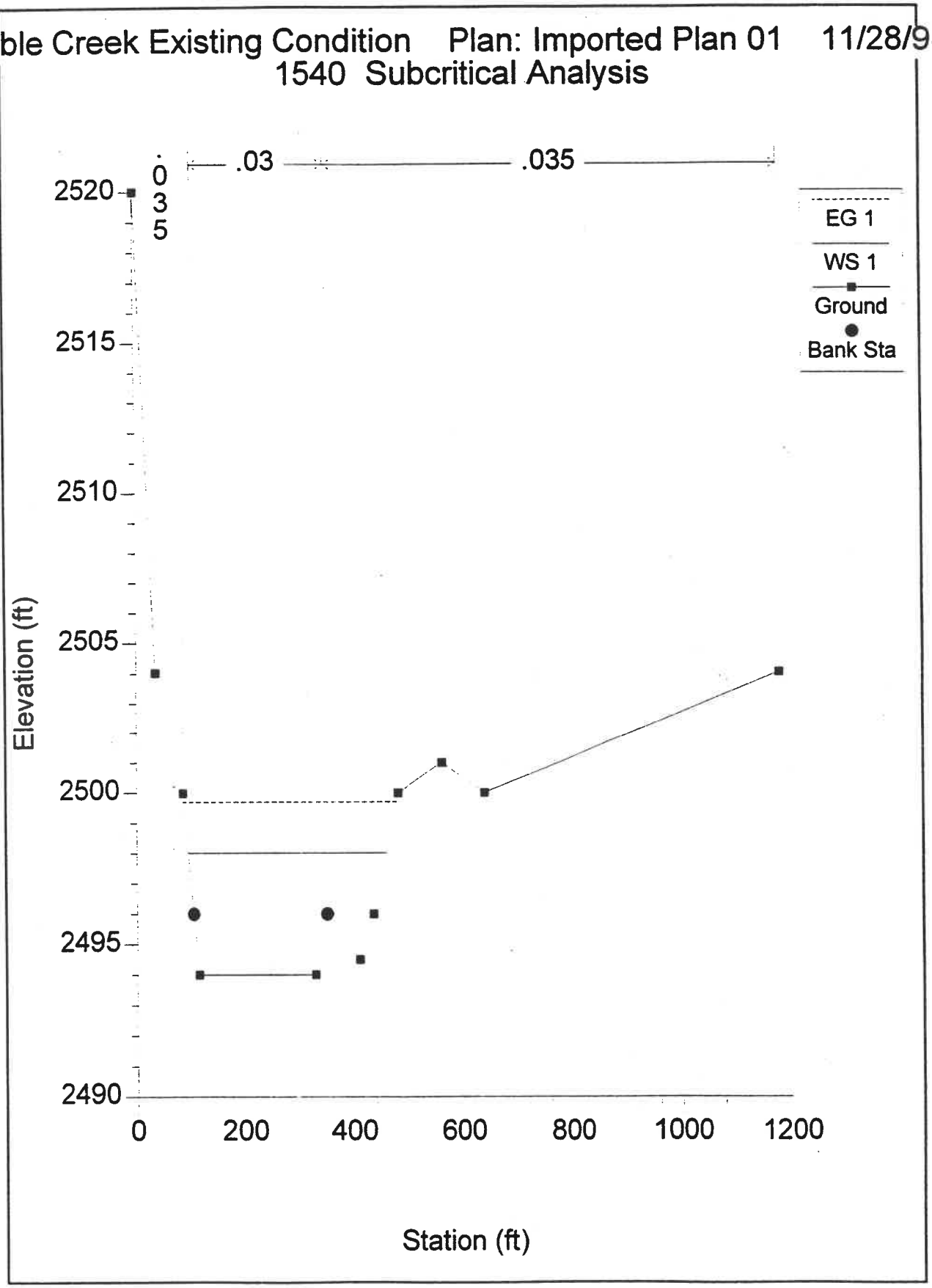
APPENDIX A

EXISTING CONDITION HEC-RAS CALCULATIONS & CROSS-SECTIONS FROM OAK VALLEY FLOOD STUDY

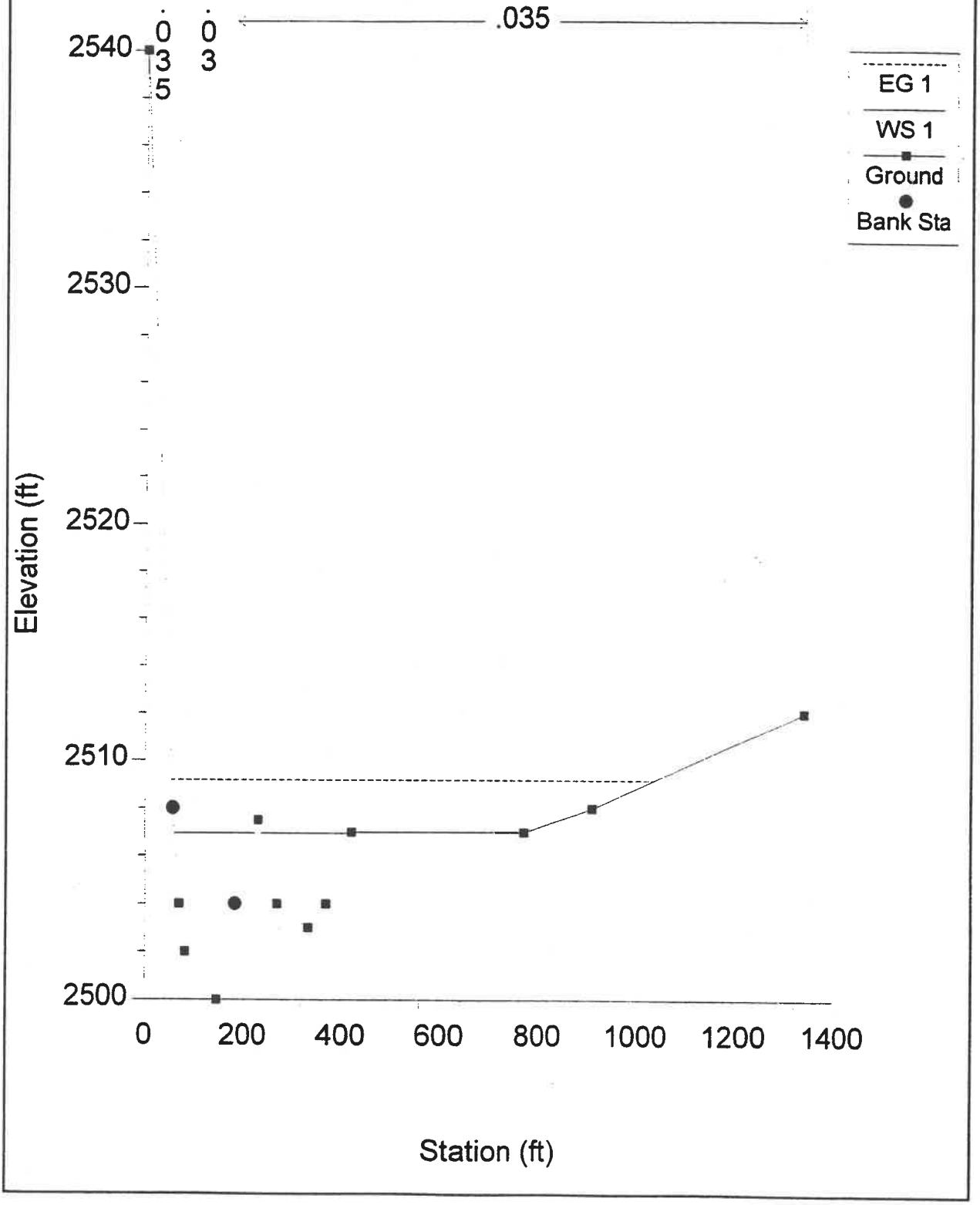
Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
1000 Subcritical Analysis



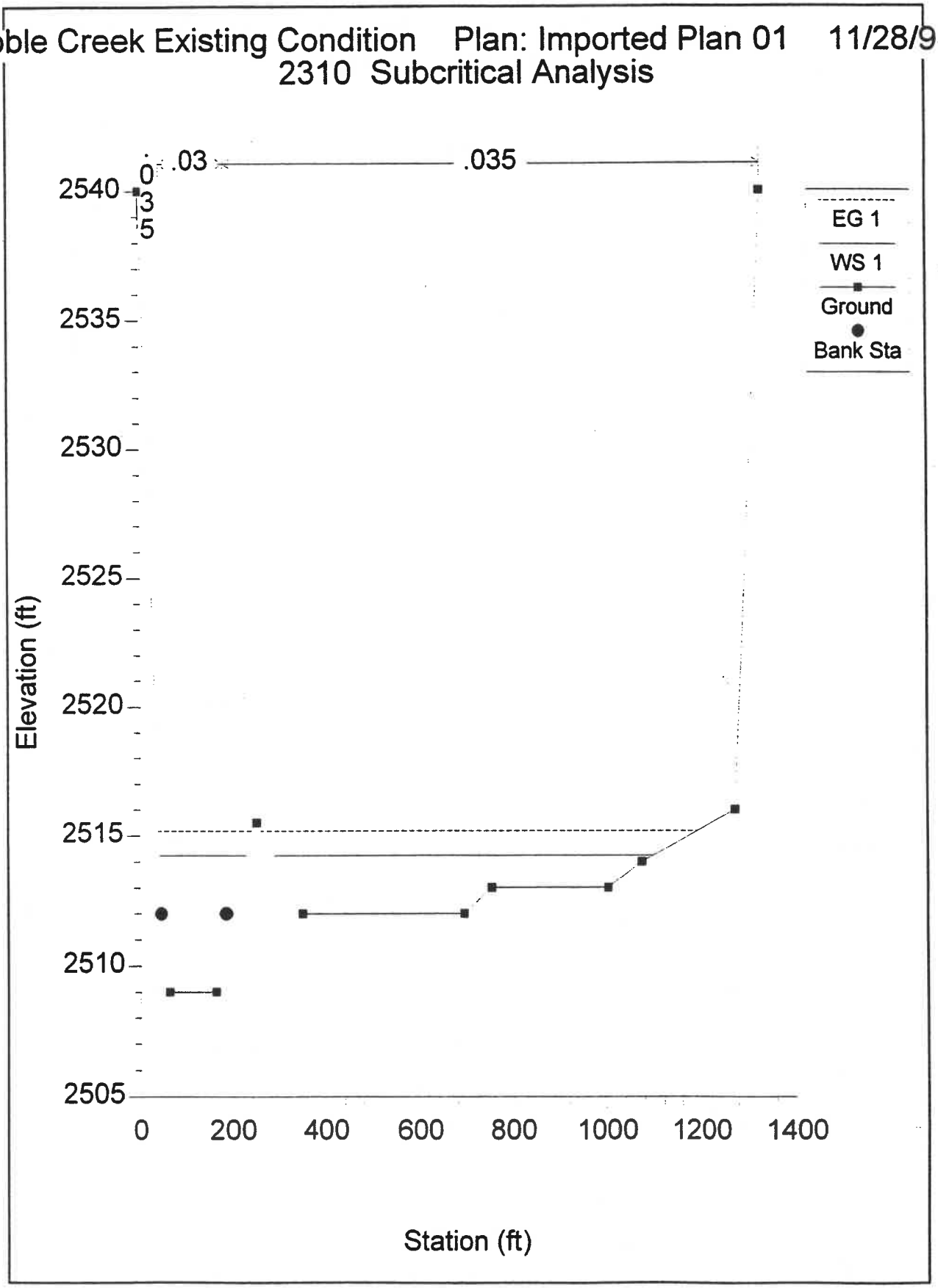
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1540 Subcritical Analysis



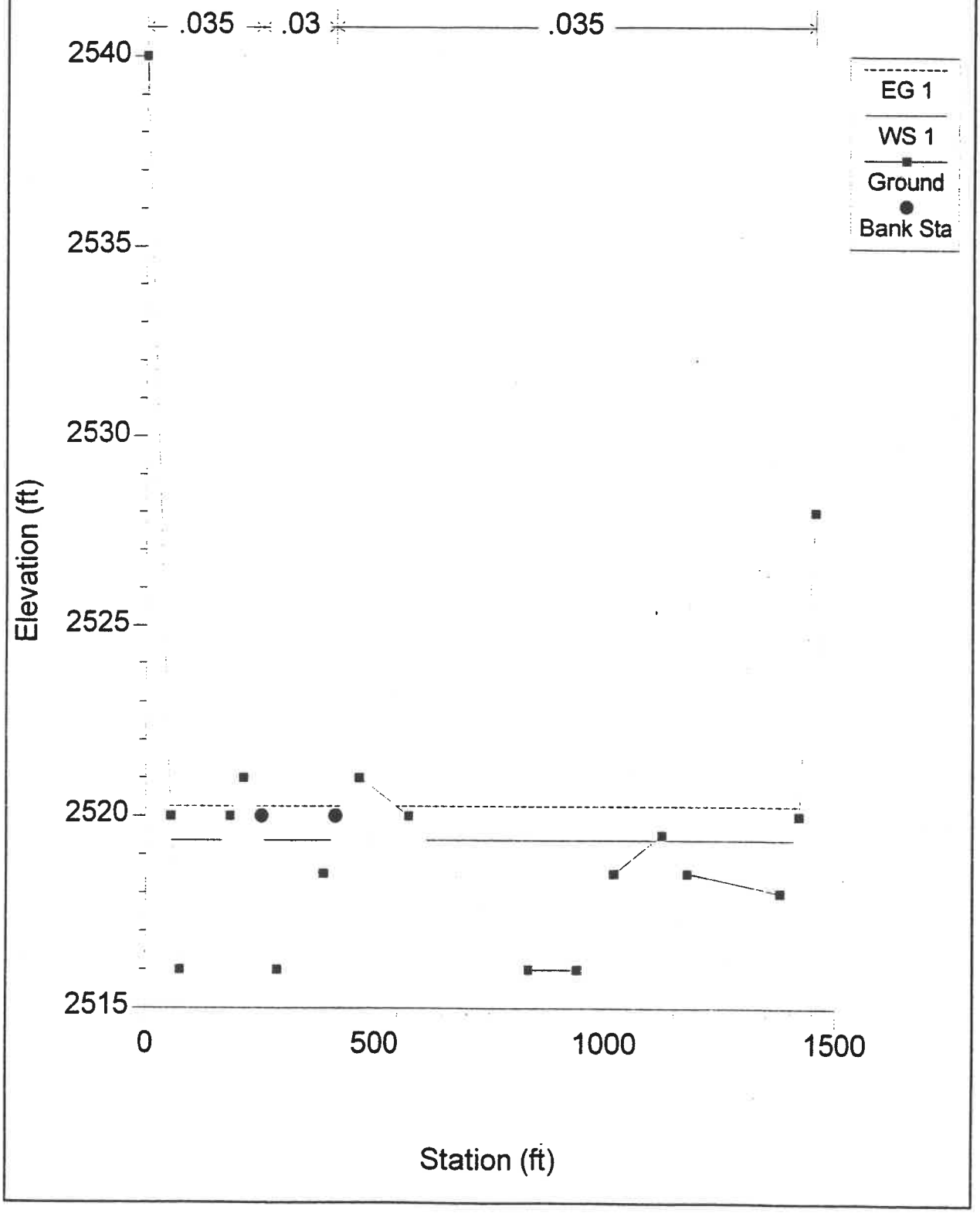
Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
1960 Subcritical Analysis

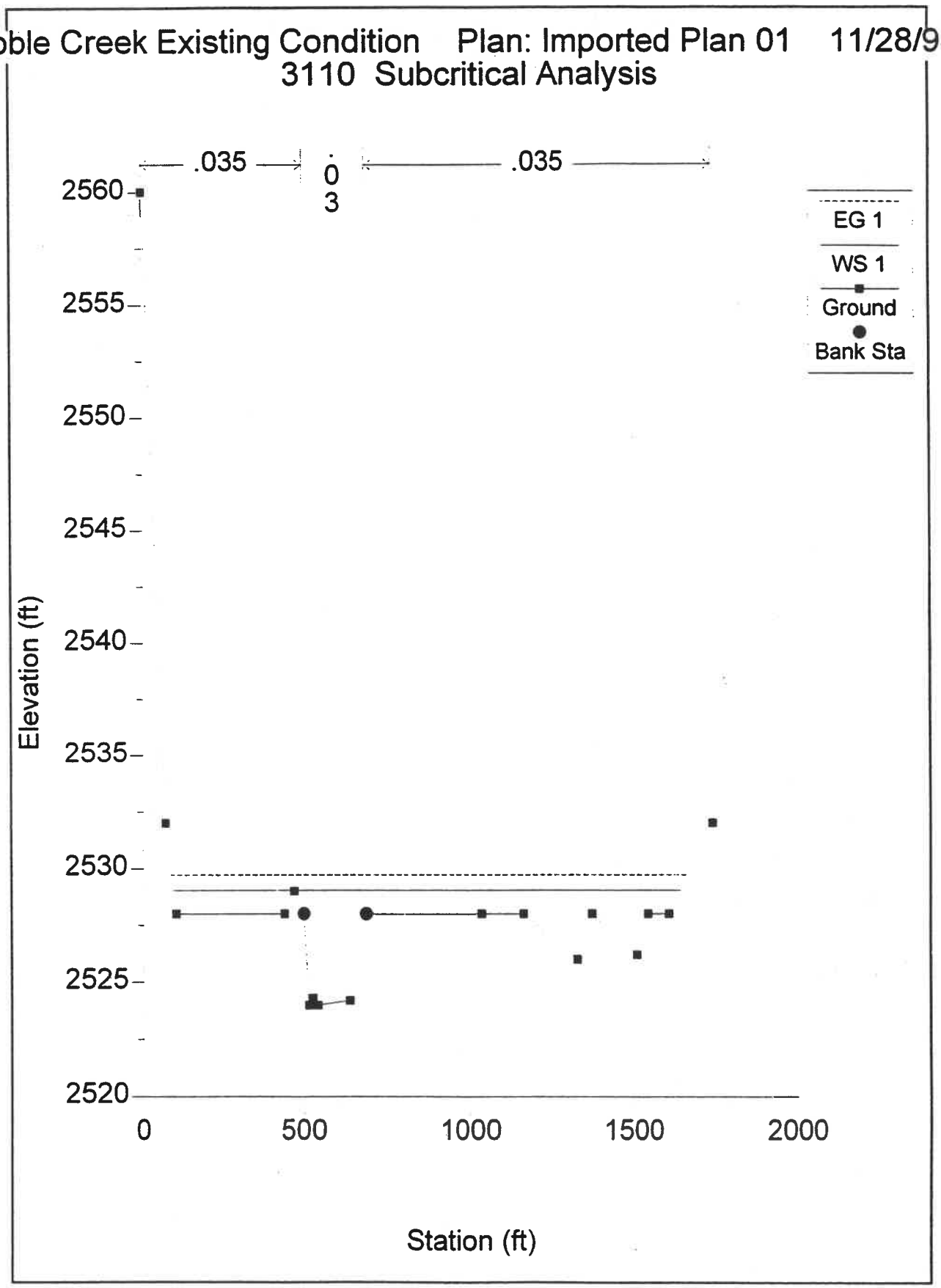


Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
2310 Subcritical Analysis

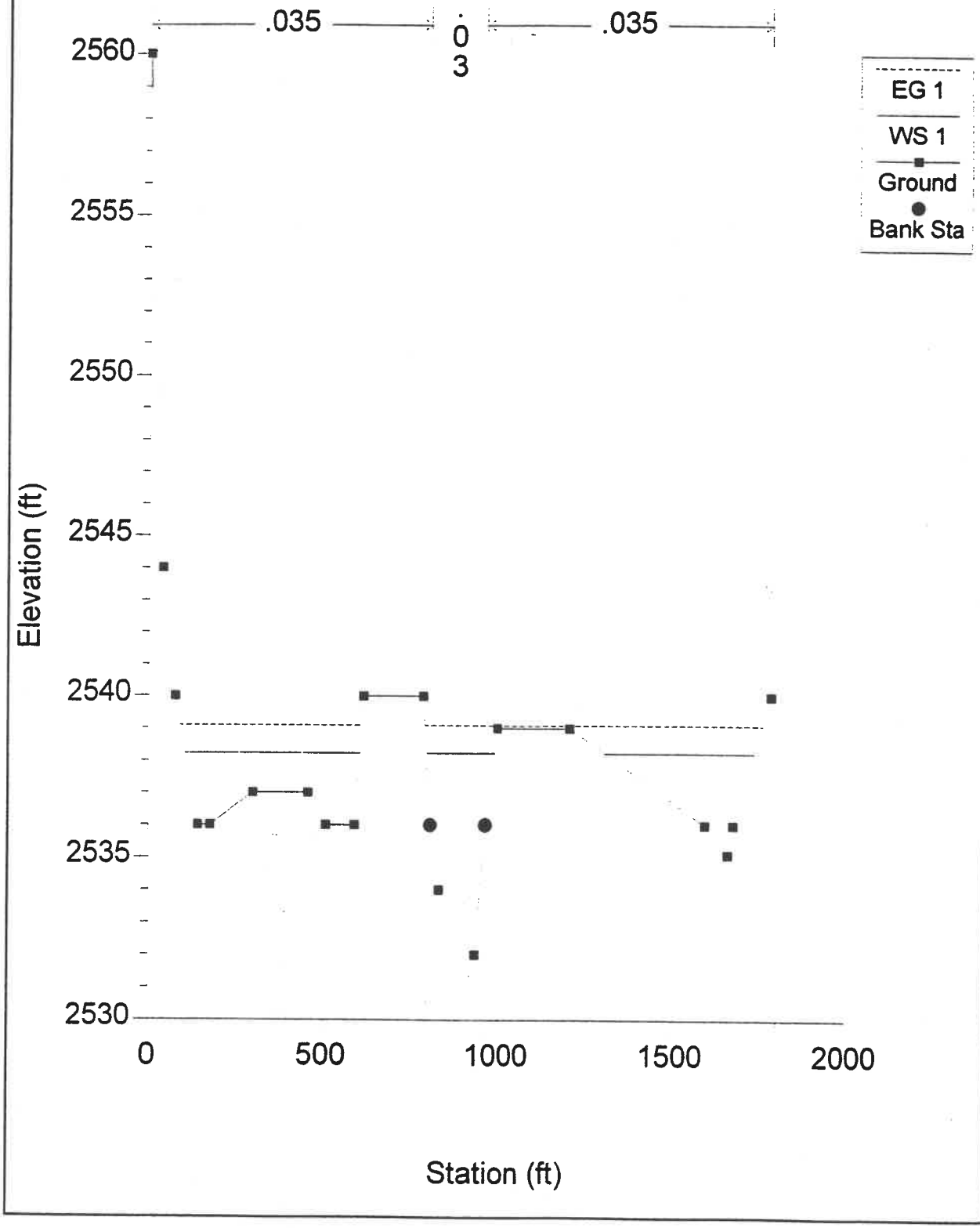


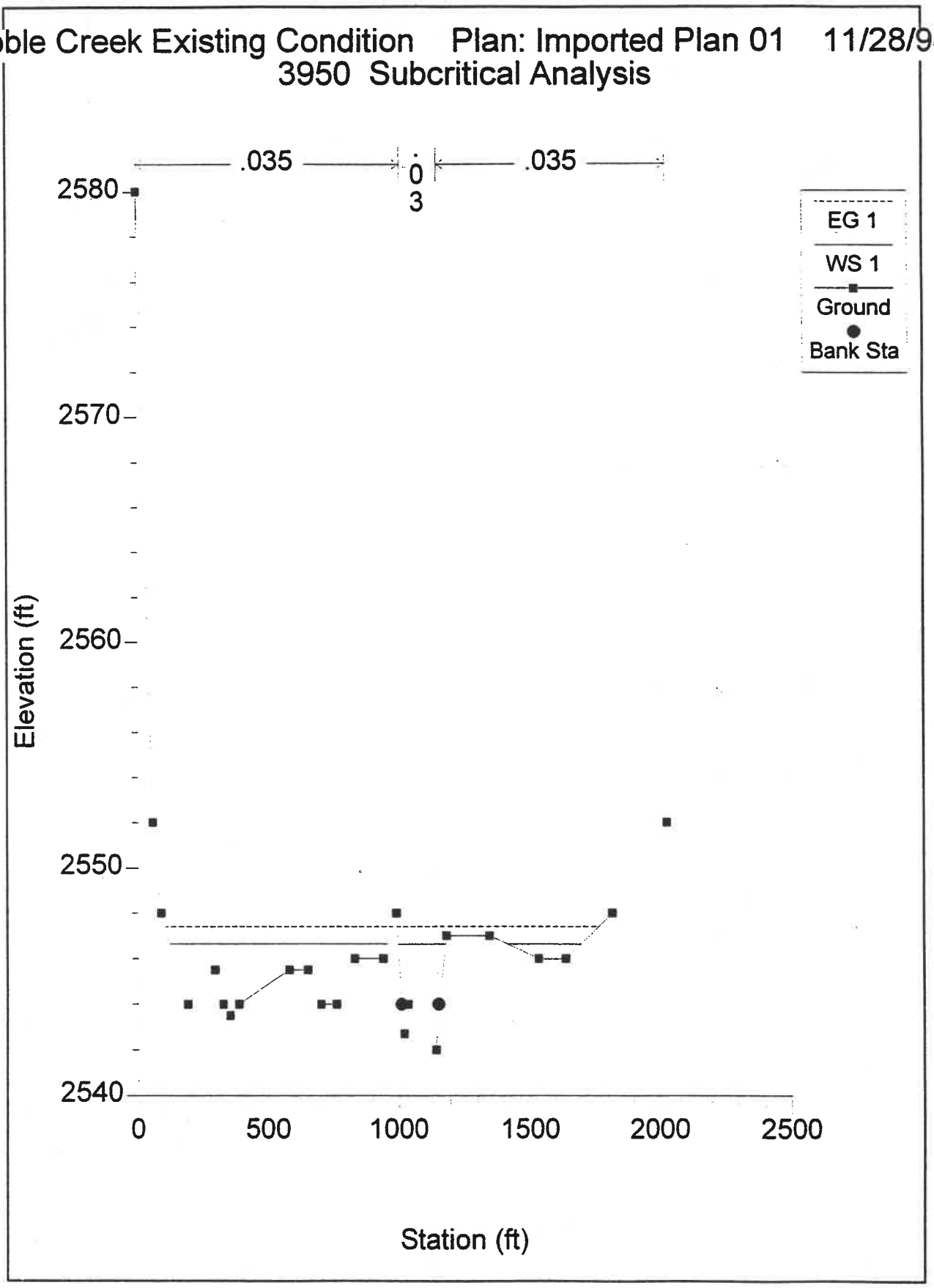
Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
2750 Subcritical Analysis



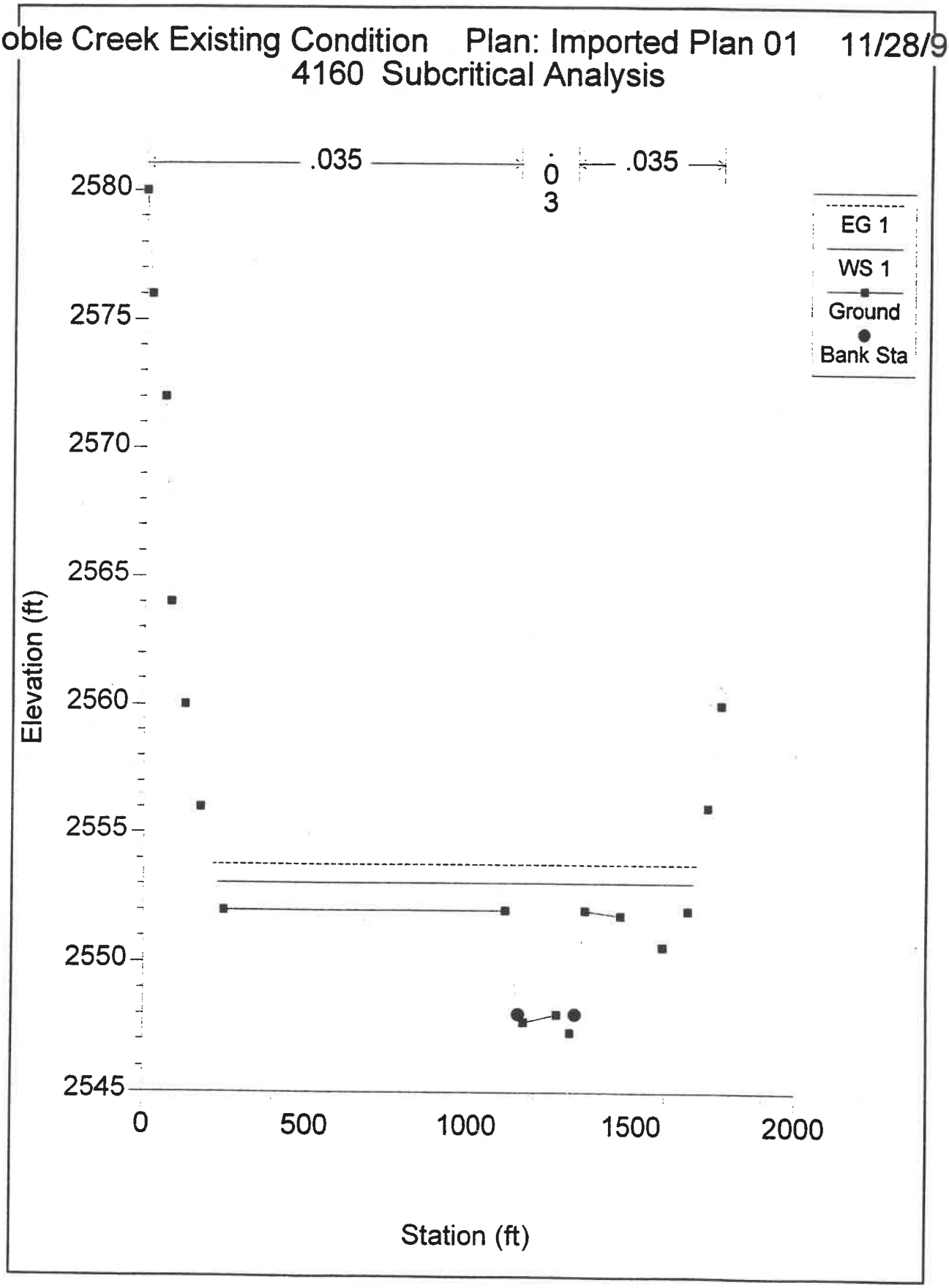

Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
3110 Subcritical Analysis
.035
.035
0
3
EG 1
WS 1
Ground
Bank Sta
2560
2555
2550
2545
2540
2535
2530
2525
2520
Elevation (ft)
0
500
1000
1500
2000
Station (ft)

Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
3580 Subcritical Analysis

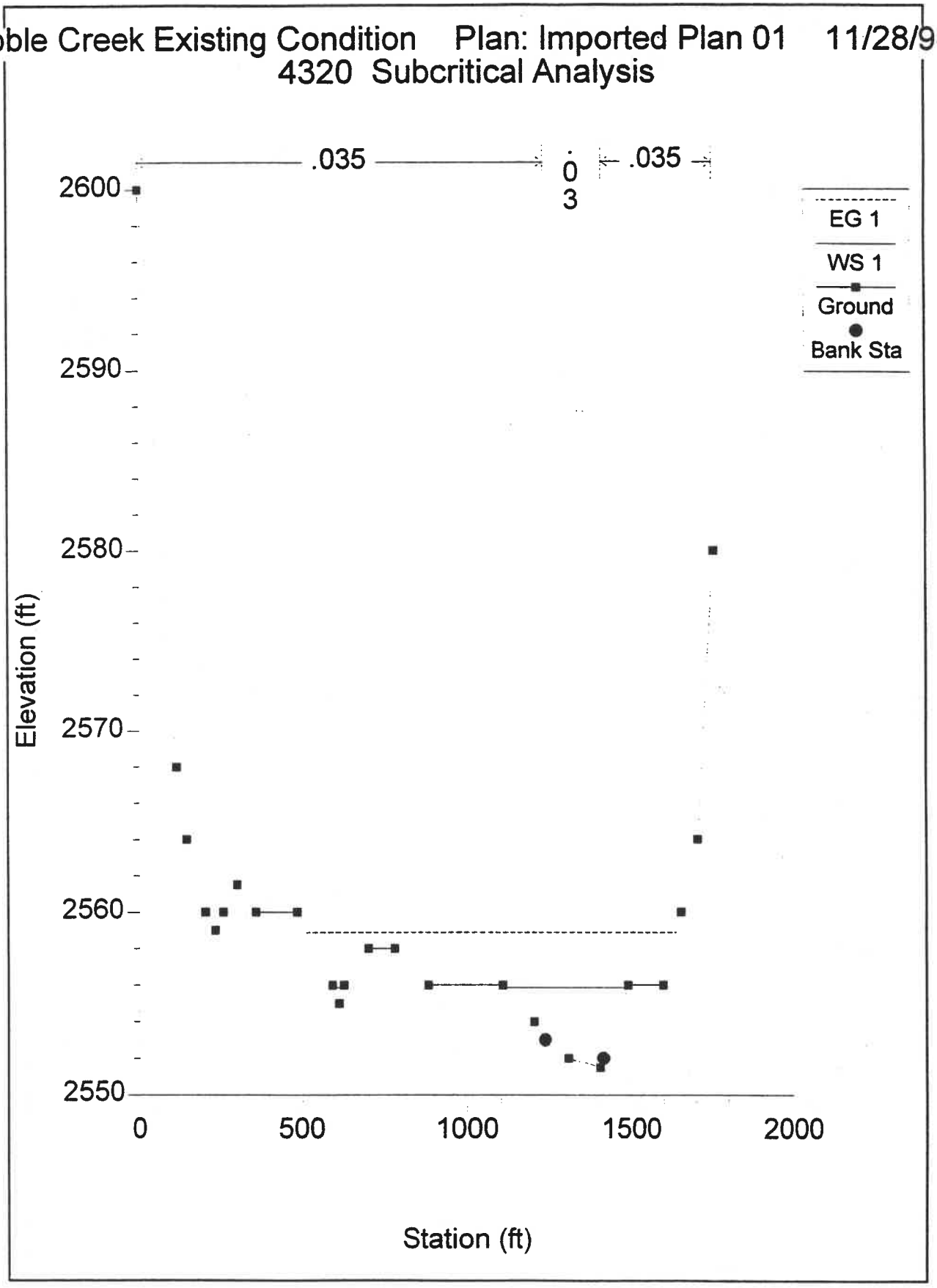



Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
3950 Subcritical Analysis
.035
.035
0.03
EG 1
WS 1
Ground
Bank Sta
2580
2570
2560
2550
2540
Elevation (ft)
0
500
1000
1500
2000
2500
Station (ft)

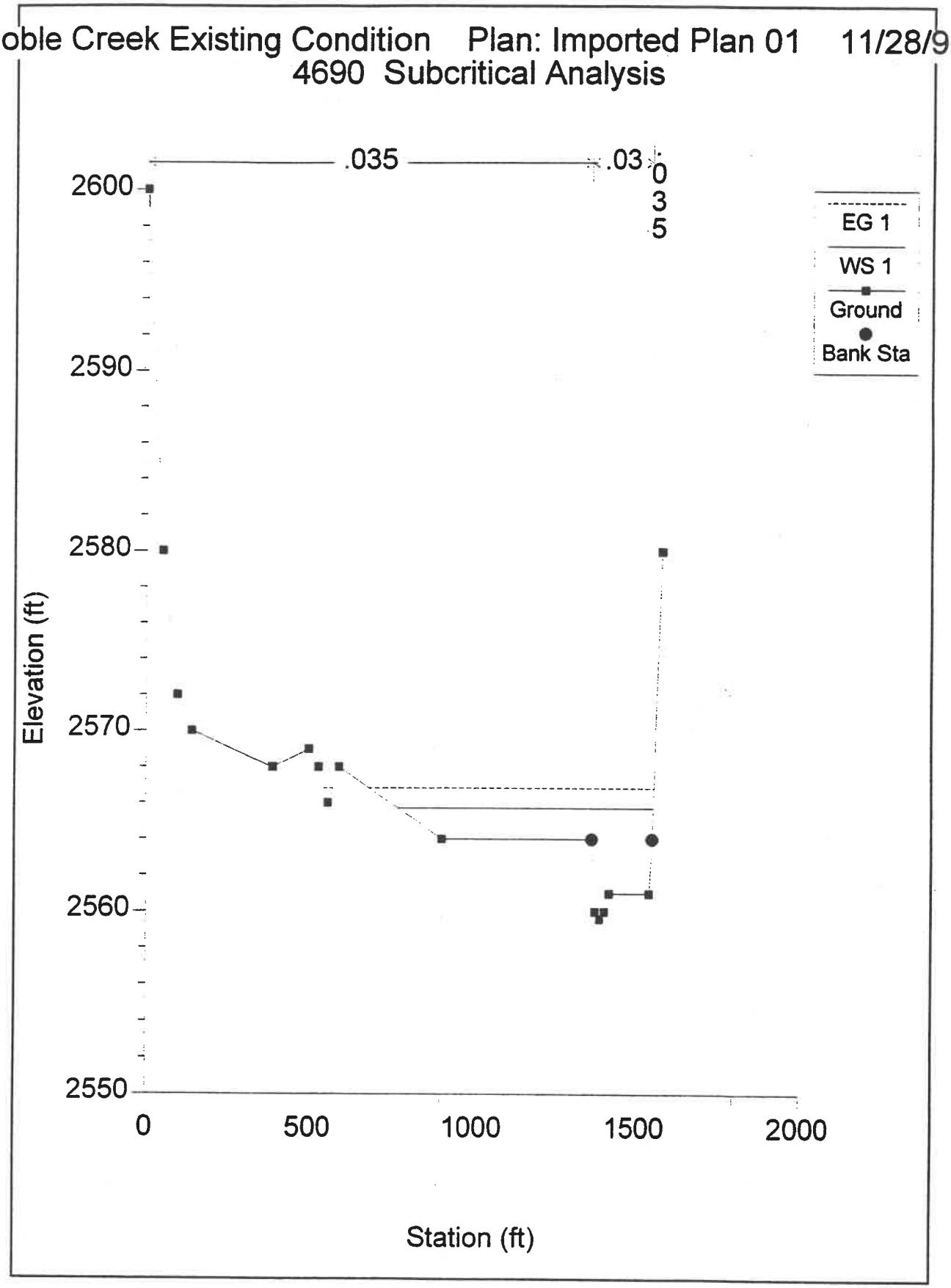
Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
4160 Subcritical Analysis



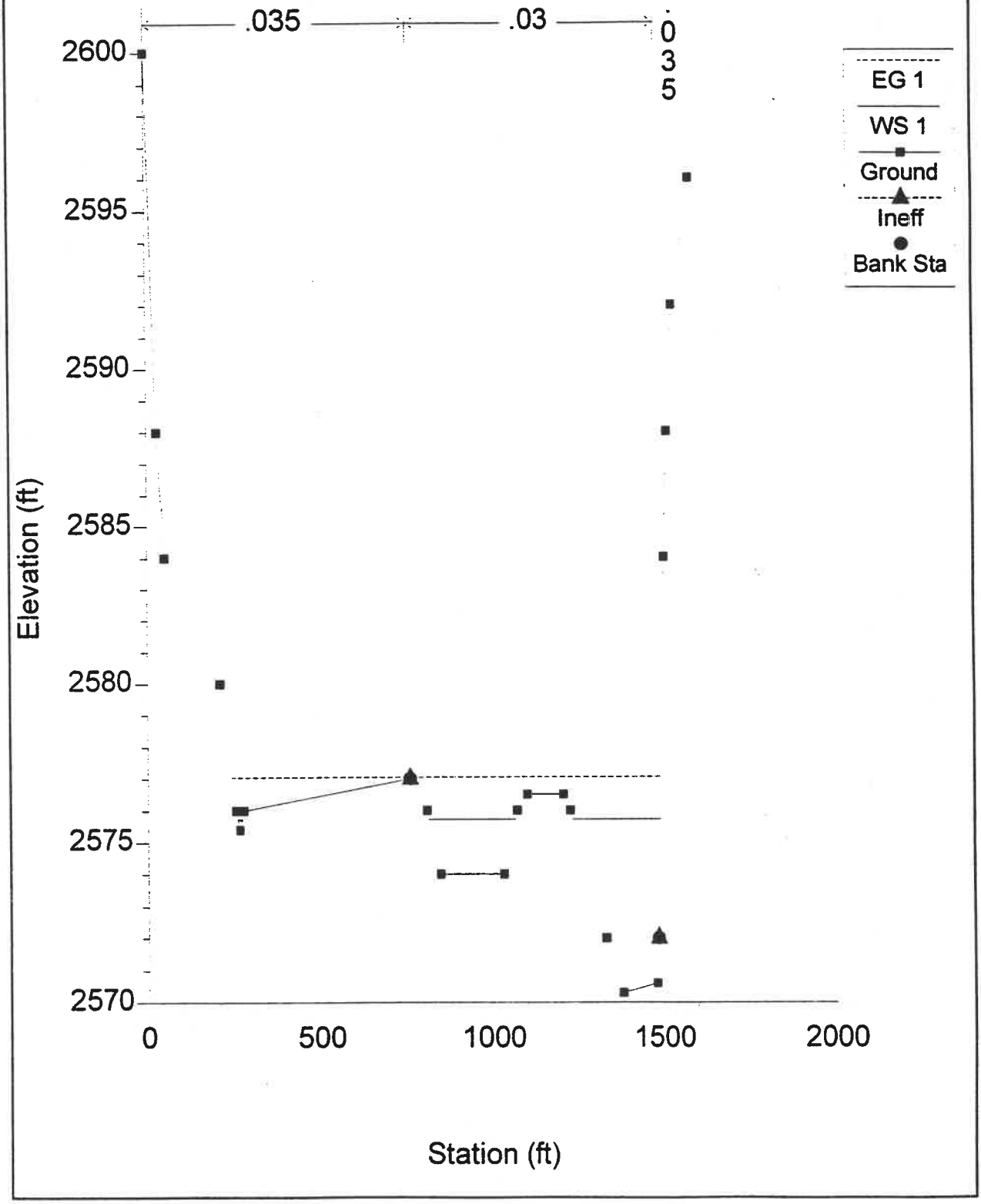
Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
4320 Subcritical Analysis



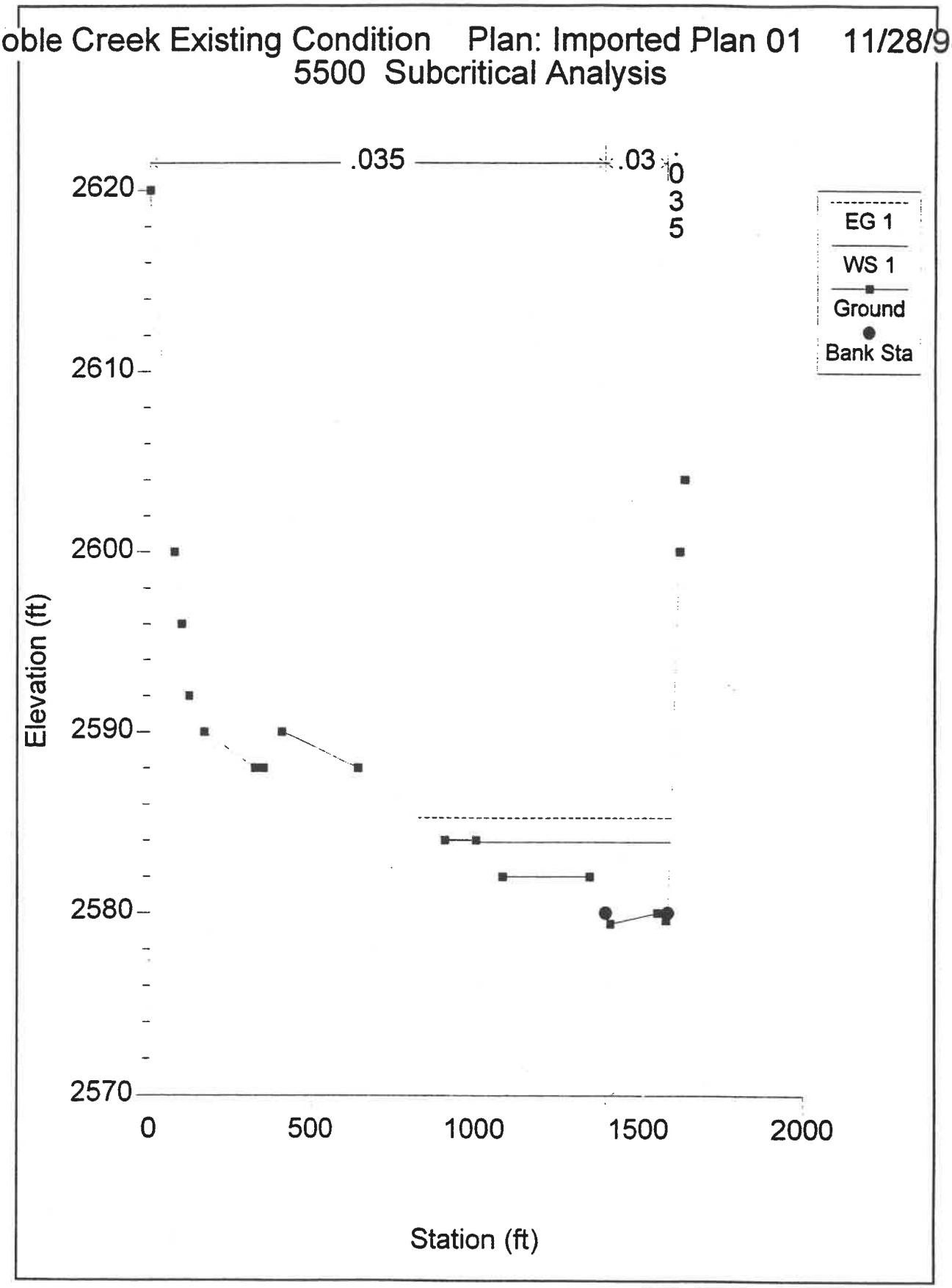
Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
4690 Subcritical Analysis



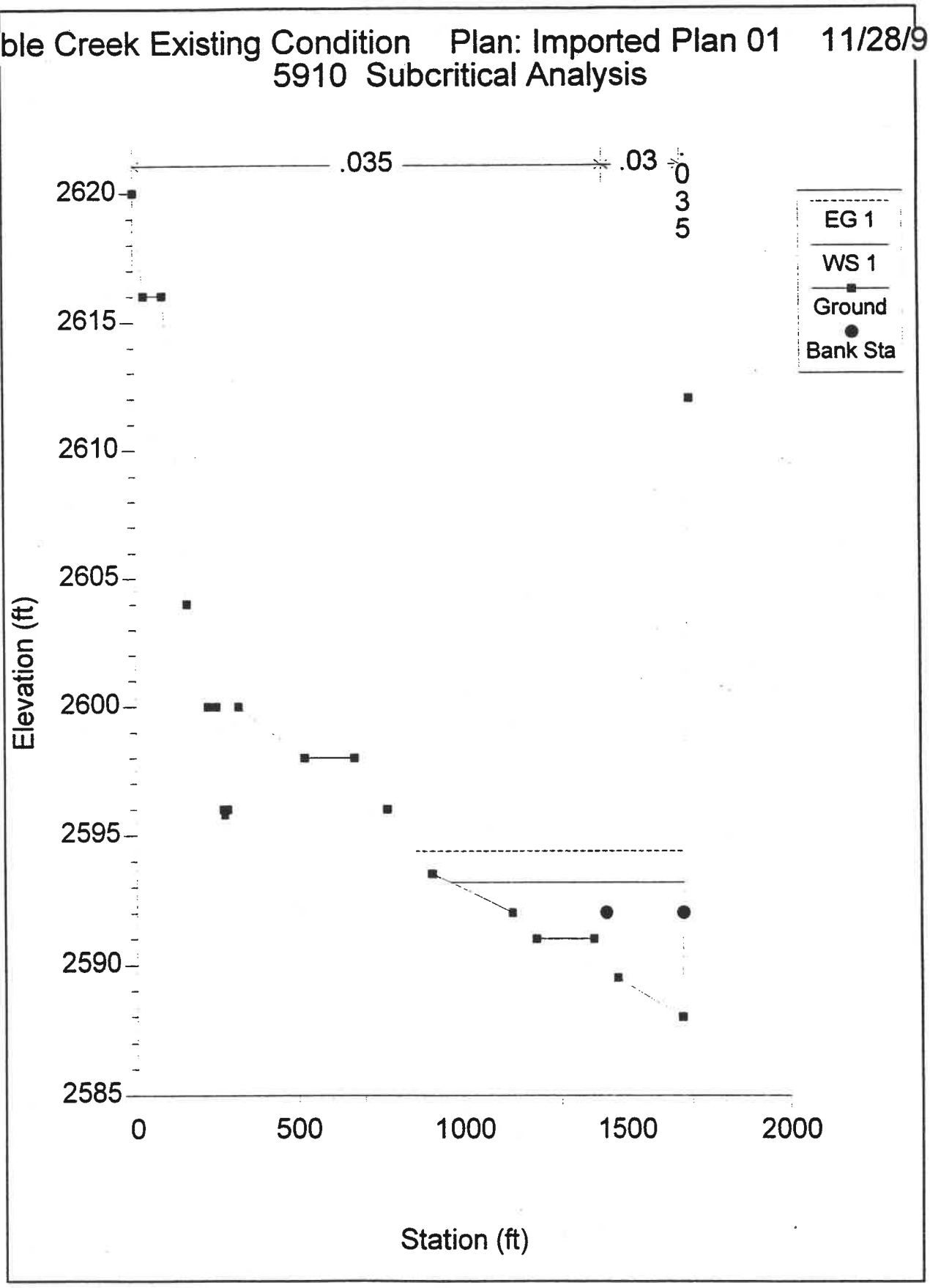
Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
5100 Subcritical Analysis



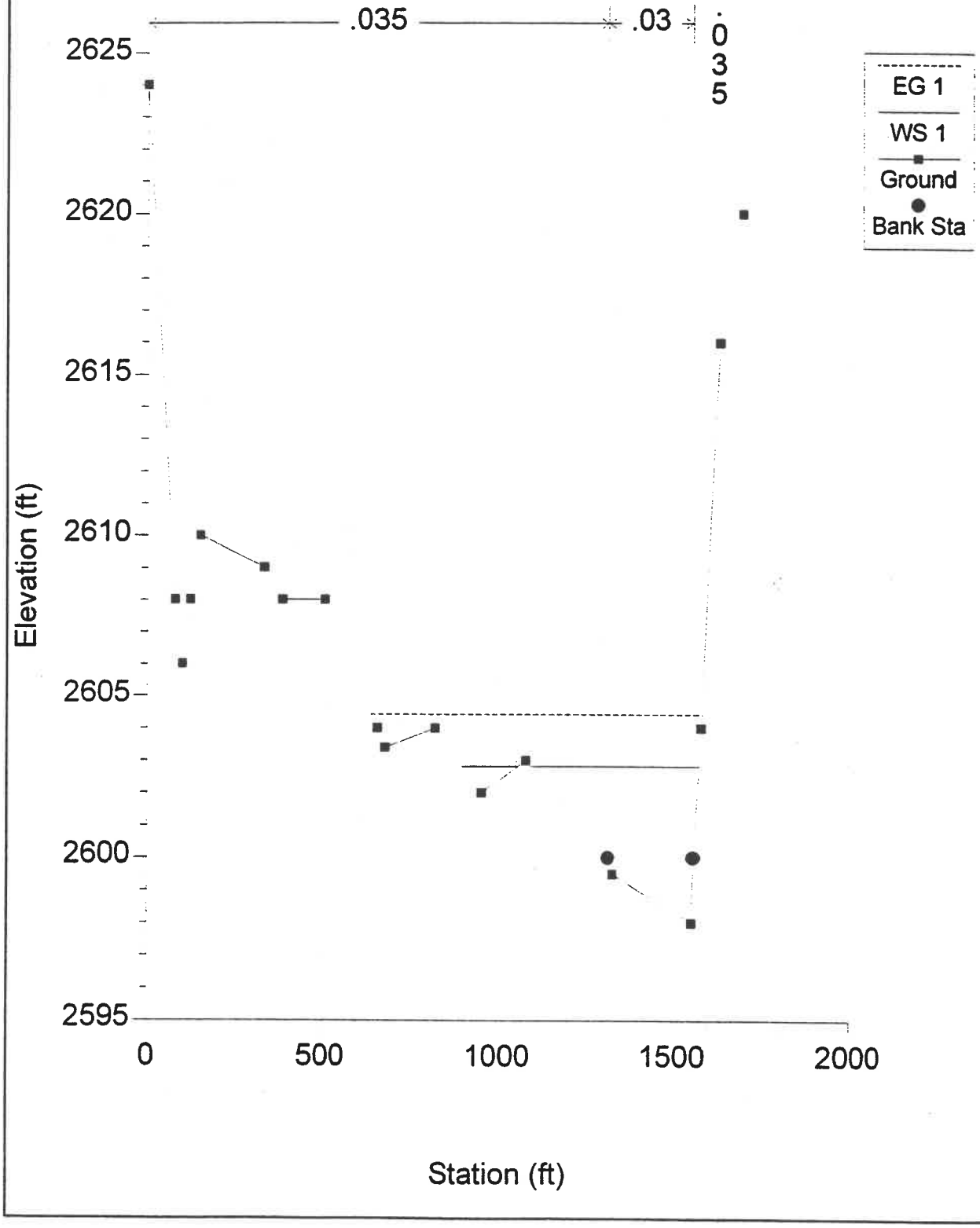
Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
5500 Subcritical Analysis



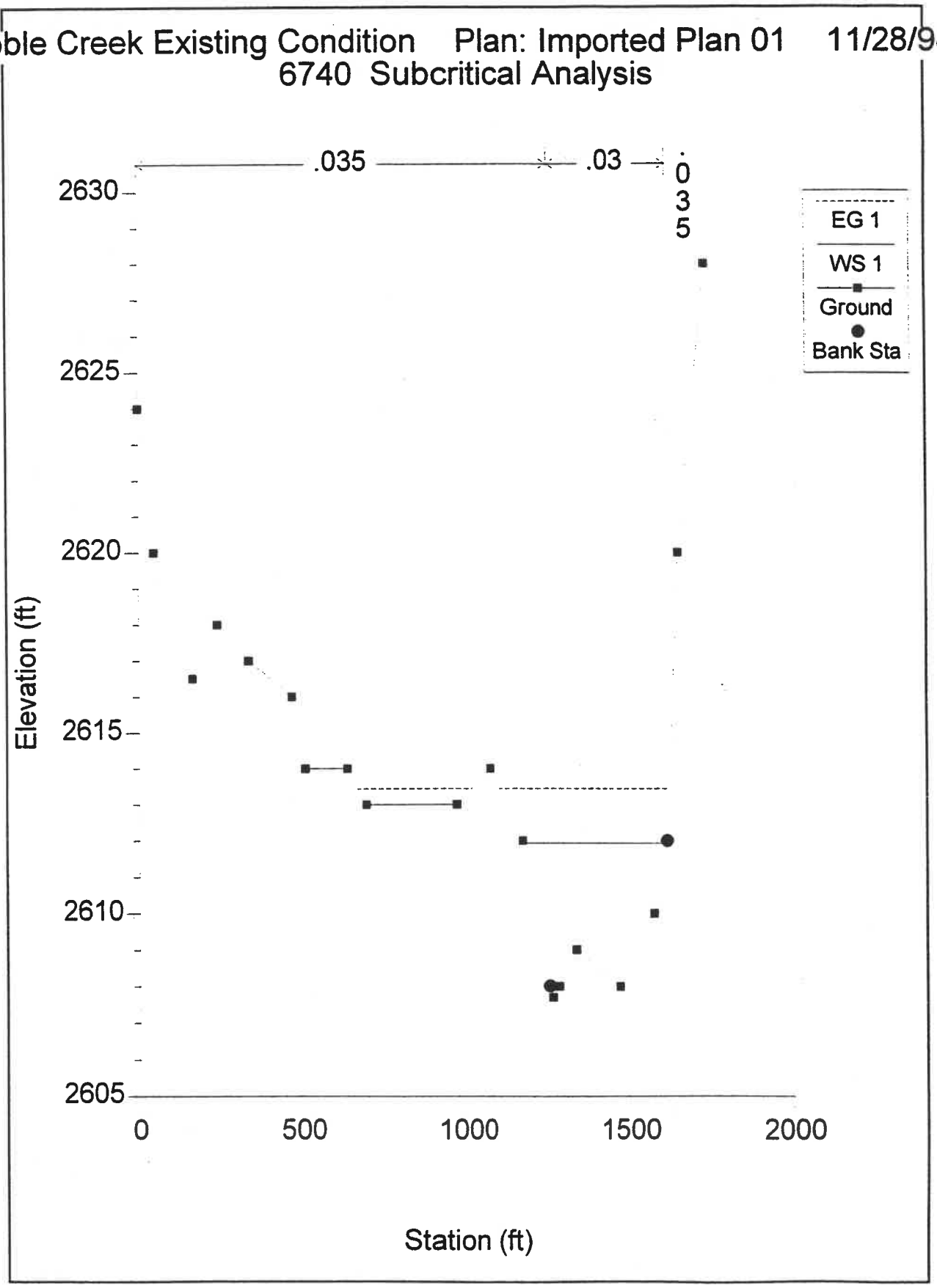
Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
5910 Subcritical Analysis



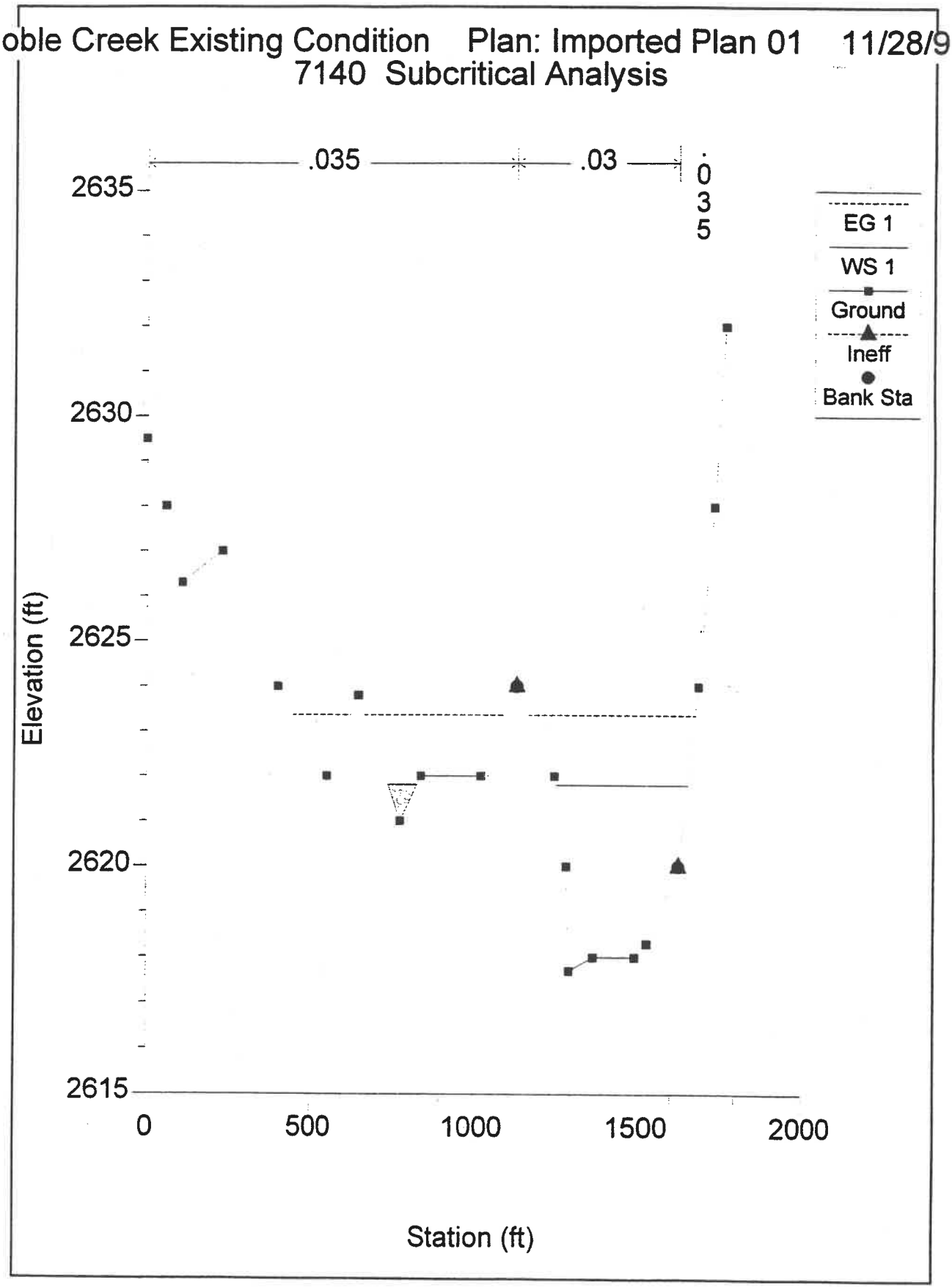
Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
6320 Subcritical Analysis

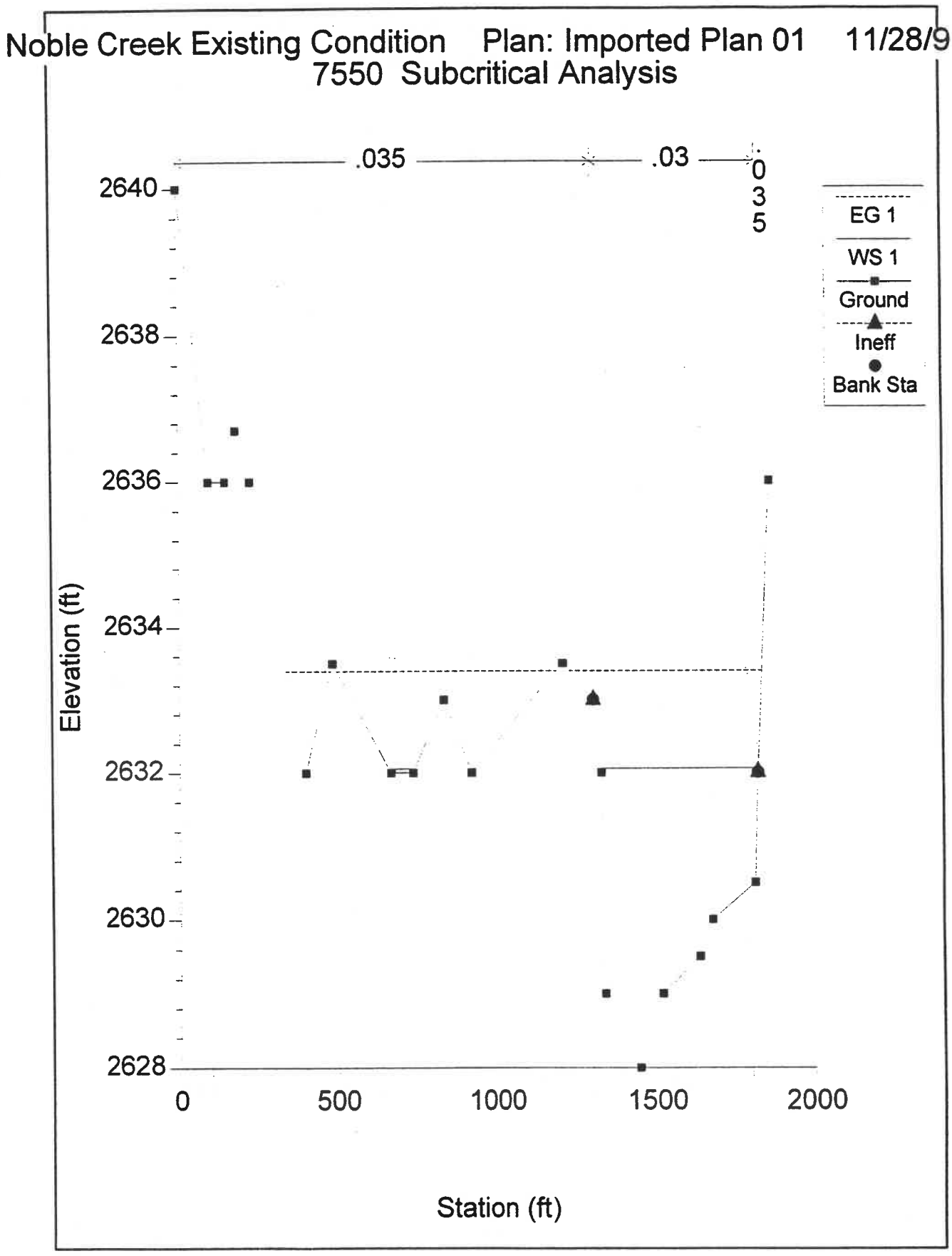


Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
6740 Subcritical Analysis

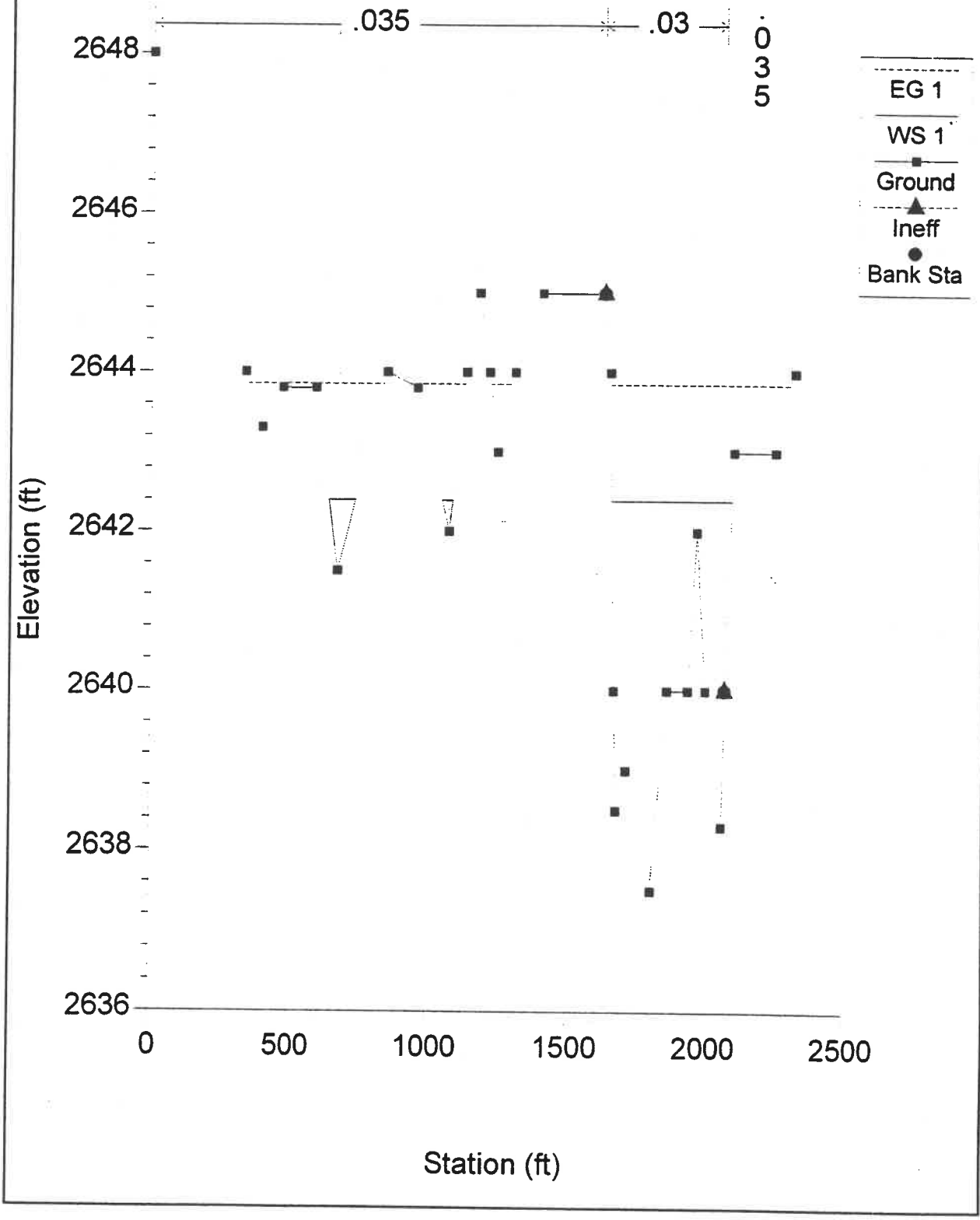


Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
7140 Subcritical Analysis

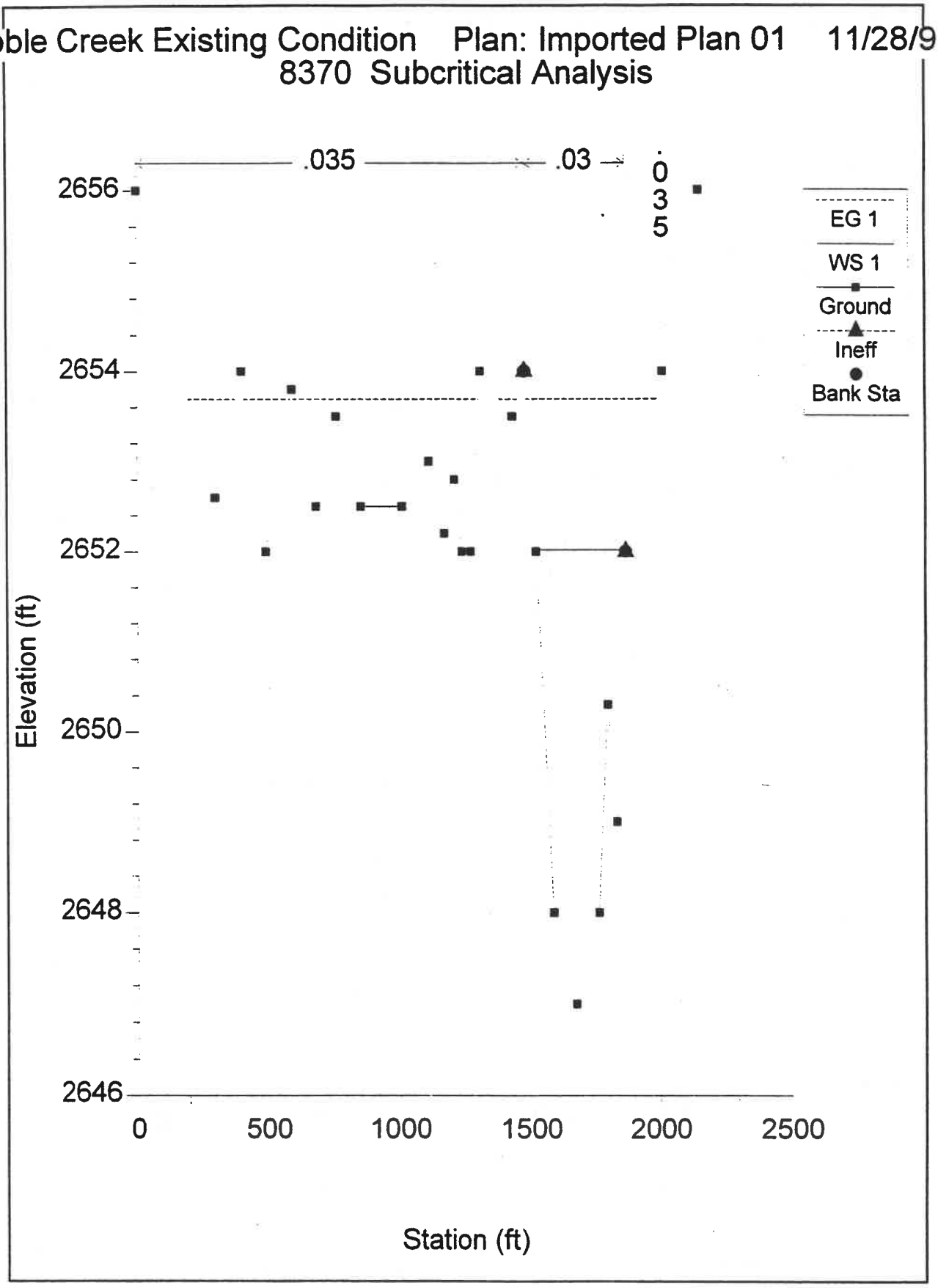



Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
7550 Subcritical Analysis
.035
.03
0
3
5
EG 1
WS 1
Ground
Ineff
Bank Sta
2640
2638
2636
2634
2632
2630
2628
Elevation (ft)
0
500
1000
1500
2000
Station (ft)

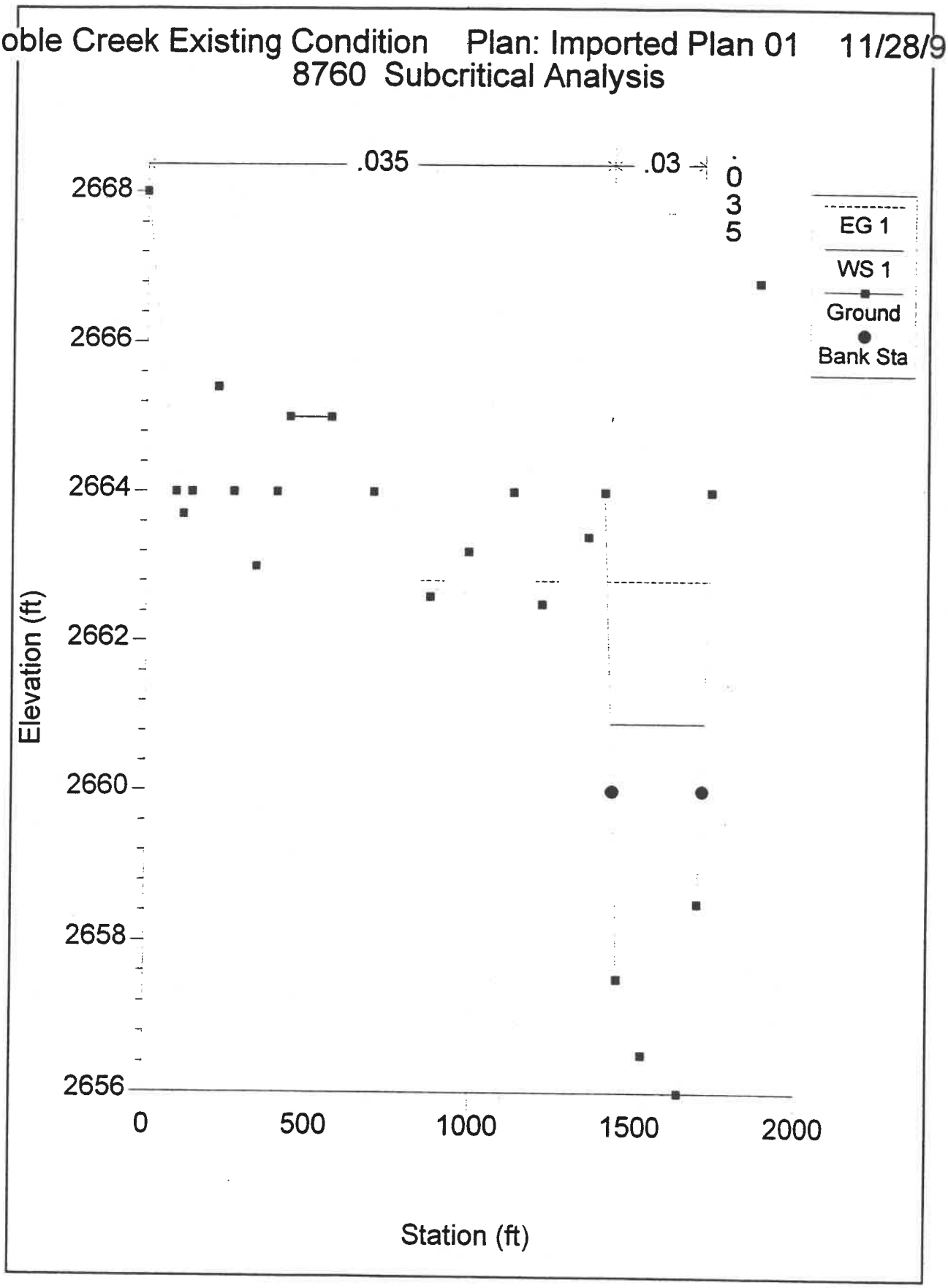
Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
7960 Subcritical Analysis



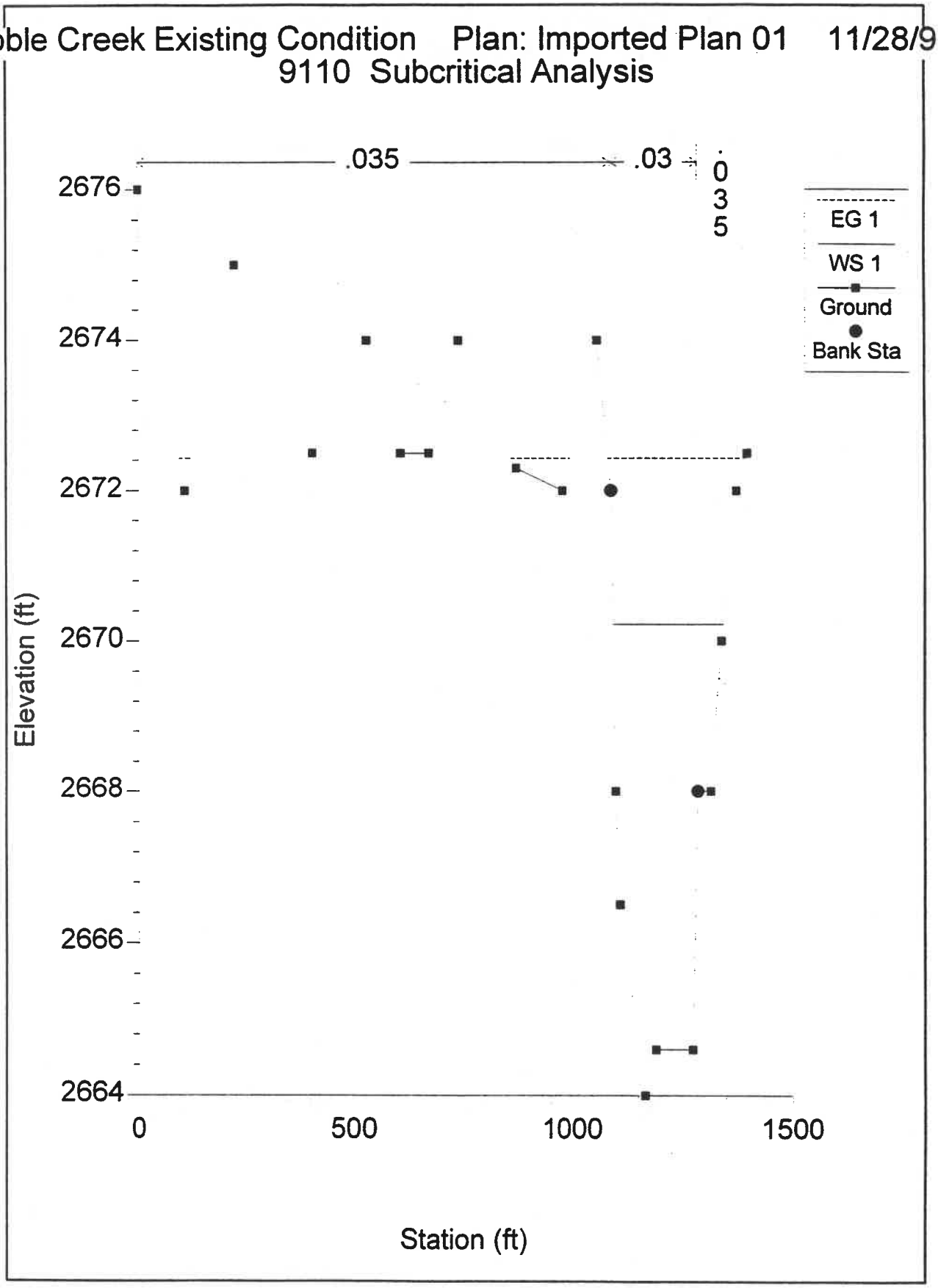
Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
8370 Subcritical Analysis



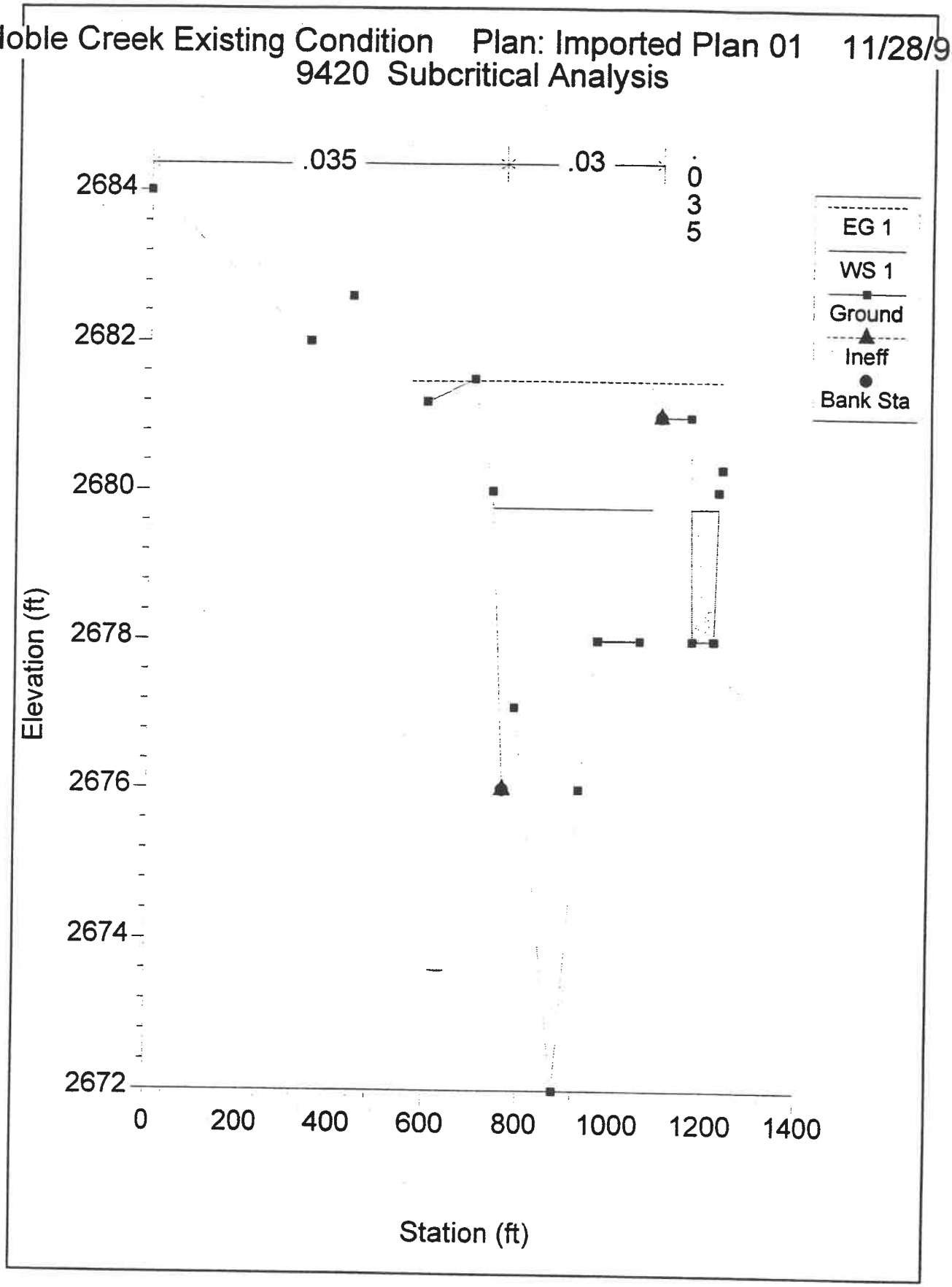
Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
8760 Subcritical Analysis



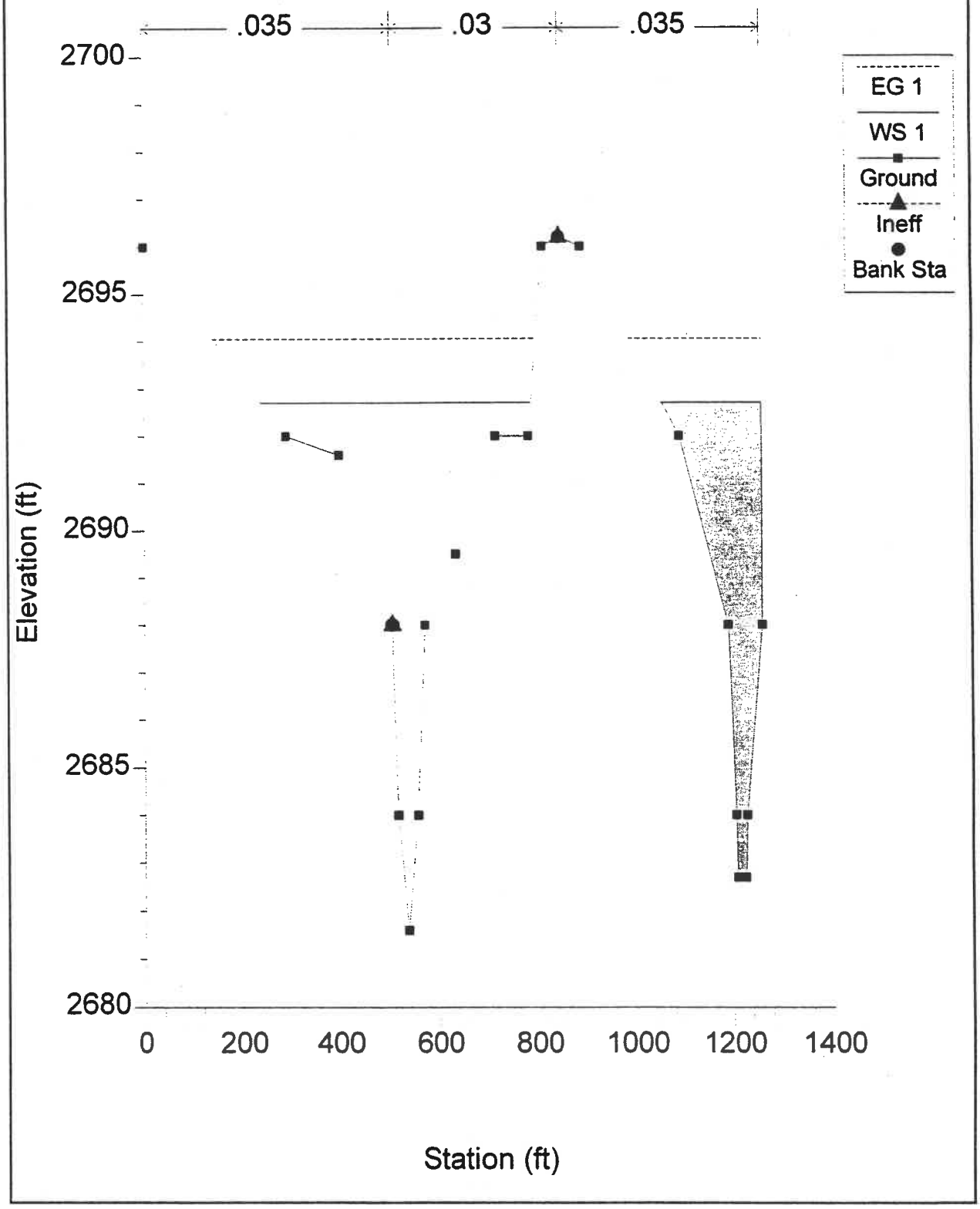
Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
9110 Subcritical Analysis



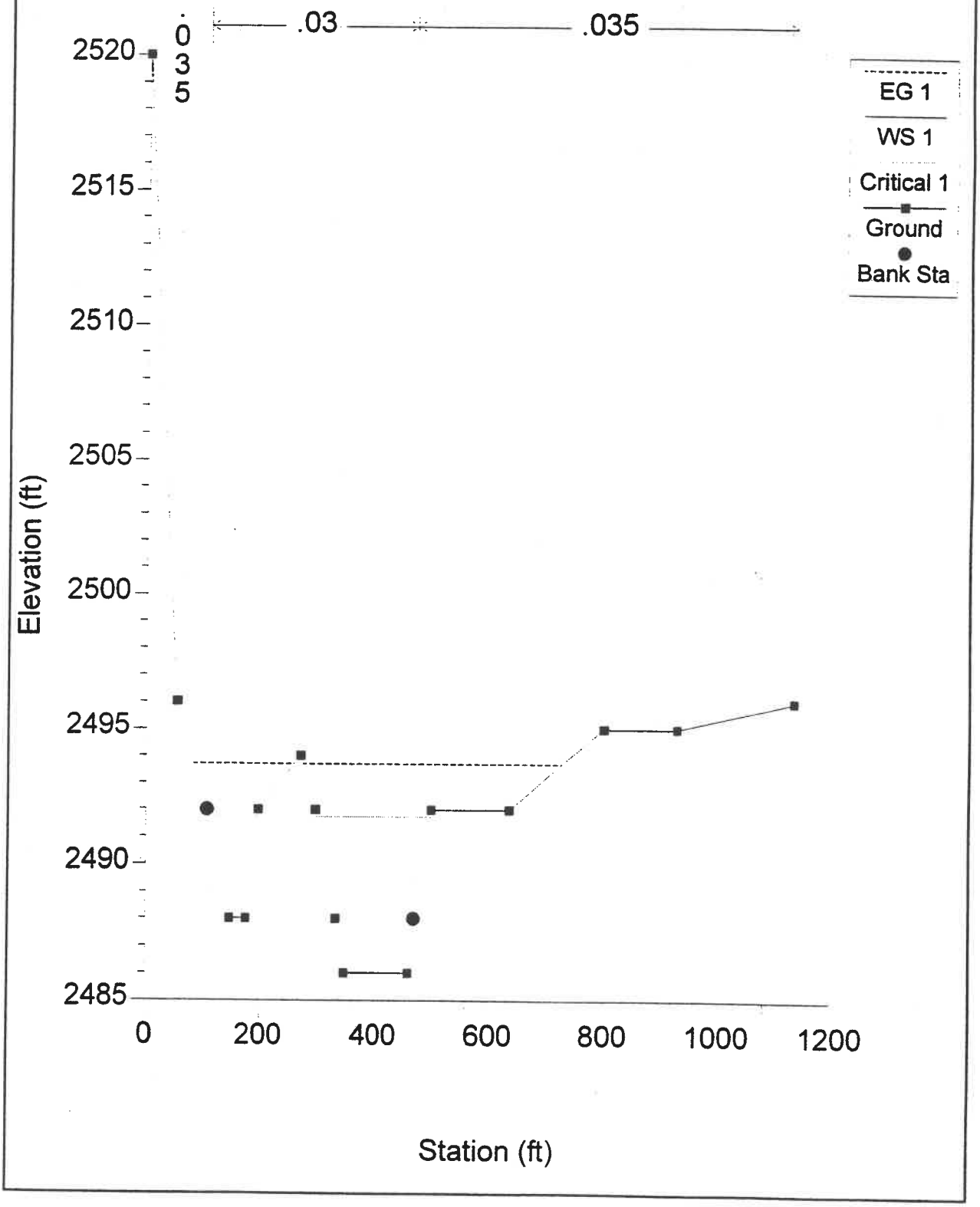
Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
9420 Subcritical Analysis



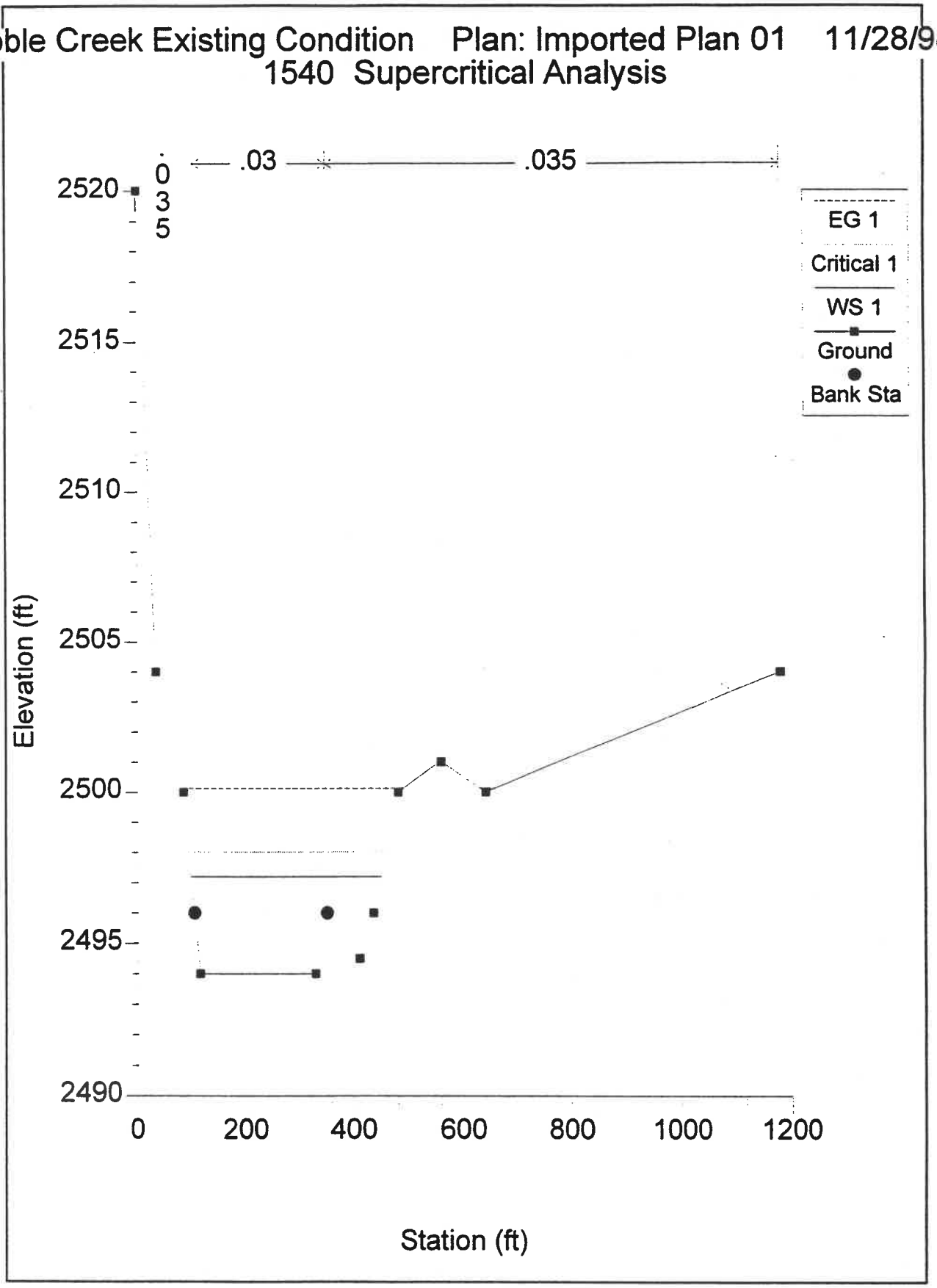
Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
9720 Subcritical Analysis



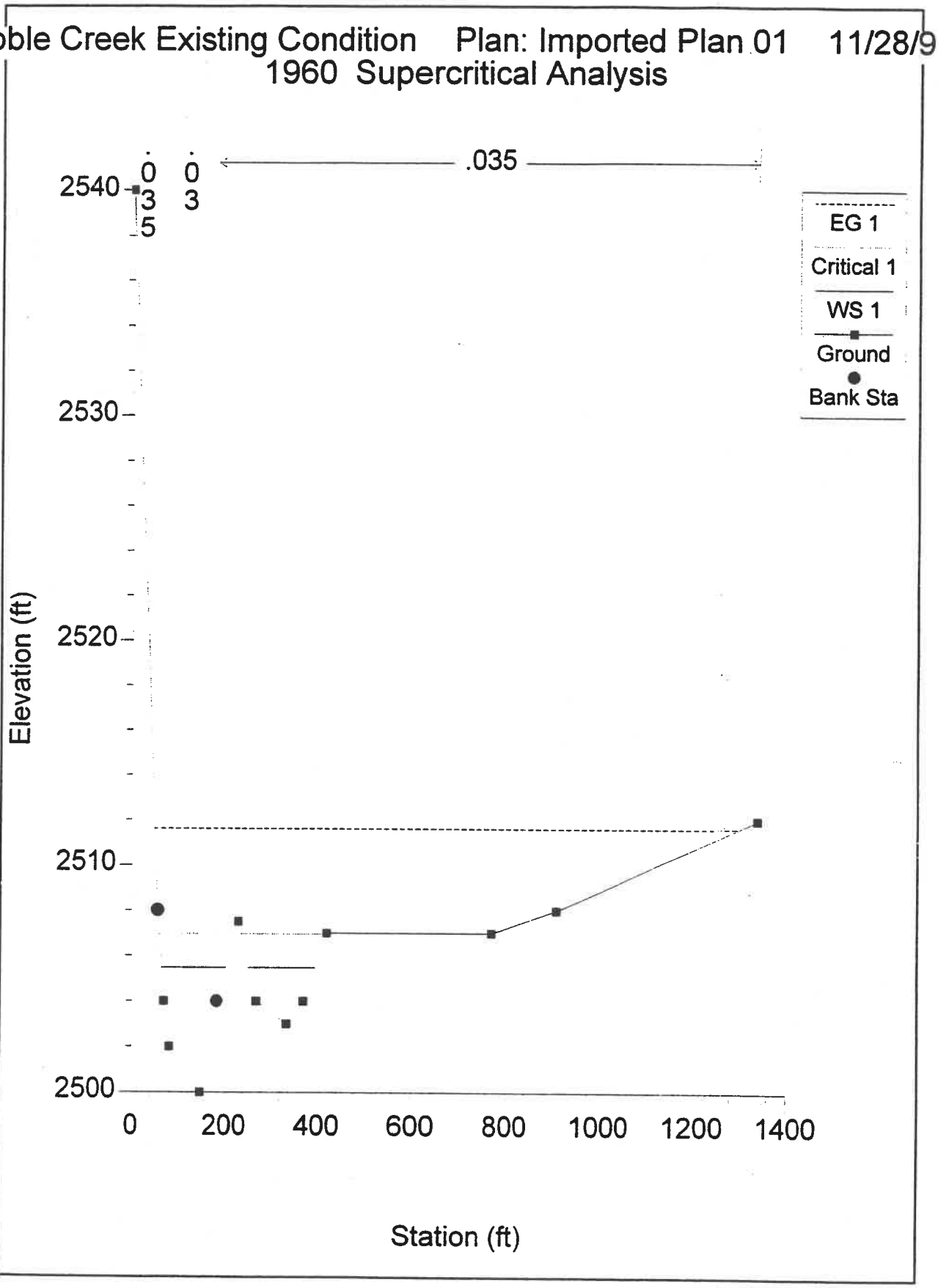
Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
1000 Supercritical Analysis



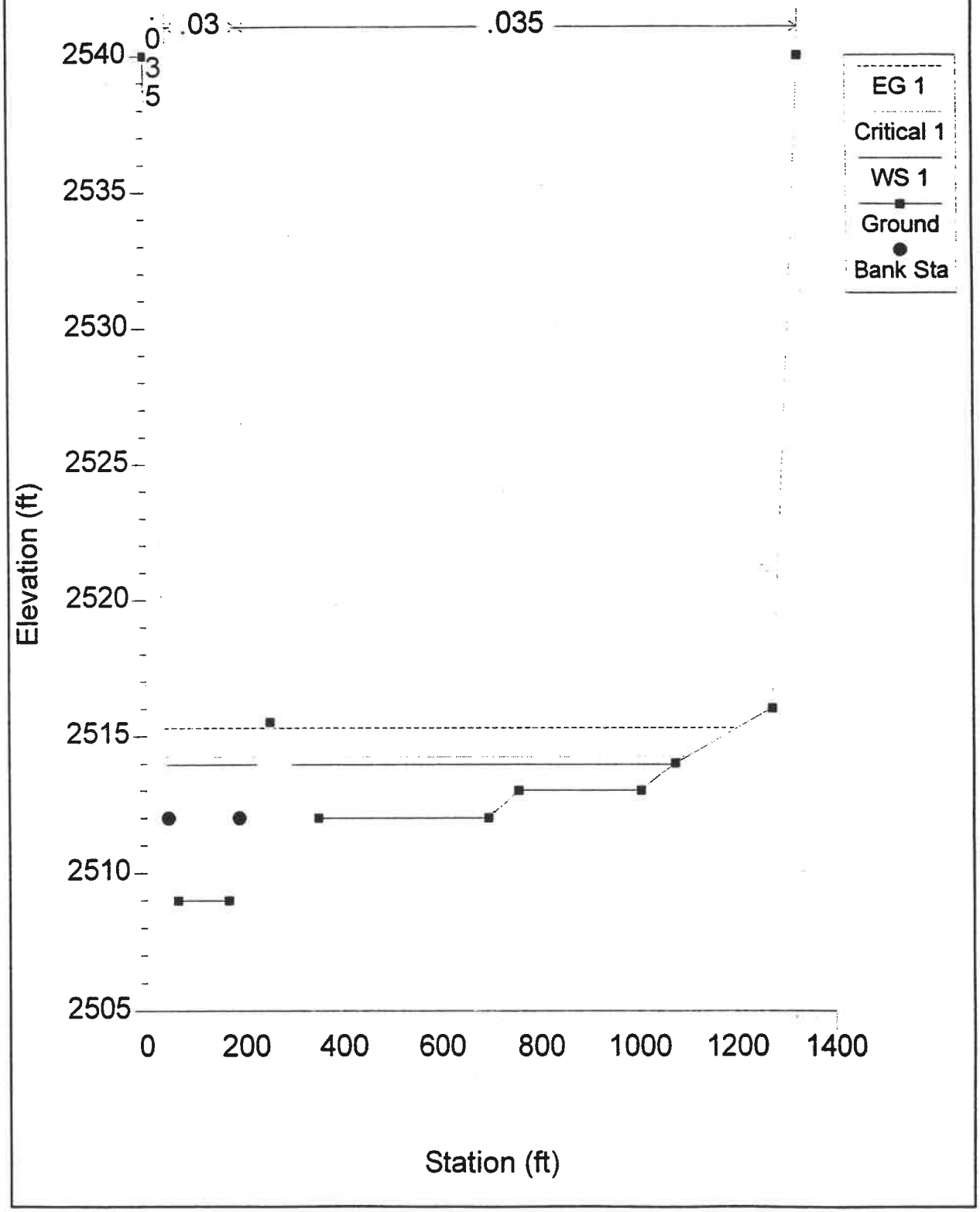
Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
1540 Supercritical Analysis



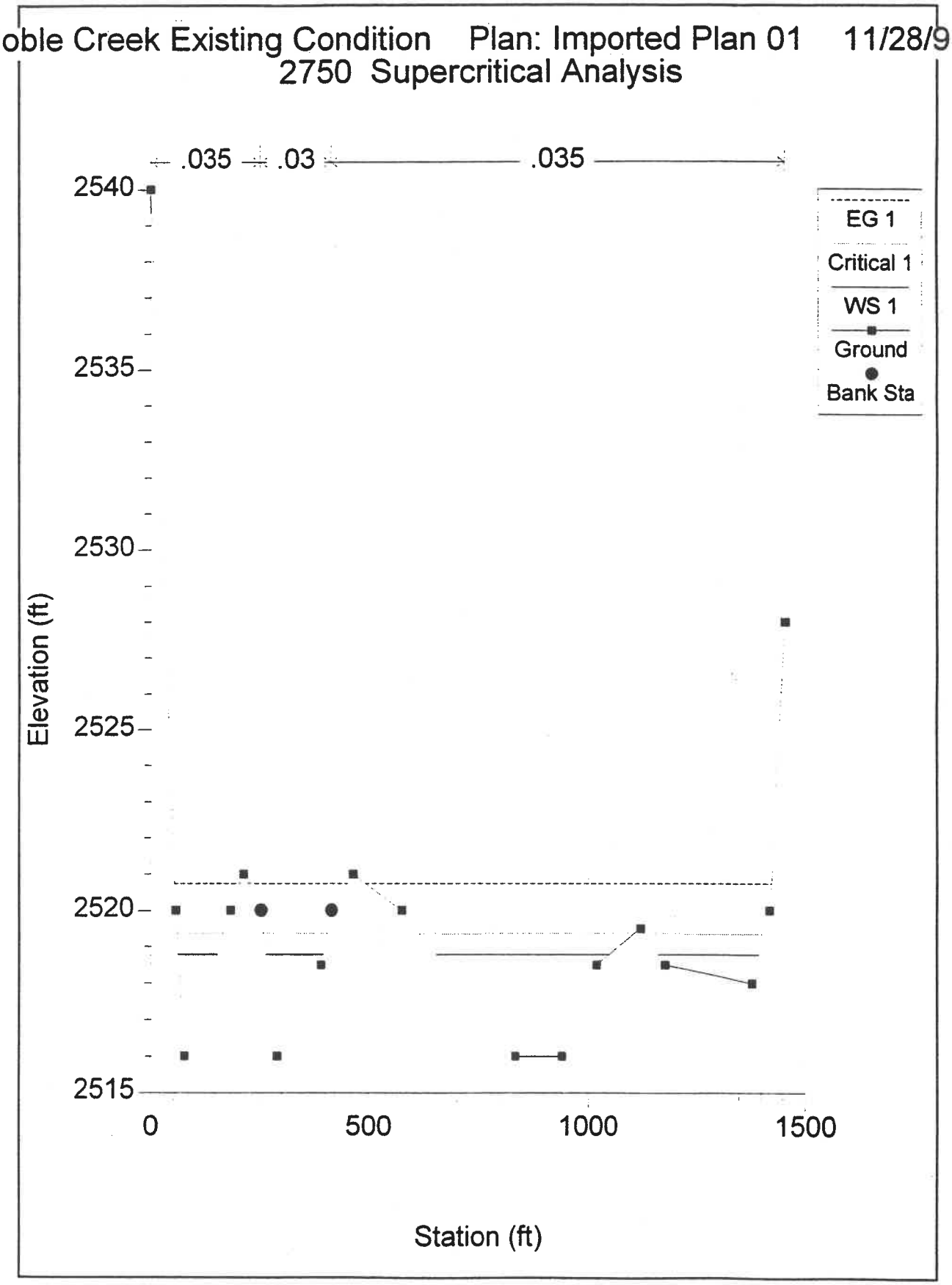
Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
1960 Supercritical Analysis



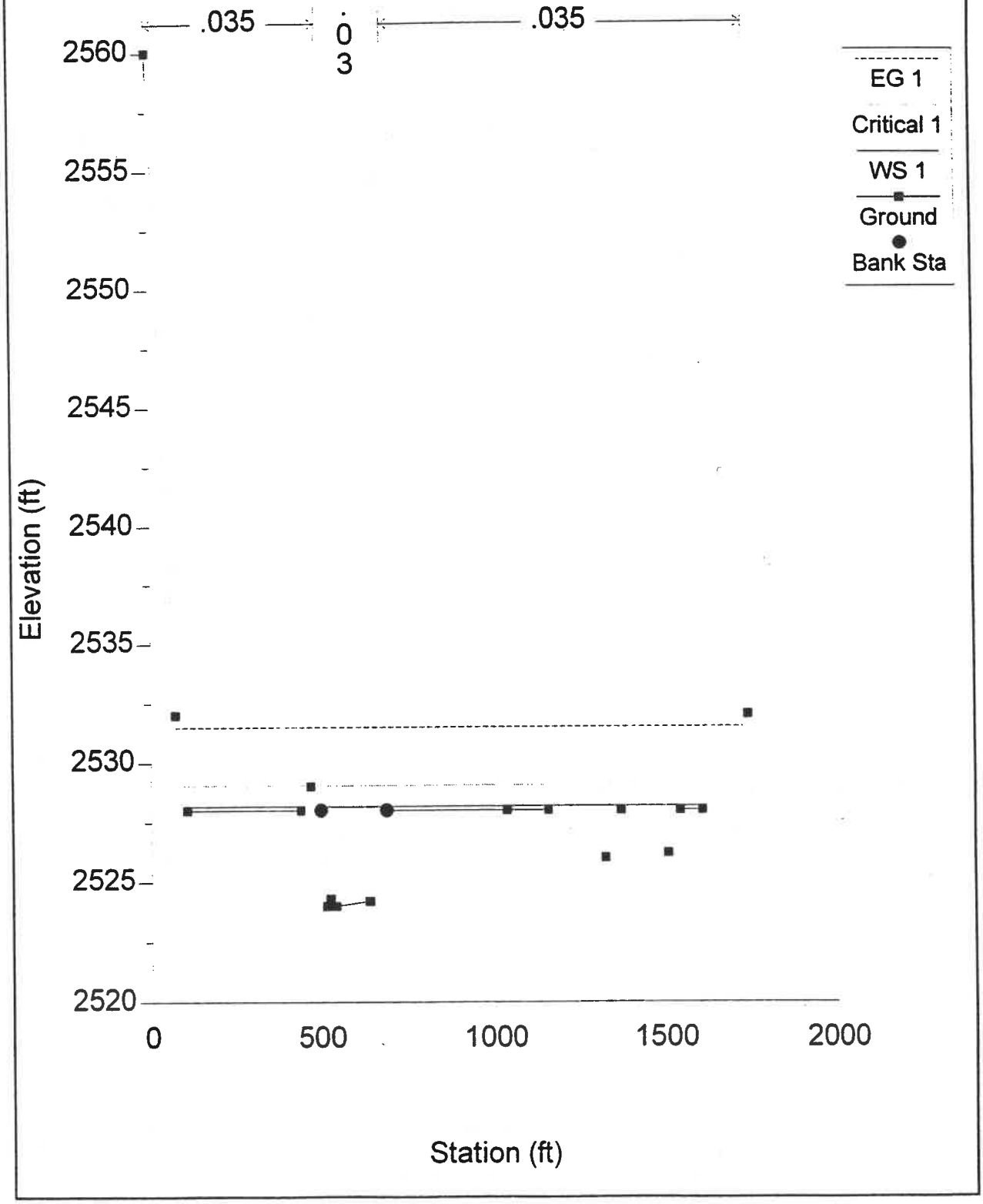
Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
2310 Supercritical Analysis



Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
2750 Supercritical Analysis

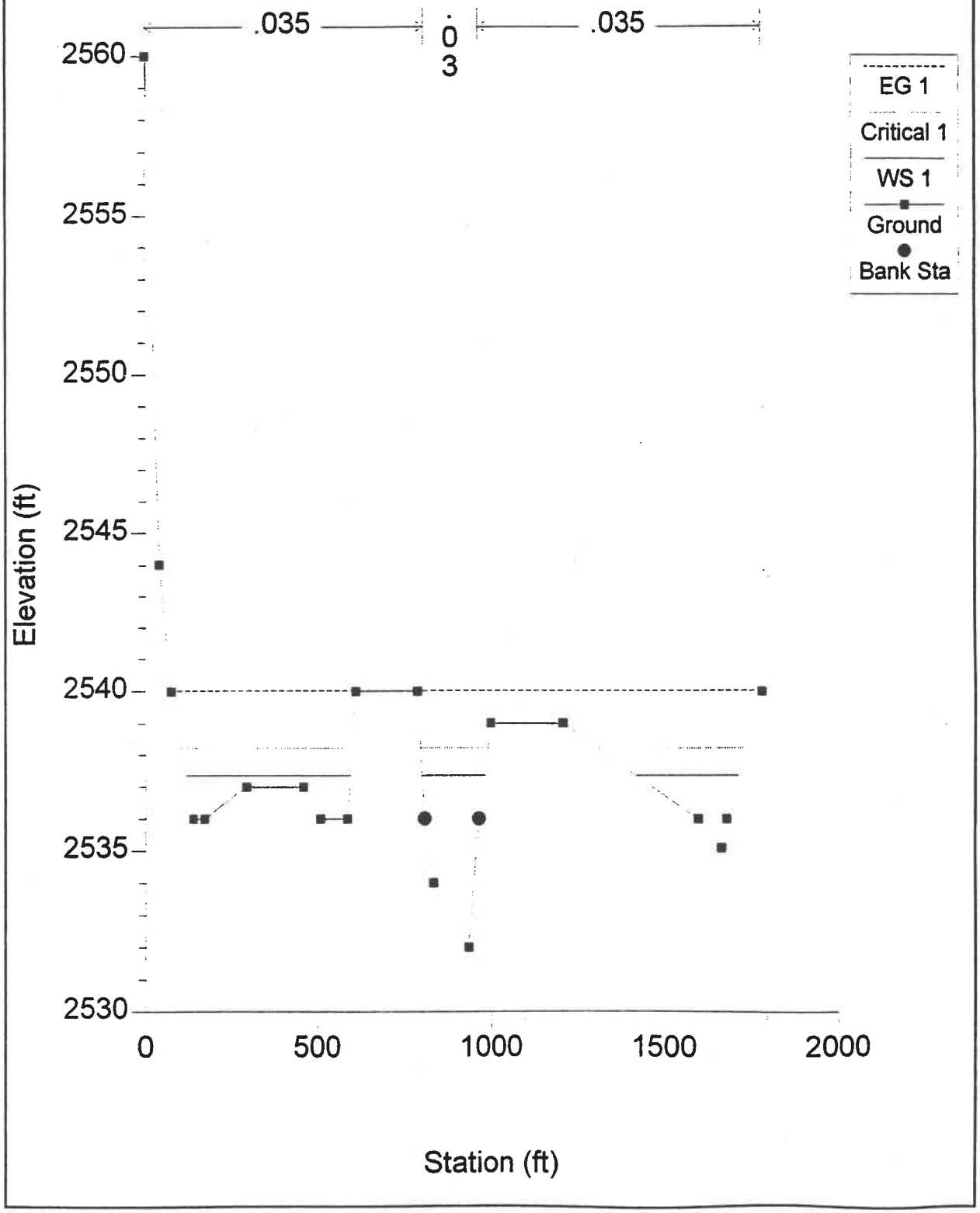


Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
3110 Supercritical Analysis

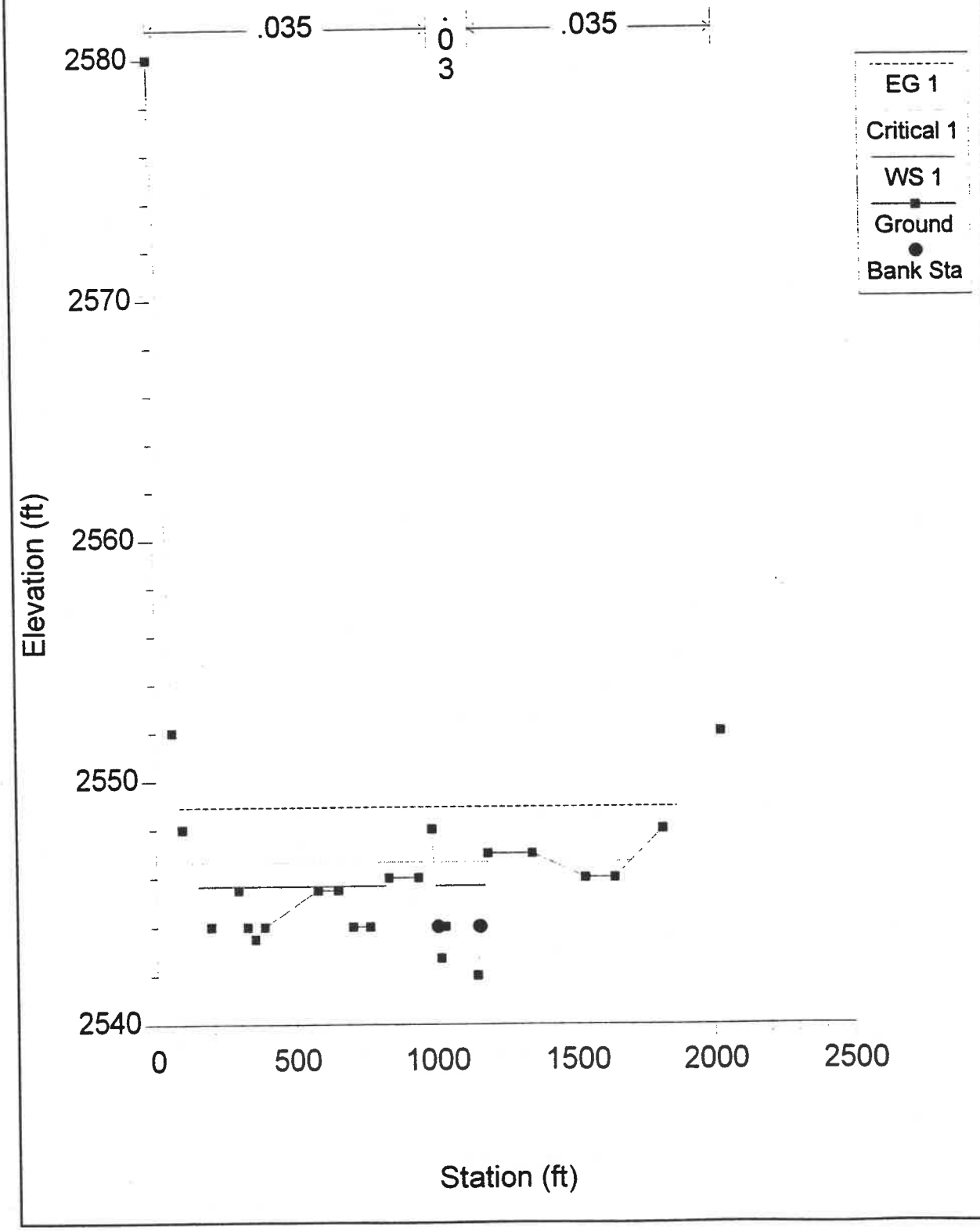


Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98

3580 Supercritical Analysis

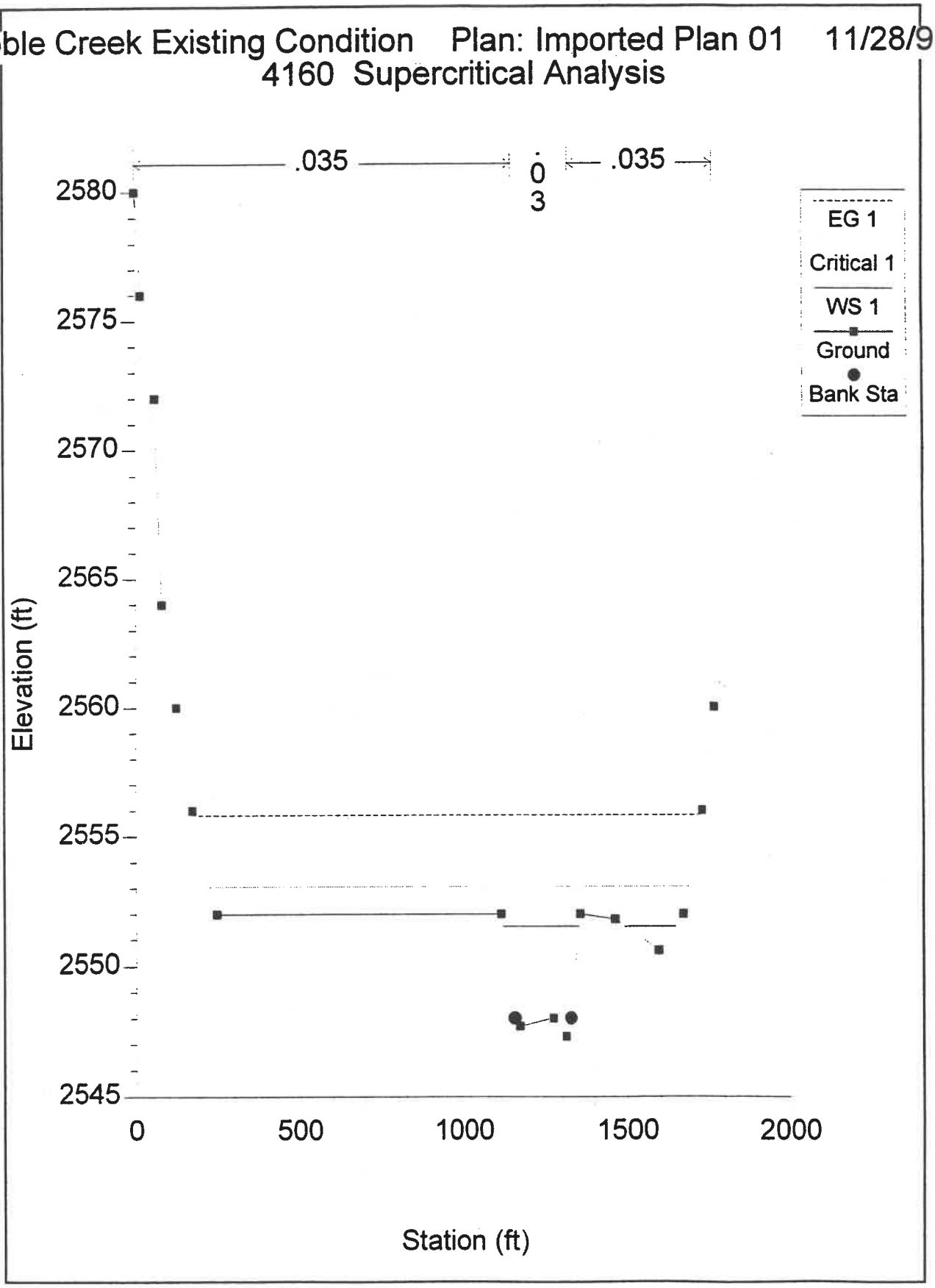


Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
3950 Supercritical Analysis



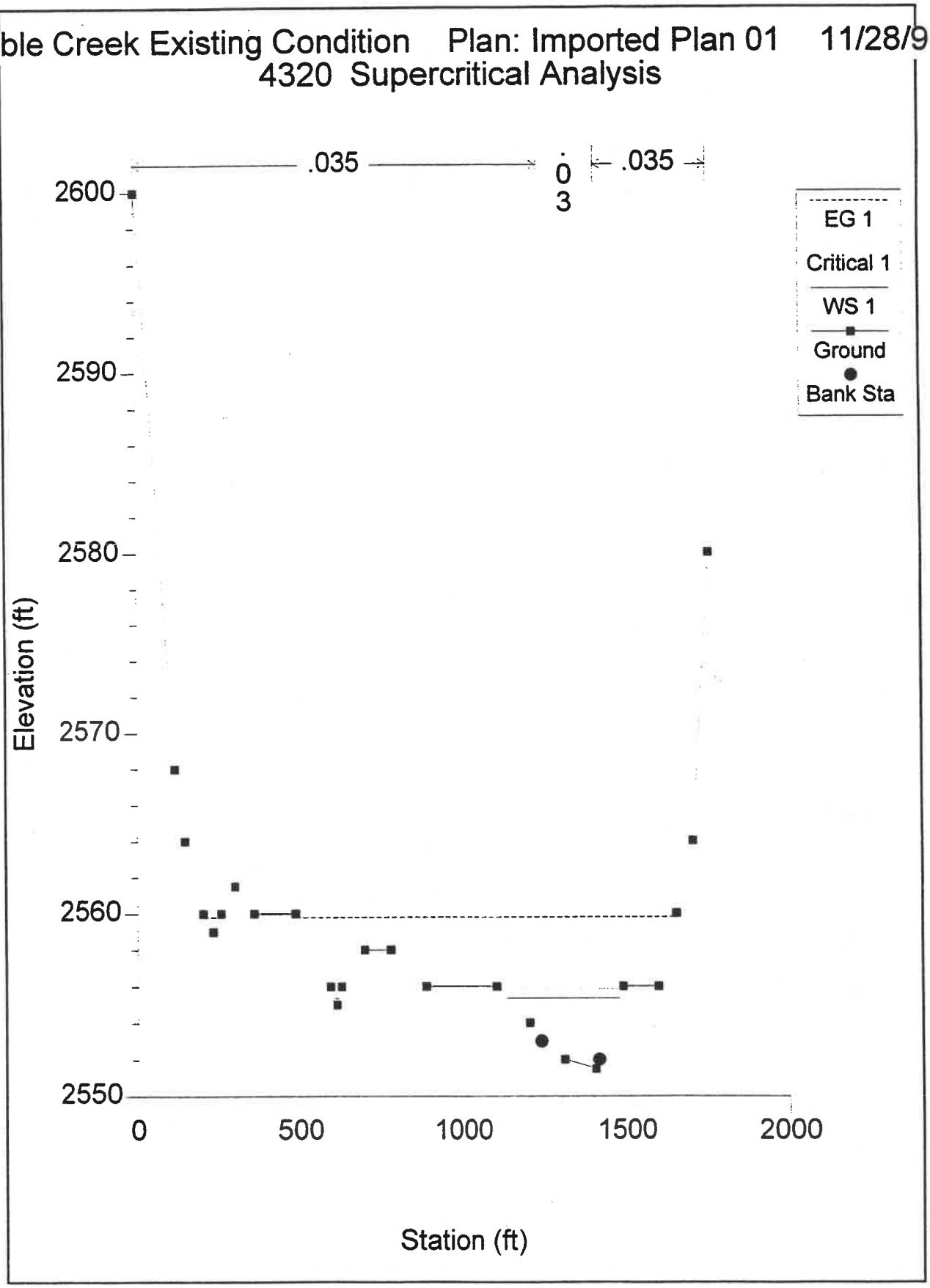
Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98

4160 Supercritical Analysis

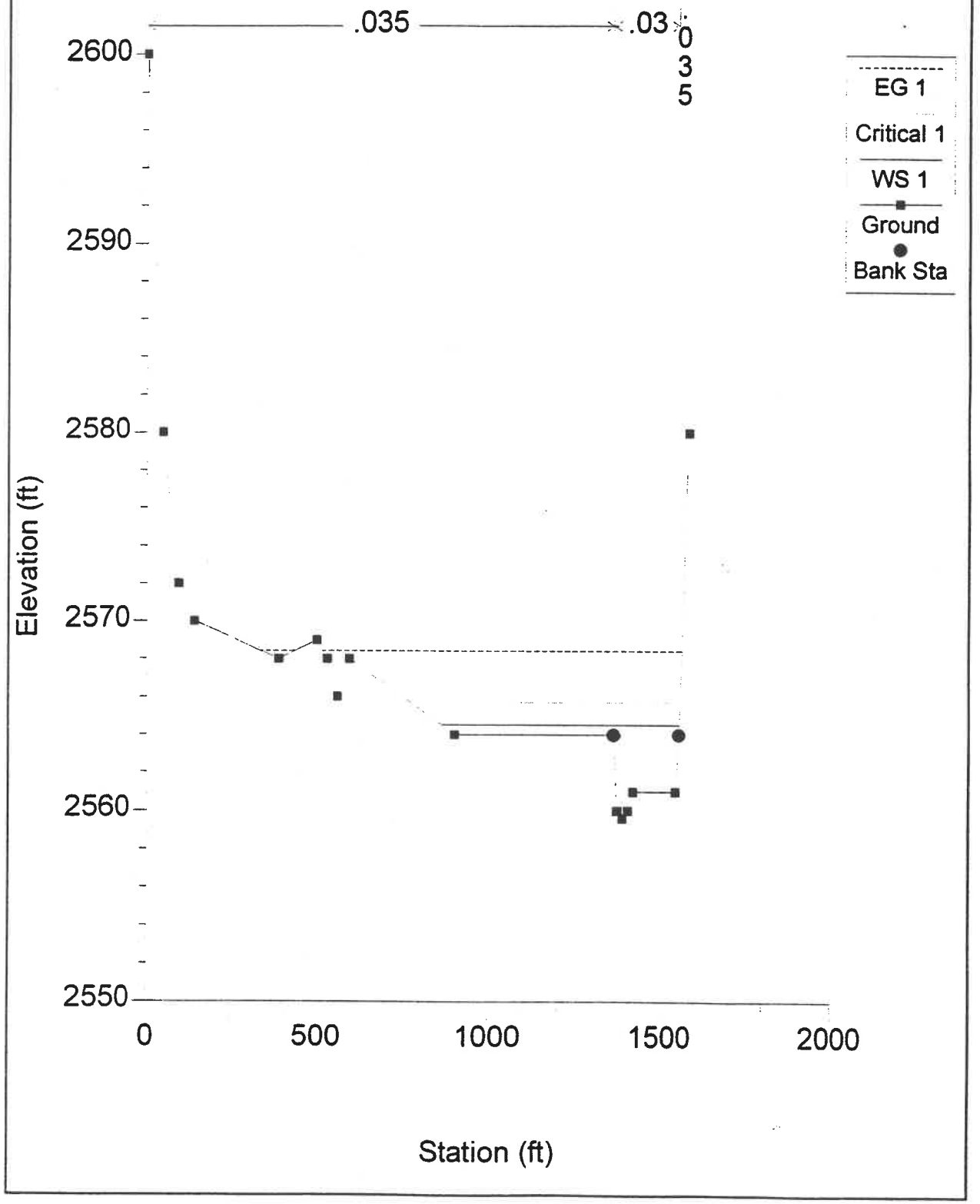


Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98

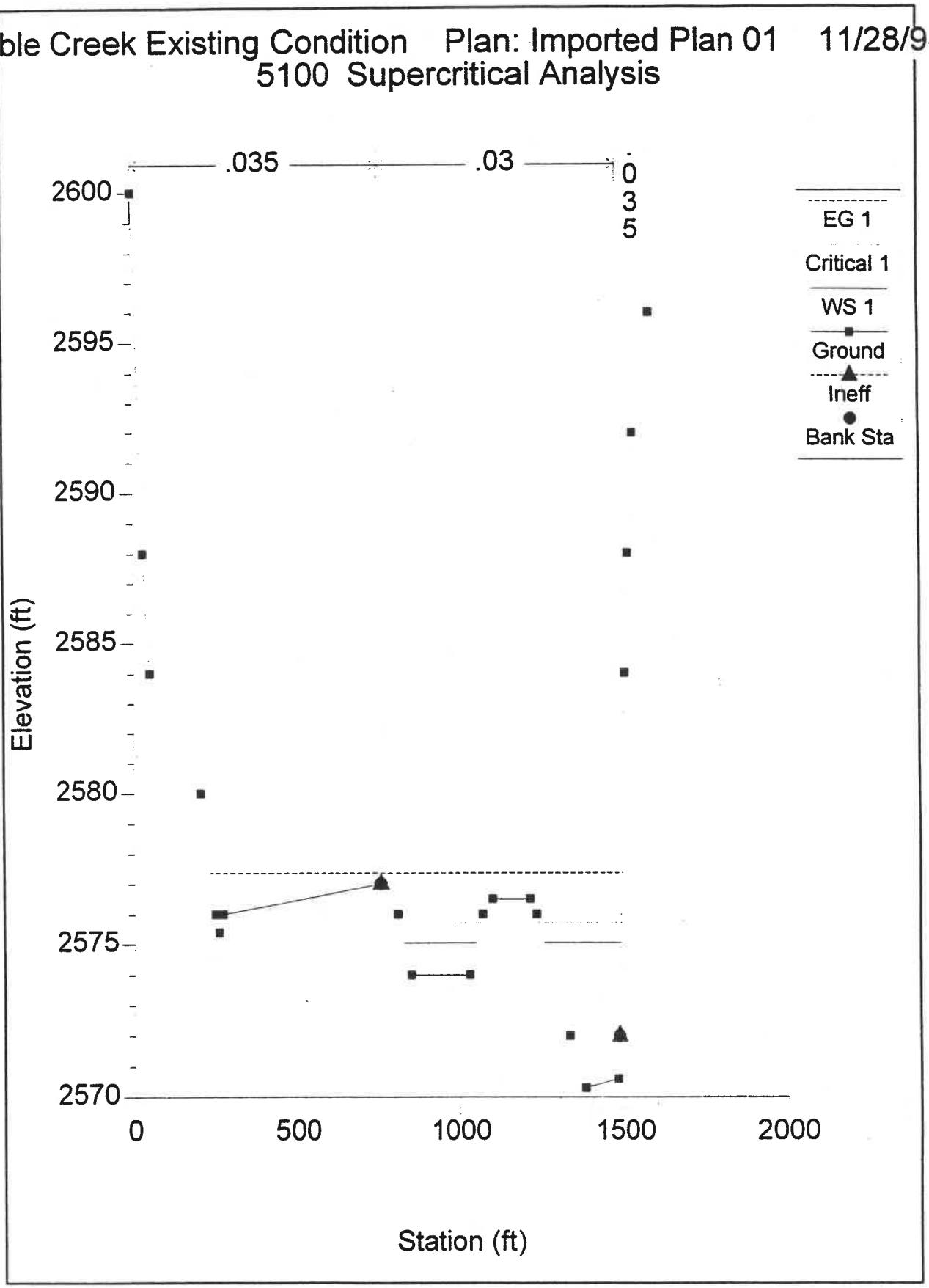
4320 Supercritical Analysis



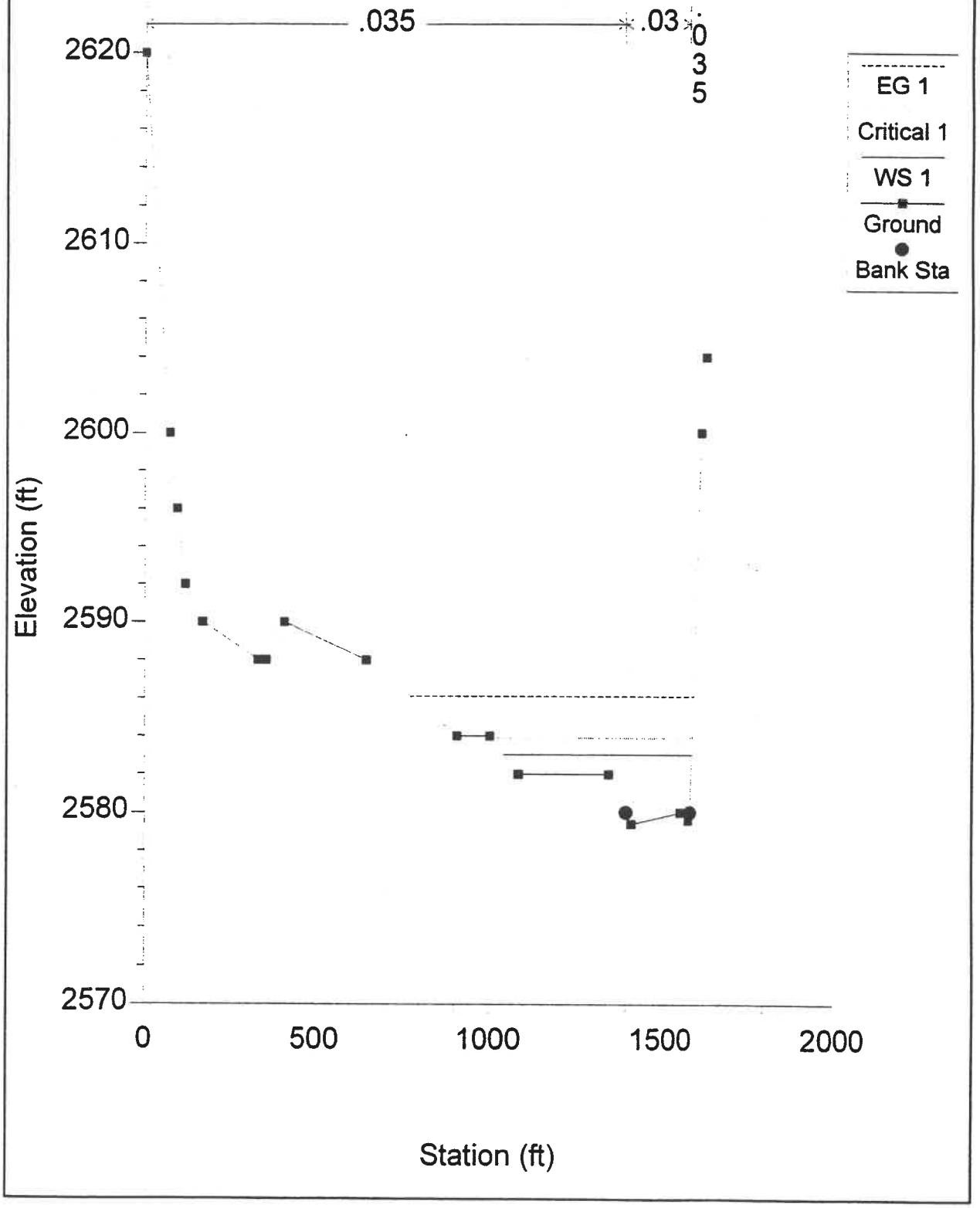
Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
4690 Supercritical Analysis

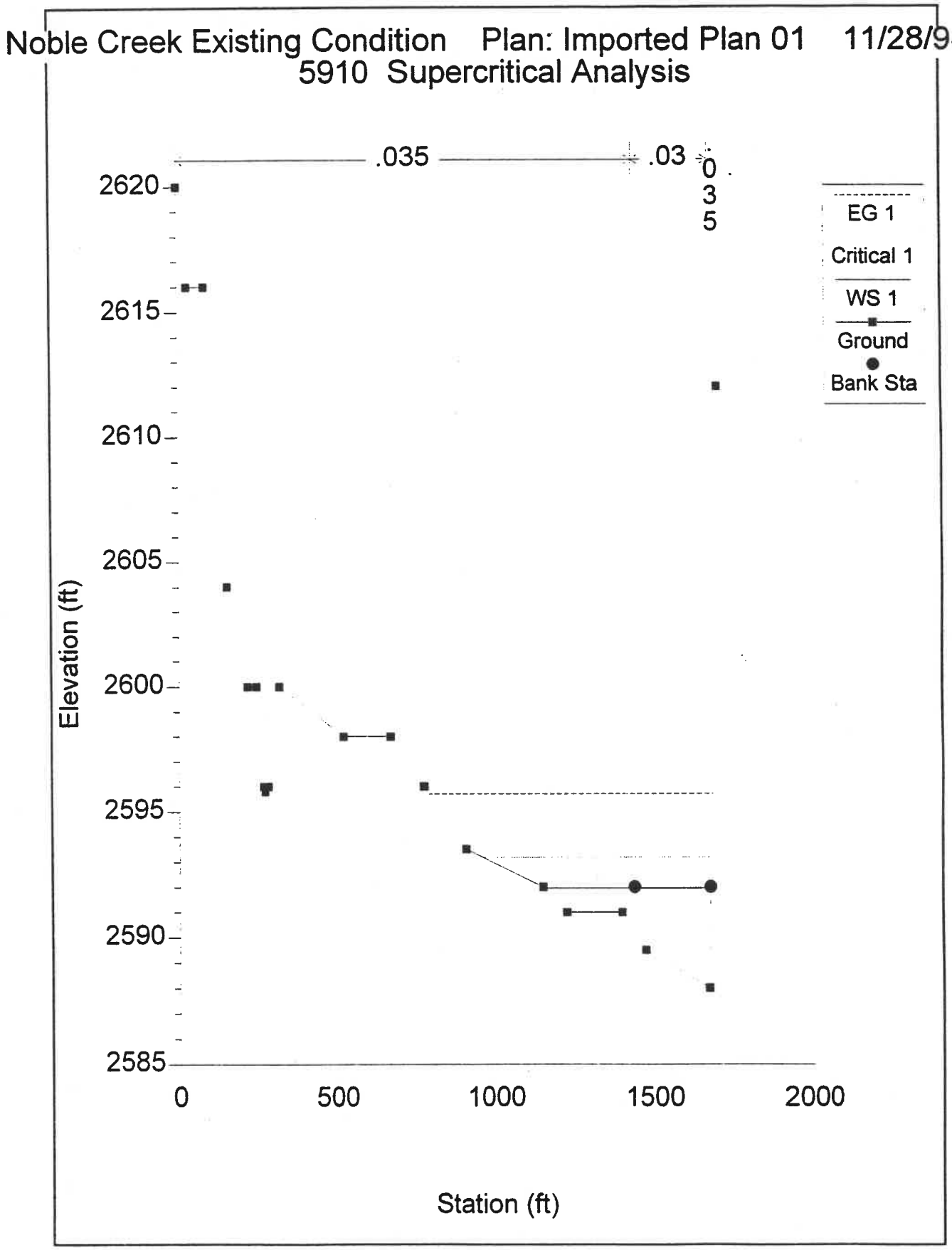


Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
5100 Supercritical Analysis

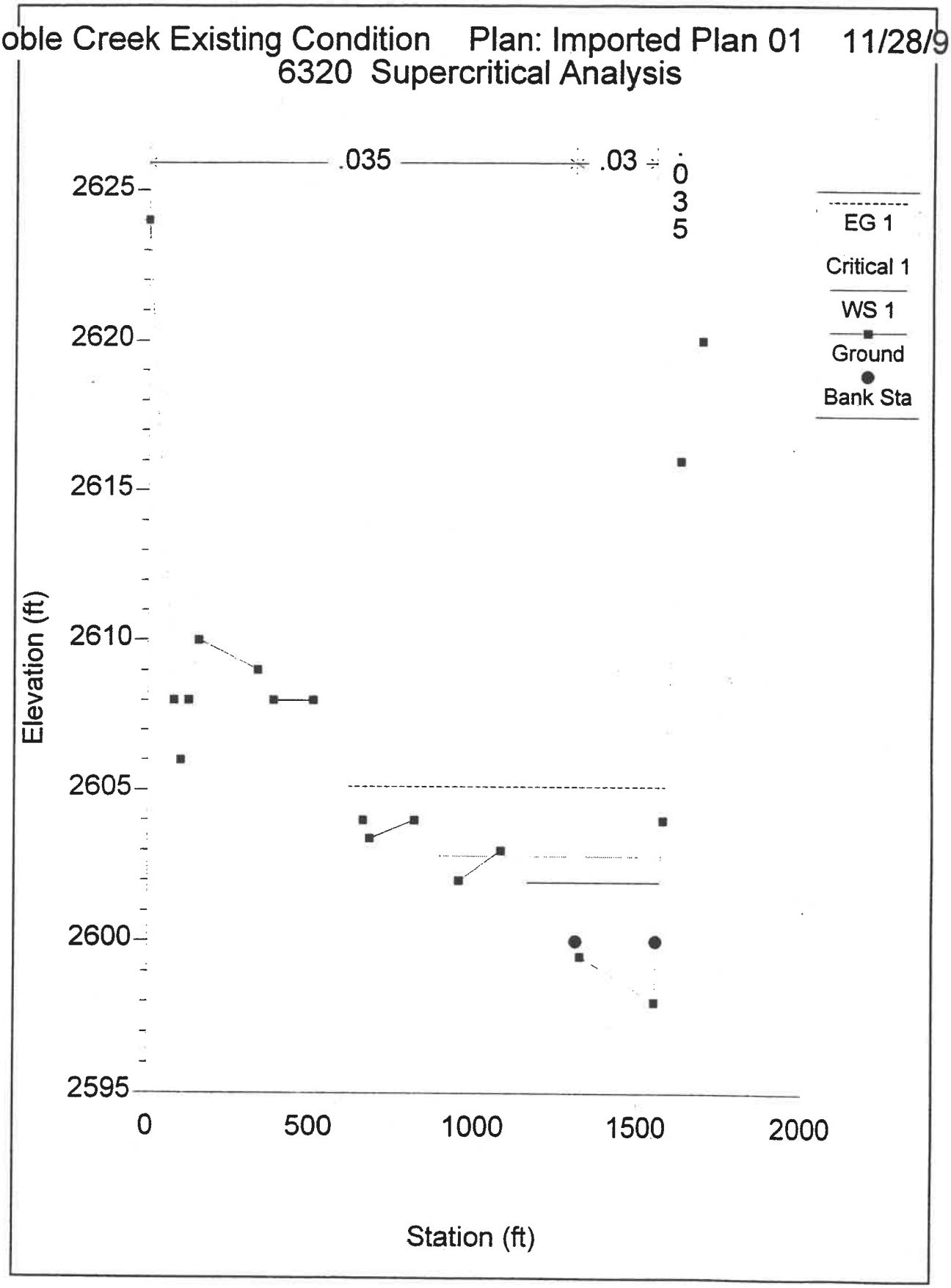


Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
5500 Supercritical Analysis

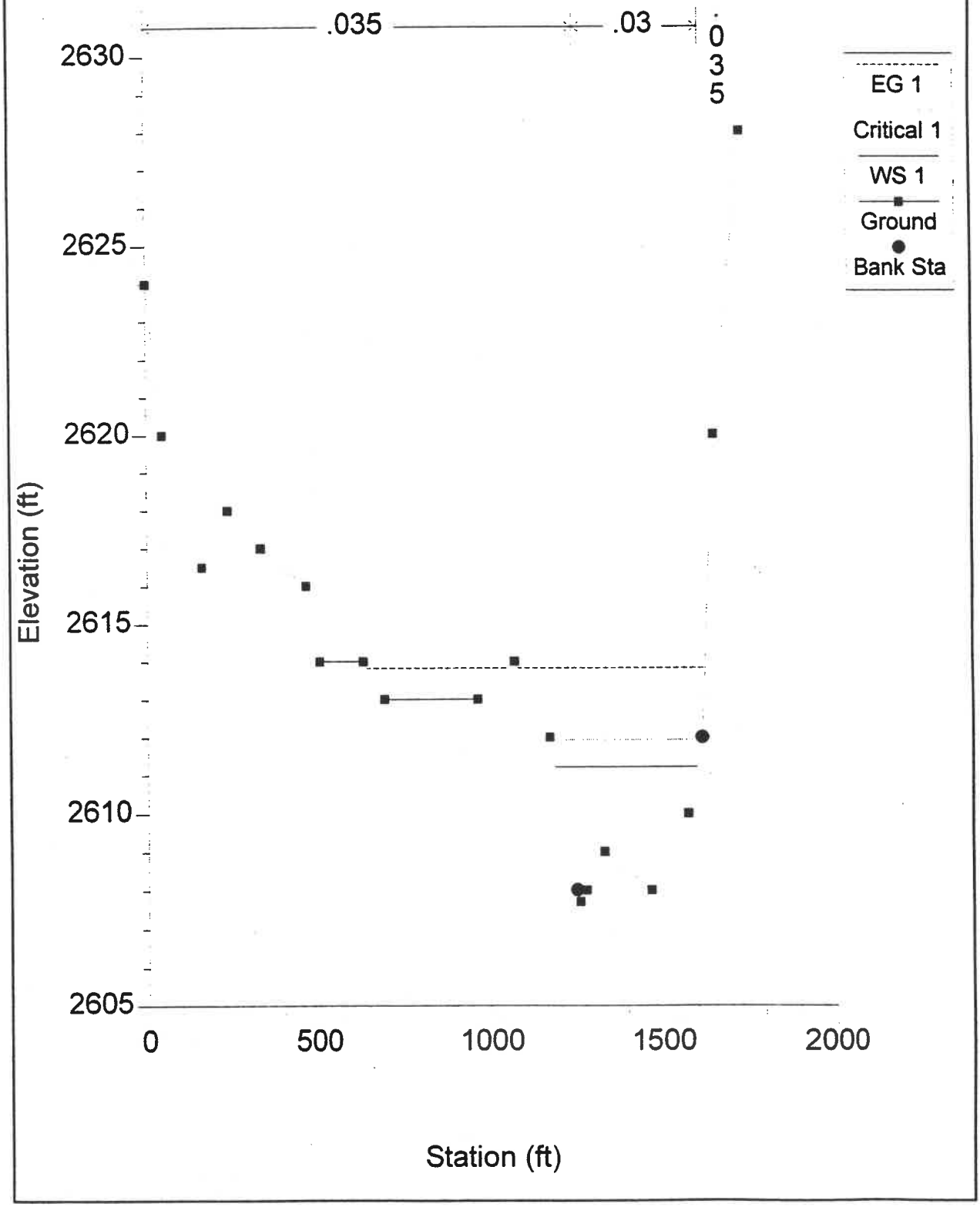



Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
5910 Supercritical Analysis
.035
.03
0.035
EG 1
Critical 1
WS 1
Ground
Bank Sta
2620
2615
2610
2605
2600
2595
2590
2585
Elevation (ft)
0
500
1000
1500
2000
Station (ft)

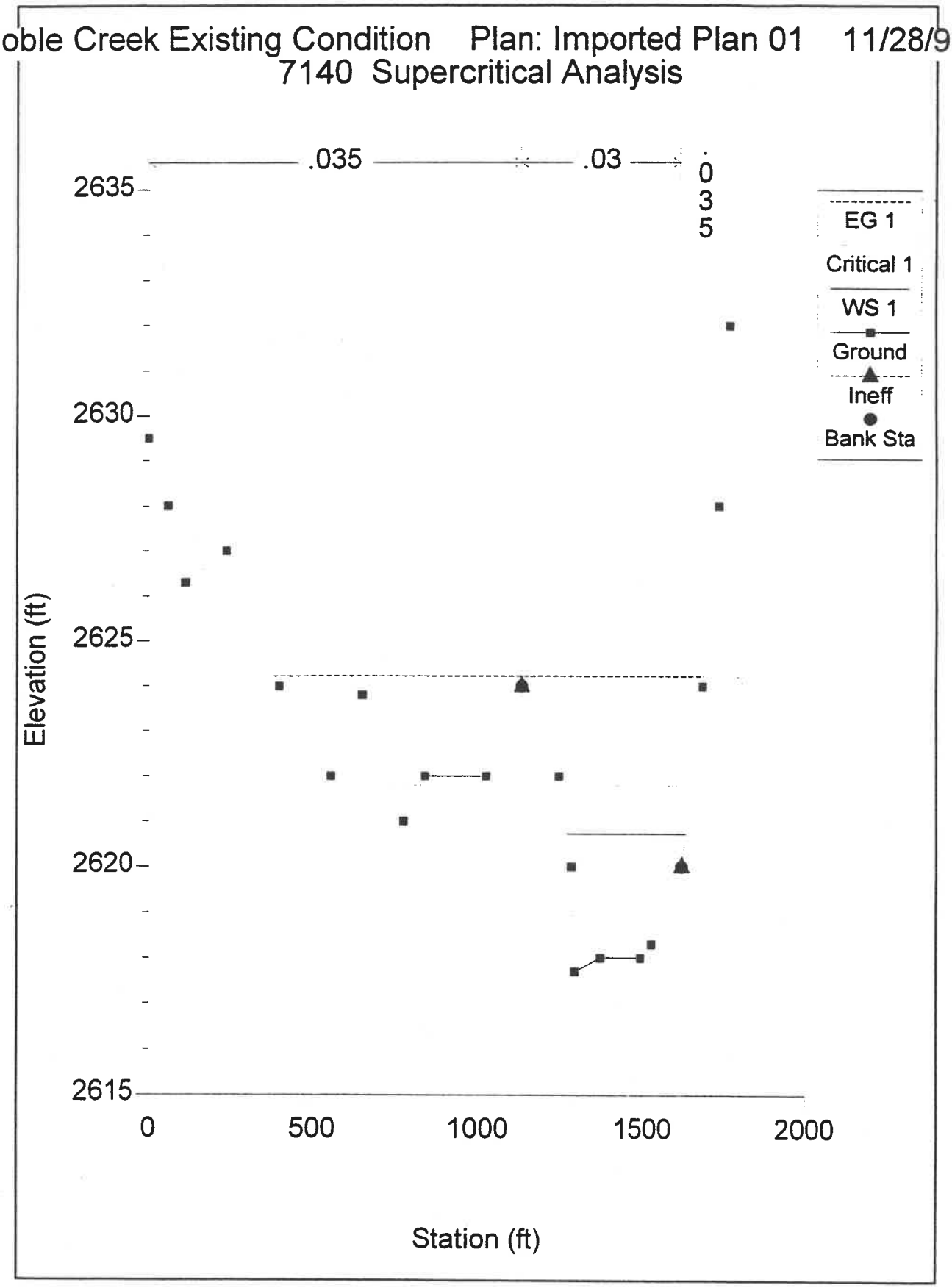
Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
6320 Supercritical Analysis



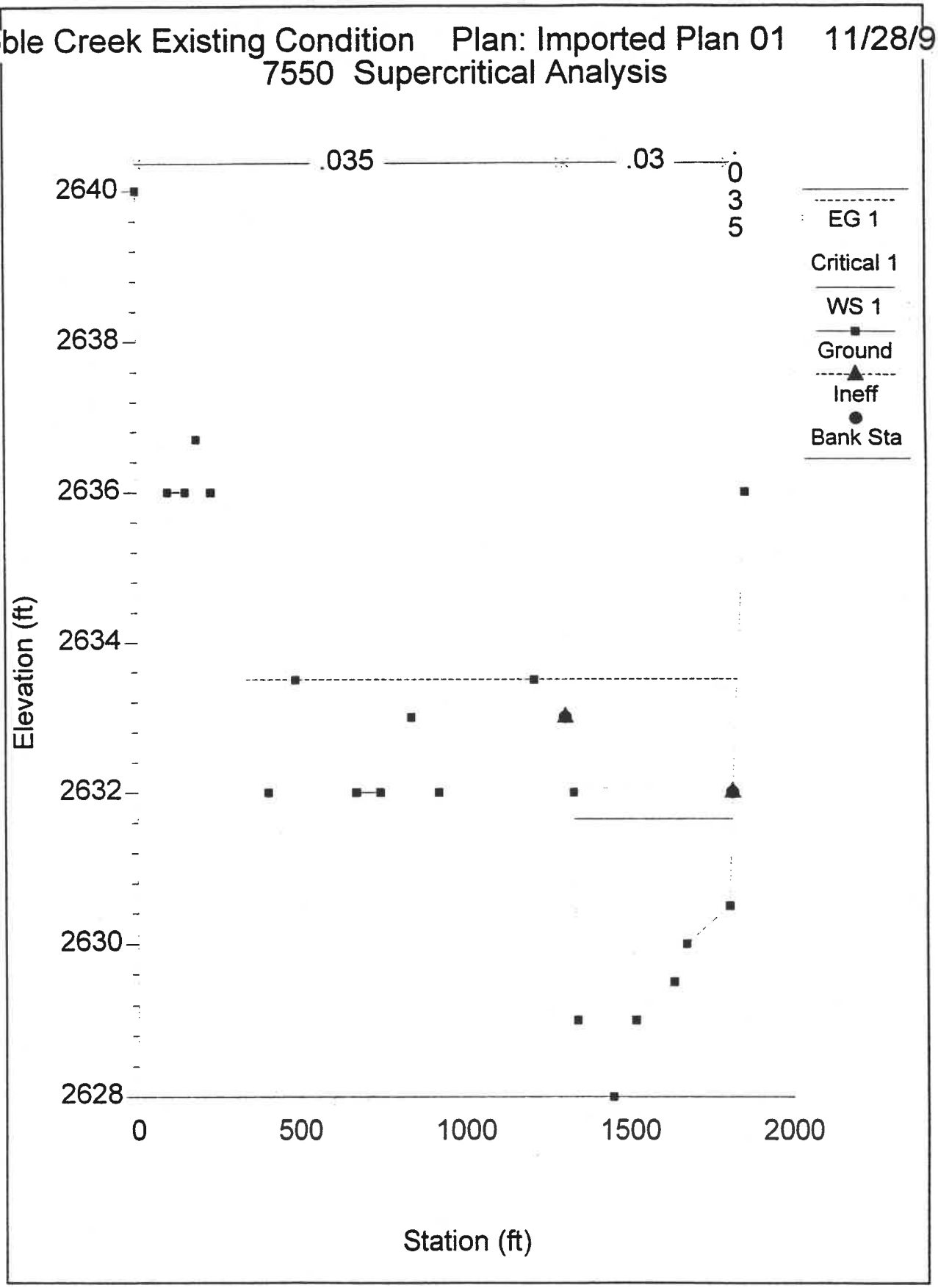
Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
6740 Supercritical Analysis



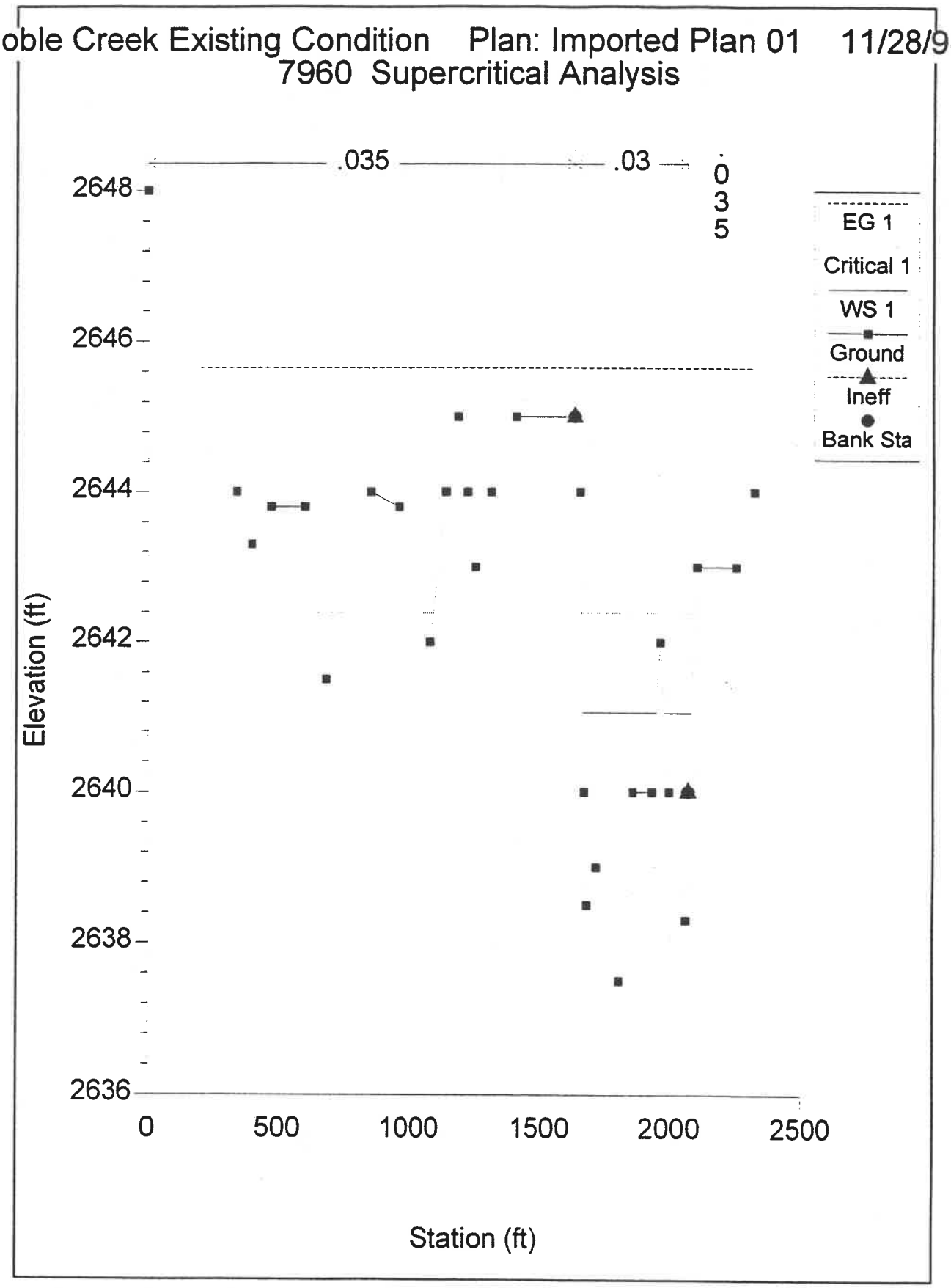
Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
7140 Supercritical Analysis



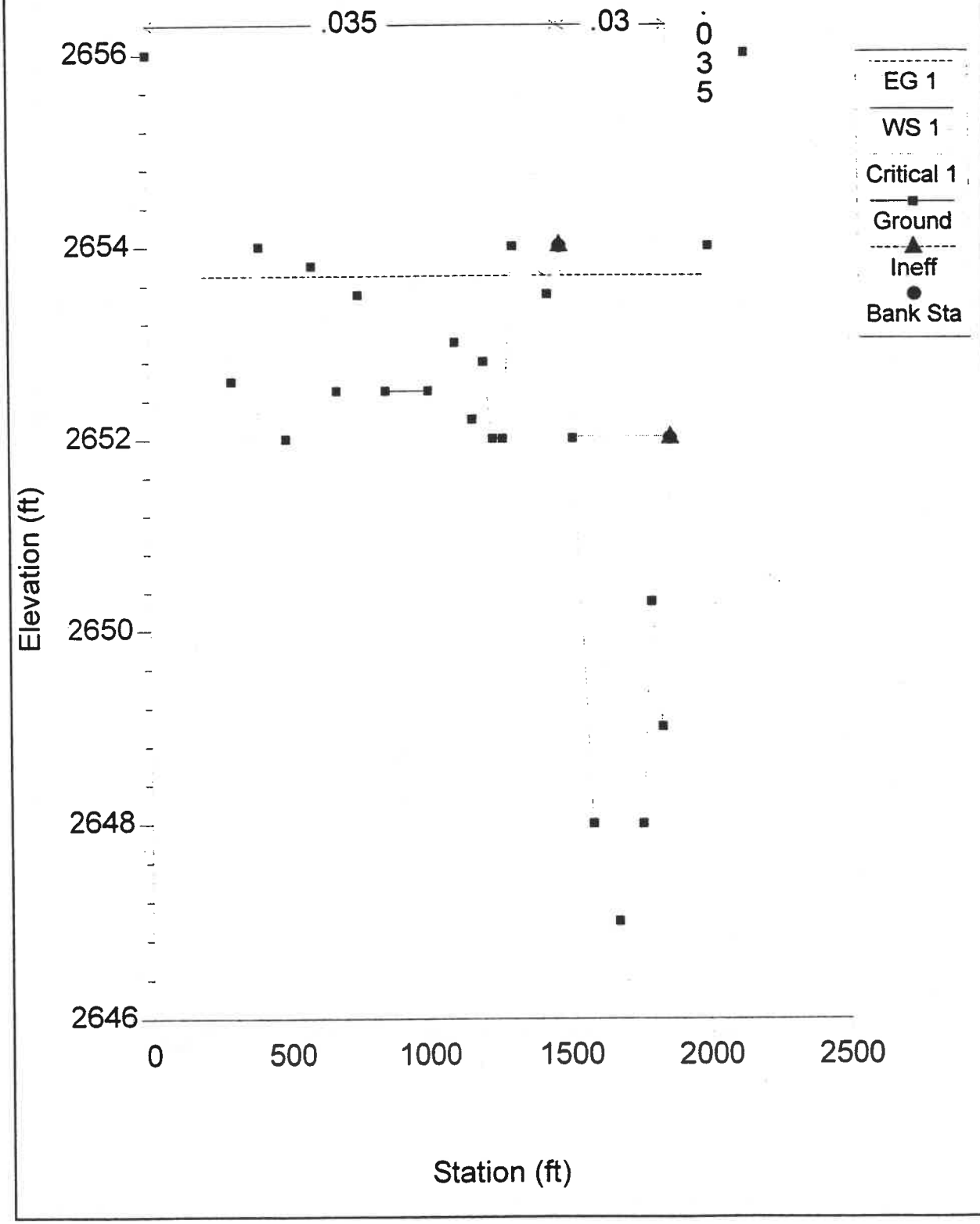
Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
7550 Supercritical Analysis



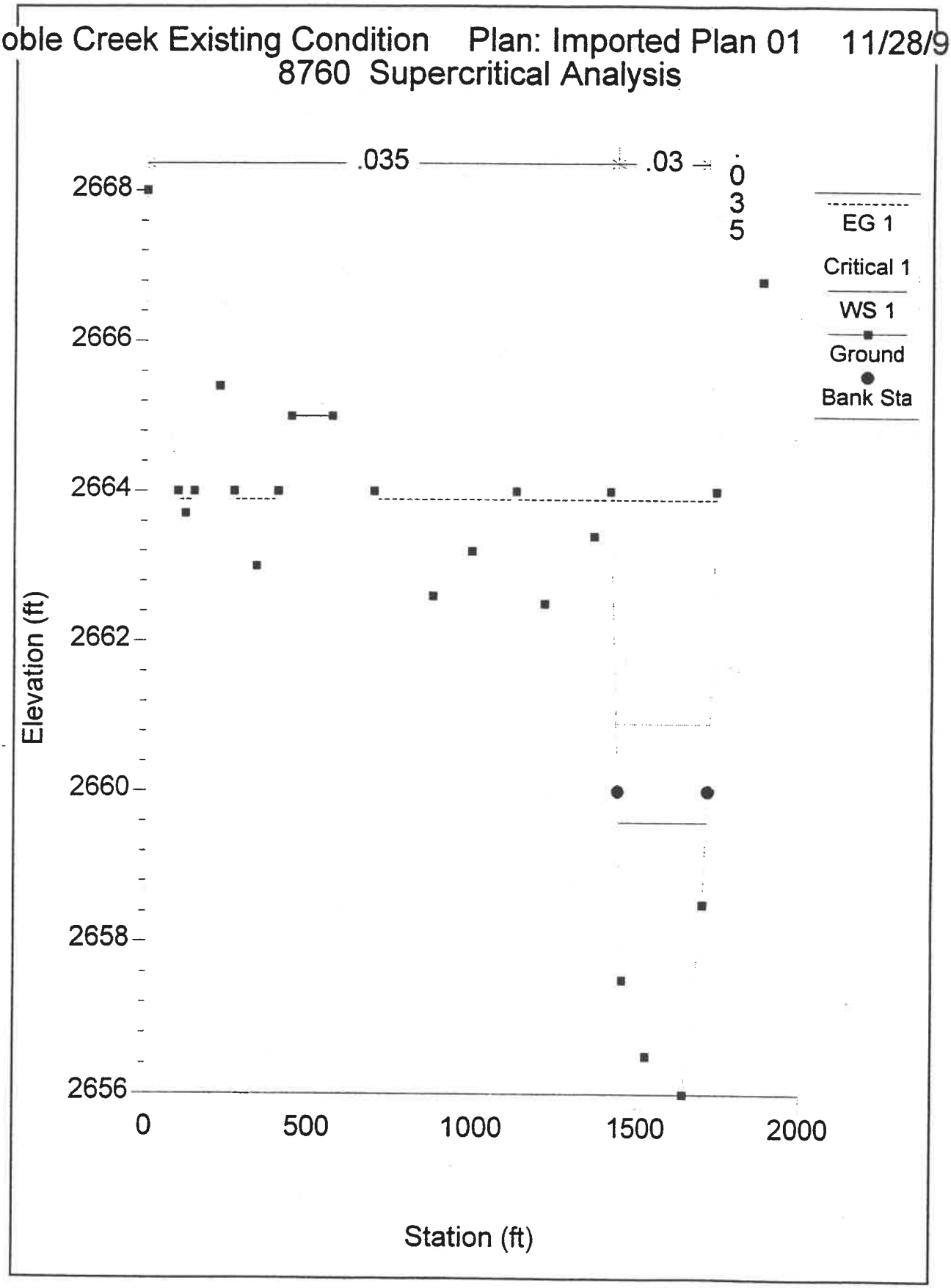
Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
7960 Supercritical Analysis

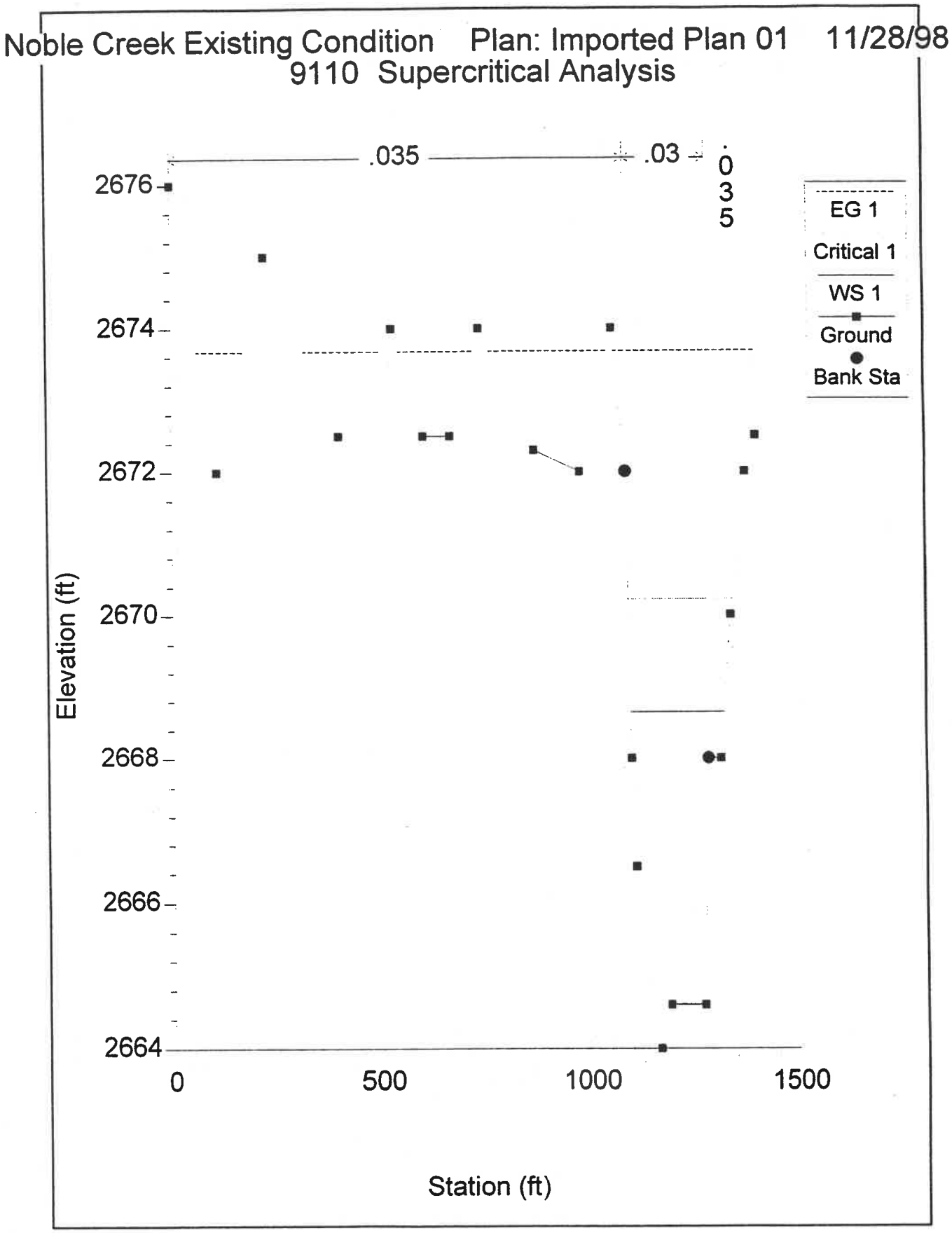


Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
8370 Supercritical Analysis



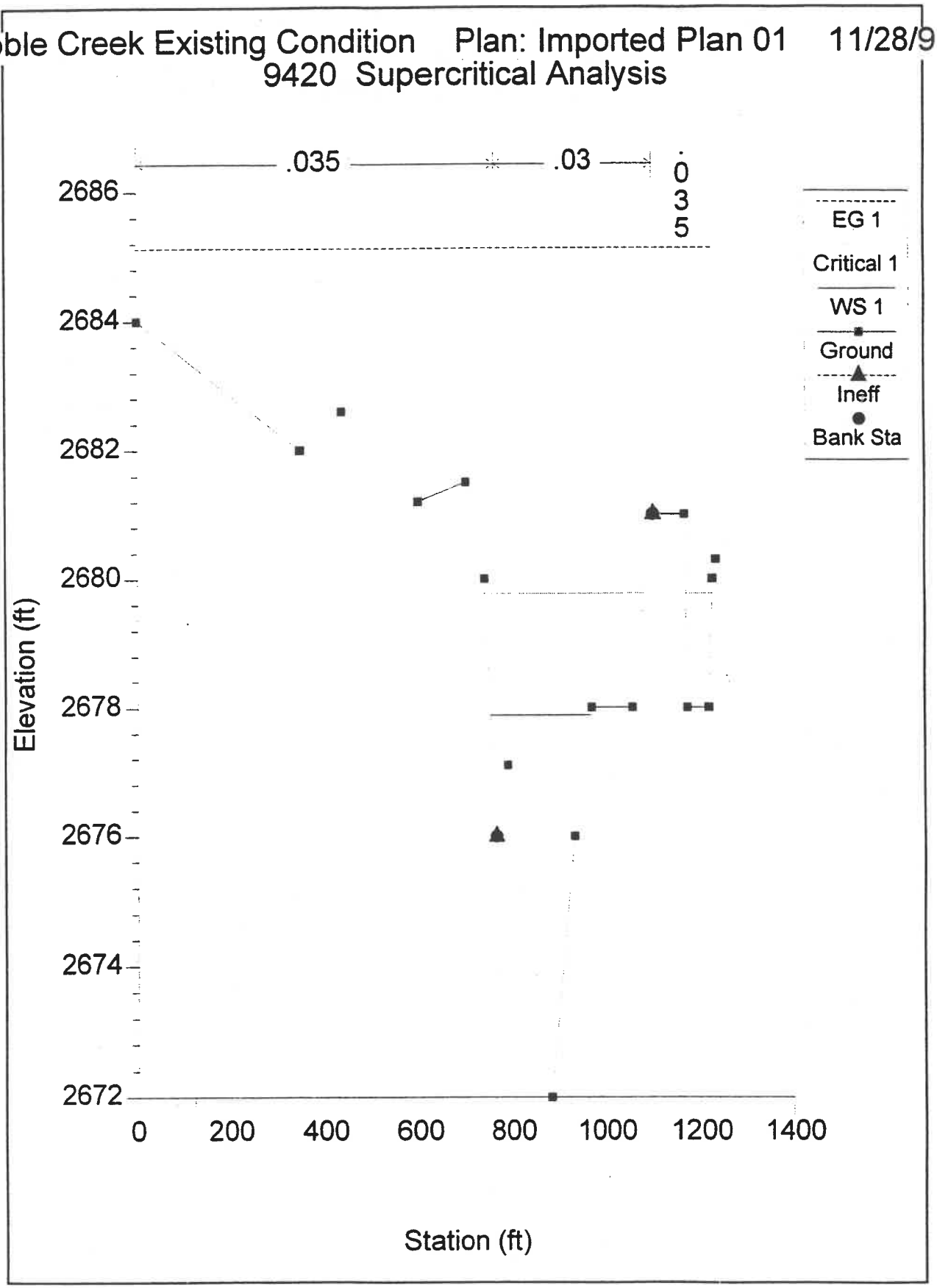
Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
8760 Supercritical Analysis



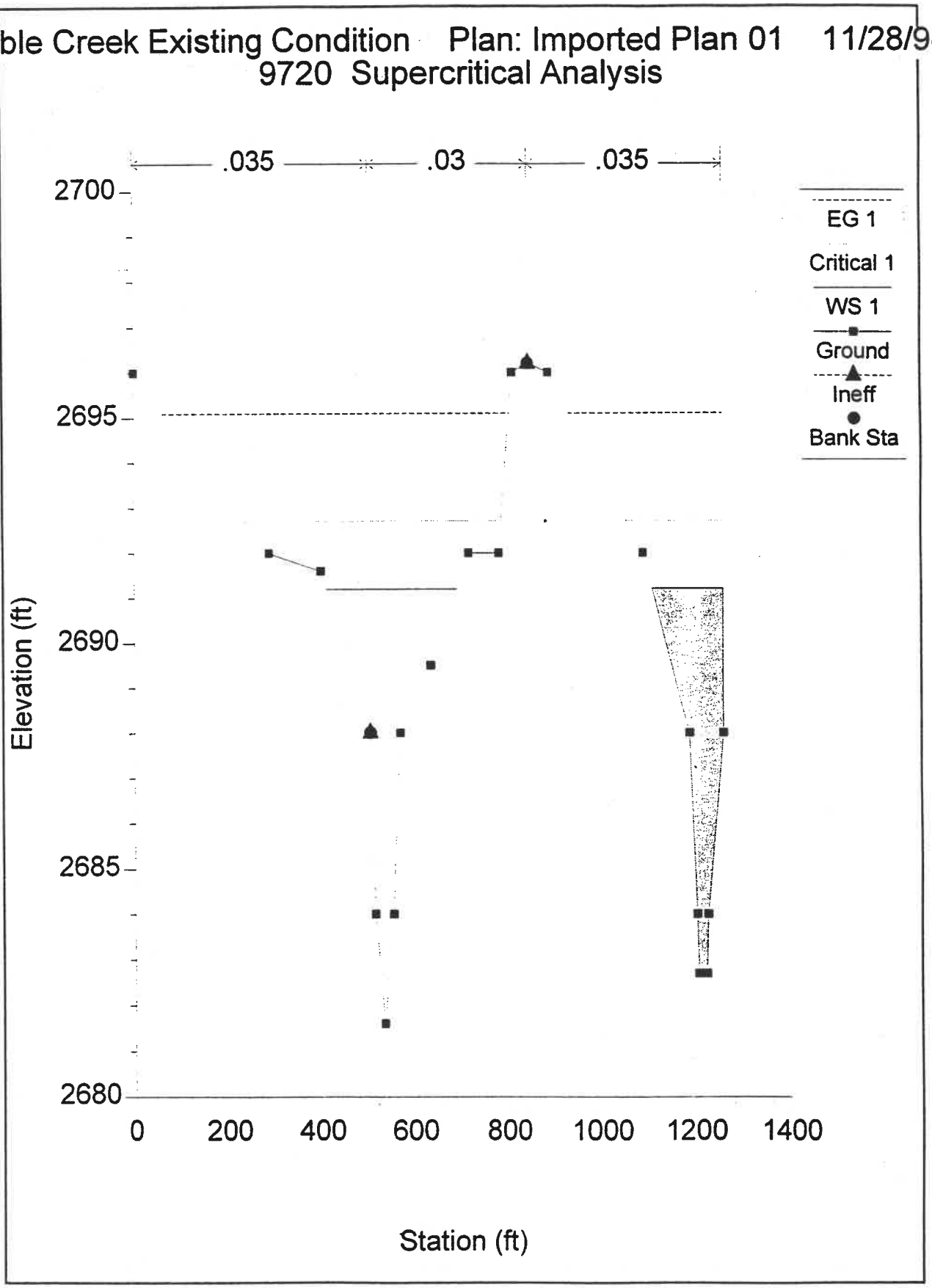

Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
9110 Supercritical Analysis
.035
.03
.035
EG 1
Critical 1
WS 1
Ground
Bank Sta
2676
2674
2672
2670
2668
2666
2664
Elevation (ft)
0
500
1000
1500
Station (ft)

Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98

9420 Supercritical Analysis



Noble Creek Existing Condition Plan: Imported Plan 01 11/28/98
9720 Supercritical Analysis



APPENDIX B:
PROPOSED CONDITION HEC-RAS CALCULATIONS & CROSS-SECTIONS

Proposed Condition
HEC-RAS Calculations & Cross-Sections

HEC-RAS September 1998 Version 2.2
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X      X   X     X  X    X
X     X  X        X           X   X     X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX   XXXX
X     X  X        X           X  X      X    X       X
X     X  X        X    X      X   X     X    X       X
X     X  XXXXXX    XXXX       X    X    X    X   XXXXX
```

PROJECT DATA
Project Title: NOBLE CREEK DESIGN
Project File : NOBD.prj
Run Date and Time: 7/4/01 10:32:14 AM

Project in English units

PLAN DATA

Plan Title: Imported Plan 01
Plan File : n:\1858\HEC\NOBD.p01

Geometry Title: Imported Geom 01
Geometry File : n:\1858\HEC\NOBD.g01

Flow Title : Imported Flow 01
Flow File : n:\1858\HEC\NOBD.f01

Plan Summary Information:

Number of:	Cross Sections	= 73	Mulitple Openings	=	0
	Culverts	= 0	Inline Weirs	=	0
	Bridges	= 0			

Computational Information

Water surface calculation tolerance	= 0.01
Critical depth calculaton tolerance	= 0.01
Maximum number of interations	= 20
Maximum difference tolerance	= 0.3
Flow tolerance factor	= 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: Imported Flow 01
Flow File : n:\1858\HEC\NOBD.f01

Flow Data (cfs)

River	Reach	RS	PF 1
1	1	6350	13530

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
1	1	PF 1	Critical	Critical

GEOMETRY DATA

Geometry Title: Imported Geom 01
Geometry File : n:\1858\HEC\NOBD.g01

CROSS SECTION RIVER: 1
REACH: 1 RS: 6350

INPUT
Description: 6350
Station Elevation Data num= 81

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
806	2687.4	808	2687.4	810	2687.4	812	2687.4	814	2687.4
816	2687.4	818	2687.4	820	2687.4	822	2687.4	824	2687.4
836	2687.4	838	2687.4	840	2687.4	842	2687.4	844	2687.4
846	2687.4	848	2687.3	850	2686.8	852	2686	854	2685.2
856	2684.4	858	2683.6	860	2682.7	862	2681.9	864	2681
866	2680.3	868	2679.7	870	2679.4	872	2679.4	874	2679.4
876	2679.4	878	2679.4	880	2679.4	882	2679.4	884	2679.4
886	2679.4	888	2679.4	890	2679.4	892	2679.4	894	2679.4
896	2679.4	1040	2679.3	1042	2679.3	1044	2679.3	1046	2679.3
1048	2679.3	1050	2679.3	1052	2679.3	1054	2679.4	1056	2679.5
1058	2679.9	1060	2680.5	1062	2681.3	1064	2682.2	1066	2683
1068	2683.8	1070	2684.7	1072	2685.5	1074	2686.3	1076	2687
1078	2687.3	1080	2687.3	1082	2687.3	1084	2687.3	1086	2687.3
1088	2687.3	1090	2687.3	1092	2687.3	1094	2687.3	1096	2687.3
1098	2687.3	1100	2687.3	1102	2687.3	1130	2687.3	1132	2687.3
1134	2687.3	1136	2687.3	1138	2687.3	1140	2687.3	1142	2687.3
1144	2687.3								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
806	.03	806	.03	1144	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
806	1144	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	2687.15	Element			
Vel Head (ft)	2.51	Wt. n-Val.		0.030	
W.S. Elev (ft)	2684.64	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2684.64	Flow Area (sq ft)		1064.96	
E.G. Slope (ft/ft)	0.007860	Area (sq ft)		1064.96	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	214.46	Top Width (ft)		214.46	
Vel Total (ft/s)	12.70	Avg. Vel. (ft/s)		12.70	
Max Chl Dpth (ft)	5.34	Hydr. Depth (ft)		4.97	
Conv. Total (cfs)	152612.9	Conv. (cfs)		152612.9	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		216.40	
Min Ch El (ft)	2679.30	Shear (lb/sq ft)		2.41	
Alpha	1.00	Stream Power (lb/ft s)		30.68	
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)		92.58	
C & E Loss (ft)	0.00	Cum SA (acres)		22.02	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 6300

INPUT
Description: 6300
Station Elevation Data num= 152

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
804	2686.2	806	2686.2	808	2686.2	810	2686.2	812	2686.2
814	2686.2	816	2686.2	818	2686.2	820	2686.2	822	2686.2
824	2686.2	826	2686.2	828	2686.2	830	2686.2	832	2686.2
834	2686.2	836	2686.2	838	2686.2	840	2686.2	842	2686.2
844	2686.2	846	2686.2	848	2686.1	850	2685.5	852	2685
854	2684.1	856	2683.3	858	2682.4	860	2681.6	862	2680.7
864	2679.9	866	2679	868	2678.4	870	2678.3	872	2678.2
874	2678.2	876	2678.2	878	2678.2	880	2678.2	882	2678.2
884	2678.2	886	2678.2	888	2678.2	890	2678.2	892	2678.2
894	2678.2	896	2678.2	898	2678.2	900	2678.2	902	2678.2
904	2678.2	906	2678.2	908	2678.2	910	2678.2	912	2678.2
914	2678.2	916	2678.2	918	2678.2	920	2678.2	922	2678.2
924	2678.2	926	2678.2	928	2678.2	930	2678.2	932	2678.2
934	2678.2	936	2678.2	938	2678.2	940	2678.2	942	2678.2
944	2678.2	946	2678.2	948	2678.2	950	2678.2	952	2678.2
954	2678.2	956	2678.2	958	2678.2	1000	2678.2	1002	2678.2
1004	2678.2	1006	2678.2	1008	2678.2	1010	2678.2	1012	2678.2
1014	2678.2	1016	2678.2	1018	2678.2	1020	2678.2	1022	2678.2
1024	2678.2	1026	2678.2	1028	2678.2	1030	2678.2	1032	2678.2
1034	2678.2	1036	2678.2	1038	2678.2	1040	2678.2	1042	2678.2
1044	2678.2	1046	2678.2	1048	2678.2	1050	2678.2	1052	2678.2
1054	2678.2	1056	2678.4	1058	2678.8	1060	2679.5	1062	2680.2
1064	2681.1	1066	2681.9	1068	2682.8	1070	2683.6	1072	2684.4
1074	2685.2	1076	2685.8	1078	2686.2	1080	2686.2	1082	2686.2
1084	2686.2	1086	2686.2	1088	2686.2	1090	2686.2	1092	2686.2
1094	2686.2	1096	2686.2	1098	2686.2	1100	2686.2	1102	2686.2
1104	2686.1	1106	2686.1	1108	2686.1	1110	2686.1	1112	2686.1
1114	2686.1	1116	2686.1	1118	2686.1	1120	2686.1	1122	2686.1
1124	2686.1	1126	2686.1	1128	2686.1	1130	2686.1	1132	2686.1
1134	2686.1	1136	2686.1	1138	2686.1	1140	2686.1	1142	2686.1
1144	2686.1	1146	2686.1						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
804	.03	804	.03	1146	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
804	1146	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2686.00	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.51	Wt. n-Val.		0.030	
W.S. Elev (ft)	2683.48	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2683.48	Flow Area (sq ft)		1064.08	
E.G. Slope (ft/ft)	0.007869	Area (sq ft)		1064.08	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	214.17	Top Width (ft)		214.17	
Vel Total (ft/s)	12.72	Avg. Vel. (ft/s)		12.72	
Max Chl Dpth (ft)	5.28	Hydr. Depth (ft)		4.97	
Conv. Total (cfs)	152520.1	Conv. (cfs)		152520.1	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		216.15	
Min Ch El (ft)	2678.20	Shear (lb/sq ft)		2.42	
Alpha	1.00	Stream Power (lb/ft s)		30.75	
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)		91.35	
C & E Loss (ft)	0.00	Cum SA (acres)		21.77	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 6250

INPUT
Description: 6250
Station Elevation Data num= 170

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
806	2685.1	808	2685.1	810	2685.1	812	2685.1	814	2685.1
816	2685.1	818	2685.1	820	2685.1	822	2685.1	824	2685.1
826	2685.1	828	2685.1	830	2685.1	832	2685.1	834	2685.1
836	2685.1	838	2685.1	840	2685.1	842	2685.1	844	2685.1
846	2685.1	848	2684.8	850	2684.5	852	2683.8	854	2683
856	2682.2	858	2681.3	860	2680.5	862	2679.6	864	2678.7
866	2678.1	868	2677.4	870	2677	872	2677	874	2677
876	2677	878	2677	880	2677	882	2677	884	2677
886	2677	888	2677	890	2677	892	2677	894	2677
896	2677	898	2677	900	2677	902	2677	904	2677
906	2677	908	2677	910	2677	912	2677	914	2677
916	2677	918	2677	920	2677	922	2677	924	2677
926	2677	928	2677	930	2677	932	2677	934	2677
936	2677	938	2677	940	2677	942	2677	944	2677
946	2677	948	2677	950	2677	952	2677	954	2677
956	2677	958	2677	960	2677	962	2677	964	2677
966	2677	968	2677	970	2677	972	2677	974	2677
976	2677	978	2677	980	2677	982	2677	984	2677
986	2677	988	2677	990	2677	992	2677	994	2677
996	2677	998	2677	1000	2677	1002	2677	1004	2677
1006	2677	1008	2677	1010	2677	1012	2677	1014	2677
1016	2677	1018	2677	1020	2677	1022	2677	1024	2677
1026	2677	1028	2677	1030	2677	1032	2677	1034	2677
1036	2677	1038	2677	1040	2677	1042	2677	1044	2677
1046	2677	1048	2677	1050	2677	1052	2677	1054	2677
1056	2677.1	1058	2677.8	1060	2678.3	1062	2679.2	1064	2680
1066	2680.8	1068	2681.7	1070	2682.5	1072	2683.3	1074	2684.2
1076	2684.8	1078	2684.9	1080	2684.9	1082	2685	1084	2685
1086	2685	1088	2685	1090	2685	1092	2685	1094	2685
1096	2685	1098	2685	1100	2685	1102	2685	1104	2685
1106	2685	1108	2685	1110	2685	1112	2685	1114	2685
1116	2685	1118	2685	1120	2685	1122	2685	1124	2685
1126	2685	1128	2685	1130	2685	1132	2685	1134	2685
1136	2685	1138	2685	1140	2685	1142	2685	1144	2685

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
806	.03	806	.03	1144	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
806	1144	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2684.81	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.51	Wt. n-Val.		0.030	
W.S. Elev (ft)	2682.30	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2682.30	Flow Area (sq ft)		1064.78	
E.G. Slope (ft/ft)	0.007833	Area (sq ft)		1064.78	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	213.76	Top Width (ft)		213.76	
Vel Total (ft/s)	12.71	Avg. Vel. (ft/s)		12.71	
Max Chl Dpth (ft)	5.30	Hydr. Depth (ft)		4.98	
Conv. Total (cfs)	152877.3	Conv. (cfs)		152877.3	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		215.75	
Min Ch El (ft)	2677.00	Shear (lb/sq ft)		2.41	
Alpha	1.00	Stream Power (lb/ft s)		30.67	
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)		90.13	
C & E Loss (ft)	0.00	Cum SA (acres)		21.53	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 6200

INPUT
Description: 6200
Station Elevation Data num= 172

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
804	2683.9	806	2683.9	808	2683.9	810	2683.9	812	2683.9
814	2683.9	816	2683.9	818	2683.9	820	2683.9	822	2683.9
824	2683.9	826	2683.9	828	2683.9	830	2683.9	832	2683.9
834	2683.9	836	2683.9	838	2683.9	840	2683.9	842	2683.9
844	2683.9	846	2683.9	848	2683.9	850	2683.4	852	2682.8
854	2681.9	856	2681	858	2680.2	860	2679.3	862	2678.5
864	2677.6	866	2676.7	868	2676.1	870	2675.9	872	2675.9
874	2675.9	876	2675.9	878	2675.9	880	2675.9	882	2675.9
884	2675.9	886	2675.9	888	2675.9	890	2675.9	892	2675.9
894	2675.9	896	2675.9	898	2675.9	900	2675.9	902	2675.9
904	2675.9	906	2675.9	908	2675.9	910	2675.9	912	2675.9
914	2675.9	916	2675.9	918	2675.9	920	2675.9	922	2675.9
924	2675.9	926	2675.9	928	2675.9	930	2675.9	932	2675.9
934	2675.9	936	2675.8	938	2675.8	940	2675.8	942	2675.8
944	2675.8	946	2675.8	948	2675.8	950	2675.8	952	2675.8
954	2675.8	956	2675.8	958	2675.8	960	2675.8	962	2675.8
964	2675.8	966	2675.8	968	2675.8	970	2675.8	972	2675.8
974	2675.8	976	2675.8	978	2675.8	980	2675.8	982	2675.8
984	2675.8	986	2675.8	988	2675.8	990	2675.8	992	2675.8
994	2675.8	996	2675.8	998	2675.8	1000	2675.8	1002	2675.8
1004	2675.8	1006	2675.8	1008	2675.8	1010	2675.8	1012	2675.8
1014	2675.8	1016	2675.8	1018	2675.8	1020	2675.8	1022	2675.8
1024	2675.8	1026	2675.8	1028	2675.8	1030	2675.8	1032	2675.8
1034	2675.8	1036	2675.8	1038	2675.8	1040	2675.8	1042	2675.8
1044	2675.8	1046	2675.8	1048	2675.8	1050	2675.8	1052	2675.8
1054	2675.8	1056	2676.2	1058	2676.6	1060	2677.3	1062	2678.1
1064	2678.9	1066	2679.8	1068	2680.6	1070	2681.4	1072	2682.3
1074	2683	1076	2683.5	1078	2683.6	1080	2683.8	1082	2683.8
1084	2683.8	1086	2683.8	1088	2683.8	1090	2683.8	1092	2683.8
1094	2683.8	1096	2683.8	1098	2683.8	1100	2683.8	1102	2683.8
1104	2683.8	1106	2683.8	1108	2683.8	1110	2683.8	1112	2683.8
1114	2683.8	1116	2683.8	1118	2683.8	1120	2683.8	1122	2683.8
1124	2683.8	1126	2683.8	1128	2683.8	1130	2683.8	1132	2683.8
1134	2683.8	1136	2683.8	1138	2683.8	1140	2683.8	1142	2683.8
1144	2683.8	1146	2683.8						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
804	.03	804	.03	1146	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
804	1146	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	2683.65	Element			
Vel Head (ft)	2.49	Wt. n-Val.		0.030	
W.S. Elev (ft)	2681.16	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2681.16	Flow Area (sq ft)		1068.04	
E.G. Slope (ft/ft)	0.007752	Area (sq ft)		1068.04	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	213.74	Top Width (ft)		213.74	
Vel Total (ft/s)	12.67	Avg. Vel. (ft/s)		12.67	
Max Chl Dpth (ft)	5.36	Hydr. Depth (ft)		5.00	
Conv. Total (cfs)	153670.7	Conv. (cfs)		153670.7	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		215.72	
Min Ch El (ft)	2675.80	Shear (lb/sq ft)		2.40	
Alpha	1.00	Stream Power (lb/ft s)		30.35	
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)		88.91	
C & E Loss (ft)	0.00	Cum SA (acres)		21.28	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 6150

INPUT
Description: 6150
Station Elevation Data num= 172

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
806	2682.7	808	2682.7	810	2682.7	812	2682.7	814	2682.7
816	2682.7	818	2682.7	820	2682.7	822	2682.7	824	2682.7
826	2682.7	828	2682.7	830	2682.7	832	2682.7	834	2682.7
836	2682.7	838	2682.7	840	2682.7	842	2682.7	844	2682.7
846	2682.7	848	2682.5	850	2682.2	852	2681.6	854	2680.8
856	2679.9	858	2679	860	2678.2	862	2677.3	864	2676.4
866	2675.6	868	2675	870	2674.7	872	2674.7	874	2674.7
876	2674.7	878	2674.7	880	2674.7	882	2674.7	884	2674.7
886	2674.7	888	2674.7	890	2674.7	892	2674.7	894	2674.7
896	2674.7	898	2674.7	900	2674.7	902	2674.7	904	2674.7
906	2674.7	908	2674.7	910	2674.7	912	2674.7	914	2674.7
916	2674.7	918	2674.7	920	2674.7	922	2674.7	924	2674.7
926	2674.7	928	2674.7	930	2674.7	932	2674.7	934	2674.7
936	2674.7	938	2674.7	940	2674.7	942	2674.7	944	2674.7
946	2674.7	948	2674.7	950	2674.7	952	2674.7	954	2674.7
956	2674.7	958	2674.7	960	2674.7	962	2674.7	964	2674.7
966	2674.7	968	2674.7	970	2674.7	972	2674.7	974	2674.7
976	2674.7	978	2674.7	980	2674.7	982	2674.7	984	2674.7
986	2674.7	988	2674.7	990	2674.7	992	2674.6	994	2674.6
996	2674.6	998	2674.6	1000	2674.6	1002	2674.6	1004	2674.6
1006	2674.6	1008	2674.6	1010	2674.6	1012	2674.6	1014	2674.6
1016	2674.6	1018	2674.6	1020	2674.6	1022	2674.6	1024	2674.6
1026	2674.6	1028	2674.6	1030	2674.6	1032	2674.6	1034	2674.6
1036	2674.6	1038	2674.6	1040	2674.6	1042	2674.6	1044	2674.6
1046	2674.6	1048	2674.6	1050	2674.6	1052	2674.6	1054	2674.8
1056	2674.9	1058	2675.4	1060	2676.2	1062	2677	1064	2677.8
1066	2678.7	1068	2679.5	1070	2680.3	1072	2681.2	1074	2682
1076	2682.2	1078	2682.6	1080	2682.6	1082	2682.6	1084	2682.6
1086	2682.6	1088	2682.6	1090	2682.6	1092	2682.6	1094	2682.6
1096	2682.6	1098	2682.6	1100	2682.6	1102	2682.6	1104	2682.6
1106	2682.6	1108	2682.6	1110	2682.6	1112	2682.6	1114	2682.6
1116	2682.6	1118	2682.6	1120	2682.6	1122	2682.6	1124	2682.6
1126	2682.6	1128	2682.6	1130	2682.6	1132	2682.6	1134	2682.6
1136	2682.6	1138	2682.6	1140	2682.6	1142	2682.6	1144	2682.6
1146	2682.6	1148	2682.6						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
806	.03	806	.03	1148	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
806	1148	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	2682.48	Element			
Vel Head (ft)	2.52	Wt. n-Val.		0.030	
W.S. Elev (ft)	2679.97	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2679.97	Flow Area (sq ft)		1063.11	
E.G. Slope (ft/ft)	0.007853	Area (sq ft)		1063.11	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	213.33	Top Width (ft)		213.33	
Vel Total (ft/s)	12.73	Avg. Vel. (ft/s)		12.73	
Max Chl Dpth (ft)	5.37	Hydr. Depth (ft)		4.98	
Conv. Total (cfs)	152681.4	Conv. (cfs)		152681.4	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		215.32	
Min Ch El (ft)	2674.60	Shear (lb/sq ft)		2.42	
Alpha	1.00	Stream Power (lb/ft s)		30.81	
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)		87.68	
C & E Loss (ft)	0.00	Cum SA (acres)		21.04	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 6100

INPUT
Description: 6100
Station Elevation Data num= 171

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
806	2681.5	808	2681.5	810	2681.5	812	2681.5	814	2681.5
816	2681.5	818	2681.5	820	2681.5	822	2681.5	824	2681.5
826	2681.5	828	2681.5	830	2681.5	832	2681.5	834	2681.5
836	2681.5	838	2681.5	840	2681.5	842	2681.5	844	2681.5
846	2681.5	848	2681.5	850	2681.1	852	2680.5	854	2679.6
856	2678.7	858	2677.9	860	2677	862	2676.1	864	2675.2
866	2674.3	868	2673.6	870	2673.5	872	2673.5	874	2673.5
876	2673.5	878	2673.5	880	2673.5	882	2673.5	884	2673.5
886	2673.5	888	2673.5	890	2673.5	892	2673.5	894	2673.5
896	2673.5	898	2673.5	900	2673.5	902	2673.5	904	2673.5
906	2673.5	908	2673.5	910	2673.5	912	2673.5	914	2673.5
916	2673.5	918	2673.5	920	2673.5	922	2673.5	924	2673.5
926	2673.5	928	2673.5	930	2673.5	932	2673.5	934	2673.5
936	2673.5	938	2673.5	940	2673.5	942	2673.5	944	2673.5
946	2673.5	948	2673.5	950	2673.5	952	2673.5	954	2673.5
956	2673.5	958	2673.5	960	2673.5	962	2673.5	964	2673.5
966	2673.5	968	2673.5	970	2673.5	972	2673.5	974	2673.5
976	2673.5	978	2673.5	980	2673.5	982	2673.5	984	2673.5
986	2673.5	988	2673.5	990	2673.5	992	2673.5	994	2673.5
996	2673.5	998	2673.5	1000	2673.5	1002	2673.5	1004	2673.5
1006	2673.5	1008	2673.5	1010	2673.5	1012	2673.5	1014	2673.5
1016	2673.5	1018	2673.5	1020	2673.5	1022	2673.5	1024	2673.5
1026	2673.5	1028	2673.5	1030	2673.5	1032	2673.5	1034	2673.5
1036	2673.5	1038	2673.5	1040	2673.5	1042	2673.5	1044	2673.5
1046	2673.5	1048	2673.5	1050	2673.5	1052	2673.5	1054	2673.5
1056	2673.6	1058	2674.2	1060	2674.9	1062	2675.8	1064	2676.6
1066	2677.5	1068	2678.3	1070	2679.2	1072	2680	1074	2680.6
1076	2681.2	1078	2681.4	1080	2681.4	1082	2681.4	1084	2681.4
1086	2681.4	1088	2681.4	1090	2681.4	1092	2681.4	1094	2681.4
1096	2681.4	1098	2681.4	1100	2681.4	1102	2681.4	1104	2681.4
1106	2681.4	1108	2681.4	1110	2681.4	1112	2681.4	1114	2681.4
1116	2681.4	1118	2681.4	1120	2681.4	1122	2681.4	1124	2681.4
1126	2681.4	1128	2681.4	1130	2681.4	1132	2681.4	1134	2681.4
1136	2681.4	1138	2681.4	1140	2681.4	1142	2681.4	1144	2681.4
1146	2681.4								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
806	.03	806	.03	1146	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
806	1146	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2681.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.51	Wt. n-Val.		0.030	
W.S. Elev (ft)	2678.79	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2678.79	Flow Area (sq ft)		1063.41	
E.G. Slope (ft/ft)	0.007849	Area (sq ft)		1063.41	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	213.31	Top Width (ft)		213.31	
Vel Total (ft/s)	12.72	Avg. Vel. (ft/s)		12.72	
Max Chl Dpth (ft)	5.29	Hydr. Depth (ft)		4.99	
Conv. Total (cfs)	152717.5	Conv. (cfs)		152717.5	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		215.39	
Min Ch El (ft)	2673.50	Shear (lb/sq ft)		2.42	
Alpha	1.00	Stream Power (lb/ft s)		30.78	

Frctn Loss (ft)	0.39	Cum Volume (acre-ft)	86.46
C & E Loss (ft)	0.00	Cum SA (acres)	20.79

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 6050

INPUT
Description: 6050
Station Elevation Data num= 174

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
798	2680.3	800	2680.3	802	2680.3	804	2680.3	806	2680.3
808	2680.3	810	2680.3	812	2680.3	814	2680.4	816	2680.4
818	2680.4	820	2680.4	822	2680.4	824	2680.4	826	2680.4
828	2680.4	830	2680.4	832	2680.4	834	2680.4	836	2680.4
838	2680.4	840	2680.4	842	2680.4	844	2680.4	846	2680.4
848	2680.2	850	2680	852	2679.2	854	2678.5	856	2677.6
858	2676.7	860	2675.7	862	2674.8	864	2673.9	866	2673.4
868	2672.6	870	2672.3	872	2672.3	874	2672.3	876	2672.3
878	2672.3	880	2672.3	882	2672.3	884	2672.3	886	2672.3
888	2672.3	890	2672.3	892	2672.3	894	2672.3	896	2672.3
898	2672.3	900	2672.3	902	2672.3	904	2672.3	906	2672.3
908	2672.3	910	2672.3	912	2672.3	914	2672.3	916	2672.3
918	2672.3	920	2672.3	922	2672.3	924	2672.3	926	2672.3
928	2672.3	930	2672.3	932	2672.3	934	2672.3	936	2672.3
938	2672.3	940	2672.3	942	2672.3	944	2672.3	946	2672.3
948	2672.3	950	2672.3	952	2672.3	954	2672.3	956	2672.3
958	2672.3	960	2672.3	962	2672.3	964	2672.3	966	2672.3
968	2672.3	970	2672.3	972	2672.3	974	2672.3	976	2672.3
978	2672.3	980	2672.3	982	2672.3	984	2672.3	986	2672.3
988	2672.3	990	2672.3	992	2672.3	994	2672.3	996	2672.3
998	2672.3	1000	2672.3	1002	2672.3	1004	2672.3	1006	2672.3
1008	2672.3	1010	2672.3	1012	2672.3	1014	2672.3	1016	2672.3
1018	2672.3	1020	2672.3	1022	2672.3	1024	2672.3	1026	2672.3
1028	2672.3	1030	2672.3	1032	2672.3	1034	2672.3	1036	2672.3
1038	2672.3	1040	2672.3	1042	2672.3	1044	2672.3	1046	2672.3
1048	2672.3	1050	2672.3	1052	2672.3	1054	2672.3	1056	2672.5
1058	2673.3	1060	2673.7	1062	2674.6	1064	2675.4	1066	2676.3
1068	2677.1	1070	2678	1072	2678.9	1074	2679.7	1076	2680.1
1078	2680.3	1080	2680.3	1082	2680.3	1084	2680.3	1086	2680.3
1088	2680.3	1090	2680.3	1092	2680.3	1094	2680.3	1096	2680.3
1098	2680.3	1100	2680.3	1102	2680.3	1104	2680.3	1106	2680.3
1108	2680.3	1110	2680.3	1112	2680.3	1114	2680.3	1116	2680.3
1118	2680.3	1120	2680.3	1122	2680.3	1124	2680.3	1126	2680.3
1128	2680.2	1130	2680.2	1132	2680.2	1134	2680.2	1136	2680.2
1138	2680.2	1140	2680.2	1142	2680.2	1144	2680.2		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
798	.03	798	.03	1144	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
798	1144	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2680.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.52	Wt. n-Val.		0.030	
W.S. Elev (ft)	2677.60	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2677.60	Flow Area (sq ft)		1062.72	
E.G. Slope (ft/ft)	0.007855	Area (sq ft)		1062.72	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	213.10	Top Width (ft)		213.10	
Vel Total (ft/s)	12.73	Avg. Vel. (ft/s)		12.73	
Max Chl Dpth (ft)	5.30	Hydr. Depth (ft)		4.99	

Conv. Total (cfs)	152662.5	Conv. (cfs)	152662.5
Length Wtd. (ft)	50.00	Wetted Per. (ft)	215.16
Min Ch El (ft)	2672.30	Shear (lb/sq ft)	2.42
Alpha	1.00	Stream Power (lb/ft s)	30.84
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)	85.24
C & E Loss (ft)	0.00	Cum SA (acres)	20.55

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 6000

INPUT
Description: 6000
Station Elevation Data num= 193

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
758	2679.2	760	2679.2	762	2679.2	764	2679.2	766	2679.2
768	2679.2	770	2679.2	772	2679.2	774	2679.2	776	2679.2
778	2679.2	780	2679.2	782	2679.2	784	2679.2	786	2679.2
788	2679.2	790	2679.2	792	2679.2	794	2679.2	796	2679.2
798	2679.2	800	2679.2	802	2679.2	804	2679.2	806	2679.2
808	2679.2	810	2679.2	812	2679.2	814	2679.2	816	2679.2
818	2679.2	820	2679.2	822	2679.2	824	2679.2	826	2679.2
828	2679.2	830	2679.2	832	2679.2	834	2679.2	836	2679.2
838	2679.2	840	2679.2	842	2679.2	844	2679.2	846	2679.2
848	2679.2	850	2678.6	852	2678.2	854	2677.3	856	2676.4
858	2675.5	860	2674.5	862	2673.6	864	2672.7	866	2671.8
868	2671.2	870	2671.1	872	2671.1	874	2671.1	876	2671.1
878	2671.1	880	2671.1	882	2671.1	884	2671.1	886	2671.1
888	2671.1	890	2671.1	892	2671.1	894	2671.1	896	2671.1
898	2671.1	900	2671.1	902	2671.1	904	2671.1	906	2671.1
908	2671.1	910	2671.1	912	2671.1	914	2671.1	916	2671.1
918	2671.1	920	2671.1	922	2671.1	924	2671.1	926	2671.1
928	2671.1	930	2671.1	932	2671.1	934	2671.1	936	2671.1
938	2671.1	940	2671.1	942	2671.1	944	2671.1	946	2671.1
948	2671.1	950	2671.1	952	2671.1	954	2671.1	956	2671.1
958	2671.1	960	2671.1	962	2671.1	964	2671.1	966	2671.1
968	2671.1	970	2671.1	972	2671.1	974	2671.1	976	2671.1
978	2671.1	980	2671.1	982	2671.1	984	2671.1	986	2671.1
988	2671.1	990	2671.1	992	2671.1	994	2671.1	996	2671.1
998	2671.1	1000	2671.1	1002	2671.1	1004	2671.1	1006	2671.1
1008	2671.1	1010	2671.1	1012	2671.1	1014	2671.1	1016	2671.1
1018	2671.1	1020	2671.1	1022	2671.1	1024	2671.1	1026	2671.1
1028	2671.1	1030	2671.1	1032	2671.1	1034	2671.1	1036	2671.1
1038	2671.1	1040	2671.1	1042	2671.1	1044	2671.1	1046	2671.1
1048	2671.1	1050	2671.1	1052	2671.1	1054	2671.1	1056	2671.6
1058	2671.8	1060	2672.5	1062	2673.4	1064	2674.2	1066	2675.1
1068	2676	1070	2676.8	1072	2677.7	1074	2678.3	1076	2678.8
1078	2679	1080	2679.1	1082	2679.1	1084	2679.1	1086	2679.1
1088	2679.1	1090	2679.1	1092	2679.1	1094	2679.1	1096	2679.1
1098	2679.1	1100	2679.1	1102	2679.1	1104	2679.1	1106	2679.1
1108	2679.1	1110	2679.1	1112	2679.1	1114	2679.1	1116	2679.1
1118	2679.1	1120	2679.1	1122	2679.1	1124	2679.1	1126	2679.1
1128	2679.1	1130	2679.1	1132	2679.1	1134	2679.1	1136	2679.1
1138	2679.1	1140	2679.1	1142	2679.1				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
758	.03	758	.03	1142	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
758	1142	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2678.91	Element	Left OB	Channel	Right OB

Vel Head (ft)	2.51	Wt. n-Val.		0.030	
W.S. Elev (ft)	2676.40	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2676.40	Flow Area (sq ft)		1063.33	
E.G. Slope (ft/ft)	0.007836	Area (sq ft)		1063.33	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	212.98	Top Width (ft)		212.98	
Vel Total (ft/s)	12.72	Avg. Vel. (ft/s)		12.72	
Max Chl Dpth (ft)	5.30	Hydr. Depth (ft)		4.99	
Conv. Total (cfs)	152845.7	Conv. (cfs)		152845.7	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		215.08	
Min Ch El (ft)	2671.10	Shear (lb/sq ft)		2.42	
Alpha	1.00	Stream Power (lb/ft s)		30.77	
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)		84.02	
C & E Loss (ft)	0.00	Cum SA (acres)		20.30	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 5950

INPUT
Description: 5950
Station Elevation Data num= 214

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
718	2678	720	2678	722	2678	724	2678	726	2678
728	2678	730	2678	732	2678	734	2678	736	2678
738	2678	740	2678	742	2678	744	2678	746	2678
748	2678	750	2678	752	2678	754	2678	756	2678
758	2678	760	2678	762	2678	764	2678	766	2678
768	2678	770	2678	772	2678	774	2678	776	2678
778	2678	780	2678	782	2678	784	2678	786	2678
788	2678	790	2678	792	2678	794	2678	796	2678
798	2678	800	2678	802	2678	804	2678	806	2678
808	2678	810	2678	812	2678	814	2678	816	2678
818	2678	820	2678	822	2678	824	2678	826	2678
828	2678	830	2678	832	2678	834	2678	836	2678
838	2678	840	2678	842	2678	844	2678	846	2678
848	2677.8	850	2677.6	852	2677.1	854	2676.2	856	2675.2
858	2674.3	860	2673.3	862	2672.4	864	2671.4	866	2670.6
868	2670.2	870	2670.1	872	2670	874	2670	876	2670
878	2670	880	2670	882	2670	884	2670	886	2670
888	2670	890	2670	892	2670	894	2670	896	2670
898	2670	900	2670	902	2670	904	2670	906	2670
908	2670	910	2670	912	2670	914	2670	916	2670
918	2670	920	2670	922	2670	924	2670	926	2670
928	2670	930	2670	932	2670	934	2669.9	936	2669.9
938	2669.9	940	2669.9	942	2669.9	944	2669.9	946	2669.9
948	2669.9	950	2669.9	952	2669.9	954	2669.9	956	2669.9
958	2669.9	960	2669.9	962	2669.9	964	2669.9	966	2669.9
968	2669.9	970	2669.9	972	2669.9	974	2669.9	976	2669.9
978	2669.9	980	2669.9	982	2669.9	984	2669.9	986	2669.9
988	2669.9	990	2669.9	992	2669.9	994	2669.9	996	2669.9
998	2669.9	1000	2669.9	1002	2669.9	1004	2669.9	1006	2669.9
1008	2669.9	1010	2669.9	1012	2669.9	1014	2669.9	1016	2669.9
1018	2669.9	1020	2669.9	1022	2669.9	1024	2669.9	1026	2669.9
1028	2669.9	1030	2669.9	1032	2669.9	1034	2669.9	1036	2669.9
1038	2669.9	1040	2669.9	1042	2669.9	1044	2669.9	1046	2669.9
1048	2669.9	1050	2669.9	1052	2669.9	1054	2670.1	1056	2670.1
1058	2670.4	1060	2671.3	1062	2672.2	1064	2673	1066	2673.9
1068	2674.8	1070	2675.7	1072	2676.5	1074	2677.2	1076	2677.7
1078	2677.9	1080	2677.9	1082	2677.9	1084	2677.9	1086	2677.9
1088	2677.9	1090	2677.9	1092	2677.9	1094	2677.9	1096	2677.9
1098	2677.9	1100	2677.9	1102	2677.9	1104	2677.9	1106	2677.9
1108	2677.9	1110	2677.9	1112	2677.9	1114	2677.9	1116	2677.9
1118	2677.9	1120	2677.9	1122	2677.9	1124	2677.9	1126	2677.9
1128	2677.9	1130	2677.9	1132	2677.9	1134	2677.9	1136	2677.9

1138	2677.9	1140	2677.9	1142	2677.9	1144	2677.9

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
718	.03	718	.03	1144	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
718	1144	50	50	50 .1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	2677.74	Element			
Vel Head (ft)	2.52	Wt. n-Val.		0.030	
W.S. Elev (ft)	2675.22	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2675.22	Flow Area (sq ft)		1062.09	
E.G. Slope (ft/ft)	0.007867	Area (sq ft)		1062.09	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	212.97	Top Width (ft)		212.97	
Vel Total (ft/s)	12.74	Avg. Vel. (ft/s)		12.74	
Max Chl Dpth (ft)	5.32	Hydr. Depth (ft)		4.99	
Conv. Total (cfs)	152546.4	Conv. (cfs)		152546.4	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		215.08	
Min Ch El (ft)	2669.90	Shear (lb/sq ft)		2.43	
Alpha	1.00	Stream Power (lb/ft s)		30.89	
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)		82.80	
C & E Loss (ft)	0.00	Cum SA (acres)		20.06	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 5900

INPUT
Description: 5900
Station Elevation Data num= 234

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
678	2676.8	680	2676.8	682	2676.8	684	2676.8	686	2676.8
688	2676.8	690	2676.8	692	2676.8	694	2676.8	696	2676.8
698	2676.8	700	2676.8	702	2676.8	704	2676.8	706	2676.8
708	2676.8	710	2676.8	712	2676.8	714	2676.8	716	2676.8
718	2676.8	720	2676.8	722	2676.8	724	2676.8	726	2676.8
728	2676.8	730	2676.8	732	2676.8	734	2676.8	736	2676.8
738	2676.8	740	2676.8	742	2676.8	744	2676.8	746	2676.8
748	2676.8	750	2676.8	752	2676.8	754	2676.8	756	2676.8
758	2676.8	760	2676.8	762	2676.8	764	2676.8	766	2676.8
768	2676.8	770	2676.8	772	2676.8	774	2676.8	776	2676.8
778	2676.8	780	2676.8	782	2676.8	784	2676.8	786	2676.8
788	2676.8	790	2676.8	792	2676.8	794	2676.8	796	2676.8
798	2676.8	800	2676.8	802	2676.8	804	2676.8	806	2676.8
808	2676.8	810	2676.8	812	2676.8	814	2676.8	816	2676.8
818	2676.8	820	2676.8	822	2676.8	824	2676.8	826	2676.8
828	2676.8	830	2676.8	832	2676.8	834	2676.8	836	2676.8
838	2676.8	840	2676.8	842	2676.8	844	2676.8	846	2676.8
848	2676.8	850	2676.6	852	2675.8	854	2674.9	856	2674
858	2673	860	2672	862	2671.1	864	2670.2	866	2669.4
868	2669.1	870	2668.8	872	2668.8	874	2668.8	876	2668.8
878	2668.8	880	2668.8	882	2668.8	884	2668.8	886	2668.8
888	2668.8	890	2668.8	892	2668.8	894	2668.8	896	2668.8
898	2668.8	900	2668.8	902	2668.8	904	2668.8	906	2668.8
908	2668.8	910	2668.8	912	2668.8	914	2668.8	916	2668.8
918	2668.8	920	2668.8	922	2668.8	924	2668.8	926	2668.8
928	2668.8	930	2668.8	932	2668.8	934	2668.8	936	2668.8
938	2668.8	940	2668.8	942	2668.8	944	2668.8	946	2668.8
948	2668.8	950	2668.8	952	2668.8	954	2668.8	956	2668.8
958	2668.8	960	2668.8	962	2668.8	964	2668.8	966	2668.8
968	2668.8	970	2668.8	972	2668.8	974	2668.8	976	2668.8

978	2668.8	980	2668.8	982	2668.8	984	2668.8	986	2668.8
988	2668.8	990	2668.8	992	2668.8	994	2668.8	996	2668.8
998	2668.8	1000	2668.8	1002	2668.8	1004	2668.8	1006	2668.8
1008	2668.8	1010	2668.8	1012	2668.8	1014	2668.8	1016	2668.8
1018	2668.8	1020	2668.8	1022	2668.8	1024	2668.8	1026	2668.8
1028	2668.8	1030	2668.8	1032	2668.8	1034	2668.8	1036	2668.8
1038	2668.8	1040	2668.8	1042	2668.8	1044	2668.8	1046	2668.8
1048	2668.8	1050	2668.8	1052	2668.8	1054	2668.8	1056	2668.8
1058	2669.3	1060	2669.9	1062	2670.8	1064	2671.7	1066	2672.6
1068	2673.5	1070	2674.4	1072	2675.3	1074	2676	1076	2676.5
1078	2676.6	1080	2676.7	1082	2676.7	1084	2676.7	1086	2676.7
1088	2676.7	1090	2676.7	1092	2676.7	1094	2676.7	1096	2676.7
1098	2676.7	1100	2676.7	1102	2676.7	1104	2676.7	1106	2676.7
1108	2676.7	1110	2676.7	1112	2676.7	1114	2676.7	1116	2676.7
1118	2676.7	1120	2676.7	1122	2676.7	1124	2676.7	1126	2676.7
1128	2676.7	1130	2676.7	1132	2676.7	1134	2676.7	1136	2676.7
1138	2676.7	1140	2676.7	1142	2676.7	1144	2676.7		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
678	.03	678	.03	1144	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
678	1144	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	2676.59	Element			
Vel Head (ft)	2.51	Wt. n-Val.		0.030	
W.S. Elev (ft)	2674.07	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2674.07	Flow Area (sq ft)		1063.89	
E.G. Slope (ft/ft)	0.007845	Area (sq ft)		1063.89	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	213.44	Top Width (ft)		213.44	
Vel Total (ft/s)	12.72	Avg. Vel. (ft/s)		12.72	
Max Chl Dpth (ft)	5.27	Hydr. Depth (ft)		4.98	
Conv. Total (cfs)	152754.9	Conv. (cfs)		152754.9	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		215.56	
Min Ch El (ft)	2668.80	Shear (lb/sq ft)		2.42	
Alpha	1.00	Stream Power (lb/ft s)		30.74	
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)		81.58	
C & E Loss (ft)	0.00	Cum SA (acres)		19.82	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 5850

INPUT
Description: 5850
Station Elevation Data num= 254

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
638	2675.7	640	2675.7	642	2675.7	644	2675.7	646	2675.7
648	2675.7	650	2675.7	652	2675.7	654	2675.7	656	2675.7
658	2675.7	660	2675.7	662	2675.7	664	2675.7	666	2675.7
668	2675.7	670	2675.7	672	2675.7	674	2675.7	676	2675.7
678	2675.7	680	2675.7	682	2675.7	684	2675.7	686	2675.7
688	2675.7	690	2675.7	692	2675.7	694	2675.7	696	2675.7
698	2675.7	700	2675.7	702	2675.7	704	2675.7	706	2675.7
708	2675.7	710	2675.7	712	2675.7	714	2675.7	716	2675.7
718	2675.7	720	2675.7	722	2675.7	724	2675.7	726	2675.7
728	2675.7	730	2675.7	732	2675.7	734	2675.7	736	2675.7
738	2675.7	740	2675.7	742	2675.7	744	2675.7	746	2675.7
748	2675.7	750	2675.7	752	2675.7	754	2675.7	756	2675.7
758	2675.7	760	2675.7	762	2675.7	764	2675.7	766	2675.7
768	2675.7	770	2675.7	772	2675.7	774	2675.7	776	2675.7

778	2675.7	780	2675.7	782	2675.7	784	2675.7	786	2675.7
788	2675.7	790	2675.7	792	2675.7	794	2675.7	796	2675.7
798	2675.7	800	2675.7	802	2675.7	804	2675.7	806	2675.7
808	2675.7	810	2675.7	812	2675.7	814	2675.7	816	2675.7
818	2675.7	820	2675.7	822	2675.7	824	2675.7	826	2675.7
828	2675.7	830	2675.7	832	2675.7	834	2675.7	836	2675.7
838	2675.7	840	2675.7	842	2675.7	844	2675.7	846	2675.7
848	2675.6	850	2675.2	852	2674.7	854	2673.7	856	2672.7
858	2671.7	860	2670.8	862	2669.8	864	2668.8	866	2668.3
868	2667.7	870	2667.6	872	2667.6	874	2667.6	876	2667.6
878	2667.6	880	2667.6	882	2667.6	884	2667.6	886	2667.6
888	2667.6	890	2667.6	892	2667.6	894	2667.6	896	2667.6
898	2667.6	900	2667.6	902	2667.6	904	2667.6	906	2667.6
908	2667.6	910	2667.6	912	2667.6	914	2667.6	916	2667.6
918	2667.6	920	2667.6	922	2667.6	924	2667.6	926	2667.6
928	2667.6	930	2667.6	932	2667.6	934	2667.6	936	2667.6
938	2667.6	940	2667.6	942	2667.6	944	2667.6	946	2667.6
948	2667.6	950	2667.6	952	2667.6	954	2667.6	956	2667.6
958	2667.6	960	2667.6	962	2667.6	964	2667.6	966	2667.6
968	2667.6	970	2667.6	972	2667.6	974	2667.6	976	2667.6
978	2667.6	980	2667.6	982	2667.6	984	2667.6	986	2667.6
988	2667.6	990	2667.6	992	2667.6	994	2667.6	996	2667.6
998	2667.6	1000	2667.6	1002	2667.6	1004	2667.6	1006	2667.6
1008	2667.6	1010	2667.6	1012	2667.6	1014	2667.6	1016	2667.6
1018	2667.6	1020	2667.6	1022	2667.6	1024	2667.6	1026	2667.6
1028	2667.6	1030	2667.6	1032	2667.6	1034	2667.6	1036	2667.6
1038	2667.6	1040	2667.6	1042	2667.6	1044	2667.6	1046	2667.6
1048	2667.6	1050	2667.6	1052	2667.6	1054	2667.6	1056	2667.6
1058	2668.3	1060	2668.5	1062	2669.4	1064	2670.4	1066	2671.3
1068	2672.3	1070	2673.2	1072	2674.1	1074	2675	1076	2675.2
1078	2675.6	1080	2675.6	1082	2675.6	1084	2675.6	1086	2675.6
1088	2675.6	1090	2675.6	1092	2675.6	1094	2675.6	1096	2675.6
1098	2675.5	1100	2675.5	1102	2675.5	1104	2675.5	1106	2675.5
1108	2675.5	1110	2675.5	1112	2675.5	1114	2675.5	1116	2675.5
1118	2675.5	1120	2675.5	1122	2675.5	1124	2675.5	1126	2675.5
1128	2675.5	1130	2675.5	1132	2675.5	1134	2675.5	1136	2675.5
1138	2675.5	1140	2675.5	1142	2675.5	1144	2675.5		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
638	.03	638	.03	1144	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
638	1144	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2675.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.51	Wt. n-Val.		0.030	
W.S. Elev (ft)	2672.86	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2672.86	Flow Area (sq ft)		1063.79	
E.G. Slope (ft/ft)	0.007859	Area (sq ft)		1063.79	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	213.58	Top Width (ft)		213.58	
Vel Total (ft/s)	12.72	Avg. Vel. (ft/s)		12.72	
Max Chl Dpth (ft)	5.26	Hydr. Depth (ft)		4.98	
Conv. Total (cfs)	152622.5	Conv. (cfs)		152622.5	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		215.78	
Min Ch El (ft)	2667.60	Shear (lb/sq ft)		2.42	
Alpha	1.00	Stream Power (lb/ft s)		30.76	
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)		80.36	
C & E Loss (ft)	0.00	Cum SA (acres)		19.57	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1

REACH: 1 RS: 5800

INPUT
Description: 5800
Station Elevation Data num= 276

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
598	2674.5	600	2674.5	602	2674.5	604	2674.5	606	2674.5
608	2674.5	610	2674.5	612	2674.5	614	2674.5	616	2674.5
618	2674.5	620	2674.5	622	2674.5	624	2674.5	626	2674.5
628	2674.5	630	2674.5	632	2674.5	634	2674.5	636	2674.5
638	2674.5	640	2674.5	642	2674.5	644	2674.5	646	2674.5
648	2674.5	650	2674.5	652	2674.5	654	2674.5	656	2674.5
658	2674.5	660	2674.5	662	2674.5	664	2674.5	666	2674.5
668	2674.5	670	2674.5	672	2674.5	674	2674.5	676	2674.5
678	2674.5	680	2674.5	682	2674.5	684	2674.5	686	2674.5
688	2674.5	690	2674.5	692	2674.5	694	2674.5	696	2674.5
698	2674.5	700	2674.5	702	2674.5	704	2674.5	706	2674.5
708	2674.5	710	2674.5	712	2674.5	714	2674.5	716	2674.5
718	2674.5	720	2674.5	722	2674.5	724	2674.5	726	2674.5
728	2674.5	730	2674.5	732	2674.5	734	2674.5	736	2674.5
738	2674.5	740	2674.5	742	2674.5	744	2674.5	746	2674.5
748	2674.5	750	2674.5	752	2674.5	754	2674.5	756	2674.5
758	2674.5	760	2674.5	762	2674.5	764	2674.5	766	2674.5
768	2674.5	770	2674.5	772	2674.5	774	2674.5	776	2674.5
778	2674.5	780	2674.5	782	2674.5	784	2674.5	786	2674.5
788	2674.5	790	2674.5	792	2674.5	794	2674.5	796	2674.5
798	2674.5	800	2674.5	802	2674.5	804	2674.5	806	2674.5
808	2674.5	810	2674.5	812	2674.5	814	2674.5	816	2674.5
818	2674.5	820	2674.5	822	2674.5	824	2674.5	826	2674.5
828	2674.5	830	2674.5	832	2674.5	834	2674.5	836	2674.5
838	2674.5	840	2674.5	842	2674.5	844	2674.5	846	2674.5
848	2674.4	850	2674.3	852	2673.4	854	2672.4	856	2671.5
858	2670.5	860	2669.5	862	2668.5	864	2667.7	866	2666.8
868	2666.6	870	2666.4	872	2666.4	874	2666.4	876	2666.4
878	2666.4	880	2666.4	882	2666.4	884	2666.4	886	2666.4
888	2666.4	890	2666.4	892	2666.4	894	2666.4	896	2666.4
898	2666.4	900	2666.4	902	2666.4	904	2666.4	906	2666.4
908	2666.4	910	2666.4	912	2666.4	914	2666.4	916	2666.4
918	2666.4	920	2666.4	922	2666.4	924	2666.4	926	2666.4
928	2666.4	930	2666.4	932	2666.4	934	2666.4	936	2666.4
938	2666.4	940	2666.4	942	2666.4	944	2666.4	946	2666.4
948	2666.4	950	2666.4	952	2666.4	954	2666.4	956	2666.4
958	2666.4	960	2666.4	962	2666.4	964	2666.4	966	2666.4
968	2666.4	970	2666.4	972	2666.4	974	2666.4	976	2666.4
978	2666.4	980	2666.4	982	2666.4	984	2666.4	986	2666.4
988	2666.4	990	2666.4	992	2666.4	994	2666.4	996	2666.4
998	2666.4	1000	2666.4	1002	2666.4	1004	2666.4	1006	2666.4
1008	2666.4	1010	2666.4	1012	2666.4	1014	2666.4	1016	2666.4
1018	2666.4	1020	2666.4	1022	2666.4	1024	2666.4	1026	2666.4
1028	2666.4	1030	2666.4	1032	2666.4	1034	2666.4	1036	2666.4
1038	2666.4	1040	2666.4	1042	2666.4	1044	2666.4	1046	2666.4
1048	2666.4	1050	2666.4	1052	2666.4	1054	2666.4	1056	2666.6
1058	2666.6	1060	2667.1	1062	2668	1064	2669	1066	2670
1068	2671	1070	2672	1072	2672.9	1074	2673.5	1076	2674.1
1078	2674.4	1080	2674.4	1082	2674.4	1084	2674.4	1086	2674.4
1088	2674.4	1090	2674.4	1092	2674.4	1094	2674.4	1096	2674.4
1098	2674.4	1100	2674.4	1102	2674.4	1104	2674.4	1106	2674.4
1108	2674.4	1110	2674.4	1112	2674.4	1114	2674.4	1116	2674.4
1118	2674.4	1120	2674.4	1122	2674.4	1124	2674.4	1126	2674.4
1128	2674.4	1130	2674.4	1132	2674.4	1134	2674.4	1136	2674.4
1138	2674.4	1140	2674.4	1142	2674.4	1144	2674.4	1146	2674.4
1148	2674.4								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
598	.03	598	.03	1148	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
598	1148	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2674.16	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.51	Wt. n-Val.		0.030	

W.S. Elev (ft)	2671.65	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2671.65	Flow Area (sq ft)		1063.49	
E.G. Slope (ft/ft)	0.007870	Area (sq ft)		1063.49	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	213.63	Top Width (ft)		213.63	
Vel Total (ft/s)	12.72	Avg. Vel. (ft/s)		12.72	
Max Chl Dpth (ft)	5.25	Hydr. Depth (ft)		4.98	
Conv. Total (cfs)	152513.6	Conv. (cfs)		152513.6	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		215.87	
Min Ch El (ft)	2666.40	Shear (lb/sq ft)		2.42	
Alpha	1.00	Stream Power (lb/ft s)		30.80	
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)		79.14	
C & E Loss (ft)	0.00	Cum SA (acres)		19.32	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 5750

INPUT
Description: 5750
Station Elevation Data num= 296

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
556	2673.4	558	2673.4	560	2673.4	562	2673.4	564	2673.4
566	2673.4	568	2673.4	570	2673.4	572	2673.4	574	2673.4
576	2673.4	578	2673.4	580	2673.4	582	2673.4	584	2673.4
586	2673.4	588	2673.4	590	2673.4	592	2673.4	594	2673.4
596	2673.4	598	2673.4	600	2673.4	602	2673.4	604	2673.4
606	2673.4	608	2673.4	610	2673.4	612	2673.4	614	2673.4
616	2673.4	618	2673.4	620	2673.4	622	2673.4	624	2673.4
626	2673.4	628	2673.4	630	2673.4	632	2673.4	634	2673.4
636	2673.4	638	2673.4	640	2673.4	642	2673.4	644	2673.4
646	2673.4	648	2673.4	650	2673.4	652	2673.4	654	2673.4
656	2673.4	658	2673.4	660	2673.4	662	2673.4	664	2673.4
666	2673.4	668	2673.4	670	2673.4	672	2673.4	674	2673.4
676	2673.4	678	2673.4	680	2673.4	682	2673.4	684	2673.4
686	2673.4	688	2673.4	690	2673.4	692	2673.4	694	2673.4
696	2673.4	698	2673.4	700	2673.4	702	2673.4	704	2673.4
706	2673.4	708	2673.4	710	2673.4	712	2673.4	714	2673.4
716	2673.4	718	2673.4	720	2673.4	722	2673.4	724	2673.4
726	2673.4	728	2673.4	730	2673.4	732	2673.4	734	2673.4
736	2673.4	738	2673.4	740	2673.4	742	2673.4	744	2673.4
746	2673.4	748	2673.4	750	2673.4	752	2673.4	754	2673.4
756	2673.4	758	2673.4	760	2673.4	762	2673.4	764	2673.4
766	2673.4	768	2673.4	770	2673.4	772	2673.4	774	2673.4
776	2673.4	778	2673.4	780	2673.4	782	2673.4	784	2673.4
786	2673.4	788	2673.4	790	2673.4	792	2673.4	794	2673.4
796	2673.3	798	2673.3	800	2673.3	802	2673.3	804	2673.3
806	2673.3	808	2673.3	810	2673.3	812	2673.3	814	2673.3
816	2673.3	818	2673.3	820	2673.3	822	2673.3	824	2673.3
826	2673.3	828	2673.3	830	2673.3	832	2673.3	834	2673.3
836	2673.3	838	2673.3	840	2673.3	842	2673.3	844	2673.3
846	2673.3	848	2672.9	850	2672.8	852	2672.2	854	2671.2
856	2670.2	858	2669.2	860	2668.2	862	2667.2	864	2666.2
866	2665.7	868	2665.3	870	2665.3	872	2665.2	874	2665.2
876	2665.2	878	2665.2	880	2665.2	882	2665.2	884	2665.2
886	2665.2	888	2665.2	890	2665.2	892	2665.2	894	2665.2
896	2665.2	898	2665.2	900	2665.2	902	2665.2	904	2665.2
906	2665.2	908	2665.2	910	2665.2	912	2665.2	914	2665.2
916	2665.2	918	2665.2	920	2665.2	922	2665.2	924	2665.3
926	2665.3	928	2665.3	930	2665.3	932	2665.3	934	2665.3
936	2665.3	938	2665.3	940	2665.3	942	2665.3	944	2665.2
946	2665.2	948	2665.2	950	2665.2	952	2665.2	954	2665.2
956	2665.2	958	2665.2	960	2665.2	962	2665.2	964	2665.2
966	2665.2	968	2665.2	970	2665.2	972	2665.2	974	2665.2
976	2665.2	978	2665.2	980	2665.2	982	2665.2	984	2665.2

986	2665.2	988	2665.2	990	2665.2	992	2665.2	994	2665.2
996	2665.2	998	2665.2	1000	2665.2	1002	2665.2	1004	2665.2
1006	2665.2	1008	2665.2	1010	2665.2	1012	2665.2	1014	2665.2
1016	2665.2	1018	2665.2	1020	2665.2	1022	2665.2	1024	2665.2
1026	2665.2	1028	2665.2	1030	2665.2	1032	2665.2	1034	2665.2
1036	2665.2	1038	2665.2	1040	2665.2	1042	2665.2	1044	2665.2
1046	2665.2	1048	2665.2	1050	2665.2	1052	2665.2	1054	2665.2
1056	2665.2	1058	2665.4	1060	2665.9	1062	2666.8	1064	2667.6
1066	2668.7	1068	2669.7	1070	2670.7	1072	2671.6	1074	2672.5
1076	2673.2	1078	2673.2	1080	2673.2	1082	2673.2	1084	2673.2
1086	2673.2	1088	2673.2	1090	2673.2	1092	2673.2	1094	2673.2
1096	2673.2	1098	2673.2	1100	2673.2	1102	2673.2	1104	2673.2
1106	2673.2	1108	2673.2	1110	2673.2	1112	2673.2	1114	2673.2
1116	2673.2	1118	2673.2	1120	2673.2	1122	2673.2	1124	2673.2
1126	2673.2	1128	2673.2	1130	2673.2	1132	2673.2	1134	2673.2
1136	2673.2	1138	2673.2	1140	2673.2	1142	2673.2	1144	2673.2
1146	2673.2								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
556	.03	556	.03	1146	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
556	1146	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	2672.96	Element			
Vel Head (ft)	2.51	Wt. n-Val.		0.030	
W.S. Elev (ft)	2670.45	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2670.45	Flow Area (sq ft)		1064.71	
E.G. Slope (ft/ft)	0.007858	Area (sq ft)		1064.71	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	214.01	Top Width (ft)		214.01	
Vel Total (ft/s)	12.71	Avg. Vel. (ft/s)		12.71	
Max Chl Dpth (ft)	5.25	Hydr. Depth (ft)		4.97	
Conv. Total (cfs)	152626.2	Conv. (cfs)		152626.2	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		216.24	
Min Ch El (ft)	2665.20	Shear (lb/sq ft)		2.42	
Alpha	1.00	Stream Power (lb/ft s)		30.70	
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)		77.92	
C & E Loss (ft)	0.00	Cum SA (acres)		19.08	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 5700

INPUT
Description: 5700
Station Elevation Data num= 290

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
572	2672.2	574	2672.2	576	2672.2	578	2672.2	580	2672.2
582	2672.2	584	2672.2	586	2672.2	588	2672.2	590	2672.2
592	2672.2	594	2672.2	596	2672.2	598	2672.2	600	2672.2
602	2672.2	604	2672.2	606	2672.2	608	2672.2	610	2672.2
612	2672.2	614	2672.2	616	2672.2	618	2672.2	620	2672.2
622	2672.2	624	2672.2	626	2672.2	628	2672.2	630	2672.2
632	2672.2	634	2672.2	636	2672.2	638	2672.2	640	2672.2
642	2672.2	644	2672.2	646	2672.2	648	2672.2	650	2672.2
652	2672.2	654	2672.2	656	2672.2	658	2672.2	660	2672.2
662	2672.2	664	2672.2	666	2672.2	668	2672.2	670	2672.2
672	2672.2	674	2672.2	676	2672.2	678	2672.2	680	2672.2
682	2672.2	684	2672.2	686	2672.2	688	2672.2	690	2672.2
692	2672.2	694	2672.2	696	2672.2	698	2672.2	700	2672.2
702	2672.2	704	2672.2	706	2672.2	708	2672.2	710	2672.2

712	2672.2	714	2672.2	716	2672.2	718	2672.2	720	2672.2
722	2672.2	724	2672.2	726	2672.2	728	2672.2	730	2672.2
732	2672.2	734	2672.2	736	2672.2	738	2672.2	740	2672.2
742	2672.2	744	2672.2	746	2672.2	748	2672.2	750	2672.2
752	2672.2	754	2672.2	756	2672.2	758	2672.2	760	2672.2
762	2672.2	764	2672.2	766	2672.2	768	2672.2	770	2672.2
772	2672.2	774	2672.2	776	2672.2	778	2672.2	780	2672.2
782	2672.2	784	2672.2	786	2672.2	788	2672.2	790	2672.2
792	2672.2	794	2672.2	796	2672.2	798	2672.2	800	2672.2
802	2672.2	804	2672.2	806	2672.2	808	2672.2	810	2672.2
812	2672.2	814	2672.2	816	2672.2	818	2672.2	820	2672.2
822	2672.2	824	2672.2	826	2672.2	828	2672.2	830	2672.2
832	2672.2	834	2672.2	836	2672.2	838	2672.2	840	2672.2
842	2672.2	844	2672.2	846	2672.2	848	2672.1	850	2672
852	2671	854	2670	856	2669.1	858	2668.1	860	2667.1
862	2666.1	864	2665.3	866	2664.6	868	2664.2	870	2664.1
872	2664.1	874	2664.1	876	2664.1	878	2664.1	880	2664.1
882	2664.1	884	2664.1	886	2664.1	888	2664.1	890	2664.1
892	2664.1	894	2664.1	896	2664.1	898	2664.1	900	2664.1
902	2664.1	904	2664.1	906	2664.1	908	2664.1	910	2664.1
912	2664.1	914	2664.1	916	2664.1	918	2664.1	920	2664.1
922	2664.1	924	2664.1	926	2664.1	928	2664.1	930	2664.1
932	2664.1	934	2664.1	936	2664.1	938	2664.1	940	2664.1
942	2664.1	944	2664.1	946	2664.1	948	2664.1	950	2664.1
952	2664.1	954	2664.1	956	2664.1	958	2664.1	960	2664.1
962	2664.1	964	2664.1	966	2664.1	968	2664.1	970	2664.1
972	2664.1	974	2664.1	976	2664.1	978	2664.1	980	2664.1
982	2664.1	984	2664.1	986	2664.1	988	2664.1	990	2664.1
992	2664.1	994	2664.1	996	2664.1	998	2664.1	1000	2664.1
1002	2664.1	1004	2664.1	1006	2664.1	1008	2664	1010	2664
1012	2664	1014	2664	1016	2664	1018	2664	1020	2664
1022	2664	1024	2664	1026	2664	1028	2664	1030	2664
1032	2664	1034	2664	1036	2664	1038	2664	1040	2664
1042	2664	1044	2664	1046	2664	1048	2664	1050	2664
1052	2664	1054	2664	1056	2664	1058	2664	1060	2664.2
1062	2664.5	1064	2665.1	1066	2666	1068	2667	1070	2668
1072	2669	1074	2670	1076	2670.9	1078	2671.7	1080	2671.9
1082	2672	1084	2672	1086	2672	1088	2672	1090	2672
1092	2672	1094	2672	1096	2672	1098	2672	1100	2672
1102	2672	1104	2672	1106	2672	1108	2672	1110	2672
1112	2672	1114	2672	1116	2672	1118	2672	1120	2672
1122	2672	1124	2672	1126	2672	1128	2672	1130	2672
1132	2672	1134	2672	1136	2672	1138	2672	1140	2672
1142	2672	1144	2672	1146	2672	1148	2672	1150	2672

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
572	.03	572	.03	1150	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
572	1150	39	39	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	2671.75	Element			
Vel Head (ft)	2.49	Wt. n-Val.		0.030	
W.S. Elev (ft)	2669.26	Reach Len. (ft)	39.00	39.00	39.00
Crit W.S. (ft)	2669.26	Flow Area (sq ft)		1068.21	
E.G. Slope (ft/ft)	0.007907	Area (sq ft)		1068.21	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	216.88	Top Width (ft)		216.88	
Vel Total (ft/s)	12.67	Avg. Vel. (ft/s)		12.67	
Max Chl Dpth (ft)	5.26	Hydr. Depth (ft)		4.93	
Conv. Total (cfs)	152161.8	Conv. (cfs)		152161.8	
Length Wtd. (ft)	39.00	Wetted Per. (ft)		219.02	
Min Ch El (ft)	2664.00	Shear (lb/sq ft)		2.41	
Alpha	1.00	Stream Power (lb/ft s)		30.49	
Frctn Loss (ft)	0.31	Cum Volume (acre-ft)		76.70	
C & E Loss (ft)	0.01	Cum SA (acres)		18.83	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: During the standard step iterations, when the assumed water surface was set equal to

critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 5660

INPUT
Description: 5660
Station Elevation Data num= 275

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
604	2671.4	606	2671.4	608	2671.4	610	2671.4	612	2671.4
614	2671.4	616	2671.4	618	2671.4	620	2671.4	622	2671.4
624	2671.4	626	2671.4	628	2671.4	630	2671.4	632	2671.4
634	2671.4	636	2671.3	638	2671.4	640	2671.4	642	2671.4
644	2671.4	646	2671.4	648	2671.4	650	2671.4	652	2671.4
654	2671.4	656	2671.4	658	2671.4	660	2671.4	662	2671.4
664	2671.4	666	2671.4	668	2671.4	670	2671.4	672	2671.4
674	2671.4	676	2671.4	678	2671.4	680	2671.4	682	2671.4
684	2671.4	686	2671.4	688	2671.4	690	2671.4	692	2671.4
694	2671.4	696	2671.4	698	2671.4	700	2671.4	702	2671.4
704	2671.4	706	2671.4	708	2671.4	710	2671.4	712	2671.4
714	2671.4	716	2671.4	718	2671.4	720	2671.4	722	2671.4
724	2671.4	726	2671.4	728	2671.4	730	2671.3	732	2671.3
734	2671.3	736	2671.3	738	2671.3	740	2671.3	742	2671.3
744	2671.3	746	2671.3	748	2671.3	750	2671.3	752	2671.3
754	2671.3	756	2671.3	758	2671.3	760	2671.3	762	2671.3
764	2671.3	766	2671.3	768	2671.3	770	2671.3	772	2671.3
774	2671.3	776	2671.3	778	2671.3	780	2671.3	782	2671.3
784	2671.3	786	2671.3	788	2671.3	790	2671.3	792	2671.3
794	2671.3	796	2671.3	798	2671.3	800	2671.3	802	2671.3
804	2671.3	806	2671.3	808	2671.3	810	2671.3	812	2671.3
814	2671.3	816	2671.3	818	2671.3	820	2671.3	822	2671.3
824	2671.3	826	2671.3	828	2671.3	830	2671.3	832	2671.3
834	2671.3	836	2671.3	838	2671.3	840	2671.3	842	2671.3
844	2671.3	846	2671.3	848	2671.2	850	2670.9	852	2670.1
854	2669.1	856	2668.2	858	2667.2	860	2666.3	862	2665.3
864	2664.5	866	2663.8	868	2663.4	870	2663.2	872	2663.2
874	2663.2	876	2663.2	878	2663.2	880	2663.2	882	2663.2
884	2663.2	886	2663.2	888	2663.2	890	2663.2	892	2663.2
894	2663.2	896	2663.2	898	2663.2	900	2663.2	902	2663.2
904	2663.2	906	2663.2	908	2663.2	910	2663.2	912	2663.2
914	2663.2	916	2663.2	918	2663.2	920	2663.2	922	2663.2
924	2663.2	926	2663.2	928	2663.2	930	2663.2	932	2663.2
934	2663.2	936	2663.2	938	2663.2	940	2663.2	942	2663.2
944	2663.2	946	2663.2	948	2663.2	950	2663.2	952	2663.2
954	2663.2	956	2663.2	958	2663.2	960	2663.2	962	2663.2
964	2663.2	966	2663.2	968	2663.2	970	2663.2	972	2663.2
974	2663.2	976	2663.2	978	2663.2	980	2663.1	982	2663.1
984	2663.1	986	2663.1	988	2663.1	990	2663.1	992	2663.1
994	2663.1	996	2663.1	998	2663.1	1000	2663.1	1002	2663.1
1004	2663.1	1006	2663.1	1008	2663.1	1010	2663.1	1012	2663.1
1014	2663.1	1016	2663.1	1018	2663.1	1020	2663.1	1022	2663.1
1024	2663.1	1026	2663.1	1028	2663.1	1030	2663.1	1032	2663.1
1034	2663.1	1036	2663.1	1038	2663.1	1040	2663.1	1042	2663.1
1044	2663.1	1046	2663.1	1048	2663.1	1050	2663.1	1052	2663.1
1054	2663.1	1056	2663.1	1058	2663.1	1060	2663.1	1062	2663.1
1064	2663.5	1066	2663.9	1068	2664.8	1070	2665.7	1072	2666.6
1074	2667.6	1076	2668.6	1078	2669.5	1080	2670.4	1082	2671
1084	2671	1086	2671	1088	2671	1090	2671	1092	2671
1094	2671	1096	2671	1098	2671	1100	2671	1102	2671
1104	2671	1106	2671	1108	2671	1110	2671	1112	2671
1114	2671	1116	2671	1118	2671	1120	2671	1122	2671
1124	2671	1126	2671	1128	2671	1130	2671	1132	2671
1134	2671	1136	2671	1138	2671	1140	2671	1142	2671
1144	2671	1146	2671	1148	2671	1150	2671	1152	2671

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
604	.03	604	.03	1152	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
604	1152	10	10	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2670.77	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.47	Wt. n-Val.		0.030	
W.S. Elev (ft)	2668.31	Reach Len. (ft)	10.00	10.00	10.00
Crit W.S. (ft)	2668.31	Flow Area (sq ft)		1073.85	
E.G. Slope (ft/ft)	0.007897	Area (sq ft)		1073.85	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	219.66	Top Width (ft)		219.66	
Vel Total (ft/s)	12.60	Avg. Vel. (ft/s)		12.60	
Max Chl Dpth (ft)	5.21	Hydr. Depth (ft)		4.89	
Conv. Total (cfs)	152248.6	Conv. (cfs)		152248.6	
Length Wtd. (ft)	10.00	Wetted Per. (ft)		221.74	
Min Ch El (ft)	2663.10	Shear (lb/sq ft)		2.39	
Alpha	1.00	Stream Power (lb/ft s)		30.08	
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)		75.74	
C & E Loss (ft)	0.00	Cum SA (acres)		18.64	

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 5650

INPUT
Description: 5650
Station Elevation Data num= 271

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
612	2671.1	614	2671.1	616	2671.1	618	2671.1	620	2671.1
622	2671.1	624	2671.1	626	2671.1	628	2671.1	630	2671.1
632	2671.1	634	2671.1	636	2671.1	638	2671.1	640	2671.1
642	2671.1	644	2671.1	646	2671.1	648	2671.1	650	2671.1
652	2671.1	654	2671.1	656	2671.1	658	2671.1	660	2671.1
662	2671.1	664	2671.1	666	2671.1	668	2671.1	670	2671.1
672	2671.1	674	2671.1	676	2671.1	678	2671.1	680	2671.1
682	2671.1	684	2671.1	686	2671.1	688	2671.1	690	2671.1
692	2671.1	694	2671.1	696	2671.1	698	2671.1	700	2671.1
702	2671.1	704	2671.1	706	2671.1	708	2671.1	710	2671.1
712	2671.1	714	2671.1	716	2671.1	718	2671.1	720	2671.1
722	2671.1	724	2671.1	726	2671.1	728	2671.1	730	2671.1
732	2671.1	734	2671.1	736	2671.1	738	2671.1	740	2671.1
742	2671.1	744	2671.1	746	2671.1	748	2671.1	750	2671.1
752	2671.1	754	2671.1	756	2671.1	758	2671.1	760	2671.1
762	2671.1	764	2671.1	766	2671.1	768	2671.1	770	2671.1
772	2671.1	774	2671.1	776	2671.1	778	2671.1	780	2671.1
782	2671.1	784	2671.1	786	2671.1	788	2671.1	790	2671.1
792	2671.1	794	2671.1	796	2671.1	798	2671.1	800	2671.1
802	2671	804	2671	806	2671	808	2671	810	2671
812	2671	814	2671	816	2671	818	2671	820	2671
822	2671	824	2671	826	2671	828	2671	830	2671
832	2671	834	2671	836	2671	838	2671	840	2671
842	2671	844	2671	846	2671	848	2670.9	850	2670.4
852	2669.6	854	2668.9	856	2667.9	858	2667	860	2666
862	2665.1	864	2664.1	866	2663.3	868	2663.1	870	2663
872	2663	874	2663	876	2663	878	2663	880	2663
882	2663	884	2663	886	2663	888	2663	890	2663
892	2663	894	2662.9	896	2662.9	898	2662.9	900	2662.9
902	2662.9	904	2662.9	906	2662.9	908	2662.9	910	2662.9
912	2662.9	914	2662.9	916	2662.9	918	2662.9	920	2662.9
922	2662.9	924	2662.9	926	2662.9	928	2662.9	930	2662.9
932	2662.9	934	2662.9	936	2662.9	938	2662.9	940	2662.9
942	2662.9	944	2662.9	946	2662.9	948	2662.9	950	2662.9
952	2662.9	954	2662.9	956	2662.9	958	2662.9	960	2662.9
962	2662.9	964	2662.9	966	2662.9	968	2662.9	970	2662.9
972	2662.9	974	2662.9	976	2662.9	978	2662.9	980	2662.9
982	2662.9	984	2662.9	986	2662.9	988	2662.9	990	2662.9
992	2662.9	994	2662.9	996	2662.9	998	2662.9	1000	2662.9
1002	2662.9	1004	2662.9	1006	2662.9	1008	2662.9	1010	2662.9

1012	2662.9	1014	2662.9	1016	2662.9	1018	2662.9	1020	2662.9
1022	2662.9	1024	2662.9	1026	2662.9	1028	2662.9	1030	2662.9
1032	2662.9	1034	2662.9	1036	2662.9	1038	2662.8	1040	2662.8
1042	2662.8	1044	2662.8	1046	2662.8	1048	2662.8	1050	2662.8
1052	2662.8	1054	2662.8	1056	2662.8	1058	2662.8	1060	2662.8
1062	2662.8	1064	2663	1066	2663.4	1068	2664.2	1070	2665.1
1072	2666	1074	2667	1076	2667.9	1078	2668.9	1080	2669.8
1082	2670.6	1084	2670.8	1086	2670.8	1088	2670.8	1090	2670.8
1092	2670.8	1094	2670.8	1096	2670.8	1098	2670.8	1100	2670.8
1102	2670.8	1104	2670.8	1106	2670.8	1108	2670.8	1110	2670.8
1112	2670.8	1114	2670.8	1116	2670.8	1118	2670.8	1120	2670.8
1122	2670.8	1124	2670.8	1126	2670.8	1128	2670.8	1130	2670.8
1132	2670.8	1134	2670.8	1136	2670.8	1138	2670.8	1140	2670.8
1142	2670.8	1144	2670.8	1146	2670.8	1148	2670.7	1150	2670.7
1152	2670.7								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
612	.03	612	.03	1152	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
612	1152	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	2670.49	Element			
Vel Head (ft)	2.45	Wt. n-Val.		0.030	
W.S. Elev (ft)	2668.05	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2668.05	Flow Area (sq ft)		1077.41	
E.G. Slope (ft/ft)	0.007856	Area (sq ft)		1077.41	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	220.58	Top Width (ft)		220.58	
Vel Total (ft/s)	12.56	Avg. Vel. (ft/s)		12.56	
Max Chl Dpth (ft)	5.25	Hydr. Depth (ft)		4.88	
Conv. Total (cfs)	152647.3	Conv. (cfs)		152647.3	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		222.70	
Min Ch El (ft)	2662.80	Shear (lb/sq ft)		2.37	
Alpha	1.00	Stream Power (lb/ft s)		29.80	
Frctn Loss (ft)	0.39	Cum Volume (acre-ft)		75.49	
C & E Loss (ft)	0.00	Cum SA (acres)		18.59	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 5600

INPUT
Description: 5600
Station Elevation Data num= 253

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
652	2669.9	654	2669.9	656	2669.9	658	2669.9	660	2669.9
662	2669.9	664	2669.9	666	2669.9	668	2669.9	670	2669.9
672	2669.9	674	2669.9	676	2669.9	678	2669.9	680	2669.9
682	2669.8	684	2669.8	686	2669.8	688	2669.8	690	2669.8
692	2669.8	694	2669.8	696	2669.8	698	2669.8	700	2669.8
702	2669.8	704	2669.8	706	2669.8	708	2669.8	710	2669.8
712	2669.8	714	2669.8	716	2669.8	718	2669.8	720	2669.8
722	2669.8	724	2669.8	726	2669.8	728	2669.8	730	2669.8
732	2669.8	734	2669.8	736	2669.8	738	2669.8	740	2669.8
742	2669.8	744	2669.9	746	2669.9	748	2669.9	750	2669.9
752	2669.9	754	2669.9	756	2669.9	758	2669.9	760	2669.9
762	2669.9	764	2669.9	766	2669.9	768	2669.9	770	2669.9
772	2669.9	774	2669.9	776	2669.9	778	2669.9	780	2669.9
782	2669.9	784	2669.9	786	2669.9	788	2669.9	790	2669.9
792	2669.9	794	2669.9	796	2669.9	798	2669.9	800	2669.9
802	2669.9	804	2669.9	806	2669.9	808	2669.8	810	2669.8

812	2669.8	814	2669.8	816	2669.8	818	2669.8	820	2669.8
822	2669.8	824	2669.8	826	2669.8	828	2669.8	830	2669.8
832	2669.8	834	2669.8	836	2669.8	838	2669.8	840	2669.8
842	2669.8	844	2669.8	846	2669.7	848	2669.6	850	2669.2
852	2668.3	854	2667.4	856	2666.4	858	2665.5	860	2664.6
862	2663.7	864	2662.9	866	2662.3	868	2661.9	870	2661.8
872	2661.8	874	2661.8	876	2661.8	878	2661.8	880	2661.8
882	2661.8	884	2661.8	886	2661.8	888	2661.8	890	2661.8
892	2661.8	894	2661.8	896	2661.8	898	2661.8	900	2661.8
902	2661.8	904	2661.8	906	2661.8	908	2661.8	910	2661.8
912	2661.8	914	2661.8	916	2661.8	918	2661.8	920	2661.8
922	2661.8	924	2661.8	926	2661.8	928	2661.8	930	2661.8
932	2661.8	934	2661.8	936	2661.7	938	2661.7	940	2661.7
942	2661.7	944	2661.7	946	2661.7	948	2661.7	950	2661.7
952	2661.7	954	2661.7	956	2661.7	958	2661.7	960	2661.7
962	2661.7	964	2661.7	966	2661.7	968	2661.7	970	2661.7
972	2661.7	974	2661.7	976	2661.7	978	2661.7	980	2661.7
982	2661.7	984	2661.7	986	2661.7	988	2661.7	990	2661.7
992	2661.7	994	2661.7	996	2661.7	998	2661.7	1000	2661.7
1002	2661.7	1004	2661.7	1006	2661.7	1008	2661.7	1010	2661.7
1012	2661.7	1014	2661.7	1016	2661.7	1018	2661.7	1020	2661.7
1022	2661.7	1024	2661.7	1026	2661.7	1028	2661.7	1030	2661.7
1032	2661.7	1034	2661.7	1036	2661.7	1038	2661.7	1040	2661.7
1042	2661.7	1044	2661.7	1046	2661.7	1048	2661.7	1050	2661.7
1052	2661.7	1054	2661.7	1056	2661.7	1058	2661.7	1060	2661.7
1062	2661.7	1064	2661.7	1066	2661.8	1068	2662.1	1070	2662.8
1072	2663.6	1074	2664.5	1076	2665.4	1078	2666.3	1080	2667.2
1082	2668.1	1084	2668.9	1086	2669.4	1088	2669.6	1090	2669.6
1092	2669.6	1094	2669.6	1096	2669.6	1098	2669.6	1100	2669.6
1102	2669.6	1104	2669.6	1106	2669.6	1108	2669.6	1110	2669.6
1112	2669.6	1114	2669.6	1116	2669.6	1118	2669.6	1120	2669.6
1122	2669.6	1124	2669.6	1126	2669.6	1128	2669.6	1130	2669.6
1132	2669.6	1134	2669.6	1136	2669.6	1138	2669.6	1140	2669.6
1142	2669.6	1144	2669.6	1146	2669.6	1148	2669.6	1150	2669.6
1152	2669.6	1154	2669.6	1156	2669.6				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
652	.03	652	.03	1156	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
652	1156	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2669.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.44	Wt. n-Val.		0.030	
W.S. Elev (ft)	2666.82	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2666.82	Flow Area (sq ft)		1080.38	
E.G. Slope (ft/ft)	0.007937	Area (sq ft)		1080.38	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	224.01	Top Width (ft)		224.01	
Vel Total (ft/s)	12.52	Avg. Vel. (ft/s)		12.52	
Max Chl Dpth (ft)	5.12	Hydr. Depth (ft)		4.82	
Conv. Total (cfs)	151872.6	Conv. (cfs)		151872.6	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		225.96	
Min Ch El (ft)	2661.70	Shear (lb/sq ft)		2.37	
Alpha	1.00	Stream Power (lb/ft s)		29.67	
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)		74.25	
C & E Loss (ft)	0.01	Cum SA (acres)		18.33	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 5550

INPUT
Description: 5550
Station Elevation Data num= 235

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
690	2668.7	692	2668.7	694	2668.7	696	2668.7	698	2668.7
700	2668.7	702	2668.7	704	2668.6	706	2668.6	708	2668.6
710	2668.6	712	2668.6	714	2668.6	716	2668.6	718	2668.6
720	2668.6	722	2668.6	724	2668.6	726	2668.6	728	2668.6
730	2668.6	732	2668.6	734	2668.6	736	2668.6	738	2668.6
740	2668.6	742	2668.6	744	2668.6	746	2668.6	748	2668.6
750	2668.6	752	2668.6	754	2668.6	756	2668.6	758	2668.6
760	2668.6	762	2668.6	764	2668.6	766	2668.6	768	2668.6
770	2668.6	772	2668.6	774	2668.6	776	2668.6	778	2668.6
780	2668.6	782	2668.6	784	2668.6	786	2668.6	788	2668.6
790	2668.6	792	2668.6	794	2668.6	796	2668.6	798	2668.6
800	2668.6	802	2668.6	804	2668.7	806	2668.7	808	2668.7
810	2668.7	812	2668.7	814	2668.7	816	2668.7	818	2668.7
820	2668.7	822	2668.7	824	2668.7	826	2668.7	828	2668.7
830	2668.7	832	2668.7	834	2668.7	836	2668.7	838	2668.7
840	2668.7	842	2668.7	844	2668.7	846	2668.2	848	2668.1
850	2667.3	852	2666.4	854	2665.5	856	2664.6	858	2663.7
860	2662.8	862	2661.9	864	2661.1	866	2660.8	868	2660.7
870	2660.6	872	2660.6	874	2660.6	876	2660.6	878	2660.6
880	2660.6	882	2660.6	884	2660.6	886	2660.6	888	2660.6
890	2660.6	892	2660.6	894	2660.6	896	2660.6	898	2660.6
900	2660.6	902	2660.6	904	2660.6	906	2660.6	908	2660.6
910	2660.6	912	2660.6	914	2660.6	916	2660.6	918	2660.6
920	2660.6	922	2660.6	924	2660.6	926	2660.6	928	2660.6
930	2660.6	932	2660.6	934	2660.6	936	2660.6	938	2660.6
940	2660.6	942	2660.6	944	2660.6	946	2660.6	948	2660.6
950	2660.6	952	2660.6	954	2660.6	956	2660.6	958	2660.6
960	2660.6	962	2660.6	964	2660.6	966	2660.6	968	2660.6
970	2660.6	972	2660.6	974	2660.5	976	2660.5	978	2660.5
980	2660.5	982	2660.5	984	2660.5	986	2660.5	988	2660.5
990	2660.5	992	2660.5	994	2660.5	996	2660.5	998	2660.5
1000	2660.5	1002	2660.5	1004	2660.5	1006	2660.5	1008	2660.5
1010	2660.5	1012	2660.5	1014	2660.5	1016	2660.5	1018	2660.5
1020	2660.5	1022	2660.5	1024	2660.5	1026	2660.5	1028	2660.5
1030	2660.5	1032	2660.5	1034	2660.5	1036	2660.5	1038	2660.5
1040	2660.5	1042	2660.5	1044	2660.5	1046	2660.5	1048	2660.5
1050	2660.5	1052	2660.5	1054	2660.5	1056	2660.5	1058	2660.5
1060	2660.5	1062	2660.5	1064	2660.5	1066	2660.5	1068	2660.5
1070	2660.8	1072	2661.6	1074	2662.4	1076	2663.3	1078	2664.2
1080	2665.1	1082	2666	1084	2666.8	1086	2667.7	1088	2668.2
1090	2668.4	1092	2668.4	1094	2668.4	1096	2668.4	1098	2668.4
1100	2668.4	1102	2668.4	1104	2668.4	1106	2668.4	1108	2668.4
1110	2668.4	1112	2668.4	1114	2668.4	1116	2668.4	1118	2668.4
1120	2668.4	1122	2668.4	1124	2668.4	1126	2668.4	1128	2668.4
1130	2668.4	1132	2668.4	1134	2668.4	1136	2668.4	1138	2668.4
1140	2668.4	1142	2668.4	1144	2668.4	1146	2668.4	1148	2668.4
1150	2668.4	1152	2668.4	1154	2668.4	1156	2668.4	1158	2668.4

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
690	.03	690	.03	1158	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
690	1158	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2668.00	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.41	Wt. n-Val.		0.030	
W.S. Elev (ft)	2665.58	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2665.58	Flow Area (sq ft)		1085.11	
E.G. Slope (ft/ft)	0.007974	Area (sq ft)		1085.11	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	227.26	Top Width (ft)		227.26	
Vel Total (ft/s)	12.47	Avg. Vel. (ft/s)		12.47	
Max Chl Dpth (ft)	5.08	Hydr. Depth (ft)		4.77	
Conv. Total (cfs)	151517.3	Conv. (cfs)		151517.3	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		229.24	
Min Ch El (ft)	2660.50	Shear (lb/sq ft)		2.36	
Alpha	1.00	Stream Power (lb/ft s)		29.38	

Frctn Loss (ft)	0.40	Cum Volume (acre-ft)	73.01
C & E Loss (ft)	0.02	Cum SA (acres)	18.07

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 5500

INPUT
Description: 5500
Station Elevation Data num= 222

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
718	2667.5	720	2667.5	722	2667.5	724	2667.5	726	2667.5
728	2667.5	730	2667.5	732	2667.5	734	2667.5	736	2667.5
738	2667.5	740	2667.5	742	2667.5	744	2667.5	746	2667.5
748	2667.4	750	2667.4	752	2667.4	754	2667.4	756	2667.4
758	2667.4	760	2667.4	762	2667.4	764	2667.4	766	2667.4
768	2667.4	770	2667.4	772	2667.4	774	2667.4	776	2667.4
778	2667.4	780	2667.4	782	2667.4	784	2667.4	786	2667.4
788	2667.4	790	2667.4	792	2667.4	794	2667.4	796	2667.4
798	2667.4	800	2667.4	802	2667.5	804	2667.5	806	2667.5
808	2667.5	810	2667.5	812	2667.5	814	2667.5	816	2667.5
818	2667.5	820	2667.5	822	2667.5	824	2667.5	826	2667.5
828	2667.5	830	2667.5	832	2667.5	834	2667.5	836	2667.5
838	2667.5	840	2667.5	842	2667.4	844	2667.2	846	2666.5
848	2665.9	850	2665	852	2664.1	854	2663.2	856	2662.3
858	2661.4	860	2660.8	862	2659.9	864	2659.5	866	2659.4
868	2659.4	870	2659.4	872	2659.4	874	2659.4	876	2659.4
878	2659.4	880	2659.4	882	2659.4	884	2659.4	886	2659.4
888	2659.4	890	2659.4	892	2659.4	894	2659.4	896	2659.4
898	2659.4	900	2659.4	902	2659.4	904	2659.4	906	2659.4
908	2659.4	910	2659.4	912	2659.4	914	2659.4	916	2659.4
918	2659.4	920	2659.4	922	2659.4	924	2659.4	926	2659.4
928	2659.4	930	2659.4	932	2659.4	934	2659.4	936	2659.4
938	2659.4	940	2659.4	942	2659.4	944	2659.4	946	2659.4
948	2659.4	950	2659.4	952	2659.4	954	2659.4	956	2659.4
958	2659.4	960	2659.4	962	2659.4	964	2659.4	966	2659.4
968	2659.4	970	2659.4	972	2659.4	974	2659.4	976	2659.4
978	2659.4	980	2659.4	982	2659.4	984	2659.4	986	2659.4
988	2659.4	990	2659.4	992	2659.4	994	2659.4	996	2659.4
998	2659.4	1000	2659.4	1002	2659.4	1004	2659.4	1006	2659.4
1008	2659.4	1010	2659.4	1012	2659.4	1014	2659.4	1016	2659.4
1018	2659.4	1020	2659.4	1022	2659.4	1024	2659.4	1026	2659.4
1028	2659.4	1030	2659.4	1032	2659.4	1034	2659.4	1036	2659.4
1038	2659.4	1040	2659.4	1042	2659.4	1044	2659.4	1046	2659.4
1048	2659.4	1050	2659.4	1052	2659.4	1054	2659.4	1056	2659.4
1058	2659.4	1060	2659.3	1062	2659.3	1064	2659.3	1066	2659.3
1068	2659.3	1070	2659.4	1072	2659.5	1074	2660.1	1076	2660.9
1078	2661.8	1080	2662.6	1082	2663.4	1084	2664.3	1086	2665.1
1088	2666	1090	2666.4	1092	2667.1	1094	2667.2	1096	2667.3
1098	2667.3	1100	2667.3	1102	2667.3	1104	2667.3	1106	2667.3
1108	2667.3	1110	2667.3	1112	2667.3	1114	2667.3	1116	2667.3
1118	2667.3	1120	2667.3	1122	2667.3	1124	2667.3	1126	2667.3
1128	2667.3	1130	2667.3	1132	2667.3	1134	2667.3	1136	2667.3
1138	2667.3	1140	2667.3	1142	2667.3	1144	2667.3	1146	2667.3
1148	2667.3	1150	2667.3	1152	2667.3	1154	2667.3	1156	2667.3
1158	2667.3	1160	2667.3						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
718	.03	718	.03	1160	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
718	1160	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2666.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.36	Wt. n-Val.		0.030	
W.S. Elev (ft)	2664.36	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2664.36	Flow Area (sq ft)		1097.61	
E.G. Slope (ft/ft)	0.007918	Area (sq ft)		1097.61	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	232.74	Top Width (ft)		232.74	
Vel Total (ft/s)	12.33	Avg. Vel. (ft/s)		12.33	
Max Chl Dpth (ft)	5.06	Hydr. Depth (ft)		4.72	
Conv. Total (cfs)	152055.4	Conv. (cfs)		152055.4	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		234.65	
Min Ch El (ft)	2659.30	Shear (lb/sq ft)		2.31	
Alpha	1.00	Stream Power (lb/ft s)		28.50	
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)		71.76	
C & E Loss (ft)	0.01	Cum SA (acres)		17.81	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 5450

INPUT
Description: 5450
Station Elevation Data num= 217

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
730	2666.2	732	2666.2	734	2666.2	736	2666.2	738	2666.2
740	2666.2	742	2666.2	744	2666.2	746	2666.2	748	2666.2
750	2666.2	752	2666.2	754	2666.2	756	2666.2	758	2666.2
760	2666.2	762	2666.3	764	2666.3	766	2666.3	768	2666.3
770	2666.3	772	2666.3	774	2666.3	776	2666.3	778	2666.3
780	2666.3	782	2666.3	784	2666.3	786	2666.3	788	2666.3
790	2666.3	792	2666.3	794	2666.3	796	2666.3	798	2666.3
800	2666.3	802	2666.3	804	2666.3	806	2666.3	808	2666.3
810	2666.3	812	2666.3	814	2666.3	816	2666.3	818	2666.3
820	2666.3	822	2666.3	824	2666.3	826	2666.3	828	2666.3
830	2666.3	832	2666.3	834	2666.3	836	2666.3	838	2666.2
840	2666	842	2665.5	844	2664.9	846	2664	848	2663.1
850	2662.2	852	2661.3	854	2660.4	856	2659.5	858	2658.9
860	2658.5	862	2658.2	864	2658.2	866	2658.2	868	2658.2
870	2658.2	872	2658.2	874	2658.2	876	2658.2	878	2658.2
880	2658.2	882	2658.2	884	2658.2	886	2658.2	888	2658.2
890	2658.2	892	2658.2	894	2658.2	896	2658.2	898	2658.2
900	2658.2	902	2658.2	904	2658.2	906	2658.2	908	2658.2
910	2658.2	912	2658.2	914	2658.2	916	2658.2	918	2658.2
920	2658.2	922	2658.2	924	2658.2	926	2658.2	928	2658.2
930	2658.2	932	2658.2	934	2658.2	936	2658.2	938	2658.2
940	2658.2	942	2658.2	944	2658.2	946	2658.2	948	2658.2
950	2658.2	952	2658.2	954	2658.2	956	2658.2	958	2658.2
960	2658.2	962	2658.2	964	2658.2	966	2658.2	968	2658.2
970	2658.2	972	2658.2	974	2658.2	976	2658.2	978	2658.2
980	2658.2	982	2658.2	984	2658.2	986	2658.2	988	2658.2
990	2658.2	992	2658.2	994	2658.2	996	2658.2	998	2658.2
1000	2658.2	1002	2658.2	1004	2658.2	1006	2658.2	1008	2658.2
1010	2658.2	1012	2658.2	1014	2658.2	1016	2658.2	1018	2658.2
1020	2658.2	1022	2658.2	1024	2658.2	1026	2658.2	1028	2658.2
1030	2658.2	1032	2658.2	1034	2658.2	1036	2658.2	1038	2658.2
1040	2658.2	1042	2658.2	1044	2658.2	1046	2658.2	1048	2658.2
1050	2658.2	1052	2658.2	1054	2658.2	1056	2658.2	1058	2658.2
1060	2658.2	1062	2658.2	1064	2658.2	1066	2658.2	1068	2658.2
1070	2658.2	1072	2658.2	1074	2658.2	1076	2658.5	1078	2659.3
1080	2660	1082	2660.8	1084	2661.7	1086	2662.5	1088	2663.3
1090	2664.1	1092	2664.9	1094	2665.5	1096	2666.1	1098	2666.1
1100	2666.1	1102	2666.1	1104	2666.1	1106	2666.1	1108	2666.1
1110	2666.1	1112	2666.1	1114	2666.1	1116	2666.1	1118	2666.1
1120	2666.1	1122	2666.1	1124	2666.1	1126	2666.1	1128	2666.1

1130	2666.1	1132	2666.1	1134	2666.1	1136	2666.1	1138	2666.1
1140	2666.1	1142	2666.1	1144	2666.1	1146	2666.1	1148	2666.1
1150	2666.1	1152	2666.1	1154	2666.1	1156	2666.1	1158	2666.1
1160	2666.1	1162	2666.1						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
730	.03	730	.03	1162	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
730	1162	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2665.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.33	Wt. n-Val.		0.030	
W.S. Elev (ft)	2663.05	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2663.05	Flow Area (sq ft)		1104.46	
E.G. Slope (ft/ft)	0.008040	Area (sq ft)		1104.46	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	239.28	Top Width (ft)		239.28	
Vel Total (ft/s)	12.25	Avg. Vel. (ft/s)		12.25	
Max Chl Dpth (ft)	4.85	Hydr. Depth (ft)		4.62	
Conv. Total (cfs)	150892.3	Conv. (cfs)		150892.3	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		241.09	
Min Ch El (ft)	2658.20	Shear (lb/sq ft)		2.30	
Alpha	1.00	Stream Power (lb/ft s)		28.17	
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)		70.49	
C & E Loss (ft)	0.01	Cum SA (acres)		17.54	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 5400

INPUT
Description: 5400
Station Elevation Data num= 213

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
742	2665	744	2665	746	2665	748	2665	750	2665
752	2665	754	2665	756	2665	758	2665	760	2665
762	2665	764	2665	766	2665	768	2665	770	2665
772	2665	774	2665	776	2665	778	2665	780	2665
782	2665	784	2665.1	786	2665.1	788	2665.1	790	2665.1
792	2665.1	794	2665.1	796	2665.1	798	2665.1	800	2665.1
802	2665.1	804	2665.1	806	2665.1	808	2665.1	810	2665.1
812	2665.1	814	2665.1	816	2665.1	818	2665.1	820	2665.1
822	2665.1	824	2665.1	826	2665.1	828	2665.1	830	2665.1
832	2665.1	834	2665.1	836	2664.8	838	2664.3	840	2663.4
842	2662.6	844	2661.7	846	2660.8	848	2659.9	850	2659
852	2658	854	2657.6	856	2657.1	858	2657	860	2657
862	2657	864	2657	866	2657	868	2657	870	2657
872	2657	874	2657	876	2657	878	2657	880	2657
882	2657	884	2657	886	2657	888	2657	890	2657
892	2657	894	2657	896	2657	898	2657	900	2657
902	2657	904	2657	906	2657	908	2657	910	2657
912	2657	914	2657	916	2657	918	2657	920	2657
922	2657	924	2657	926	2657	928	2657	930	2657
932	2657	934	2657	936	2657	938	2657	940	2657
942	2657	944	2657	946	2657	948	2657	950	2657
952	2657	954	2657	956	2657	958	2657	960	2657
962	2657	964	2657	966	2657	968	2657	970	2657
972	2657	974	2657	976	2657	978	2657	980	2657
982	2657	984	2657	986	2657	988	2657	990	2657
992	2657	994	2657	996	2657	998	2657	1000	2657
1002	2657	1004	2657	1006	2657	1008	2657	1010	2657

1012	2657	1014	2657	1016	2657	1018	2657	1020	2657
1022	2657	1024	2657	1026	2657	1028	2657	1030	2657
1032	2657	1034	2657	1036	2657	1038	2657	1040	2657
1042	2657	1044	2657	1046	2657	1048	2657	1050	2657
1052	2657	1054	2657	1056	2657	1058	2657	1060	2657
1062	2657	1064	2657	1066	2657	1068	2657	1070	2657
1072	2657	1074	2657	1076	2657.1	1078	2657.4	1080	2658
1082	2658.6	1084	2659.4	1086	2660.2	1088	2661	1090	2661.8
1092	2662.6	1094	2663.4	1096	2664.2	1098	2664.7	1100	2664.9
1102	2664.9	1104	2664.9	1106	2664.9	1108	2664.9	1110	2664.9
1112	2664.9	1114	2664.9	1116	2664.9	1118	2664.9	1120	2664.9
1122	2664.9	1124	2664.9	1126	2664.9	1128	2664.9	1130	2664.9
1132	2664.9	1134	2664.9	1136	2664.9	1138	2665	1140	2665
1142	2665	1144	2665	1146	2665	1148	2665	1150	2665
1152	2665	1154	2665	1156	2665	1158	2665	1160	2665
1162	2665	1164	2665	1166	2665				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
742	.03	742	.03	1166	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
742	1166	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2664.05	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.29	Wt. n-Val.		0.030	
W.S. Elev (ft)	2661.76	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2661.76	Flow Area (sq ft)		1114.97	
E.G. Slope (ft/ft)	0.008079	Area (sq ft)		1114.97	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	246.03	Top Width (ft)		246.03	
Vel Total (ft/s)	12.13	Avg. Vel. (ft/s)		12.13	
Max Chl Dpth (ft)	4.76	Hydr. Depth (ft)		4.53	
Conv. Total (cfs)	150526.7	Conv. (cfs)		150526.7	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		247.77	
Min Ch El (ft)	2657.00	Shear (lb/sq ft)		2.27	
Alpha	1.00	Stream Power (lb/ft s)		27.54	
Frctn Loss (ft)	0.41	Cum Volume (acre-ft)		69.22	
C & E Loss (ft)	0.01	Cum SA (acres)		17.26	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 5350

INPUT
Description: 5350
Station Elevation Data num= 207

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
754	2663.8	756	2663.8	758	2663.8	760	2663.8	762	2663.8
764	2663.8	766	2663.8	768	2663.8	770	2663.8	772	2663.8
774	2663.8	776	2663.8	778	2663.8	780	2663.8	782	2663.8
784	2663.8	786	2663.8	788	2663.8	790	2663.8	792	2663.9
794	2663.9	796	2663.9	798	2663.9	800	2663.9	802	2663.9
804	2663.9	806	2663.9	808	2663.9	810	2663.9	812	2663.9
814	2663.9	816	2663.9	818	2663.9	820	2663.9	822	2663.9
824	2663.9	826	2663.9	828	2663.9	830	2663.5	832	2663.3
834	2662.6	836	2661.7	838	2660.8	840	2659.9	842	2658.9
844	2658	846	2657.1	848	2656.5	850	2656.2	852	2655.8
854	2655.8	856	2655.8	858	2655.8	860	2655.8	862	2655.8
864	2655.8	866	2655.8	868	2655.8	870	2655.8	872	2655.8
874	2655.8	876	2655.8	878	2655.8	880	2655.8	882	2655.8
884	2655.8	886	2655.8	888	2655.8	890	2655.8	892	2655.8
894	2655.8	896	2655.8	898	2655.8	900	2655.8	902	2655.8

904	2655.8	906	2655.8	908	2655.8	910	2655.8	912	2655.8
914	2655.8	916	2655.8	918	2655.8	920	2655.8	922	2655.8
924	2655.8	926	2655.8	928	2655.8	930	2655.8	932	2655.8
934	2655.8	936	2655.8	938	2655.9	940	2655.9	942	2655.9
944	2655.9	946	2655.9	948	2655.9	950	2655.9	952	2655.9
954	2655.9	956	2655.9	958	2655.9	960	2655.9	962	2655.9
964	2655.9	966	2655.9	968	2655.9	970	2655.9	972	2655.9
974	2655.9	976	2655.9	978	2655.9	980	2655.9	982	2655.9
984	2655.9	986	2655.9	988	2655.9	990	2655.9	992	2655.9
994	2655.9	996	2655.9	998	2655.9	1000	2655.9	1002	2655.9
1004	2655.9	1006	2655.9	1008	2655.9	1010	2655.9	1012	2655.9
1014	2655.9	1016	2655.9	1018	2655.9	1020	2655.9	1022	2655.9
1024	2655.9	1026	2655.9	1028	2655.9	1030	2655.9	1032	2655.9
1034	2655.9	1036	2655.9	1038	2655.9	1040	2655.9	1042	2655.9
1044	2655.9	1046	2655.9	1048	2655.9	1050	2655.9	1052	2655.9
1054	2655.9	1056	2655.9	1058	2655.8	1060	2655.8	1062	2655.8
1064	2655.8	1066	2655.8	1068	2655.8	1070	2655.8	1072	2655.8
1074	2655.8	1076	2655.9	1078	2656	1080	2656.3	1082	2656.8
1084	2657.6	1086	2658.4	1088	2659.1	1090	2659.9	1092	2660.7
1094	2661.4	1096	2662.2	1098	2662.8	1100	2663.4	1102	2663.6
1104	2663.8	1106	2663.8	1108	2663.8	1110	2663.8	1112	2663.8
1114	2663.8	1116	2663.8	1118	2663.8	1120	2663.8	1122	2663.8
1124	2663.8	1126	2663.8	1128	2663.8	1130	2663.8	1132	2663.8
1134	2663.8	1136	2663.8	1138	2663.8	1140	2663.8	1142	2663.8
1144	2663.8	1146	2663.8	1148	2663.8	1150	2663.8	1152	2663.8
1154	2663.8	1156	2663.8	1158	2663.8	1160	2663.8	1162	2663.8
1164	2663.8	1166	2663.8						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
754	.03	754	.03	1166	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
754	1166	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	2662.76	Element			
Vel Head (ft)	2.25	Wt. n-Val.		0.030	
W.S. Elev (ft)	2660.52	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2660.52	Flow Area (sq ft)		1125.15	
E.G. Slope (ft/ft)	0.008128	Area (sq ft)		1125.15	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	252.91	Top Width (ft)		252.91	
Vel Total (ft/s)	12.03	Avg. Vel. (ft/s)		12.03	
Max Chl Dpth (ft)	4.72	Hydr. Depth (ft)		4.45	
Conv. Total (cfs)	150076.3	Conv. (cfs)		150076.3	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		254.60	
Min Ch El (ft)	2655.80	Shear (lb/sq ft)		2.24	
Alpha	1.00	Stream Power (lb/ft s)		26.96	
Frctn Loss (ft)	0.41	Cum Volume (acre-ft)		67.93	
C & E Loss (ft)	0.01	Cum SA (acres)		16.97	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 5300

INPUT
Description: 5300
Station Elevation Data num= 204

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
760	2662.7	762	2662.7	764	2662.7	766	2662.7	768	2662.7
770	2662.7	772	2662.7	774	2662.7	776	2662.7	778	2662.7
780	2662.7	782	2662.7	784	2662.7	786	2662.7	788	2662.7
790	2662.7	792	2662.7	794	2662.7	796	2662.7	798	2662.7

800	2662.7	802	2662.7	804	2662.7	806	2662.7	808	2662.7
810	2662.7	812	2662.7	814	2662.7	816	2662.7	818	2662.7
820	2662.7	822	2662.7	824	2662.7	826	2662.1	828	2661.8
830	2661	832	2660	834	2659.1	836	2658.2	838	2657.3
840	2656.3	842	2655.4	844	2654.8	846	2654.7	848	2654.7
850	2654.7	852	2654.7	854	2654.7	856	2654.7	858	2654.7
860	2654.7	862	2654.7	864	2654.7	866	2654.7	868	2654.7
870	2654.7	872	2654.7	874	2654.7	876	2654.7	878	2654.7
880	2654.7	882	2654.7	884	2654.7	886	2654.7	888	2654.7
890	2654.7	892	2654.7	894	2654.7	896	2654.7	898	2654.7
900	2654.7	902	2654.7	904	2654.7	906	2654.7	908	2654.7
910	2654.7	912	2654.7	914	2654.7	916	2654.7	918	2654.7
920	2654.7	922	2654.7	924	2654.7	926	2654.7	928	2654.7
930	2654.7	932	2654.7	934	2654.7	936	2654.7	938	2654.7
940	2654.7	942	2654.7	944	2654.7	946	2654.7	948	2654.7
950	2654.7	952	2654.7	954	2654.7	956	2654.7	958	2654.7
960	2654.7	962	2654.7	964	2654.7	966	2654.7	968	2654.7
970	2654.7	972	2654.7	974	2654.7	976	2654.7	978	2654.7
980	2654.7	982	2654.7	984	2654.7	986	2654.7	988	2654.7
990	2654.7	992	2654.7	994	2654.7	996	2654.7	998	2654.7
1000	2654.7	1002	2654.7	1004	2654.7	1006	2654.7	1008	2654.7
1010	2654.7	1012	2654.7	1014	2654.7	1016	2654.7	1018	2654.7
1020	2654.7	1022	2654.7	1024	2654.7	1026	2654.7	1028	2654.7
1030	2654.7	1032	2654.7	1034	2654.7	1036	2654.7	1038	2654.7
1040	2654.7	1042	2654.7	1044	2654.7	1046	2654.7	1048	2654.7
1050	2654.7	1052	2654.7	1054	2654.7	1056	2654.7	1058	2654.7
1060	2654.7	1062	2654.7	1064	2654.7	1066	2654.7	1068	2654.7
1070	2654.7	1072	2654.7	1074	2654.7	1076	2654.7	1078	2654.7
1080	2654.7	1082	2655.2	1084	2655.9	1086	2656.6	1088	2657.3
1090	2658.1	1092	2658.9	1094	2659.6	1096	2660.4	1098	2661.2
1100	2661.9	1102	2662.5	1104	2662.5	1106	2662.6	1108	2662.6
1110	2662.6	1112	2662.6	1114	2662.6	1116	2662.6	1118	2662.6
1120	2662.6	1122	2662.6	1124	2662.6	1126	2662.6	1128	2662.6
1130	2662.6	1132	2662.6	1134	2662.6	1136	2662.6	1138	2662.6
1140	2662.6	1142	2662.6	1144	2662.6	1146	2662.6	1148	2662.6
1150	2662.6	1152	2662.6	1154	2662.6	1156	2662.6	1158	2662.6
1160	2662.6	1162	2662.6	1164	2662.6	1166	2662.6		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
760	.03	760	.03	1166	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
760	1166	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2661.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.21	Wt. n-Val.		0.030	
W.S. Elev (ft)	2659.27	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2659.27	Flow Area (sq ft)		1135.39	
E.G. Slope (ft/ft)	0.008159	Area (sq ft)		1135.39	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	259.45	Top Width (ft)		259.45	
Vel Total (ft/s)	11.92	Avg. Vel. (ft/s)		11.92	
Max Chl Dpth (ft)	4.57	Hydr. Depth (ft)		4.38	
Conv. Total (cfs)	149790.2	Conv. (cfs)		149790.2	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		261.19	
Min Ch El (ft)	2654.70	Shear (lb/sq ft)		2.21	
Alpha	1.00	Stream Power (lb/ft s)		26.39	
Frctn Loss (ft)	0.41	Cum Volume (acre-ft)		66.64	
C & E Loss (ft)	0.01	Cum SA (acres)		16.68	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1

REACH: 1 RS: 5250

INPUT
Description: 5250
Station Elevation Data num= 206

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
760	2661.6	762	2661.6	764	2661.6	766	2661.6	768	2661.6
770	2661.6	772	2661.6	774	2661.6	776	2661.6	778	2661.6
780	2661.6	782	2661.6	784	2661.6	786	2661.6	788	2661.6
790	2661.6	792	2661.6	794	2661.6	796	2661.6	798	2661.6
800	2661.6	802	2661.6	804	2661.6	806	2661.6	808	2661.6
810	2661.6	812	2661.6	814	2661.6	816	2661.6	818	2661.6
820	2661.6	822	2661.5	824	2661.2	826	2660.4	828	2659.4
830	2658.5	832	2657.5	834	2656.5	836	2655.5	838	2654.6
840	2654	842	2653.9	844	2653.6	846	2653.6	848	2653.6
850	2653.6	852	2653.6	854	2653.6	856	2653.6	858	2653.6
860	2653.6	862	2653.6	864	2653.6	866	2653.6	868	2653.6
870	2653.6	872	2653.5	874	2653.5	876	2653.5	878	2653.5
880	2653.5	882	2653.5	884	2653.5	886	2653.5	888	2653.5
890	2653.5	892	2653.5	894	2653.5	896	2653.5	898	2653.5
900	2653.5	902	2653.5	904	2653.5	906	2653.5	908	2653.5
910	2653.5	912	2653.5	914	2653.5	916	2653.5	918	2653.5
920	2653.5	922	2653.5	924	2653.5	926	2653.5	928	2653.5
930	2653.5	932	2653.5	934	2653.5	936	2653.5	938	2653.5
940	2653.5	942	2653.5	944	2653.5	946	2653.5	948	2653.5
950	2653.5	952	2653.5	954	2653.5	956	2653.5	958	2653.5
960	2653.5	962	2653.5	964	2653.5	966	2653.5	968	2653.5
970	2653.5	972	2653.5	974	2653.5	976	2653.5	978	2653.5
980	2653.5	982	2653.5	984	2653.5	986	2653.5	988	2653.5
990	2653.5	992	2653.5	994	2653.5	996	2653.5	998	2653.5
1000	2653.5	1002	2653.5	1004	2653.5	1006	2653.5	1008	2653.5
1010	2653.5	1012	2653.5	1014	2653.5	1016	2653.5	1018	2653.5
1020	2653.5	1022	2653.5	1024	2653.5	1026	2653.5	1028	2653.5
1030	2653.5	1032	2653.5	1034	2653.5	1036	2653.5	1038	2653.5
1040	2653.5	1042	2653.5	1044	2653.5	1046	2653.5	1048	2653.5
1050	2653.5	1052	2653.5	1054	2653.5	1056	2653.5	1058	2653.5
1060	2653.5	1062	2653.5	1064	2653.4	1066	2653.4	1068	2653.4
1070	2653.4	1072	2653.4	1074	2653.4	1076	2653.4	1078	2653.4
1080	2653.4	1082	2653.4	1084	2653.8	1086	2654.4	1088	2655.2
1090	2656	1092	2656.8	1094	2657.6	1096	2658.4	1098	2659.3
1100	2660	1102	2660.7	1104	2660.9	1106	2661.4	1108	2661.4
1110	2661.4	1112	2661.4	1114	2661.3	1116	2661.3	1118	2661.3
1120	2661.3	1122	2661.3	1124	2661.3	1126	2661.3	1128	2661.3
1130	2661.3	1132	2661.3	1134	2661.3	1136	2661.3	1138	2661.3
1140	2661.3	1142	2661.3	1144	2661.3	1146	2661.3	1148	2661.3
1150	2661.3	1152	2661.3	1154	2661.3	1156	2661.3	1158	2661.3
1160	2661.3	1162	2661.3	1164	2661.3	1166	2661.3	1168	2661.3
1170	2661.3								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
760	.03	760	.03	1170	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
760	1170	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	2660.19	Element			
Vel Head (ft)	2.18	Wt. n-Val.		0.030	
W.S. Elev (ft)	2658.01	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2658.01	Flow Area (sq ft)		1141.92	
E.G. Slope (ft/ft)	0.008192	Area (sq ft)		1141.92	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	264.05	Top Width (ft)		264.05	
Vel Total (ft/s)	11.85	Avg. Vel. (ft/s)		11.85	
Max Chl Dpth (ft)	4.61	Hydr. Depth (ft)		4.32	
Conv. Total (cfs)	149483.2	Conv. (cfs)		149483.2	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		265.77	
Min Ch El (ft)	2653.40	Shear (lb/sq ft)		2.20	
Alpha	1.00	Stream Power (lb/ft s)		26.04	
Frctn Loss (ft)	0.41	Cum Volume (acre-ft)		65.33	
C & E Loss (ft)	0.01	Cum SA (acres)		16.38	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 5200

INPUT
Description: 5200
Station Elevation Data num= 208

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
756	2660.6	758	2660.6	760	2660.6	762	2660.6	764	2660.5
766	2660.5	768	2660.5	770	2660.5	772	2660.5	774	2660.5
776	2660.5	778	2660.5	780	2660.5	782	2660.5	784	2660.5
786	2660.5	788	2660.5	790	2660.5	792	2660.5	794	2660.5
796	2660.5	798	2660.5	800	2660.5	802	2660.5	804	2660.5
806	2660.5	808	2660.5	810	2660.5	812	2660.5	814	2660.5
816	2660.5	818	2660.5	820	2660.1	822	2659.1	824	2658.4
826	2657.4	828	2656.4	830	2655.3	832	2654.3	834	2653.4
836	2652.6	838	2652.5	840	2652.5	842	2652.5	844	2652.5
846	2652.5	848	2652.5	850	2652.5	852	2652.5	854	2652.5
856	2652.5	858	2652.5	860	2652.5	862	2652.5	864	2652.5
866	2652.5	868	2652.4	870	2652.4	872	2652.4	874	2652.4
876	2652.4	878	2652.4	880	2652.4	882	2652.4	884	2652.4
886	2652.4	888	2652.4	890	2652.4	892	2652.4	894	2652.4
896	2652.4	898	2652.4	900	2652.4	902	2652.4	904	2652.4
906	2652.4	908	2652.4	910	2652.4	912	2652.4	914	2652.4
916	2652.4	918	2652.4	920	2652.4	922	2652.4	924	2652.4
926	2652.4	928	2652.4	930	2652.4	932	2652.4	934	2652.4
936	2652.4	938	2652.4	940	2652.4	942	2652.4	944	2652.4
946	2652.4	948	2652.4	950	2652.4	952	2652.4	954	2652.4
956	2652.4	958	2652.4	960	2652.3	962	2652.3	964	2652.3
966	2652.3	968	2652.3	970	2652.3	972	2652.3	974	2652.3
976	2652.3	978	2652.3	980	2652.3	982	2652.3	984	2652.3
986	2652.3	988	2652.3	990	2652.3	992	2652.3	994	2652.3
996	2652.3	998	2652.3	1000	2652.3	1002	2652.3	1004	2652.3
1006	2652.3	1008	2652.3	1010	2652.3	1012	2652.3	1014	2652.3
1016	2652.3	1018	2652.3	1020	2652.3	1022	2652.3	1024	2652.3
1026	2652.3	1028	2652.3	1030	2652.3	1032	2652.3	1034	2652.3
1036	2652.3	1038	2652.3	1040	2652.3	1042	2652.3	1044	2652.3
1046	2652.3	1048	2652.2	1050	2652.2	1052	2652.2	1054	2652.2
1056	2652.2	1058	2652.2	1060	2652.2	1062	2652.2	1064	2652.2
1066	2652.2	1068	2652.2	1070	2652.2	1072	2652.2	1074	2652.2
1076	2652.2	1078	2652.2	1080	2652.2	1082	2652.2	1084	2652.4
1086	2652.7	1088	2653.4	1090	2654.1	1092	2655	1094	2655.9
1096	2656.7	1098	2657.6	1100	2658.5	1102	2659.2	1104	2659.8
1106	2659.9	1108	2660.1	1110	2660.1	1112	2660.1	1114	2660.1
1116	2660.1	1118	2660.1	1120	2660.1	1122	2660.1	1124	2660.1
1126	2660.1	1128	2660.1	1130	2660.1	1132	2660.1	1134	2660.1
1136	2660.1	1138	2660.1	1140	2660.1	1142	2660.1	1144	2660.1
1146	2660.1	1148	2660.1	1150	2660.1	1152	2660.1	1154	2660.1
1156	2660.1	1158	2660.1	1160	2660.1	1162	2660.1	1164	2660.1
1166	2660.1	1168	2660.1	1170	2660.1				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
756	.03	756	.03	1170	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
756	1170	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	2658.94	Element			
Vel Head (ft)	2.15	Wt. n-Val.		0.030	
W.S. Elev (ft)	2656.78	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2656.78	Flow Area (sq ft)		1149.03	
E.G. Slope (ft/ft)	0.008225	Area (sq ft)		1149.03	

Q Total (cfs)	13530.00	Flow (cfs)	13530.00
Top Width (ft)	268.95	Top Width (ft)	268.95
Vel Total (ft/s)	11.78	Avg. Vel. (ft/s)	11.78
Max Chl Dpth (ft)	4.58	Hydr. Depth (ft)	4.27
Conv. Total (cfs)	149184.9	Conv. (cfs)	149184.9
Length Wtd. (ft)	50.00	Wetted Per. (ft)	270.74
Min Ch El (ft)	2652.20	Shear (lb/sq ft)	2.18
Alpha	1.00	Stream Power (lb/ft s)	25.66
Frctn Loss (ft)	0.41	Cum Volume (acre-ft)	64.01
C & E Loss (ft)	0.01	Cum SA (acres)	16.07

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 5150

INPUT
Description: 5150
Station Elevation Data num= 210

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
754	2659.5	756	2659.5	758	2659.5	760	2659.5	762	2659.5
764	2659.5	766	2659.5	768	2659.5	770	2659.5	772	2659.5
774	2659.5	776	2659.5	778	2659.5	780	2659.5	782	2659.5
784	2659.5	786	2659.4	788	2659.4	790	2659.4	792	2659.4
794	2659.4	796	2659.4	798	2659.4	800	2659.4	802	2659.4
804	2659.4	806	2659.4	808	2659.4	810	2659.4	812	2659.4
814	2659.3	816	2658.4	818	2658	820	2656.9	822	2655.8
824	2654.7	826	2653.6	828	2652.5	830	2652.3	832	2651.4
834	2651.4	836	2651.4	838	2651.4	840	2651.4	842	2651.4
844	2651.4	846	2651.4	848	2651.4	850	2651.4	852	2651.4
854	2651.4	856	2651.4	858	2651.4	860	2651.3	862	2651.3
864	2651.3	866	2651.3	868	2651.3	870	2651.3	872	2651.3
874	2651.3	876	2651.3	878	2651.3	880	2651.3	882	2651.3
884	2651.3	886	2651.3	888	2651.3	890	2651.3	892	2651.3
894	2651.3	896	2651.3	898	2651.3	900	2651.3	902	2651.3
904	2651.3	906	2651.3	908	2651.3	910	2651.3	912	2651.3
914	2651.3	916	2651.3	918	2651.3	920	2651.3	922	2651.2
924	2651.2	926	2651.2	928	2651.2	930	2651.2	932	2651.2
934	2651.2	936	2651.2	938	2651.2	940	2651.2	942	2651.2
944	2651.2	946	2651.2	948	2651.2	950	2651.2	952	2651.2
954	2651.2	956	2651.2	958	2651.2	960	2651.2	962	2651.2
964	2651.2	966	2651.2	968	2651.1	970	2651.1	972	2651.1
974	2651.1	976	2651.1	978	2651.1	980	2651.1	982	2651.1
984	2651.1	986	2651.1	988	2651.1	990	2651.1	992	2651.1
994	2651.1	996	2651.1	998	2651.1	1000	2651.1	1002	2651.1
1004	2651.1	1006	2651.1	1008	2651.1	1010	2651.1	1012	2651.1
1014	2651.1	1016	2651.1	1018	2651.1	1020	2651.1	1022	2651.1
1024	2651.1	1026	2651.1	1028	2651.1	1030	2651.1	1032	2651.1
1034	2651.1	1036	2651.1	1038	2651	1040	2651	1042	2651
1044	2651	1046	2651	1048	2651	1050	2651	1052	2651
1054	2651	1056	2651	1058	2651	1060	2651	1062	2651
1064	2651	1066	2651	1068	2651	1070	2651	1072	2651
1074	2651	1076	2651	1078	2651	1080	2651	1082	2651
1084	2651	1086	2651.3	1088	2651.9	1090	2652.6	1092	2653.5
1094	2654.4	1096	2655.3	1098	2656.2	1100	2657.2	1102	2658.1
1104	2658.6	1106	2658.9	1108	2658.9	1110	2658.9	1112	2658.9
1114	2658.9	1116	2658.9	1118	2658.9	1120	2658.9	1122	2658.9
1124	2658.9	1126	2658.9	1128	2658.9	1130	2658.9	1132	2658.9
1134	2658.9	1136	2658.8	1138	2658.8	1140	2658.8	1142	2658.8
1144	2658.8	1146	2658.8	1148	2658.8	1150	2658.8	1152	2658.8
1154	2658.8	1156	2658.8	1158	2658.8	1160	2658.8	1162	2658.8
1164	2658.8	1166	2658.8	1168	2658.8	1170	2658.8	1172	2658.8

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
754	.03	754	.03	1172	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
754	1172	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	2657.68	Element			
Vel Head (ft)	2.13	Wt. n-Val.		0.030	
W.S. Elev (ft)	2655.55	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2655.55	Flow Area (sq ft)		1155.73	
E.G. Slope (ft/ft)	0.008275	Area (sq ft)		1155.73	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	274.10	Top Width (ft)		274.10	
Vel Total (ft/s)	11.71	Avg. Vel. (ft/s)		11.71	
Max Chl Dpth (ft)	4.55	Hydr. Depth (ft)		4.22	
Conv. Total (cfs)	148734.7	Conv. (cfs)		148734.7	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		275.95	
Min Ch El (ft)	2651.00	Shear (lb/sq ft)		2.16	
Alpha	1.00	Stream Power (lb/ft s)		25.33	
Frctn Loss (ft)	0.41	Cum Volume (acre-ft)		62.69	
C & E Loss (ft)	0.01	Cum SA (acres)		15.76	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 5100

INPUT
Description: 5100
Station Elevation Data num= 212

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
750	2658.4	752	2658.4	754	2658.4	756	2658.4	758	2658.4
760	2658.4	762	2658.4	764	2658.4	766	2658.4	768	2658.4
770	2658.4	772	2658.4	774	2658.4	776	2658.4	778	2658.3
780	2658.3	782	2658.3	784	2658.3	786	2658.3	788	2658.3
790	2658.3	792	2658.3	794	2658.3	796	2658.3	798	2658.3
800	2658.3	802	2658.3	804	2658.3	806	2658.3	808	2658
810	2657.8	812	2657.1	814	2656	816	2654.8	818	2653.7
820	2652.5	822	2651.3	824	2650.7	826	2650.3	828	2650.3
830	2650.3	832	2650.3	834	2650.3	836	2650.3	838	2650.3
840	2650.3	842	2650.3	844	2650.3	846	2650.2	848	2650.2
850	2650.2	852	2650.2	854	2650.2	856	2650.2	858	2650.2
860	2650.2	862	2650.2	864	2650.2	866	2650.2	868	2650.2
870	2650.2	872	2650.2	874	2650.2	876	2650.2	878	2650.2
880	2650.1	882	2650.1	884	2650.1	886	2650.1	888	2650.1
890	2650.1	892	2650.1	894	2650.1	896	2650.1	898	2650.1
900	2650.1	902	2650.1	904	2650.1	906	2650.1	908	2650.1
910	2650.1	912	2650.1	914	2650.1	916	2650.1	918	2650.1
920	2650.1	922	2650.1	924	2650.1	926	2650.1	928	2650
930	2650	932	2650	934	2650	936	2650	938	2650
940	2650	942	2650	944	2650	946	2650	948	2650
950	2650	952	2650	954	2650	956	2650	958	2650
960	2650	962	2650	964	2650	966	2650	968	2650
970	2650	972	2650	974	2650	976	2649.9	978	2649.9
980	2649.9	982	2649.9	984	2649.9	986	2649.9	988	2649.9
990	2649.9	992	2649.9	994	2649.9	996	2649.9	998	2649.9
1000	2649.9	1002	2649.9	1004	2649.9	1006	2649.9	1008	2649.9
1010	2649.9	1012	2649.9	1014	2649.9	1016	2649.9	1018	2649.9
1020	2649.9	1022	2649.9	1024	2649.9	1026	2649.9	1028	2649.9
1030	2649.9	1032	2649.9	1034	2649.9	1036	2649.9	1038	2649.9
1040	2649.9	1042	2649.8	1044	2649.8	1046	2649.8	1048	2649.8
1050	2649.8	1052	2649.8	1054	2649.8	1056	2649.8	1058	2649.8
1060	2649.8	1062	2649.8	1064	2649.8	1066	2649.8	1068	2649.8
1070	2649.8	1072	2649.8	1074	2649.8	1076	2649.8	1078	2649.8
1080	2649.8	1082	2649.8	1084	2649.8	1086	2650	1088	2650.3
1090	2651.1	1092	2652	1094	2653	1096	2653.9	1098	2654.9

1100	2655.8	1102	2656.7	1104	2657.3	1106	2657.5	1108	2657.7
1110	2657.7	1112	2657.7	1114	2657.7	1116	2657.7	1118	2657.7
1120	2657.7	1122	2657.7	1124	2657.7	1126	2657.7	1128	2657.7
1130	2657.7	1132	2657.7	1134	2657.7	1136	2657.7	1138	2657.7
1140	2657.7	1142	2657.6	1144	2657.6	1146	2657.6	1148	2657.6
1150	2657.6	1152	2657.6	1154	2657.6	1156	2657.6	1158	2657.6
1160	2657.6	1162	2657.6	1164	2657.6	1166	2657.6	1168	2657.6
1170	2657.6	1172	2657.6						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
750	.03	750	.03	1172	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
750	1172	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2656.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.10	Wt. n-Val.		0.030	
W.S. Elev (ft)	2654.30	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2654.30	Flow Area (sq ft)		1164.30	
E.G. Slope (ft/ft)	0.008301	Area (sq ft)		1164.30	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	279.89	Top Width (ft)		279.89	
Vel Total (ft/s)	11.62	Avg. Vel. (ft/s)		11.62	
Max Chl Dpth (ft)	4.50	Hydr. Depth (ft)		4.16	
Conv. Total (cfs)	148503.5	Conv. (cfs)		148503.5	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		281.75	
Min Ch El (ft)	2649.80	Shear (lb/sq ft)		2.14	
Alpha	1.00	Stream Power (lb/ft s)		24.89	
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)		61.36	
C & E Loss (ft)	0.01	Cum SA (acres)		15.44	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 5050

INPUT
Description: 5050
Station Elevation Data num= 216

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
744	2657.2	746	2657.2	748	2657.2	750	2657.2	752	2657.2
754	2657.2	756	2657.2	758	2657.2	760	2657.2	762	2657.2
764	2657.2	766	2657.2	768	2657.2	770	2657.2	772	2657.2
774	2657.2	776	2657.2	778	2657.2	780	2657.1	782	2657.1
784	2657.1	786	2657.1	788	2657.1	790	2657.1	792	2657.1
794	2657.1	796	2657.1	798	2657.1	800	2657.1	802	2657.1
804	2656.9	806	2656.3	808	2655.4	810	2654.5	812	2653.4
814	2652.2	816	2651.1	818	2650	820	2649.4	822	2649.1
824	2649.1	826	2649.1	828	2649.1	830	2649.1	832	2649.1
834	2649.1	836	2649	838	2649	840	2649	842	2649
844	2649	846	2649	848	2649	850	2649	852	2649
854	2649	856	2649	858	2649	860	2649	862	2649
864	2649	866	2649	868	2649	870	2649	872	2649
874	2649	876	2649	878	2648.9	880	2648.9	882	2648.9
884	2648.9	886	2648.9	888	2648.9	890	2648.9	892	2648.9
894	2648.9	896	2648.9	898	2648.9	900	2648.9	902	2648.9
904	2648.9	906	2648.9	908	2648.9	910	2648.9	912	2648.9
914	2648.9	916	2648.9	918	2648.9	920	2648.9	922	2648.8
924	2648.8	926	2648.8	928	2648.8	930	2648.8	932	2648.8
934	2648.8	936	2648.8	938	2648.8	940	2648.8	942	2648.8
944	2648.8	946	2648.8	948	2648.8	950	2648.8	952	2648.8
954	2648.8	956	2648.8	958	2648.8	960	2648.8	962	2648.8
964	2648.8	966	2648.8	968	2648.8	970	2648.8	972	2648.8

974	2648.8	976	2648.8	978	2648.8	980	2648.8	982	2648.7
984	2648.7	986	2648.7	988	2648.7	990	2648.7	992	2648.7
994	2648.7	996	2648.7	998	2648.7	1000	2648.7	1002	2648.7
1004	2648.7	1006	2648.7	1008	2648.7	1010	2648.7	1012	2648.7
1014	2648.7	1016	2648.7	1018	2648.7	1020	2648.7	1022	2648.7
1024	2648.7	1026	2648.7	1028	2648.7	1030	2648.7	1032	2648.7
1034	2648.7	1036	2648.7	1038	2648.7	1040	2648.7	1042	2648.7
1044	2648.7	1046	2648.7	1048	2648.7	1050	2648.7	1052	2648.7
1054	2648.7	1056	2648.7	1058	2648.7	1060	2648.7	1062	2648.7
1064	2648.7	1066	2648.7	1068	2648.7	1070	2648.7	1072	2648.7
1074	2648.7	1076	2648.7	1078	2648.7	1080	2648.7	1082	2648.7
1084	2648.7	1086	2648.7	1088	2649	1090	2649.3	1092	2650.1
1094	2651	1096	2651.9	1098	2652.9	1100	2653.8	1102	2654.7
1104	2655.6	1106	2655.9	1108	2656.5	1110	2656.5	1112	2656.5
1114	2656.5	1116	2656.5	1118	2656.5	1120	2656.5	1122	2656.5
1124	2656.5	1126	2656.5	1128	2656.5	1130	2656.5	1132	2656.5
1134	2656.5	1136	2656.5	1138	2656.5	1140	2656.5	1142	2656.5
1144	2656.5	1146	2656.5	1148	2656.5	1150	2656.5	1152	2656.5
1154	2656.5	1156	2656.5	1158	2656.5	1160	2656.5	1162	2656.5
1164	2656.5	1166	2656.5	1168	2656.5	1170	2656.5	1172	2656.5
1174	2656.5								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
744	.03	744	.03	1174	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
744	1174	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2655.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.07	Wt. n-Val.		0.030	
W.S. Elev (ft)	2653.05	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2653.05	Flow Area (sq ft)		1170.88	
E.G. Slope (ft/ft)	0.008370	Area (sq ft)		1170.88	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	285.75	Top Width (ft)		285.75	
Vel Total (ft/s)	11.56	Avg. Vel. (ft/s)		11.56	
Max Chl Dpth (ft)	4.35	Hydr. Depth (ft)		4.10	
Conv. Total (cfs)	147891.5	Conv. (cfs)		147891.5	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		287.52	
Min Ch El (ft)	2648.70	Shear (lb/sq ft)		2.13	
Alpha	1.00	Stream Power (lb/ft s)		24.59	
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)		60.02	
C & E Loss (ft)	0.01	Cum SA (acres)		15.12	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 5000

INPUT
Description: 5000
Station Elevation Data num= 217

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
740	2655.9	742	2655.9	744	2655.9	746	2655.9	748	2655.9
750	2655.9	752	2655.9	754	2655.9	756	2655.9	758	2655.9
760	2655.9	762	2655.9	764	2655.9	766	2655.9	768	2655.9
770	2655.9	772	2655.9	774	2655.9	776	2655.9	778	2655.9
780	2655.9	782	2655.9	784	2655.9	786	2655.9	788	2655.9
790	2655.9	792	2655.9	794	2655.9	796	2655.9	798	2655.8
800	2655.6	802	2654.9	804	2654.1	806	2653	808	2651.9
810	2650.8	812	2649.8	814	2648.7	816	2647.8	818	2647.8
820	2647.8	822	2647.8	824	2647.8	826	2647.8	828	2647.8
830	2647.8	832	2647.8	834	2647.8	836	2647.8	838	2647.8

840	2647.8	842	2647.8	844	2647.8	846	2647.8	848	2647.8
850	2647.8	852	2647.8	854	2647.8	856	2647.8	858	2647.7
860	2647.7	862	2647.7	864	2647.7	866	2647.7	868	2647.7
870	2647.7	872	2647.7	874	2647.7	876	2647.7	878	2647.7
880	2647.7	882	2647.7	884	2647.7	886	2647.7	888	2647.7
890	2647.7	892	2647.7	894	2647.7	896	2647.7	898	2647.7
900	2647.7	902	2647.7	904	2647.7	906	2647.7	908	2647.7
910	2647.7	912	2647.7	914	2647.6	916	2647.6	918	2647.6
920	2647.6	922	2647.6	924	2647.6	926	2647.6	928	2647.6
930	2647.6	932	2647.6	934	2647.6	936	2647.6	938	2647.6
940	2647.6	942	2647.6	944	2647.6	946	2647.6	948	2647.6
950	2647.6	952	2647.6	954	2647.6	956	2647.6	958	2647.6
960	2647.6	962	2647.6	964	2647.6	966	2647.6	968	2647.6
970	2647.6	972	2647.5	974	2647.5	976	2647.5	978	2647.5
980	2647.5	982	2647.5	984	2647.5	986	2647.5	988	2647.5
990	2647.5	992	2647.5	994	2647.5	996	2647.5	998	2647.5
1000	2647.5	1002	2647.5	1004	2647.5	1006	2647.5	1008	2647.5
1010	2647.5	1012	2647.5	1014	2647.5	1016	2647.5	1018	2647.5
1020	2647.5	1022	2647.5	1024	2647.5	1026	2647.5	1028	2647.5
1030	2647.5	1032	2647.5	1034	2647.5	1036	2647.5	1038	2647.5
1040	2647.5	1042	2647.5	1044	2647.5	1046	2647.5	1048	2647.5
1050	2647.5	1052	2647.5	1054	2647.5	1056	2647.5	1058	2647.5
1060	2647.5	1062	2647.5	1064	2647.5	1066	2647.5	1068	2647.5
1070	2647.5	1072	2647.5	1074	2647.5	1076	2647.5	1078	2647.5
1080	2647.5	1082	2647.5	1084	2647.5	1086	2647.5	1088	2647.5
1090	2647.7	1092	2648.5	1094	2649.4	1096	2650.3	1098	2651.2
1100	2652.2	1102	2653.1	1104	2654	1106	2654.8	1108	2655
1110	2655.4	1112	2655.4	1114	2655.4	1116	2655.4	1118	2655.4
1120	2655.4	1122	2655.4	1124	2655.4	1126	2655.4	1128	2655.4
1130	2655.4	1132	2655.4	1134	2655.4	1136	2655.4	1138	2655.4
1140	2655.4	1142	2655.4	1144	2655.4	1146	2655.4	1148	2655.4
1150	2655.4	1152	2655.4	1154	2655.4	1156	2655.4	1158	2655.4
1160	2655.4	1162	2655.4	1164	2655.4	1166	2655.4	1168	2655.4
1170	2655.4	1172	2655.4						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
740	.03	740	.03	1172	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
740	1172	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2653.83	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.05	Wt. n-Val.		0.030	
W.S. Elev (ft)	2651.78	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2651.78	Flow Area (sq ft)		1178.88	
E.G. Slope (ft/ft)	0.008383	Area (sq ft)		1178.88	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	290.95	Top Width (ft)		290.95	
Vel Total (ft/s)	11.48	Avg. Vel. (ft/s)		11.48	
Max Chl Dpth (ft)	4.28	Hydr. Depth (ft)		4.05	
Conv. Total (cfs)	147777.7	Conv. (cfs)		147777.7	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		292.80	
Min Ch El (ft)	2647.50	Shear (lb/sq ft)		2.11	
Alpha	1.00	Stream Power (lb/ft s)		24.18	
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)		58.67	
C & E Loss (ft)	0.01	Cum SA (acres)		14.79	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 4950

INPUT

Description: 4950

Station Elevation Data num= 222

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
732	2654.7	734	2654.6	736	2654.6	738	2654.6	740	2654.6
742	2654.6	744	2654.6	746	2654.6	748	2654.6	750	2654.6
752	2654.6	754	2654.6	756	2654.6	758	2654.6	760	2654.6
762	2654.6	764	2654.6	766	2654.6	768	2654.6	770	2654.6
772	2654.6	774	2654.6	776	2654.6	778	2654.6	780	2654.6
782	2654.6	784	2654.6	786	2654.6	788	2654.6	790	2654.6
792	2654.6	794	2654.6	796	2654	798	2653.1	800	2652
802	2650.9	804	2649.9	806	2648.8	808	2647.8	810	2647
812	2646.7	814	2646.5	816	2646.5	818	2646.5	820	2646.5
822	2646.5	824	2646.5	826	2646.5	828	2646.5	830	2646.5
832	2646.5	834	2646.5	836	2646.5	838	2646.5	840	2646.5
842	2646.5	844	2646.5	846	2646.5	848	2646.5	850	2646.5
852	2646.5	854	2646.5	856	2646.5	858	2646.5	860	2646.5
862	2646.5	864	2646.5	866	2646.5	868	2646.5	870	2646.5
872	2646.5	874	2646.5	876	2646.5	878	2646.5	880	2646.4
882	2646.4	884	2646.4	886	2646.4	888	2646.4	890	2646.4
892	2646.4	894	2646.4	896	2646.4	898	2646.4	900	2646.4
902	2646.4	904	2646.4	906	2646.4	908	2646.4	910	2646.4
912	2646.4	914	2646.4	916	2646.4	918	2646.4	920	2646.4
922	2646.4	924	2646.4	926	2646.4	928	2646.4	930	2646.4
932	2646.4	934	2646.4	936	2646.4	938	2646.4	940	2646.4
942	2646.4	944	2646.4	946	2646.4	948	2646.3	950	2646.3
952	2646.3	954	2646.3	956	2646.3	958	2646.3	960	2646.3
962	2646.3	964	2646.3	966	2646.3	968	2646.3	970	2646.3
972	2646.3	974	2646.3	976	2646.3	978	2646.3	980	2646.3
982	2646.3	984	2646.3	986	2646.3	988	2646.3	990	2646.3
992	2646.3	994	2646.3	996	2646.3	998	2646.3	1000	2646.3
1002	2646.3	1004	2646.3	1006	2646.3	1008	2646.3	1010	2646.3
1012	2646.3	1014	2646.3	1016	2646.3	1018	2646.3	1020	2646.3
1022	2646.3	1024	2646.3	1026	2646.3	1028	2646.3	1030	2646.3
1032	2646.3	1034	2646.3	1036	2646.3	1038	2646.3	1040	2646.3
1042	2646.3	1044	2646.3	1046	2646.3	1048	2646.3	1050	2646.3
1052	2646.3	1054	2646.3	1056	2646.3	1058	2646.3	1060	2646.3
1062	2646.3	1064	2646.3	1066	2646.3	1068	2646.3	1070	2646.3
1072	2646.3	1074	2646.3	1076	2646.3	1078	2646.3	1080	2646.3
1082	2646.3	1084	2646.3	1086	2646.3	1088	2646.4	1090	2646.7
1092	2647.3	1094	2648.2	1096	2649.1	1098	2650	1100	2650.9
1102	2651.8	1104	2652.7	1106	2653.3	1108	2654	1110	2654.3
1112	2654.3	1114	2654.3	1116	2654.3	1118	2654.3	1120	2654.3
1122	2654.3	1124	2654.3	1126	2654.3	1128	2654.3	1130	2654.3
1132	2654.3	1134	2654.3	1136	2654.3	1138	2654.3	1140	2654.3
1142	2654.3	1144	2654.3	1146	2654.3	1148	2654.3	1150	2654.3
1152	2654.3	1154	2654.3	1156	2654.3	1158	2654.3	1160	2654.3
1162	2654.3	1164	2654.3	1166	2654.3	1168	2654.3	1170	2654.3
1172	2654.3	1174	2654.3						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
732	.03	732	.03	1174	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
732	1174	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	2652.52	Element			
Vel Head (ft)	2.02	Wt. n-Val.		0.030	
W.S. Elev (ft)	2650.50	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2650.50	Flow Area (sq ft)		1186.48	
E.G. Slope (ft/ft)	0.008399	Area (sq ft)		1186.48	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	296.32	Top Width (ft)		296.32	
Vel Total (ft/s)	11.40	Avg. Vel. (ft/s)		11.40	
Max Chl Dpth (ft)	4.20	Hydr. Depth (ft)		4.00	
Conv. Total (cfs)	147633.3	Conv. (cfs)		147633.3	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		297.98	
Min Ch El (ft)	2646.30	Shear (lb/sq ft)		2.09	
Alpha	1.00	Stream Power (lb/ft s)		23.81	
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)		57.31	
C & E Loss (ft)	0.01	Cum SA (acres)		14.45	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 4900

INPUT
Description: 4900
Station Elevation Data num= 226

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
726	2653.4	728	2653.4	730	2653.4	732	2653.3	734	2653.3
736	2653.3	738	2653.3	740	2653.3	742	2653.3	744	2653.3
746	2653.3	748	2653.3	750	2653.3	752	2653.3	754	2653.3
756	2653.3	758	2653.3	760	2653.3	762	2653.3	764	2653.3
766	2653.3	768	2653.3	770	2653.3	772	2653.4	774	2653.4
776	2653.4	778	2653.4	780	2653.4	782	2653.4	784	2653.4
786	2653.4	788	2653.2	790	2652.4	792	2651.6	794	2650.5
796	2649.5	798	2648.5	800	2647.5	802	2646.6	804	2645.8
806	2645.7	808	2645.3	810	2645.3	812	2645.3	814	2645.3
816	2645.3	818	2645.3	820	2645.3	822	2645.3	824	2645.3
826	2645.2	828	2645.2	830	2645.2	832	2645.2	834	2645.2
836	2645.2	838	2645.2	840	2645.2	842	2645.2	844	2645.2
846	2645.2	848	2645.2	850	2645.2	852	2645.2	854	2645.2
856	2645.2	858	2645.2	860	2645.2	862	2645.2	864	2645.2
866	2645.2	868	2645.2	870	2645.2	872	2645.2	874	2645.2
876	2645.2	878	2645.2	880	2645.2	882	2645.1	884	2645.1
886	2645.1	888	2645.1	890	2645.1	892	2645.1	894	2645.1
896	2645.1	898	2645.1	900	2645.1	902	2645.1	904	2645.1
906	2645.1	908	2645.1	910	2645.1	912	2645.1	914	2645.1
916	2645.1	918	2645.1	920	2645.1	922	2645.1	924	2645.1
926	2645.1	928	2645.1	930	2645.1	932	2645.1	934	2645.1
936	2645.1	938	2645.1	940	2645.1	942	2645.1	944	2645.1
946	2645.1	948	2645.1	950	2645.1	952	2645.1	954	2645.1
956	2645.1	958	2645.1	960	2645.1	962	2645.1	964	2645.1
966	2645.1	968	2645.1	970	2645.1	972	2645.1	974	2645.1
976	2645.1	978	2645.1	980	2645.1	982	2645.1	984	2645.1
986	2645.1	988	2645.1	990	2645.1	992	2645.1	994	2645.1
996	2645.1	998	2645.1	1000	2645.1	1002	2645.1	1004	2645.1
1006	2645.1	1008	2645.1	1010	2645.1	1012	2645.1	1014	2645.1
1016	2645.1	1018	2645.1	1020	2645.1	1022	2645.1	1024	2645.1
1026	2645.1	1028	2645.1	1030	2645.1	1032	2645.1	1034	2645.1
1036	2645.1	1038	2645.1	1040	2645.1	1042	2645.1	1044	2645.1
1046	2645.1	1048	2645.1	1050	2645.1	1052	2645.1	1054	2645.1
1056	2645.1	1058	2645.1	1060	2645.1	1062	2645.1	1064	2645.1
1066	2645.1	1068	2645.1	1070	2645.1	1072	2645.1	1074	2645.2
1076	2645.2	1078	2645.2	1080	2645.2	1082	2645.2	1084	2645.2
1086	2645.2	1088	2645.4	1090	2645.8	1092	2646.5	1094	2647.3
1096	2648.2	1098	2649.1	1100	2650	1102	2650.9	1104	2651.8
1106	2652.3	1108	2653	1110	2653.1	1112	2653.1	1114	2653.1
1116	2653.1	1118	2653.1	1120	2653.1	1122	2653.1	1124	2653.1
1126	2653.1	1128	2653.1	1130	2653.1	1132	2653.1	1134	2653.1
1136	2653.1	1138	2653.1	1140	2653.1	1142	2653.1	1144	2653.1
1146	2653.1	1148	2653.1	1150	2653.1	1152	2653.1	1154	2653.1
1156	2653.1	1158	2653.1	1160	2653.1	1162	2653.1	1164	2653.1
1166	2653.1	1168	2653.1	1170	2653.1	1172	2653.2	1174	2653.2
1176	2653.2								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
726	.03	726	.03	1176	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
726	1176	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2651.22	Element	Left OB	Channel	Right OB

Vel Head (ft)	2.00	Wt. n-Val.		0.030	
W.S. Elev (ft)	2649.22	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2649.22	Flow Area (sq ft)		1192.71	
E.G. Slope (ft/ft)	0.008449	Area (sq ft)		1192.71	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	301.71	Top Width (ft)		301.71	
Vel Total (ft/s)	11.34	Avg. Vel. (ft/s)		11.34	
Max Chl Dpth (ft)	4.12	Hydr. Depth (ft)		3.95	
Conv. Total (cfs)	147198.5	Conv. (cfs)		147198.5	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		303.24	
Min Ch El (ft)	2645.10	Shear (lb/sq ft)		2.07	
Alpha	1.00	Stream Power (lb/ft s)		23.53	
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)		55.95	
C & E Loss (ft)	0.01	Cum SA (acres)		14.11	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 4850

INPUT
Description: 4850
Station Elevation Data num= 229

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
720	2652	722	2652	724	2652	726	2652	728	2652
730	2652	732	2652	734	2652	736	2652	738	2652
740	2652	742	2652	744	2652	746	2652	748	2652
750	2652	752	2652	754	2652	756	2652	758	2652
760	2652	762	2652	764	2652	766	2652	768	2652
770	2652	772	2652	774	2652	776	2652	778	2652
780	2652	782	2651.9	784	2651.3	786	2650.3	788	2649.3
790	2648.3	792	2647.3	794	2646.3	796	2645.4	798	2644.6
800	2644.2	802	2643.9	804	2643.9	806	2643.9	808	2643.9
810	2643.9	812	2643.9	814	2643.9	816	2643.9	818	2643.9
820	2643.9	822	2643.9	824	2643.9	826	2643.9	828	2643.9
830	2643.9	832	2643.9	834	2643.9	836	2643.9	838	2643.9
840	2643.9	842	2643.9	844	2643.9	846	2643.9	848	2643.9
850	2643.9	852	2643.9	854	2643.9	856	2643.9	858	2643.9
860	2643.9	862	2643.9	864	2643.9	866	2643.9	868	2643.9
870	2643.9	872	2643.9	874	2643.9	876	2643.9	878	2643.9
880	2643.9	882	2643.8	884	2643.8	886	2643.8	888	2643.8
890	2643.8	892	2643.8	894	2643.8	896	2643.8	898	2643.8
900	2643.8	902	2643.8	904	2643.8	906	2643.8	908	2643.8
910	2643.8	912	2643.8	914	2643.8	916	2643.8	918	2643.8
920	2643.8	922	2643.8	924	2643.8	926	2643.8	928	2643.8
930	2643.8	932	2643.8	934	2643.8	936	2643.8	938	2643.8
940	2643.8	942	2643.8	944	2643.8	946	2643.8	948	2643.8
950	2643.8	952	2643.8	954	2643.8	956	2643.8	958	2643.8
960	2643.8	962	2643.8	964	2643.8	966	2643.8	968	2643.8
970	2643.8	972	2643.8	974	2643.8	976	2643.8	978	2643.8
980	2643.8	982	2643.8	984	2643.8	986	2643.8	988	2643.8
990	2643.8	992	2643.8	994	2643.8	996	2643.8	998	2643.8
1000	2643.8	1002	2643.8	1004	2643.8	1006	2643.8	1008	2643.8
1010	2643.9	1012	2643.9	1014	2643.9	1016	2643.9	1018	2643.9
1020	2643.9	1022	2643.9	1024	2643.9	1026	2643.9	1028	2643.9
1030	2643.9	1032	2643.9	1034	2643.9	1036	2643.9	1038	2643.9
1040	2643.9	1042	2643.9	1044	2643.9	1046	2643.9	1048	2643.9
1050	2643.9	1052	2643.9	1054	2643.9	1056	2643.9	1058	2643.9
1060	2643.9	1062	2643.9	1064	2643.9	1066	2643.9	1068	2643.9
1070	2643.9	1072	2643.9	1074	2643.9	1076	2643.9	1078	2643.9
1080	2643.9	1082	2643.9	1084	2643.9	1086	2643.9	1088	2644
1090	2644.5	1092	2645.2	1094	2646	1096	2646.9	1098	2647.8
1100	2648.7	1102	2649.5	1104	2650.4	1106	2651.2	1108	2651.7
1110	2651.9	1112	2651.9	1114	2651.9	1116	2651.9	1118	2651.9
1120	2651.9	1122	2651.9	1124	2651.9	1126	2651.9	1128	2651.9
1130	2651.9	1132	2651.9	1134	2651.9	1136	2651.9	1138	2651.9

1140	2651.9	1142	2651.9	1144	2651.9	1146	2651.9	1148	2651.9
1150	2651.9	1152	2651.9	1154	2651.9	1156	2651.9	1158	2651.9
1160	2651.9	1162	2651.9	1164	2651.9	1166	2651.9	1168	2651.9
1170	2651.9	1172	2651.9	1174	2651.9	1176	2651.9		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
720	.03	720	.03	1176	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
720	1176	31	31	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2649.85	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.97	Wt. n-Val.		0.030	
W.S. Elev (ft)	2647.88	Reach Len. (ft)	31.00	31.00	31.00
Crit W.S. (ft)	2647.88	Flow Area (sq ft)		1200.60	
E.G. Slope (ft/ft)	0.008470	Area (sq ft)		1200.60	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	307.35	Top Width (ft)		307.35	
Vel Total (ft/s)	11.27	Avg. Vel. (ft/s)		11.27	
Max Chl Dpth (ft)	4.08	Hydr. Depth (ft)		3.91	
Conv. Total (cfs)	147009.1	Conv. (cfs)		147009.1	
Length Wtd. (ft)	31.00	Wetted Per. (ft)		308.88	
Min Ch El (ft)	2643.80	Shear (lb/sq ft)		2.06	
Alpha	1.00	Stream Power (lb/ft s)		23.16	
Frctn Loss (ft)	0.26	Cum Volume (acre-ft)		54.57	
C & E Loss (ft)	0.00	Cum SA (acres)		13.76	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 4818

INPUT
Description: 4818
Station Elevation Data num= 229

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
718	2651.1	720	2651.1	722	2651.1	724	2651.1	726	2651.1
728	2651.1	730	2651.1	732	2651.1	734	2651.1	736	2651.1
738	2651.1	740	2651.1	742	2651.1	744	2651.1	746	2651.1
748	2651.1	750	2651.1	752	2651.1	754	2651.1	756	2651.1
758	2651.1	760	2651.1	762	2651.1	764	2651.1	766	2651.1
768	2651.1	770	2651.1	772	2651.1	774	2651.1	776	2651.1
778	2650.9	780	2650.3	782	2649.5	784	2648.6	786	2647.6
788	2646.6	790	2645.6	792	2644.6	794	2643.6	796	2643.1
798	2643.1	800	2643.1	802	2643.1	804	2643.1	806	2643.1
808	2643.1	810	2643.1	812	2643.1	814	2643.1	816	2643.1
818	2643.1	820	2643.1	822	2643.1	824	2643.1	826	2643.1
828	2643.1	830	2643.1	832	2643.1	834	2643.1	836	2643.1
838	2643.1	840	2643.1	842	2643.1	844	2643.1	846	2643.1
848	2643.1	850	2643.1	852	2643.1	854	2643.1	856	2643.1
858	2643.1	860	2643.1	862	2643.1	864	2643	866	2643
868	2643	870	2643	872	2643	874	2643	876	2643
878	2643	880	2643	882	2643	884	2643	886	2643
888	2643	890	2643	892	2643	894	2643	896	2643
898	2643	900	2643	902	2643	904	2643	906	2643
908	2643	910	2643	912	2643	914	2643	916	2643
918	2643	920	2643	922	2643	924	2643	926	2643
928	2643	930	2643	932	2643	934	2643	936	2643
938	2643	940	2643	942	2643	944	2643	946	2643
948	2643	950	2643	952	2643	954	2643	956	2643
958	2643	960	2643	962	2643	964	2643	966	2643
968	2643	970	2643	972	2643	974	2643	976	2643
978	2643	980	2643	982	2643	984	2643	986	2643.1
988	2643.1	990	2643.1	992	2643.1	994	2643.1	996	2643.1
998	2643.1	1000	2643.1	1002	2643.1	1004	2643.1	1006	2643.1

1008	2643.1	1010	2643.1	1012	2643.1	1014	2643.1	1016	2643.1
1018	2643.1	1020	2643.1	1022	2643.1	1024	2643.1	1026	2643.1
1028	2643.1	1030	2643.1	1032	2643.1	1034	2643.1	1036	2643.1
1038	2643.1	1040	2643.1	1042	2643.1	1044	2643.1	1046	2643.1
1048	2643.1	1050	2643.1	1052	2643.1	1054	2643.1	1056	2643.1
1058	2643.1	1060	2643.1	1062	2643.1	1064	2643.1	1066	2643.1
1068	2643.1	1070	2643.1	1072	2643.1	1074	2643.1	1076	2643.1
1078	2643.1	1080	2643.1	1082	2643.1	1084	2643.1	1086	2643.2
1088	2643.4	1090	2643.8	1092	2644.5	1094	2645.3	1096	2646.2
1098	2647.1	1100	2647.9	1102	2648.8	1104	2649.7	1106	2650.5
1108	2650.8	1110	2651.1	1112	2651.1	1114	2651.1	1116	2651.1
1118	2651.1	1120	2651.1	1122	2651.1	1124	2651.1	1126	2651.1
1128	2651.1	1130	2651.1	1132	2651.1	1134	2651.1	1136	2651.1
1138	2651.1	1140	2651.1	1142	2651.1	1144	2651.1	1146	2651.1
1148	2651.1	1150	2651.1	1152	2651.1	1154	2651.1	1156	2651.2
1158	2651.2	1160	2651.2	1162	2651.2	1164	2651.2	1166	2651.2
1168	2651.2	1170	2651.2	1172	2651.2	1174	2651.2		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
718	.03	718	.03	1174	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
718	1174	18	18	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2649.01	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.96	Wt. n-Val.		0.030	
W.S. Elev (ft)	2647.05	Reach Len. (ft)	18.00	18.00	18.00
Crit W.S. (ft)	2647.05	Flow Area (sq ft)		1204.65	
E.G. Slope (ft/ft)	0.008502	Area (sq ft)		1204.65	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	310.79	Top Width (ft)		310.79	
Vel Total (ft/s)	11.23	Avg. Vel. (ft/s)		11.23	
Max Chl Dpth (ft)	4.05	Hydr. Depth (ft)		3.88	
Conv. Total (cfs)	146734.4	Conv. (cfs)		146734.4	
Length Wtd. (ft)	18.00	Wetted Per. (ft)		312.37	
Min Ch El (ft)	2643.00	Shear (lb/sq ft)		2.05	
Alpha	1.00	Stream Power (lb/ft s)		22.99	
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)		53.72	
C & E Loss (ft)	0.00	Cum SA (acres)		13.54	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 4800

INPUT
Description: 4800
Station Elevation Data num= 231

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
714	2650.6	716	2650.6	718	2650.6	720	2650.6	722	2650.6
724	2650.6	726	2650.6	728	2650.6	730	2650.6	732	2650.6
734	2650.6	736	2650.6	738	2650.6	740	2650.6	742	2650.6
744	2650.6	746	2650.6	748	2650.6	750	2650.6	752	2650.6
754	2650.6	756	2650.6	758	2650.6	760	2650.6	762	2650.6
764	2650.6	766	2650.6	768	2650.6	770	2650.6	772	2650.7
774	2650.6	776	2650.4	778	2650	780	2649	782	2648
784	2647	786	2646	788	2645	790	2644	792	2643.2
794	2642.8	796	2642.6	798	2642.6	800	2642.6	802	2642.6
804	2642.6	806	2642.6	808	2642.6	810	2642.6	812	2642.6
814	2642.6	816	2642.6	818	2642.6	820	2642.6	822	2642.6
824	2642.6	826	2642.6	828	2642.6	830	2642.6	832	2642.6
834	2642.6	836	2642.6	838	2642.6	840	2642.6	842	2642.6
844	2642.6	846	2642.6	848	2642.6	850	2642.6	852	2642.6
854	2642.6	856	2642.6	858	2642.6	860	2642.6	862	2642.6
864	2642.6	866	2642.6	868	2642.6	870	2642.6	872	2642.6

874	2642.6	876	2642.6	878	2642.6	880	2642.6	882	2642.6
884	2642.6	886	2642.6	888	2642.6	890	2642.6	892	2642.6
894	2642.6	896	2642.6	898	2642.6	900	2642.6	902	2642.6
904	2642.6	906	2642.6	908	2642.6	910	2642.6	912	2642.6
914	2642.6	916	2642.6	918	2642.6	920	2642.6	922	2642.6
924	2642.6	926	2642.6	928	2642.6	930	2642.6	932	2642.6
934	2642.6	936	2642.6	938	2642.6	940	2642.6	942	2642.6
944	2642.6	946	2642.6	948	2642.6	950	2642.6	952	2642.6
954	2642.6	956	2642.6	958	2642.6	960	2642.6	962	2642.6
964	2642.6	966	2642.6	968	2642.6	970	2642.6	972	2642.6
974	2642.6	976	2642.6	978	2642.6	980	2642.6	982	2642.6
984	2642.6	986	2642.6	988	2642.6	990	2642.6	992	2642.6
994	2642.6	996	2642.6	998	2642.6	1000	2642.6	1002	2642.6
1004	2642.6	1006	2642.6	1008	2642.6	1010	2642.6	1012	2642.6
1014	2642.6	1016	2642.6	1018	2642.6	1020	2642.6	1022	2642.6
1024	2642.6	1026	2642.6	1028	2642.6	1030	2642.6	1032	2642.6
1034	2642.6	1036	2642.6	1038	2642.6	1040	2642.6	1042	2642.6
1044	2642.6	1046	2642.6	1048	2642.6	1050	2642.6	1052	2642.6
1054	2642.6	1056	2642.6	1058	2642.6	1060	2642.6	1062	2642.6
1064	2642.6	1066	2642.6	1068	2642.6	1070	2642.6	1072	2642.6
1074	2642.6	1076	2642.6	1078	2642.6	1080	2642.6	1082	2642.6
1084	2642.6	1086	2642.7	1088	2642.9	1090	2643.5	1092	2644.1
1094	2644.9	1096	2645.8	1098	2646.7	1100	2647.5	1102	2648.4
1104	2649.3	1106	2650	1108	2650.2	1110	2650.6	1112	2650.6
1114	2650.6	1116	2650.6	1118	2650.6	1120	2650.6	1122	2650.6
1124	2650.6	1126	2650.6	1128	2650.6	1130	2650.6	1132	2650.6
1134	2650.6	1136	2650.6	1138	2650.6	1140	2650.6	1142	2650.6
1144	2650.6	1146	2650.7	1148	2650.7	1150	2650.7	1152	2650.7
1154	2650.7	1156	2650.7	1158	2650.7	1160	2650.7	1162	2650.7
1164	2650.7	1166	2650.7	1168	2650.7	1170	2650.7	1172	2650.7
1174	2650.7								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
714	.03	714	.03	1174	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
714	1174	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2648.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.95	Wt. n-Val.		0.030	
W.S. Elev (ft)	2646.58	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2646.58	Flow Area (sq ft)		1207.97	
E.G. Slope (ft/ft)	0.008498	Area (sq ft)		1207.97	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	312.88	Top Width (ft)		312.88	
Vel Total (ft/s)	11.20	Avg. Vel. (ft/s)		11.20	
Max Chl Dpth (ft)	3.98	Hydr. Depth (ft)		3.86	
Conv. Total (cfs)	146773.4	Conv. (cfs)		146773.4	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		314.40	
Min Ch El (ft)	2642.60	Shear (lb/sq ft)		2.04	
Alpha	1.00	Stream Power (lb/ft s)		22.83	
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)		53.22	
C & E Loss (ft)	0.01	Cum SA (acres)		13.41	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 4750

INPUT
Description: 4750
Station Elevation Data num= 233

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

710	2649.3	712	2649.3	714	2649.3	716	2649.3	718	2649.3
720	2649.3	722	2649.3	724	2649.3	726	2649.3	728	2649.3
730	2649.3	732	2649.3	734	2649.3	736	2649.3	738	2649.3
740	2649.3	742	2649.3	744	2649.3	746	2649.3	748	2649.3
750	2649.3	752	2649.3	754	2649.3	756	2649.3	758	2649.3
760	2649.3	762	2649.3	764	2649.4	766	2649.4	768	2649.2
770	2649.1	772	2648.6	774	2647.8	776	2646.8	778	2645.8
780	2644.7	782	2643.7	784	2642.7	786	2642	788	2641.4
790	2641.3	792	2641.3	794	2641.3	796	2641.3	798	2641.3
800	2641.3	802	2641.3	804	2641.3	806	2641.3	808	2641.3
810	2641.3	812	2641.3	814	2641.3	816	2641.3	818	2641.3
820	2641.3	822	2641.3	824	2641.3	826	2641.3	828	2641.3
830	2641.3	832	2641.3	834	2641.3	836	2641.3	838	2641.3
840	2641.3	842	2641.3	844	2641.3	846	2641.3	848	2641.3
850	2641.3	852	2641.3	854	2641.3	856	2641.3	858	2641.3
860	2641.3	862	2641.3	864	2641.3	866	2641.3	868	2641.3
870	2641.3	872	2641.3	874	2641.3	876	2641.3	878	2641.3
880	2641.3	882	2641.3	884	2641.3	886	2641.3	888	2641.3
890	2641.3	892	2641.3	894	2641.3	896	2641.3	898	2641.3
900	2641.3	902	2641.3	904	2641.3	906	2641.3	908	2641.3
910	2641.3	912	2641.3	914	2641.3	916	2641.3	918	2641.3
920	2641.3	922	2641.3	924	2641.3	926	2641.3	928	2641.3
930	2641.3	932	2641.3	934	2641.3	936	2641.3	938	2641.3
940	2641.3	942	2641.3	944	2641.3	946	2641.3	948	2641.3
950	2641.3	952	2641.3	954	2641.3	956	2641.3	958	2641.3
960	2641.3	962	2641.3	964	2641.3	966	2641.3	968	2641.3
970	2641.3	972	2641.3	974	2641.3	976	2641.3	978	2641.3
980	2641.3	982	2641.3	984	2641.3	986	2641.3	988	2641.3
990	2641.3	992	2641.3	994	2641.3	996	2641.3	998	2641.3
1000	2641.3	1002	2641.3	1004	2641.3	1006	2641.3	1008	2641.3
1010	2641.3	1012	2641.3	1014	2641.3	1016	2641.3	1018	2641.3
1020	2641.3	1022	2641.3	1024	2641.3	1026	2641.3	1028	2641.3
1030	2641.3	1032	2641.3	1034	2641.3	1036	2641.3	1038	2641.3
1040	2641.3	1042	2641.3	1044	2641.3	1046	2641.3	1048	2641.3
1050	2641.3	1052	2641.3	1054	2641.3	1056	2641.3	1058	2641.3
1060	2641.3	1062	2641.3	1064	2641.3	1066	2641.3	1068	2641.3
1070	2641.3	1072	2641.3	1074	2641.3	1076	2641.3	1078	2641.3
1080	2641.3	1082	2641.3	1084	2641.3	1086	2641.4	1088	2641.9
1090	2642.2	1092	2643	1094	2643.9	1096	2644.7	1098	2645.6
1100	2646.5	1102	2647.3	1104	2648.2	1106	2648.6	1108	2649.2
1110	2649.3	1112	2649.3	1114	2649.3	1116	2649.3	1118	2649.3
1120	2649.3	1122	2649.3	1124	2649.3	1126	2649.3	1128	2649.3
1130	2649.3	1132	2649.3	1134	2649.3	1136	2649.3	1138	2649.3
1140	2649.3	1142	2649.3	1144	2649.3	1146	2649.3	1148	2649.3
1150	2649.3	1152	2649.3	1154	2649.3	1156	2649.3	1158	2649.3
1160	2649.3	1162	2649.3	1164	2649.3	1166	2649.3	1168	2649.4
1170	2649.4	1172	2649.4	1174	2649.4				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
710	.03	710	.03	1174	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
710	1174	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2647.16	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.93	Wt. n-Val.		0.030	
W.S. Elev (ft)	2645.23	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2645.23	Flow Area (sq ft)		1214.16	
E.G. Slope (ft/ft)	0.008541	Area (sq ft)		1214.16	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	318.14	Top Width (ft)		318.14	
Vel Total (ft/s)	11.14	Avg. Vel. (ft/s)		11.14	
Max Chl Dpth (ft)	3.93	Hydr. Depth (ft)		3.82	
Conv. Total (cfs)	146402.4	Conv. (cfs)		146402.4	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		319.65	
Min Ch El (ft)	2641.30	Shear (lb/sq ft)		2.03	
Alpha	1.00	Stream Power (lb/ft s)		22.57	
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)		51.83	
C & E Loss (ft)	0.01	Cum SA (acres)		13.05	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 4700

INPUT
Description: 4700
Station Elevation Data num= 236

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
704	2648	706	2648	708	2648	710	2648	712	2648
714	2648	716	2648	718	2648	720	2648	722	2648
724	2648	726	2648	728	2648	730	2648	732	2648
734	2648	736	2648	738	2648	740	2648	742	2648
744	2648	746	2648	748	2648	750	2648	752	2648
754	2648	756	2648.1	758	2648.1	760	2648.1	762	2648
764	2647.8	766	2647.3	768	2646.4	770	2645.6	772	2644.6
774	2643.6	776	2642.6	778	2641.6	780	2640.6	782	2640.4
784	2640	786	2640	788	2640	790	2640	792	2640
794	2640	796	2640	798	2640	800	2640	802	2640
804	2640	806	2640	808	2640	810	2640	812	2640
814	2640	816	2640	818	2640	820	2640	822	2640
824	2640	826	2640	828	2640	830	2640	832	2640
834	2640	836	2640	838	2640	840	2640	842	2640
844	2640	846	2640	848	2640	850	2640	852	2640
854	2640	856	2640	858	2640	860	2640	862	2640
864	2640	866	2640	868	2640	870	2640	872	2640
874	2640	876	2640	878	2640	880	2640	882	2640
884	2640	886	2640	888	2640	890	2640	892	2640
894	2640	896	2640	898	2640	900	2640	902	2640
904	2640	906	2640	908	2640	910	2640	912	2640
914	2640	916	2640	918	2640	920	2640	922	2640
924	2640	926	2640	928	2640	930	2640	932	2640
934	2640	936	2640	938	2640	940	2640	942	2640
944	2640	946	2640	948	2640	950	2640	952	2640
954	2640	956	2640	958	2640	960	2640	962	2640
964	2640	966	2640	968	2640	970	2640	972	2640
974	2640	976	2640	978	2640	980	2640	982	2640
984	2640	986	2640	988	2640	990	2640	992	2640
994	2640	996	2640	998	2640	1000	2640	1002	2640
1004	2640	1006	2640	1008	2640	1010	2640	1012	2640
1014	2640	1016	2640	1018	2640	1020	2640	1022	2640
1024	2640	1026	2640	1028	2640	1030	2640	1032	2640
1034	2640	1036	2640	1038	2640	1040	2640	1042	2640
1044	2640	1046	2640	1048	2640	1050	2640	1052	2640
1054	2640	1056	2640	1058	2640	1060	2640	1062	2640
1064	2640	1066	2640	1068	2640	1070	2640	1072	2640
1074	2640	1076	2640	1078	2640	1080	2640	1082	2640
1084	2640	1086	2640.3	1088	2640.5	1090	2641.2	1092	2642
1094	2642.8	1096	2643.7	1098	2644.5	1100	2645.4	1102	2646.2
1104	2646.8	1106	2647.6	1108	2647.9	1110	2648	1112	2648
1114	2648	1116	2648	1118	2648	1120	2648	1122	2648
1124	2648	1126	2648	1128	2648	1130	2648	1132	2648
1134	2648	1136	2648	1138	2648	1140	2648	1142	2648
1144	2648	1146	2648	1148	2648	1150	2648	1152	2648
1154	2648	1156	2648	1158	2648	1160	2648	1162	2648
1164	2648	1166	2648	1168	2648	1170	2648	1172	2648
1174	2648								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
704	.03	704	.03	1174	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
704	1174	50	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2645.80	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.91	Wt. n-Val.		0.030	
W.S. Elev (ft)	2643.89	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2643.89	Flow Area (sq ft)		1221.45	
E.G. Slope (ft/ft)	0.008544	Area (sq ft)		1221.45	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	323.06	Top Width (ft)		323.06	
Vel Total (ft/s)	11.08	Avg. Vel. (ft/s)		11.08	
Max Chl Dpth (ft)	3.89	Hydr. Depth (ft)		3.78	
Conv. Total (cfs)	146373.3	Conv. (cfs)		146373.3	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		324.57	
Min Ch El (ft)	2640.00	Shear (lb/sq ft)		2.01	
Alpha	1.00	Stream Power (lb/ft s)		22.24	
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)		50.43	
C & E Loss (ft)	0.00	Cum SA (acres)		12.68	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 4650

INPUT
Description: 4650
Station Elevation Data num= 235

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
704	2646.7	706	2646.7	708	2646.7	710	2646.7	712	2646.7
714	2646.7	716	2646.7	718	2646.7	720	2646.7	722	2646.7
724	2646.7	726	2646.7	728	2646.7	730	2646.7	732	2646.7
734	2646.7	736	2646.7	738	2646.7	740	2646.7	742	2646.7
744	2646.7	746	2646.7	748	2646.7	750	2646.7	752	2646.7
754	2646.8	756	2646.8	758	2646.7	760	2646.6	762	2646.1
764	2645.4	766	2644.5	768	2643.5	770	2642.6	772	2641.6
774	2640.7	776	2639.8	778	2639.2	780	2639	782	2638.7
784	2638.7	786	2638.7	788	2638.7	790	2638.7	792	2638.7
794	2638.7	796	2638.7	798	2638.7	800	2638.7	802	2638.7
804	2638.7	806	2638.7	808	2638.7	810	2638.7	812	2638.7
814	2638.7	816	2638.7	818	2638.7	820	2638.7	822	2638.7
824	2638.7	826	2638.7	828	2638.7	830	2638.7	832	2638.7
834	2638.7	836	2638.7	838	2638.7	840	2638.7	842	2638.7
844	2638.7	846	2638.7	848	2638.7	850	2638.7	852	2638.7
854	2638.7	856	2638.7	858	2638.7	860	2638.7	862	2638.7
864	2638.7	866	2638.7	868	2638.7	870	2638.7	872	2638.7
874	2638.7	876	2638.7	878	2638.7	880	2638.7	882	2638.7
884	2638.7	886	2638.7	888	2638.7	890	2638.7	892	2638.7
894	2638.7	896	2638.7	898	2638.7	900	2638.7	902	2638.7
904	2638.7	906	2638.7	908	2638.7	910	2638.7	912	2638.7
914	2638.7	916	2638.7	918	2638.7	920	2638.7	922	2638.7
924	2638.7	926	2638.7	928	2638.7	930	2638.7	932	2638.7
934	2638.7	936	2638.7	938	2638.7	940	2638.7	942	2638.7
944	2638.7	946	2638.7	948	2638.7	950	2638.7	952	2638.7
954	2638.7	956	2638.7	958	2638.7	960	2638.7	962	2638.7
964	2638.7	966	2638.7	968	2638.7	970	2638.7	972	2638.7
974	2638.7	976	2638.7	978	2638.7	980	2638.7	982	2638.7
984	2638.7	986	2638.7	988	2638.7	990	2638.7	992	2638.7
994	2638.7	996	2638.7	998	2638.7	1000	2638.7	1002	2638.7
1004	2638.7	1006	2638.7	1008	2638.7	1010	2638.7	1012	2638.7
1014	2638.7	1016	2638.7	1018	2638.7	1020	2638.7	1022	2638.7
1024	2638.7	1026	2638.7	1028	2638.7	1030	2638.7	1032	2638.7
1034	2638.7	1036	2638.7	1038	2638.7	1040	2638.7	1042	2638.7
1044	2638.7	1046	2638.7	1048	2638.7	1050	2638.7	1052	2638.7
1054	2638.7	1056	2638.7	1058	2638.7	1060	2638.7	1062	2638.7
1064	2638.7	1066	2638.7	1068	2638.7	1070	2638.7	1072	2638.7
1074	2638.7	1076	2638.7	1078	2638.7	1080	2638.7	1082	2638.7
1084	2638.9	1086	2639	1088	2639.4	1090	2640	1092	2640.8
1094	2641.7	1096	2642.5	1098	2643.4	1100	2644.2	1102	2645.1
1104	2645.9	1106	2646.5	1108	2646.7	1110	2646.7	1112	2646.7

1114	2646.7	1116	2646.7	1118	2646.7	1120	2646.7	1122	2646.7
1124	2646.7	1126	2646.7	1128	2646.7	1130	2646.7	1132	2646.7
1134	2646.7	1136	2646.7	1138	2646.7	1140	2646.7	1142	2646.7
1144	2646.7	1146	2646.7	1148	2646.7	1150	2646.7	1152	2646.7
1154	2646.7	1156	2646.7	1158	2646.7	1160	2646.7	1162	2646.7
1164	2646.7	1166	2646.7	1168	2646.7	1170	2646.7	1172	2646.7

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
704	.03	704	.03	1172	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
704	1172	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2644.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.90	Wt. n-Val.		0.030	
W.S. Elev (ft)	2642.57	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2642.57	Flow Area (sq ft)		1224.61	
E.G. Slope (ft/ft)	0.008572	Area (sq ft)		1224.61	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	326.09	Top Width (ft)		326.09	
Vel Total (ft/s)	11.05	Avg. Vel. (ft/s)		11.05	
Max Chl Dpth (ft)	3.87	Hydr. Depth (ft)		3.76	
Conv. Total (cfs)	146131.8	Conv. (cfs)		146131.8	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		327.48	
Min Ch El (ft)	2638.70	Shear (lb/sq ft)		2.00	
Alpha	1.00	Stream Power (lb/ft s)		22.11	
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)		49.03	
C & E Loss (ft)	0.00	Cum SA (acres)		12.31	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 4600

INPUT
Description: 4600
Station Elevation Data num= 239

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
698	2645.4	700	2645.4	702	2645.4	704	2645.4	706	2645.4
708	2645.4	710	2645.4	712	2645.4	714	2645.4	716	2645.4
718	2645.4	720	2645.4	722	2645.4	724	2645.4	726	2645.4
728	2645.4	730	2645.4	732	2645.4	734	2645.4	736	2645.4
738	2645.4	740	2645.4	742	2645.4	744	2645.4	746	2645.4
748	2645.4	750	2645.5	752	2645.5	754	2645.5	756	2645.4
758	2645	760	2644.2	762	2643.4	764	2642.5	766	2641.6
768	2640.7	770	2639.8	772	2638.8	774	2637.9	776	2637.6
778	2637.5	780	2637.4	782	2637.4	784	2637.4	786	2637.4
788	2637.4	790	2637.4	792	2637.4	794	2637.4	796	2637.4
798	2637.4	800	2637.4	802	2637.4	804	2637.4	806	2637.4
808	2637.4	810	2637.4	812	2637.4	814	2637.4	816	2637.4
818	2637.4	820	2637.4	822	2637.4	824	2637.4	826	2637.4
828	2637.4	830	2637.4	832	2637.4	834	2637.4	836	2637.4
838	2637.4	840	2637.4	842	2637.4	844	2637.4	846	2637.4
848	2637.4	850	2637.4	852	2637.4	854	2637.4	856	2637.4
858	2637.4	860	2637.4	862	2637.4	864	2637.4	866	2637.4
868	2637.4	870	2637.4	872	2637.4	874	2637.4	876	2637.4
878	2637.4	880	2637.4	882	2637.4	884	2637.4	886	2637.4
888	2637.4	890	2637.4	892	2637.4	894	2637.4	896	2637.4
898	2637.4	900	2637.4	902	2637.4	904	2637.4	906	2637.4
908	2637.4	910	2637.4	912	2637.4	914	2637.4	916	2637.4
918	2637.4	920	2637.4	922	2637.4	924	2637.4	926	2637.4
928	2637.4	930	2637.4	932	2637.4	934	2637.4	936	2637.4
938	2637.4	940	2637.4	942	2637.4	944	2637.4	946	2637.4

948	2637.4	950	2637.4	952	2637.4	954	2637.4	956	2637.4
958	2637.4	960	2637.4	962	2637.4	964	2637.4	966	2637.4
968	2637.4	970	2637.4	972	2637.4	974	2637.4	976	2637.4
978	2637.4	980	2637.4	982	2637.4	984	2637.4	986	2637.4
988	2637.4	990	2637.4	992	2637.4	994	2637.4	996	2637.4
998	2637.4	1000	2637.4	1002	2637.4	1004	2637.4	1006	2637.4
1008	2637.4	1010	2637.4	1012	2637.4	1014	2637.4	1016	2637.4
1018	2637.4	1020	2637.4	1022	2637.4	1024	2637.4	1026	2637.4
1028	2637.4	1030	2637.4	1032	2637.4	1034	2637.4	1036	2637.4
1038	2637.4	1040	2637.4	1042	2637.4	1044	2637.4	1046	2637.4
1048	2637.4	1050	2637.4	1052	2637.4	1054	2637.4	1056	2637.4
1058	2637.4	1060	2637.4	1062	2637.4	1064	2637.4	1066	2637.4
1068	2637.4	1070	2637.4	1072	2637.4	1074	2637.4	1076	2637.4
1078	2637.4	1080	2637.4	1082	2637.4	1084	2637.4	1086	2637.6
1088	2638.2	1090	2638.9	1092	2639.7	1094	2640.5	1096	2641.4
1098	2642.2	1100	2643	1102	2643.9	1104	2644.7	1106	2645.1
1108	2645.3	1110	2645.4	1112	2645.4	1114	2645.4	1116	2645.4
1118	2645.4	1120	2645.4	1122	2645.4	1124	2645.4	1126	2645.4
1128	2645.4	1130	2645.4	1132	2645.4	1134	2645.4	1136	2645.4
1138	2645.4	1140	2645.4	1142	2645.4	1144	2645.4	1146	2645.4
1148	2645.4	1150	2645.4	1152	2645.4	1154	2645.4	1156	2645.4
1158	2645.4	1160	2645.4	1162	2645.4	1164	2645.4	1166	2645.4
1168	2645.4	1170	2645.4	1172	2645.4	1174	2645.4		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
698	.03	698	.03	1174	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
698	1174	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	2643.13	Element			
Vel Head (ft)	1.88	Wt. n-Val.		0.030	
W.S. Elev (ft)	2641.24	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2641.24	Flow Area (sq ft)		1228.16	
E.G. Slope (ft/ft)	0.008588	Area (sq ft)		1228.16	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	328.85	Top Width (ft)		328.85	
Vel Total (ft/s)	11.02	Avg. Vel. (ft/s)		11.02	
Max Chl Dpth (ft)	3.84	Hydr. Depth (ft)		3.73	
Conv. Total (cfs)	146001.8	Conv. (cfs)		146001.8	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		330.30	
Min Ch El (ft)	2637.40	Shear (lb/sq ft)		1.99	
Alpha	1.00	Stream Power (lb/ft s)		21.96	
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)		47.62	
C & E Loss (ft)	0.00	Cum SA (acres)		11.93	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 4550

INPUT
Description: 4550
Station Elevation Data num= 240

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
696	2644.1	698	2644.1	700	2644.1	702	2644.1	704	2644.1
706	2644.1	708	2644.1	710	2644.1	712	2644.1	714	2644.1
716	2644.1	718	2644.1	720	2644.1	722	2644.1	724	2644.1
726	2644.1	728	2644.1	730	2644.1	732	2644.1	734	2644.1
736	2644.1	738	2644.1	740	2644.1	742	2644.1	744	2644.1
746	2644.1	748	2644.1	750	2644.2	752	2644.1	754	2643.9
756	2643.2	758	2642.4	760	2641.5	762	2640.6	764	2639.7
766	2638.8	768	2637.9	770	2637.1	772	2636.4	774	2636.1

776	2636.1	778	2636.1	780	2636.1	782	2636.1	784	2636.1
786	2636.1	788	2636.1	790	2636.1	792	2636.1	794	2636.1
796	2636.1	798	2636.1	800	2636.1	802	2636.1	804	2636.1
806	2636.1	808	2636.1	810	2636.1	812	2636.1	814	2636.1
816	2636.1	818	2636.1	820	2636.1	822	2636.1	824	2636.1
826	2636.1	828	2636.1	830	2636.1	832	2636.1	834	2636.1
836	2636.1	838	2636.1	840	2636.1	842	2636.1	844	2636.1
846	2636.1	848	2636.1	850	2636.1	852	2636.1	854	2636.1
856	2636.1	858	2636.1	860	2636.1	862	2636.1	864	2636.1
866	2636.1	868	2636.1	870	2636.1	872	2636.1	874	2636.1
876	2636.1	878	2636.1	880	2636.1	882	2636.1	884	2636.1
886	2636.1	888	2636.1	890	2636.1	892	2636.1	894	2636.1
896	2636.1	898	2636.1	900	2636.1	902	2636.1	904	2636.1
906	2636.1	908	2636.1	910	2636.1	912	2636.1	914	2636.1
916	2636.1	918	2636.1	920	2636.1	922	2636.1	924	2636.1
926	2636.1	928	2636.1	930	2636.1	932	2636.1	934	2636.1
936	2636.1	938	2636.1	940	2636.1	942	2636.1	944	2636.1
946	2636.1	948	2636.1	950	2636.1	952	2636.1	954	2636.1
956	2636.1	958	2636.1	960	2636.1	962	2636.1	964	2636.1
966	2636.1	968	2636.1	970	2636.1	972	2636.1	974	2636.1
976	2636.1	978	2636.1	980	2636.1	982	2636.1	984	2636.1
986	2636.1	988	2636.1	990	2636.1	992	2636.1	994	2636.1
996	2636.1	998	2636.1	1000	2636.1	1002	2636.1	1004	2636.1
1006	2636.1	1008	2636.1	1010	2636.1	1012	2636.1	1014	2636.1
1016	2636.1	1018	2636.1	1020	2636.1	1022	2636.1	1024	2636.1
1026	2636.1	1028	2636.1	1030	2636.1	1032	2636.1	1034	2636.1
1036	2636.1	1038	2636.1	1040	2636.1	1042	2636.1	1044	2636.1
1046	2636.1	1048	2636.1	1050	2636.1	1052	2636.1	1054	2636.1
1056	2636.1	1058	2636.1	1060	2636.1	1062	2636.1	1064	2636.1
1066	2636.1	1068	2636.1	1070	2636.1	1072	2636.1	1074	2636.1
1076	2636.1	1078	2636.1	1080	2636.1	1082	2636.1	1084	2636.2
1086	2636.6	1088	2637.1	1090	2637.7	1092	2638.6	1094	2639.4
1096	2640.2	1098	2641.1	1100	2641.9	1102	2642.7	1104	2643.3
1106	2643.7	1108	2644.1	1110	2644.1	1112	2644.1	1114	2644.1
1116	2644.1	1118	2644.1	1120	2644.1	1122	2644.1	1124	2644.1
1126	2644.1	1128	2644.1	1130	2644.1	1132	2644.1	1134	2644.1
1136	2644.1	1138	2644.1	1140	2644.1	1142	2644.1	1144	2644.1
1146	2644.1	1148	2644.1	1150	2644.1	1152	2644.1	1154	2644.1
1156	2644.1	1158	2644.1	1160	2644.1	1162	2644.1	1164	2644.1
1166	2644.1	1168	2644.1	1170	2644.1	1172	2644.1	1174	2644.2

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
696	.03	696	.03	1174	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
696	1174	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2641.80	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.87	Wt. n-Val.		0.030	
W.S. Elev (ft)	2639.92	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2639.92	Flow Area (sq ft)		1231.44	
E.G. Slope (ft/ft)	0.008610	Area (sq ft)		1231.44	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	331.79	Top Width (ft)		331.79	
Vel Total (ft/s)	10.99	Avg. Vel. (ft/s)		10.99	
Max Chl Dpth (ft)	3.82	Hydr. Depth (ft)		3.71	
Conv. Total (cfs)	145811.5	Conv. (cfs)		145811.5	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		333.16	
Min Ch El (ft)	2636.10	Shear (lb/sq ft)		1.99	
Alpha	1.00	Stream Power (lb/ft s)		21.83	
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)		46.21	
C & E Loss (ft)	0.00	Cum SA (acres)		11.55	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates

that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 4500

INPUT
Description: 4500
Station Elevation Data num= 241

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
692	2642.8	694	2642.8	696	2642.8	698	2642.8	700	2642.8
702	2642.8	704	2642.8	706	2642.8	708	2642.8	710	2642.8
712	2642.8	714	2642.8	716	2642.8	718	2642.8	720	2642.8
722	2642.8	724	2642.8	726	2642.8	728	2642.8	730	2642.8
732	2642.8	734	2642.8	736	2642.8	738	2642.8	740	2642.8
742	2642.8	744	2642.8	746	2642.8	748	2642.8	750	2642.3
752	2642.1	754	2641.4	756	2640.5	758	2639.7	760	2638.8
762	2638	764	2637.1	766	2636.3	768	2635.5	770	2635
772	2634.8	774	2634.8	776	2634.8	778	2634.8	780	2634.8
782	2634.8	784	2634.8	786	2634.8	788	2634.8	790	2634.8
792	2634.8	794	2634.8	796	2634.8	798	2634.8	800	2634.8
802	2634.8	804	2634.8	806	2634.8	808	2634.8	810	2634.8
812	2634.8	814	2634.8	816	2634.8	818	2634.8	820	2634.8
822	2634.8	824	2634.8	826	2634.8	828	2634.8	830	2634.8
832	2634.8	834	2634.8	836	2634.8	838	2634.8	840	2634.8
842	2634.8	844	2634.8	846	2634.8	848	2634.8	850	2634.8
852	2634.8	854	2634.8	856	2634.8	858	2634.8	860	2634.8
862	2634.8	864	2634.8	866	2634.8	868	2634.8	870	2634.8
872	2634.8	874	2634.8	876	2634.8	878	2634.8	880	2634.8
882	2634.8	884	2634.8	886	2634.8	888	2634.8	890	2634.8
892	2634.8	894	2634.8	896	2634.8	898	2634.8	900	2634.8
902	2634.8	904	2634.8	906	2634.8	908	2634.8	910	2634.8
912	2634.8	914	2634.8	916	2634.8	918	2634.8	920	2634.8
922	2634.8	924	2634.8	926	2634.8	928	2634.8	930	2634.8
932	2634.8	934	2634.8	936	2634.8	938	2634.8	940	2634.8
942	2634.8	944	2634.8	946	2634.8	948	2634.8	950	2634.8
952	2634.8	954	2634.8	956	2634.8	958	2634.8	960	2634.8
962	2634.8	964	2634.8	966	2634.8	968	2634.8	970	2634.8
972	2634.8	974	2634.8	976	2634.8	978	2634.8	980	2634.8
982	2634.8	984	2634.8	986	2634.8	988	2634.8	990	2634.8
992	2634.8	994	2634.8	996	2634.8	998	2634.8	1000	2634.8
1002	2634.8	1004	2634.8	1006	2634.8	1008	2634.8	1010	2634.8
1012	2634.8	1014	2634.8	1016	2634.8	1018	2634.8	1020	2634.8
1022	2634.8	1024	2634.8	1026	2634.8	1028	2634.8	1030	2634.8
1032	2634.8	1034	2634.8	1036	2634.8	1038	2634.8	1040	2634.8
1042	2634.8	1044	2634.8	1046	2634.8	1048	2634.8	1050	2634.8
1052	2634.8	1054	2634.8	1056	2634.8	1058	2634.8	1060	2634.8
1062	2634.8	1064	2634.6	1066	2634.8	1068	2634.8	1070	2634.8
1072	2634.8	1074	2634.8	1076	2634.8	1078	2634.8	1080	2634.8
1082	2634.8	1084	2635	1086	2635.3	1088	2635.8	1090	2636.6
1092	2637.4	1094	2638.2	1096	2639.1	1098	2639.9	1100	2640.7
1102	2641.5	1104	2642.1	1106	2642.7	1108	2642.8	1110	2642.8
1112	2642.8	1114	2642.8	1116	2642.8	1118	2642.8	1120	2642.8
1122	2642.8	1124	2642.8	1126	2642.8	1128	2642.8	1130	2642.8
1132	2642.8	1134	2642.8	1136	2642.8	1138	2642.8	1140	2642.8
1142	2642.8	1144	2642.8	1146	2642.8	1148	2642.8	1150	2642.8
1152	2642.8	1154	2642.8	1156	2642.8	1158	2642.8	1160	2642.8
1162	2642.8	1164	2642.8	1166	2642.8	1168	2642.8	1170	2642.8
1172	2642.9								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
692	.03	692	.03	1172	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
692	1172	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2640.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.86	Wt. n-Val.		0.030	
W.S. Elev (ft)	2638.61	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2638.61	Flow Area (sq ft)		1236.00	
E.G. Slope (ft/ft)	0.008593	Area (sq ft)		1236.00	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	

Top Width (ft)	334.42	Top Width (ft)	334.42
Vel Total (ft/s)	10.95	Avg. Vel. (ft/s)	10.95
Max Chl Dpth (ft)	3.81	Hydr. Depth (ft)	3.70
Conv. Total (cfs)	145958.7	Conv. (cfs)	145958.7
Length Wtd. (ft)	50.00	Wetted Per. (ft)	335.75
Min Ch El (ft)	2634.80	Shear (lb/sq ft)	1.97
Alpha	1.00	Stream Power (lb/ft s)	21.62
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)	44.79
C & E Loss (ft)	0.00	Cum SA (acres)	11.17

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 4450

INPUT
Description: 4450
Station Elevation Data num= 243

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
690	2641.5	692	2641.5	694	2641.5	696	2641.5	698	2641.5
700	2641.5	702	2641.5	704	2641.5	706	2641.5	708	2641.5
710	2641.5	712	2641.5	714	2641.5	716	2641.5	718	2641.5
720	2641.5	722	2641.5	724	2641.5	726	2641.5	728	2641.5
730	2641.5	732	2641.5	734	2641.5	736	2641.5	738	2641.5
740	2641.5	742	2641.5	744	2641.5	746	2641.5	748	2641.1
750	2641	752	2640.3	754	2639.4	756	2638.5	758	2637.6
760	2636.8	762	2635.9	764	2635	766	2634.6	768	2633.8
770	2633.5	772	2633.5	774	2633.5	776	2633.5	778	2633.5
780	2633.5	782	2633.5	784	2633.5	786	2633.5	788	2633.5
790	2633.5	792	2633.5	794	2633.5	796	2633.5	798	2633.5
800	2633.5	802	2633.5	804	2633.5	806	2633.5	808	2633.5
810	2633.5	812	2633.5	814	2633.5	816	2633.5	818	2633.5
820	2633.5	822	2633.5	824	2633.5	826	2633.5	828	2633.5
830	2633.5	832	2633.5	834	2633.5	836	2633.5	838	2633.5
840	2633.5	842	2633.5	844	2633.5	846	2633.5	848	2633.5
850	2633.5	852	2633.5	854	2633.5	856	2633.5	858	2633.5
860	2633.5	862	2633.5	864	2633.5	866	2633.5	868	2633.5
870	2633.5	872	2633.5	874	2633.5	876	2633.5	878	2633.5
880	2633.5	882	2633.5	884	2633.5	886	2633.5	888	2633.5
890	2633.5	892	2633.5	894	2633.5	896	2633.5	898	2633.5
900	2633.5	902	2633.5	904	2633.5	906	2633.5	908	2633.5
910	2633.5	912	2633.5	914	2633.5	916	2633.5	918	2633.5
920	2633.5	922	2633.5	924	2633.5	926	2633.5	928	2633.5
930	2633.5	932	2633.5	934	2633.5	936	2633.5	938	2633.5
940	2633.5	942	2633.5	944	2633.5	946	2633.5	948	2633.5
950	2633.5	952	2633.5	954	2633.5	956	2633.5	958	2633.5
960	2633.5	962	2633.5	964	2633.5	966	2633.5	968	2633.5
970	2633.5	972	2633.5	974	2633.5	976	2633.5	978	2633.5
980	2633.5	982	2633.5	984	2633.5	986	2633.5	988	2633.5
990	2633.5	992	2633.5	994	2633.5	996	2633.5	998	2633.5
1000	2633.5	1002	2633.5	1004	2633.5	1006	2633.5	1008	2633.5
1010	2633.5	1012	2633.5	1014	2633.5	1016	2633.5	1018	2633.5
1020	2633.5	1022	2633.5	1024	2633.5	1026	2633.5	1028	2633.5
1030	2633.5	1032	2633.5	1034	2633.5	1036	2633.5	1038	2633.5
1040	2633.5	1042	2633.5	1044	2633.5	1046	2633.5	1048	2633.5
1050	2633.5	1052	2633.5	1054	2633.5	1056	2633.5	1058	2633.5
1060	2633.5	1062	2633.5	1064	2633.5	1066	2633.5	1068	2633.5
1070	2633.5	1072	2633.5	1074	2633.5	1076	2633.5	1078	2633.5
1080	2633.5	1082	2633.5	1084	2633.6	1086	2633.8	1088	2634.5
1090	2635.3	1092	2636.1	1094	2637	1096	2637.8	1098	2638.7
1100	2639.5	1102	2640.3	1104	2640.9	1106	2641.3	1108	2641.4
1110	2641.5	1112	2641.5	1114	2641.5	1116	2641.5	1118	2641.5
1120	2641.5	1122	2641.5	1124	2641.5	1126	2641.5	1128	2641.5
1130	2641.5	1132	2641.5	1134	2641.5	1136	2641.5	1138	2641.5
1140	2641.5	1142	2641.5	1144	2641.5	1146	2641.5	1148	2641.5
1150	2641.5	1152	2641.5	1154	2641.5	1156	2641.5	1158	2641.5

1160	2641.5	1162	2641.5	1164	2641.5	1166	2641.5	1168	2641.5
1170	2641.5	1172	2641.5	1174	2641.5				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
690	.03	690	.03	1174	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
690	1174	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	2639.15	Element			
Vel Head (ft)	1.86	Wt. n-Val.		0.030	
W.S. Elev (ft)	2637.29	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2637.29	Flow Area (sq ft)		1237.11	
E.G. Slope (ft/ft)	0.008621	Area (sq ft)		1237.11	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	335.95	Top Width (ft)		335.95	
Vel Total (ft/s)	10.94	Avg. Vel. (ft/s)		10.94	
Max Chl Dpth (ft)	3.79	Hydr. Depth (ft)		3.68	
Conv. Total (cfs)	145719.5	Conv. (cfs)		145719.5	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		337.33	
Min Ch El (ft)	2633.50	Shear (lb/sq ft)		1.97	
Alpha	1.00	Stream Power (lb/ft s)		21.59	
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)		43.37	
C & E Loss (ft)	0.00	Cum SA (acres)		10.78	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 4400

INPUT
Description: 4400
Station Elevation Data num= 242

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
690	2640.2	692	2640.2	694	2640.2	696	2640.2	698	2640.2
700	2640.2	702	2640.2	704	2640.2	706	2640.2	708	2640.2
710	2640.2	712	2640.2	714	2640.2	716	2640.2	718	2640.2
720	2640.2	722	2640.2	724	2640.2	726	2640.2	728	2640.2
730	2640.2	732	2640.2	734	2640.2	736	2640.2	738	2640.2
740	2640.2	742	2640.2	744	2640.2	746	2640.2	748	2639.8
750	2639.2	752	2638.3	754	2637.4	756	2636.5	758	2635.6
760	2634.7	762	2633.8	764	2632.9	766	2632.5	768	2632.2
770	2632.2	772	2632.2	774	2632.2	776	2632.2	778	2632.2
780	2632.2	782	2632.2	784	2632.2	786	2632.2	788	2632.2
790	2632.2	792	2632.2	794	2632.2	796	2632.2	798	2632.2
800	2632.2	802	2632.2	804	2632.2	806	2632.2	808	2632.2
810	2632.2	812	2632.2	814	2632.2	816	2632.2	818	2632.2
820	2632.2	822	2632.2	824	2632.2	826	2632.2	828	2632.2
830	2632.2	832	2632.2	834	2632.2	836	2632.2	838	2632.2
840	2632.2	842	2632.2	844	2632.2	846	2632.2	848	2632.2
850	2632.2	852	2632.2	854	2632.2	856	2632.2	858	2632.2
860	2632.2	862	2632.2	864	2632.2	866	2632.2	868	2632.2
870	2632.2	872	2632.2	874	2632.2	876	2632.2	878	2632.2
880	2632.2	882	2632.2	884	2632.2	886	2632.2	888	2632.2
890	2632.2	892	2632.2	894	2632.2	896	2632.2	898	2632.2
900	2632.2	902	2632.2	904	2632.2	906	2632.2	908	2632.2
910	2632.2	912	2632.2	914	2632.2	916	2632.2	918	2632.2
920	2632.2	922	2632.2	924	2632.2	926	2632.2	928	2632.2
930	2632.2	932	2632.2	934	2632.2	936	2632.2	938	2632.2
940	2632.2	942	2632.2	944	2632.2	946	2632.2	948	2632.2
950	2632.2	952	2632.2	954	2632.2	956	2632.2	958	2632.2
960	2632.2	962	2632.2	964	2632.2	966	2632.2	968	2632.2
970	2632.2	972	2632.2	974	2632.2	976	2632.2	978	2632.2

980	2632.2	982	2632.2	984	2632.2	986	2632.2	988	2632.2
990	2632.2	992	2632.2	994	2632.2	996	2632.2	998	2632.2
1000	2632.2	1002	2632.2	1004	2632.2	1006	2632.2	1008	2632.2
1010	2632.2	1012	2632.2	1014	2632.2	1016	2632.2	1018	2632.2
1020	2632.2	1022	2632.2	1024	2632.2	1026	2632.2	1028	2632.2
1030	2632.2	1032	2632.2	1034	2632.2	1036	2632.2	1038	2632.2
1040	2632.2	1042	2632.2	1044	2632.2	1046	2632.2	1048	2632.2
1050	2632.2	1052	2632.2	1054	2632.2	1056	2632.2	1058	2632.2
1060	2632.2	1062	2632.2	1064	2632.2	1066	2632.2	1068	2632.2
1070	2632.2	1072	2632.2	1074	2632.2	1076	2632.2	1078	2632.2
1080	2632.2	1082	2632.2	1084	2632.3	1086	2632.6	1088	2633.4
1090	2634	1092	2634.8	1094	2635.7	1096	2636.6	1098	2637.4
1100	2638.3	1102	2639.1	1104	2639.7	1106	2639.9	1108	2640.2
1110	2640.2	1112	2640.2	1114	2640.2	1116	2640.2	1118	2640.2
1120	2640.2	1122	2640.2	1124	2640.2	1126	2640.2	1128	2640.2
1130	2640.2	1132	2640.2	1134	2640.2	1136	2640.2	1138	2640.2
1140	2640.2	1142	2640.2	1144	2640.2	1146	2640.2	1148	2640.2
1150	2640.2	1152	2640.2	1154	2640.2	1156	2640.2	1158	2640.2
1160	2640.2	1162	2640.2	1164	2640.2	1166	2640.2	1168	2640.2
1170	2640.2	1172	2640.2						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
690	.03	690	.03	1172	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
690	1172	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2637.83	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.85	Wt. n-Val.		0.030	
W.S. Elev (ft)	2635.98	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2635.98	Flow Area (sq ft)		1240.62	
E.G. Slope (ft/ft)	0.008592	Area (sq ft)		1240.62	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	337.46	Top Width (ft)		337.46	
Vel Total (ft/s)	10.91	Avg. Vel. (ft/s)		10.91	
Max Chl Dpth (ft)	3.78	Hydr. Depth (ft)		3.68	
Conv. Total (cfs)	145969.7	Conv. (cfs)		145969.7	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		338.86	
Min Ch El (ft)	2632.20	Shear (lb/sq ft)		1.96	
Alpha	1.00	Stream Power (lb/ft s)		21.42	
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)		41.95	
C & E Loss (ft)	0.00	Cum SA (acres)		10.40	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 4350

INPUT
Description: 4350
Station Elevation Data num= 245

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
686	2638.9	688	2638.9	690	2638.9	692	2638.9	694	2638.9
696	2638.9	698	2638.9	700	2638.9	702	2638.9	704	2638.9
706	2638.9	708	2638.9	710	2638.9	712	2638.9	714	2638.9
716	2638.9	718	2638.9	720	2638.9	722	2638.9	724	2638.9
726	2638.9	728	2638.9	730	2638.9	732	2638.9	734	2638.9
736	2638.9	738	2638.9	740	2638.9	742	2638.9	744	2638.9
746	2638.6	748	2638.1	750	2637.2	752	2636.3	754	2635.3
756	2634.4	758	2633.5	760	2632.5	762	2631.6	764	2631.1
766	2630.9	768	2630.9	770	2630.9	772	2630.9	774	2630.9
776	2630.9	778	2630.9	780	2630.9	782	2630.9	784	2630.9
786	2630.9	788	2630.9	790	2630.9	792	2630.9	794	2630.9

796	2630.9	798	2630.9	800	2630.9	802	2630.9	804	2630.9
806	2630.9	808	2630.9	810	2630.9	812	2630.9	814	2630.9
816	2630.9	818	2630.9	820	2630.9	822	2630.9	824	2630.9
826	2630.9	828	2630.9	830	2630.9	832	2630.9	834	2630.9
836	2630.9	838	2630.9	840	2630.9	842	2630.9	844	2630.9
846	2630.9	848	2630.9	850	2630.9	852	2630.9	854	2630.9
856	2630.9	858	2630.9	860	2630.9	862	2630.9	864	2630.9
866	2630.9	868	2630.9	870	2630.9	872	2630.9	874	2630.9
876	2630.9	878	2630.9	880	2630.9	882	2630.9	884	2630.9
886	2630.9	888	2630.9	890	2630.9	892	2630.9	894	2630.9
896	2630.9	898	2630.9	900	2630.9	902	2630.9	904	2630.9
906	2630.9	908	2630.9	910	2630.9	912	2630.9	914	2630.9
916	2630.9	918	2630.9	920	2630.9	922	2630.9	924	2630.9
926	2630.9	928	2630.9	930	2630.9	932	2630.9	934	2630.9
936	2630.9	938	2630.9	940	2630.9	942	2630.9	944	2630.9
946	2630.9	948	2630.9	950	2630.9	952	2630.9	954	2630.9
956	2630.9	958	2630.9	960	2630.9	962	2630.9	964	2630.9
966	2630.9	968	2630.9	970	2630.9	972	2630.9	974	2630.9
976	2630.9	978	2630.9	980	2630.9	982	2630.9	984	2630.9
986	2630.9	988	2630.9	990	2630.9	992	2630.9	994	2630.9
996	2630.9	998	2630.9	1000	2630.9	1002	2630.9	1004	2630.9
1006	2630.9	1008	2630.9	1010	2630.9	1012	2630.9	1014	2630.9
1016	2630.9	1018	2630.9	1020	2630.9	1022	2630.9	1024	2630.9
1026	2630.9	1028	2630.9	1030	2630.9	1032	2630.9	1034	2630.9
1036	2630.9	1038	2630.9	1040	2630.9	1042	2630.9	1044	2630.9
1046	2630.9	1048	2630.9	1050	2630.9	1052	2630.9	1054	2630.9
1056	2630.9	1058	2630.9	1060	2630.9	1062	2630.9	1064	2630.9
1066	2630.9	1068	2630.9	1070	2630.9	1072	2630.9	1074	2630.9
1076	2630.9	1078	2630.9	1080	2630.9	1082	2630.9	1084	2630.9
1086	2631.5	1088	2631.9	1090	2632.7	1092	2633.6	1094	2634.4
1096	2635.3	1098	2636.2	1100	2637	1102	2637.9	1104	2638.3
1106	2638.8	1108	2638.9	1110	2638.9	1112	2638.9	1114	2638.9
1116	2638.9	1118	2638.9	1120	2638.9	1122	2638.9	1124	2638.9
1126	2638.9	1128	2638.9	1130	2638.9	1132	2638.9	1134	2638.9
1136	2638.9	1138	2638.9	1140	2638.9	1142	2638.9	1144	2638.9
1146	2638.9	1148	2638.9	1150	2638.9	1152	2638.9	1154	2638.9
1156	2638.9	1158	2638.9	1160	2638.9	1162	2638.9	1164	2638.9
1166	2638.9	1168	2638.9	1170	2638.9	1172	2638.9	1174	2638.9

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
686	.03	686	.03	1174	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
686	1174	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2636.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.84	Wt. n-Val.		0.030	
W.S. Elev (ft)	2634.66	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2634.66	Flow Area (sq ft)		1241.88	
E.G. Slope (ft/ft)	0.008621	Area (sq ft)		1241.88	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	339.16	Top Width (ft)		339.16	
Vel Total (ft/s)	10.89	Avg. Vel. (ft/s)		10.89	
Max Chl Dpth (ft)	3.76	Hydr. Depth (ft)		3.66	
Conv. Total (cfs)	145718.9	Conv. (cfs)		145718.9	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		340.59	
Min Ch El (ft)	2630.90	Shear (lb/sq ft)		1.96	
Alpha	1.00	Stream Power (lb/ft s)		21.38	
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)		40.53	
C & E Loss (ft)	0.00	Cum SA (acres)		10.01	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 4300

INPUT
Description: 4300
Station Elevation Data num= 244

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
686	2637.6	688	2637.6	690	2637.6	692	2637.6	694	2637.6
696	2637.6	698	2637.6	700	2637.6	702	2637.6	704	2637.6
706	2637.6	708	2637.6	710	2637.6	712	2637.6	714	2637.6
716	2637.6	718	2637.6	720	2637.6	722	2637.6	724	2637.6
726	2637.6	728	2637.6	730	2637.6	732	2637.6	734	2637.6
736	2637.6	738	2637.6	740	2637.6	742	2637.6	744	2637.5
746	2637.2	748	2636.5	750	2635.5	752	2634.6	754	2633.6
756	2632.7	758	2631.7	760	2630.8	762	2630	764	2629.7
766	2629.6	768	2629.6	770	2629.6	772	2629.6	774	2629.6
776	2629.6	778	2629.6	780	2629.6	782	2629.6	784	2629.6
786	2629.6	788	2629.6	790	2629.6	792	2629.6	794	2629.6
796	2629.6	798	2629.6	800	2629.6	802	2629.6	804	2629.6
806	2629.6	808	2629.6	810	2629.6	812	2629.6	814	2629.6
816	2629.6	818	2629.6	820	2629.6	822	2629.6	824	2629.6
826	2629.6	828	2629.6	830	2629.6	832	2629.6	834	2629.6
836	2629.6	838	2629.6	840	2629.6	842	2629.6	844	2629.6
846	2629.6	848	2629.6	850	2629.6	852	2629.6	854	2629.6
856	2629.6	858	2629.6	860	2629.6	862	2629.6	864	2629.6
866	2629.6	868	2629.6	870	2629.6	872	2629.6	874	2629.6
876	2629.6	878	2629.6	880	2629.6	882	2629.6	884	2629.6
886	2629.6	888	2629.6	890	2629.6	892	2629.6	894	2629.6
896	2629.6	898	2629.6	900	2629.6	902	2629.6	904	2629.6
906	2629.6	908	2629.6	910	2629.6	912	2629.6	914	2629.6
916	2629.6	918	2629.6	920	2629.6	922	2629.6	924	2629.6
926	2629.6	928	2629.6	930	2629.6	932	2629.6	934	2629.6
936	2629.6	938	2629.6	940	2629.6	942	2629.6	944	2629.6
946	2629.6	948	2629.6	950	2629.6	952	2629.6	954	2629.6
956	2629.6	958	2629.6	960	2629.6	962	2629.6	964	2629.6
966	2629.6	968	2629.6	970	2629.6	972	2629.6	974	2629.6
976	2629.6	978	2629.6	980	2629.6	982	2629.6	984	2629.6
986	2629.6	988	2629.6	990	2629.6	992	2629.6	994	2629.6
996	2629.6	998	2629.6	1000	2629.6	1002	2629.6	1004	2629.6
1006	2629.6	1008	2629.6	1010	2629.6	1012	2629.6	1014	2629.6
1016	2629.6	1018	2629.6	1020	2629.6	1022	2629.6	1024	2629.6
1026	2629.6	1028	2629.6	1030	2629.6	1032	2629.6	1034	2629.6
1036	2629.6	1038	2629.6	1040	2629.6	1042	2629.6	1044	2629.6
1046	2629.6	1048	2629.6	1050	2629.6	1052	2629.6	1054	2629.6
1056	2629.6	1058	2629.6	1060	2629.6	1062	2629.6	1064	2629.6
1066	2629.6	1068	2629.6	1070	2629.6	1072	2629.6	1074	2629.6
1076	2629.6	1078	2629.6	1080	2629.6	1082	2629.6	1084	2629.9
1086	2630	1088	2630.5	1090	2631.4	1092	2632.3	1094	2633.2
1096	2634.1	1098	2634.9	1100	2635.8	1102	2636.5	1104	2637.2
1106	2637.6	1108	2637.6	1110	2637.6	1112	2637.6	1114	2637.6
1116	2637.6	1118	2637.6	1120	2637.6	1122	2637.6	1124	2637.6
1126	2637.6	1128	2637.6	1130	2637.6	1132	2637.6	1134	2637.6
1136	2637.6	1138	2637.6	1140	2637.6	1142	2637.6	1144	2637.6
1146	2637.6	1148	2637.6	1150	2637.6	1152	2637.6	1154	2637.6
1156	2637.6	1158	2637.6	1160	2637.6	1162	2637.6	1164	2637.6
1166	2637.6	1168	2637.6	1170	2637.6	1172	2637.6		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
686	.03	686	.03	1172	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
686	1172	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2635.19	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.84	Wt. n-Val.		0.030	
W.S. Elev (ft)	2633.35	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2633.35	Flow Area (sq ft)		1242.58	
E.G. Slope (ft/ft)	0.008627	Area (sq ft)		1242.58	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	339.79	Top Width (ft)		339.79	
Vel Total (ft/s)	10.89	Avg. Vel. (ft/s)		10.89	

Max Chl Dpth (ft)	3.75	Hydr. Depth (ft)	3.66
Conv. Total (cfs)	145670.7	Conv. (cfs)	145670.7
Length Wtd. (ft)	50.00	Wetted Per. (ft)	341.24
Min Ch El (ft)	2629.60	Shear (lb/sq ft)	1.96
Alpha	1.00	Stream Power (lb/ft s)	21.35
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)	39.10
C & E Loss (ft)	0.00	Cum SA (acres)	9.62

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 4250

INPUT
Description: 4250
Station Elevation Data num= 243

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
686	2636.3	688	2636.3	690	2636.3	692	2636.3	694	2636.3
696	2636.3	698	2636.3	700	2636.3	702	2636.3	704	2636.3
706	2636.3	708	2636.3	710	2636.3	712	2636.3	714	2636.3
716	2636.3	718	2636.3	720	2636.3	722	2636.3	724	2636.3
726	2636.3	728	2636.3	730	2636.3	732	2636.3	734	2636.3
736	2636.3	738	2636.3	740	2636.3	742	2636.3	744	2636.3
746	2636	748	2635.3	750	2634.6	752	2633.7	754	2632.7
756	2631.7	758	2630.7	760	2629.7	762	2628.8	764	2628.3
766	2628.3	768	2628.3	770	2628.3	772	2628.3	774	2628.3
776	2628.3	778	2628.3	780	2628.3	782	2628.3	784	2628.3
786	2628.3	788	2628.3	790	2628.3	792	2628.3	794	2628.3
796	2628.3	798	2628.3	800	2628.3	802	2628.3	804	2628.3
806	2628.3	808	2628.3	810	2628.3	812	2628.3	814	2628.3
816	2628.3	818	2628.3	820	2628.3	822	2628.3	824	2628.3
826	2628.3	828	2628.3	830	2628.3	832	2628.3	834	2628.3
836	2628.3	838	2628.3	840	2628.3	842	2628.3	844	2628.3
846	2628.3	848	2628.3	850	2628.3	852	2628.3	854	2628.3
856	2628.3	858	2628.3	860	2628.3	862	2628.3	864	2628.3
866	2628.3	868	2628.3	870	2628.3	872	2628.3	874	2628.3
876	2628.3	878	2628.3	880	2628.3	882	2628.3	884	2628.3
886	2628.3	888	2628.3	890	2628.3	892	2628.3	894	2628.3
896	2628.3	898	2628.3	900	2628.3	902	2628.3	904	2628.3
906	2628.3	908	2628.3	910	2628.3	912	2628.3	914	2628.3
916	2628.3	918	2628.3	920	2628.3	922	2628.3	924	2628.3
926	2628.3	928	2628.3	930	2628.3	932	2628.3	934	2628.3
936	2628.3	938	2628.3	940	2628.3	942	2628.3	944	2628.3
946	2628.3	948	2628.3	950	2628.3	952	2628.3	954	2628.3
956	2628.3	958	2628.3	960	2628.3	962	2628.3	964	2628.3
966	2628.3	968	2628.3	970	2628.3	972	2628.3	974	2628.3
976	2628.3	978	2628.3	980	2628.3	982	2628.3	984	2628.3
986	2628.3	988	2628.3	990	2628.3	992	2628.3	994	2628.3
996	2628.3	998	2628.3	1000	2628.3	1002	2628.3	1004	2628.3
1006	2628.3	1008	2628.3	1010	2628.3	1012	2628.3	1014	2628.3
1016	2628.3	1018	2628.3	1020	2628.3	1022	2628.3	1024	2628.3
1026	2628.3	1028	2628.3	1030	2628.3	1032	2628.3	1034	2628.3
1036	2628.3	1038	2628.3	1040	2628.3	1042	2628.3	1044	2628.3
1046	2628.3	1048	2628.3	1050	2628.3	1052	2628.3	1054	2628.3
1056	2628.3	1058	2628.3	1060	2628.3	1062	2628.3	1064	2628.3
1066	2628.3	1068	2628.3	1070	2628.3	1072	2628.3	1074	2628.3
1076	2628.3	1078	2628.3	1080	2628.3	1082	2628.3	1084	2628.3
1086	2628.3	1088	2629.1	1090	2630.1	1092	2631	1094	2631.9
1096	2632.8	1098	2633.7	1100	2634.6	1102	2635.4	1104	2636.1
1106	2636.3	1108	2636.3	1110	2636.3	1112	2636.3	1114	2636.3
1116	2636.3	1118	2636.3	1120	2636.3	1122	2636.3	1124	2636.3
1126	2636.3	1128	2636.3	1130	2636.3	1132	2636.3	1134	2636.3
1136	2636.3	1138	2636.3	1140	2636.3	1142	2636.3	1144	2636.3
1146	2636.3	1148	2636.3	1150	2636.3	1152	2636.3	1154	2636.3
1156	2636.3	1158	2636.3	1160	2636.3	1162	2636.3	1164	2636.3
1166	2636.3	1168	2636.3	1170	2636.3				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
686	.03	686	.03	1170	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
686	1170	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	2633.89	Element			
Vel Head (ft)	1.85	Wt. n-Val.		0.030	
W.S. Elev (ft)	2632.05	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2632.05	Flow Area (sq ft)		1239.96	
E.G. Slope (ft/ft)	0.008667	Area (sq ft)		1239.96	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	339.02	Top Width (ft)		339.02	
Vel Total (ft/s)	10.91	Avg. Vel. (ft/s)		10.91	
Max Chl Dpth (ft)	3.75	Hydr. Depth (ft)		3.66	
Conv. Total (cfs)	145332.5	Conv. (cfs)		145332.5	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		340.63	
Min Ch El (ft)	2628.30	Shear (lb/sq ft)		1.97	
Alpha	1.00	Stream Power (lb/ft s)		21.49	
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)		37.68	
C & E Loss (ft)	0.00	Cum SA (acres)		9.23	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 4200

INPUT
Description: 4200
Station Elevation Data num= 243

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
688	2635	690	2635	692	2635	694	2635	696	2635
698	2635	700	2635	702	2635	704	2635	706	2635
708	2635	710	2635	712	2635	714	2635	716	2635
718	2635	720	2635	722	2635	724	2635	726	2635
728	2635	730	2635	732	2635	734	2635	736	2635
738	2635	740	2635	742	2635	744	2635	746	2634.7
748	2634.4	750	2633.8	752	2632.8	754	2631.8	756	2630.8
758	2629.7	760	2628.7	762	2627.9	764	2627.3	766	2627.2
768	2627	770	2627	772	2627	774	2627	776	2627
778	2627	780	2627	782	2627	784	2627	786	2627
788	2627	790	2627	792	2627	794	2627	796	2627
798	2627	800	2627	802	2627	804	2627	806	2627
808	2627	810	2627	812	2627	814	2627	816	2627
818	2627	820	2627	822	2627	824	2627	826	2627
828	2627	830	2627	832	2627	834	2627	836	2627
838	2627	840	2627	842	2627	844	2627	846	2627
848	2627	850	2627	852	2627	854	2627	856	2627
858	2627	860	2627	862	2627	864	2627	866	2627
868	2627	870	2627	872	2627	874	2627	876	2627
878	2627	880	2627	882	2627	884	2627	886	2627
888	2627	890	2627	892	2627	894	2627	896	2627
898	2627	900	2627	902	2627	904	2627	906	2627
908	2627	910	2627	912	2627	914	2627	916	2627
918	2627	920	2627	922	2627	924	2627	926	2627
928	2627	930	2627	932	2627	934	2627	936	2627
938	2627	940	2627	942	2627	944	2627	946	2627
948	2627	950	2627	952	2627	954	2627	956	2627
958	2627	960	2627	962	2627	964	2627	966	2627
968	2627	970	2627	972	2627	974	2627	976	2627
978	2627	980	2627	982	2627	984	2627	986	2627
988	2627	990	2627	992	2627	994	2627	996	2627

998	2627	1000	2627	1002	2627	1004	2627	1006	2627
1008	2627	1010	2627	1012	2627	1014	2627	1016	2627
1018	2627	1020	2627	1022	2627	1024	2627	1026	2627
1028	2627	1030	2627	1032	2627	1034	2627	1036	2627
1038	2627	1040	2627	1042	2627	1044	2627	1046	2627
1048	2627	1050	2627	1052	2627	1054	2627	1056	2627
1058	2627	1060	2627	1062	2627	1064	2627	1066	2627
1068	2627	1070	2627	1072	2627	1074	2627	1076	2627
1078	2627	1080	2627	1082	2627	1084	2627	1086	2627.3
1088	2628.2	1090	2628.7	1092	2629.7	1094	2630.6	1096	2631.6
1098	2632.5	1100	2633.4	1102	2634.3	1104	2634.8	1106	2635
1108	2635	1110	2635	1112	2635	1114	2635	1116	2635
1118	2635	1120	2635	1122	2635	1124	2635	1126	2635
1128	2635	1130	2635	1132	2635	1134	2635	1136	2635
1138	2635	1140	2635	1142	2635	1144	2635	1146	2635
1148	2635	1150	2635	1152	2635	1154	2635	1156	2635
1158	2635	1160	2635	1162	2635	1164	2635	1166	2635
1168	2635	1170	2635	1172	2635				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
688	.03	688	.03	1172	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
688	1172	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2632.61	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.85	Wt. n-Val.		0.030	
W.S. Elev (ft)	2630.76	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2630.76	Flow Area (sq ft)		1240.52	
E.G. Slope (ft/ft)	0.008624	Area (sq ft)		1240.52	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	338.25	Top Width (ft)		338.25	
Vel Total (ft/s)	10.91	Avg. Vel. (ft/s)		10.91	
Max Chl Dpth (ft)	3.76	Hydr. Depth (ft)		3.67	
Conv. Total (cfs)	145691.7	Conv. (cfs)		145691.7	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		339.76	
Min Ch El (ft)	2627.00	Shear (lb/sq ft)		1.97	
Alpha	1.00	Stream Power (lb/ft s)		21.44	
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)		36.25	
C & E Loss (ft)	0.00	Cum SA (acres)		8.84	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 4150

INPUT
Description: 4150
Station Elevation Data num= 241

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
690	2633.7	692	2633.7	694	2633.7	696	2633.7	698	2633.7
700	2633.7	702	2633.7	704	2633.7	706	2633.7	708	2633.7
710	2633.7	712	2633.7	714	2633.6	716	2633.6	718	2633.6
720	2633.6	722	2633.6	724	2633.6	726	2633.6	728	2633.6
730	2633.6	732	2633.6	734	2633.6	736	2633.6	738	2633.6
740	2633.6	742	2633.6	744	2633.6	746	2633.6	748	2633.4
750	2632.7	752	2631.9	754	2630.9	756	2629.8	758	2628.8
760	2627.8	762	2626.7	764	2626.3	766	2625.7	768	2625.7
770	2625.7	772	2625.7	774	2625.7	776	2625.7	778	2625.7
780	2625.7	782	2625.7	784	2625.7	786	2625.7	788	2625.7
790	2625.7	792	2625.7	794	2625.7	796	2625.7	798	2625.7
800	2625.7	802	2625.7	804	2625.7	806	2625.7	808	2625.7
810	2625.7	812	2625.7	814	2625.7	816	2625.7	818	2625.7

820	2625.7	822	2625.7	824	2625.7	826	2625.7	828	2625.7
830	2625.7	832	2625.7	834	2625.7	836	2625.7	838	2625.7
840	2625.7	842	2625.7	844	2625.7	846	2625.7	848	2625.7
850	2625.7	852	2625.7	854	2625.7	856	2625.7	858	2625.7
860	2625.7	862	2625.7	864	2625.7	866	2625.7	868	2625.7
870	2625.7	872	2625.7	874	2625.7	876	2625.7	878	2625.7
880	2625.7	882	2625.7	884	2625.7	886	2625.7	888	2625.7
890	2625.7	892	2625.7	894	2625.7	896	2625.7	898	2625.7
900	2625.7	902	2625.7	904	2625.7	906	2625.7	908	2625.7
910	2625.7	912	2625.7	914	2625.7	916	2625.7	918	2625.7
920	2625.7	922	2625.7	924	2625.7	926	2625.7	928	2625.7
930	2625.7	932	2625.7	934	2625.7	936	2625.7	938	2625.7
940	2625.7	942	2625.7	944	2625.7	946	2625.7	948	2625.7
950	2625.7	952	2625.7	954	2625.7	956	2625.7	958	2625.7
960	2625.7	962	2625.7	964	2625.7	966	2625.7	968	2625.7
970	2625.7	972	2625.7	974	2625.7	976	2625.7	978	2625.7
980	2625.7	982	2625.7	984	2625.7	986	2625.7	988	2625.7
990	2625.7	992	2625.7	994	2625.7	996	2625.7	998	2625.7
1000	2625.7	1002	2625.7	1004	2625.7	1006	2625.7	1008	2625.7
1010	2625.7	1012	2625.7	1014	2625.7	1016	2625.7	1018	2625.7
1020	2625.7	1022	2625.7	1024	2625.7	1026	2625.7	1028	2625.7
1030	2625.7	1032	2625.7	1034	2625.7	1036	2625.7	1038	2625.7
1040	2625.7	1042	2625.7	1044	2625.7	1046	2625.7	1048	2625.7
1050	2625.7	1052	2625.7	1054	2625.7	1056	2625.7	1058	2625.7
1060	2625.7	1062	2625.7	1064	2625.7	1066	2625.7	1068	2625.7
1070	2625.7	1072	2625.7	1074	2625.7	1076	2625.7	1078	2625.7
1080	2625.7	1082	2625.7	1084	2625.7	1086	2625.9	1088	2626.5
1090	2627.4	1092	2628.4	1094	2629.3	1096	2630.3	1098	2631.3
1100	2632.2	1102	2633	1104	2633.5	1106	2633.7	1108	2633.7
1110	2633.7	1112	2633.7	1114	2633.7	1116	2633.7	1118	2633.7
1120	2633.7	1122	2633.7	1124	2633.7	1126	2633.7	1128	2633.7
1130	2633.7	1132	2633.7	1134	2633.7	1136	2633.7	1138	2633.7
1140	2633.7	1142	2633.7	1144	2633.7	1146	2633.7	1148	2633.7
1150	2633.7	1152	2633.7	1154	2633.7	1156	2633.7	1158	2633.7
1160	2633.7	1162	2633.7	1164	2633.7	1166	2633.7	1168	2633.7
1170	2633.7								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
690	.03	690	.03	1170	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
690	1170	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2631.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.85	Wt. n-Val.		0.030	
W.S. Elev (ft)	2629.46	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2629.46	Flow Area (sq ft)		1238.68	
E.G. Slope (ft/ft)	0.008648	Area (sq ft)		1238.68	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	337.64	Top Width (ft)		337.64	
Vel Total (ft/s)	10.92	Avg. Vel. (ft/s)		10.92	
Max Chl Dpth (ft)	3.76	Hydr. Depth (ft)		3.67	
Conv. Total (cfs)	145491.0	Conv. (cfs)		145491.0	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		339.20	
Min Ch El (ft)	2625.70	Shear (lb/sq ft)		1.97	
Alpha	1.00	Stream Power (lb/ft s)		21.54	
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)		34.83	
C & E Loss (ft)	0.00	Cum SA (acres)		8.45	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 4100

INPUT
Description: 4100
Station Elevation Data num= 241

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
692	2632.3	694	2632.3	696	2632.3	698	2632.3	700	2632.3
702	2632.3	704	2632.3	706	2632.3	708	2632.3	710	2632.3
712	2632.3	714	2632.3	716	2632.3	718	2632.3	720	2632.3
722	2632.3	724	2632.3	726	2632.3	728	2632.3	730	2632.3
732	2632.3	734	2632.3	736	2632.3	738	2632.3	740	2632.3
742	2632.3	744	2632.3	746	2632.3	748	2632.1	750	2631.9
752	2631.4	754	2630.4	756	2629.3	758	2628.3	760	2627.3
762	2626.2	764	2625.2	766	2624.7	768	2624.4	770	2624.4
772	2624.4	774	2624.4	776	2624.4	778	2624.4	780	2624.4
782	2624.4	784	2624.4	786	2624.4	788	2624.4	790	2624.4
792	2624.4	794	2624.4	796	2624.4	798	2624.4	800	2624.4
802	2624.4	804	2624.4	806	2624.4	808	2624.4	810	2624.4
812	2624.4	814	2624.4	816	2624.4	818	2624.4	820	2624.4
822	2624.4	824	2624.4	826	2624.4	828	2624.4	830	2624.4
832	2624.4	834	2624.4	836	2624.4	838	2624.4	840	2624.4
842	2624.4	844	2624.4	846	2624.4	848	2624.4	850	2624.4
852	2624.4	854	2624.4	856	2624.4	858	2624.4	860	2624.4
862	2624.4	864	2624.4	866	2624.4	868	2624.4	870	2624.4
872	2624.4	874	2624.4	876	2624.4	878	2624.4	880	2624.4
882	2624.4	884	2624.4	886	2624.4	888	2624.4	890	2624.4
892	2624.4	894	2624.4	896	2624.4	898	2624.4	900	2624.4
902	2624.4	904	2624.4	906	2624.4	908	2624.4	910	2624.4
912	2624.4	914	2624.4	916	2624.4	918	2624.4	920	2624.4
922	2624.4	924	2624.4	926	2624.4	928	2624.4	930	2624.4
932	2624.4	934	2624.4	936	2624.4	938	2624.4	940	2624.4
942	2624.4	944	2624.4	946	2624.4	948	2624.4	950	2624.4
952	2624.4	954	2624.4	956	2624.4	958	2624.4	960	2624.4
962	2624.4	964	2624.4	966	2624.4	968	2624.4	970	2624.4
972	2624.4	974	2624.4	976	2624.4	978	2624.4	980	2624.4
982	2624.4	984	2624.4	986	2624.4	988	2624.4	990	2624.4
992	2624.4	994	2624.4	996	2624.4	998	2624.4	1000	2624.4
1002	2624.4	1004	2624.4	1006	2624.4	1008	2624.4	1010	2624.4
1012	2624.4	1014	2624.4	1016	2624.4	1018	2624.4	1020	2624.4
1022	2624.4	1024	2624.4	1026	2624.4	1028	2624.4	1030	2624.4
1032	2624.4	1034	2624.4	1036	2624.4	1038	2624.4	1040	2624.4
1042	2624.4	1044	2624.4	1046	2624.4	1048	2624.4	1050	2624.4
1052	2624.4	1054	2624.4	1056	2624.4	1058	2624.4	1060	2624.4
1062	2624.4	1064	2624.4	1066	2624.4	1068	2624.4	1070	2624.4
1072	2624.4	1074	2624.4	1076	2624.4	1078	2624.4	1080	2624.4
1082	2624.4	1084	2624.4	1086	2624.7	1088	2625.3	1090	2626.1
1092	2627.1	1094	2628.1	1096	2629	1098	2630	1100	2630.9
1102	2631.8	1104	2632.3	1106	2632.4	1108	2632.4	1110	2632.4
1112	2632.4	1114	2632.4	1116	2632.4	1118	2632.4	1120	2632.4
1122	2632.4	1124	2632.4	1126	2632.4	1128	2632.4	1130	2632.4
1132	2632.4	1134	2632.4	1136	2632.4	1138	2632.4	1140	2632.4
1142	2632.4	1144	2632.4	1146	2632.4	1148	2632.4	1150	2632.4
1152	2632.4	1154	2632.4	1156	2632.4	1158	2632.4	1160	2632.4
1162	2632.4	1164	2632.4	1166	2632.4	1168	2632.4	1170	2632.4
1172	2632.4								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
692	.03	692	.03	1172	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
692	1172	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	2630.03	Element			
Vel Head (ft)	1.86	Wt. n-Val.		0.030	
W.S. Elev (ft)	2628.17	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2628.17	Flow Area (sq ft)		1237.66	
E.G. Slope (ft/ft)	0.008613	Area (sq ft)		1237.66	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	335.91	Top Width (ft)		335.91	
Vel Total (ft/s)	10.93	Avg. Vel. (ft/s)		10.93	
Max Chl Dpth (ft)	3.77	Hydr. Depth (ft)		3.68	
Conv. Total (cfs)	145786.2	Conv. (cfs)		145786.2	

Length Wtd. (ft)	50.00	Wetted Per. (ft)	337.47
Min Ch El (ft)	2624.40	Shear (lb/sq ft)	1.97
Alpha	1.00	Stream Power (lb/ft s)	21.56
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)	33.41
C & E Loss (ft)	0.00	Cum SA (acres)	8.07

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 4050

INPUT
Description: 4050
Station Elevation Data num= 241

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
690	2631	692	2631	694	2631	696	2631	698	2631
700	2631	702	2631	704	2631	706	2631	708	2631
710	2631	712	2631	714	2631	716	2631	718	2631
720	2631	722	2631	724	2631	726	2631	728	2631
730	2631	732	2631	734	2631	736	2631	738	2631
740	2631	742	2631	744	2631	746	2631	748	2631
750	2631	752	2630.8	754	2630.2	756	2629.2	758	2628.2
760	2627.1	762	2626.1	764	2625.1	766	2624.2	768	2623.4
770	2623.1	772	2623.1	774	2623.1	776	2623.1	778	2623.1
780	2623.1	782	2623.1	784	2623.1	786	2623.1	788	2623.1
790	2623.1	792	2623.1	794	2623.1	796	2623.1	798	2623.1
800	2623.1	802	2623.1	804	2623.1	806	2623.1	808	2623.1
810	2623.1	812	2623.1	814	2623.1	816	2623.1	818	2623.1
820	2623.1	822	2623.1	824	2623.1	826	2623.1	828	2623.1
830	2623.1	832	2623.1	834	2623.1	836	2623.1	838	2623.1
840	2623.1	842	2623.1	844	2623.1	846	2623.1	848	2623.1
850	2623.1	852	2623.1	854	2623.1	856	2623.1	858	2623.1
860	2623.1	862	2623.1	864	2623.1	866	2623.1	868	2623.1
870	2623.1	872	2623.1	874	2623.1	876	2623.1	878	2623.1
880	2623.1	882	2623.1	884	2623.1	886	2623.1	888	2623.1
890	2623.1	892	2623.1	894	2623.1	896	2623.1	898	2623.1
900	2623.1	902	2623.1	904	2623.1	906	2623.1	908	2623.1
910	2623.1	912	2623.1	914	2623.1	916	2623.1	918	2623.1
920	2623.1	922	2623.1	924	2623.1	926	2623.1	928	2623.1
930	2623.1	932	2623.1	934	2623.1	936	2623.1	938	2623.1
940	2623.1	942	2623.1	944	2623.1	946	2623.1	948	2623.1
950	2623.1	952	2623.1	954	2623.1	956	2623.1	958	2623.1
960	2623.1	962	2623.1	964	2623.1	966	2623.1	968	2623.1
970	2623.1	972	2623.1	974	2623.1	976	2623.1	978	2623.1
980	2623.1	982	2623.1	984	2623.1	986	2623.1	988	2623.1
990	2623.1	992	2623.1	994	2623.1	996	2623.1	998	2623.1
1000	2623.1	1002	2623.1	1004	2623.1	1006	2623.1	1008	2623.1
1010	2623.1	1012	2623.1	1014	2623.1	1016	2623.1	1018	2623.1
1020	2623.1	1022	2623.1	1024	2623.1	1026	2623.1	1028	2623.1
1030	2623.1	1032	2623.1	1034	2623.1	1036	2623.1	1038	2623.1
1040	2623.1	1042	2623.1	1044	2623.1	1046	2623.1	1048	2623.1
1050	2623.1	1052	2623.1	1054	2623.1	1056	2623.1	1058	2623.1
1060	2623.1	1062	2623.1	1064	2623.1	1066	2623.1	1068	2623.1
1070	2623.1	1072	2623.1	1074	2623.1	1076	2623.1	1078	2623.1
1080	2623.1	1082	2623.1	1084	2623.1	1086	2623.3	1088	2623.9
1090	2624.9	1092	2625.8	1094	2626.7	1096	2627.7	1098	2628.6
1100	2629.6	1102	2630.4	1104	2630.9	1106	2631.1	1108	2631.1
1110	2631.1	1112	2631.1	1114	2631.1	1116	2631.1	1118	2631.1
1120	2631.1	1122	2631.1	1124	2631.1	1126	2631.1	1128	2631.1
1130	2631.1	1132	2631.1	1134	2631.1	1136	2631.1	1138	2631.1
1140	2631.1	1142	2631.1	1144	2631.1	1146	2631.1	1148	2631.1
1150	2631.1	1152	2631.1	1154	2631.1	1156	2631.1	1158	2631.1
1160	2631.1	1162	2631.1	1164	2631.1	1166	2631.1	1168	2631.1
1170	2631.1								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
690	.03	690	.03	1170	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
690	1170	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2628.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.85	Wt. n-Val.		0.030	
W.S. Elev (ft)	2626.91	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2626.91	Flow Area (sq ft)		1239.86	
E.G. Slope (ft/ft)	0.008499	Area (sq ft)		1239.86	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	334.02	Top Width (ft)		334.02	
Vel Total (ft/s)	10.91	Avg. Vel. (ft/s)		10.91	
Max Chl Dpth (ft)	3.81	Hydr. Depth (ft)		3.71	
Conv. Total (cfs)	146764.3	Conv. (cfs)		146764.3	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		335.59	
Min Ch El (ft)	2623.10	Shear (lb/sq ft)		1.96	
Alpha	1.00	Stream Power (lb/ft s)		21.39	
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)		31.99	
C & E Loss (ft)	0.00	Cum SA (acres)		7.68	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 4000

INPUT
Description: 4000
Station Elevation Data num= 241

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
692	2629.7	694	2629.7	696	2629.7	698	2629.7	700	2629.7
702	2629.7	704	2629.7	706	2629.7	708	2629.7	710	2629.7
712	2629.7	714	2629.7	716	2629.7	718	2629.7	720	2629.7
722	2629.7	724	2629.7	726	2629.7	728	2629.7	730	2629.7
732	2629.7	734	2629.7	736	2629.7	738	2629.7	740	2629.7
742	2629.7	744	2629.7	746	2629.7	748	2629.7	750	2629.7
752	2629.7	754	2629.5	756	2628.9	758	2627.9	760	2627
762	2626	764	2625	766	2624	768	2623	770	2622.6
772	2621.9	774	2621.8	776	2621.8	778	2621.8	780	2621.8
782	2621.8	784	2621.8	786	2621.8	788	2621.8	790	2621.8
792	2621.8	794	2621.8	796	2621.8	798	2621.8	800	2621.8
802	2621.8	804	2621.8	806	2621.8	808	2621.8	810	2621.8
812	2621.8	814	2621.8	816	2621.8	818	2621.8	820	2621.8
822	2621.8	824	2621.8	826	2621.8	828	2621.8	830	2621.8
832	2621.8	834	2621.8	836	2621.8	838	2621.8	840	2621.8
842	2621.8	844	2621.8	846	2621.8	848	2621.8	850	2621.8
852	2621.8	854	2621.8	856	2621.8	858	2621.8	860	2621.8
862	2621.8	864	2621.8	866	2621.8	868	2621.8	870	2621.8
872	2621.8	874	2621.8	876	2621.8	878	2621.8	880	2621.8
882	2621.8	884	2621.8	886	2621.8	888	2621.8	890	2621.8
892	2621.8	894	2621.8	896	2621.8	898	2621.8	900	2621.8
902	2621.8	904	2621.8	906	2621.8	908	2621.8	910	2621.8
912	2621.8	914	2621.8	916	2621.8	918	2621.8	920	2621.8
922	2621.8	924	2621.8	926	2621.8	928	2621.8	930	2621.8
932	2621.8	934	2621.8	936	2621.8	938	2621.8	940	2621.8
942	2621.8	944	2621.8	946	2621.8	948	2621.8	950	2621.8
952	2621.8	954	2621.8	956	2621.8	958	2621.8	960	2621.8
962	2621.8	964	2621.8	966	2621.8	968	2621.8	970	2621.8
972	2621.8	974	2621.8	976	2621.8	978	2621.8	980	2621.8
982	2621.8	984	2621.8	986	2621.8	988	2621.8	990	2621.8
992	2621.8	994	2621.8	996	2621.8	998	2621.8	1000	2621.8
1002	2621.8	1004	2621.8	1006	2621.8	1008	2621.8	1010	2621.8
1012	2621.8	1014	2621.8	1016	2621.8	1018	2621.8	1020	2621.8

1022	2621.8	1024	2621.8	1026	2621.8	1028	2621.8	1030	2621.8
1032	2621.8	1034	2621.8	1036	2621.8	1038	2621.8	1040	2621.8
1042	2621.8	1044	2621.8	1046	2621.8	1048	2621.8	1050	2621.8
1052	2621.8	1054	2621.8	1056	2621.8	1058	2621.8	1060	2621.8
1062	2621.8	1064	2621.8	1066	2621.8	1068	2621.8	1070	2621.8
1072	2621.8	1074	2621.8	1076	2621.8	1078	2621.8	1080	2621.8
1082	2621.8	1084	2621.8	1086	2622.1	1088	2622.9	1090	2623.6
1092	2624.5	1094	2625.4	1096	2626.4	1098	2627.3	1100	2628.2
1102	2629.1	1104	2629.7	1106	2629.7	1108	2629.8	1110	2629.8
1112	2629.8	1114	2629.8	1116	2629.8	1118	2629.8	1120	2629.8
1122	2629.8	1124	2629.8	1126	2629.8	1128	2629.8	1130	2629.8
1132	2629.8	1134	2629.8	1136	2629.8	1138	2629.8	1140	2629.8
1142	2629.8	1144	2629.8	1146	2629.8	1148	2629.8	1150	2629.8
1152	2629.8	1154	2629.8	1156	2629.8	1158	2629.8	1160	2629.8
1162	2629.8	1164	2629.8	1166	2629.8	1168	2629.8	1170	2629.8
1172	2629.8								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
692	.03	692	.03	1172	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
692	1172	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2627.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.87	Wt. n-Val.		0.030	
W.S. Elev (ft)	2625.62	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2625.62	Flow Area (sq ft)		1232.32	
E.G. Slope (ft/ft)	0.008590	Area (sq ft)		1232.32	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	331.66	Top Width (ft)		331.66	
Vel Total (ft/s)	10.98	Avg. Vel. (ft/s)		10.98	
Max Chl Dpth (ft)	3.82	Hydr. Depth (ft)		3.72	
Conv. Total (cfs)	145981.7	Conv. (cfs)		145981.7	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		333.17	
Min Ch El (ft)	2621.80	Shear (lb/sq ft)		1.98	
Alpha	1.00	Stream Power (lb/ft s)		21.78	
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)		30.57	
C & E Loss (ft)	0.00	Cum SA (acres)		7.30	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 3950

INPUT
Description: 3950
Station Elevation Data num= 242

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
694	2628.5	696	2628.5	698	2628.5	700	2628.5	702	2628.5
704	2628.5	706	2628.5	708	2628.4	710	2628.4	712	2628.4
714	2628.4	716	2628.4	718	2628.4	720	2628.4	722	2628.4
724	2628.4	726	2628.4	728	2628.4	730	2628.4	732	2628.4
734	2628.4	736	2628.4	738	2628.4	740	2628.4	742	2628.4
744	2628.4	746	2628.4	748	2628.4	750	2628.4	752	2628.4
754	2628.4	756	2628.2	758	2627.4	760	2626.7	762	2625.8
764	2624.8	766	2623.9	768	2622.9	770	2622	772	2621.1
774	2620.7	776	2620.5	778	2620.5	780	2620.5	782	2620.5
784	2620.5	786	2620.5	788	2620.5	790	2620.5	792	2620.5
794	2620.5	796	2620.5	798	2620.5	800	2620.5	802	2620.5
804	2620.5	806	2620.5	808	2620.5	810	2620.5	812	2620.5
814	2620.5	816	2620.5	818	2620.5	820	2620.5	822	2620.5
824	2620.5	826	2620.5	828	2620.5	830	2620.5	832	2620.5
834	2620.5	836	2620.5	838	2620.5	840	2620.5	842	2620.5

844	2620.5	846	2620.5	848	2620.5	850	2620.5	852	2620.5
854	2620.5	856	2620.5	858	2620.5	860	2620.5	862	2620.5
864	2620.5	866	2620.5	868	2620.5	870	2620.5	872	2620.5
874	2620.5	876	2620.5	878	2620.5	880	2620.5	882	2620.5
884	2620.5	886	2620.5	888	2620.5	890	2620.5	892	2620.5
894	2620.5	896	2620.5	898	2620.5	900	2620.5	902	2620.5
904	2620.5	906	2620.5	908	2620.5	910	2620.5	912	2620.5
914	2620.5	916	2620.5	918	2620.5	920	2620.5	922	2620.5
924	2620.5	926	2620.5	928	2620.5	930	2620.5	932	2620.5
934	2620.5	936	2620.5	938	2620.5	940	2620.5	942	2620.5
944	2620.5	946	2620.5	948	2620.5	950	2620.5	952	2620.5
954	2620.5	956	2620.5	958	2620.5	960	2620.5	962	2620.5
964	2620.5	966	2620.5	968	2620.5	970	2620.5	972	2620.5
974	2620.5	976	2620.5	978	2620.5	980	2620.5	982	2620.5
984	2620.5	986	2620.5	988	2620.5	990	2620.5	992	2620.5
994	2620.5	996	2620.5	998	2620.5	1000	2620.5	1002	2620.5
1004	2620.5	1006	2620.5	1008	2620.5	1010	2620.5	1012	2620.5
1014	2620.5	1016	2620.5	1018	2620.5	1020	2620.5	1022	2620.5
1024	2620.5	1026	2620.5	1028	2620.5	1030	2620.5	1032	2620.5
1034	2620.5	1036	2620.5	1038	2620.5	1040	2620.5	1042	2620.5
1044	2620.5	1046	2620.5	1048	2620.5	1050	2620.5	1052	2620.5
1054	2620.5	1056	2620.5	1058	2620.5	1060	2620.5	1062	2620.5
1064	2620.5	1066	2620.5	1068	2620.5	1070	2620.5	1072	2620.5
1074	2620.5	1076	2620.5	1078	2620.5	1080	2620.5	1082	2620.5
1084	2620.6	1086	2620.9	1088	2621.6	1090	2622.3	1092	2623.2
1094	2624.1	1096	2625	1098	2626	1100	2626.9	1102	2627.7
1104	2628.2	1106	2628.3	1108	2628.5	1110	2628.5	1112	2628.5
1114	2628.5	1116	2628.5	1118	2628.5	1120	2628.5	1122	2628.5
1124	2628.5	1126	2628.5	1128	2628.5	1130	2628.5	1132	2628.5
1134	2628.5	1136	2628.5	1138	2628.5	1140	2628.5	1142	2628.5
1144	2628.5	1146	2628.5	1148	2628.5	1150	2628.5	1152	2628.5
1154	2628.5	1156	2628.5	1158	2628.5	1160	2628.5	1162	2628.5
1164	2628.5	1166	2628.5	1168	2628.5	1170	2628.5	1172	2628.5
1174	2628.5	1176	2628.5						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
694	.03	694	.03	1176	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
694	1176	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	2626.22	Element			
Vel Head (ft)	1.88	Wt. n-Val.		0.030	
W.S. Elev (ft)	2624.34	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2624.34	Flow Area (sq ft)		1229.86	
E.G. Slope (ft/ft)	0.008571	Area (sq ft)		1229.86	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	329.49	Top Width (ft)		329.49	
Vel Total (ft/s)	11.00	Avg. Vel. (ft/s)		11.00	
Max Chl Dpth (ft)	3.84	Hydr. Depth (ft)		3.73	
Conv. Total (cfs)	146145.3	Conv. (cfs)		146145.3	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		330.96	
Min Ch El (ft)	2620.50	Shear (lb/sq ft)		1.99	
Alpha	1.00	Stream Power (lb/ft s)		21.87	
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)		29.15	
C & E Loss (ft)	0.00	Cum SA (acres)		6.92	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 3900

INPUT

Description: 3900

Station Elevation Data num= 240

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
700	2627.2	702	2627.2	704	2627.2	706	2627.2	708	2627.2
710	2627.2	712	2627.2	714	2627.2	716	2627.2	718	2627.2
720	2627.2	722	2627.2	724	2627.2	726	2627.2	728	2627.2
730	2627.2	732	2627.1	734	2627.1	736	2627.1	738	2627.1
740	2627.1	742	2627.1	744	2627.1	746	2627.1	748	2627.1
750	2627.1	752	2627.1	754	2627.1	756	2627.1	758	2627.1
760	2626.6	762	2626	764	2625.2	766	2624.3	768	2623.3
770	2622.4	772	2621.5	774	2620.5	776	2619.6	778	2619.3
780	2619.2	782	2619.2	784	2619.2	786	2619.2	788	2619.2
790	2619.2	792	2619.2	794	2619.2	796	2619.2	798	2619.2
800	2619.2	802	2619.2	804	2619.2	806	2619.2	808	2619.2
810	2619.2	812	2619.2	814	2619.2	816	2619.2	818	2619.2
820	2619.2	822	2619.2	824	2619.2	826	2619.2	828	2619.2
830	2619.2	832	2619.2	834	2619.2	836	2619.2	838	2619.2
840	2619.2	842	2619.2	844	2619.2	846	2619.2	848	2619.2
850	2619.2	852	2619.2	854	2619.2	856	2619.2	858	2619.2
860	2619.2	862	2619.2	864	2619.2	866	2619.2	868	2619.2
870	2619.2	872	2619.2	874	2619.2	876	2619.2	878	2619.2
880	2619.2	882	2619.2	884	2619.2	886	2619.2	888	2619.2
890	2619.2	892	2619.2	894	2619.2	896	2619.2	898	2619.2
900	2619.2	902	2619.2	904	2619.2	906	2619.2	908	2619.2
910	2619.2	912	2619.2	914	2619.2	916	2619.2	918	2619.2
920	2619.2	922	2619.2	924	2619.2	926	2619.2	928	2619.2
930	2619.2	932	2619.2	934	2619.2	936	2619.2	938	2619.2
940	2619.2	942	2619.2	944	2619.2	946	2619.2	948	2619.2
950	2619.2	952	2619.2	954	2619.2	956	2619.2	958	2619.2
960	2619.2	962	2619.2	964	2619.2	966	2619.2	968	2619.2
970	2619.2	972	2619.2	974	2619.2	976	2619.2	978	2619.2
980	2619.2	982	2619.2	984	2619.2	986	2619.2	988	2619.2
990	2619.2	992	2619.2	994	2619.2	996	2619.2	998	2619.2
1000	2619.2	1002	2619.2	1004	2619.2	1006	2619.2	1008	2619.2
1010	2619.2	1012	2619.2	1014	2619.2	1016	2619.2	1018	2619.2
1020	2619.2	1022	2619.2	1024	2619.2	1026	2619.2	1028	2619.2
1030	2619.2	1032	2619.2	1034	2619.2	1036	2619.2	1038	2619.2
1040	2619.2	1042	2619.2	1044	2619.2	1046	2619.2	1048	2619.2
1050	2619.2	1052	2619.2	1054	2619.2	1056	2619.2	1058	2619.2
1060	2619.2	1062	2619.2	1064	2619.2	1066	2619.2	1068	2619.2
1070	2619.2	1072	2619.2	1074	2619.2	1076	2619.2	1078	2619.2
1080	2619.2	1082	2619.2	1084	2619.2	1086	2619.6	1088	2620.1
1090	2620.9	1092	2621.8	1094	2622.7	1096	2623.6	1098	2624.5
1100	2625.4	1102	2626.3	1104	2626.6	1106	2627.2	1108	2627.2
1110	2627.2	1112	2627.2	1114	2627.2	1116	2627.2	1118	2627.2
1120	2627.2	1122	2627.2	1124	2627.2	1126	2627.2	1128	2627.2
1130	2627.2	1132	2627.2	1134	2627.2	1136	2627.2	1138	2627.2
1140	2627.2	1142	2627.2	1144	2627.2	1146	2627.2	1148	2627.2
1150	2627.2	1152	2627.2	1154	2627.2	1156	2627.2	1158	2627.2
1160	2627.2	1162	2627.2	1164	2627.2	1166	2627.2	1168	2627.2
1170	2627.2	1172	2627.2	1174	2627.2	1176	2627.2	1178	2627.2

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
700	.03	700	.03	1178	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
700	1178	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2624.95	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.89	Wt. n-Val.		0.030	
W.S. Elev (ft)	2623.06	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2623.06	Flow Area (sq ft)		1225.76	
E.G. Slope (ft/ft)	0.008556	Area (sq ft)		1225.76	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	326.27	Top Width (ft)		326.27	
Vel Total (ft/s)	11.04	Avg. Vel. (ft/s)		11.04	
Max Chl Dpth (ft)	3.86	Hydr. Depth (ft)		3.76	
Conv. Total (cfs)	146271.0	Conv. (cfs)		146271.0	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		327.78	
Min Ch El (ft)	2619.20	Shear (lb/sq ft)		2.00	
Alpha	1.00	Stream Power (lb/ft s)		22.05	

Frctn Loss (ft)	0.43	Cum Volume (acre-ft)	27.75
C & E Loss (ft)	0.00	Cum SA (acres)	6.54

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 3850

INPUT
Description: 3850
Station Elevation Data num= 241

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
702	2625.9	704	2625.9	706	2625.9	708	2625.9	710	2625.9
712	2625.9	714	2625.9	716	2625.9	718	2625.9	720	2625.9
722	2625.9	724	2625.9	726	2625.9	728	2625.9	730	2625.9
732	2625.9	734	2625.9	736	2625.9	738	2625.9	740	2625.9
742	2625.9	744	2625.9	746	2625.9	748	2625.9	750	2625.9
752	2625.9	754	2625.9	756	2625.9	758	2625.9	760	2625.9
762	2625.9	764	2625.3	766	2624.9	768	2624	770	2623.1
772	2622.2	774	2621.3	776	2620.4	778	2619.5	780	2618.6
782	2618.2	784	2617.9	786	2617.9	788	2617.9	790	2617.9
792	2617.9	794	2617.9	796	2617.9	798	2617.9	800	2617.9
802	2617.9	804	2617.9	806	2617.9	808	2617.9	810	2617.9
812	2617.9	814	2617.9	816	2617.9	818	2617.9	820	2617.9
822	2617.9	824	2617.9	826	2617.9	828	2617.9	830	2617.9
832	2617.9	834	2617.9	836	2617.9	838	2617.9	840	2617.9
842	2617.9	844	2617.9	846	2617.9	848	2618	850	2618
852	2618	854	2618	856	2618	858	2618	860	2618
862	2618	864	2618	866	2618	868	2618	870	2618
872	2618	874	2618	876	2618	878	2618	880	2618
882	2618	884	2618	886	2618	888	2618	890	2618
892	2618	894	2618	896	2618	898	2618	900	2618
902	2618	904	2618	906	2618	908	2618	910	2618
912	2618	914	2618	916	2618	918	2618	920	2618
922	2618	924	2618	926	2618	928	2618	930	2618
932	2618	934	2618	936	2618	938	2617.9	940	2617.9
942	2617.9	944	2617.9	946	2617.9	948	2617.9	950	2617.9
952	2617.9	954	2617.9	956	2617.9	958	2617.9	960	2617.9
962	2617.9	964	2617.9	966	2617.9	968	2617.9	970	2617.9
972	2617.9	974	2617.9	976	2617.9	978	2617.9	980	2617.9
982	2617.9	984	2617.9	986	2617.9	988	2617.9	990	2617.9
992	2617.9	994	2617.9	996	2617.9	998	2617.9	1000	2617.9
1002	2617.9	1004	2617.9	1006	2617.9	1008	2617.9	1010	2617.9
1012	2617.9	1014	2617.9	1016	2617.9	1018	2617.9	1020	2617.9
1022	2617.9	1024	2617.9	1026	2617.9	1028	2617.9	1030	2617.9
1032	2617.9	1034	2617.9	1036	2617.9	1038	2617.9	1040	2617.9
1042	2617.9	1044	2617.9	1046	2617.9	1048	2617.9	1050	2617.9
1052	2617.9	1054	2617.9	1056	2617.9	1058	2617.9	1060	2617.9
1062	2617.9	1064	2617.9	1066	2617.9	1068	2617.9	1070	2617.9
1072	2617.9	1074	2617.9	1076	2617.9	1078	2617.9	1080	2617.9
1082	2617.9	1084	2618	1086	2618.1	1088	2618.8	1090	2619.5
1092	2620.3	1094	2621.2	1096	2622.1	1098	2622.9	1100	2623.8
1102	2624.6	1104	2625.4	1106	2625.7	1108	2625.9	1110	2625.9
1112	2625.9	1114	2625.9	1116	2625.9	1118	2625.9	1120	2625.9
1122	2625.9	1124	2625.9	1126	2625.9	1128	2625.9	1130	2625.9
1132	2625.9	1134	2625.9	1136	2625.9	1138	2625.9	1140	2625.9
1142	2625.9	1144	2625.9	1146	2625.9	1148	2625.9	1150	2625.9
1152	2625.9	1154	2625.9	1156	2625.9	1158	2625.9	1160	2625.9
1162	2625.9	1164	2625.9	1166	2625.9	1168	2625.9	1170	2625.9
1172	2625.9	1174	2625.9	1176	2625.9	1178	2625.9	1180	2625.9
1182	2625.9								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
702	.03	702	.03	1182	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
702	1182	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	2623.73	Element			
Vel Head (ft)	1.90	Wt. n-Val.		0.030	
W.S. Elev (ft)	2621.83	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2621.83	Flow Area (sq ft)		1221.55	
E.G. Slope (ft/ft)	0.008524	Area (sq ft)		1221.55	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	322.57	Top Width (ft)		322.57	
Vel Total (ft/s)	11.08	Avg. Vel. (ft/s)		11.08	
Max Chl Dpth (ft)	3.93	Hydr. Depth (ft)		3.79	
Conv. Total (cfs)	146547.4	Conv. (cfs)		146547.4	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		324.06	
Min Ch El (ft)	2617.90	Shear (lb/sq ft)		2.01	
Alpha	1.00	Stream Power (lb/ft s)		22.22	
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)		26.34	
C & E Loss (ft)	0.00	Cum SA (acres)		6.17	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 3800

INPUT
Description: 3800
Station Elevation Data num= 242

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
706	2624.5	708	2624.6	710	2624.6	712	2624.6	714	2624.6
716	2624.6	718	2624.6	720	2624.6	722	2624.6	724	2624.6
726	2624.6	728	2624.6	730	2624.6	732	2624.6	734	2624.6
736	2624.6	738	2624.6	740	2624.6	742	2624.6	744	2624.6
746	2624.6	748	2624.6	750	2624.6	752	2624.6	754	2624.6
756	2624.6	758	2624.6	760	2624.6	762	2624.6	764	2624.6
766	2624.6	768	2624.2	770	2623.4	772	2622.8	774	2621.9
776	2621	778	2620.2	780	2619.3	782	2618.4	784	2617.5
786	2616.9	788	2616.9	790	2616.6	792	2616.6	794	2616.6
796	2616.6	798	2616.6	800	2616.6	802	2616.6	804	2616.6
806	2616.6	808	2616.6	810	2616.6	812	2616.6	814	2616.6
816	2616.6	818	2616.6	820	2616.6	822	2616.6	824	2616.6
826	2616.6	828	2616.6	830	2616.6	832	2616.6	834	2616.7
836	2616.7	838	2616.7	840	2616.7	842	2616.7	844	2616.7
846	2616.7	848	2616.7	850	2616.7	852	2616.7	854	2616.7
856	2616.7	858	2616.7	860	2616.7	862	2616.7	864	2616.7
866	2616.7	868	2616.7	870	2616.7	872	2616.7	874	2616.7
876	2616.7	878	2616.7	880	2616.7	882	2616.7	884	2616.7
886	2616.7	888	2616.7	890	2616.7	892	2616.7	894	2616.7
896	2616.7	898	2616.7	900	2616.7	902	2616.7	904	2616.7
906	2616.7	908	2616.7	910	2616.7	912	2616.7	914	2616.7
916	2616.7	918	2616.7	920	2616.7	922	2616.7	924	2616.7
926	2616.7	928	2616.7	930	2616.7	932	2616.7	934	2616.7
936	2616.7	938	2616.7	940	2616.7	942	2616.7	944	2616.7
946	2616.7	948	2616.7	950	2616.7	952	2616.7	954	2616.7
956	2616.7	958	2616.7	960	2616.7	962	2616.7	964	2616.7
966	2616.7	968	2616.7	970	2616.7	972	2616.7	974	2616.7
976	2616.7	978	2616.7	980	2616.7	982	2616.7	984	2616.7
986	2616.7	988	2616.7	990	2616.7	992	2616.7	994	2616.7
996	2616.7	998	2616.7	1000	2616.7	1002	2616.7	1004	2616.7
1006	2616.7	1008	2616.7	1010	2616.7	1012	2616.7	1014	2616.7
1016	2616.7	1018	2616.6	1020	2616.6	1022	2616.6	1024	2616.6
1026	2616.6	1028	2616.6	1030	2616.6	1032	2616.6	1034	2616.6
1036	2616.6	1038	2616.6	1040	2616.6	1042	2616.6	1044	2616.6
1046	2616.6	1048	2616.6	1050	2616.6	1052	2616.6	1054	2616.6
1056	2616.6	1058	2616.6	1060	2616.6	1062	2616.6	1064	2616.6

1066	2616.6	1068	2616.6	1070	2616.6	1072	2616.6	1074	2616.6
1076	2616.6	1078	2616.6	1080	2616.6	1082	2616.6	1084	2616.6
1086	2617	1088	2617.3	1090	2618	1092	2618.9	1094	2619.7
1096	2620.5	1098	2621.4	1100	2622.2	1102	2623.1	1104	2623.7
1106	2624.2	1108	2624.4	1110	2624.5	1112	2624.5	1114	2624.5
1116	2624.5	1118	2624.5	1120	2624.5	1122	2624.5	1124	2624.6
1126	2624.6	1128	2624.6	1130	2624.6	1132	2624.6	1134	2624.6
1136	2624.6	1138	2624.6	1140	2624.6	1142	2624.6	1144	2624.6
1146	2624.6	1148	2624.6	1150	2624.6	1152	2624.6	1154	2624.6
1156	2624.6	1158	2624.6	1160	2624.6	1162	2624.6	1164	2624.6
1166	2624.6	1168	2624.6	1170	2624.6	1172	2624.6	1174	2624.6
1176	2624.6	1178	2624.6	1180	2624.6	1182	2624.6	1184	2624.6
1186	2624.6	1188	2624.6						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
706	.03	706	.03	1188	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
706	1188	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	2622.51	Element			
Vel Head (ft)	1.92	Wt. n-Val.		0.030	
W.S. Elev (ft)	2620.59	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2620.59	Flow Area (sq ft)		1216.05	
E.G. Slope (ft/ft)	0.008532	Area (sq ft)		1216.05	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	319.19	Top Width (ft)		319.19	
Vel Total (ft/s)	11.13	Avg. Vel. (ft/s)		11.13	
Max Chl Dpth (ft)	3.99	Hydr. Depth (ft)		3.81	
Conv. Total (cfs)	146474.8	Conv. (cfs)		146474.8	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		320.66	
Min Ch El (ft)	2616.60	Shear (lb/sq ft)		2.02	
Alpha	1.00	Stream Power (lb/ft s)		22.48	
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)		24.94	
C & E Loss (ft)	0.00	Cum SA (acres)		5.80	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 3750

INPUT
Description: 3750
Station Elevation Data num= 239

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
714	2623.3	716	2623.3	718	2623.3	720	2623.3	722	2623.3
724	2623.3	726	2623.3	728	2623.3	730	2623.3	732	2623.3
734	2623.3	736	2623.3	738	2623.3	740	2623.3	742	2623.3
744	2623.3	746	2623.3	748	2623.3	750	2623.3	752	2623.3
754	2623.3	756	2623.3	758	2623.3	760	2623.3	762	2623.3
764	2623.3	766	2623.3	768	2623.3	770	2623.3	772	2623.1
774	2622.4	776	2621.6	778	2620.8	780	2619.9	782	2619
784	2618.2	786	2617.3	788	2616.4	790	2615.6	792	2615.4
794	2615.4	796	2615.3	798	2615.3	800	2615.3	802	2615.3
804	2615.3	806	2615.3	808	2615.3	810	2615.3	812	2615.3
814	2615.3	816	2615.3	818	2615.3	820	2615.3	822	2615.3
824	2615.4	826	2615.4	828	2615.4	830	2615.4	832	2615.4
834	2615.4	836	2615.4	838	2615.4	840	2615.4	842	2615.4
844	2615.4	846	2615.4	848	2615.4	850	2615.4	852	2615.4
854	2615.4	856	2615.4	858	2615.4	860	2615.4	862	2615.4
864	2615.4	866	2615.4	868	2615.4	870	2615.4	872	2615.4
874	2615.4	876	2615.4	878	2615.4	880	2615.4	882	2615.4
884	2615.4	886	2615.4	888	2615.4	890	2615.4	892	2615.5

894	2615.5	896	2615.5	898	2615.5	900	2615.5	902	2615.5
904	2615.5	906	2615.5	908	2615.5	910	2615.5	912	2615.5
914	2615.5	916	2615.5	918	2615.5	920	2615.5	922	2615.5
924	2615.5	926	2615.5	928	2615.5	930	2615.5	932	2615.5
934	2615.5	936	2615.5	938	2615.5	940	2615.5	942	2615.5
944	2615.5	946	2615.5	948	2615.5	950	2615.5	952	2615.5
954	2615.5	956	2615.5	958	2615.5	960	2615.5	962	2615.5
964	2615.5	966	2615.5	968	2615.5	970	2615.5	972	2615.5
974	2615.5	976	2615.4	978	2615.4	980	2615.4	982	2615.4
984	2615.4	986	2615.4	988	2615.4	990	2615.4	992	2615.4
994	2615.4	996	2615.4	998	2615.4	1000	2615.4	1002	2615.4
1004	2615.4	1006	2615.4	1008	2615.4	1010	2615.4	1012	2615.4
1014	2615.4	1016	2615.4	1018	2615.4	1020	2615.4	1022	2615.4
1024	2615.4	1026	2615.4	1028	2615.4	1030	2615.4	1032	2615.4
1034	2615.4	1036	2615.4	1038	2615.4	1040	2615.4	1042	2615.4
1044	2615.4	1046	2615.4	1048	2615.4	1050	2615.4	1052	2615.4
1054	2615.4	1056	2615.3	1058	2615.3	1060	2615.3	1062	2615.3
1064	2615.3	1066	2615.3	1068	2615.3	1070	2615.3	1072	2615.3
1074	2615.3	1076	2615.3	1078	2615.3	1080	2615.3	1082	2615.3
1084	2615.4	1086	2615.5	1088	2615.9	1090	2616.6	1092	2617.4
1094	2618.2	1096	2619	1098	2619.9	1100	2620.7	1102	2621.5
1104	2622.3	1106	2622.9	1108	2623.2	1110	2623.2	1112	2623.2
1114	2623.2	1116	2623.2	1118	2623.2	1120	2623.2	1122	2623.2
1124	2623.2	1126	2623.2	1128	2623.3	1130	2623.3	1132	2623.3
1134	2623.3	1136	2623.3	1138	2623.3	1140	2623.3	1142	2623.3
1144	2623.3	1146	2623.3	1148	2623.3	1150	2623.3	1152	2623.3
1154	2623.3	1156	2623.3	1158	2623.3	1160	2623.3	1162	2623.3
1164	2623.3	1166	2623.3	1168	2623.3	1170	2623.3	1172	2623.3
1174	2623.3	1176	2623.3	1178	2623.3	1180	2623.3	1182	2623.3
1184	2623.3	1186	2623.3	1188	2623.3	1190	2623.3		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
714	.03	714	.03	1190	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
714	1190	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2621.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.94	Wt. n-Val.		0.030	
W.S. Elev (ft)	2619.37	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2619.37	Flow Area (sq ft)		1211.32	
E.G. Slope (ft/ft)	0.008518	Area (sq ft)		1211.32	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	315.64	Top Width (ft)		315.64	
Vel Total (ft/s)	11.17	Avg. Vel. (ft/s)		11.17	
Max Chl Dpth (ft)	4.07	Hydr. Depth (ft)		3.84	
Conv. Total (cfs)	146601.7	Conv. (cfs)		146601.7	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		317.14	
Min Ch El (ft)	2615.30	Shear (lb/sq ft)		2.03	
Alpha	1.00	Stream Power (lb/ft s)		22.69	
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)		23.55	
C & E Loss (ft)	0.00	Cum SA (acres)		5.44	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 3700

INPUT
Description: 3700
Station Elevation Data num= 240

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
722	2622.1	724	2622.1	726	2622.1	728	2622.1	730	2622.1

732	2622.1	734	2622.1	736	2622.1	738	2622.1	740	2622.1
742	2622.1	744	2622.1	746	2622.1	748	2622.1	750	2622.1
752	2622.1	754	2622.1	756	2622.1	758	2622.1	760	2622.1
762	2622.1	764	2622.1	766	2622.1	768	2622.1	770	2622.1
772	2622.1	774	2622.1	776	2622.1	778	2621.7	780	2621.3
782	2620.7	784	2619.8	786	2618.9	788	2618	790	2617.2
792	2616.3	794	2615.4	796	2614.9	798	2614.4	800	2614.1
802	2614.1	804	2614.1	806	2614.1	808	2614.1	810	2614.1
812	2614.1	814	2614.1	816	2614.1	818	2614.1	820	2614.1
822	2614.1	824	2614.1	826	2614.1	828	2614.1	830	2614.1
832	2614.1	834	2614.1	836	2614.1	838	2614.1	840	2614.1
842	2614.1	844	2614.1	846	2614.1	848	2614.1	850	2614.1
852	2614.2	854	2614.2	856	2614.2	858	2614.2	860	2614.2
862	2614.2	864	2614.2	866	2614.2	868	2614.2	870	2614.2
872	2614.2	874	2614.2	876	2614.2	878	2614.2	880	2614.2
882	2614.2	884	2614.2	886	2614.2	888	2614.2	890	2614.2
892	2614.2	894	2614.2	896	2614.2	898	2614.2	900	2614.2
902	2614.2	904	2614.2	906	2614.2	908	2614.2	910	2614.2
912	2614.2	914	2614.2	916	2614.2	918	2614.2	920	2614.2
922	2614.2	924	2614.2	926	2614.2	928	2614.2	930	2614.2
932	2614.2	934	2614.2	936	2614.2	938	2614.2	940	2614.2
942	2614.2	944	2614.2	946	2614.2	948	2614.2	950	2614.2
952	2614.2	954	2614.2	956	2614.2	958	2614.2	960	2614.2
962	2614.2	964	2614.2	966	2614.2	968	2614.2	970	2614.2
972	2614.2	974	2614.2	976	2614.2	978	2614.2	980	2614.2
982	2614.2	984	2614.2	986	2614.2	988	2614.2	990	2614.2
992	2614.2	994	2614.2	996	2614.2	998	2614.2	1000	2614.2
1002	2614.2	1004	2614.2	1006	2614.2	1008	2614.2	1010	2614.2
1012	2614.2	1014	2614.2	1016	2614.2	1018	2614.2	1020	2614.2
1022	2614.2	1024	2614.2	1026	2614.2	1028	2614.2	1030	2614.2
1032	2614.2	1034	2614.1	1036	2614.1	1038	2614.1	1040	2614.1
1042	2614.1	1044	2614.1	1046	2614.1	1048	2614.1	1050	2614.1
1052	2614.1	1054	2614.1	1056	2614.1	1058	2614.1	1060	2614.1
1062	2614.1	1064	2614.1	1066	2614.1	1068	2614.1	1070	2614.1
1072	2614.1	1074	2614.1	1076	2614.1	1078	2614.1	1080	2614.1
1082	2614.1	1084	2614.1	1086	2614.2	1088	2614.6	1090	2615.5
1092	2616.2	1094	2617.1	1096	2617.9	1098	2618.7	1100	2619.5
1102	2620.4	1104	2621.1	1106	2621.7	1108	2621.8	1110	2622
1112	2622	1114	2622	1116	2622	1118	2622	1120	2622
1122	2622	1124	2622	1126	2622	1128	2622	1130	2622
1132	2622	1134	2622	1136	2622	1138	2622	1140	2622
1142	2622	1144	2622	1146	2622.1	1148	2622.1	1150	2622.1
1152	2622.1	1154	2622.1	1156	2622.1	1158	2622.1	1160	2622.1
1162	2622.1	1164	2622.1	1166	2622.1	1168	2622.1	1170	2622.1
1172	2622.1	1174	2622.1	1176	2622.1	1178	2622.1	1180	2622.1
1182	2622.1	1184	2622.1	1186	2622.1	1188	2622.1	1190	2622.1
1192	2622.1	1194	2622.1	1196	2622.1	1198	2622.1	1200	2622.1

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
722	.03	722	.03	1200	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
722	1200	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2620.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.96	Wt. n-Val.		0.030	
W.S. Elev (ft)	2618.19	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2618.19	Flow Area (sq ft)		1203.97	
E.G. Slope (ft/ft)	0.008455	Area (sq ft)		1203.97	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	309.14	Top Width (ft)		309.14	
Vel Total (ft/s)	11.24	Avg. Vel. (ft/s)		11.24	
Max Chl Dpth (ft)	4.09	Hydr. Depth (ft)		3.89	
Conv. Total (cfs)	147142.2	Conv. (cfs)		147142.2	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		310.63	
Min Ch El (ft)	2614.10	Shear (lb/sq ft)		2.05	
Alpha	1.00	Stream Power (lb/ft s)		22.99	
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)		22.16	
C & E Loss (ft)	0.00	Cum SA (acres)		5.08	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 3650

INPUT
Description: 3650
Station Elevation Data num= 241

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
726	2620.9	728	2620.9	730	2620.9	732	2620.9	734	2620.9
736	2620.9	738	2620.9	740	2620.9	742	2620.9	744	2620.9
746	2620.9	748	2620.9	750	2620.9	752	2620.9	754	2620.9
756	2620.9	758	2620.9	760	2620.9	762	2620.9	764	2620.9
766	2620.9	768	2620.9	770	2620.9	772	2620.9	774	2620.9
776	2620.9	778	2620.9	780	2620.9	782	2620.9	784	2620.9
786	2620.7	788	2620	790	2619.2	792	2618.3	794	2617.4
796	2616.5	798	2615.6	800	2614.7	802	2613.9	804	2613.1
806	2612.9	808	2612.9	810	2612.9	812	2612.9	814	2612.9
816	2612.9	818	2612.9	820	2612.9	822	2612.9	824	2612.9
826	2612.9	828	2612.9	830	2612.9	832	2612.9	834	2612.9
836	2612.9	838	2612.9	840	2612.9	842	2612.9	844	2612.9
846	2612.9	848	2612.9	850	2612.9	852	2612.9	854	2612.9
856	2612.9	858	2612.9	860	2612.9	862	2612.9	864	2612.9
866	2612.9	868	2612.9	870	2612.9	872	2612.9	874	2612.9
876	2612.9	878	2612.9	880	2612.9	882	2612.9	884	2613
886	2613	888	2613	890	2613	892	2613	894	2613
896	2613	898	2613	900	2613	902	2613	904	2613
906	2613	908	2613	910	2613	912	2613	914	2613
916	2613	918	2613	920	2613	922	2613	924	2613
926	2613	928	2613	930	2613	932	2613	934	2613
936	2613	938	2613	940	2613	942	2613	944	2613
946	2613	948	2613	950	2613	952	2613	954	2613
956	2613	958	2613	960	2613	962	2613	964	2613
966	2613	968	2613	970	2613	972	2613	974	2613
976	2613	978	2613	980	2613	982	2613	984	2613
986	2613	988	2613	990	2613	992	2613	994	2613
996	2613	998	2613	1000	2613	1002	2613	1004	2613
1006	2613	1008	2613	1010	2613	1012	2613	1014	2613
1016	2613	1018	2613	1020	2613	1022	2613	1024	2613
1026	2613	1028	2613	1030	2613	1032	2613	1034	2613
1036	2613	1038	2613	1040	2613	1042	2613	1044	2613
1046	2613	1048	2613	1050	2612.9	1052	2612.9	1054	2612.9
1056	2612.9	1058	2612.9	1060	2612.9	1062	2612.9	1064	2612.9
1066	2612.9	1068	2612.9	1070	2612.9	1072	2612.9	1074	2612.9
1076	2612.9	1078	2612.9	1080	2612.9	1082	2612.9	1084	2612.9
1086	2613.1	1088	2613.8	1090	2614.3	1092	2615.1	1094	2616
1096	2616.8	1098	2617.7	1100	2618.5	1102	2619.3	1104	2620.1
1106	2620.4	1108	2620.8	1110	2620.8	1112	2620.9	1114	2620.9
1116	2620.9	1118	2620.9	1120	2620.9	1122	2620.9	1124	2620.9
1126	2620.9	1128	2620.9	1130	2620.9	1132	2620.9	1134	2620.9
1136	2620.9	1138	2620.9	1140	2620.9	1142	2620.9	1144	2620.9
1146	2620.9	1148	2620.9	1150	2620.9	1152	2620.9	1154	2620.9
1156	2620.9	1158	2620.9	1160	2620.9	1162	2620.9	1164	2620.9
1166	2620.9	1168	2620.9	1170	2620.9	1172	2620.9	1174	2620.9
1176	2620.9	1178	2620.9	1180	2620.9	1182	2620.9	1184	2620.9
1186	2620.9	1188	2620.9	1190	2620.9	1192	2620.9	1194	2620.9
1196	2620.9	1198	2620.9	1200	2620.9	1202	2620.9	1204	2620.9
1206	2620.9								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
726	.03	726	.03	1206	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
726	1206	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2619.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.00	Wt. n-Val.		0.030	
W.S. Elev (ft)	2617.05	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2617.05	Flow Area (sq ft)		1193.52	
E.G. Slope (ft/ft)	0.008433	Area (sq ft)		1193.52	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	301.77	Top Width (ft)		301.77	
Vel Total (ft/s)	11.34	Avg. Vel. (ft/s)		11.34	
Max Chl Dpth (ft)	4.15	Hydr. Depth (ft)		3.96	
Conv. Total (cfs)	147334.9	Conv. (cfs)		147334.9	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		303.34	
Min Ch El (ft)	2612.90	Shear (lb/sq ft)		2.07	
Alpha	1.00	Stream Power (lb/ft s)		23.48	
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)		20.79	
C & E Loss (ft)	0.00	Cum SA (acres)		4.73	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 3600

INPUT
Description: 3600
Station Elevation Data num= 243

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
734	2619.7	736	2619.7	738	2619.7	740	2619.7	742	2619.7
744	2619.7	746	2619.7	748	2619.7	750	2619.7	752	2619.7
754	2619.7	756	2619.7	758	2619.7	760	2619.7	762	2619.7
764	2619.7	766	2619.7	768	2619.7	770	2619.7	772	2619.7
774	2619.7	776	2619.7	778	2619.7	780	2619.7	782	2619.7
784	2619.7	786	2619.7	788	2619.7	790	2619.7	792	2619.5
794	2619.1	796	2618.4	798	2617.6	800	2616.7	802	2615.8
804	2614.9	806	2614	808	2613.1	810	2612.4	812	2612
814	2611.8	816	2611.7	818	2611.7	820	2611.7	822	2611.7
824	2611.7	826	2611.7	828	2611.7	830	2611.7	832	2611.7
834	2611.7	836	2611.7	838	2611.7	840	2611.7	842	2611.7
844	2611.7	846	2611.7	848	2611.7	850	2611.7	852	2611.7
854	2611.7	856	2611.7	858	2611.7	860	2611.7	862	2611.7
864	2611.7	866	2611.7	868	2611.7	870	2611.7	872	2611.7
874	2611.7	876	2611.7	878	2611.7	880	2611.7	882	2611.7
884	2611.7	886	2611.7	888	2611.7	890	2611.7	892	2611.7
894	2611.7	896	2611.7	898	2611.7	900	2611.7	902	2611.7
904	2611.7	906	2611.7	908	2611.7	910	2611.7	912	2611.7
914	2611.7	916	2611.7	918	2611.7	920	2611.7	922	2611.8
924	2611.8	926	2611.8	928	2611.8	930	2611.8	932	2611.8
934	2611.8	936	2611.8	938	2611.8	940	2611.8	942	2611.8
944	2611.8	946	2611.8	948	2611.8	950	2611.8	952	2611.8
954	2611.8	956	2611.8	958	2611.8	960	2611.8	962	2611.8
964	2611.8	966	2611.8	968	2611.8	970	2611.8	972	2611.8
974	2611.8	976	2611.8	978	2611.8	980	2611.8	982	2611.8
984	2611.8	986	2611.8	988	2611.8	990	2611.8	992	2611.8
994	2611.8	996	2611.8	998	2611.8	1000	2611.8	1002	2611.8
1004	2611.8	1006	2611.8	1008	2611.8	1010	2611.8	1012	2611.8
1014	2611.8	1016	2611.8	1018	2611.8	1020	2611.8	1022	2611.8
1024	2611.8	1026	2611.8	1028	2611.8	1030	2611.8	1032	2611.8
1034	2611.8	1036	2611.8	1038	2611.8	1040	2611.8	1042	2611.8
1044	2611.8	1046	2611.8	1048	2611.8	1050	2611.8	1052	2611.8
1054	2611.8	1056	2611.8	1058	2611.8	1060	2611.8	1062	2611.8
1064	2611.8	1066	2611.8	1068	2611.8	1070	2611.8	1072	2611.7
1074	2611.7	1076	2611.7	1078	2611.7	1080	2611.7	1082	2611.7
1084	2611.7	1086	2611.8	1088	2612.4	1090	2613.2	1092	2614
1094	2614.9	1096	2615.7	1098	2616.6	1100	2617.5	1102	2618.3
1104	2618.8	1106	2619.5	1108	2619.7	1110	2619.7	1112	2619.7
1114	2619.7	1116	2619.7	1118	2619.7	1120	2619.7	1122	2619.7
1124	2619.7	1126	2619.7	1128	2619.7	1130	2619.7	1132	2619.7

1134	2619.7	1136	2619.7	1138	2619.7	1140	2619.7	1142	2619.7
1144	2619.7	1146	2619.7	1148	2619.7	1150	2619.7	1152	2619.7
1154	2619.7	1156	2619.7	1158	2619.7	1160	2619.7	1162	2619.7
1164	2619.7	1166	2619.7	1168	2619.7	1170	2619.7	1172	2619.7
1174	2619.7	1176	2619.7	1178	2619.7	1180	2619.7	1182	2619.7
1184	2619.7	1186	2619.7	1188	2619.7	1190	2619.7	1192	2619.7
1194	2619.7	1196	2619.7	1198	2619.7	1200	2619.7	1202	2619.7
1204	2619.7	1206	2619.7	1208	2619.7	1210	2619.7	1212	2619.7
1214	2619.7	1216	2619.7	1218	2619.7				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
734	.03	734	.03	1218	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
734	1218	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2617.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.03	Wt. n-Val.		0.030	
W.S. Elev (ft)	2615.91	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2615.91	Flow Area (sq ft)		1183.94	
E.G. Slope (ft/ft)	0.008396	Area (sq ft)		1183.94	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	294.72	Top Width (ft)		294.72	
Vel Total (ft/s)	11.43	Avg. Vel. (ft/s)		11.43	
Max Chl Dpth (ft)	4.21	Hydr. Depth (ft)		4.02	
Conv. Total (cfs)	147663.5	Conv. (cfs)		147663.5	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		296.30	
Min Ch El (ft)	2611.70	Shear (lb/sq ft)		2.09	
Alpha	1.00	Stream Power (lb/ft s)		23.93	
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)		19.42	
C & E Loss (ft)	0.00	Cum SA (acres)		4.39	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 3550

INPUT
Description: 3550
Station Elevation Data num= 246

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
738	2618.5	740	2618.5	742	2618.5	744	2618.5	746	2618.5
748	2618.5	750	2618.5	752	2618.5	754	2618.5	756	2618.5
758	2618.5	760	2618.5	762	2618.5	764	2618.5	766	2618.5
768	2618.5	770	2618.5	772	2618.5	774	2618.5	776	2618.5
778	2618.5	780	2618.5	782	2618.5	784	2618.5	786	2618.5
788	2618.5	790	2618.6	792	2618.6	794	2618.6	796	2618.6
798	2618.4	800	2618.3	802	2617.9	804	2617	806	2616.1
808	2615.2	810	2614.2	812	2613.3	814	2612.4	816	2611.7
818	2610.9	820	2610.5	822	2610.5	824	2610.5	826	2610.5
828	2610.5	830	2610.5	832	2610.5	834	2610.5	836	2610.5
838	2610.5	840	2610.5	842	2610.5	844	2610.5	846	2610.5
848	2610.5	850	2610.5	852	2610.5	854	2610.5	856	2610.5
858	2610.5	860	2610.5	862	2610.5	864	2610.5	866	2610.5
868	2610.5	870	2610.5	872	2610.5	874	2610.5	876	2610.5
878	2610.5	880	2610.5	882	2610.5	884	2610.5	886	2610.5
888	2610.5	890	2610.5	892	2610.5	894	2610.5	896	2610.5
898	2610.5	900	2610.5	902	2610.5	904	2610.5	906	2610.5
908	2610.5	910	2610.5	912	2610.5	914	2610.5	916	2610.5
918	2610.5	920	2610.5	922	2610.5	924	2610.5	926	2610.5
928	2610.6	930	2610.6	932	2610.6	934	2610.6	936	2610.6
938	2610.6	940	2610.6	942	2610.6	944	2610.6	946	2610.6
948	2610.6	950	2610.6	952	2610.6	954	2610.6	956	2610.6

958	2610.6	960	2610.6	962	2610.6	964	2610.6	966	2610.6
968	2610.6	970	2610.6	972	2610.6	974	2610.6	976	2610.6
978	2610.6	980	2610.6	982	2610.6	984	2610.6	986	2610.6
988	2610.6	990	2610.6	992	2610.6	994	2610.6	996	2610.6
998	2610.6	1000	2610.6	1002	2610.6	1004	2610.6	1006	2610.6
1008	2610.6	1010	2610.6	1012	2610.6	1014	2610.6	1016	2610.6
1018	2610.6	1020	2610.6	1022	2610.6	1024	2610.6	1026	2610.6
1028	2610.6	1030	2610.6	1032	2610.6	1034	2610.6	1036	2610.6
1038	2610.6	1040	2610.6	1042	2610.6	1044	2610.6	1046	2610.6
1048	2610.6	1050	2610.6	1052	2610.6	1054	2610.6	1056	2610.6
1058	2610.6	1060	2610.6	1062	2610.6	1064	2610.6	1066	2610.6
1068	2610.6	1070	2610.6	1072	2610.6	1074	2610.6	1076	2610.6
1078	2610.6	1080	2610.6	1082	2610.6	1084	2610.6	1086	2610.8
1088	2611.3	1090	2612	1092	2612.9	1094	2613.8	1096	2614.7
1098	2615.5	1100	2616.4	1102	2617.3	1104	2618	1106	2618.4
1108	2618.5	1110	2618.5	1112	2618.5	1114	2618.5	1116	2618.5
1118	2618.5	1120	2618.5	1122	2618.5	1124	2618.5	1126	2618.5
1128	2618.5	1130	2618.5	1132	2618.5	1134	2618.5	1136	2618.5
1138	2618.5	1140	2618.5	1142	2618.5	1144	2618.5	1146	2618.5
1148	2618.5	1150	2618.5	1152	2618.5	1154	2618.5	1156	2618.5
1158	2618.5	1160	2618.5	1162	2618.5	1164	2618.5	1166	2618.5
1168	2618.5	1170	2618.5	1172	2618.5	1174	2618.5	1176	2618.5
1178	2618.5	1180	2618.5	1182	2618.5	1184	2618.5	1186	2618.5
1188	2618.5	1190	2618.5	1192	2618.5	1194	2618.5	1196	2618.5
1198	2618.5	1200	2618.5	1202	2618.5	1204	2618.5	1206	2618.5
1208	2618.5	1210	2618.5	1212	2618.5	1214	2618.5	1216	2618.5
1218	2618.6	1220	2618.6	1222	2618.6	1224	2618.6	1226	2618.6
1228	2618.6								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
738	.03	738	.03	1228	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
738	1228	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2616.85	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.06	Wt. n-Val.		0.030	
W.S. Elev (ft)	2614.79	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2614.79	Flow Area (sq ft)		1174.25	
E.G. Slope (ft/ft)	0.008348	Area (sq ft)		1174.25	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	287.40	Top Width (ft)		287.40	
Vel Total (ft/s)	11.52	Avg. Vel. (ft/s)		11.52	
Max Chl Dpth (ft)	4.29	Hydr. Depth (ft)		4.09	
Conv. Total (cfs)	148086.1	Conv. (cfs)		148086.1	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		289.03	
Min Ch El (ft)	2610.50	Shear (lb/sq ft)		2.12	
Alpha	1.00	Stream Power (lb/ft s)		24.40	
Frctn Loss (ft)	0.42	Cum Volume (acre-ft)		18.07	
C & E Loss (ft)	0.00	Cum SA (acres)		4.05	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 3500

INPUT
Description: 3500
Station Elevation Data num= 247

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
746	2617.3	748	2617.3	750	2617.4	752	2617.4	754	2617.4
756	2617.4	758	2617.4	760	2617.4	762	2617.4	764	2617.4
766	2617.4	768	2617.4	770	2617.4	772	2617.4	774	2617.4

776	2617.4	778	2617.4	780	2617.4	782	2617.4	784	2617.4
786	2617.4	788	2617.4	790	2617.4	792	2617.4	794	2617.4
796	2617.4	798	2617.4	800	2617.4	802	2617.4	804	2617.4
806	2617.4	808	2617	810	2616.5	812	2615.9	814	2615
816	2614.1	818	2613.2	820	2612.2	822	2611.3	824	2610.4
826	2609.8	828	2609.6	830	2609.4	832	2609.3	834	2609.3
836	2609.3	838	2609.3	840	2609.3	842	2609.3	844	2609.3
846	2609.3	848	2609.3	850	2609.3	852	2609.3	854	2609.3
856	2609.3	858	2609.3	860	2609.3	862	2609.3	864	2609.3
866	2609.3	868	2609.3	870	2609.3	872	2609.3	874	2609.3
876	2609.3	878	2609.3	880	2609.3	882	2609.3	884	2609.3
886	2609.3	888	2609.3	890	2609.3	892	2609.3	894	2609.3
896	2609.3	898	2609.3	900	2609.3	902	2609.3	904	2609.4
906	2609.4	908	2609.4	910	2609.4	912	2609.4	914	2609.4
916	2609.4	918	2609.4	920	2609.4	922	2609.4	924	2609.4
926	2609.4	928	2609.4	930	2609.4	932	2609.4	934	2609.4
936	2609.4	938	2609.4	940	2609.4	942	2609.4	944	2609.4
946	2609.4	948	2609.4	950	2609.4	952	2609.4	954	2609.4
956	2609.4	958	2609.4	960	2609.4	962	2609.4	964	2609.4
966	2609.4	968	2609.4	970	2609.4	972	2609.4	974	2609.4
976	2609.4	978	2609.4	980	2609.4	982	2609.4	984	2609.4
986	2609.4	988	2609.4	990	2609.4	992	2609.4	994	2609.4
996	2609.4	998	2609.4	1000	2609.4	1002	2609.4	1004	2609.4
1006	2609.4	1008	2609.4	1010	2609.4	1012	2609.4	1014	2609.4
1016	2609.4	1018	2609.4	1020	2609.4	1022	2609.4	1024	2609.4
1026	2609.4	1028	2609.4	1030	2609.4	1032	2609.4	1034	2609.4
1036	2609.4	1038	2609.4	1040	2609.4	1042	2609.4	1044	2609.4
1046	2609.4	1048	2609.4	1050	2609.4	1052	2609.4	1054	2609.4
1056	2609.4	1058	2609.4	1060	2609.4	1062	2609.4	1064	2609.4
1066	2609.4	1068	2609.4	1070	2609.4	1072	2609.4	1074	2609.4
1076	2609.4	1078	2609.4	1080	2609.4	1082	2609.4	1084	2609.4
1086	2609.5	1088	2610	1090	2610.9	1092	2611.7	1094	2612.6
1096	2613.5	1098	2614.4	1100	2615.3	1102	2616.1	1104	2616.9
1106	2617.4	1108	2617.4	1110	2617.4	1112	2617.4	1114	2617.4
1116	2617.4	1118	2617.4	1120	2617.4	1122	2617.4	1124	2617.4
1126	2617.4	1128	2617.4	1130	2617.4	1132	2617.4	1134	2617.4
1136	2617.4	1138	2617.4	1140	2617.4	1142	2617.4	1144	2617.4
1146	2617.4	1148	2617.4	1150	2617.4	1152	2617.4	1154	2617.4
1156	2617.4	1158	2617.4	1160	2617.4	1162	2617.4	1164	2617.4
1166	2617.4	1168	2617.4	1170	2617.4	1172	2617.4	1174	2617.4
1176	2617.4	1178	2617.4	1180	2617.4	1182	2617.4	1184	2617.4
1186	2617.4	1188	2617.4	1190	2617.4	1192	2617.4	1194	2617.4
1196	2617.4	1198	2617.4	1200	2617.4	1202	2617.4	1204	2617.4
1206	2617.4	1208	2617.4	1210	2617.4	1212	2617.4	1214	2617.4
1216	2617.4	1218	2617.4	1220	2617.4	1222	2617.4	1224	2617.4
1226	2617.4	1228	2617.4	1230	2617.4	1232	2617.4	1234	2617.4
1236	2617.4	1238	2617.4						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
746	.03	746	.03	1238	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
746	1238	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2615.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.10	Wt. n-Val.		0.030	
W.S. Elev (ft)	2613.69	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2613.69	Flow Area (sq ft)		1163.88	
E.G. Slope (ft/ft)	0.008288	Area (sq ft)		1163.88	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	279.51	Top Width (ft)		279.51	
Vel Total (ft/s)	11.62	Avg. Vel. (ft/s)		11.62	
Max Chl Dpth (ft)	4.39	Hydr. Depth (ft)		4.16	
Conv. Total (cfs)	148615.1	Conv. (cfs)		148615.1	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		281.18	
Min Ch El (ft)	2609.30	Shear (lb/sq ft)		2.14	
Alpha	1.00	Stream Power (lb/ft s)		24.90	
Frctn Loss (ft)	0.41	Cum Volume (acre-ft)		16.73	
C & E Loss (ft)	0.00	Cum SA (acres)		3.73	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 3450

INPUT
Description: 3450
Station Elevation Data num= 248

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
756	2616.2	758	2616.2	760	2616.2	762	2616.2	764	2616.2
766	2616.2	768	2616.2	770	2616.2	772	2616.2	774	2616.2
776	2616.2	778	2616.2	780	2616.2	782	2616.2	784	2616.2
786	2616.2	788	2616.2	790	2616.2	792	2616.2	794	2616.2
796	2616.2	798	2616.2	800	2616.2	802	2616.2	804	2616.2
806	2616.2	808	2616.2	810	2616.2	812	2616.2	814	2616.2
816	2616.2	818	2615.8	820	2615.3	822	2614.4	824	2613.4
826	2612.5	828	2611.5	830	2610.6	832	2609.7	834	2608.8
836	2608.3	838	2608.3	840	2608.2	842	2608.2	844	2608.2
846	2608.2	848	2608.2	850	2608.2	852	2608.2	854	2608.2
856	2608.2	858	2608.2	860	2608.2	862	2608.2	864	2608.2
866	2608.2	868	2608.2	870	2608.2	872	2608.2	874	2608.2
876	2608.2	878	2608.2	880	2608.2	882	2608.2	884	2608.2
886	2608.2	888	2608.2	890	2608.2	892	2608.2	894	2608.2
896	2608.2	898	2608.2	900	2608.2	902	2608.2	904	2608.2
906	2608.2	908	2608.2	910	2608.2	912	2608.2	914	2608.2
916	2608.2	918	2608.2	920	2608.2	922	2608.2	924	2608.2
926	2608.2	928	2608.2	930	2608.2	932	2608.2	934	2608.2
936	2608.2	938	2608.2	940	2608.2	942	2608.2	944	2608.2
946	2608.2	948	2608.2	950	2608.2	952	2608.2	954	2608.2
956	2608.2	958	2608.2	960	2608.2	962	2608.2	964	2608.2
966	2608.2	968	2608.2	970	2608.2	972	2608.2	974	2608.2
976	2608.2	978	2608.2	980	2608.2	982	2608.2	984	2608.2
986	2608.2	988	2608.2	990	2608.2	992	2608.2	994	2608.2
996	2608.2	998	2608.2	1000	2608.2	1002	2608.2	1004	2608.2
1006	2608.2	1008	2608.2	1010	2608.2	1012	2608.2	1014	2608.2
1016	2608.2	1018	2608.2	1020	2608.2	1022	2608.2	1024	2608.2
1026	2608.2	1028	2608.2	1030	2608.2	1032	2608.2	1034	2608.2
1036	2608.2	1038	2608.2	1040	2608.2	1042	2608.2	1044	2608.2
1046	2608.2	1048	2608.2	1050	2608.2	1052	2608.2	1054	2608.2
1056	2608.2	1058	2608.2	1060	2608.2	1062	2608.2	1064	2608.2
1066	2608.2	1068	2608.2	1070	2608.2	1072	2608.2	1074	2608.2
1076	2608.2	1078	2608.2	1080	2608.2	1082	2608.2	1084	2608.2
1086	2608.4	1088	2608.9	1090	2609.8	1092	2610.5	1094	2611.4
1096	2612.3	1098	2613.3	1100	2614.2	1102	2615.1	1104	2615.8
1106	2616.1	1108	2616.2	1110	2616.2	1112	2616.2	1114	2616.2
1116	2616.2	1118	2616.2	1120	2616.2	1122	2616.2	1124	2616.2
1126	2616.2	1128	2616.2	1130	2616.2	1132	2616.2	1134	2616.2
1136	2616.2	1138	2616.2	1140	2616.2	1142	2616.2	1144	2616.2
1146	2616.2	1148	2616.2	1150	2616.2	1152	2616.2	1154	2616.2
1156	2616.2	1158	2616.2	1160	2616.2	1162	2616.2	1164	2616.2
1166	2616.2	1168	2616.2	1170	2616.2	1172	2616.2	1174	2616.2
1176	2616.2	1178	2616.2	1180	2616.2	1182	2616.2	1184	2616.2
1186	2616.2	1188	2616.2	1190	2616.2	1192	2616.2	1194	2616.2
1196	2616.2	1198	2616.2	1200	2616.2	1202	2616.2	1204	2616.2
1206	2616.2	1208	2616.2	1210	2616.2	1212	2616.2	1214	2616.2
1216	2616.2	1218	2616.2	1220	2616.2	1222	2616.2	1224	2616.2
1226	2616.2	1228	2616.2	1230	2616.2	1232	2616.2	1234	2616.2
1236	2616.2	1238	2616.2	1240	2616.2	1242	2616.2	1244	2616.2
1246	2616.2	1248	2616.2	1250	2616.2				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
756	.03	756	.03	1250	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
756	1250	50	50	50	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2614.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.14	Wt. n-Val.		0.030	
W.S. Elev (ft)	2612.62	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2612.62	Flow Area (sq ft)		1152.04	
E.G. Slope (ft/ft)	0.008230	Area (sq ft)		1152.04	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	270.89	Top Width (ft)		270.89	
Vel Total (ft/s)	11.74	Avg. Vel. (ft/s)		11.74	
Max Chl Dpth (ft)	4.42	Hydr. Depth (ft)		4.25	
Conv. Total (cfs)	149139.7	Conv. (cfs)		149139.7	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		272.64	
Min Ch El (ft)	2608.20	Shear (lb/sq ft)		2.17	
Alpha	1.00	Stream Power (lb/ft s)		25.50	
Frctn Loss (ft)	0.41	Cum Volume (acre-ft)		15.40	
C & E Loss (ft)	0.01	Cum SA (acres)		3.41	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 3400

INPUT
Description: 3400
Station Elevation Data num= 250

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
768	2615	770	2615	772	2615	774	2615	776	2615
778	2615	780	2615	782	2615	784	2615	786	2615
788	2615	790	2615	792	2615	794	2615	796	2615
798	2615	800	2615	802	2615	804	2615	806	2615
808	2615	810	2615	812	2615	814	2615	816	2615
818	2615	820	2615	822	2615	824	2615	826	2614.8
828	2614.5	830	2613.6	832	2612.8	834	2611.8	836	2610.9
838	2609.9	840	2609	842	2608	844	2607.6	846	2607
848	2607	850	2607	852	2607	854	2607	856	2607
858	2607	860	2607	862	2607	864	2607	866	2607
868	2607	870	2607	872	2607	874	2607	876	2607
878	2607	880	2607	882	2607	884	2607	886	2607
888	2607	890	2607	892	2607	894	2607	896	2607
898	2607	900	2607	902	2607	904	2607	906	2607
908	2607	910	2607	912	2607	914	2607	916	2607
918	2607	920	2607	922	2607	924	2607	926	2607
928	2607	930	2607	932	2607	934	2607	936	2607
938	2607	940	2607	942	2607	944	2607	946	2607
948	2607	950	2607	952	2607	954	2607	956	2607
958	2607	960	2607	962	2607	964	2607	966	2607
968	2607	970	2607	972	2607	974	2607	976	2607
978	2607	980	2607	982	2607	984	2607	986	2607
988	2607	990	2607	992	2607	994	2607	996	2607
998	2607	1000	2607	1002	2607	1004	2607	1006	2607
1008	2607	1010	2607	1012	2607	1014	2607	1016	2607
1018	2607	1020	2607	1022	2607	1024	2607	1026	2607.1
1028	2607.1	1030	2607.1	1032	2607.1	1034	2607.1	1036	2607.1
1038	2607.1	1040	2607.1	1042	2607.1	1044	2607.1	1046	2607.1
1048	2607.1	1050	2607.1	1052	2607.1	1054	2607.1	1056	2607.1
1058	2607.1	1060	2607.1	1062	2607.1	1064	2607.1	1066	2607.1
1068	2607.1	1070	2607.1	1072	2607.1	1074	2607.1	1076	2607.1
1078	2607.1	1080	2607.1	1082	2607.1	1084	2607.1	1086	2607.2
1088	2607.9	1090	2608.4	1092	2609.3	1094	2610.2	1096	2611.2
1098	2612.1	1100	2613	1102	2613.9	1104	2614.6	1106	2615
1108	2615	1110	2615	1112	2615	1114	2615	1116	2615
1118	2615	1120	2615	1122	2615	1124	2615	1126	2615
1128	2615	1130	2615	1132	2615	1134	2615	1136	2615
1138	2615	1140	2615	1142	2615	1144	2615	1146	2615
1148	2615	1150	2615	1152	2615	1154	2615	1156	2615

1158	2615	1160	2615	1162	2615	1164	2615	1166	2615
1168	2615	1170	2615	1172	2615	1174	2615	1176	2615
1178	2615	1180	2615	1182	2615	1184	2615	1186	2615
1188	2615	1190	2615	1192	2615	1194	2615	1196	2615
1198	2615	1200	2615	1202	2615	1204	2615	1206	2615
1208	2615	1210	2615	1212	2615	1214	2615	1216	2615
1218	2615	1220	2615	1222	2615	1224	2615	1226	2615
1228	2615	1230	2615	1232	2615	1234	2615	1236	2615
1238	2615	1240	2615	1242	2615	1244	2615	1246	2615
1248	2615	1250	2615	1252	2615	1254	2615	1256	2615
1258	2615	1260	2615	1262	2615	1264	2615	1266	2615

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
768	.03	768	.03	1266	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
768	1266	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	2613.74	Element			
Vel Head (ft)	2.19	Wt. n-Val.		0.030	
W.S. Elev (ft)	2611.54	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2611.54	Flow Area (sq ft)		1138.53	
E.G. Slope (ft/ft)	0.008201	Area (sq ft)		1138.53	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	262.19	Top Width (ft)		262.19	
Vel Total (ft/s)	11.88	Avg. Vel. (ft/s)		11.88	
Max Chl Dpth (ft)	4.54	Hydr. Depth (ft)		4.34	
Conv. Total (cfs)	149409.0	Conv. (cfs)		149409.0	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		264.00	
Min Ch El (ft)	2607.00	Shear (lb/sq ft)		2.21	
Alpha	1.00	Stream Power (lb/ft s)		26.24	
Frctn Loss (ft)	0.41	Cum Volume (acre-ft)		14.08	
C & E Loss (ft)	0.00	Cum SA (acres)		3.11	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 3350

INPUT
Description: 3350
Station Elevation Data num= 253

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
774	2613.8	776	2613.8	778	2613.8	780	2613.8	782	2613.8
784	2613.8	786	2613.8	788	2613.8	790	2613.8	792	2613.8
794	2613.8	796	2613.8	798	2613.8	800	2613.8	802	2613.8
804	2613.8	806	2613.8	808	2613.8	810	2613.8	812	2613.8
814	2613.8	816	2613.8	818	2613.8	820	2613.8	822	2613.9
824	2613.9	826	2613.9	828	2613.9	830	2613.9	832	2613.9
834	2613.9	836	2613.5	838	2613	840	2612.1	842	2611.1
844	2610.2	846	2609.2	848	2608.3	850	2607.3	852	2606.8
854	2606.1	856	2605.9	858	2605.8	860	2605.8	862	2605.8
864	2605.8	866	2605.8	868	2605.8	870	2605.8	872	2605.8
874	2605.8	876	2605.8	878	2605.8	880	2605.8	882	2605.8
884	2605.8	886	2605.8	888	2605.8	890	2605.8	892	2605.8
894	2605.8	896	2605.8	898	2605.8	900	2605.8	902	2605.8
904	2605.8	906	2605.8	908	2605.8	910	2605.8	912	2605.8
914	2605.8	916	2605.8	918	2605.8	920	2605.8	922	2605.8
924	2605.8	926	2605.8	928	2605.8	930	2605.8	932	2605.8
934	2605.8	936	2605.8	938	2605.8	940	2605.8	942	2605.8
944	2605.8	946	2605.8	948	2605.8	950	2605.8	952	2605.8
954	2605.8	956	2605.8	958	2605.8	960	2605.8	962	2605.8
964	2605.8	966	2605.8	968	2605.8	970	2605.8	972	2605.8

974	2605.8	976	2605.8	978	2605.8	980	2605.8	982	2605.8
984	2605.8	986	2605.8	988	2605.8	990	2605.8	992	2605.8
994	2605.9	996	2605.9	998	2605.9	1000	2605.9	1002	2605.9
1004	2605.9	1006	2605.9	1008	2605.9	1010	2605.9	1012	2605.9
1014	2605.9	1016	2605.9	1018	2605.9	1020	2605.9	1022	2605.9
1024	2605.9	1026	2605.9	1028	2605.9	1030	2605.9	1032	2605.9
1034	2605.9	1036	2605.9	1038	2605.9	1040	2605.9	1042	2605.9
1044	2605.9	1046	2605.9	1048	2605.9	1050	2605.9	1052	2605.9
1054	2605.9	1056	2605.9	1058	2605.9	1060	2605.9	1062	2605.9
1064	2605.9	1066	2605.9	1068	2605.9	1070	2605.9	1072	2605.9
1074	2605.9	1076	2605.9	1078	2605.9	1080	2605.9	1082	2605.9
1084	2605.9	1086	2606.3	1088	2606.4	1090	2607.2	1092	2608.1
1094	2609.1	1096	2610	1098	2610.9	1100	2611.8	1102	2612.8
1104	2613	1106	2613.8	1108	2613.8	1110	2613.8	1112	2613.8
1114	2613.8	1116	2613.8	1118	2613.8	1120	2613.8	1122	2613.8
1124	2613.8	1126	2613.8	1128	2613.8	1130	2613.8	1132	2613.8
1134	2613.8	1136	2613.8	1138	2613.8	1140	2613.8	1142	2613.8
1144	2613.8	1146	2613.8	1148	2613.8	1150	2613.8	1152	2613.8
1154	2613.8	1156	2613.8	1158	2613.8	1160	2613.8	1162	2613.8
1164	2613.8	1166	2613.8	1168	2613.8	1170	2613.8	1172	2613.8
1174	2613.8	1176	2613.8	1178	2613.8	1180	2613.8	1182	2613.8
1184	2613.8	1186	2613.8	1188	2613.8	1190	2613.8	1192	2613.8
1194	2613.8	1196	2613.8	1198	2613.8	1200	2613.8	1202	2613.8
1204	2613.8	1206	2613.8	1208	2613.8	1210	2613.8	1212	2613.8
1214	2613.8	1216	2613.8	1218	2613.8	1220	2613.8	1222	2613.8
1224	2613.8	1226	2613.8	1228	2613.8	1230	2613.8	1232	2613.8
1234	2613.8	1236	2613.8	1238	2613.8	1240	2613.8	1242	2613.8
1244	2613.8	1246	2613.8	1248	2613.8	1250	2613.8	1252	2613.8
1254	2613.8	1256	2613.8	1258	2613.8	1260	2613.8	1262	2613.8
1264	2613.8	1266	2613.8	1268	2613.8	1270	2613.8	1272	2613.8
1274	2613.8	1276	2613.8	1278	2613.8				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
774	.03	774	.03	1278	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
774	1278	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2612.71	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.24	Wt. n-Val.		0.030	
W.S. Elev (ft)	2610.48	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2610.48	Flow Area (sq ft)		1127.11	
E.G. Slope (ft/ft)	0.008119	Area (sq ft)		1127.11	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	253.67	Top Width (ft)		253.67	
Vel Total (ft/s)	12.00	Avg. Vel. (ft/s)		12.00	
Max Chl Dpth (ft)	4.68	Hydr. Depth (ft)		4.44	
Conv. Total (cfs)	150156.0	Conv. (cfs)		150156.0	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		255.51	
Min Ch El (ft)	2605.80	Shear (lb/sq ft)		2.24	
Alpha	1.00	Stream Power (lb/ft s)		26.84	
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)		12.78	
C & E Loss (ft)	0.00	Cum SA (acres)		2.81	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 3300

INPUT
Description: 3300
Station Elevation Data num= 257

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

782	2612.7	784	2612.7	786	2612.7	788	2612.7	790	2612.7
792	2612.7	794	2612.7	796	2612.7	798	2612.7	800	2612.7
802	2612.7	804	2612.7	806	2612.7	808	2612.7	810	2612.7
812	2612.7	814	2612.7	816	2612.7	818	2612.7	820	2612.7
822	2612.7	824	2612.7	826	2612.7	828	2612.7	830	2612.7
832	2612.7	834	2612.7	836	2612.7	838	2612.7	840	2612.6
842	2612.6	844	2612.1	846	2611.3	848	2610.4	850	2609.4
852	2608.4	854	2607.4	856	2606.5	858	2605.9	860	2605
862	2604.7	864	2604.7	866	2604.7	868	2604.7	870	2604.7
872	2604.7	874	2604.7	876	2604.7	878	2604.7	880	2604.7
882	2604.7	884	2604.7	886	2604.7	888	2604.7	890	2604.7
892	2604.7	894	2604.7	896	2604.7	898	2604.7	900	2604.7
902	2604.7	904	2604.7	906	2604.7	908	2604.7	910	2604.7
912	2604.7	914	2604.7	916	2604.7	918	2604.7	920	2604.7
922	2604.7	924	2604.7	926	2604.7	928	2604.7	930	2604.7
932	2604.7	934	2604.7	936	2604.7	938	2604.7	940	2604.7
942	2604.7	944	2604.7	946	2604.7	948	2604.7	950	2604.7
952	2604.7	954	2604.7	956	2604.7	958	2604.7	960	2604.7
962	2604.7	964	2604.7	966	2604.7	968	2604.7	970	2604.7
972	2604.7	974	2604.7	976	2604.7	978	2604.7	980	2604.7
982	2604.7	984	2604.7	986	2604.7	988	2604.7	990	2604.7
992	2604.7	994	2604.7	996	2604.7	998	2604.7	1000	2604.7
1002	2604.7	1004	2604.7	1006	2604.7	1008	2604.7	1010	2604.7
1012	2604.7	1014	2604.7	1016	2604.7	1018	2604.7	1020	2604.7
1022	2604.7	1024	2604.7	1026	2604.7	1028	2604.7	1030	2604.7
1032	2604.7	1034	2604.7	1036	2604.7	1038	2604.7	1040	2604.7
1042	2604.7	1044	2604.7	1046	2604.7	1048	2604.7	1050	2604.7
1052	2604.7	1054	2604.7	1056	2604.7	1058	2604.7	1060	2604.7
1062	2604.7	1064	2604.7	1066	2604.7	1068	2604.7	1070	2604.7
1072	2604.7	1074	2604.7	1076	2604.7	1078	2604.7	1080	2604.7
1082	2604.7	1084	2604.8	1086	2604.8	1088	2605.3	1090	2606
1092	2606.9	1094	2607.9	1096	2608.8	1098	2609.7	1100	2610.7
1102	2611.3	1104	2612.2	1106	2612.6	1108	2612.6	1110	2612.6
1112	2612.6	1114	2612.6	1116	2612.6	1118	2612.6	1120	2612.6
1122	2612.6	1124	2612.6	1126	2612.6	1128	2612.6	1130	2612.6
1132	2612.6	1134	2612.6	1136	2612.6	1138	2612.6	1140	2612.6
1142	2612.6	1144	2612.6	1146	2612.6	1148	2612.6	1150	2612.6
1152	2612.6	1154	2612.6	1156	2612.6	1158	2612.6	1160	2612.6
1162	2612.6	1164	2612.6	1166	2612.6	1168	2612.6	1170	2612.6
1172	2612.6	1174	2612.6	1176	2612.6	1178	2612.6	1180	2612.6
1182	2612.6	1184	2612.6	1186	2612.6	1188	2612.6	1190	2612.6
1192	2612.6	1194	2612.6	1196	2612.6	1198	2612.6	1200	2612.6
1202	2612.6	1204	2612.7	1206	2612.7	1208	2612.7	1210	2612.7
1212	2612.7	1214	2612.7	1216	2612.7	1218	2612.7	1220	2612.7
1222	2612.7	1224	2612.7	1226	2612.7	1228	2612.7	1230	2612.7
1232	2612.7	1234	2612.7	1236	2612.7	1238	2612.7	1240	2612.7
1242	2612.7	1244	2612.7	1246	2612.7	1248	2612.7	1250	2612.7
1252	2612.7	1254	2612.7	1256	2612.7	1258	2612.7	1260	2612.7
1262	2612.7	1264	2612.7	1266	2612.7	1268	2612.7	1270	2612.7
1272	2612.7	1274	2612.7	1276	2612.7	1278	2612.7	1280	2612.7
1282	2612.7	1284	2612.7	1286	2612.7	1288	2612.7	1290	2612.7
1292	2612.7	1294	2612.7						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
782	.03	782	.03	1294	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
782	1294	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2611.69	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.27	Wt. n-Val.		0.030	
W.S. Elev (ft)	2609.42	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2609.42	Flow Area (sq ft)		1118.04	
E.G. Slope (ft/ft)	0.008073	Area (sq ft)		1118.04	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	247.41	Top Width (ft)		247.41	
Vel Total (ft/s)	12.10	Avg. Vel. (ft/s)		12.10	
Max Chl Dpth (ft)	4.72	Hydr. Depth (ft)		4.52	
Conv. Total (cfs)	150588.6	Conv. (cfs)		150588.6	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		249.32	
Min Ch El (ft)	2604.70	Shear (lb/sq ft)		2.26	

Alpha	1.00	Stream Power (lb/ft s)	27.35
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)	11.49
C & E Loss (ft)	0.00	Cum SA (acres)	2.52

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 3250

INPUT
Description: 3250
Station Elevation Data num= 261

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
784	2611.5	786	2611.5	788	2611.5	790	2611.5	792	2611.5
794	2611.5	796	2611.5	798	2611.5	800	2611.5	802	2611.5
804	2611.5	806	2611.5	808	2611.5	810	2611.5	812	2611.5
814	2611.5	816	2611.5	818	2611.5	820	2611.5	822	2611.5
824	2611.5	826	2611.5	828	2611.5	830	2611.5	832	2611.5
834	2611.5	836	2611.5	838	2611.5	840	2611.5	842	2611.3
844	2611	846	2610.5	848	2609.7	850	2608.7	852	2607.7
854	2606.7	856	2605.7	858	2604.8	860	2604	862	2603.7
864	2603.6	866	2603.5	868	2603.5	870	2603.5	872	2603.5
874	2603.5	876	2603.5	878	2603.5	880	2603.5	882	2603.5
884	2603.5	886	2603.5	888	2603.5	890	2603.5	892	2603.5
894	2603.5	896	2603.5	898	2603.5	900	2603.5	902	2603.5
904	2603.5	906	2603.5	908	2603.5	910	2603.5	912	2603.5
914	2603.5	916	2603.5	918	2603.5	920	2603.5	922	2603.5
924	2603.5	926	2603.5	928	2603.5	930	2603.5	932	2603.5
934	2603.5	936	2603.5	938	2603.5	940	2603.5	942	2603.5
944	2603.5	946	2603.5	948	2603.5	950	2603.5	952	2603.5
954	2603.5	956	2603.5	958	2603.5	960	2603.5	962	2603.5
964	2603.5	966	2603.5	968	2603.5	970	2603.5	972	2603.5
974	2603.5	976	2603.5	978	2603.5	980	2603.5	982	2603.5
984	2603.5	986	2603.5	988	2603.5	990	2603.5	992	2603.5
994	2603.5	996	2603.5	998	2603.5	1000	2603.5	1002	2603.5
1004	2603.5	1006	2603.5	1008	2603.5	1010	2603.5	1012	2603.5
1014	2603.5	1016	2603.5	1018	2603.5	1020	2603.5	1022	2603.5
1024	2603.5	1026	2603.5	1028	2603.5	1030	2603.5	1032	2603.5
1034	2603.5	1036	2603.5	1038	2603.5	1040	2603.5	1042	2603.5
1044	2603.5	1046	2603.5	1048	2603.5	1050	2603.5	1052	2603.5
1054	2603.5	1056	2603.5	1058	2603.5	1060	2603.5	1062	2603.5
1064	2603.5	1066	2603.5	1068	2603.5	1070	2603.5	1072	2603.5
1074	2603.5	1076	2603.5	1078	2603.5	1080	2603.5	1082	2603.5
1084	2603.5	1086	2603.7	1088	2604.2	1090	2605	1092	2605.9
1094	2606.8	1096	2607.7	1098	2608.6	1100	2609.5	1102	2610.4
1104	2611.2	1106	2611.4	1108	2611.4	1110	2611.5	1112	2611.5
1114	2611.5	1116	2611.5	1118	2611.5	1120	2611.5	1122	2611.5
1124	2611.5	1126	2611.5	1128	2611.5	1130	2611.5	1132	2611.5
1134	2611.5	1136	2611.5	1138	2611.5	1140	2611.5	1142	2611.5
1144	2611.5	1146	2611.5	1148	2611.5	1150	2611.5	1152	2611.5
1154	2611.5	1156	2611.5	1158	2611.5	1160	2611.5	1162	2611.5
1164	2611.5	1166	2611.5	1168	2611.5	1170	2611.5	1172	2611.5
1174	2611.5	1176	2611.5	1178	2611.5	1180	2611.5	1182	2611.5
1184	2611.5	1186	2611.5	1188	2611.5	1190	2611.5	1192	2611.5
1194	2611.5	1196	2611.5	1198	2611.5	1200	2611.5	1202	2611.5
1204	2611.5	1206	2611.5	1208	2611.5	1210	2611.5	1212	2611.5
1214	2611.5	1216	2611.5	1218	2611.5	1220	2611.5	1222	2611.5
1224	2611.5	1226	2611.5	1228	2611.5	1230	2611.5	1232	2611.5
1234	2611.5	1236	2611.5	1238	2611.5	1240	2611.5	1242	2611.5
1244	2611.5	1246	2611.5	1248	2611.5	1250	2611.5	1252	2611.5
1254	2611.5	1256	2611.5	1258	2611.5	1260	2611.5	1262	2611.5
1264	2611.5	1266	2611.5	1268	2611.5	1270	2611.5	1272	2611.5
1274	2611.5	1276	2611.5	1278	2611.5	1280	2611.5	1282	2611.5
1284	2611.5	1286	2611.5	1288	2611.5	1290	2611.5	1292	2611.5
1294	2611.5	1296	2611.5	1298	2611.5	1300	2611.5	1302	2611.5
1304	2611.5								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
784	.03	784	.03	1304	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
784	1304	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	2610.52	Element			
Vel Head (ft)	2.27	Wt. n-Val.		0.030	
W.S. Elev (ft)	2608.24	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2608.24	Flow Area (sq ft)		1118.78	
E.G. Slope (ft/ft)	0.008006	Area (sq ft)		1118.78	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	246.30	Top Width (ft)		246.30	
Vel Total (ft/s)	12.09	Avg. Vel. (ft/s)		12.09	
Max Chl Dpth (ft)	4.74	Hydr. Depth (ft)		4.54	
Conv. Total (cfs)	151210.0	Conv. (cfs)		151210.0	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		248.20	
Min Ch El (ft)	2603.50	Shear (lb/sq ft)		2.25	
Alpha	1.00	Stream Power (lb/ft s)		27.25	
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)		10.21	
C & E Loss (ft)	0.00	Cum SA (acres)		2.24	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 3200

INPUT
Description: 3200
Station Elevation Data num= 268

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
786	2610.3	788	2610.3	790	2610.3	792	2610.3	794	2610.3
796	2610.3	798	2610.3	800	2610.3	802	2610.3	804	2610.3
806	2610.3	808	2610.3	810	2610.3	812	2610.3	814	2610.3
816	2610.3	818	2610.3	820	2610.3	822	2610.3	824	2610.3
826	2610.3	828	2610.3	830	2610.3	832	2610.3	834	2610.3
836	2610.3	838	2610.3	840	2610.3	842	2610.3	844	2610.1
846	2609.8	848	2608.8	850	2608	852	2607	854	2606
856	2605	858	2604	860	2603.2	862	2602.7	864	2602.3
866	2602.3	868	2602.3	870	2602.3	872	2602.3	874	2602.3
876	2602.3	878	2602.3	880	2602.3	882	2602.3	884	2602.3
886	2602.3	888	2602.3	890	2602.3	892	2602.3	894	2602.3
896	2602.3	898	2602.3	900	2602.3	902	2602.3	904	2602.3
906	2602.3	908	2602.3	910	2602.3	912	2602.3	914	2602.3
916	2602.3	918	2602.3	920	2602.3	922	2602.3	924	2602.3
926	2602.3	928	2602.3	930	2602.3	932	2602.3	934	2602.3
936	2602.3	938	2602.3	940	2602.3	942	2602.3	944	2602.3
946	2602.3	948	2602.3	950	2602.3	952	2602.3	954	2602.3
956	2602.3	958	2602.3	960	2602.3	962	2602.3	964	2602.3
966	2602.3	968	2602.3	970	2602.3	972	2602.3	974	2602.3
976	2602.3	978	2602.3	980	2602.3	982	2602.3	984	2602.3
986	2602.3	988	2602.3	990	2602.3	992	2602.3	994	2602.3
996	2602.3	998	2602.3	1000	2602.3	1002	2602.3	1004	2602.3
1006	2602.3	1008	2602.3	1010	2602.3	1012	2602.3	1014	2602.3
1016	2602.3	1018	2602.3	1020	2602.3	1022	2602.3	1024	2602.3
1026	2602.3	1028	2602.3	1030	2602.3	1032	2602.3	1034	2602.3
1036	2602.3	1038	2602.3	1040	2602.3	1042	2602.3	1044	2602.3
1046	2602.3	1048	2602.3	1050	2602.3	1052	2602.3	1054	2602.3
1056	2602.3	1058	2602.3	1060	2602.3	1062	2602.3	1064	2602.3
1066	2602.3	1068	2602.3	1070	2602.3	1072	2602.3	1074	2602.3
1076	2602.3	1078	2602.3	1080	2602.3	1082	2602.3	1084	2602.4
1086	2602.7	1088	2603.3	1090	2603.9	1092	2604.8	1094	2605.7

1096	2606.6	1098	2607.5	1100	2608.4	1102	2609.2	1104	2609.8
1106	2610	1108	2610.3	1110	2610.3	1112	2610.3	1114	2610.3
1116	2610.3	1118	2610.3	1120	2610.3	1122	2610.3	1124	2610.3
1126	2610.3	1128	2610.3	1130	2610.3	1132	2610.3	1134	2610.3
1136	2610.3	1138	2610.3	1140	2610.3	1142	2610.3	1144	2610.3
1146	2610.3	1148	2610.3	1150	2610.3	1152	2610.3	1154	2610.3
1156	2610.3	1158	2610.3	1160	2610.3	1162	2610.3	1164	2610.3
1166	2610.3	1168	2610.3	1170	2610.3	1172	2610.3	1174	2610.3
1176	2610.3	1178	2610.3	1180	2610.3	1182	2610.3	1184	2610.3
1186	2610.3	1188	2610.3	1190	2610.3	1192	2610.3	1194	2610.3
1196	2610.3	1198	2610.3	1200	2610.3	1202	2610.3	1204	2610.3
1206	2610.3	1208	2610.3	1210	2610.3	1212	2610.3	1214	2610.3
1216	2610.3	1218	2610.3	1220	2610.3	1222	2610.3	1224	2610.3
1226	2610.3	1228	2610.3	1230	2610.3	1232	2610.3	1234	2610.3
1236	2610.3	1238	2610.3	1240	2610.3	1242	2610.3	1244	2610.3
1246	2610.3	1248	2610.3	1250	2610.3	1252	2610.3	1254	2610.3
1256	2610.3	1258	2610.3	1260	2610.3	1262	2610.3	1264	2610.3
1266	2610.3	1268	2610.3	1270	2610.3	1272	2610.3	1274	2610.3
1276	2610.3	1278	2610.3	1280	2610.3	1282	2610.3	1284	2610.3
1286	2610.3	1288	2610.3	1290	2610.3	1292	2610.3	1294	2610.3
1296	2610.3	1298	2610.3	1300	2610.3	1302	2610.3	1304	2610.3
1306	2610.3	1308	2610.3	1310	2610.3	1312	2610.3	1314	2610.3
1316	2610.3	1318	2610.3	1320	2610.3				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
786	.03	786	.03	1320	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
786	1320	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2609.34	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.29	Wt. n-Val.		0.030	
W.S. Elev (ft)	2607.05	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2607.05	Flow Area (sq ft)		1114.03	
E.G. Slope (ft/ft)	0.008067	Area (sq ft)		1114.03	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	245.11	Top Width (ft)		245.11	
Vel Total (ft/s)	12.15	Avg. Vel. (ft/s)		12.15	
Max Chl Dpth (ft)	4.75	Hydr. Depth (ft)		4.55	
Conv. Total (cfs)	150641.6	Conv. (cfs)		150641.6	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		246.96	
Min Ch El (ft)	2602.30	Shear (lb/sq ft)		2.27	
Alpha	1.00	Stream Power (lb/ft s)		27.59	
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)		8.93	
C & E Loss (ft)	0.00	Cum SA (acres)		1.96	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 3150

INPUT
Description: 3150
Station Elevation Data num= 274

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
786	2609.1	788	2609.1	790	2609.1	792	2609.1	794	2609.1
796	2609.1	798	2609.1	800	2609.1	802	2609.1	804	2609.1
806	2609.1	808	2609.1	810	2609.1	812	2609.1	814	2609.1
816	2609.1	818	2609.1	820	2609.1	822	2609.1	824	2609.1
826	2609.1	828	2609.1	830	2609.1	832	2609.1	834	2609.1
836	2609.1	838	2609.1	840	2609.1	842	2609.1	844	2609.1
846	2608.5	848	2608.2	850	2607.3	852	2606.3	854	2605.2
856	2604.2	858	2603.2	860	2602.4	862	2601.5	864	2601.3

866	2601.1	868	2601.1	870	2601.1	872	2601.1	874	2601.1
876	2601.1	878	2601.1	880	2601.1	882	2601.1	884	2601.1
886	2601.1	888	2601.1	890	2601.1	892	2601.1	894	2601.1
896	2601.1	898	2601.1	900	2601.1	902	2601.1	904	2601.2
906	2601.2	908	2601.2	910	2601.2	912	2601.2	914	2601.2
916	2601.2	918	2601.2	920	2601.2	922	2601.2	924	2601.2
926	2601.2	928	2601.2	930	2601.2	932	2601.2	934	2601.2
936	2601.2	938	2601.1	940	2601.1	942	2601.1	944	2601.1
946	2601.1	948	2601.1	950	2601.1	952	2601.1	954	2601.1
956	2601.1	958	2601.1	960	2601.1	962	2601.1	964	2601.1
966	2601.1	968	2601.1	970	2601.1	972	2601.1	974	2601.1
976	2601.1	978	2601.1	980	2601.1	982	2601.1	984	2601.1
986	2601.1	988	2601.1	990	2601.1	992	2601.1	994	2601.1
996	2601.1	998	2601.1	1000	2601.1	1002	2601.1	1004	2601.1
1006	2601.1	1008	2601.1	1010	2601.1	1012	2601.1	1014	2601.1
1016	2601.1	1018	2601.1	1020	2601.1	1022	2601.1	1024	2601.1
1026	2601.1	1028	2601.1	1030	2601.1	1032	2601.1	1034	2601.1
1036	2601.1	1038	2601.1	1040	2601.1	1042	2601.1	1044	2601.1
1046	2601.1	1048	2601.1	1050	2601.1	1052	2601.1	1054	2601.1
1056	2601.1	1058	2601.1	1060	2601.1	1062	2601.1	1064	2601.1
1066	2601.1	1068	2601.1	1070	2601.1	1072	2601.1	1074	2601.1
1076	2601.1	1078	2601.1	1080	2601.1	1082	2601.1	1084	2601.3
1086	2601.6	1088	2602	1090	2602.9	1092	2603.7	1094	2604.6
1096	2605.5	1098	2606.3	1100	2607.2	1102	2608	1104	2608.5
1106	2609	1108	2609.1	1110	2609.1	1112	2609.1	1114	2609.1
1116	2609.1	1118	2609.1	1120	2609.1	1122	2609.1	1124	2609.1
1126	2609.1	1128	2609.1	1130	2609.1	1132	2609.1	1134	2609.1
1136	2609.1	1138	2609.1	1140	2609.1	1142	2609.1	1144	2609.1
1146	2609.1	1148	2609.1	1150	2609.1	1152	2609.1	1154	2609.1
1156	2609.1	1158	2609.1	1160	2609.1	1162	2609.1	1164	2609.1
1166	2609.1	1168	2609.1	1170	2609.1	1172	2609.1	1174	2609.1
1176	2609.1	1178	2609.1	1180	2609.1	1182	2609.1	1184	2609.1
1186	2609.1	1188	2609.1	1190	2609.1	1192	2609.1	1194	2609.1
1196	2609.1	1198	2609.1	1200	2609.1	1202	2609.1	1204	2609.1
1206	2609.1	1208	2609.1	1210	2609.1	1212	2609.1	1214	2609.1
1216	2609.1	1218	2609.1	1220	2609.1	1222	2609.1	1224	2609.1
1226	2609.1	1228	2609.1	1230	2609.1	1232	2609.1	1234	2609.1
1236	2609.1	1238	2609.1	1240	2609.1	1242	2609.1	1244	2609.1
1246	2609.1	1248	2609.1	1250	2609.1	1252	2609.1	1254	2609.1
1256	2609.1	1258	2609.1	1260	2609.1	1262	2609.1	1264	2609.1
1266	2609.1	1268	2609.1	1270	2609.1	1272	2609.1	1274	2609.1
1276	2609.1	1278	2609.1	1280	2609.1	1282	2609.1	1284	2609.1
1286	2609.1	1288	2609.1	1290	2609.1	1292	2609.1	1294	2609.1
1296	2609.1	1298	2609.1	1300	2609.1	1302	2609.1	1304	2609.1
1306	2609.1	1308	2609.1	1310	2609.1	1312	2609.1	1314	2609.1
1316	2609.1	1318	2609.1	1320	2609.1	1322	2609.1	1324	2609.1
1326	2609.1	1328	2609.1	1330	2609.1	1332	2609.1		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
786	.03	786	.03	1332	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
786	1332	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2608.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.29	Wt. n-Val.		0.030	
W.S. Elev (ft)	2605.88	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2605.88	Flow Area (sq ft)		1113.35	
E.G. Slope (ft/ft)	0.008046	Area (sq ft)		1113.35	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	244.21	Top Width (ft)		244.21	
Vel Total (ft/s)	12.15	Avg. Vel. (ft/s)		12.15	
Max Chl Dpth (ft)	4.78	Hydr. Depth (ft)		4.56	
Conv. Total (cfs)	150838.3	Conv. (cfs)		150838.3	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		246.11	
Min Ch El (ft)	2601.10	Shear (lb/sq ft)		2.27	
Alpha	1.00	Stream Power (lb/ft s)		27.61	
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)		7.65	
C & E Loss (ft)	0.00	Cum SA (acres)		1.68	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 3100

INPUT
Description: 3100
Station Elevation Data num= 281

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
788	2608	790	2608	792	2608	794	2607.9	796	2607.9
798	2607.9	800	2607.9	802	2607.9	804	2607.9	806	2607.9
808	2607.9	810	2607.9	812	2607.9	814	2607.9	816	2607.9
818	2607.9	820	2607.9	822	2607.9	824	2607.9	826	2607.9
828	2607.9	830	2607.9	832	2607.9	834	2607.9	836	2607.9
838	2607.9	840	2607.9	842	2607.9	844	2607.8	846	2607.8
848	2607.6	850	2606.6	852	2605.5	854	2604.5	856	2603.4
858	2602.4	860	2601.4	862	2600.8	864	2600.1	866	2600
868	2600	870	2600	872	2600	874	2600	876	2600
878	2600	880	2600	882	2600	884	2600	886	2600
888	2600	890	2600	892	2600	894	2600	896	2600
898	2600	900	2600	902	2600	904	2600	906	2600
908	2600	910	2600	912	2600	914	2600	916	2600
918	2600	920	2600	922	2600	924	2600	926	2600
928	2600	930	2600	932	2600	934	2600	936	2600
938	2600	940	2600	942	2600	944	2600	946	2600
948	2600	950	2600	952	2600	954	2600	956	2600
958	2600	960	2600	962	2600	964	2600	966	2600
968	2600	970	2600	972	2600	974	2600	976	2600
978	2600	980	2600	982	2600	984	2600	986	2600
988	2600	990	2600	992	2600	994	2600	996	2600
998	2600	1000	2600	1002	2600	1004	2600	1006	2600
1008	2600	1010	2600	1012	2600	1014	2600	1016	2600
1018	2600	1020	2600	1022	2600	1024	2599.9	1026	2599.9
1028	2599.9	1030	2599.9	1032	2599.9	1034	2599.9	1036	2599.9
1038	2599.9	1040	2599.9	1042	2599.9	1044	2599.9	1046	2599.9
1048	2599.9	1050	2599.9	1052	2599.9	1054	2599.9	1056	2599.9
1058	2599.9	1060	2599.9	1062	2599.9	1064	2599.9	1066	2599.9
1068	2599.9	1070	2599.9	1072	2599.9	1074	2599.9	1076	2599.9
1078	2599.9	1080	2599.9	1082	2599.9	1084	2600.1	1086	2600.3
1088	2601	1090	2601.6	1092	2602.7	1094	2603.5	1096	2604.4
1098	2605.2	1100	2606.1	1102	2606.8	1104	2607.4	1106	2607.8
1108	2607.9	1110	2607.9	1112	2607.9	1114	2607.9	1116	2607.9
1118	2607.9	1120	2607.9	1122	2607.9	1124	2607.9	1126	2607.9
1128	2607.9	1130	2607.9	1132	2607.9	1134	2607.9	1136	2607.9
1138	2607.9	1140	2607.9	1142	2607.9	1144	2607.9	1146	2607.9
1148	2607.9	1150	2607.9	1152	2607.9	1154	2607.9	1156	2607.9
1158	2607.9	1160	2607.9	1162	2607.9	1164	2607.9	1166	2607.9
1168	2607.9	1170	2607.9	1172	2607.9	1174	2607.9	1176	2607.9
1178	2607.9	1180	2607.9	1182	2607.9	1184	2607.9	1186	2607.9
1188	2607.9	1190	2607.9	1192	2607.9	1194	2607.9	1196	2607.9
1198	2607.9	1200	2607.9	1202	2607.9	1204	2607.9	1206	2607.9
1208	2607.9	1210	2607.9	1212	2607.9	1214	2607.9	1216	2607.9
1218	2607.9	1220	2607.9	1222	2607.9	1224	2607.9	1226	2607.9
1228	2607.9	1230	2607.9	1232	2607.9	1234	2607.9	1236	2607.9
1238	2607.9	1240	2607.9	1242	2607.9	1244	2607.9	1246	2607.9
1248	2607.9	1250	2607.9	1252	2607.9	1254	2607.9	1256	2607.9
1258	2607.9	1260	2607.9	1262	2607.9	1264	2607.9	1266	2607.9
1268	2607.9	1270	2607.9	1272	2607.9	1274	2607.9	1276	2607.9
1278	2607.9	1280	2607.9	1282	2607.9	1284	2607.9	1286	2607.9
1288	2607.9	1290	2607.9	1292	2607.9	1294	2607.9	1296	2607.9
1298	2607.9	1300	2607.9	1302	2607.9	1304	2607.9	1306	2607.9
1308	2607.9	1310	2607.9	1312	2607.9	1314	2607.9	1316	2607.9
1318	2607.9	1320	2607.9	1322	2607.9	1324	2607.9	1326	2607.9
1328	2607.9	1330	2607.9	1332	2607.9	1334	2607.9	1336	2607.9
1338	2607.9	1340	2607.9	1342	2607.9	1344	2607.9	1346	2607.9
1348	2607.9								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
788	.03	788	.03	1348	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
788	1348	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	2607.05	Element			
Vel Head (ft)	2.30	Wt. n-Val.		0.030	
W.S. Elev (ft)	2604.75	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2604.75	Flow Area (sq ft)		1110.99	
E.G. Slope (ft/ft)	0.008067	Area (sq ft)		1110.99	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	243.36	Top Width (ft)		243.36	
Vel Total (ft/s)	12.18	Avg. Vel. (ft/s)		12.18	
Max Chl Dpth (ft)	4.85	Hydr. Depth (ft)		4.57	
Conv. Total (cfs)	150641.1	Conv. (cfs)		150641.1	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		245.28	
Min Ch El (ft)	2599.90	Shear (lb/sq ft)		2.28	
Alpha	1.00	Stream Power (lb/ft s)		27.78	
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)		6.37	
C & E Loss (ft)	0.00	Cum SA (acres)		1.40	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 3050

INPUT
Description: 3050
Station Elevation Data num= 287

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
786	2606.8	788	2606.8	790	2606.8	792	2606.8	794	2606.8
796	2606.8	798	2606.8	800	2606.8	802	2606.8	804	2606.8
806	2606.8	808	2606.8	810	2606.8	812	2606.8	814	2606.8
816	2606.8	818	2606.8	820	2606.8	822	2606.8	824	2606.8
826	2606.8	828	2606.8	830	2606.8	832	2606.8	834	2606.8
836	2606.8	838	2606.8	840	2606.8	842	2606.8	844	2606.8
846	2606.8	848	2606.1	850	2605.1	852	2604.3	854	2603.2
856	2602.2	858	2601.2	860	2600.3	862	2599.4	864	2599
866	2598.8	868	2598.8	870	2598.8	872	2598.8	874	2598.8
876	2598.8	878	2598.8	880	2598.8	882	2598.8	884	2598.8
886	2598.8	888	2598.8	890	2598.8	892	2598.8	894	2598.8
896	2598.8	898	2598.8	900	2598.8	902	2598.8	904	2598.8
906	2598.8	908	2598.8	910	2598.8	912	2598.8	914	2598.8
916	2598.8	918	2598.8	920	2598.8	922	2598.8	924	2598.8
926	2598.8	928	2598.8	930	2598.8	932	2598.8	934	2598.8
936	2598.8	938	2598.8	940	2598.8	942	2598.8	944	2598.8
946	2598.8	948	2598.8	950	2598.8	952	2598.8	954	2598.8
956	2598.8	958	2598.8	960	2598.8	962	2598.8	964	2598.8
966	2598.8	968	2598.8	970	2598.8	972	2598.8	974	2598.8
976	2598.8	978	2598.8	980	2598.8	982	2598.8	984	2598.8
986	2598.8	988	2598.8	990	2598.8	992	2598.8	994	2598.8
996	2598.8	998	2598.8	1000	2598.8	1002	2598.8	1004	2598.8
1006	2598.8	1008	2598.8	1010	2598.8	1012	2598.8	1014	2598.8
1016	2598.8	1018	2598.8	1020	2598.8	1022	2598.8	1024	2598.8
1026	2598.8	1028	2598.8	1030	2598.8	1032	2598.8	1034	2598.8
1036	2598.8	1038	2598.8	1040	2598.8	1042	2598.8	1044	2598.8
1046	2598.8	1048	2598.8	1050	2598.8	1052	2598.8	1054	2598.8
1056	2598.8	1058	2598.8	1060	2598.8	1062	2598.8	1064	2598.8
1066	2598.8	1068	2598.8	1070	2598.8	1072	2598.8	1074	2598.8
1076	2598.8	1078	2598.8	1080	2598.8	1082	2598.8	1084	2598.9
1086	2599.3	1088	2599.8	1090	2600.7	1092	2601.6	1094	2602.4
1096	2603.3	1098	2604.1	1100	2605	1102	2605.8	1104	2606.3

1106	2606.6	1108	2606.8	1110	2606.8	1112	2606.8	1114	2606.8
1116	2606.8	1118	2606.8	1120	2606.8	1122	2606.8	1124	2606.8
1126	2606.8	1128	2606.8	1130	2606.8	1132	2606.8	1134	2606.8
1136	2606.8	1138	2606.8	1140	2606.8	1142	2606.8	1144	2606.8
1146	2606.8	1148	2606.8	1150	2606.8	1152	2606.8	1154	2606.8
1156	2606.8	1158	2606.8	1160	2606.8	1162	2606.8	1164	2606.8
1166	2606.8	1168	2606.8	1170	2606.8	1172	2606.8	1174	2606.8
1176	2606.8	1178	2606.8	1180	2606.8	1182	2606.8	1184	2606.8
1186	2606.8	1188	2606.8	1190	2606.8	1192	2606.8	1194	2606.8
1196	2606.8	1198	2606.8	1200	2606.8	1202	2606.8	1204	2606.8
1206	2606.8	1208	2606.8	1210	2606.8	1212	2606.8	1214	2606.8
1216	2606.8	1218	2606.8	1220	2606.8	1222	2606.8	1224	2606.8
1226	2606.8	1228	2606.8	1230	2606.8	1232	2606.8	1234	2606.8
1236	2606.8	1238	2606.8	1240	2606.8	1242	2606.8	1244	2606.8
1246	2606.8	1248	2606.8	1250	2606.8	1252	2606.8	1254	2606.8
1256	2606.8	1258	2606.8	1260	2606.8	1262	2606.8	1264	2606.8
1266	2606.8	1268	2606.8	1270	2606.8	1272	2606.8	1274	2606.8
1276	2606.8	1278	2606.8	1280	2606.8	1282	2606.8	1284	2606.8
1286	2606.8	1288	2606.8	1290	2606.8	1292	2606.8	1294	2606.8
1296	2606.8	1298	2606.8	1300	2606.8	1302	2606.8	1304	2606.8
1306	2606.8	1308	2606.8	1310	2606.8	1312	2606.8	1314	2606.8
1316	2606.8	1318	2606.8	1320	2606.8	1322	2606.8	1324	2606.8
1326	2606.8	1328	2606.8	1330	2606.8	1332	2606.8	1334	2606.8
1336	2606.8	1338	2606.8	1340	2606.8	1342	2606.8	1344	2606.8
1346	2606.8	1348	2606.8	1350	2606.8	1352	2606.8	1354	2606.8
1356	2606.8	1358	2606.8						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
786	.03	786	.03	1358	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
786	1358	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2605.88	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.30	Wt. n-Val.		0.030	
W.S. Elev (ft)	2603.57	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2603.57	Flow Area (sq ft)		1110.85	
E.G. Slope (ft/ft)	0.008069	Area (sq ft)		1110.85	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	243.37	Top Width (ft)		243.37	
Vel Total (ft/s)	12.18	Avg. Vel. (ft/s)		12.18	
Max Chl Dpth (ft)	4.77	Hydr. Depth (ft)		4.56	
Conv. Total (cfs)	150618.3	Conv. (cfs)		150618.3	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		245.26	
Min Ch El (ft)	2598.80	Shear (lb/sq ft)		2.28	
Alpha	1.00	Stream Power (lb/ft s)		27.79	
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)		5.10	
C & E Loss (ft)	0.00	Cum SA (acres)		1.12	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 3000

INPUT
Description: 3000
Station Elevation Data num= 295

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
788	2605.6	790	2605.6	792	2605.6	794	2605.6	796	2605.6
798	2605.6	800	2605.6	802	2605.6	804	2605.6	806	2605.6
808	2605.6	810	2605.6	812	2605.6	814	2605.6	816	2605.6
818	2605.6	820	2605.6	822	2605.6	824	2605.6	826	2605.6
828	2605.6	830	2605.6	832	2605.6	834	2605.6	836	2605.6

838	2605.6	840	2605.6	842	2605.6	844	2605.6	846	2605.4
848	2604.9	850	2604	852	2603	854	2602	856	2601
858	2599.9	860	2599	862	2598	864	2597.6	866	2597.6
868	2597.6	870	2597.6	872	2597.6	874	2597.6	876	2597.6
878	2597.6	880	2597.6	882	2597.6	884	2597.6	886	2597.6
888	2597.6	890	2597.6	892	2597.6	894	2597.6	896	2597.6
898	2597.6	900	2597.6	902	2597.6	904	2597.6	906	2597.6
908	2597.6	910	2597.6	912	2597.6	914	2597.6	916	2597.6
918	2597.6	920	2597.6	922	2597.6	924	2597.6	926	2597.6
928	2597.6	930	2597.6	932	2597.6	934	2597.6	936	2597.6
938	2597.6	940	2597.6	942	2597.6	944	2597.6	946	2597.6
948	2597.6	950	2597.6	952	2597.6	954	2597.6	956	2597.6
958	2597.6	960	2597.6	962	2597.6	964	2597.6	966	2597.6
968	2597.6	970	2597.6	972	2597.6	974	2597.6	976	2597.6
978	2597.6	980	2597.6	982	2597.6	984	2597.6	986	2597.6
988	2597.6	990	2597.6	992	2597.6	994	2597.6	996	2597.6
998	2597.6	1000	2597.6	1002	2597.6	1004	2597.6	1006	2597.6
1008	2597.6	1010	2597.6	1012	2597.6	1014	2597.6	1016	2597.6
1018	2597.6	1020	2597.6	1022	2597.6	1024	2597.6	1026	2597.6
1028	2597.6	1030	2597.6	1032	2597.6	1034	2597.6	1036	2597.6
1038	2597.6	1040	2597.6	1042	2597.6	1044	2597.6	1046	2597.6
1048	2597.6	1050	2597.6	1052	2597.6	1054	2597.6	1056	2597.6
1058	2597.6	1060	2597.6	1062	2597.6	1064	2597.6	1066	2597.6
1068	2597.6	1070	2597.6	1072	2597.6	1074	2597.6	1076	2597.6
1078	2597.6	1080	2597.6	1082	2597.6	1084	2597.8	1086	2598.3
1088	2598.7	1090	2599.6	1092	2600.4	1094	2601.3	1096	2602.2
1098	2603.1	1100	2603.9	1102	2604.7	1104	2605.1	1106	2605.5
1108	2605.6	1110	2605.6	1112	2605.6	1114	2605.6	1116	2605.6
1118	2605.6	1120	2605.6	1122	2605.6	1124	2605.6	1126	2605.6
1128	2605.6	1130	2605.6	1132	2605.6	1134	2605.6	1136	2605.6
1138	2605.6	1140	2605.6	1142	2605.6	1144	2605.6	1146	2605.6
1148	2605.6	1150	2605.6	1152	2605.6	1154	2605.6	1156	2605.6
1158	2605.6	1160	2605.6	1162	2605.6	1164	2605.6	1166	2605.6
1168	2605.6	1170	2605.6	1172	2605.6	1174	2605.6	1176	2605.6
1178	2605.6	1180	2605.6	1182	2605.6	1184	2605.6	1186	2605.6
1188	2605.6	1190	2605.6	1192	2605.6	1194	2605.6	1196	2605.6
1198	2605.6	1200	2605.6	1202	2605.6	1204	2605.6	1206	2605.6
1208	2605.6	1210	2605.6	1212	2605.6	1214	2605.6	1216	2605.6
1218	2605.6	1220	2605.6	1222	2605.6	1224	2605.6	1226	2605.6
1228	2605.6	1230	2605.6	1232	2605.6	1234	2605.6	1236	2605.6
1238	2605.6	1240	2605.6	1242	2605.6	1244	2605.6	1246	2605.6
1248	2605.6	1250	2605.6	1252	2605.6	1254	2605.6	1256	2605.6
1258	2605.6	1260	2605.6	1262	2605.6	1264	2605.6	1266	2605.6
1268	2605.6	1270	2605.6	1272	2605.6	1274	2605.6	1276	2605.6
1278	2605.6	1280	2605.6	1282	2605.6	1284	2605.6	1286	2605.6
1288	2605.6	1290	2605.6	1292	2605.6	1294	2605.6	1296	2605.6
1298	2605.6	1300	2605.6	1302	2605.6	1304	2605.6	1306	2605.6
1308	2605.6	1310	2605.6	1312	2605.6	1314	2605.6	1316	2605.6
1318	2605.6	1320	2605.6	1322	2605.6	1324	2605.6	1326	2605.6
1328	2605.6	1330	2605.6	1332	2605.6	1334	2605.6	1336	2605.6
1338	2605.6	1340	2605.6	1342	2605.6	1344	2605.6	1346	2605.6
1348	2605.6	1350	2605.6	1352	2605.6	1354	2605.6	1356	2605.6
1358	2605.6	1360	2605.6	1362	2605.6	1364	2605.6	1366	2605.6
1368	2605.6	1370	2605.6	1372	2605.6	1374	2605.6	1376	2605.6

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
788	.03	788	.03	1376	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
788	1376	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2604.68	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.30	Wt. n-Val.		0.030	
W.S. Elev (ft)	2602.38	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2602.38	Flow Area (sq ft)		1110.70	
E.G. Slope (ft/ft)	0.008066	Area (sq ft)		1110.70	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	243.14	Top Width (ft)		243.14	
Vel Total (ft/s)	12.18	Avg. Vel. (ft/s)		12.18	
Max Chl Dpth (ft)	4.77	Hydr. Depth (ft)		4.57	
Conv. Total (cfs)	150653.2	Conv. (cfs)		150653.2	

Length Wtd. (ft)	50.00	Wetted Per. (ft)	245.10
Min Ch El (ft)	2597.60	Shear (lb/sq ft)	2.28
Alpha	1.00	Stream Power (lb/ft s)	27.80
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)	3.82
C & E Loss (ft)	0.00	Cum SA (acres)	0.84

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates
that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 2950

INPUT
Description: 2950
Station Elevation Data num= 280

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
788	2604.4	790	2604.4	792	2604.4	794	2604.4	796	2604.4
798	2604.4	800	2604.4	802	2604.4	804	2604.4	806	2604.4
808	2604.4	810	2604.4	812	2604.4	814	2604.4	816	2604.4
818	2604.4	820	2604.4	822	2604.4	824	2604.4	826	2604.4
828	2604.4	830	2604.4	832	2604.4	834	2604.4	836	2604.4
838	2604.4	840	2604.4	842	2604.4	844	2604.4	846	2604.3
848	2603.7	850	2602.7	852	2601.7	854	2600.7	856	2599.7
858	2598.7	860	2597.7	862	2596.9	864	2596.5	866	2596.4
868	2596.4	870	2596.4	872	2596.4	874	2596.4	876	2596.4
878	2596.4	880	2596.4	882	2596.4	884	2596.4	886	2596.4
888	2596.4	890	2596.4	892	2596.4	894	2596.4	896	2596.4
898	2596.4	900	2596.4	902	2596.4	904	2596.4	906	2596.4
908	2596.4	910	2596.4	912	2596.4	914	2596.4	916	2596.4
918	2596.4	920	2596.4	922	2596.4	924	2596.4	926	2596.4
928	2596.4	930	2596.4	932	2596.4	934	2596.4	936	2596.4
938	2596.4	940	2596.4	942	2596.4	944	2596.4	946	2596.4
948	2596.4	950	2596.4	952	2596.4	954	2596.4	956	2596.4
958	2596.4	960	2596.4	962	2596.4	964	2596.4	966	2596.4
968	2596.4	970	2596.4	972	2596.4	974	2596.4	976	2596.4
978	2596.4	980	2596.4	982	2596.4	984	2596.4	986	2596.4
988	2596.4	990	2596.4	992	2596.4	994	2596.4	996	2596.4
998	2596.4	1000	2596.4	1002	2596.4	1004	2596.4	1006	2596.4
1008	2596.4	1010	2596.4	1012	2596.4	1014	2596.4	1016	2596.4
1018	2596.4	1020	2596.4	1022	2596.4	1024	2596.4	1026	2596.4
1028	2596.4	1030	2596.4	1032	2596.4	1034	2596.4	1036	2596.4
1038	2596.4	1040	2596.4	1042	2596.4	1044	2596.4	1046	2596.4
1048	2596.4	1050	2596.4	1052	2596.4	1054	2596.4	1056	2596.4
1058	2596.4	1060	2596.4	1062	2596.4	1064	2596.4	1066	2596.4
1068	2596.4	1070	2596.4	1072	2596.4	1074	2596.4	1076	2596.4
1078	2596.4	1080	2596.4	1082	2596.4	1084	2596.8	1086	2597
1088	2597.5	1090	2598.4	1092	2599.3	1094	2600.2	1096	2601.1
1098	2602	1100	2602.8	1102	2603.5	1104	2604.1	1106	2604.4
1108	2604.4	1110	2604.4	1112	2604.4	1114	2604.4	1116	2604.4
1118	2604.4	1120	2604.4	1122	2604.4	1124	2604.4	1126	2604.4
1128	2604.4	1130	2604.4	1132	2604.4	1134	2604.4	1136	2604.4
1138	2604.4	1140	2604.4	1142	2604.4	1144	2604.4	1146	2604.4
1148	2604.4	1150	2604.4	1152	2604.4	1154	2604.4	1156	2604.4
1158	2604.4	1160	2604.4	1162	2604.4	1164	2604.4	1166	2604.4
1168	2604.4	1170	2604.4	1172	2604.4	1174	2604.4	1176	2604.4
1178	2604.4	1180	2604.4	1182	2604.4	1184	2604.4	1186	2604.4
1188	2604.4	1190	2604.4	1192	2604.4	1194	2604.4	1196	2604.4
1198	2604.4	1200	2604.4	1202	2604.4	1204	2604.4	1206	2604.4
1208	2604.4	1210	2604.4	1212	2604.4	1214	2604.4	1216	2604.4
1218	2604.4	1220	2604.4	1222	2604.4	1224	2604.4	1226	2604.4
1228	2604.4	1230	2604.4	1232	2604.4	1234	2604.4	1236	2604.4
1238	2604.4	1240	2604.4	1242	2604.4	1244	2604.4	1246	2604.4
1248	2604.4	1250	2604.4	1252	2604.4	1254	2604.4	1256	2604.4
1258	2604.4	1260	2604.4	1262	2604.4	1264	2604.4	1266	2604.4
1268	2604.4	1270	2604.4	1272	2604.4	1274	2604.4	1276	2604.4
1278	2604.4	1280	2604.4	1282	2604.4	1284	2604.4	1286	2604.4
1288	2604.4	1290	2604.4	1292	2604.4	1294	2604.4	1296	2604.4

1298	2604.4	1300	2604.4	1302	2604.4	1304	2604.4	1346	2604.4
1348	2604.4	1350	2604.4	1352	2604.4	1354	2604.4	1356	2604.4
1358	2604.4	1360	2604.4	1362	2604.4	1364	2604.4	1366	2604.4
1368	2604.4	1370	2604.4	1372	2604.4	1374	2604.4	1376	2604.4
1378	2604.4	1380	2604.4	1382	2604.4	1384	2604.4	1386	2604.4

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
788	.03	788	.03	1386	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
788	1386	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2603.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.30	Wt. n-Val.		0.030	
W.S. Elev (ft)	2601.18	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2601.18	Flow Area (sq ft)		1110.63	
E.G. Slope (ft/ft)	0.008065	Area (sq ft)		1110.63	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	243.12	Top Width (ft)		243.12	
Vel Total (ft/s)	12.18	Avg. Vel. (ft/s)		12.18	
Max Chl Dpth (ft)	4.78	Hydr. Depth (ft)		4.57	
Conv. Total (cfs)	150659.8	Conv. (cfs)		150659.8	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		245.04	
Min Ch El (ft)	2596.40	Shear (lb/sq ft)		2.28	
Alpha	1.00	Stream Power (lb/ft s)		27.80	
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)		2.55	
C & E Loss (ft)	0.00	Cum SA (acres)		0.56	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 2900

INPUT
Description: 2900
Station Elevation Data num= 221

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
788	2603.2	790	2603.2	792	2603.2	794	2603.2	796	2603.2
798	2603.2	800	2603.2	802	2603.2	804	2603.2	806	2603.2
808	2603.2	810	2603.2	812	2603.2	814	2603.2	816	2603.2
818	2603.3	820	2603.3	822	2603.3	824	2603.3	826	2603.3
828	2603.3	830	2603.3	832	2603.3	834	2603.3	836	2603.3
838	2603.3	840	2603.3	842	2603.3	844	2603.3	846	2603
848	2602.4	850	2601.4	852	2600.4	854	2599.4	856	2598.4
858	2597.4	860	2596.4	862	2595.7	864	2595.3	866	2595.3
868	2595.3	870	2595.3	872	2595.3	874	2595.3	876	2595.3
878	2595.3	880	2595.3	882	2595.3	884	2595.3	886	2595.2
888	2595.2	890	2595.2	892	2595.2	894	2595.2	896	2595.2
898	2595.2	900	2595.2	902	2595.2	904	2595.2	906	2595.2
908	2595.2	910	2595.2	912	2595.2	914	2595.2	916	2595.2
918	2595.2	920	2595.2	922	2595.2	924	2595.2	926	2595.2
928	2595.2	930	2595.2	932	2595.2	934	2595.2	936	2595.2
938	2595.2	940	2595.2	942	2595.2	944	2595.2	946	2595.2
948	2595.2	950	2595.2	952	2595.2	954	2595.2	956	2595.2
958	2595.2	960	2595.2	962	2595.2	964	2595.2	966	2595.2
968	2595.2	970	2595.2	972	2595.2	974	2595.2	976	2595.2
978	2595.2	980	2595.2	982	2595.2	984	2595.2	986	2595.2
988	2595.2	990	2595.2	992	2595.2	994	2595.2	996	2595.2
1026	2595.2	1028	2595.2	1030	2595.2	1032	2595.2	1034	2595.2
1036	2595.2	1038	2595.2	1040	2595.3	1042	2595.3	1044	2595.3
1046	2595.3	1048	2595.3	1050	2595.3	1052	2595.3	1054	2595.3
1056	2595.3	1058	2595.3	1060	2595.3	1062	2595.3	1064	2595.3
1066	2595.3	1068	2595.3	1070	2595.3	1072	2595.3	1074	2595.3

1076	2595.3	1078	2595.3	1080	2595.3	1082	2595.3	1084	2595.3
1086	2595.5	1088	2596.4	1090	2597.3	1092	2598.2	1094	2599.1
1096	2600	1098	2600.9	1100	2601.7	1102	2602.6	1104	2603.1
1106	2603.2	1108	2603.2	1110	2603.2	1112	2603.2	1114	2603.2
1116	2603.2	1118	2603.2	1120	2603.2	1122	2603.2	1124	2603.2
1126	2603.2	1128	2603.2	1130	2603.2	1132	2603.2	1134	2603.2
1136	2603.2	1138	2603.2	1140	2603.2	1142	2603.2	1144	2603.2
1146	2603.2	1148	2603.2	1150	2603.2	1152	2603.2	1154	2603.2
1156	2603.2	1158	2603.2	1160	2603.2	1162	2603.2	1164	2603.2
1166	2603.2	1168	2603.2	1170	2603.2	1172	2603.2	1174	2603.2
1176	2603.2	1178	2603.2	1180	2603.2	1182	2603.2	1184	2603.2
1186	2603.2	1188	2603.2	1190	2603.2	1192	2603.2	1194	2603.2
1196	2603.2	1198	2603.2	1200	2603.2	1202	2603.2	1204	2603.2
1206	2603.2	1208	2603.2	1210	2603.2	1212	2603.2	1214	2603.2
1216	2603.2	1218	2603.2	1220	2603.2	1222	2603.2	1224	2603.2
1226	2603.2	1228	2603.2	1230	2603.2	1232	2603.2	1380	2603.2
1382	2603.3	1384	2603.3	1386	2603.3	1388	2603.3	1390	2603.3
1392	2603.3	1394	2603.3	1396	2603.3	1398	2603.3	1400	2603.3
1402	2603.3								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
788	.03	788	.03	1402	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
788	1402	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2602.30	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.31	Wt. n-Val.		0.030	
W.S. Elev (ft)	2600.00	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	2600.00	Flow Area (sq ft)		1110.02	
E.G. Slope (ft/ft)	0.008086	Area (sq ft)		1110.02	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	243.18	Top Width (ft)		243.18	
Vel Total (ft/s)	12.19	Avg. Vel. (ft/s)		12.19	
Max Chl Dpth (ft)	4.80	Hydr. Depth (ft)		4.56	
Conv. Total (cfs)	150467.4	Conv. (cfs)		150467.4	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		245.17	
Min Ch El (ft)	2595.20	Shear (lb/sq ft)		2.29	
Alpha	1.00	Stream Power (lb/ft s)		27.86	
Frctn Loss (ft)	0.40	Cum Volume (acre-ft)		1.27	
C & E Loss (ft)	0.00	Cum SA (acres)		0.28	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION RIVER: 1
REACH: 1 RS: 2850

INPUT
Description: 2850
Station Elevation Data num= 123

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
788	2602.1	790	2602.1	792	2602.1	794	2602.1	796	2602.1
798	2602.1	800	2602.1	802	2602.1	804	2602.1	806	2602.1
808	2602.1	810	2602.1	812	2602.1	814	2602.1	816	2602.1
818	2602.1	820	2602.1	822	2602.1	824	2602.1	826	2602.1
828	2602.1	830	2602.1	832	2602.1	834	2602.1	836	2602.1
838	2602.1	840	2602.1	842	2602.1	844	2602	846	2601.7
848	2601.1	850	2600.1	852	2599.2	854	2598.2	856	2597.3
858	2596.3	860	2595.4	862	2594.6	864	2594.2	866	2594.1
868	2594.1	870	2594.1	872	2594.1	874	2594.1	876	2594.1
878	2594.1	880	2594.1	882	2594.1	884	2594.1	886	2594.1
888	2594.1	890	2594.1	892	2594.1	894	2594.1	896	2594.1
898	2594.1	900	2594.1	902	2594.1	904	2594.1	906	2594.1

908	2594.1	910	2594.1	912	2594.1	914	2594.1	916	2594.1
918	2594.1	920	2594.1	922	2594.1	924	2594.1	926	2594.1
1062	2594.1	1064	2594.1	1066	2594.1	1068	2594.1	1070	2594.1
1072	2594.1	1074	2594.1	1076	2594.1	1078	2594.1	1080	2594.1
1082	2594.1	1084	2594.1	1086	2594.5	1088	2595.1	1090	2596
1092	2597	1094	2597.9	1096	2598.8	1098	2599.8	1100	2600.7
1102	2601.5	1104	2601.9	1106	2602.1	1108	2602.1	1110	2602.1
1112	2602.1	1114	2602.1	1116	2602.1	1118	2602.1	1120	2602.1
1122	2602.1	1124	2602.1	1126	2602.1	1128	2602.1	1130	2602.1
1132	2602.1	1134	2602.1	1136	2602.1	1138	2602.1	1140	2602.1
1142	2602.1	1144	2602.1	1146	2602.1	1148	2602.1	1150	2602.1
1152	2602.1	1154	2602.1	1156	2602.1	1158	2602.1	1160	2602.1
1416	2602.1	1418	2602.1	1420	2602.1				

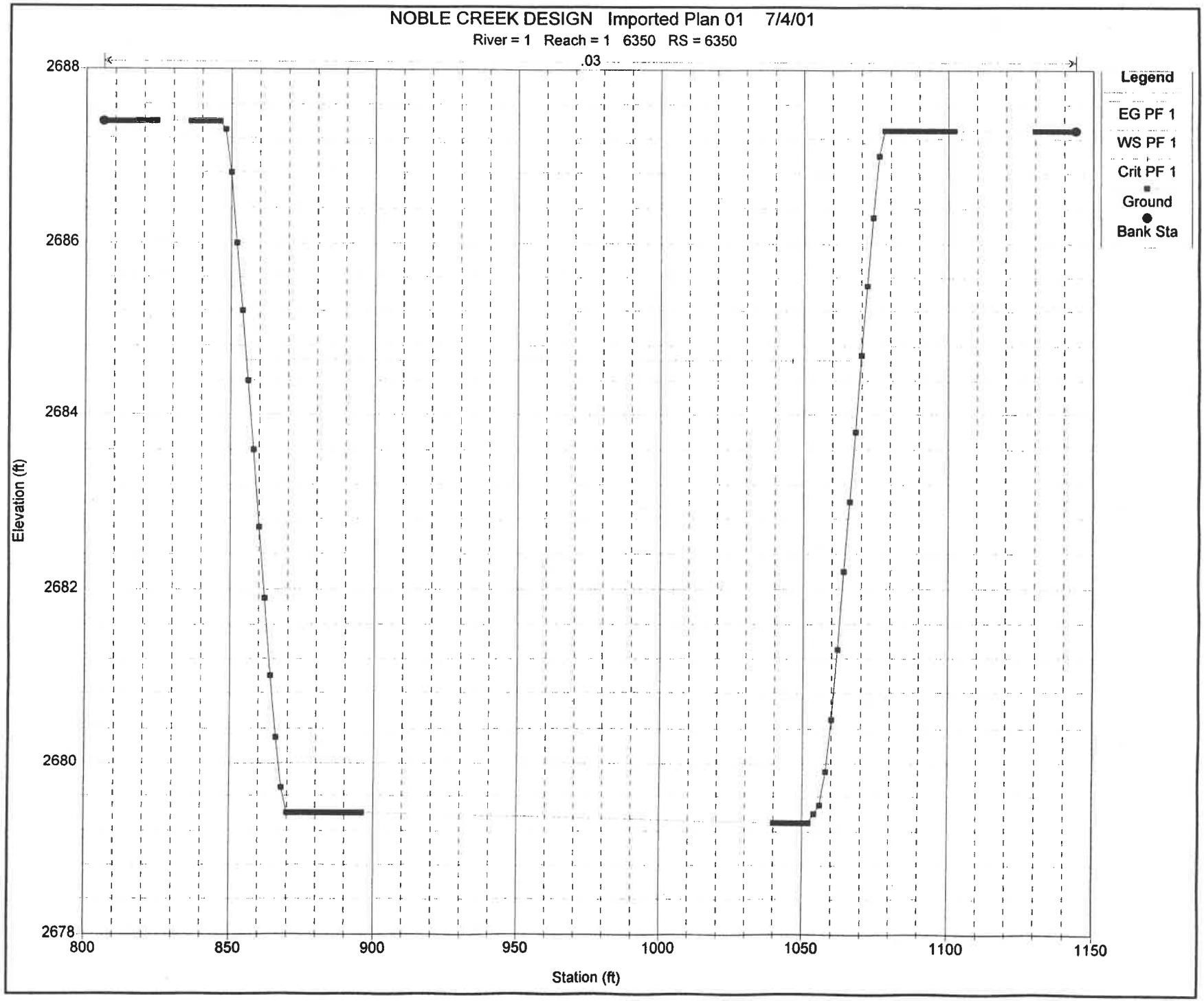
Manning's n Values num= 3

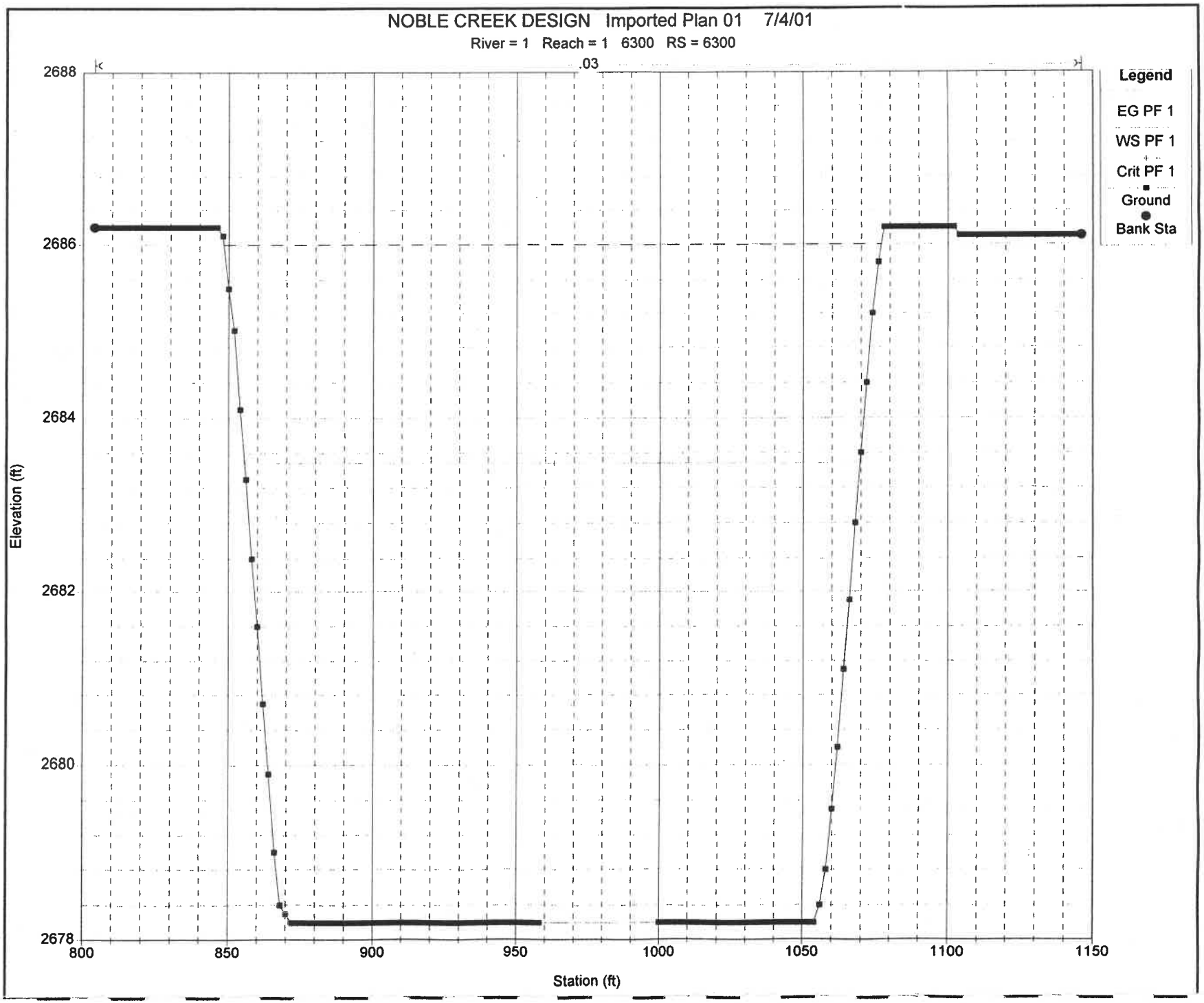
Sta	n Val	Sta	n Val	Sta	n Val
788	.03	788	.03	1420	.03

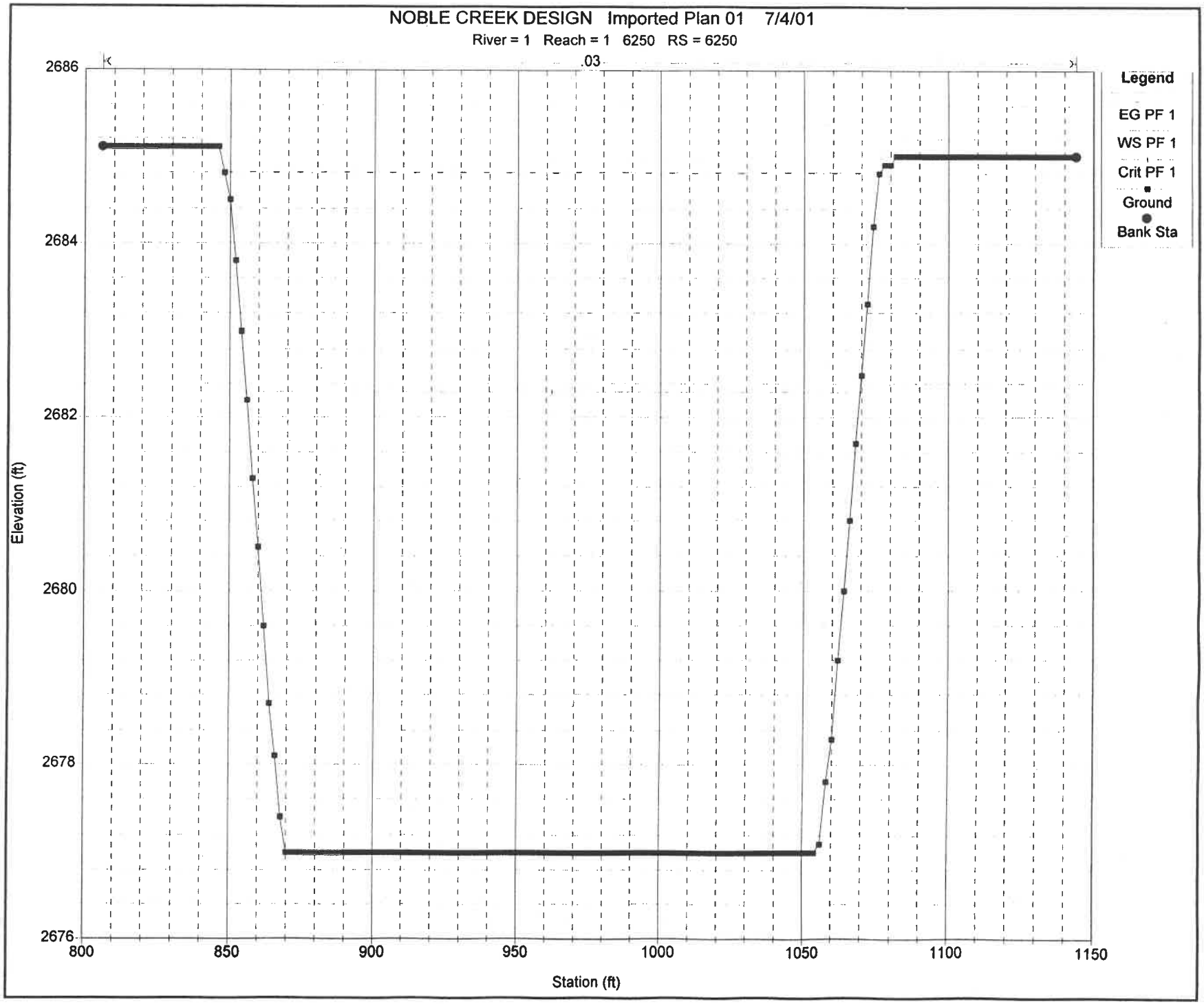
Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
788	1420	0	0	.1	.3

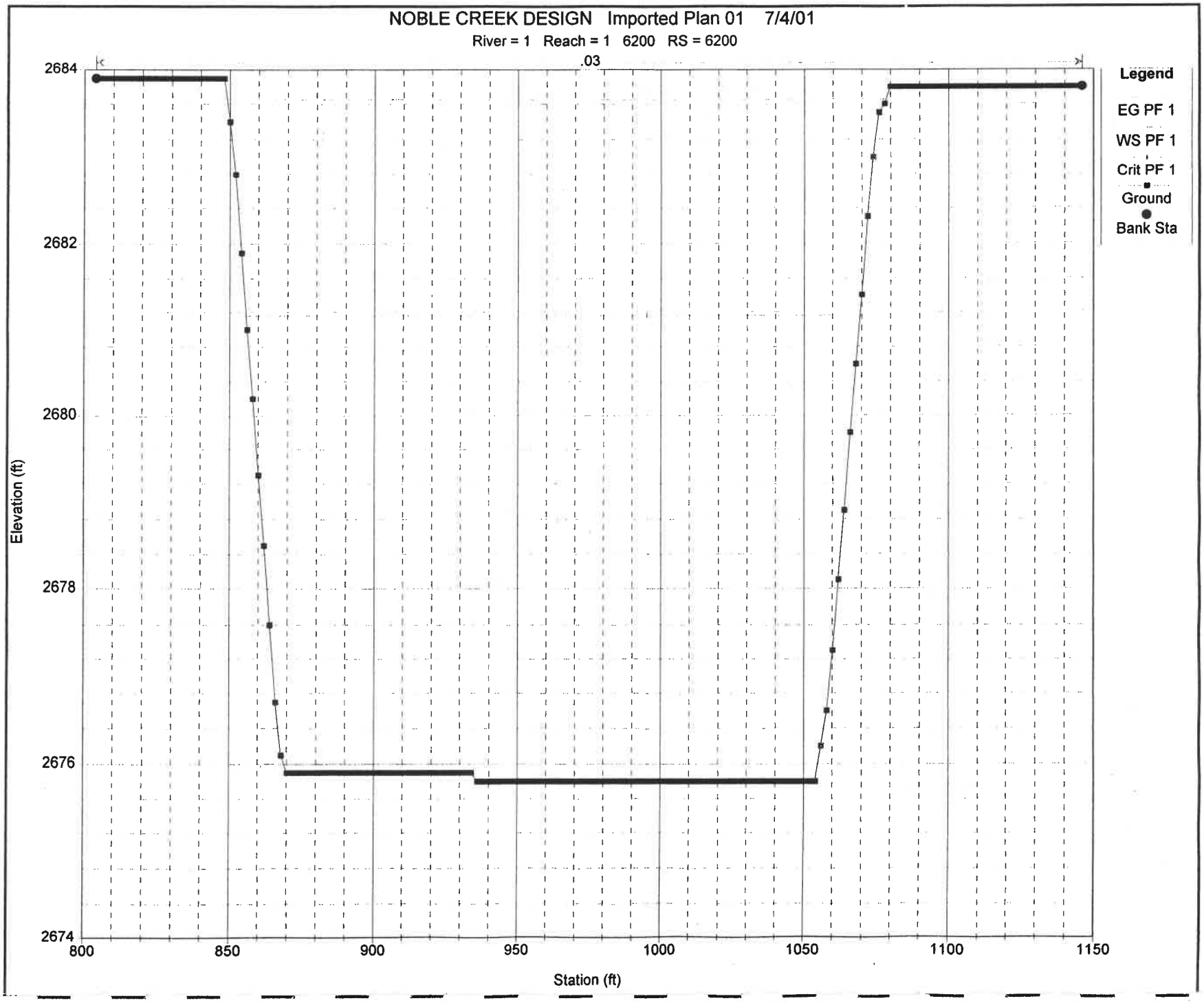
CROSS SECTION OUTPUT Profile #PF 1

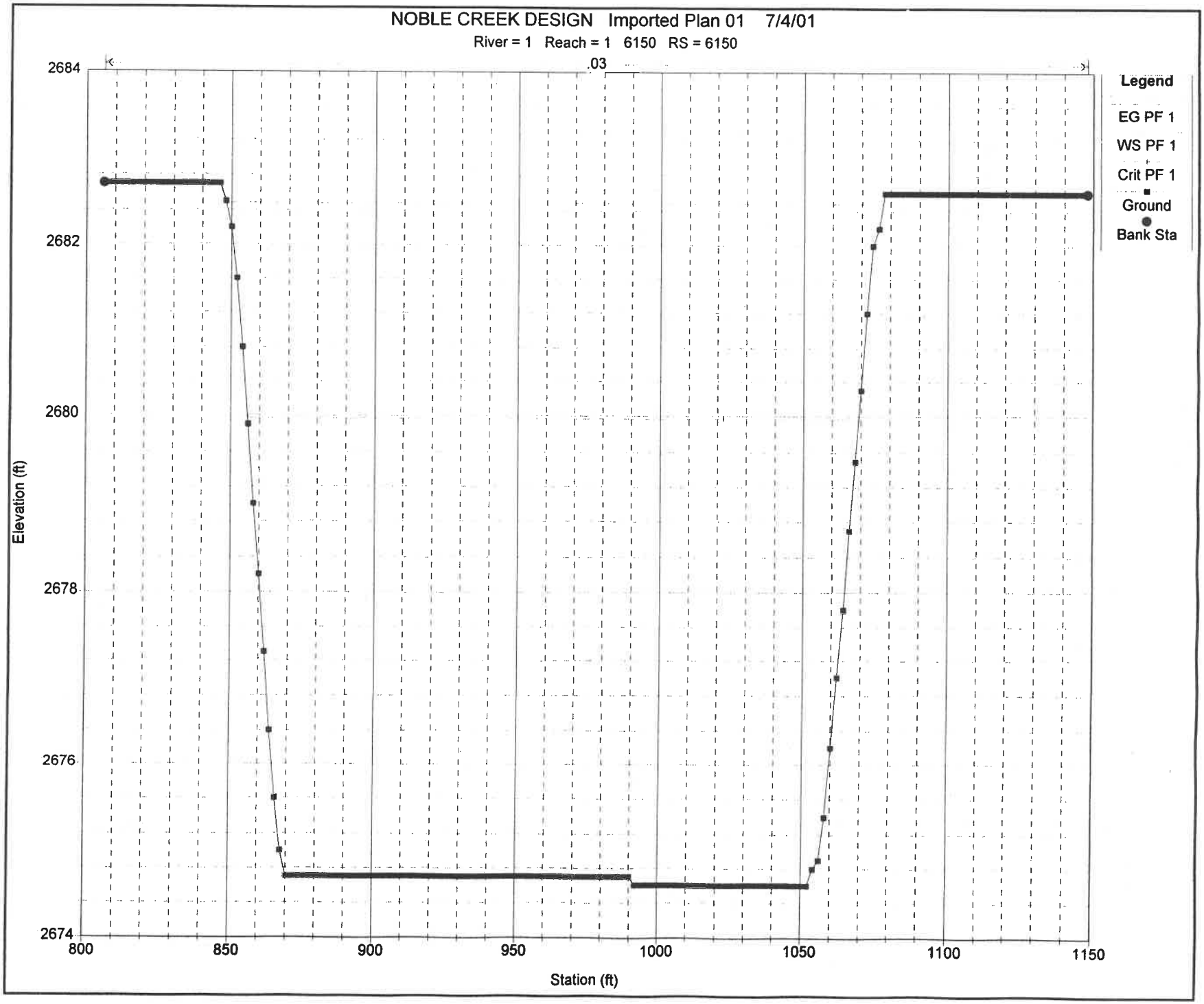
E.G. Elev (ft)	2601.17	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.30	Wt. n-Val.		0.030	
W.S. Elev (ft)	2598.87	Reach Len. (ft)			
Crit W.S. (ft)	2598.87	Flow Area (sq ft)		1110.93	
E.G. Slope (ft/ft)	0.008074	Area (sq ft)		1110.93	
Q Total (cfs)	13530.00	Flow (cfs)		13530.00	
Top Width (ft)	243.47	Top Width (ft)		243.47	
Vel Total (ft/s)	12.18	Avg. Vel. (ft/s)		12.18	
Max Chl Dpth (ft)	4.77	Hydr. Depth (ft)		4.56	
Conv. Total (cfs)	150576.0	Conv. (cfs)		150576.0	
Length Wtd. (ft)		Wetted Per. (ft)		245.41	
Min Ch El (ft)	2594.10	Shear (lb/sq ft)		2.28	
Alpha	1.00	Stream Power (lb/ft s)		27.79	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

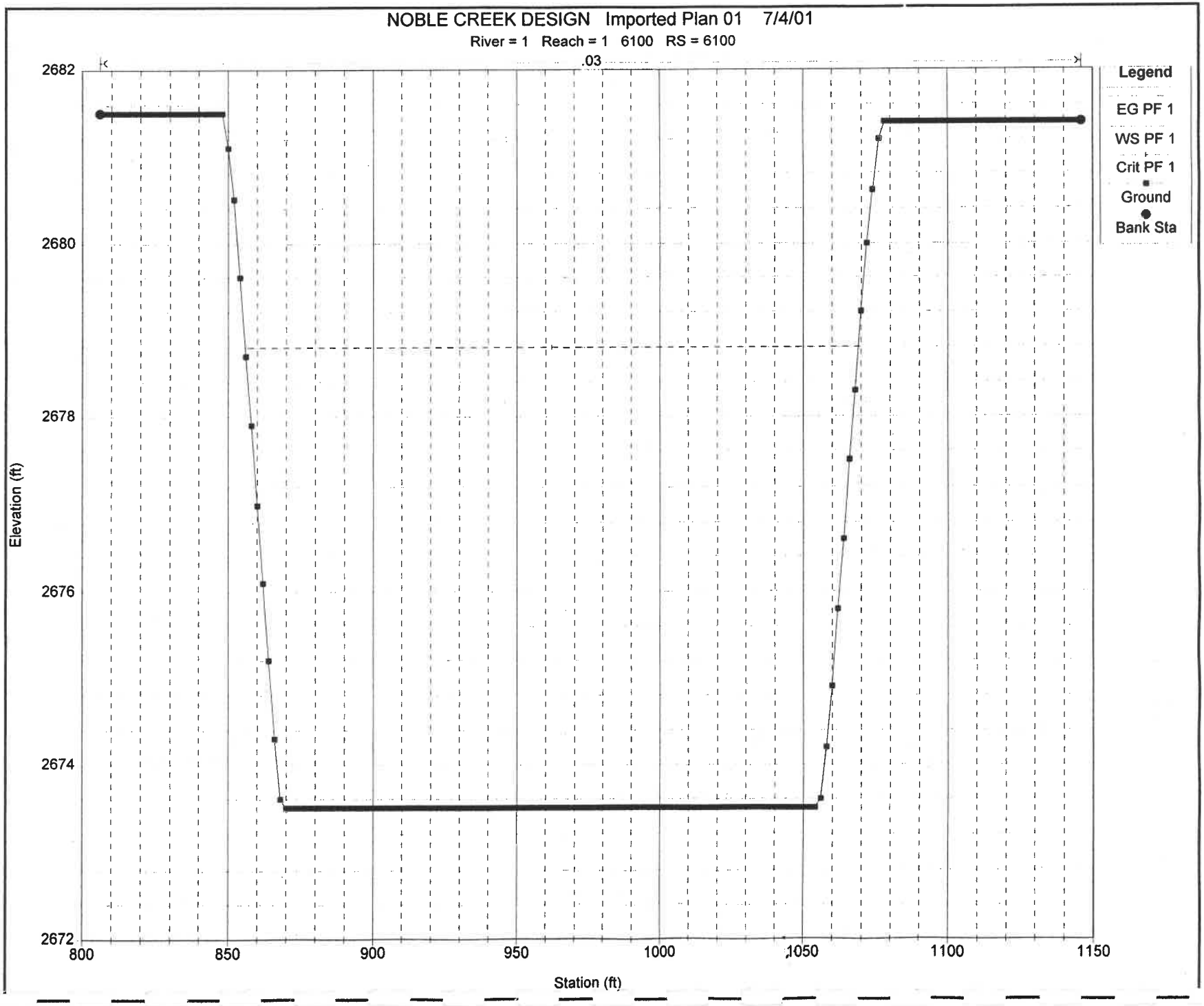

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 6350 RS = 6350
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2688
2686
2684
2682
2680
2678
800
850
900
950
1000
1050
1100
1150
Station (ft)

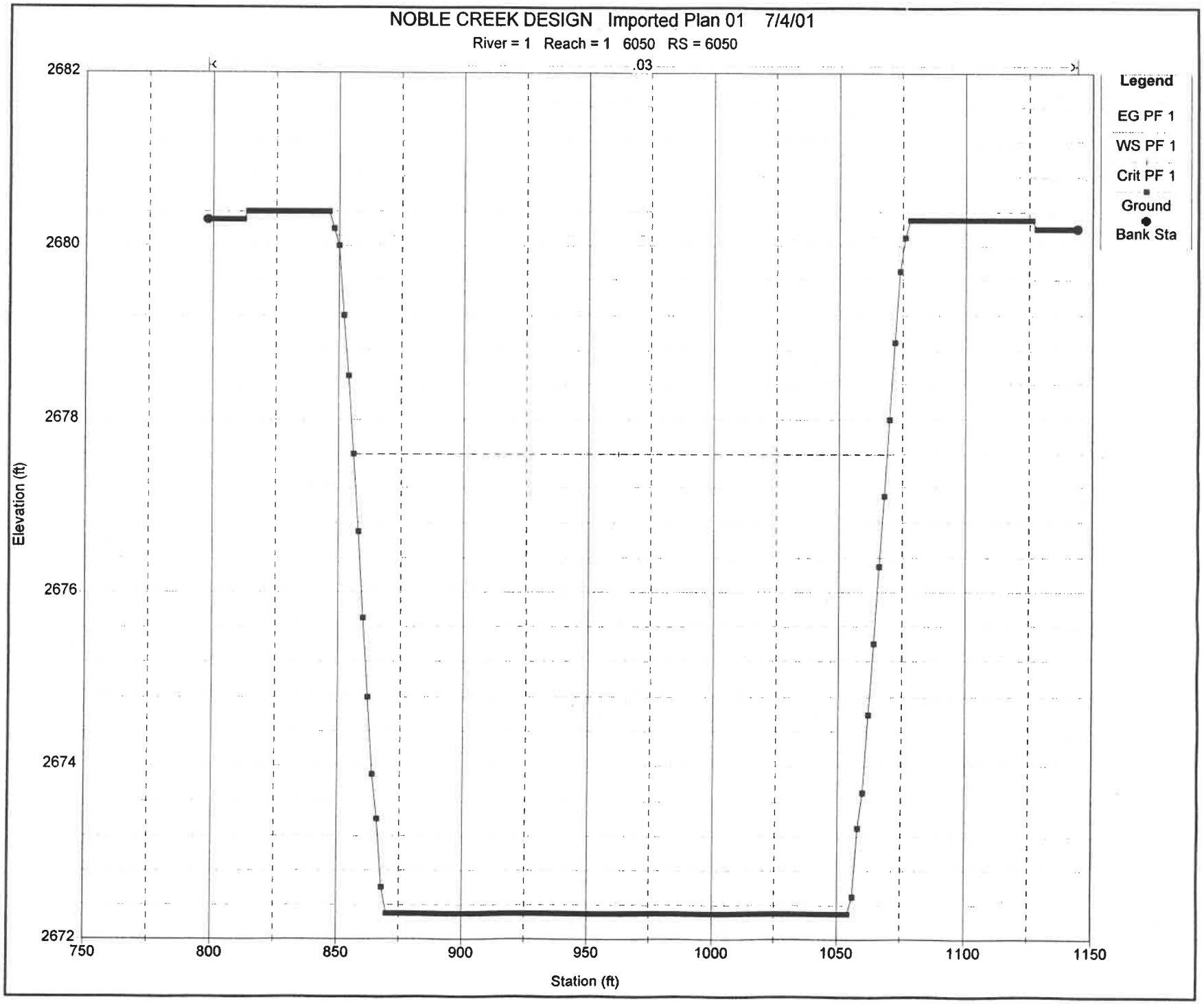

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 6300 RS = 6300
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2688
2686
2684
2682
2680
2678
800
850
900
950
1000
1050
1100
1150
Station (ft)

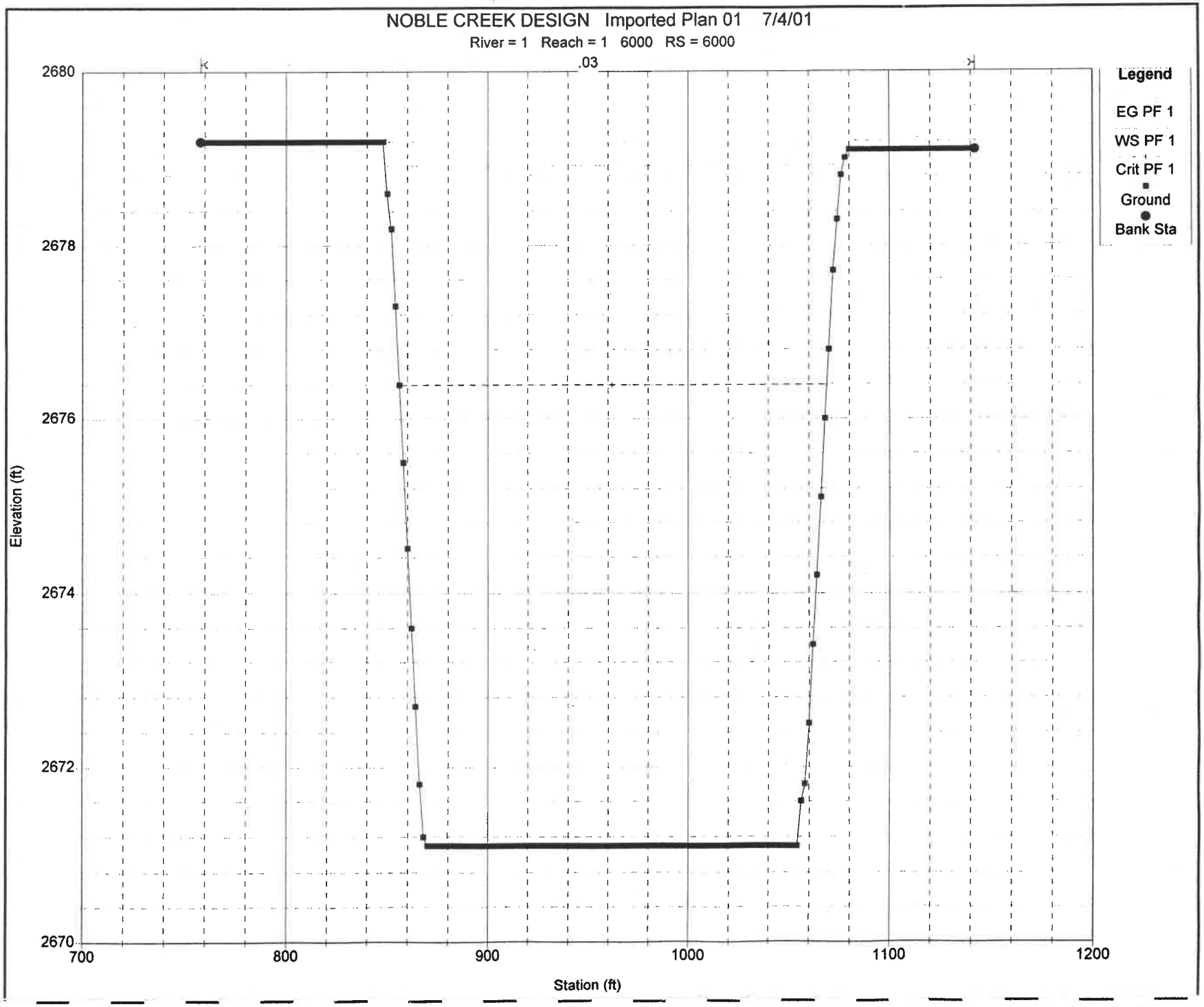

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 6250 RS = 6250
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2686
2684
2682
2680
2678
2676
800
850
900
950
1000
1050
1100
1150
Station (ft)

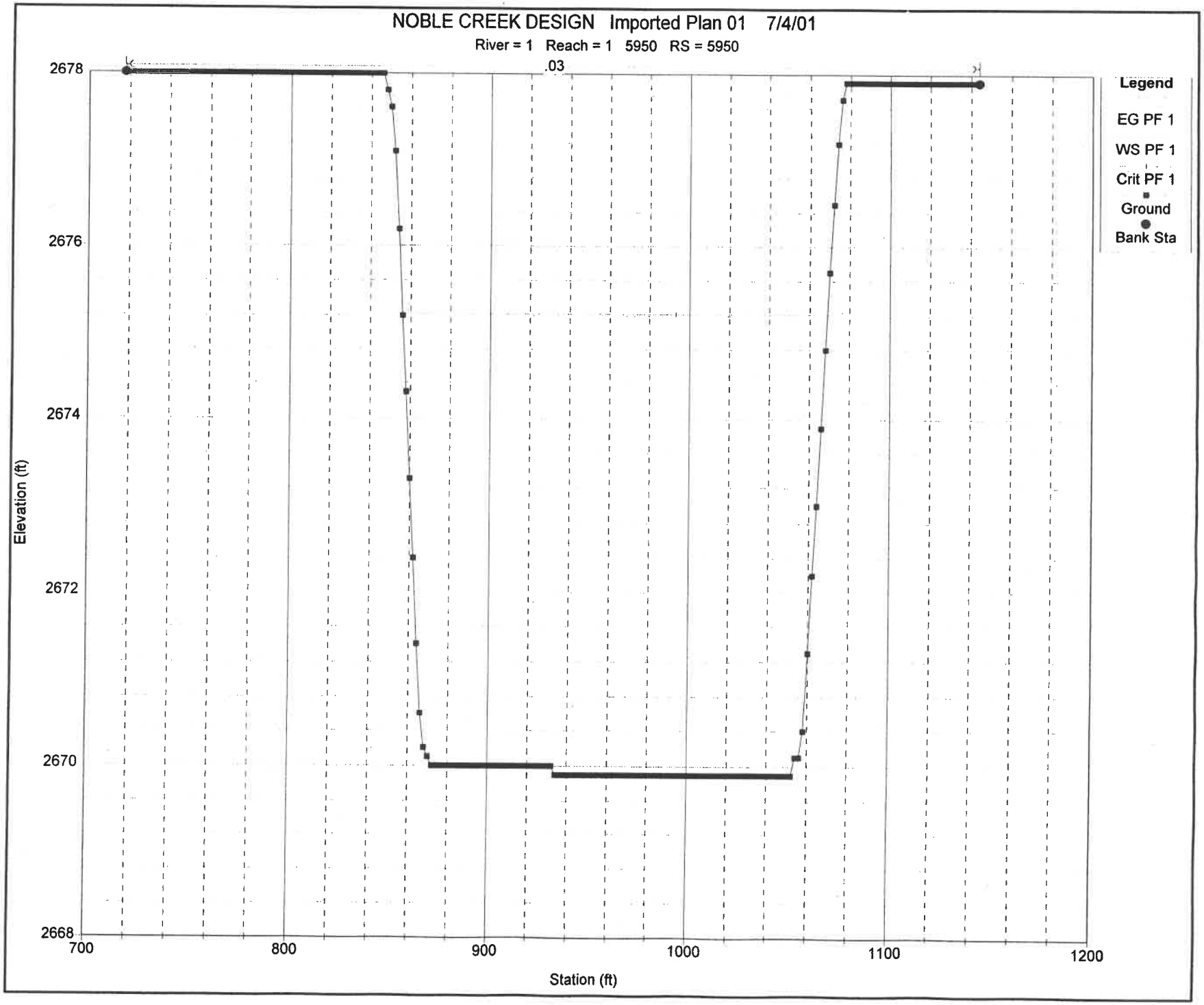

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 6200 RS = 6200
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2684
2682
2680
2678
2676
2674
800
850
900
950
1000
1050
1100
1150
Station (ft)

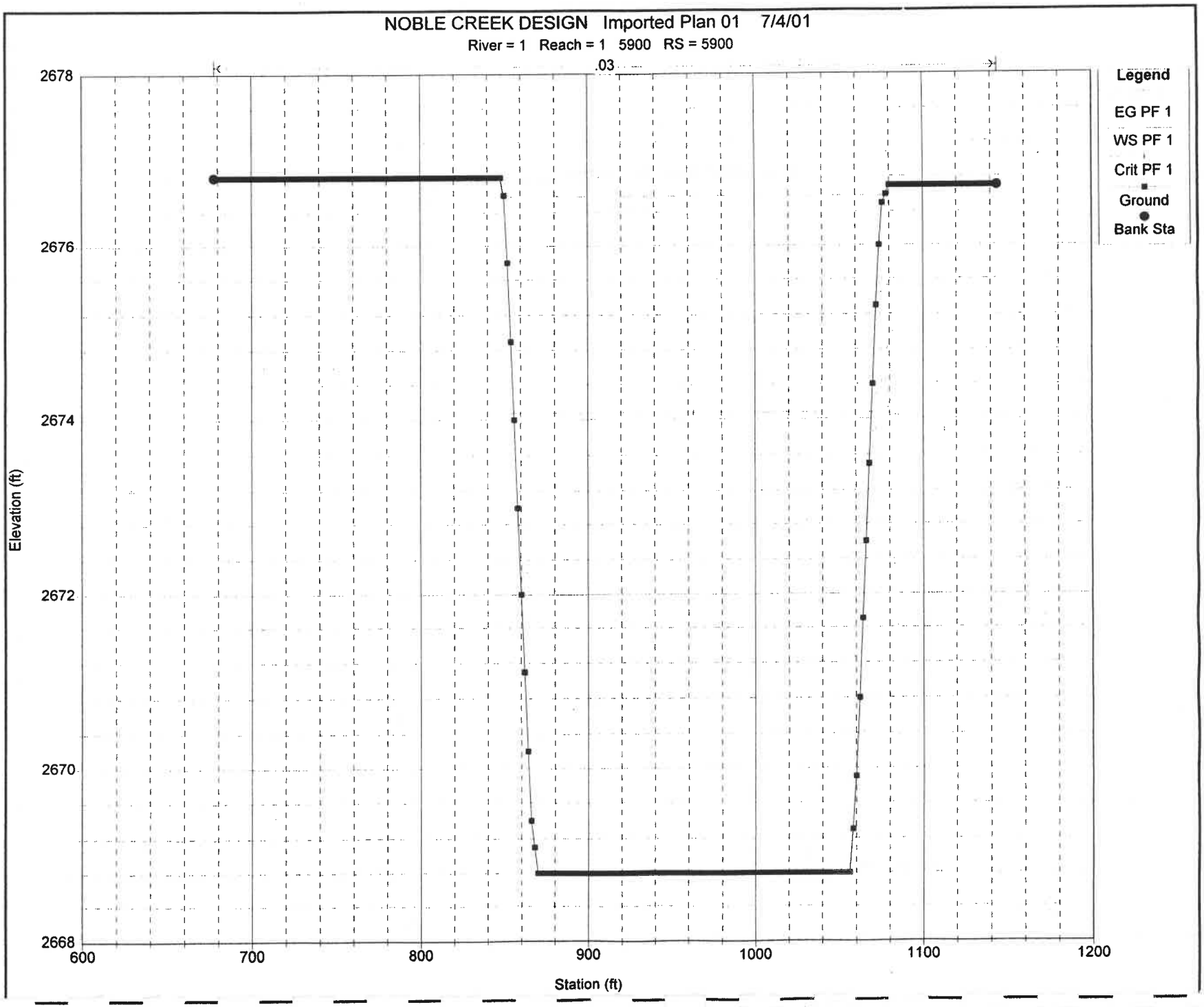

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 6150 RS = 6150
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2684
2682
2680
2678
2676
2674
800
850
900
950
1000
1050
1100
1150
Station (ft)

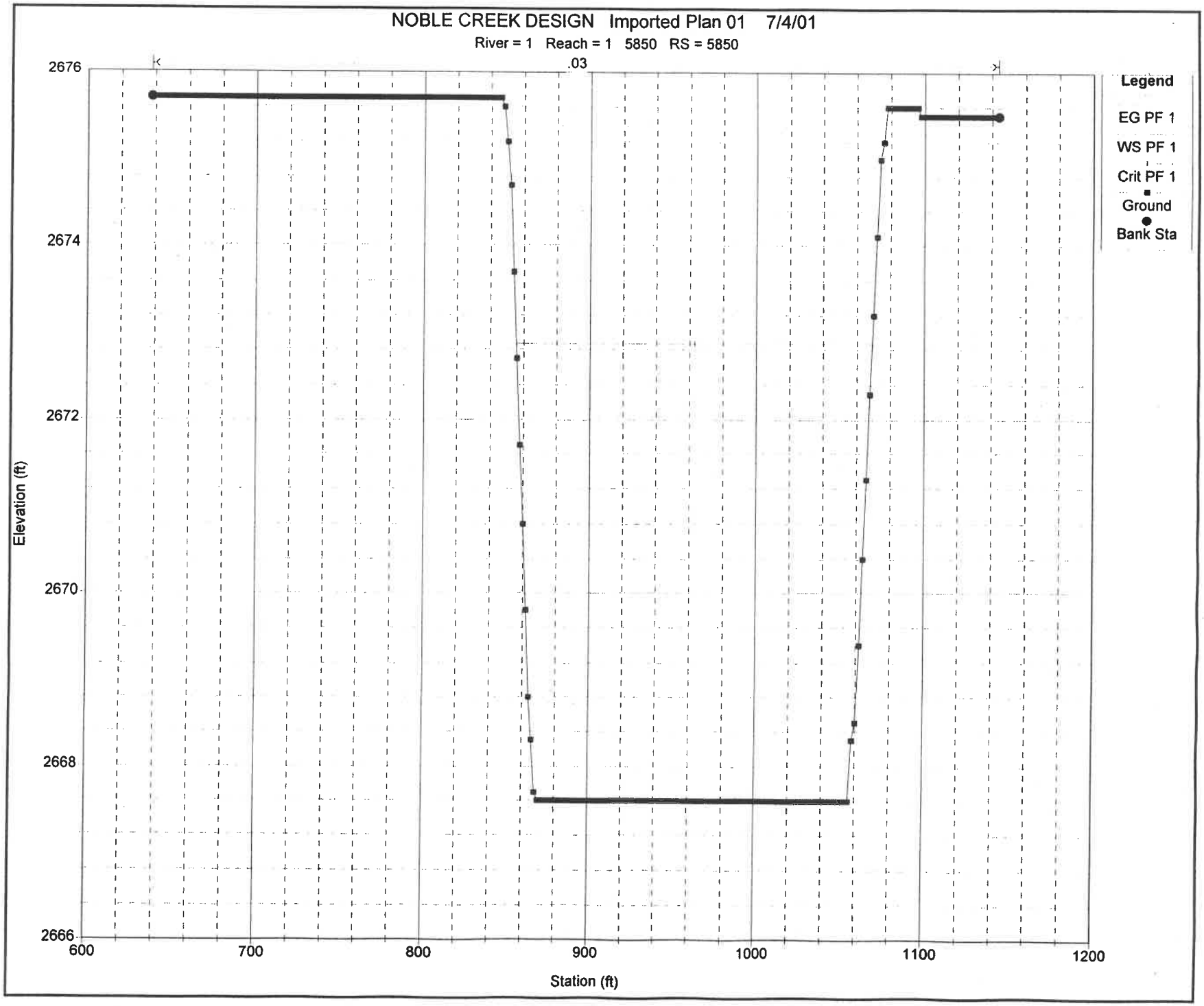

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 6100 RS = 6100
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2682
2680
2678
2676
2674
2672
800
850
900
950
1000
1050
1100
1150
Station (ft)

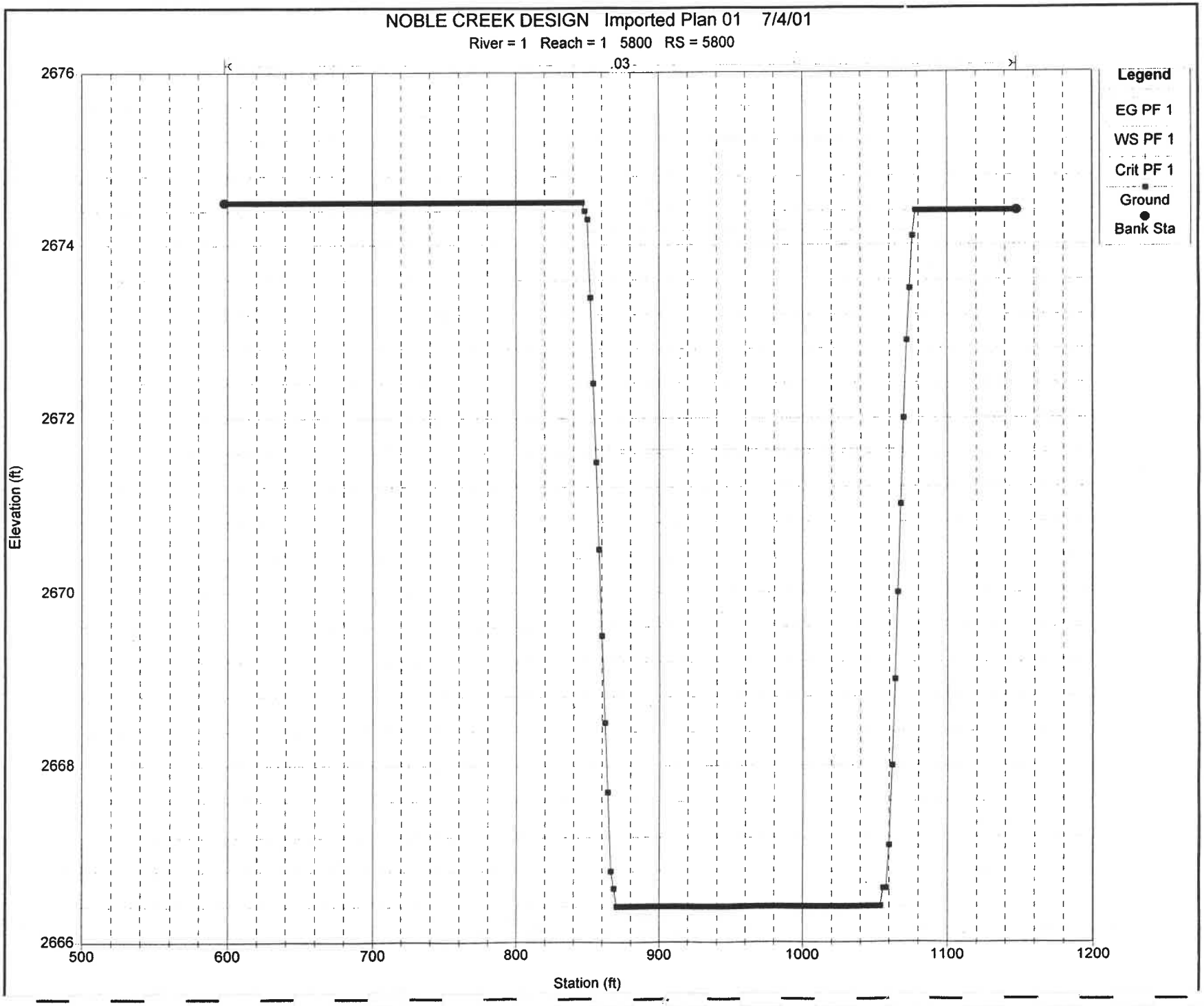

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 6050 RS = 6050
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2682
2680
2678
2676
2674
2672
750
800
850
900
950
1000
1050
1100
1150
Station (ft)

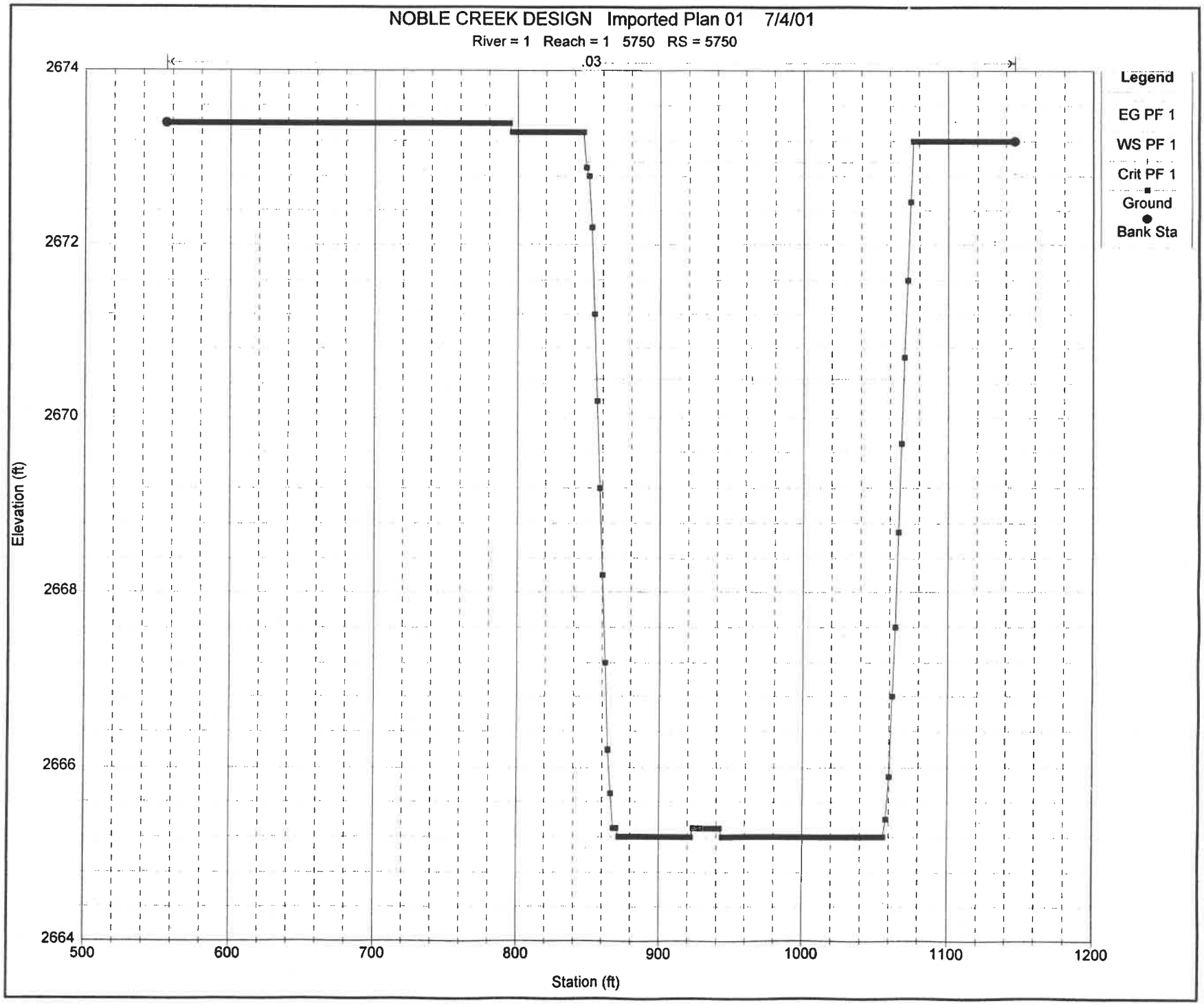

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 6000 RS = 6000
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2680
2678
2676
2674
2672
2670
700
800
900
1000
1100
1200
Station (ft)

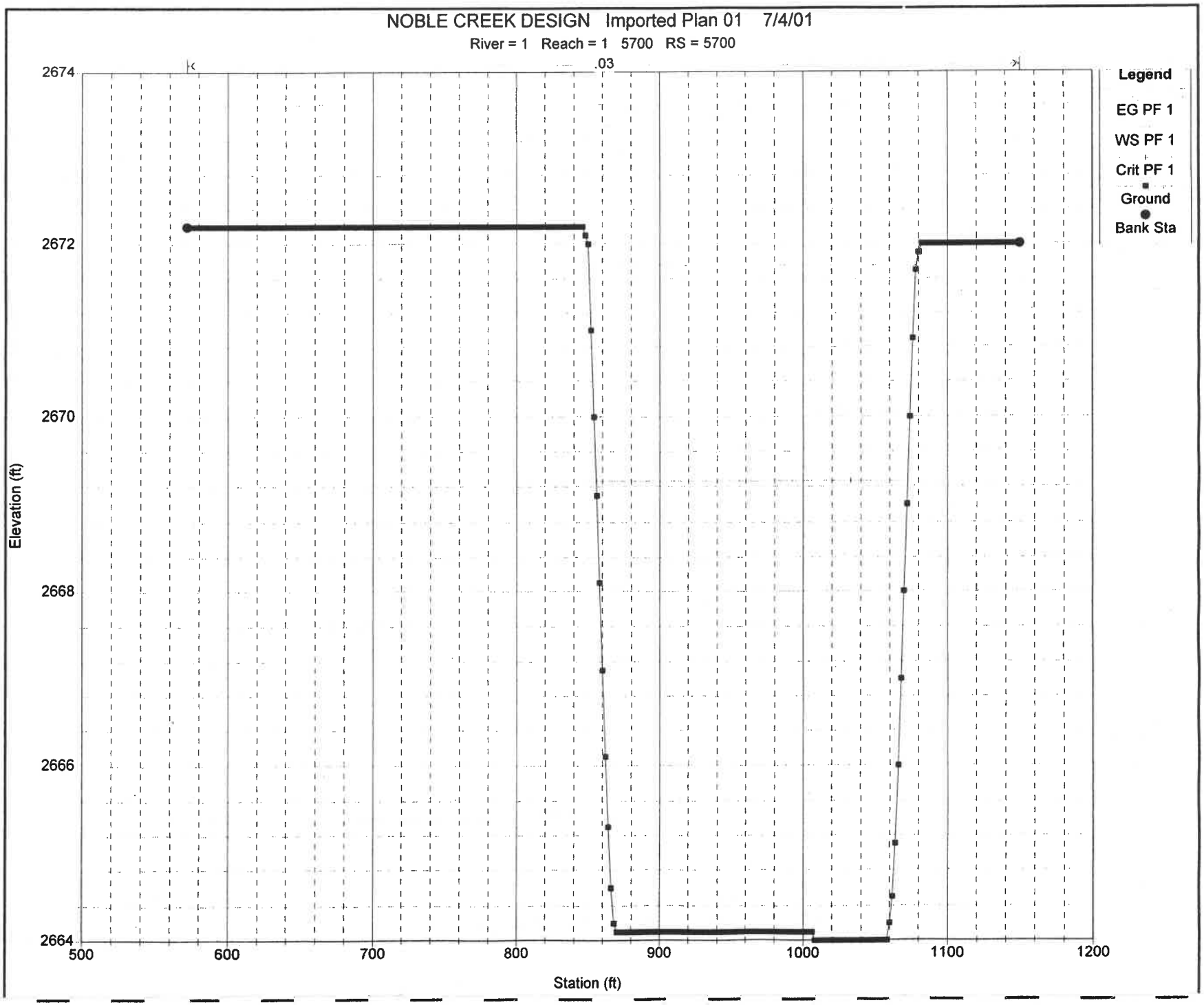

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 5950 RS = 5950
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2678
2676
2674
2672
2670
2668
700
800
900
1000
1100
1200
Station (ft)

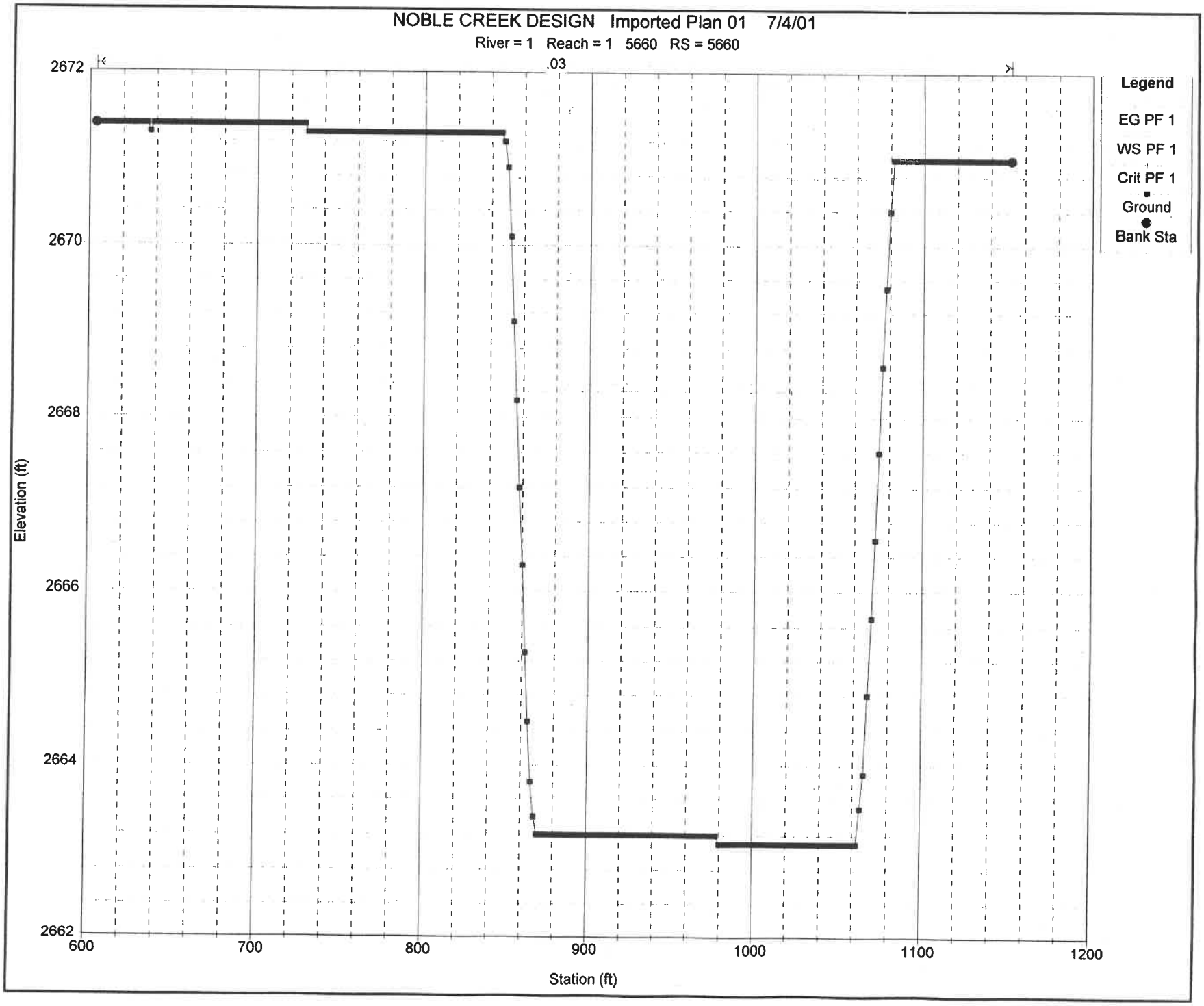

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 5900 RS = 5900
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2678
2676
2674
2672
2670
2668
600
700
800
900
1000
1100
1200
Station (ft)

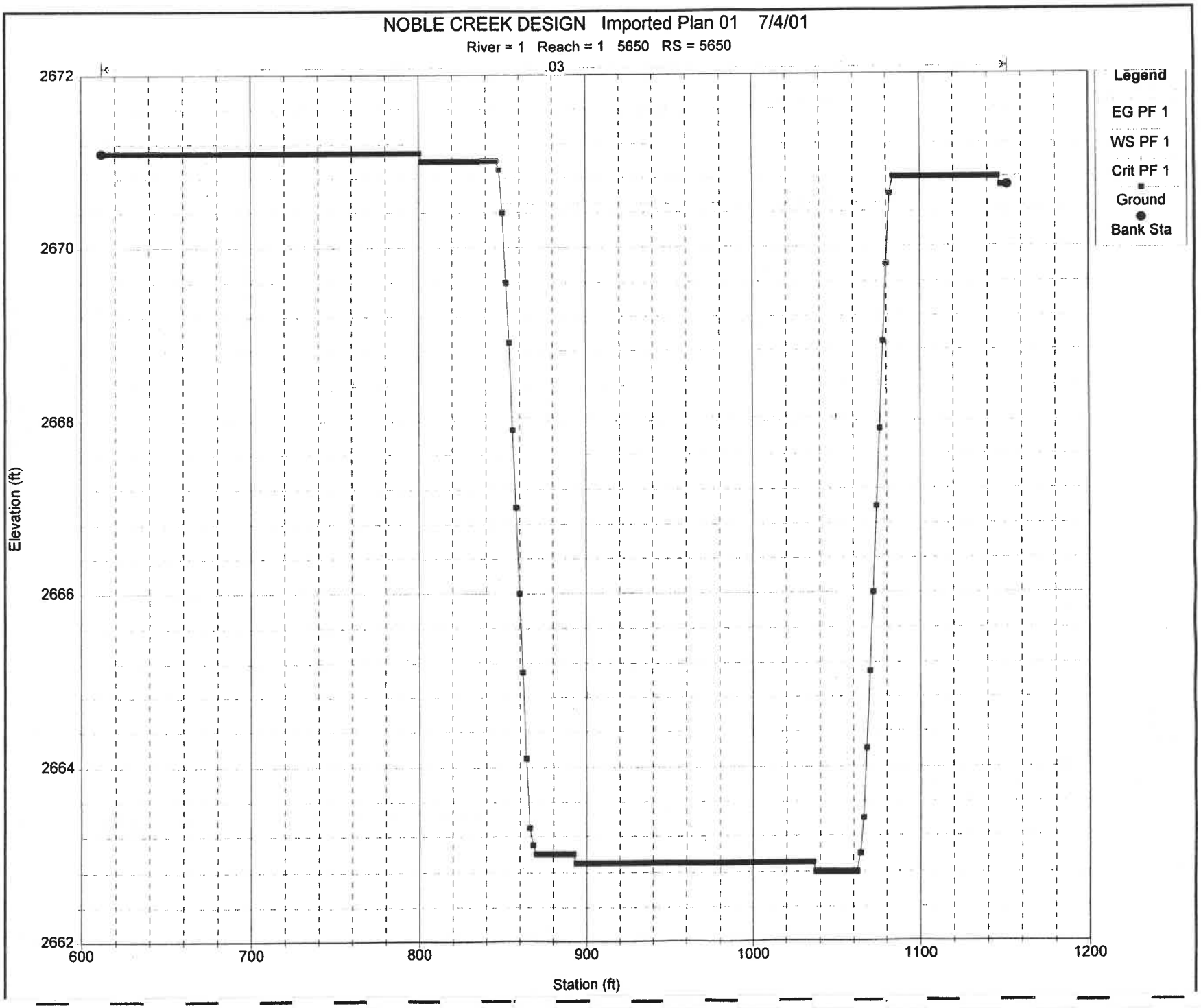

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 5850 RS = 5850
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2676
2674
2672
2670
2668
2666
600
700
800
900
1000
1100
1200
Station (ft)

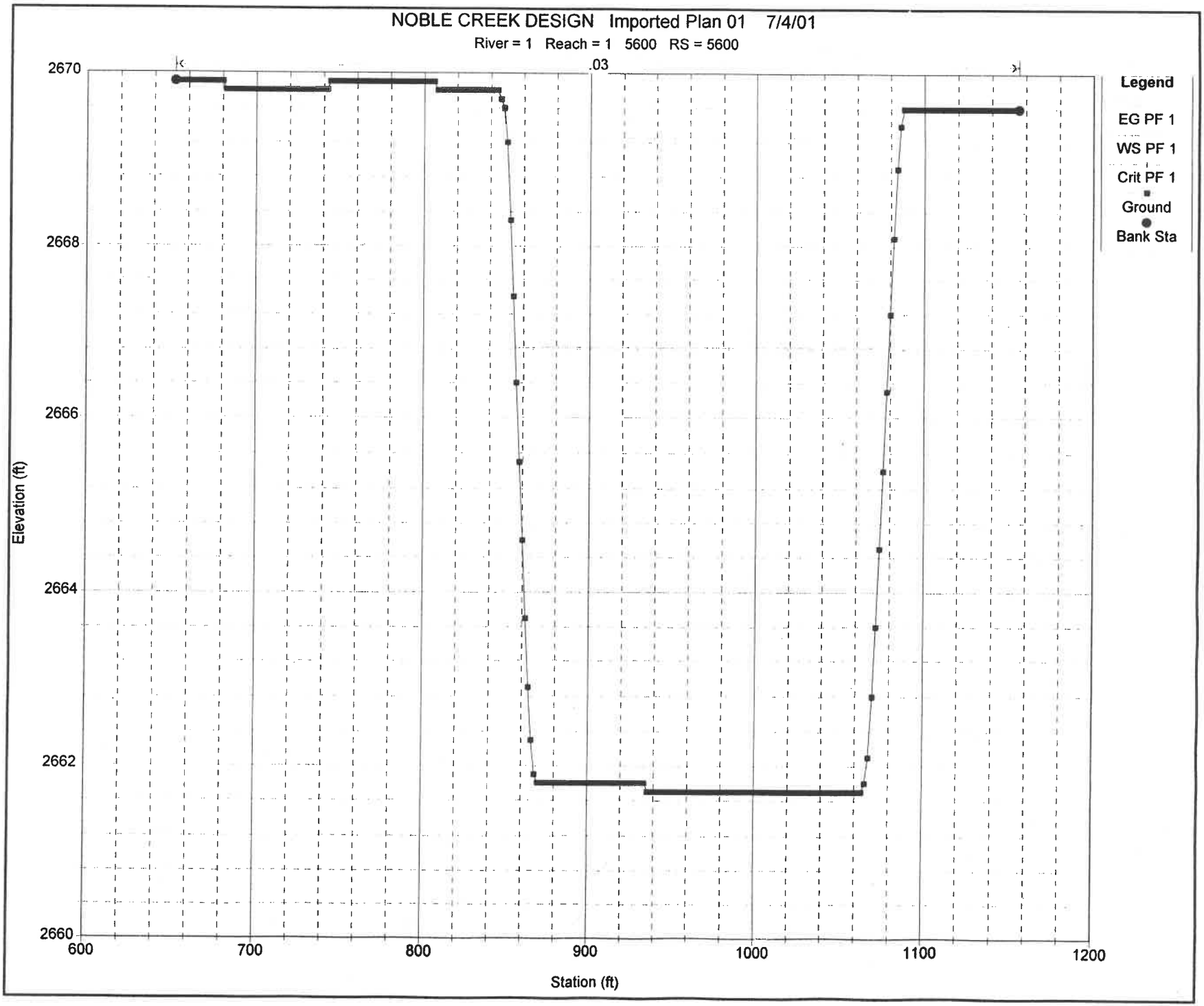

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 5800 RS = 5800
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2676
2674
2672
2670
2668
2666
500
600
700
800
900
1000
1100
1200
Station (ft)

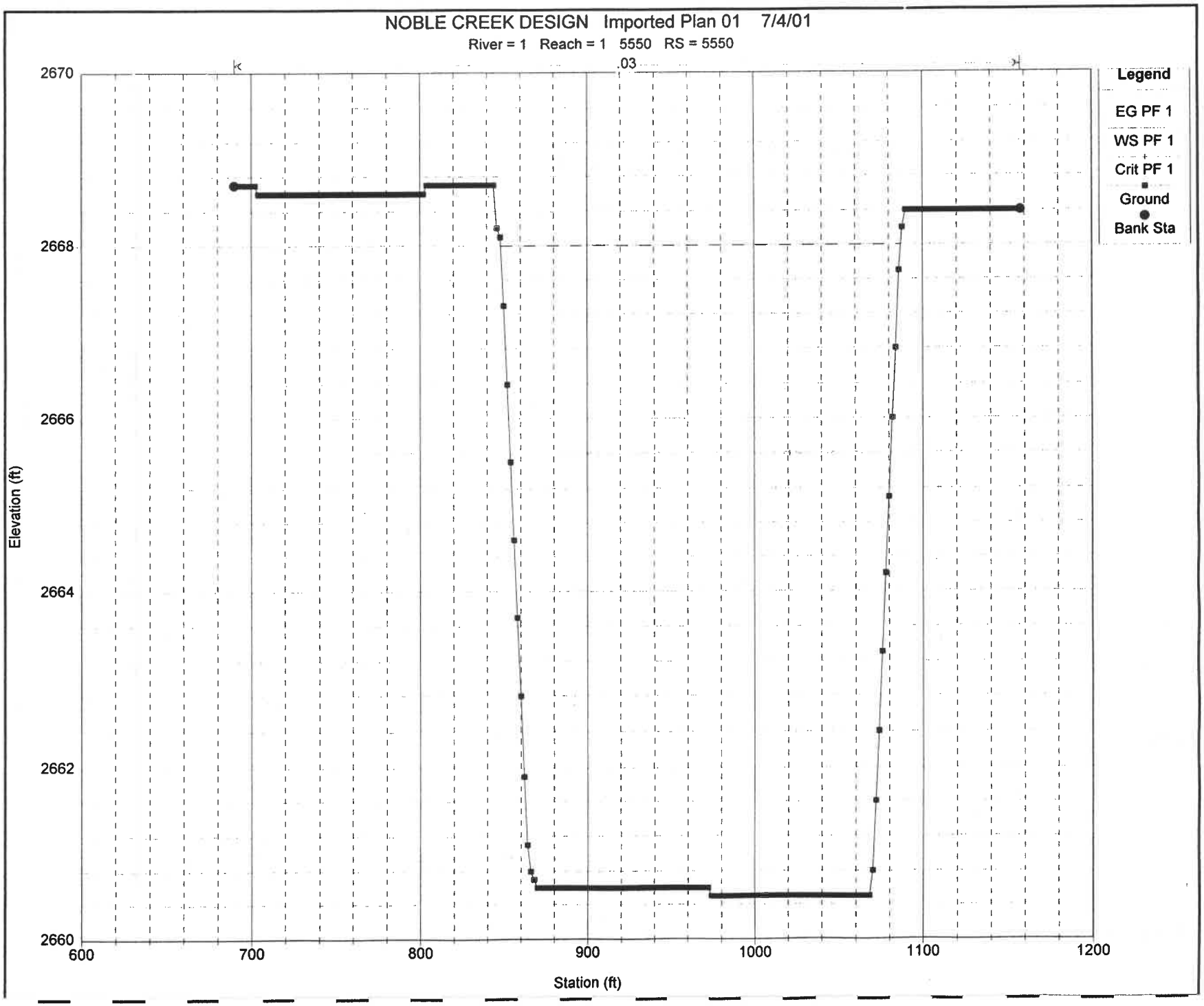

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 5750 RS = 5750
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2674
2672
2670
2668
2666
2664
500
600
700
800
900
1000
1100
1200
Station (ft)

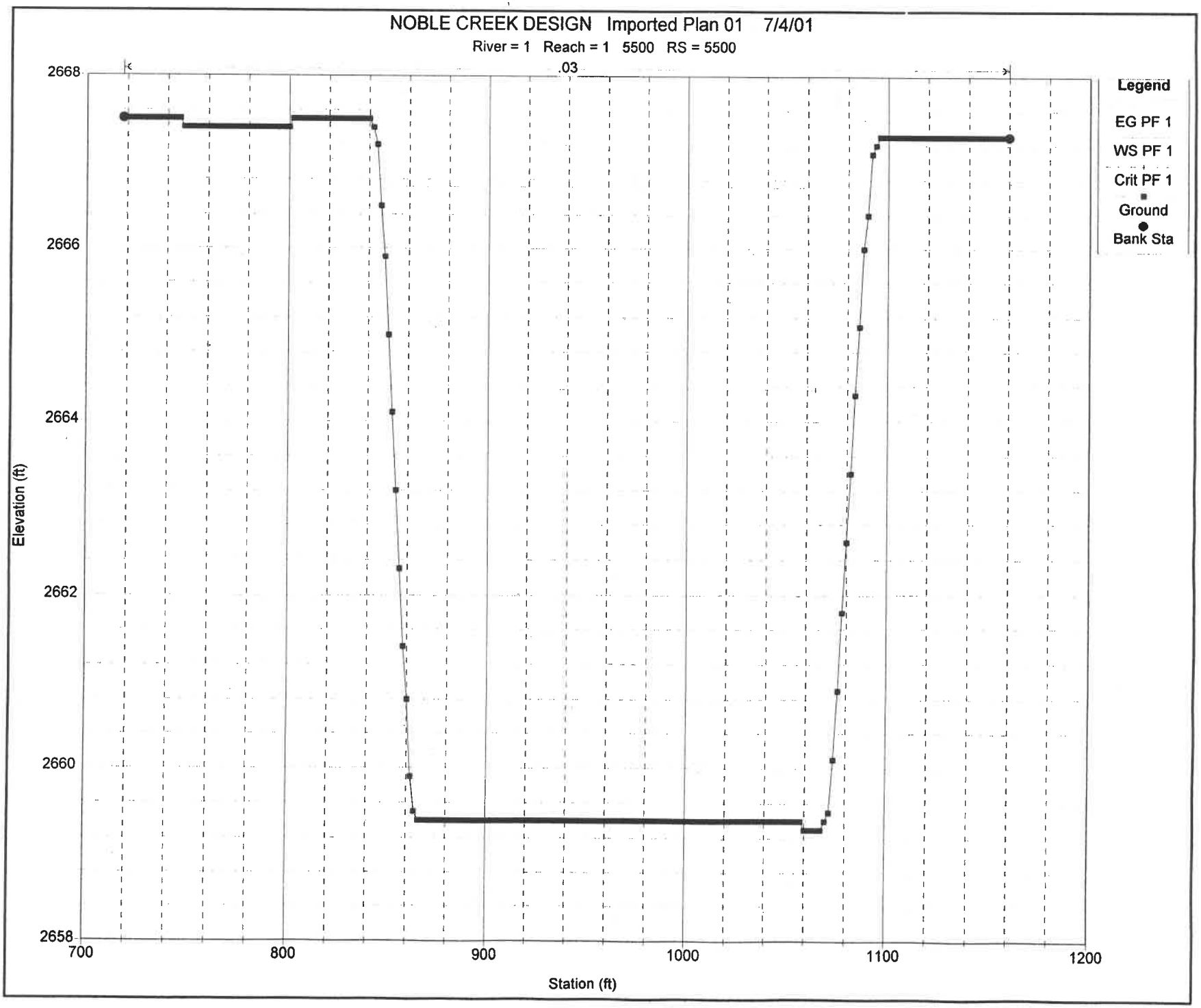

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 5700 RS = 5700
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2674
2672
2670
2668
2666
2664
500
600
700
800
900
1000
1100
1200
Station (ft)

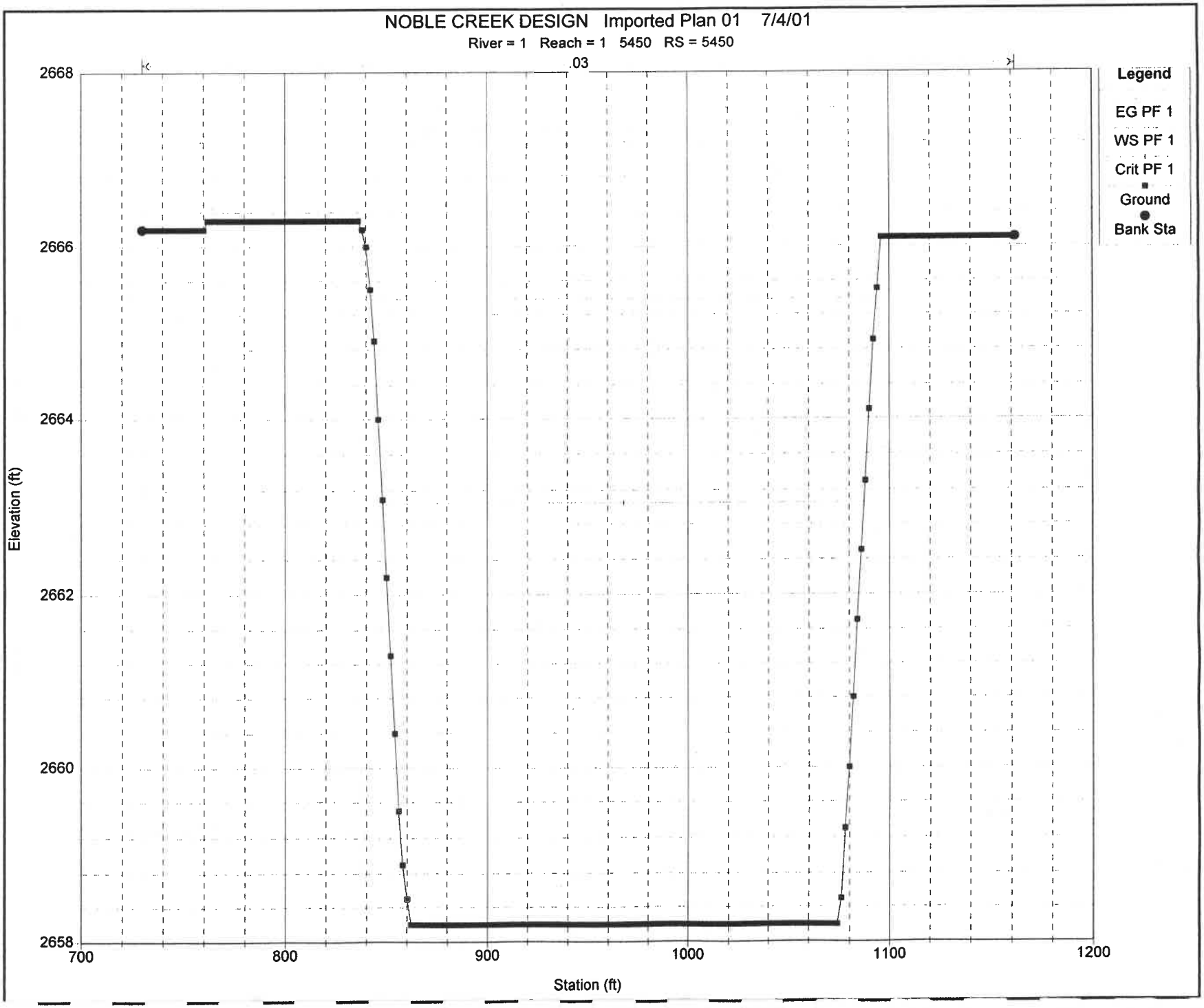

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 5660 RS = 5660
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2672
2670
2668
2666
2664
2662
600
700
800
900
1000
1100
1200
Station (ft)

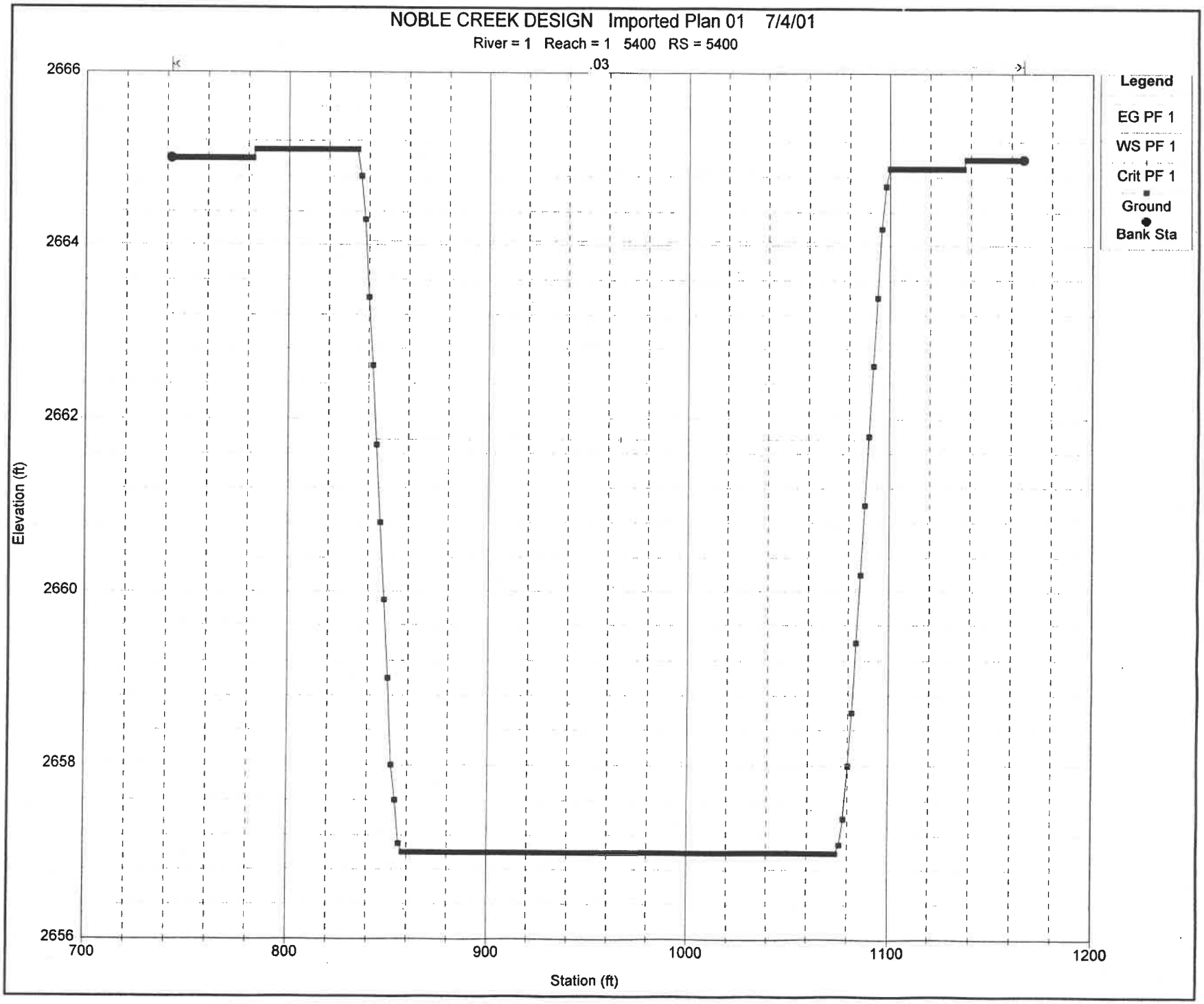

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 5650 RS = 5650
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2672
2670
2668
2666
2664
2662
600
700
800
900
1000
1100
1200
Station (ft)

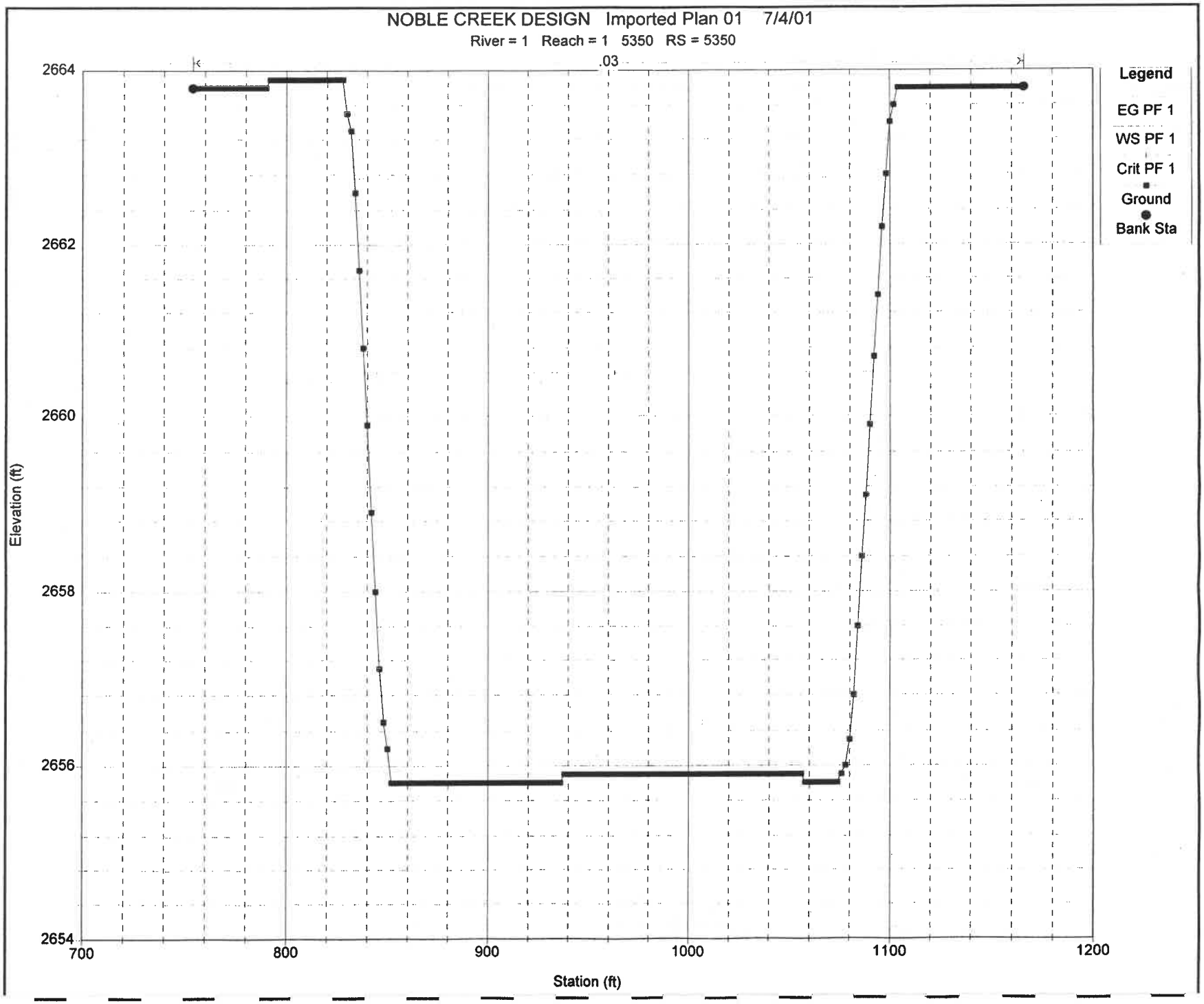

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 5600 RS = 5600
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2670
2668
2666
2664
2662
2660
600
700
800
900
1000
1100
1200
Station (ft)

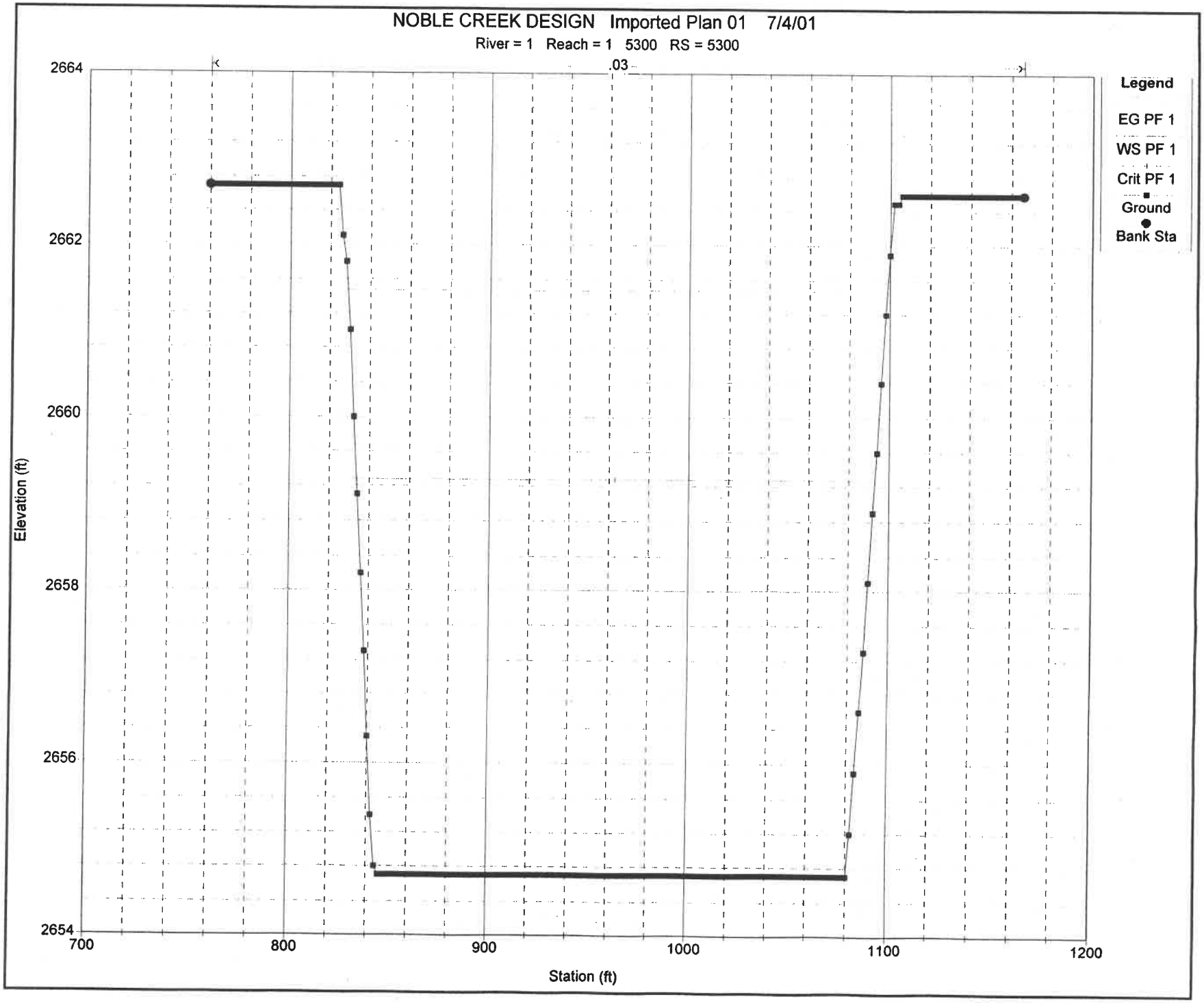

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 5550 RS = 5550
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2670
2668
2666
2664
2662
2660
600
700
800
900
1000
1100
1200
Station (ft)

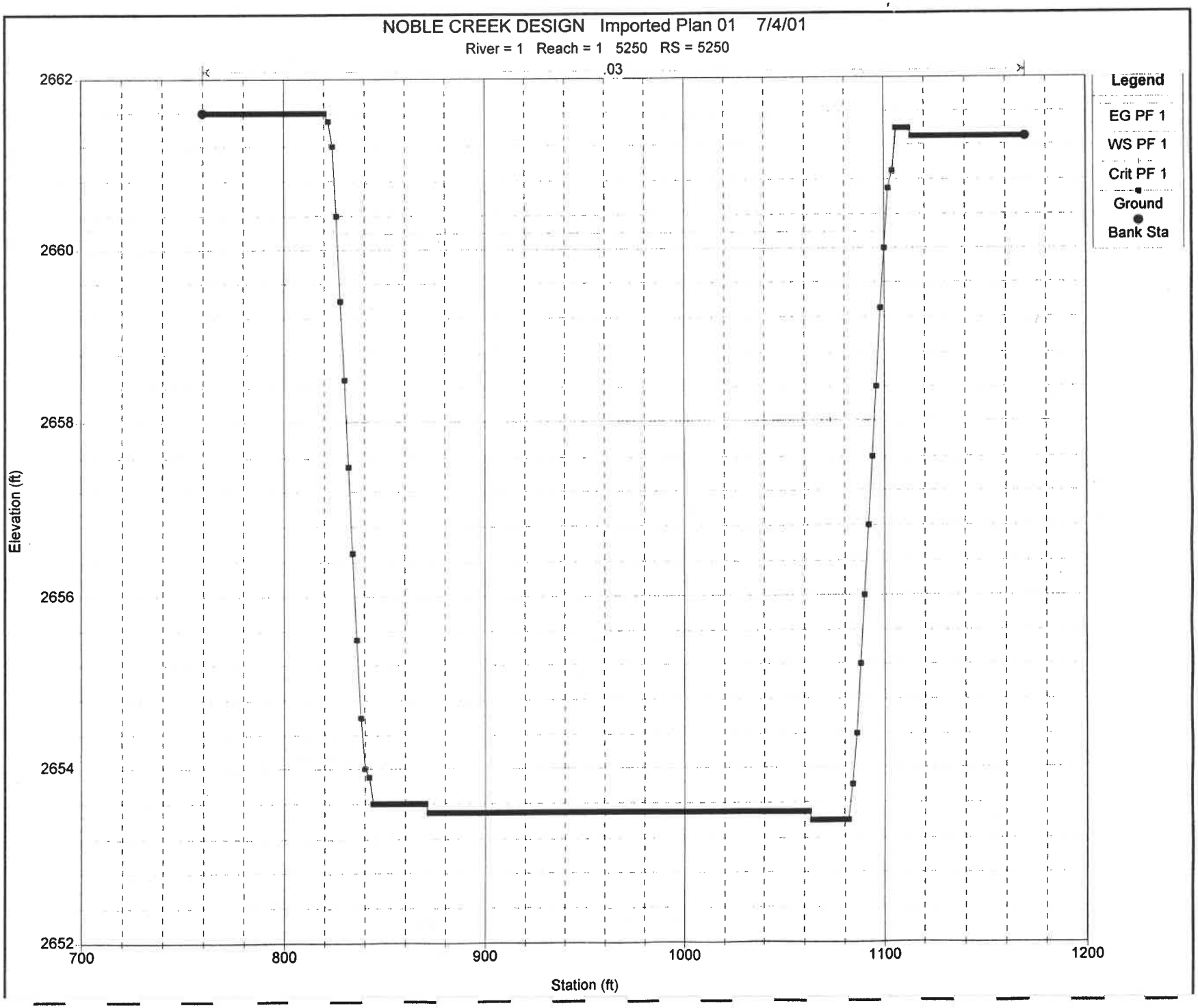

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 5500 RS = 5500
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2668
2666
2664
2662
2660
2658
700
800
900
1000
1100
1200
Station (ft)

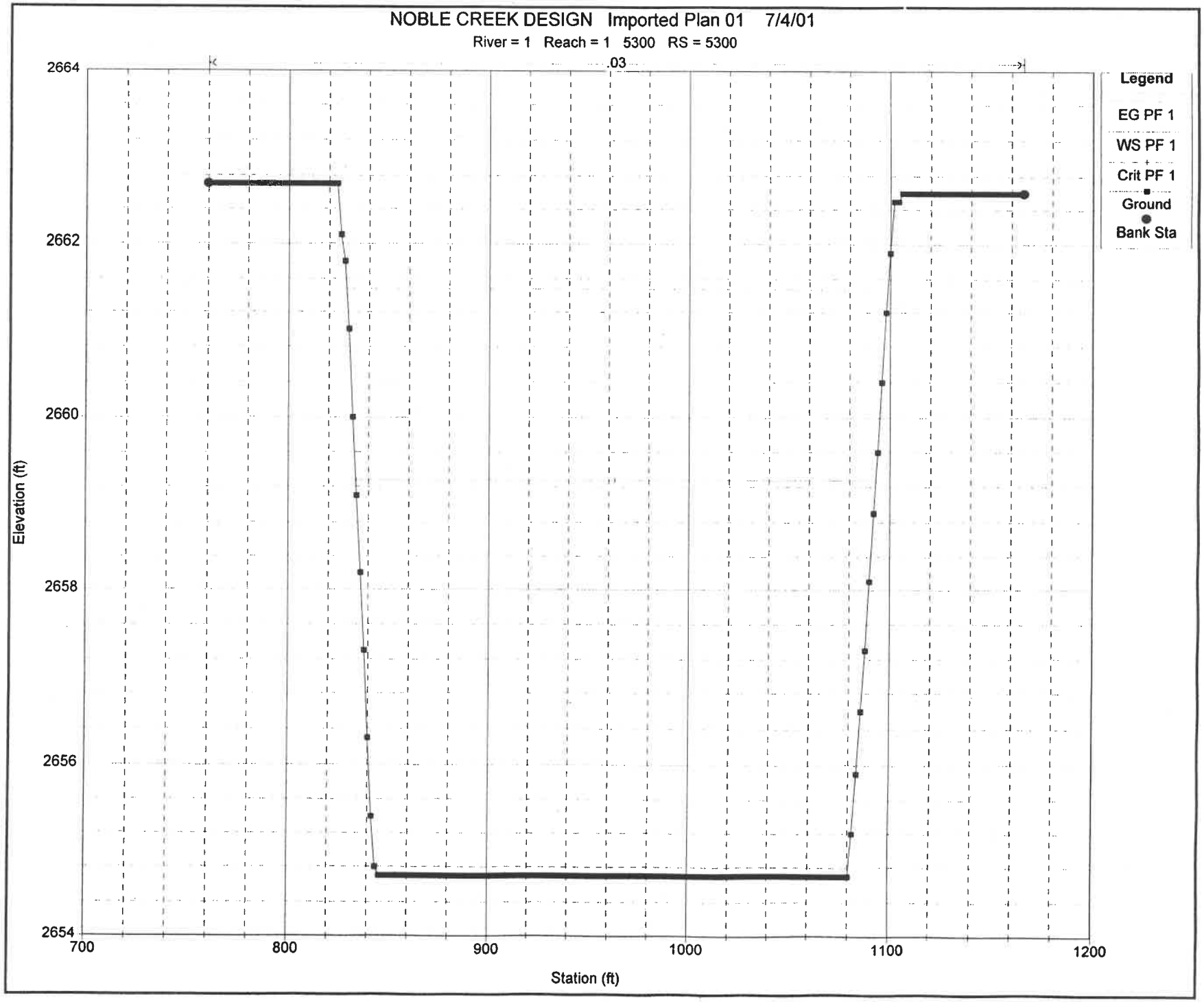

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 5450 RS = 5450
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2668
2666
2664
2662
2660
2658
700
800
900
1000
1100
1200
Station (ft)

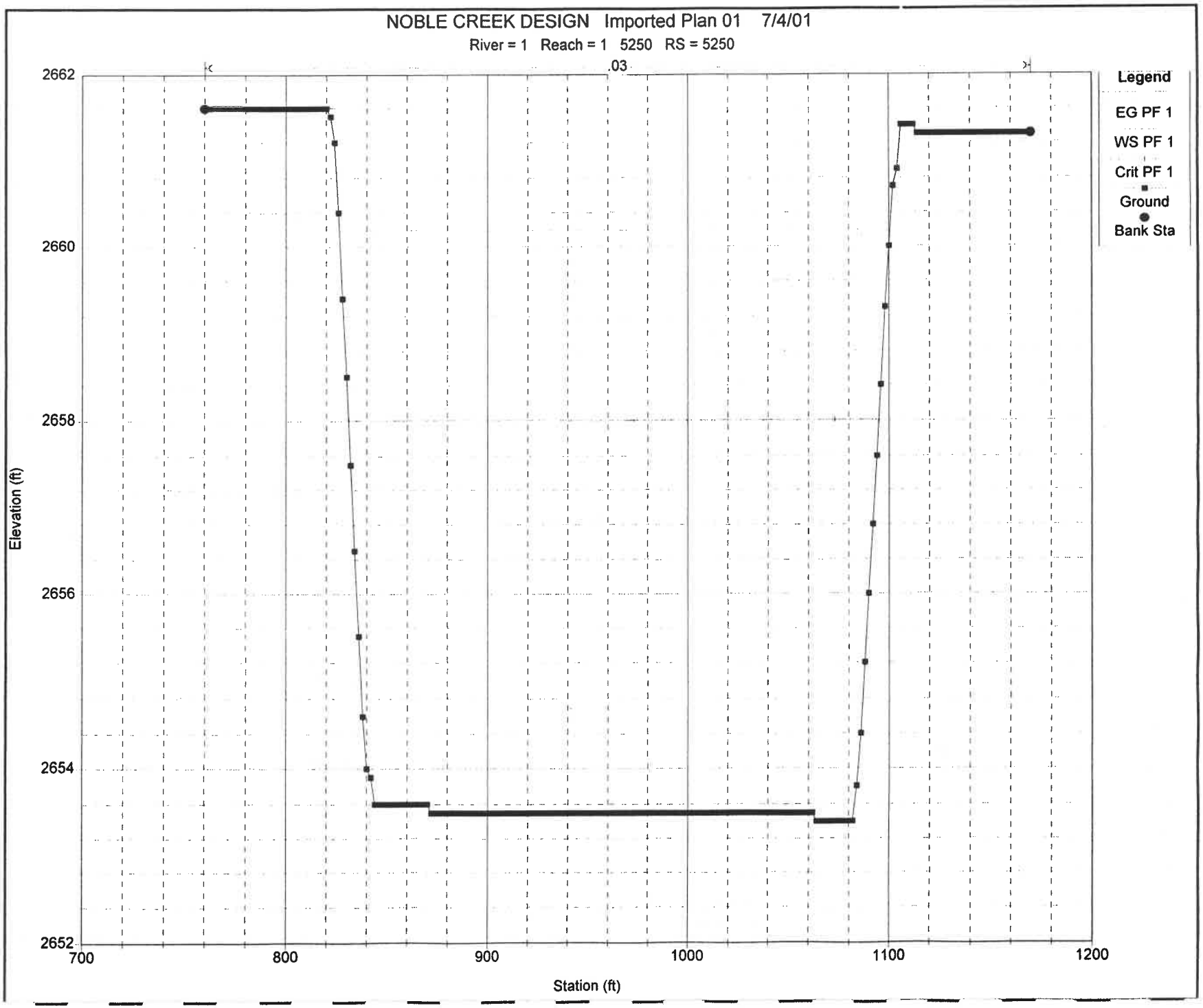

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 5400 RS = 5400
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2666
2664
2662
2660
2658
2656
700
800
900
1000
1100
1200
Station (ft)

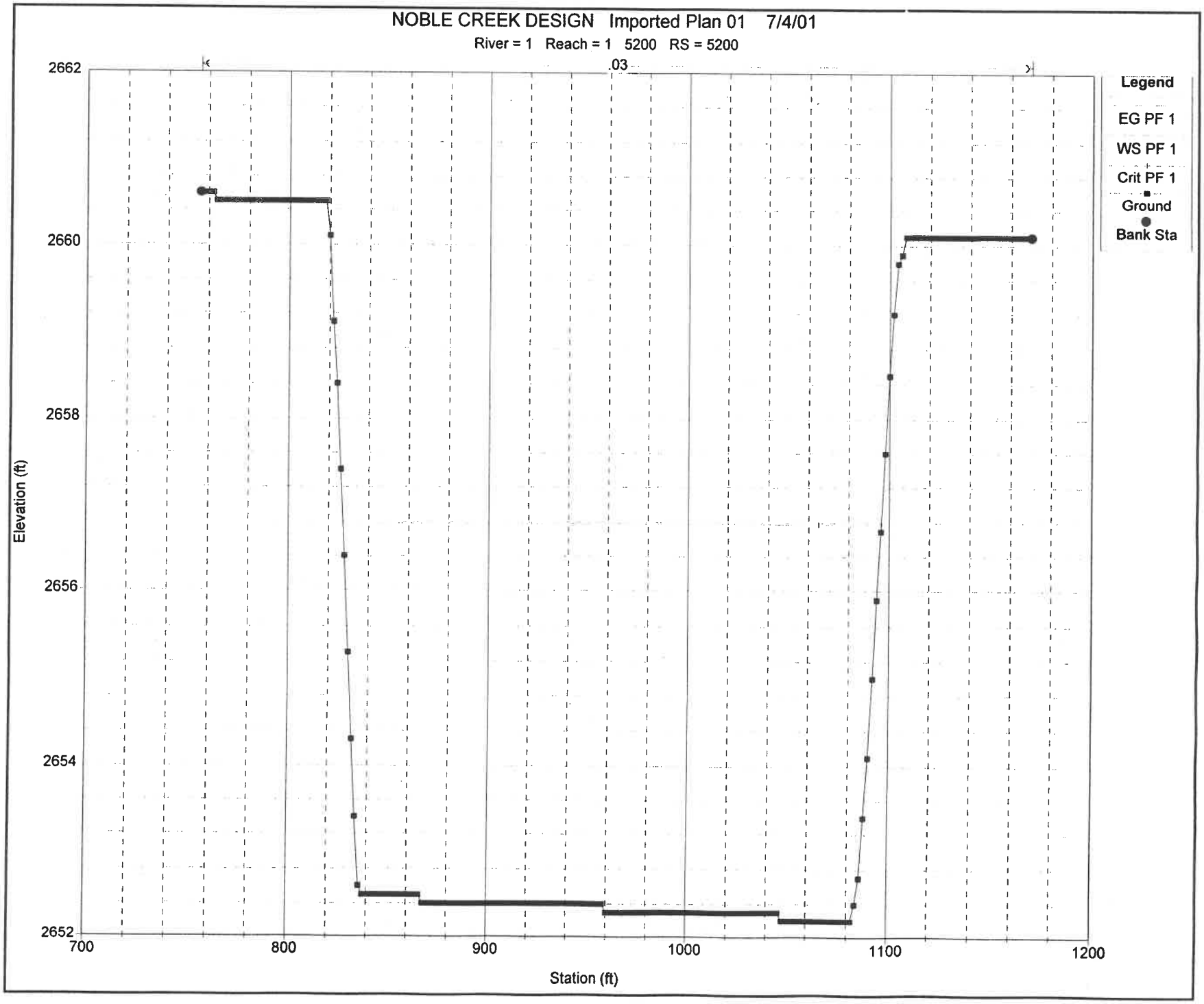

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 5350 RS = 5350
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2664
2662
2660
2658
2656
2654
700
800
900
1000
1100
1200
Station (ft)

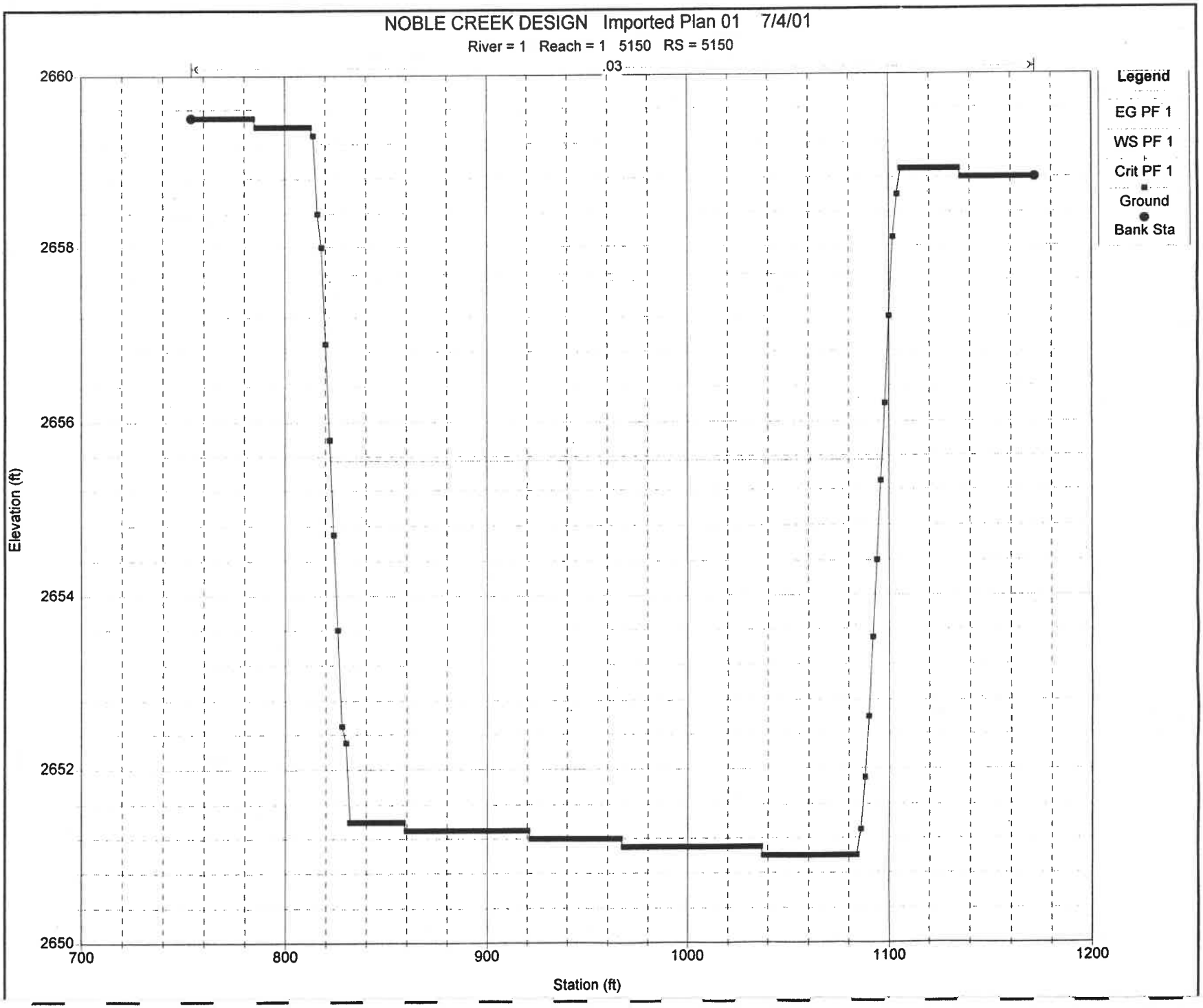

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 5300 RS = 5300
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2664
2662
2660
2658
2656
2654
700
800
900
1000
1100
1200
Station (ft)

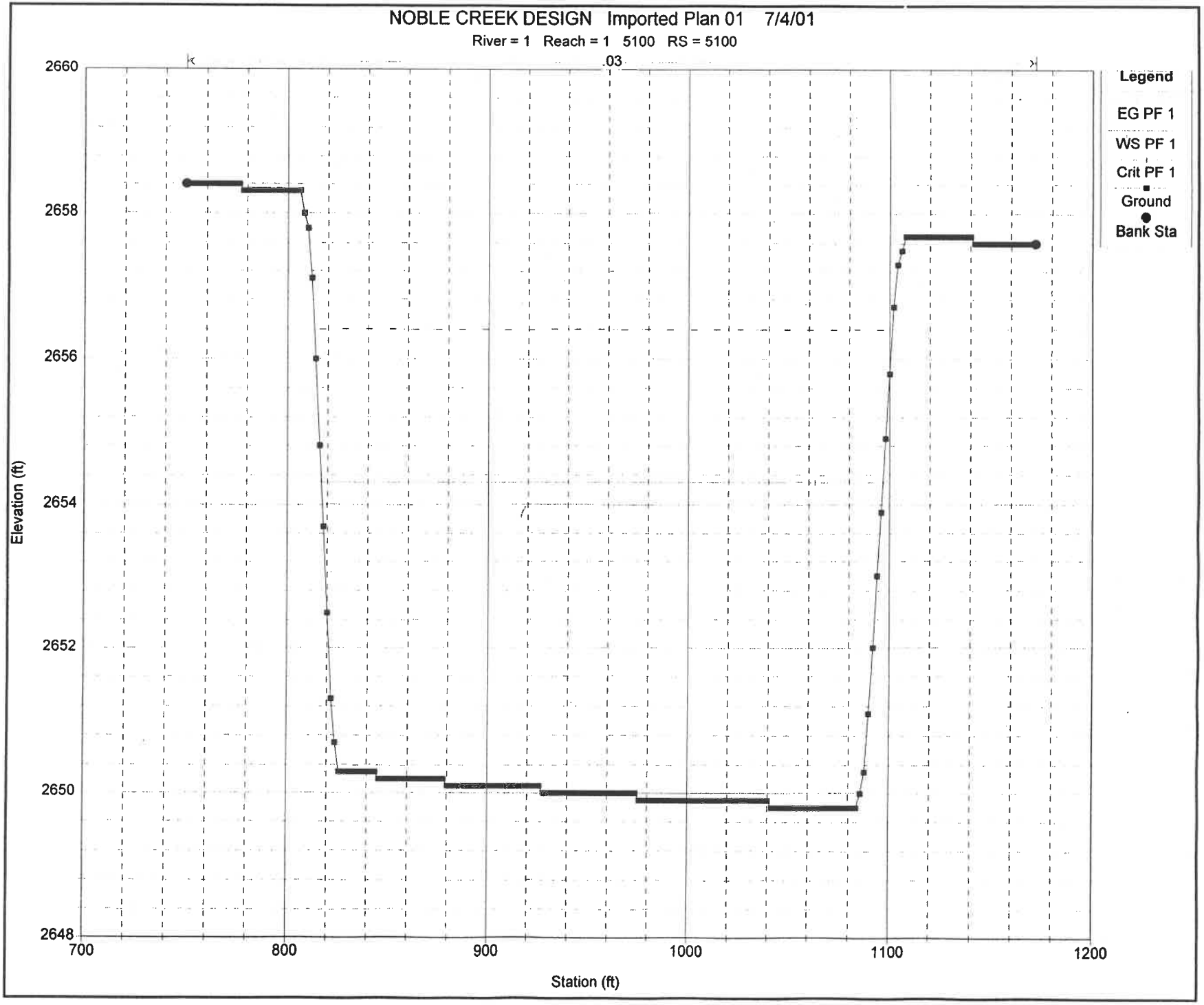

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 5250 RS = 5250
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2662
2660
2658
2656
2654
2652
700
800
900
1000
1100
1200
Station (ft)

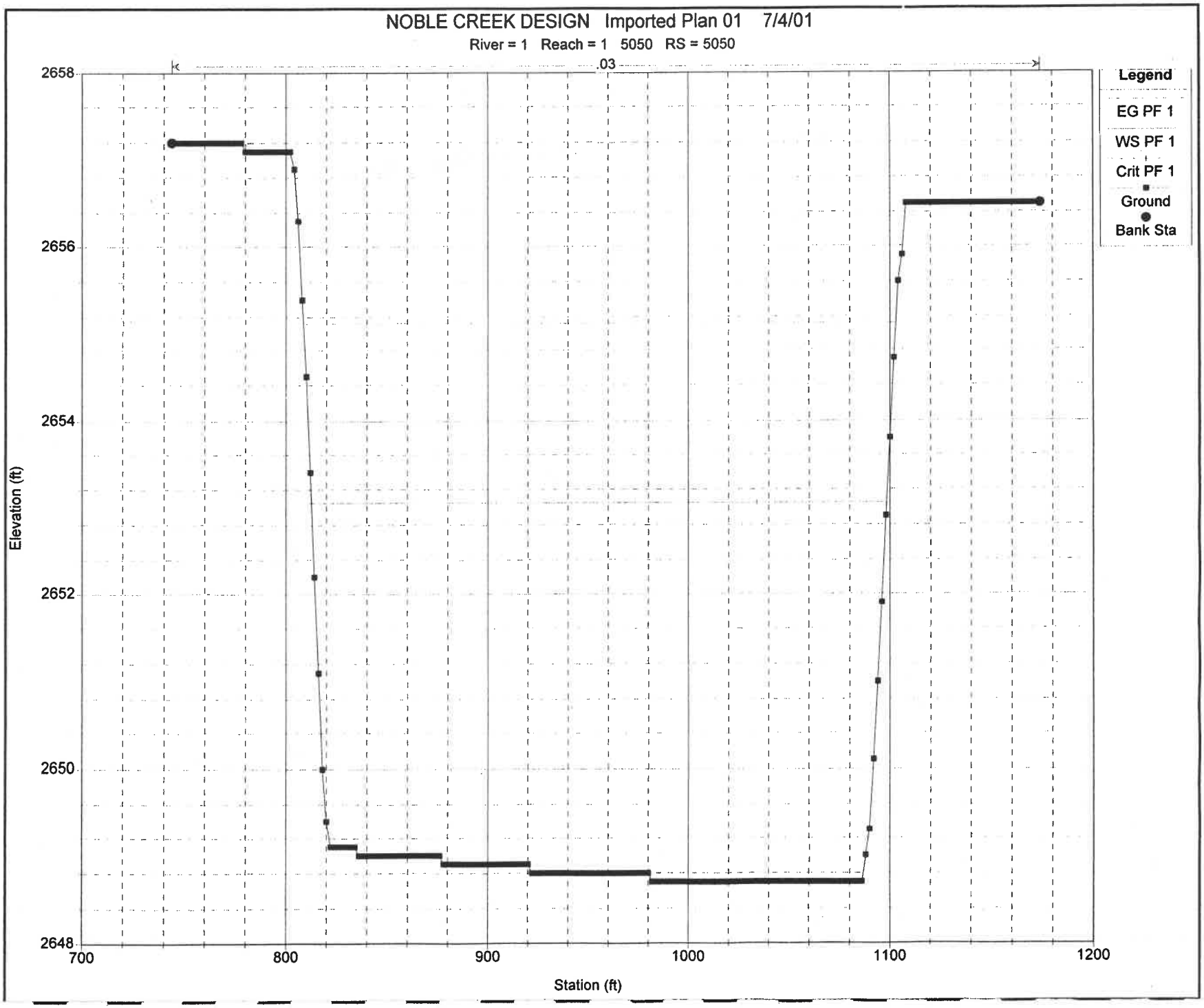

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 5300 RS = 5300
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2664
2662
2660
2658
2656
2654
700
800
900
1000
1100
1200
Station (ft)

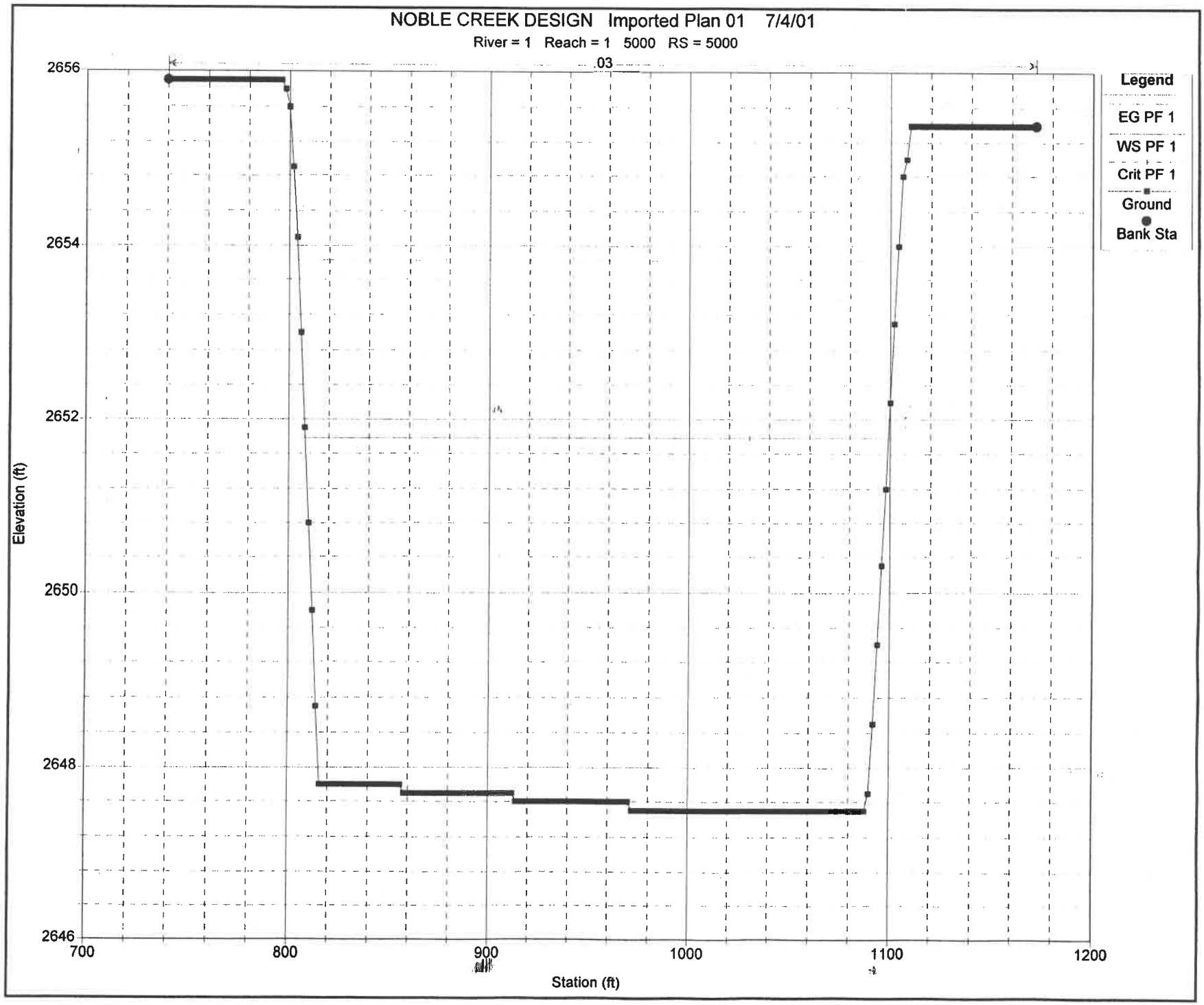

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 5250 RS = 5250
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2662
2660
2658
2656
2654
2652
700
800
900
1000
1100
1200
Station (ft)

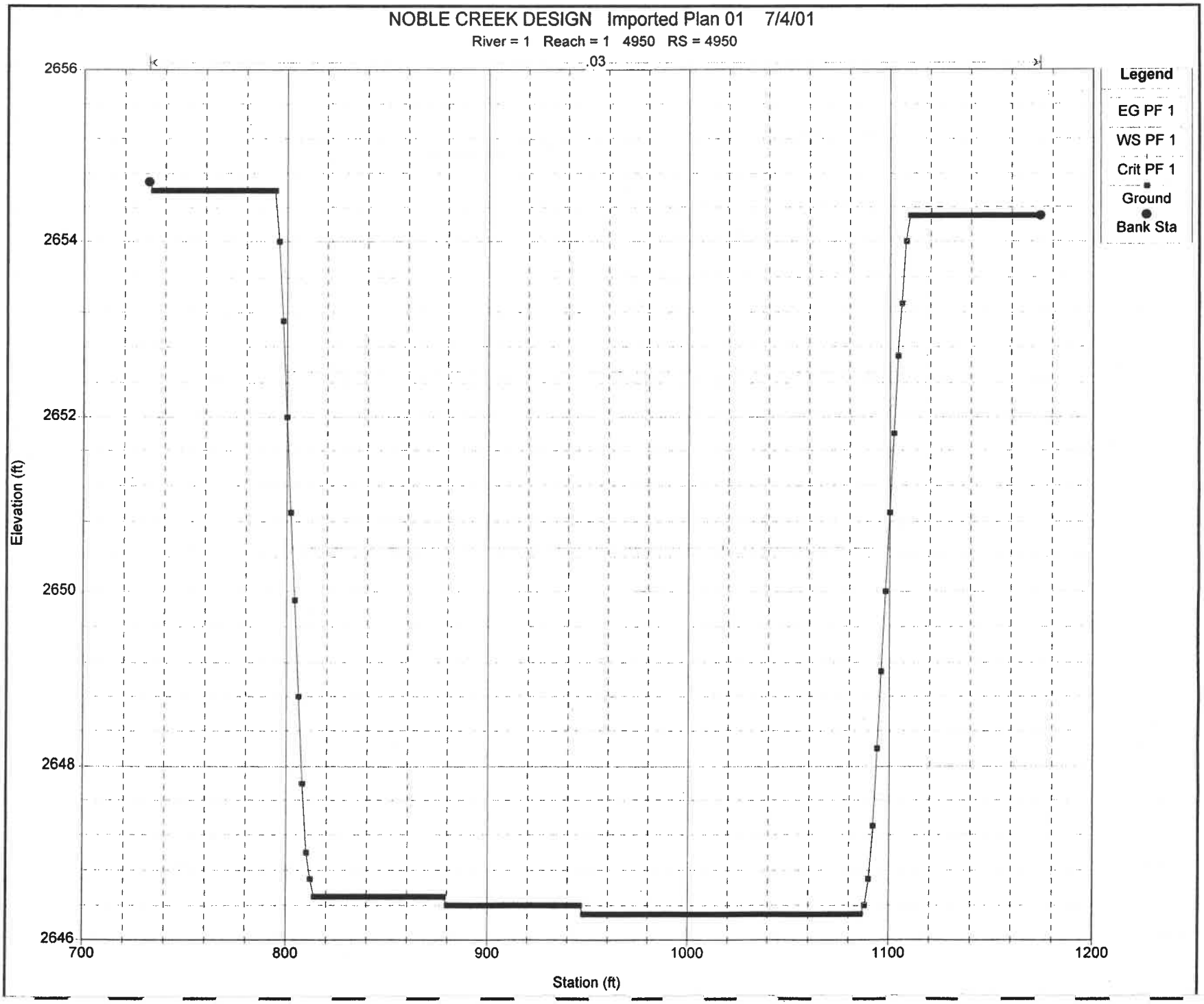

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 5200 RS = 5200
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2662
2660
2658
2656
2654
2652
700
800
900
1000
1100
1200
Station (ft)

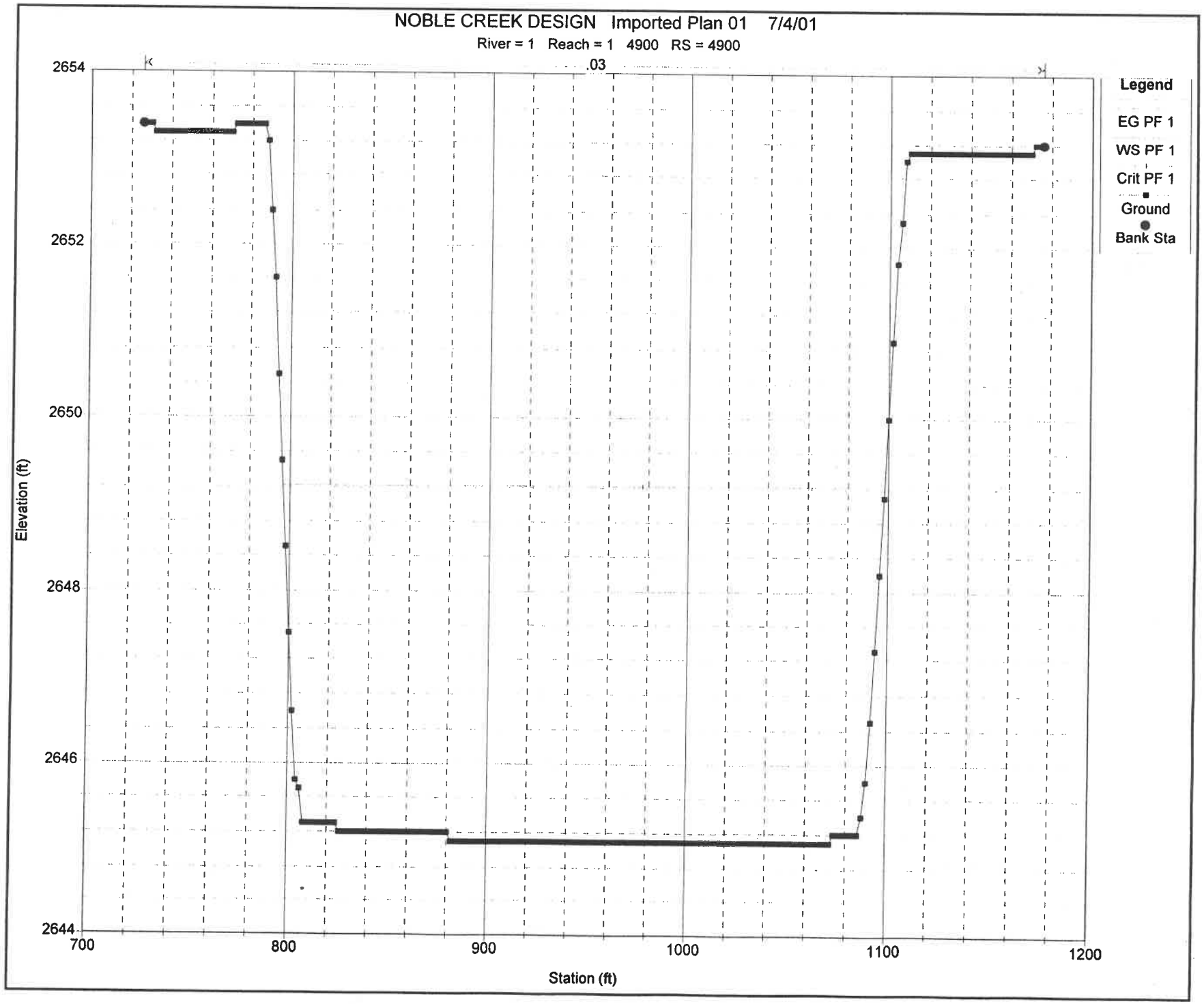

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 5150 RS = 5150
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2660
2658
2656
2654
2652
2650
700
800
900
1000
1100
1200
Station (ft)

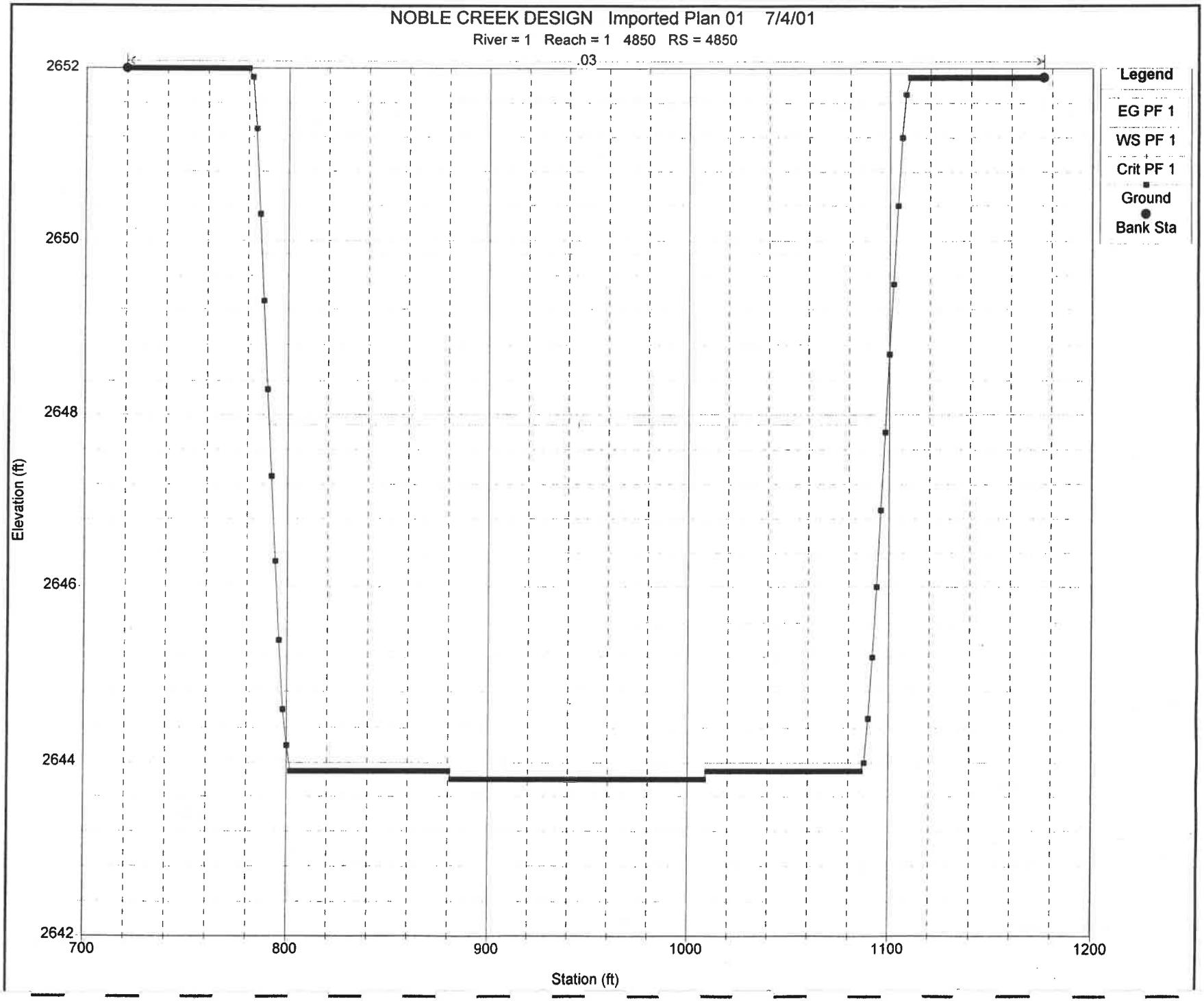

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 5100 RS = 5100
03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2660
2658
2656
2654
2652
2650
2648
700
800
900
1000
1100
1200
Station (ft)

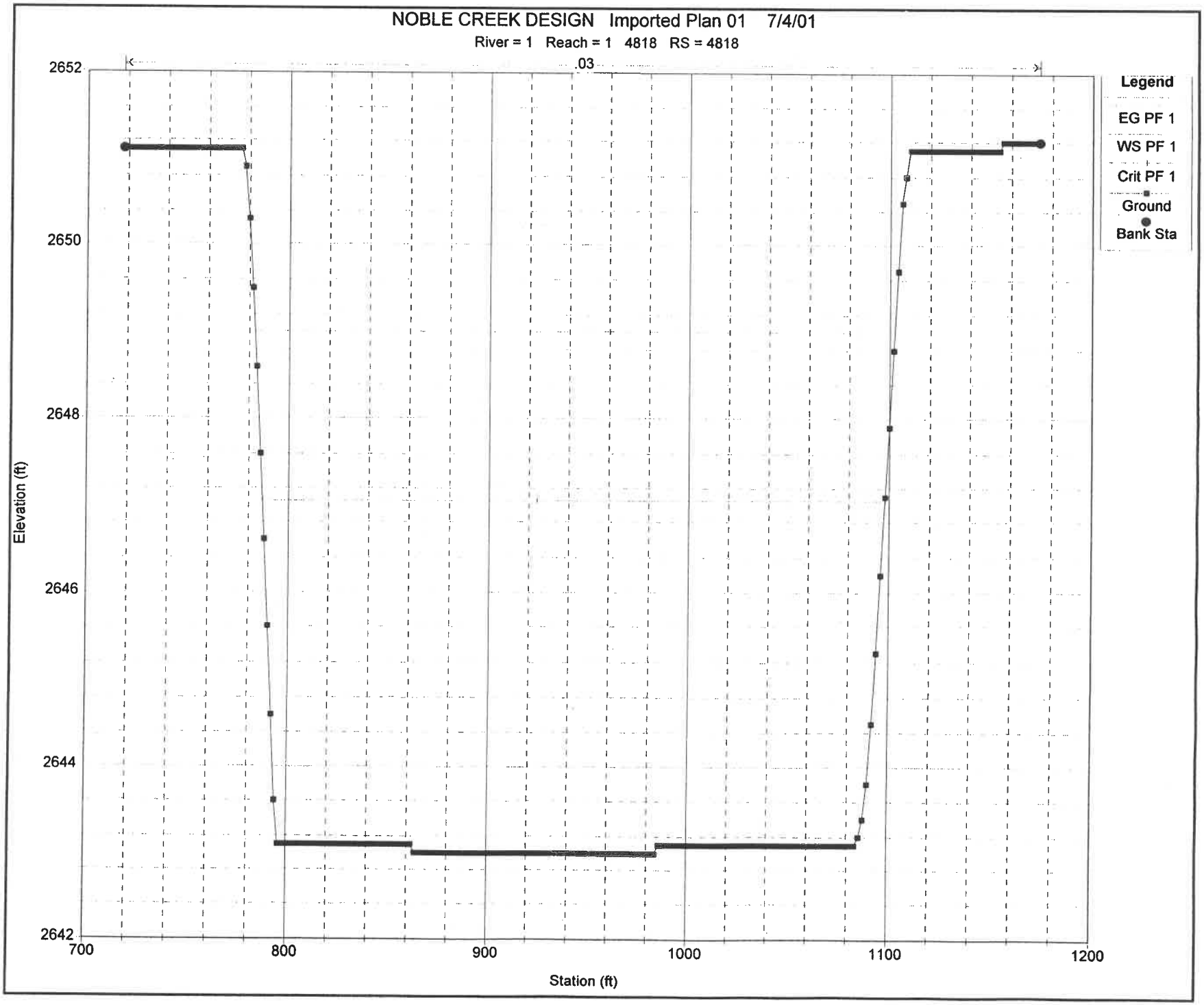

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 5050 RS = 5050
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
2658
2656
2654
2652
2650
2648
700
800
900
1000
1100
1200

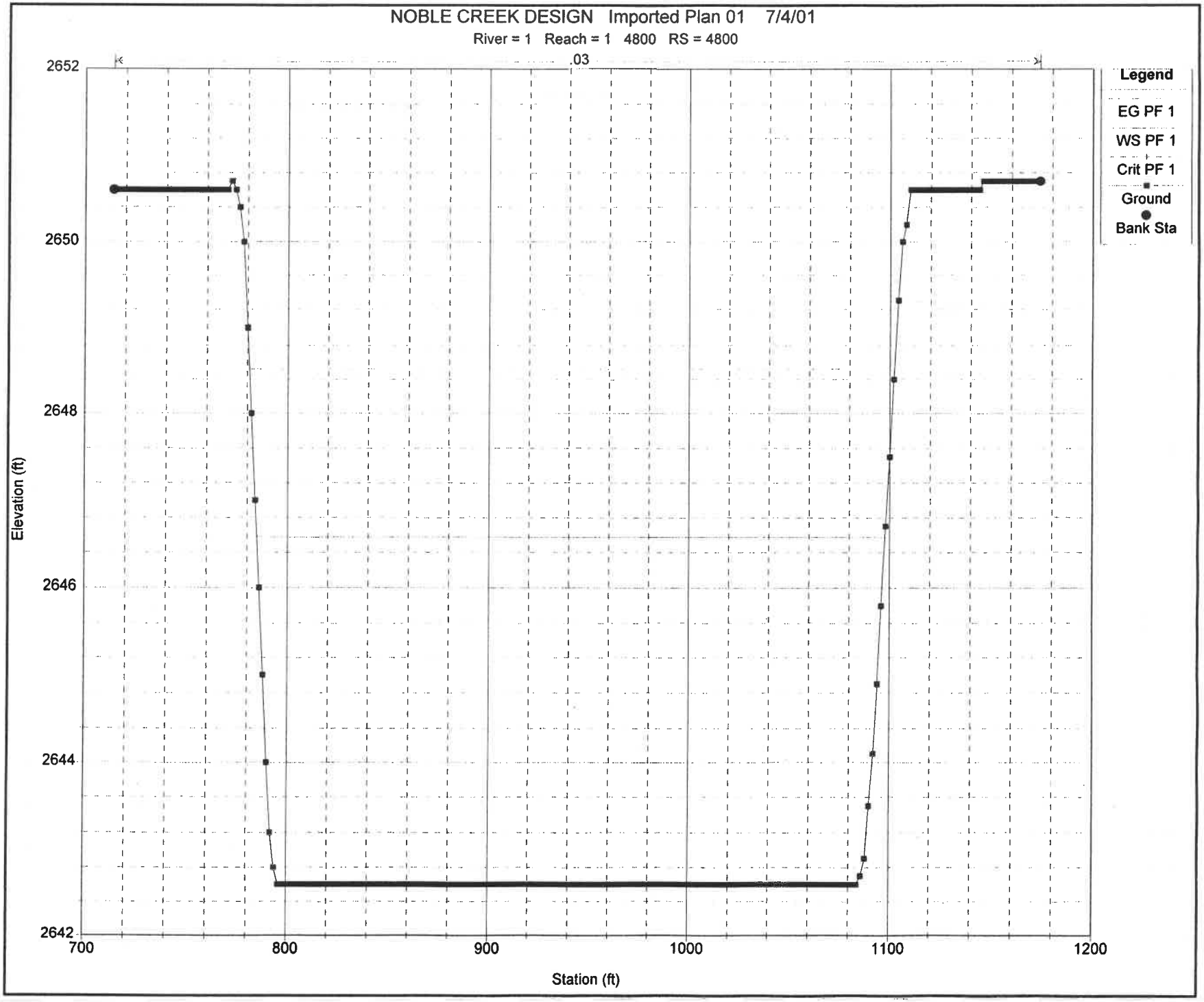

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 5000 RS = 5000
03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2656
2654
2652
2650
2648
2646
700
800
900
1000
1100
1200
Station (ft)

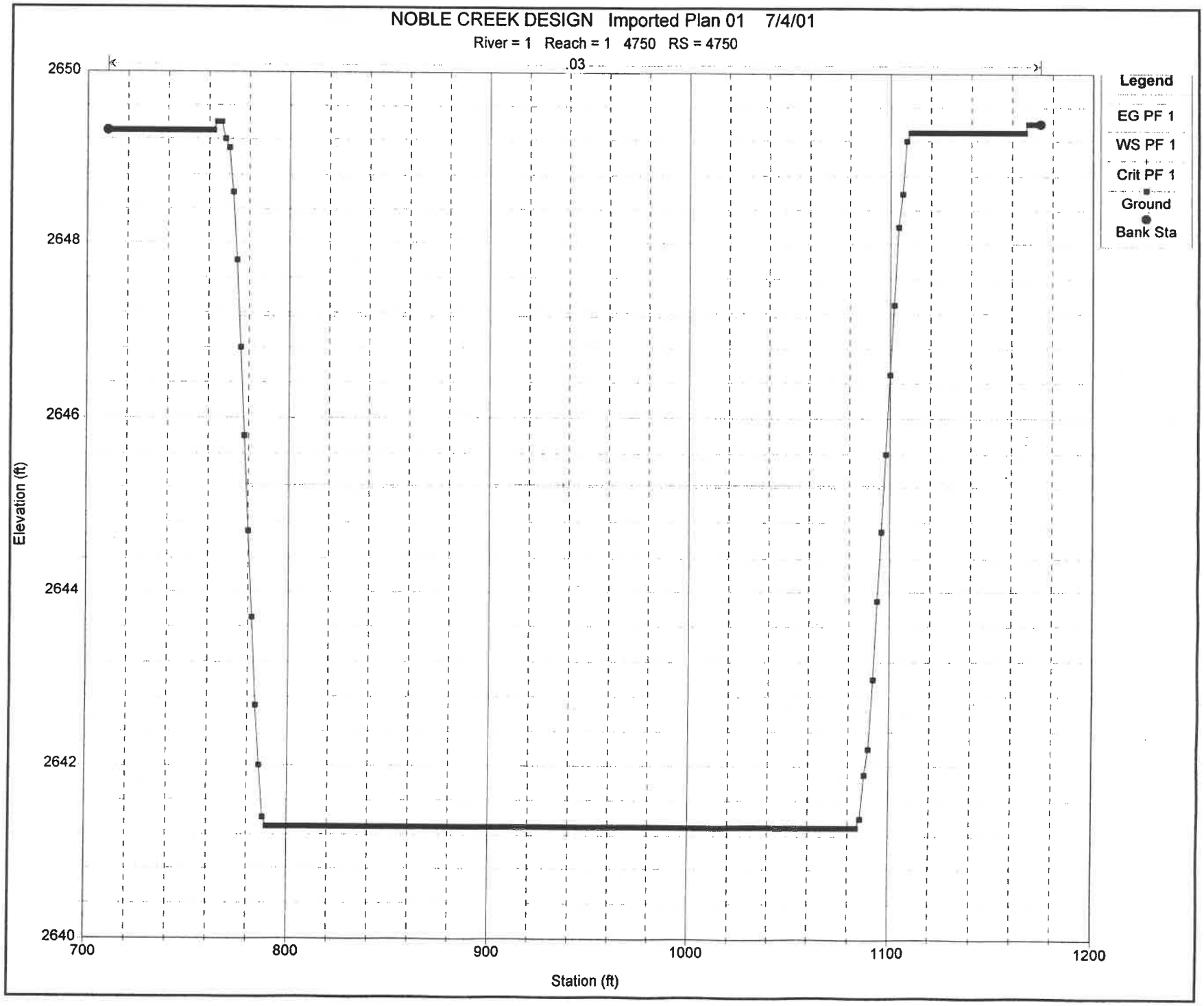

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 4950 RS = 4950
03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2656
2654
2652
2650
2648
2646
700
800
900
1000
1100
1200
Station (ft)

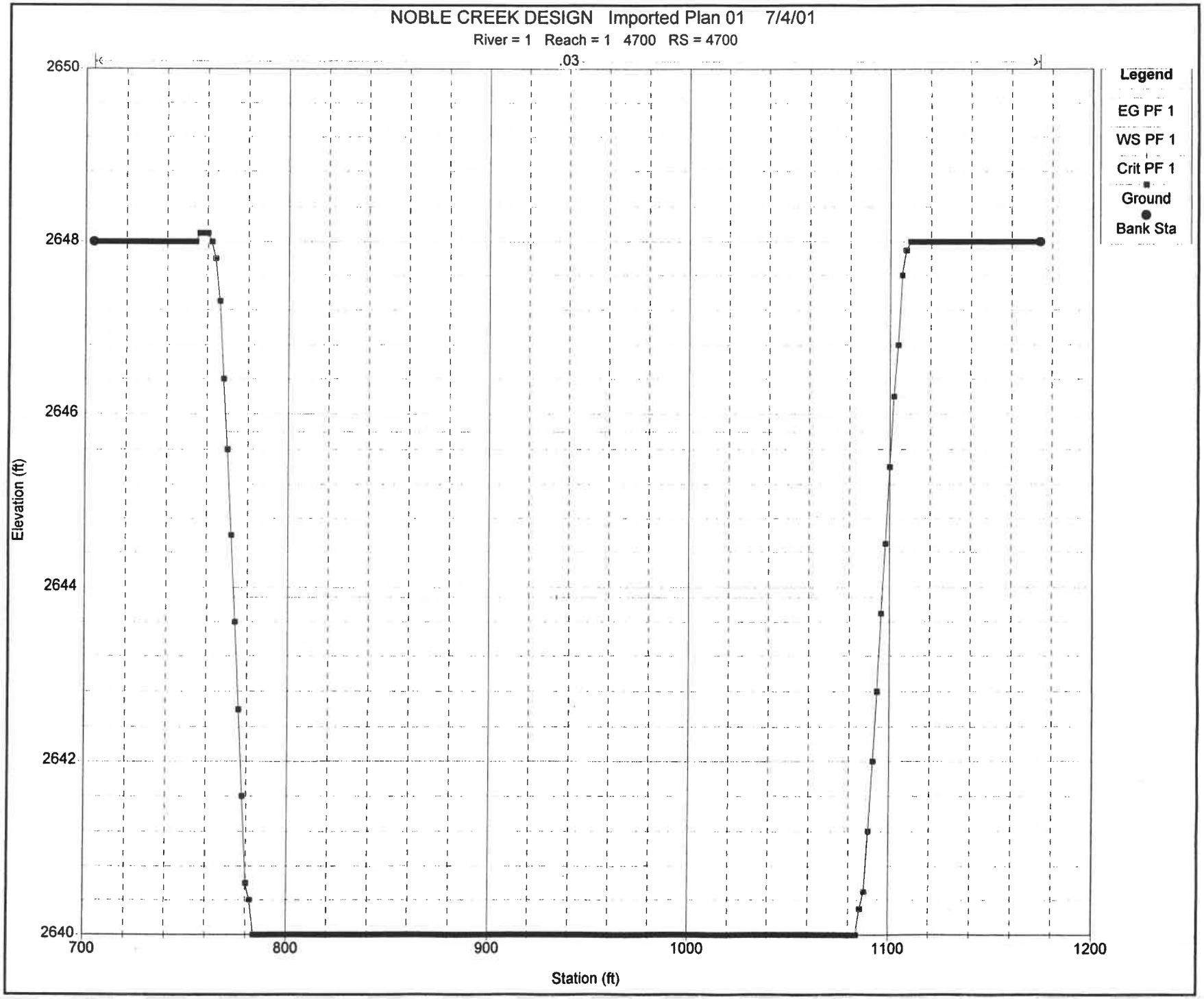

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 4900 RS = 4900
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2654
2652
2650
2648
2646
2644
700
800
900
1000
1100
1200
Station (ft)

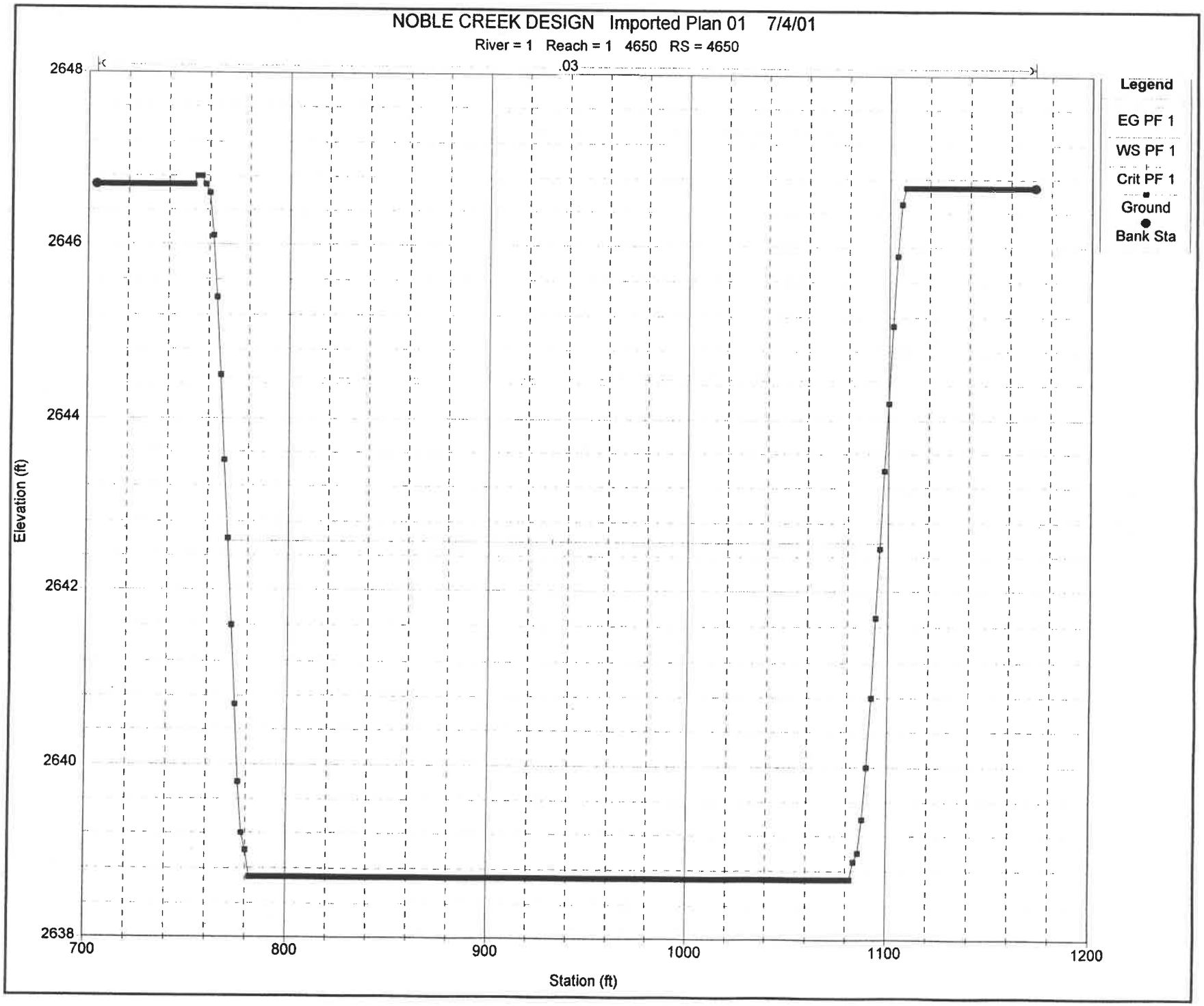

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 4850 RS = 4850
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2652
2650
2648
2646
2644
2642
700
800
900
1000
1100
1200
Station (ft)

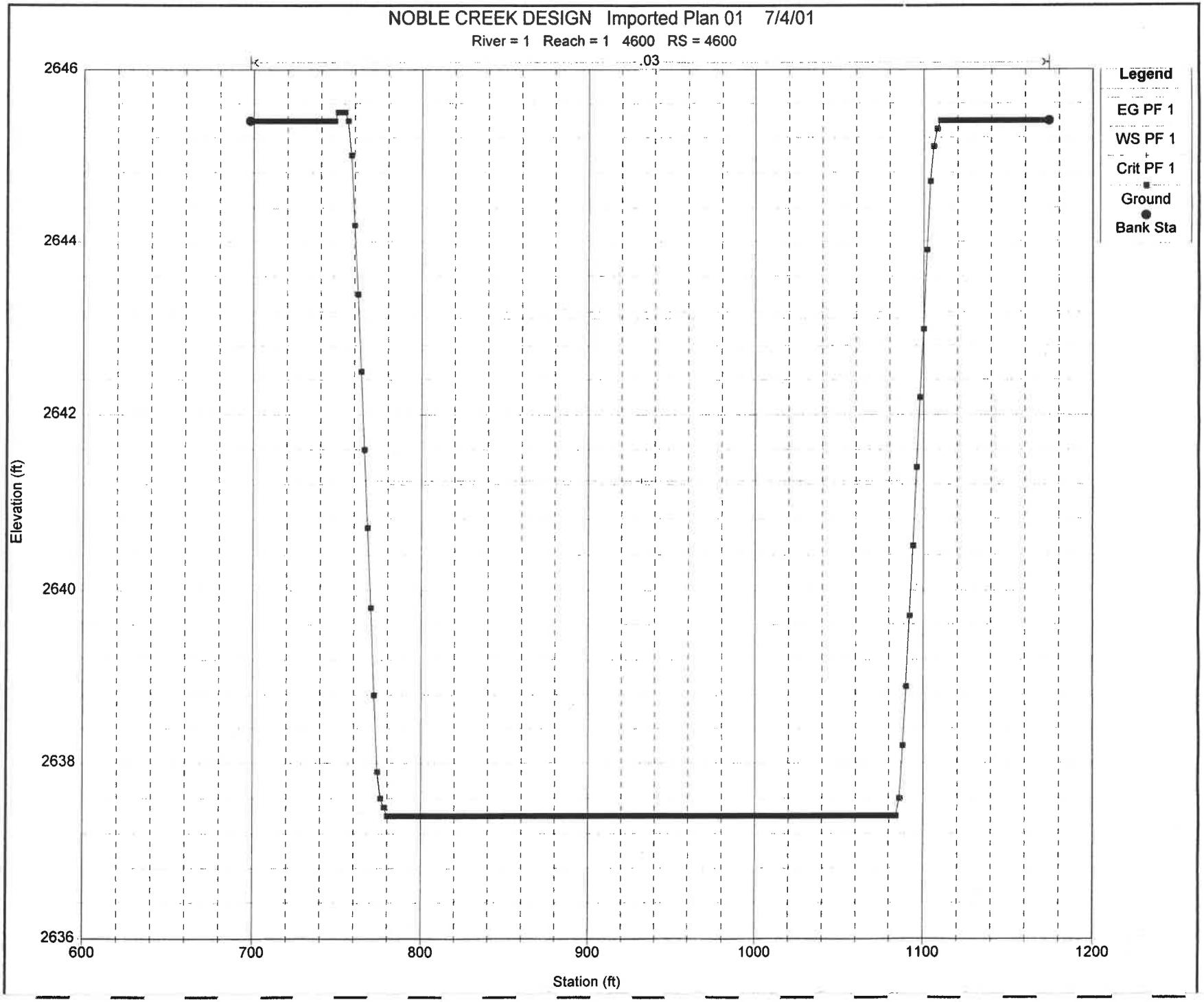

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 4818 RS = 4818
03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2652
2650
2648
2646
2644
2642
700
800
900
1000
1100
1200
Station (ft)

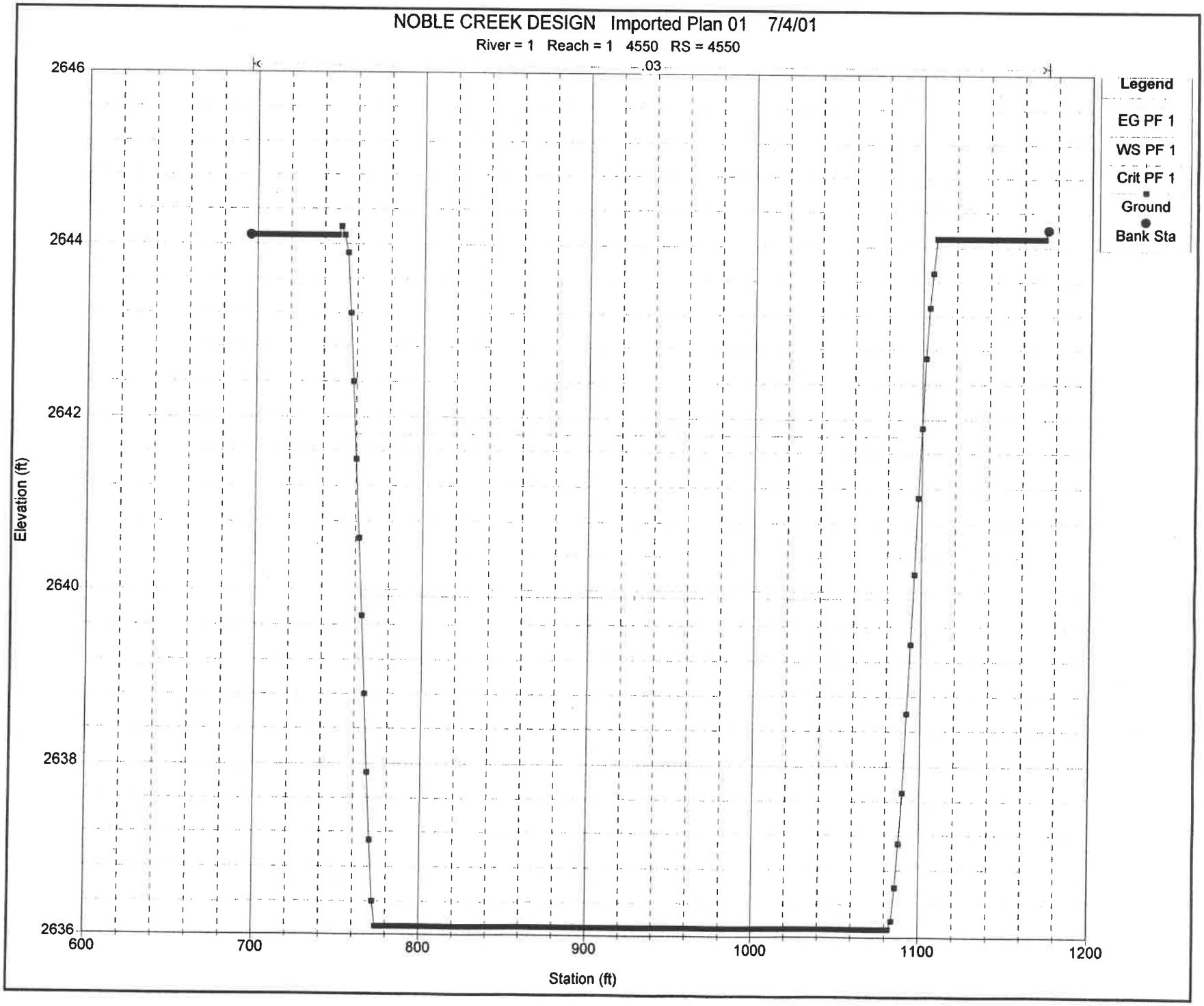

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 4800 RS = 4800
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2652
2650
2648
2646
2644
2642
700
800
900
1000
1100
1200
Station (ft)

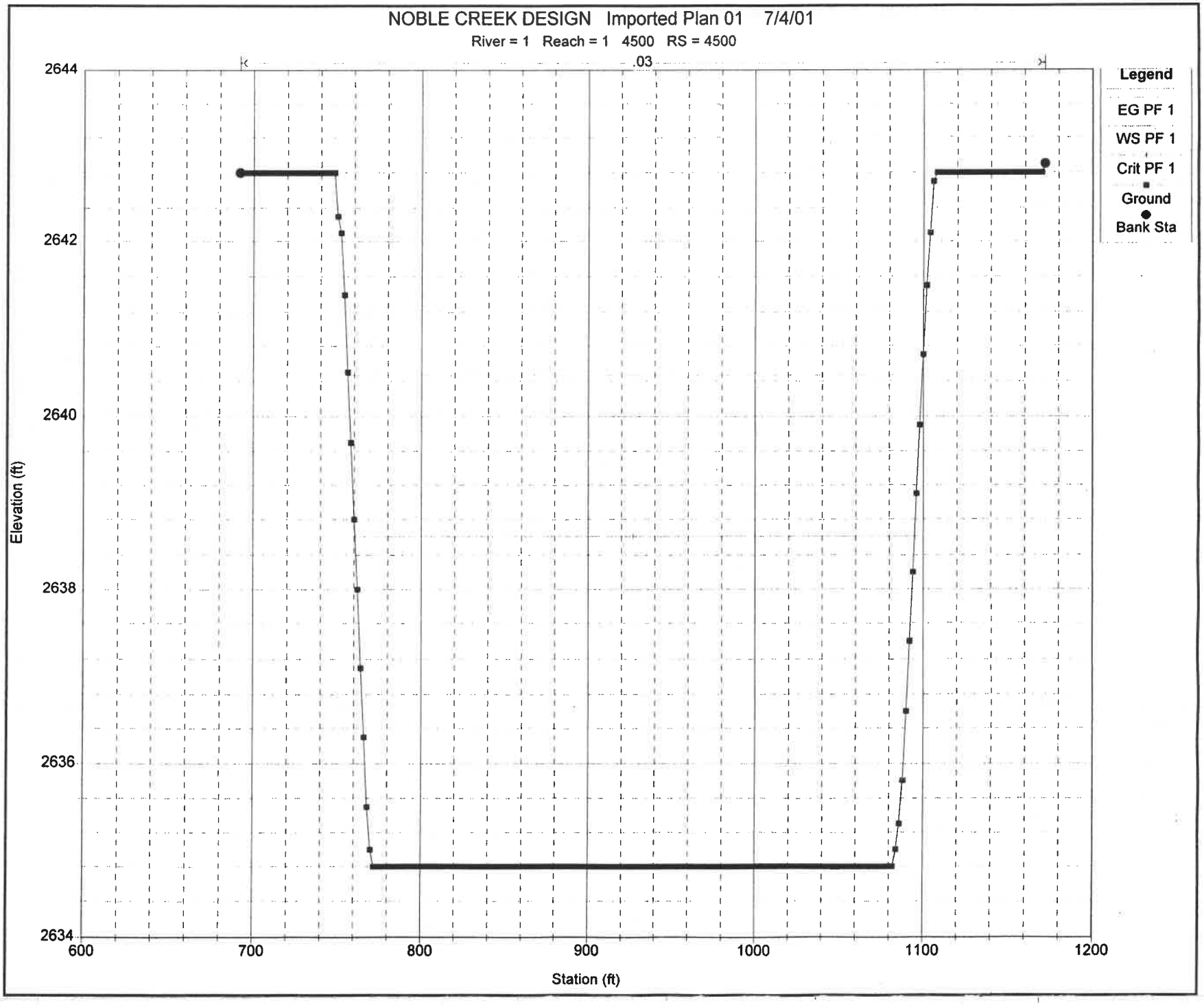

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 4750 RS = 4750
03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2650
2648
2646
2644
2642
2640
700
800
900
1000
1100
1200
Station (ft)

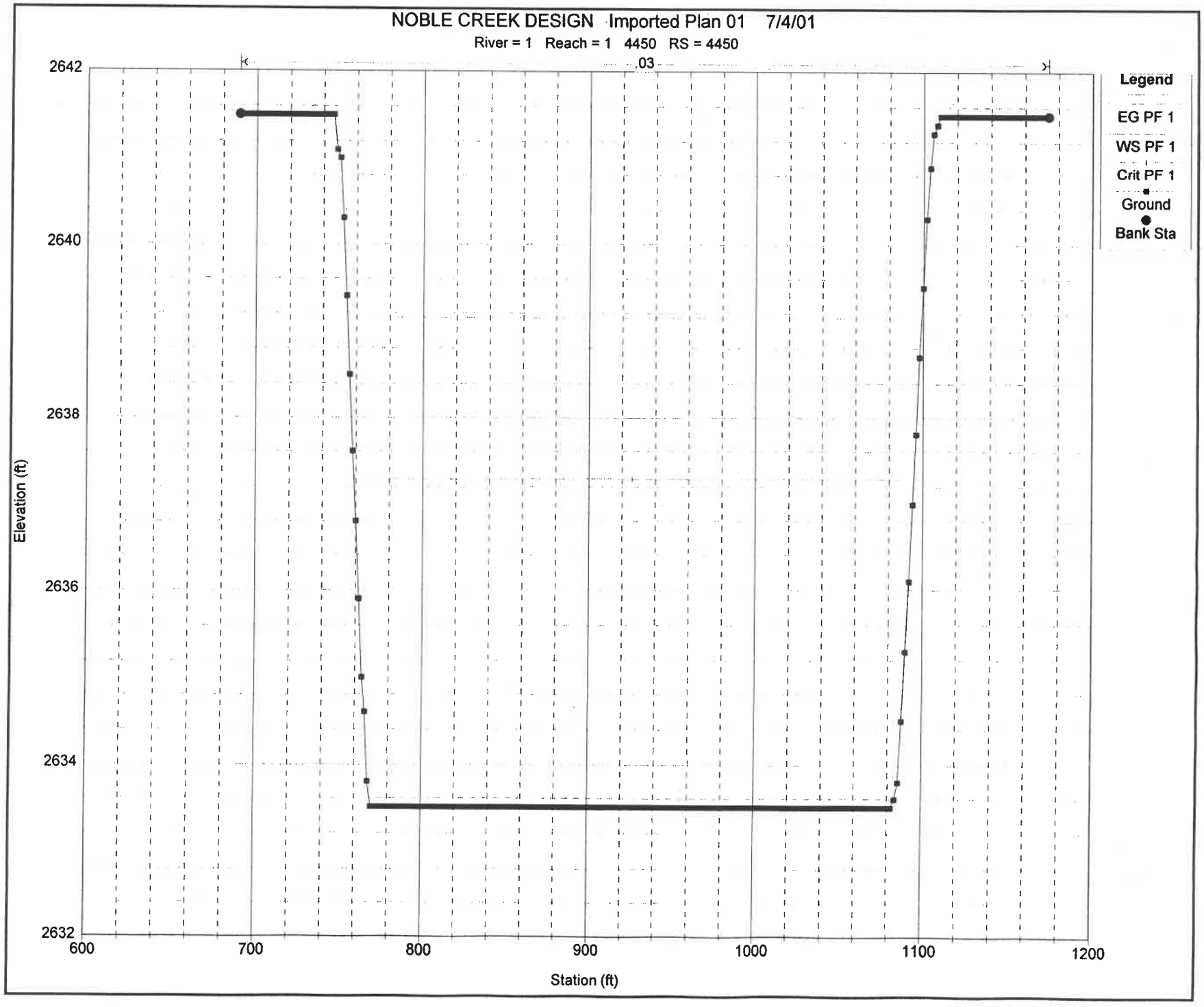

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 4700 RS = 4700
.03
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
2650
2648
2646
2644
2642
2640
700
800
900
1000
1100
1200
Station (ft)

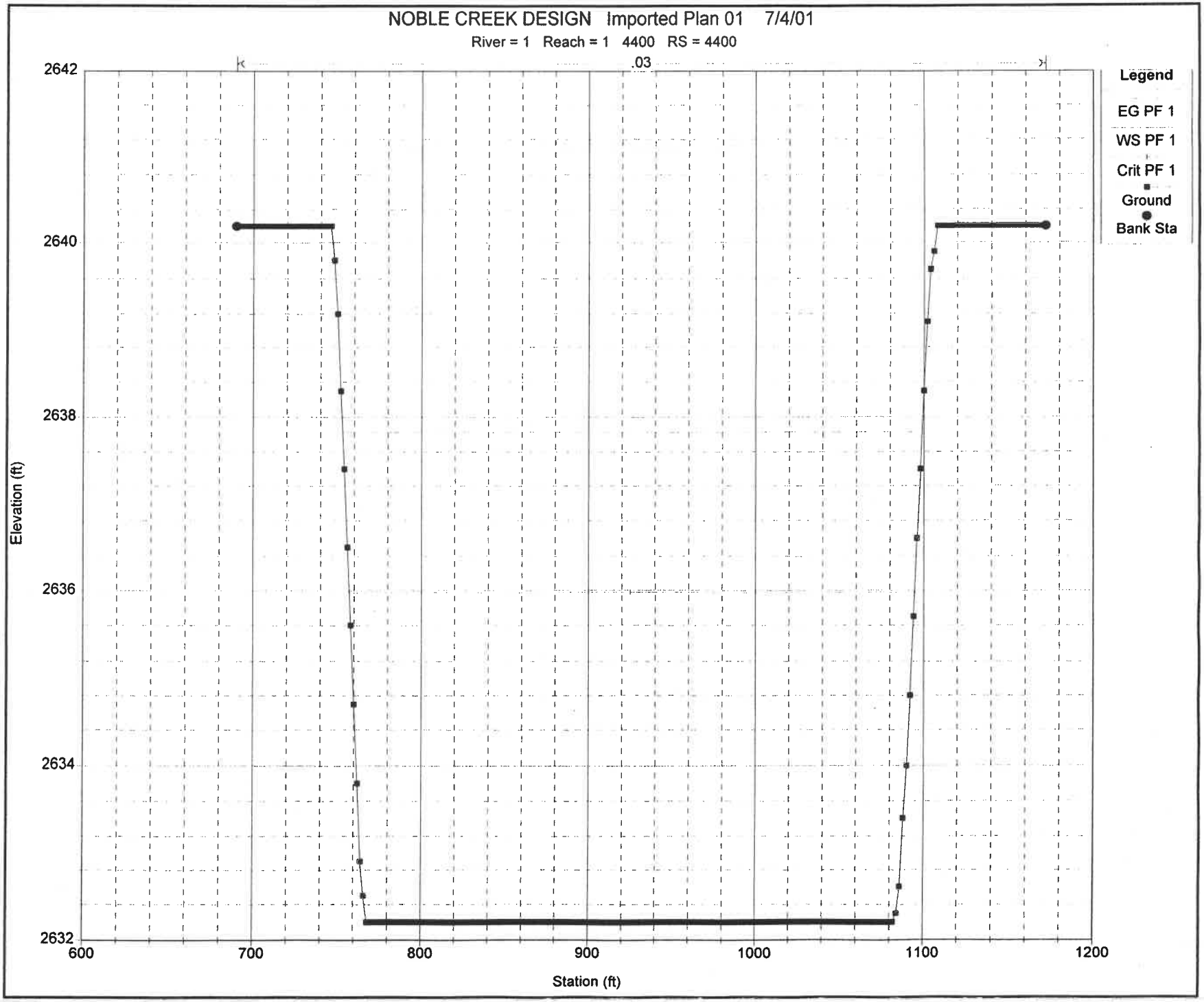

NOBLE CREEK DESIGN Imported Plan 01 7/4/01
River = 1 Reach = 1 4650 RS = 4650
.03
Legend
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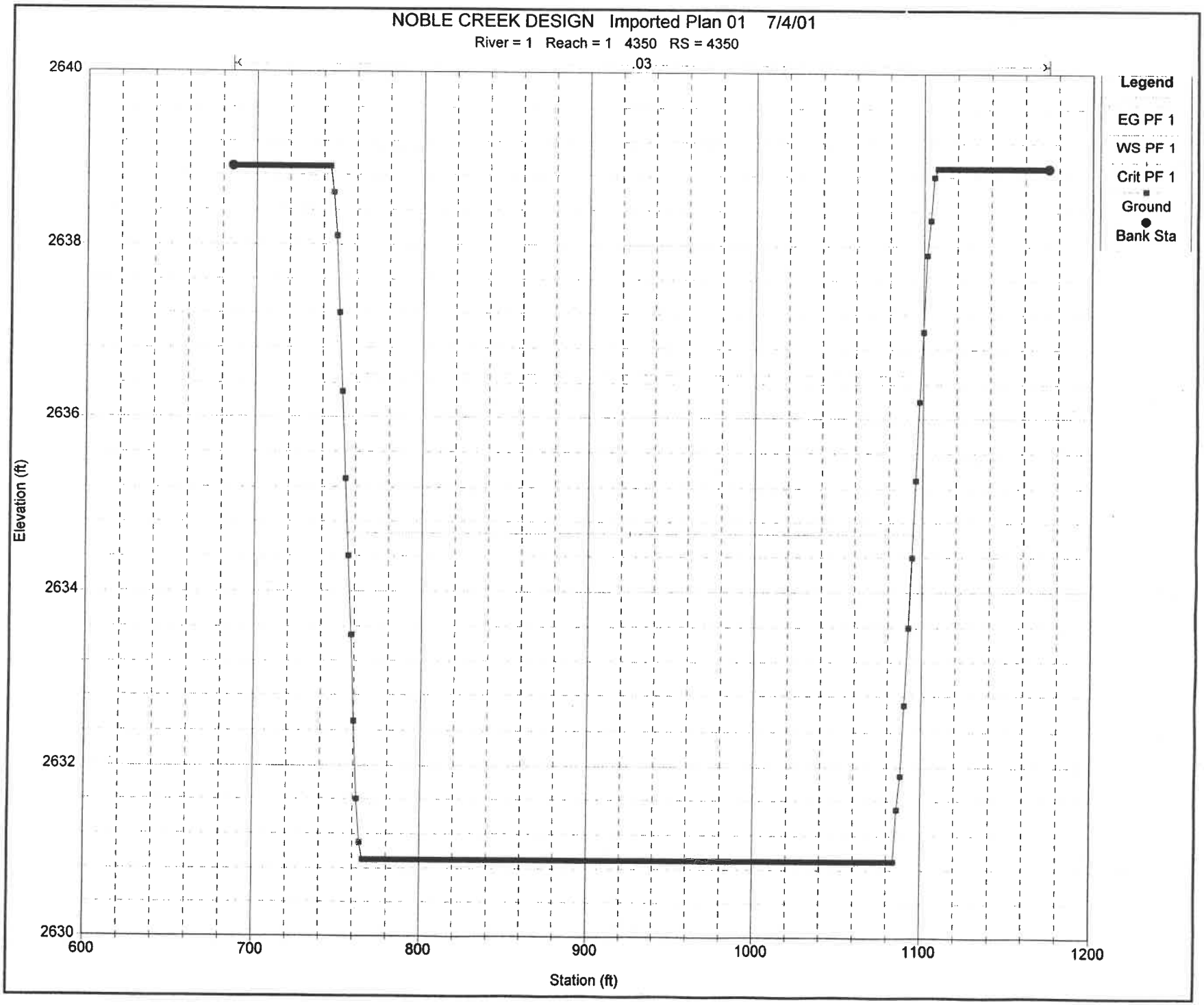

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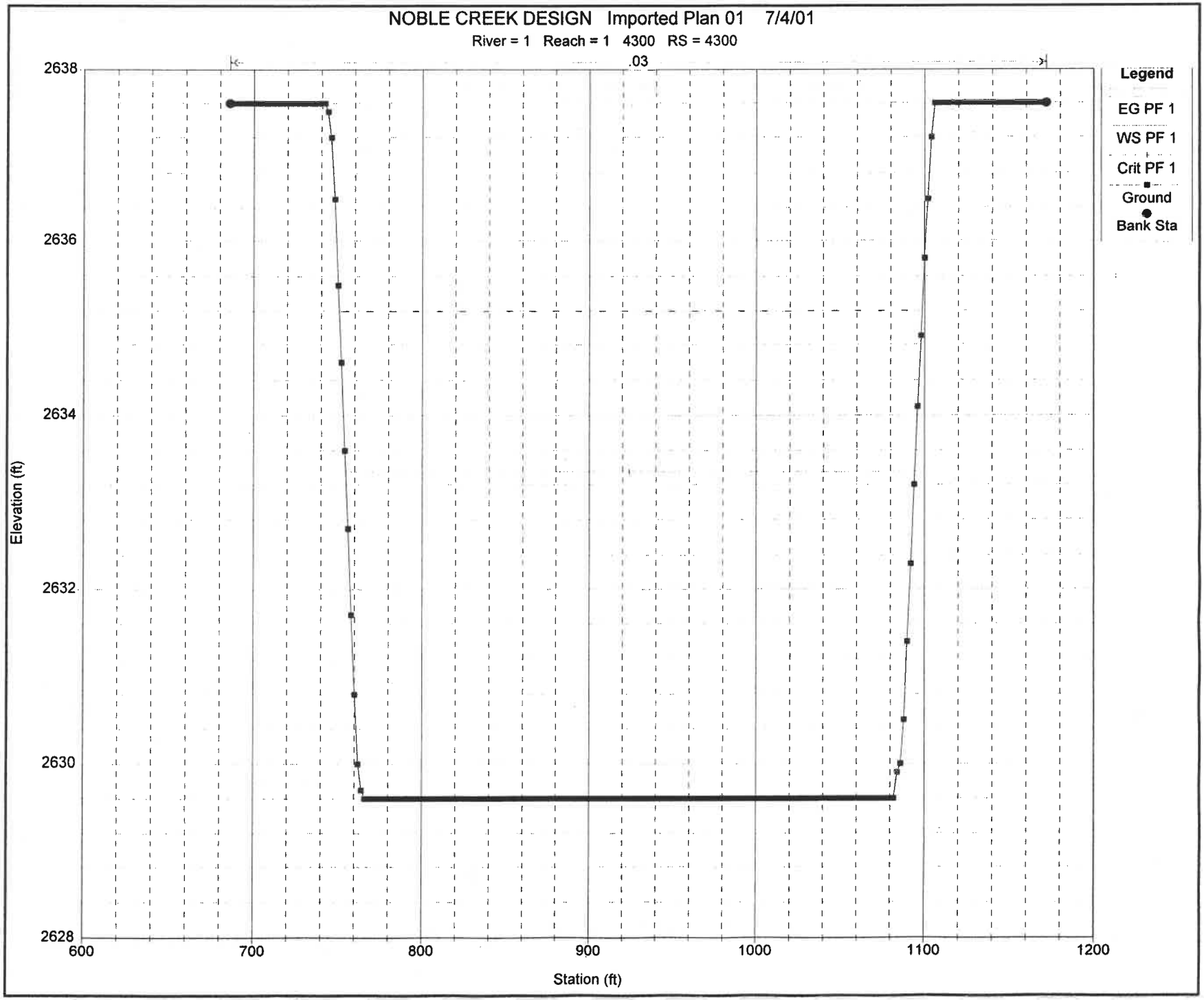

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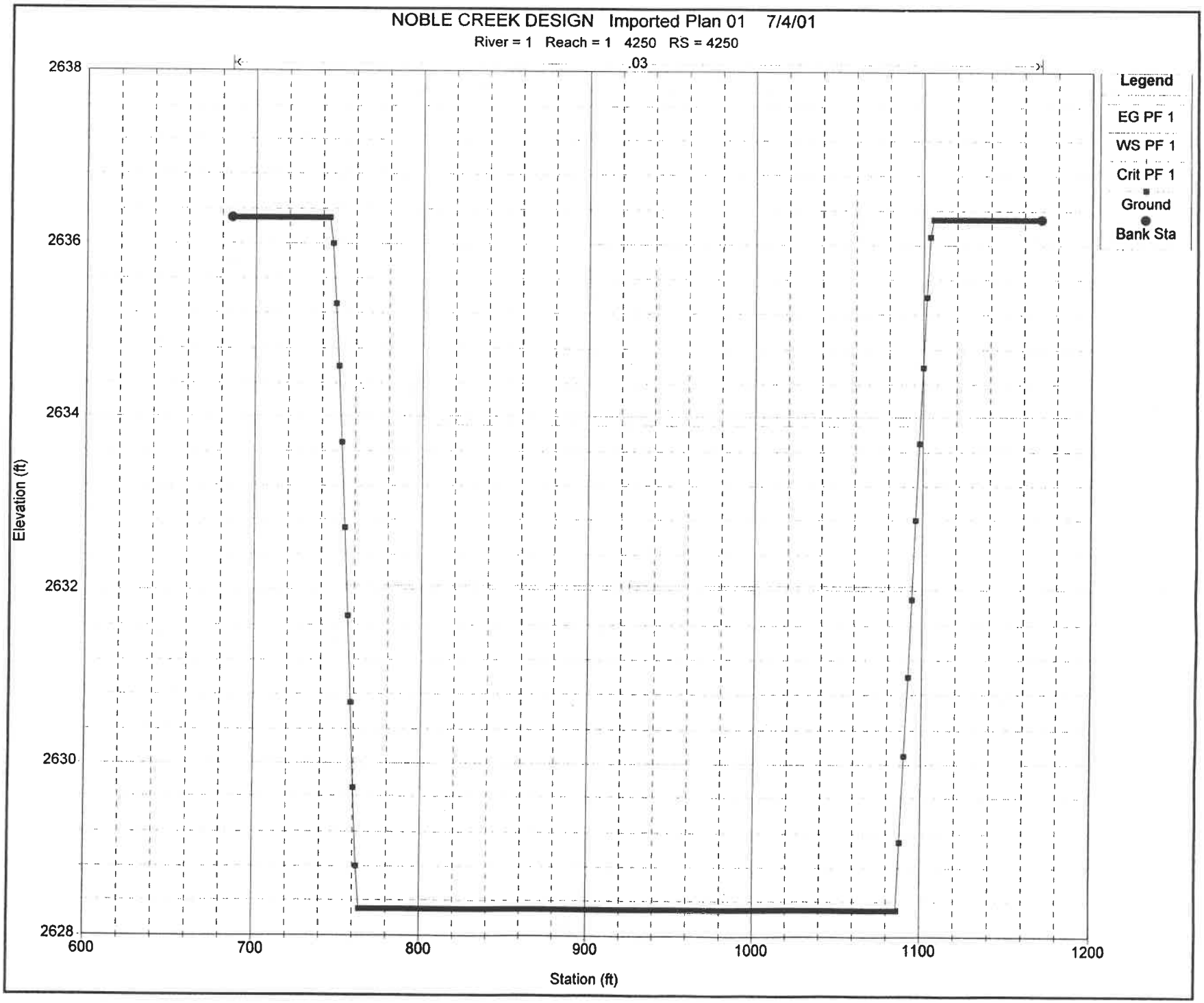

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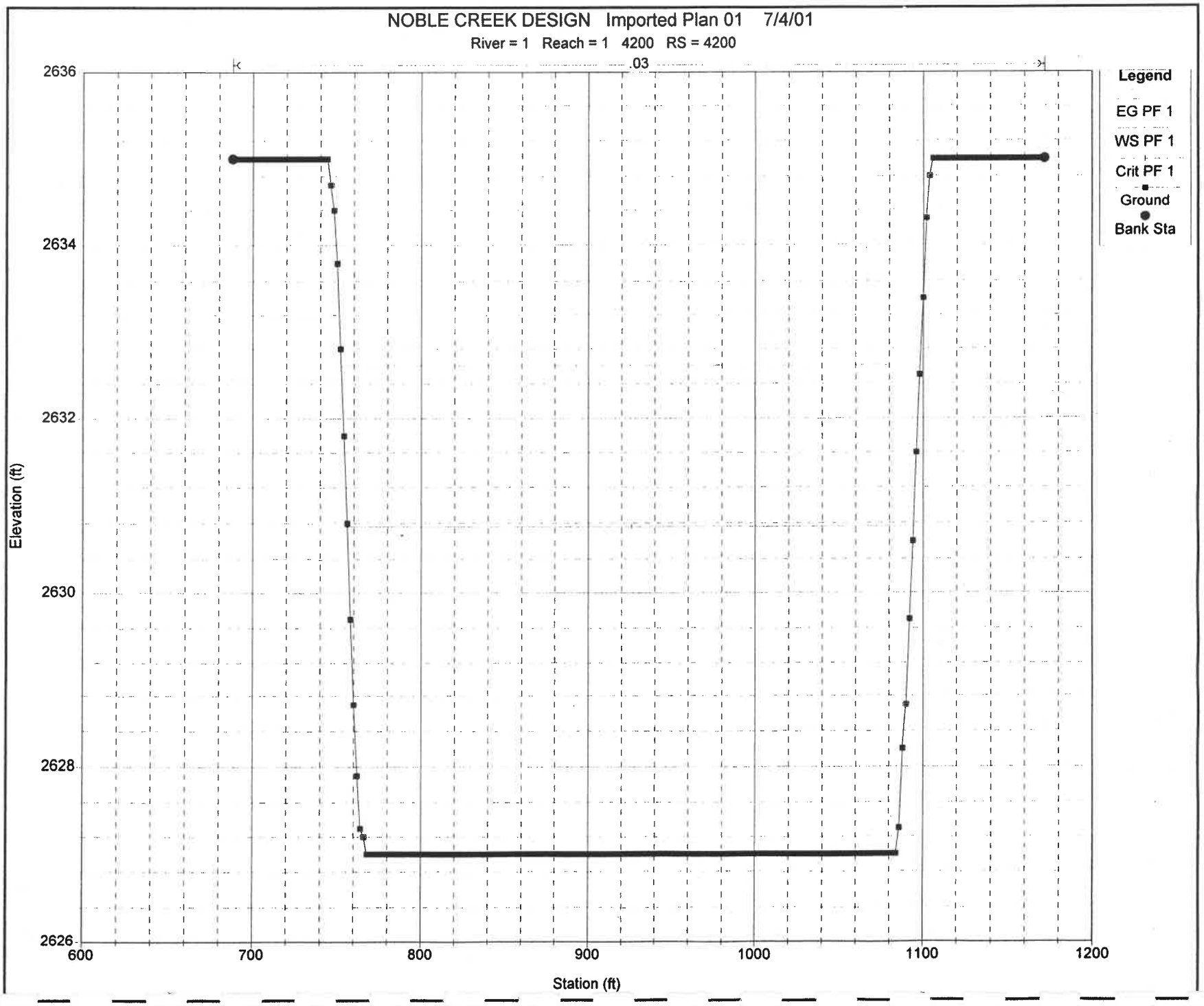

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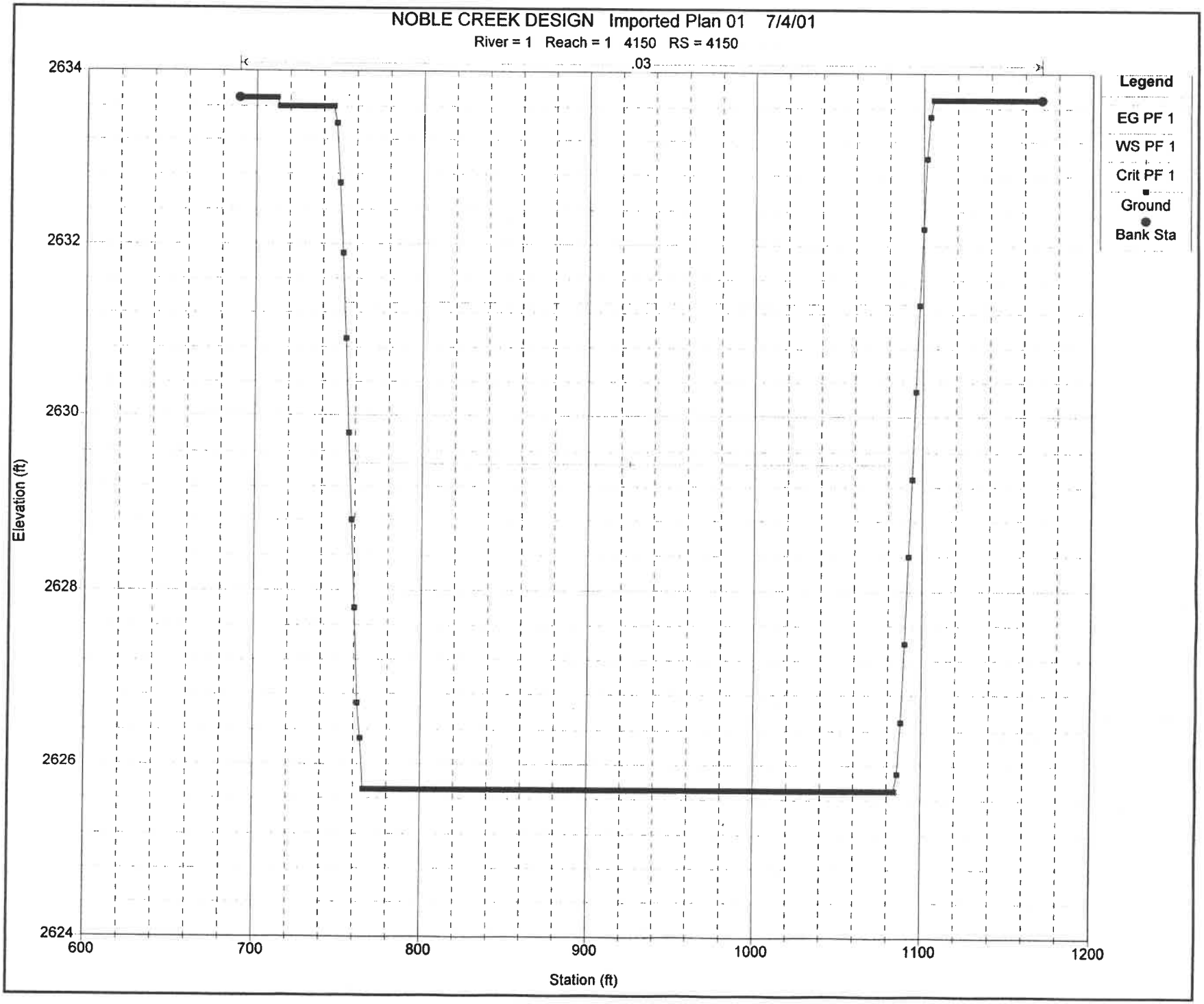

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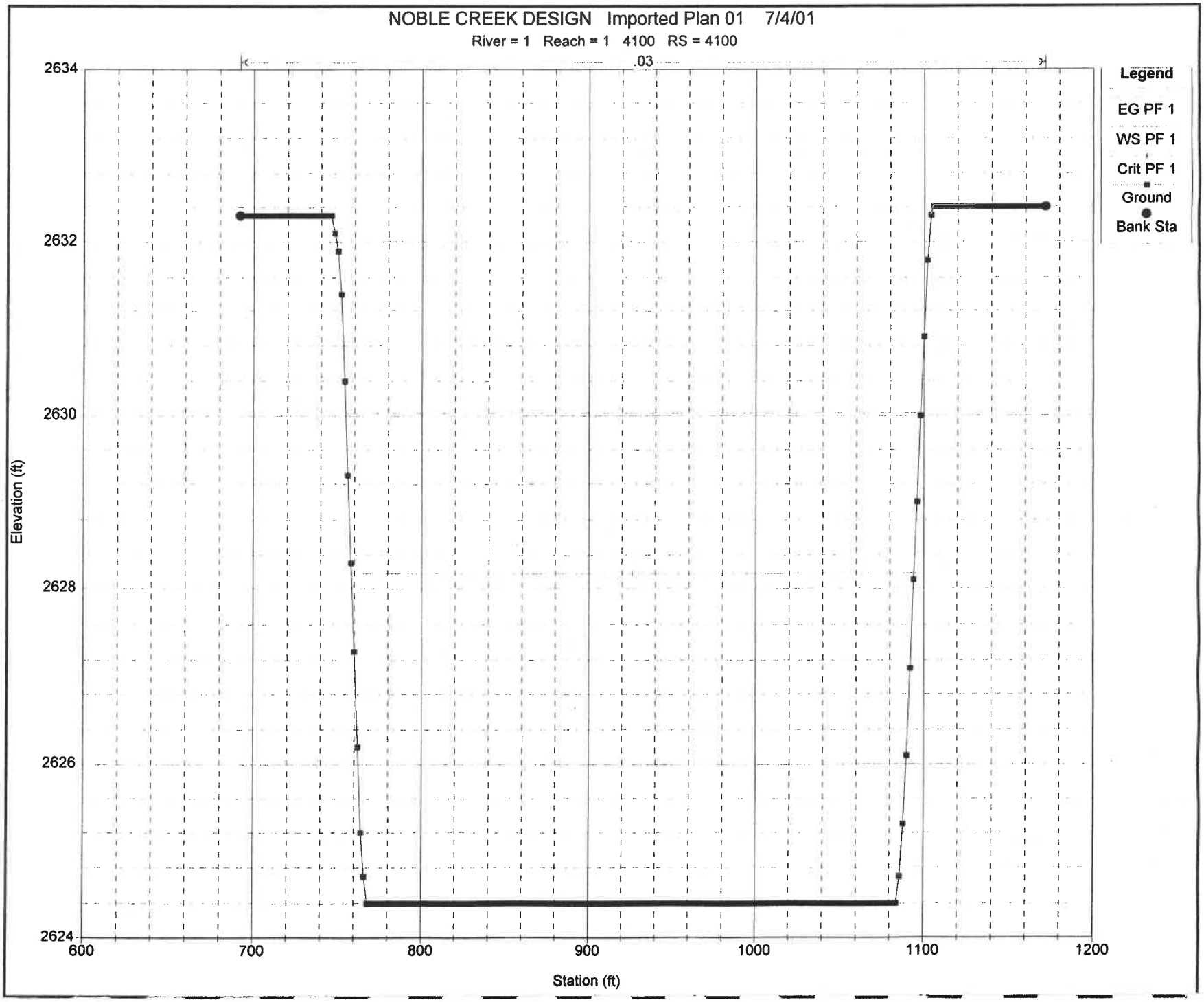

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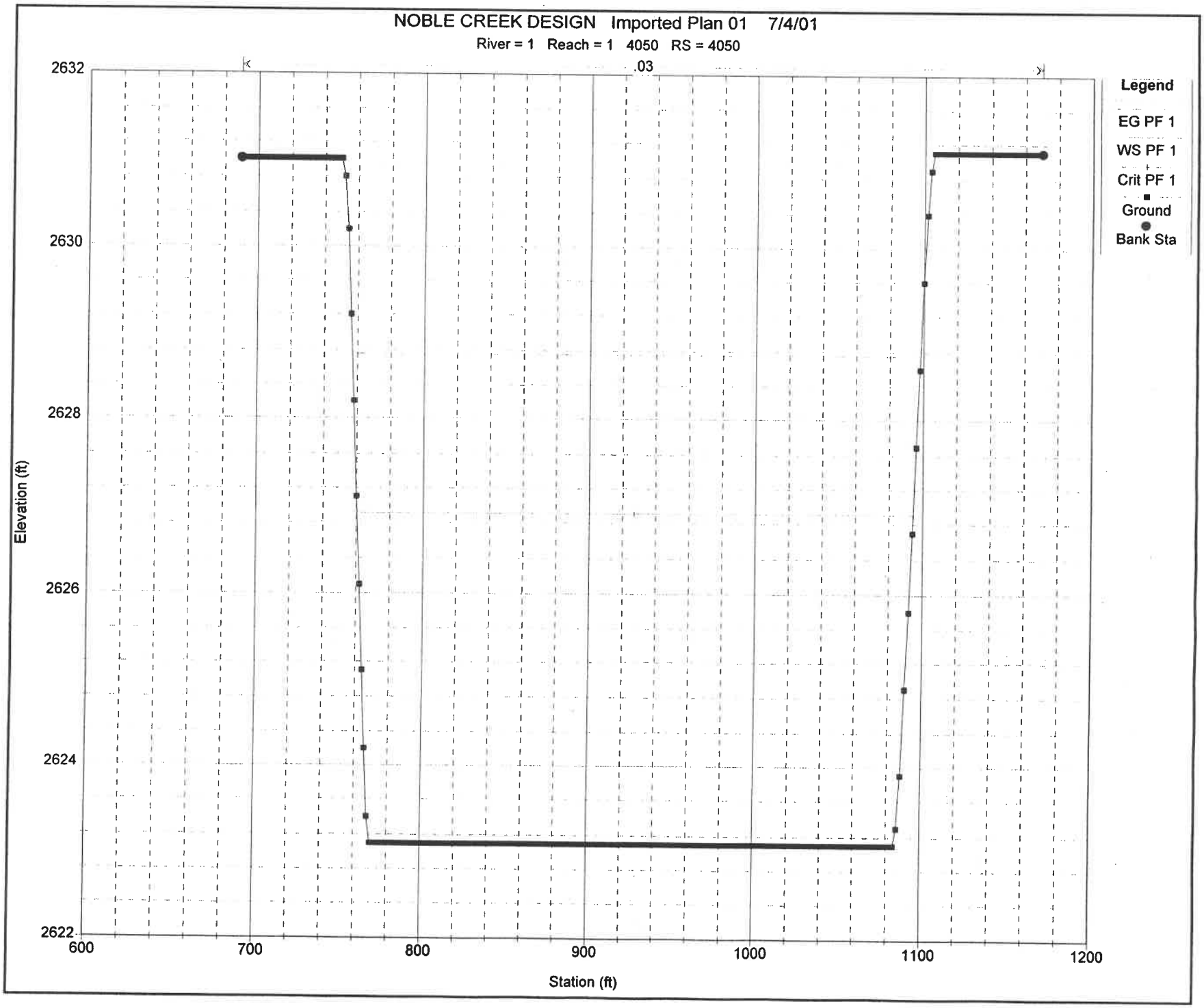

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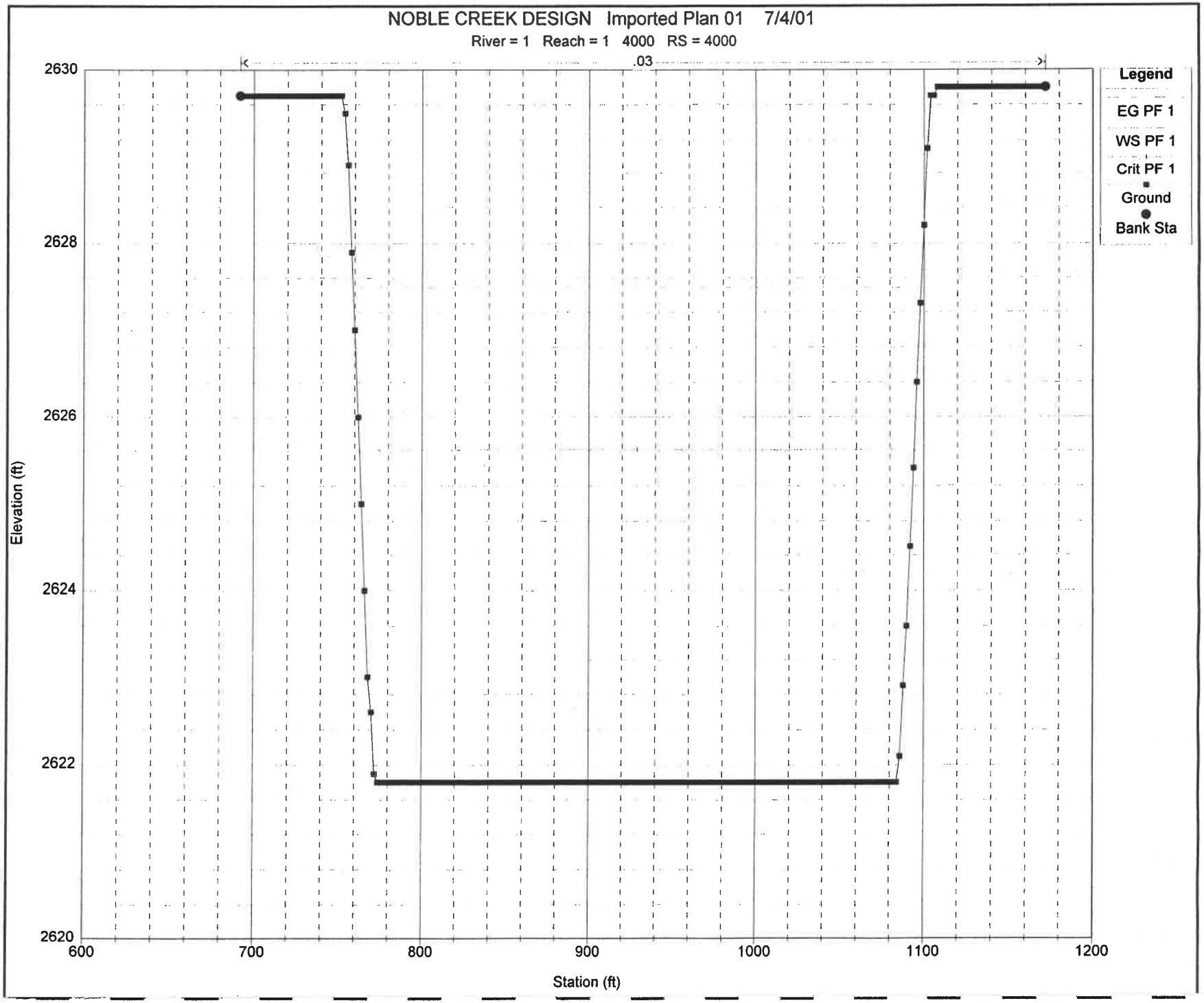

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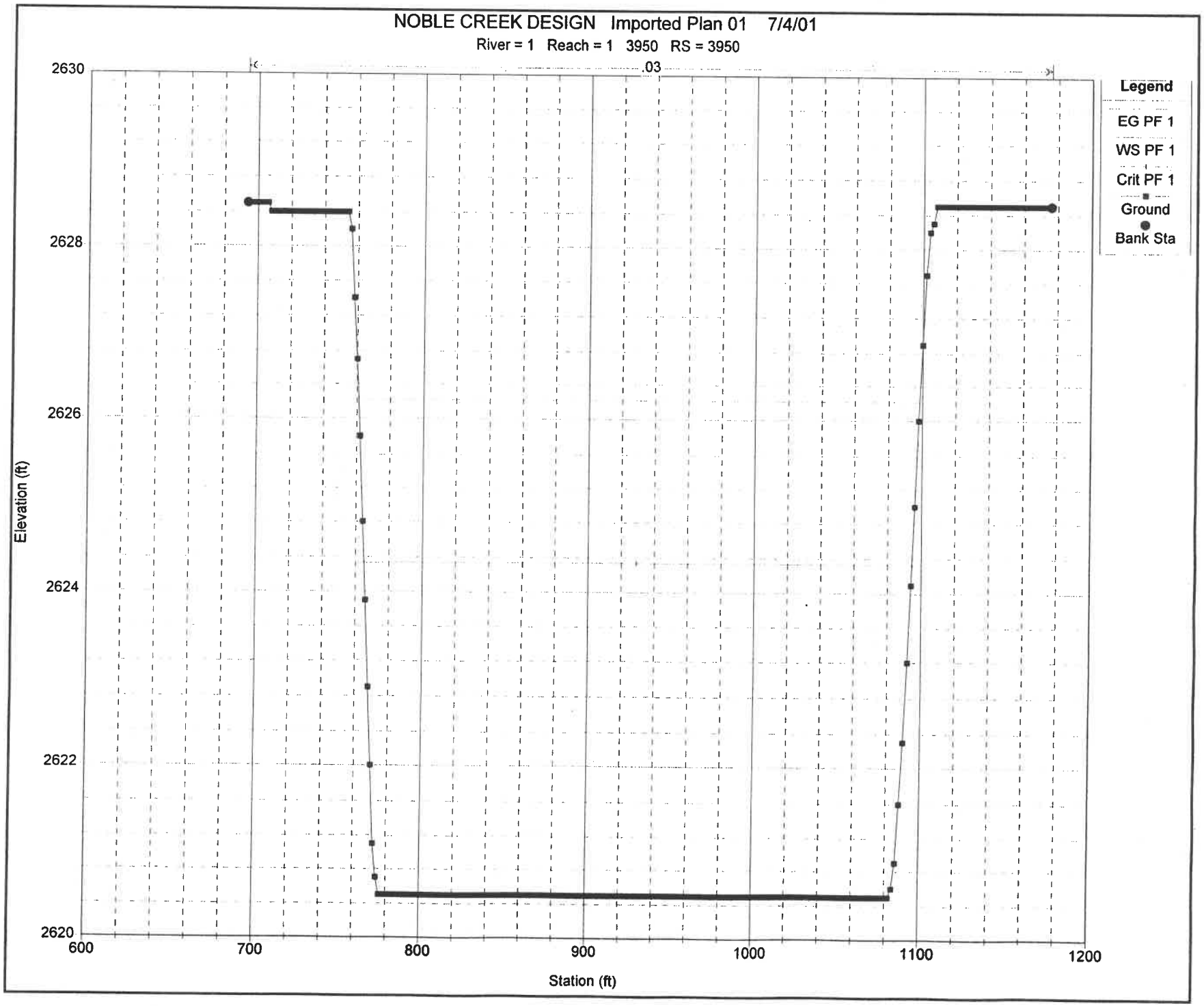

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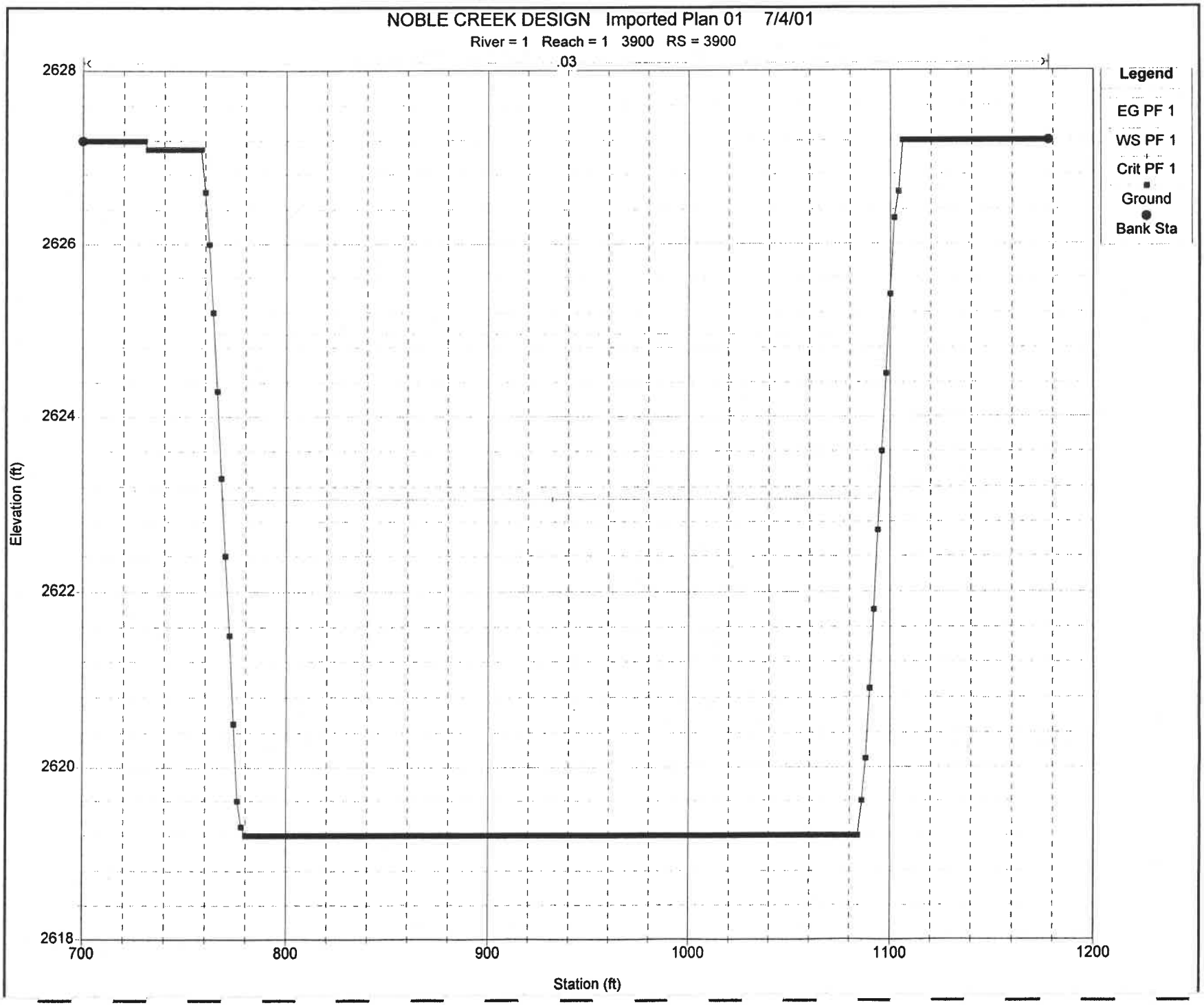

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D. BIOLOGICAL RESOURCES TECHNICAL STUDIES

FOCUSED BIOLOGICAL SURVEYS FOR NOBLE CREEK VISTAS RIVERSIDE COUNTY CALIFORNIA

Prepared for:

APPLIED PLANNING, INC
2151 Convention Center Way
Building C, Suite 122
Ontario, California 91764

Prepared by:

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May 22, 2001

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FOCUSED BIOLOGICAL SURVEYS OF NOBLE CREEK VISTAS PROJECT CITY OF BEAUMONT, RIVERSIDE COUNTY, CALIFORNIA

SUMMARY

Focused surveys for rare plants and the burrowing owl were conducted at the 332-acre Noble Creek Vistas project site located in the City of Beaumont, Riverside County, California. The project site was surveyed on Monday, April 16, 2001. Neither burrowing owls nor rare plants were detected onsite.

INTRODUCTION

Harmsworth Associates was retained by Applied Planning, Inc. to conduct a biological assessment of the Noble Creek Vistas Site. Focused surveys for rare plants and the burrowing owl were conducted at the 332-acre Noble Creek Vistas located in the City of Beaumont, Riverside County, California.

The purpose of the biological assessment was three-fold: (1) to determine presence/absence of rare plants onsite, (2) to determine presence/absence of the burrowing owl, and (3) verify, update and supplement information provided in previous biological resources surveys/reports prepared for the project site and vicinity. Previous surveys/reports considered in this regard included: the Wildlife/Vegetation Section of the Noble Creek Specific Plan Draft Environmental Impact Report (DERI, dated June 5, 1998). The DEIR provided information from surveys in 1998 (VHBC 1998), and from a Biological Assessment conducted in 1992 (hereafter referred to as "BA") and a site check for Stephen's Kangaroo Rat in 1991.

SETTING

The project site is located at the foothills of the San Bernardino Mountains, north of the City of Beaumont, southwest of Cherry Valley (Please refer to Figure 1). The irregularly-shaped project area, is bounded by Brookside Avenue on the north; Beaumont Avenue on the east; 14th Street/Oak Valley parkway to the south; Noble Creek Park to the southwest, and the Oak Valley Planned Residential Community to the west. (Please refer to Figure 2). From its northeasterly corner at the intersection of Brookside Avenue and Beaumont Avenue, the project area slopes gently southwesterly. Elevations within the project area range from 2,800 feet above mean sea level (MSL) in the northeast to 2,600 feet MSL in the southwest.

The majority of the project site has historically been used for dry-land farming and cattle grazing. However there is no current, nor has there been any recent productive agricultural use of the project area. At present, the proposed Specific Plan area is

predominantly vacant and unimproved, although site preparation has been initiated for a Middle School facility to be constructed in the easterly portion of the project site, northwesterly of the proposed intersection of Cougar Way and Beaumont Avenue. One residential home with scattered auxiliary buildings also exists within the project area.

The unlined Noble Creek storm channel (a blue-line drainage as depicted on the U.S. Geological Survey (USGS) topographic map Beaumont, California [dated 1996]) transects the project site in a northeast to southwest direction. Within the Noble Creek channel area, the County Parks and Recreation Department is currently conducting limited sand and gravel mining/reclamation for its use in development of recreation projects.

Another notable feature within the project area is an approximately 200 foot wide Southern California Edison utility easement. With overhead high-voltage power lines in place, this easement crosses the southern portion of the site in an east-west direction, approximately 1,000 feet north of 14th Street.

Northerly of the project area is the Unincorporated Community of Cherry Valley. North/northwesterly of the project site land uses are characterized by scattered single-family residences and vacant, unimproved properties. Additional uses in this area include a mobile home park and a County maintenance yard located to the north/northwest of the project site.

Adjacent and abutting properties to the east, south and west of the project site lie within the City of Beaumont. Easterly of the project site, across Beaumont Avenue, are mix of uses including vacant, unimproved properties; single and multifamily residential development; neighborhood commercial uses; and the City Sports Park. Southerly of the project site, across 14th Street, are vacant properties and scattered single-family residences. Noble Creek Park constitutes the southwesterly boundary of the project area. To the west of the project, on-going (as of April 2001) construction of the Oak Valley Planned Residential Community is occurring.

METHODS

Records of the California Natural Diversity Database (CNDDB, 2001) and California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California (2001) were reviewed regarding the potential occurrence of any federal or state listed or proposed endangered or threatened species, candidate species, or otherwise sensitive species or habitat within or in close proximity of the project site. In addition, the Riverside County Checklist for Species or Environmental Issues of Concern was reviewed (Appendix C).

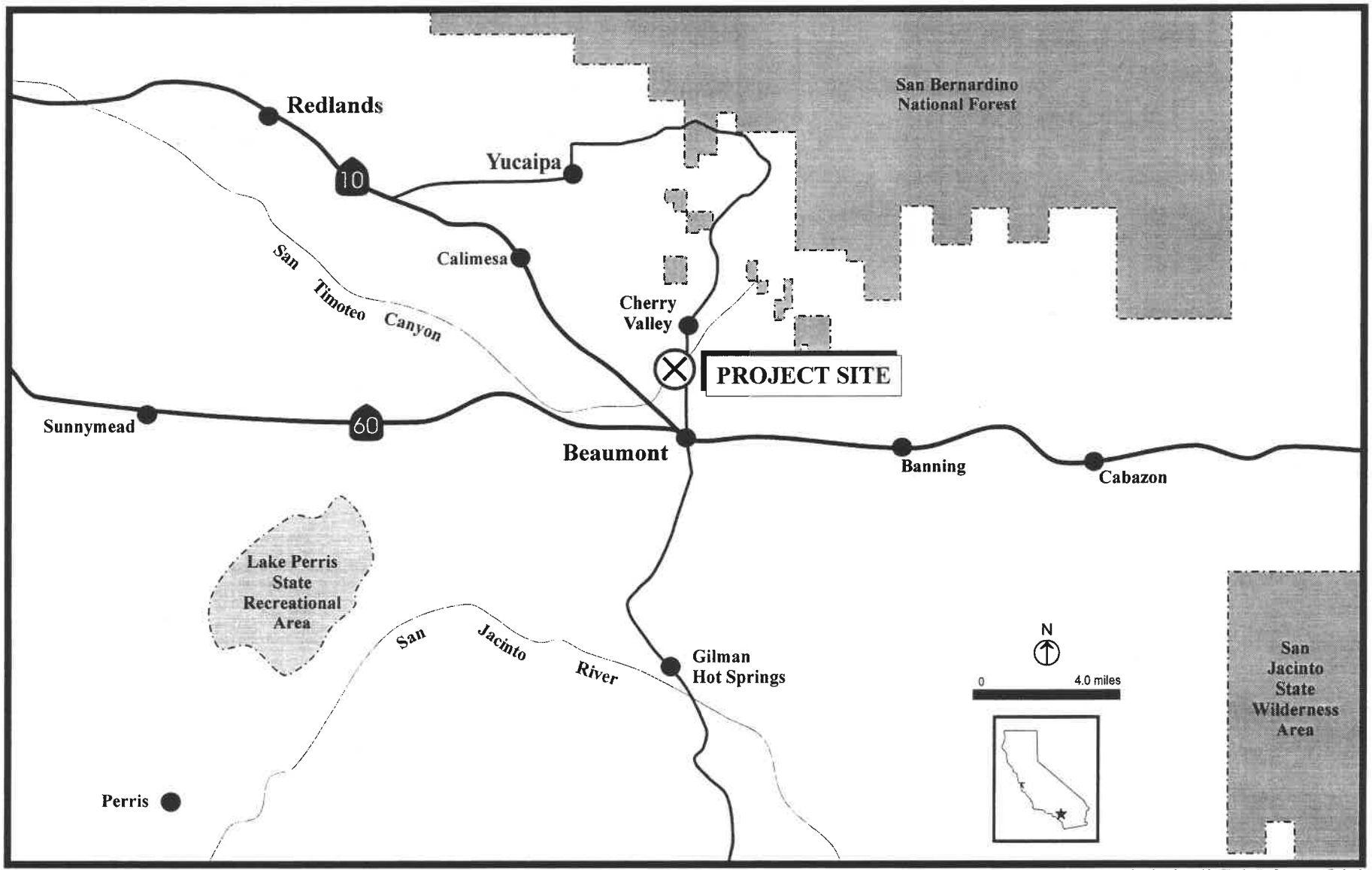


Figure 1: Noble Creek Vistas Project Vicinity

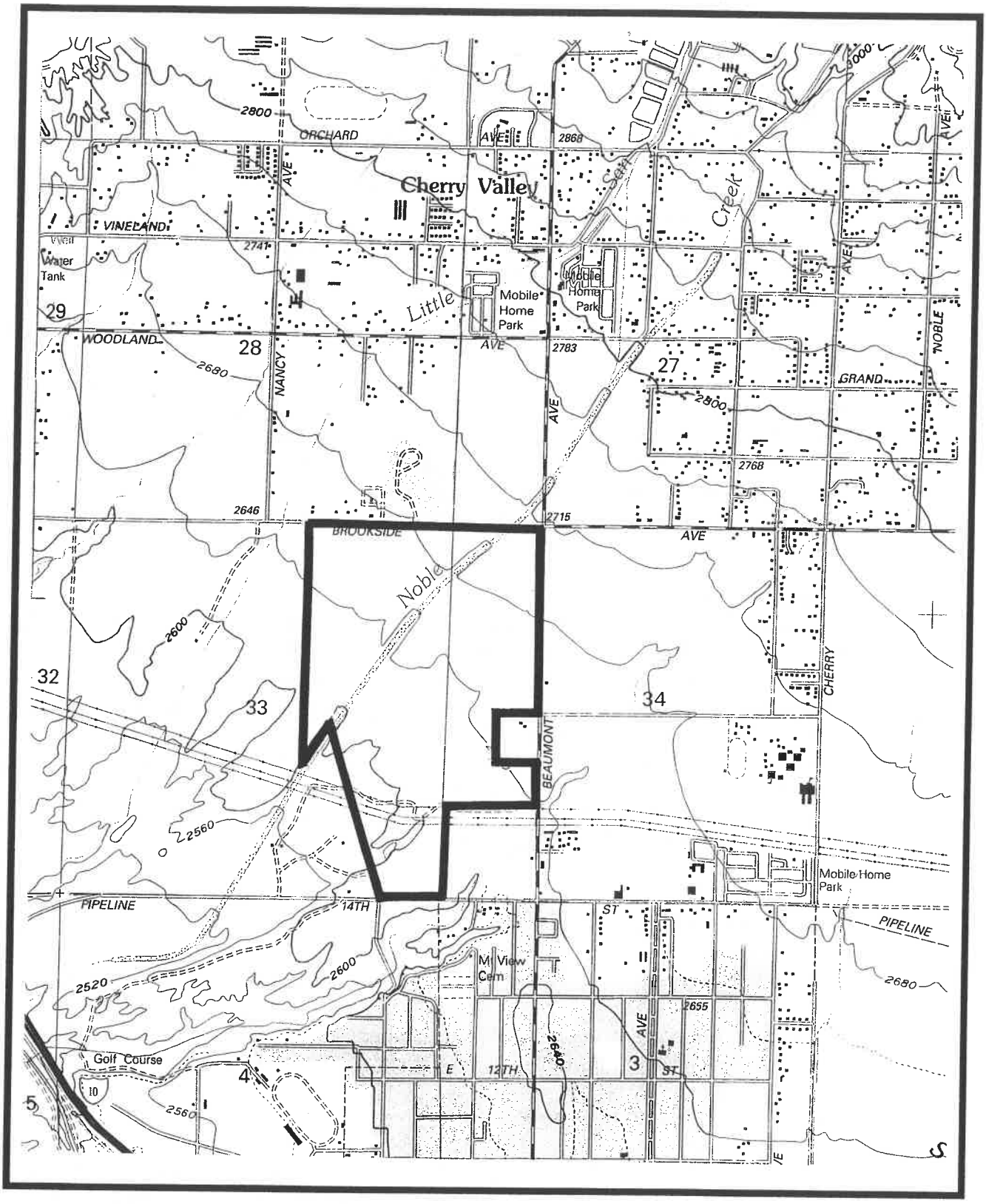


Figure 2: Noble Creek Vistas Project Site (Source: U.S. Geological Survey (USGS) topographic map Beaumont quadrangle, California [dated 1996])

Botanical Survey
Based on the results of the CNDDB and CNPS archival search, several sensitive plant species were identified as potentially occurring onsite, including *Calochortus plummerae* (Plummer's mariposa lily), *Caulanthus simulans* (Payson's jewel flower), *Astragalus jaegeri* var. *pachypus* (thick-podded rattleweed), *Hemizonia laevis* (smooth tarweed), *Chorizanthe parryi* (Parry's spineflower), *Quercus engelmannii* (Engelmann Oak),, *Atriplex coronata* var. *notatior* (San Jacinto Valley saltbush), *Dodecahema leptoceras* (slender horned spineflower), and *Eriastrum densiflorum* ssp. *sanctorum* (Santa Ana woollystar). Focused surveys for these target species were conducted in all suitable habitats.

The entire site was surveyed on foot. Focused botanical surveys were concentrated within Noble Creek and the adjacent terraces where native vegetation persisted, and where rare plant species were most likely to occur. Unknown plant species were collected and identified. Questionable taxa identification were confirmed by Mr. Andrew Sanders (curator for the University of California, Riverside Herbarium).

Burrowing Owl Survey
The spring survey for the burrowing owl (*Speotyto cunicularia*) followed the CDFG survey protocol for the species (CDFG, September 1995), as follows: three biologists conducted the survey by walking survey transects (no more than 30 meters apart) within suitable habitat on the entire project site. The survey was conducted from one hour before to two hours after sunrise. Careful inspections of all burrows and man-made structures (debris piles) were conducted to determine if the burrows were occupied by burrowing owls. Furthermore, burrow entrances were inspected for presence of birds, molted feathers, cast pellets, prey remains, eggshell fragments and excrement. Each biologist was familiar with the vocalization of the burrowing owl.

RESULTS AND DISCUSSION

On Monday, April 16, 2001, biologists of Harmsworth Associates (HWA) [Mr. Adrian Wolf, Mr. Paul Galvin and Mr. Brian Karpman] examined the property for the burrowing owl and rare plants. All plant and wildlife species detected during the surveys were noted and appear in Appendix A and B.

Vegetation and Botanical Resources
Habitat types observed onsite were generally consistent with the descriptions presented in 1998 DEIR. The vegetation was remapped since the site conditions had changed slightly from the conditions described and mapped in 1992 (PSBS 1992). Six distinct vegetation categories were noted during the current biological study: disturbed annual/ruderal grassland, disturbed alluvial fan scrub, disturbed Riversidian sage scrub, disturbed sycamore woodland, ornamental landscaping and disturbed (Table 1, Figure 3).

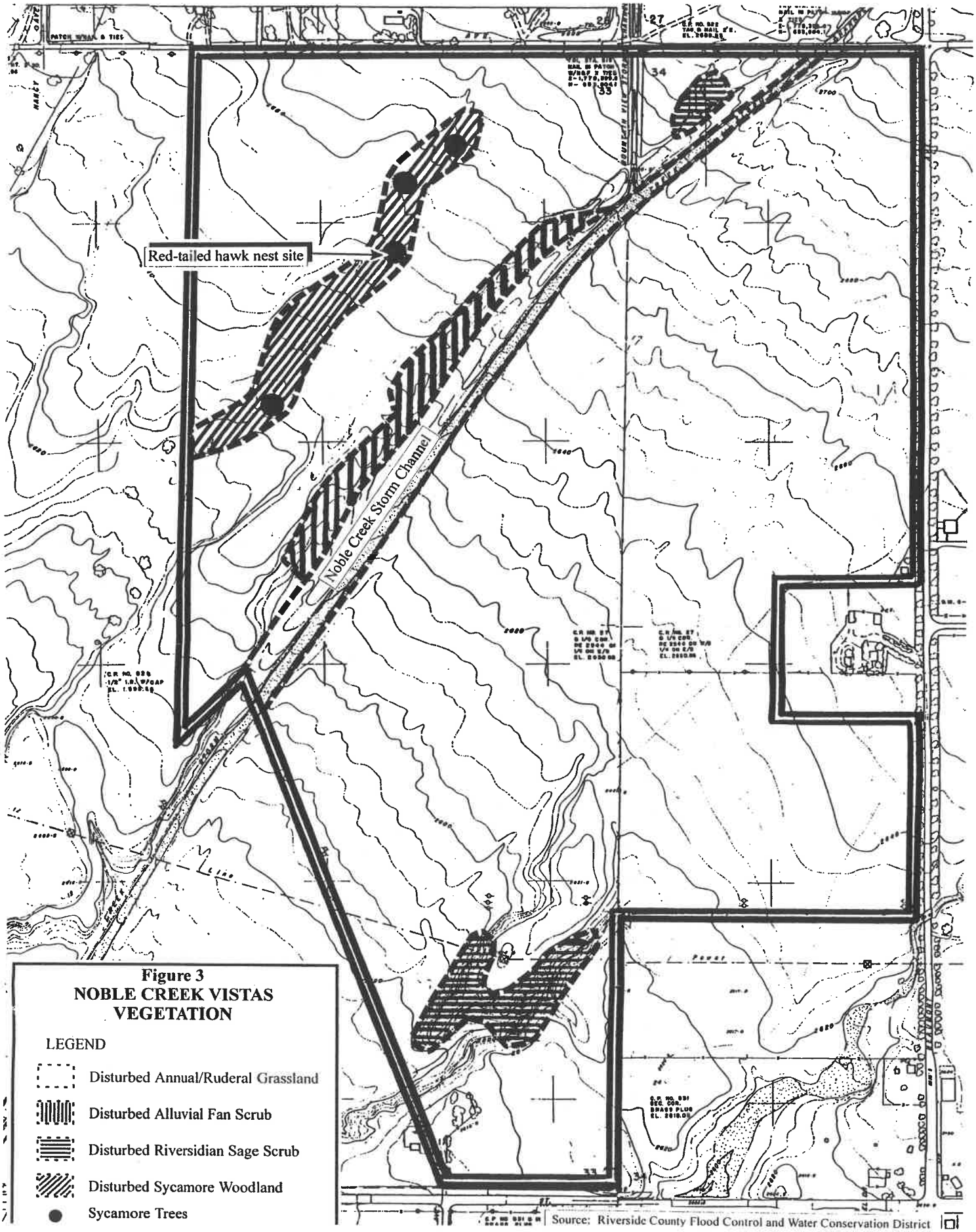


Figure 3
NOBLE CREEK VISTAS
VEGETATION

LEGEND

- Disturbed Annual/Ruderal Grassland
- Disturbed Alluvial Fan Scrub
- Disturbed Riversidian Sage Scrub
- Disturbed Sycamore Woodland
- Sycamore Trees

Table 1: Habitat Types on the 332-acre Noble Creek Vistas Project Site

Habitat Type*	Acreage
Annual grassland	295.10
Riversidian sage scrub	7.17
Disturbed sycamore woodland	9.26
Disturbed alluvial fan scrub	7.73
Noble Creek wash (disturbed)	12.98
Total	**332.25**
* Note: acreage of ornamental landscaping included within annual grassland acreage	

Disturbed Annual/Ruderal Grassland
The majority of the gentle sloping broad historic floodplain east and west of Noble Creek consisted of non-native annual grasslands dominated by a variety of Mediterranean non-native grasses and forbs, including *Bromus diandrus* (ripgut brome), *Bromus madritensis* ssp. *rubens* (red-brome), *Bromus tectorum* (cheat grass) and *Erodium cicutarium* (red-stemmed filaree). Other non-native species detected within this community included *Hirschfeldia incana* (shortpod mustard), *Pectocarya linearis* var. *ferocula* (pectocarya) and *Poa annua* (annual bluegrass). Native shrubs, including *Lepidospartum squamatum* (scalebroom) and native herbs such as *Cryptantha intermedia* (common popcorn flower) and *Amsinckia menzeisii* var. *intermedia* (fiddleneck), Croton californicum (California croton), *Eriogonum fasciculatum* (California buckwheat) and *Heterotheca grandiflora* (telegraph weed) were scattered throughout the annual grasslands. The grassland was heavily disturbed as a result of decades of dryland farming and cattle grazing.

Disturbed alluvial fan scrub
Noble Creek extended south of Brookside Avenue through a culvert then continued south channelized between corrugated sheet pilings on both sides of the wash for approximately 1000 feet at which point the piling structures ended and the creek opened into a broad floodplain. Little vegetation remained in the channelized portion. In the broader plain, sparsely distributed shrubs included *Lepidospartum squamatum* (scalebroom), *Eriogonum fasciculatum* (California buckwheat), *Baccharis salicifolius* (mulefat), *Lotus scoparius* (deerweed) and *Artemisia dracunculus* (tarragon). Several other native and non-native herbaceous species were detected growing in the alluvium and banks, including *Salvia columbariae* (chia), *Bromus tectorum* (cheat grass), *Cryptantha intermedia* (popcorn flower), *Penstemon spectabilis* (showy penstemon) and *Phacelia distans* (common phacelia).

Disturbed Riversidian sage scrub
Riversidian sage scrub (RSS) dominated by *Eriogonum fasciculatum* occurred in two areas within the project site: 1) in the northwestern portion of Noble Creek outside of the gravel mining operations, east of the concrete lined Mountain View Storm Channel; and 2) in the southern portion of the site, where a prominent knoll feature provided steep

slopes that supported RSS, east of the Noble Creek Park, north of Fourteenth Street. The RSS onsite was heavily disturbed by cattle grazing and invasive exotic species, and little native understory persisted. Native species detected within the RSS community included *Sambucus mexicana* (Mexican elderberry), *Artemisia californica* (California sagebrush) and *Ericameria palmeri* ssp. *pachylepis* (grassland goldenbush). The composition of the understory within the RSS was similar to that of the adjacent non-native annual grasslands.

Disturbed sycamore woodland
To the west of Noble Creek, five mature *Platanus racemosa* (western sycamores) occurred on the historic upper floodplain terrace. The understory vegetation in the vicinity of the sycamore trees was comprised of non-native grassland species similar to the non-native annual grassland community, however, relics of historic woodland/scrub elements were widely scattered including *Sambucus mexicana* (Mexican elderberry), *Lepidospartum squamatum* (scalebroom), *Opuntia littoralis* (prickly pear cactus) and valley cholla (*Opuntia parryi* var. *parryi*).

Ornamental Landscaping and Plantings
Ornamental plantings of *Cedrus deodar* (Deodara Cedar) lined Beaumont Avenue extending from Fourteenth Street to Brookside Avenue. In the southern portion of the property, *Olea europeae* (Olive), an occasional *Schinus molle* (Peruvian pepper tree) and *Eucalyptus* sp. were noted.

Disturbed (gravel mining).
A sand and gravel mining operation was observed in the lower portion of Noble Creek, extending upstream from Noble Creek Park for approximately 1,000 feet. Gravel mining equipment was present onsite and no vegetation occurred within the vicinity.

Floristics
Floristic abundance onsite was low due to the highly disturbed nature of the site resulting from agricultural activities and cattle grazing. A total of 83 plants species (representing 29 families) were detected during the survey, including 52 native and 31 non-native species (Appendix B). The EA studies recorded 88 taxa (representing 33 families), however, the increased number of taxa recorded was likely as a result of the larger survey area which included several other vegetation types (oak trees etc.) north of Brookside Avenue and east of Beaumont Avenue which were not present onsite.

Sensitive Vegetation and Plants
Upland Riversidian sage scrub and Riversidian alluvial fan sage scrub are declining regionally and are thus considered rare plant communities by the Resource Agencies. However, the two communities' onsite were highly degraded as a result of historical cattle grazing, agricultural activities and gravel mining operations.

Surveys for rare plants were concentrated in the natural vegetation communities including alluvial fan sage scrub and Riversidian sage scrub. The majority of the native understory herbs and forbs were in flower and were concentrated in areas within Noble Creek and in the shallow soils of the annual grasslands where non-native exotic species were precluded. No sensitive plant species were detected during the survey. Due to the highly disturbed nature and the poor quality of the native habitat types, no sensitive plant species are expected to occur within the project site.

Wildlife Survey

Burrowing Owl Survey
Surveys were initiated at 0530 in the southern portion of the project site. One biologist walked in the streambed, the other two walked flanked the streambed by walking along the upper banks of the creek. Several burrows made by fossorial mammals (presumably ground-squirrel) were noted in the banks along Noble Creek extending from the gravel mining operation to Brookside Avenue. In addition, several debris piles in the vicinity of the gravel mining operation were noted. Each burrow complex and debris pile was inspected for burrowing owl sign (pellets, excrement, etc). Surveys for owls were also conducted in the annual grasslands east and west of Noble Creek. In addition, the banks of the creek near the corner of Beaumont Avenue and Fourteenth Street (offsite) were surveyed.

Ground-squirrel burrow complexes were common within the project site primarily distributed along Noble Creek and east of Noble Creek within the annual grasslands north of the powerlines and adjacent Beaumont Avenue. The majority of these large burrow complexes were occupied by ground squirrels and neither burrowing owls (nor sign) were detected during the surveys.

The CDFG survey protocol for the burrowing owl recommends both spring and winter surveys for the species. Due to the presence of several burrow complexes onsite and adjacent suitable foraging habitat, winter surveys are recommended.

General Wildlife
Wildlife detected on the project site was typical of those found within open habitat types and grassland vegetation communities (Appendix A). For example, avian species typical of grassland habitats such as savannah sparrows (*Passerculus sandwichensis*), western meadowlark (*Sturnella neglecta*), mourning doves (*Zenaida macroura*), horned lark (*Eremophila alpestris*), lesser goldfinch (*Carduelis psaltria*), and lark sparrows (*Chondestes grammacus*) were common. Two raptor species were detected including the red-tailed hawk (*Buteo jamaicensis*) and American kestrel (*Falco sparverius*). On the western boundary of the project site, an active red-tailed hawk nest (with nestlings) was observed in one of the large sycamore trees.

Reptiles detected onsite included the side blotched lizard (*Uta stansburiana*), and western fence lizard (*Sceloporus occidentalis*).

Species typically associated with scrub communities were absent from the project site presumably due to the highly disturbed nature of the site. For example, wrentits (*Chamaea fasciata*), Bewick's wren (*Thryomanes bewickii*), California towhee (*Pipilo crissalis*), nor spotted towhee (*Pipilo erythrophthalmus*) were detected onsite which are commonly found in scrub habitats.

Sensitive Wildlife
The CNDDB identified several sensitive wildlife species with potential to occur onsite include Stephen's kangaroo rat (*Dipodomys stephensii*), San Diego horned lizard (*Phrynosoma coronatum*), and western spadefoot toad (*Scaphiopus hammondii*).

Three sensitive wildlife species, all "California Species of Concern Species" were detected onsite, namely the San Diego black-tailed jackrabbit (*Lepus californicus*), horned lark (*Eremophila alpestris*) and western spadefoot toad (*Scaphiopus hammondii*). Several jackrabbits and horned larks were flushed from the RSS and grasslands in the western portion of the project site. In the southern portion of the project site, east of Noble Creek Park, south of the SCE pole location on the prominent hill, an old pond feature occurred within the natural shallow drainage (Figure 2). *Baccharis salicifolius* (mulefat) and *Eucalyptus* surrounded the temporary pond wherein less than 20 spadefoot toad larvae (tadpoles) were detected. The adjacent RSS and uplands provide suitable foraging habitat for the adult spadefoots.

No other sensitive wildlife species were detected onsite.

A site assessment conducted for Stephen's Kangaroo Rat (*Dipodomys stephensi*) and San Bernardino Kangaroo rat (*Dipodomys merriami parvus*) (Philippe Vergne, pers. comm.). identified suitable habitat on the property and recommended that trapping surveys be conducted to determine whether the species occurs onsite. Trapping is expected to be conducted in summer 2001.

Other Sensitive Environmental Issue of Concern
Other sensitive environmental issues concern the presence of Noble Creek (as indicated by the blueline stream on the USGS maps) and the temporary pond located in the southern portion of the project site. At this conceptual stage of the project, it is estimated that up to 13 acres of wetlands/jurisdictional and streambed areas waters (as defined by the U.S. Army Corps of Engineers' [Corps]) and CDFG) may by affected by the proposed project. Consistent with final tract map design of the Specific Plan, a detailed wetland delineation will be required to determine the extent of the CDFG and U.S. Army Corps of Engineers' (Corps) jurisdictions onsite. If impacts occur to either CDFG and Corps jurisdictional areas, appropriate permits (CDFG Streambed Alteration Agreement, Corps 404, and State Regional Water Quality Control Board 401) will have to be obtained.

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APPENDIX A: WILDLIFE DETECTED AT THE NOBLE CREEK VISTAS PROJECT SITE, SPRING 2001

FAMILY/SPECIES NAME	COMMON NAME
LEPIDOPTERA	**BUTTERFLIES**
Brush Footed Butterflies	
Vanessa cardui	painted lady
Blues	
Icaricia acmon	Acmon blue
Metalmarks	
Apodemia mormo virgulti	Behr's metalmark
AMPHIBIA	**AMPHIBIANS**
PELOBATIDAE	**SPADEFOOT TOADS**
Scaphiopus hammondii	western spadefoot
REPTILIA	**REPTILES**
IGUANIDAE	**IGUANIDS**
Sceloporus occidentalis	western fence lizard
Uta stansburiana	side-blotched lizard
AVES	**BIRDS**
ACCIPITRIDAE	**KITES, HAWKS, EAGLES & VULTURES**
Buteo jamaicensis	red-tailed hawk
FALCONIDAE	**FALCONS**
Falco sparverius	American kestrel
CHARADRIIDAE	**PLOVERS**
Charadrius vociferus	killdeer
COLUMBIDAE	**PIGEONS & DOVES**
Zenaida macroura	mourning dove
Columba livia	rock dove
STRIGIDAE	**TYPICAL OWLS**
Bubo virginianus	great horned owl
TROCHILIDAE	**HUMMINGBIRDS**
Calypte anna	Anna's hummingbird
PICIDAE	**WOODPECKERS**
Colaptes auratus	northern flicker
TYRANNIDAE	**TYRANT FLYCATCHERS**
Tyrannus verticalis	western kingbird
Myiarchus cinerascens	ash-throated flycatcher
Sayornis saya	Say's Phoebe

APPENDIX A (CONT.): WILDLIFE DETECTED AT THE NOBLE CREEK VISTAS PROJECT SITE, SPRING 2001

FAMILY/SPECIES NAME	COMMON NAME
ALAUDIDAE	**LARKS**
Eremophila alpestris	horned lark
CORVIDAE	**CROWS, JAYS**
Corvus brachyrhynchos	American crow
Corvus corax	raven
MUSCICAPIDAE	**THRUSHES, OLD WORLD WARBLERS**
Sialia currucoides	mountain bluebird
MIMIDAE	**MOCKINGBIRDS & THRASHERS**
Mimus poolyglottos	northern mockingbird
STURNIDAE	**STARLINGS**
Sturnus vulgaris	European starling
EMBERIZIDAE	**WOOD WARBLERS, SPARROWS, NEW WORLD FINCHES & BLACKBIRDS**
Dendroica coronata	yellow-rumped warbler
Piranga ludoviciana	western tanager
Zonotricha leucophrys	white-crowned sparrow
Chondestes grammacus	lark sparrow
Spizella passerina	chipping sparrow
Spizella breweri	Brewer's sparrow
Passerculus sandwichensis	savannah sparrow
Sturnella neglecta	western meadowlark
Molothrus ater	brown headed cowbird
Icterus galbula bullocki	northern/bullocks oriole
FRINGILLIDAE	**OLD WORLD FINCHES**
Carpodacus mexicanus	house finch
Carduelis psaltria	lesser goldfinch
Carduelis tristis	American goldfinch
PASSERIDAE	**OLD WORLD SPARROWS**
Passer domesticus	house sparrow
MAMMALIA	**MAMMALS**
FELIDAE	**CATS**
Felis domesticus	domestic cat
SCIURIDAE	**SQUIRRELS**
Citellus beecheyi	California ground squirrel
LEPORIDAE	**HARES, RABBITS**
Lepus californicus	blacktailed jackrabbit
Sylvilagus auduboni	desert cottontail

APPENDIX B: PLANTS DETECTED AT THE NOBLE CREEK VISTAS PROJECT SITE, SPRING 2001

SCIENTIFIC NAME	COMMON NAME
GYMNOSPERMS	
CUPRESSACEAE	**CYPRESS FAMILY**
*Cedrus decodar**	Deodar Cedar
ANGIOSPERMS-DICOTS	
ANACARDIACEAE	**SUMAC OR CASHEW FAMILY**
*Schinus molle**	Peruvian Pepper Tree
ASTERACEAE	**SUNFLOWER FAMILY**
Ambrosia acanthicarpa	Annual Bur Sage
Artemisia californica	Coastal Sagebrush
Artemisia douglasiana	Mugwort
Artemisia dracunculus	Tarragon/ Dragon Sagewort
Baccharis salicifolia	Mulefat
*Chamomilla suaveolens**	Pineapple Weed
*Cnicus benedictus**	Blessed Thistle
Ericameria palmeri ssp. *pachylepis*	Grassland Goldenbush
Erigeron foliosus	Fleabane
Filago californica	California Fluffweed
Heterotheca grandiflora	Telegraph Weed
Lepidospartum squamatum	Scale-broom
Lessingia filaginifolia ssp. *virgata*	California Aster
Malacothrix californica	Malacothrix
Stephanomeria exigua ssp. *deanei*	Wreath plant
Uropappus lindleyi	Silver Puffs
BORAGINACEAE	**BORAGE FAMILY**
Amsinckia menziesii ssp. *intermedia*	Rancher's Fireweed/Fiddleneck
Cryptantha intermedia	Popcorn Flower
Pectocarya linearis var. *ferocula*	Slender Pectocarya
Plagiobothrys arizonicus	Popcornflower
Plagiobothrys canescens	Popcornflower
BRASSICACEAE	**MUSTARD FAMILY**
*Hirschfeldia incana**	Hirschfeldia / Shortpod Mustard
*Sisymbrium officinale**	Hedge Mustard
CACTACEAE	**CACTUS FAMILY**
Opuntia littoralis var. *littoralis*	
Opuntia parryi var. *parryi*	Valley Cholla
CAPRIFOLIACEAE	**HONEYSUCKLE FAMILY**
Sambucus mexicana	Mexican Elderberry

APPENDIX B (CONT): PLANTS DETECTED AT THE NOBLE CREEK VISTAS PROJECT SITE, SPRING 2001

SCIENTIFIC NAME	COMMON NAME
CHENOPODIACEAE	**GOOSEFOOT FAMILY**
*Salsola tragus**	Russian Thistle
CONVOLVUACEAE	**MORNING-GLORY FAMILY**
*Convolvulus arvensis**	Bindweed/Orchard Morning Glory
CRASSULACEAE	**STONECROP FAMILY**
Crassula connata	Pygmy-weed
EUPHORBIACEAE	**SPURGE FAMILY**
Croton californicus	California Croton
Eremocarpus setigerus	Dove Weed
FABACEAE	**LEGUME FAMILY**
Lotus strigosus	Hairy Lotus
Lupinus bicolor	Miniature Lupine
Lupinus hirsutissimus	Stinging Lupine
Lupinus sparsiflorus	Coulter's Lupine
*Melilotus alba**	White Sweetclover
*Vicia villosa**	vetch
GERANIACEAE	**GERANIUM FAMILY**
*Erodium botrys**	Long-beaked Filaree
*Erodium cicutarium**	Red-stemmed Filaree
HYDROPHYLLACEAE	**WATERLEAF FAMILY**
Emmenanthe pendulaflora	Whispering Bells
Phacelia distans	Common Phacelia
Phacelia ramosissima	Phacelia
LAMIACEAE	**MINT FAMILY**
*Lamium amplexicaule**	Dead Nettle
*Marrubium vulgare**	Horehound
Salvia columbariae	Chia
Salvia mellifera	Black Sage
Trichostema lanceolatum	Vinegar Weed
MYRTACEAE	**MYRTLE FAMILY**
Eucalyptus sp.*	Eucalyptus/ Gum Tree
OLEACEAE	**OLIVE FAMILY**
*Olea europaea**	European Olive
ONAGRACEAE	**EVENING PRIMROSE FAMILY**
Camissonia bistorta	Southern Sun Cup
Camissonia hirtella	primrose
PAPAVERACEAE	**POPPY FAMILY**
Eschscholzia californica	California Poppy
PLATANACEAE	**PLANE TREE, SYCAMORE FAMILY**
Platanus racemosa	Western Sycamore

APPENDIX B (CONT): PLANTS DETECTED AT THE NOBLE CREEK VISTAS PROJECT SITE, SPRING 2001

SCIENTIFIC NAME	COMMON NAME
POLEMONIACEAE	**PHLOX FAMILY**
Eriastrum sapphirinum	Sapphire Eriastrum
Gilia angelensis	Grassland Gilia
POLYGONACEAE	**BUCKWHEAT FAMILY**
Eriogonum fasciculatum var. *fasciculatum*	California Buckwheat
Eriogonum gracile	Slender Eriogonum
Rumex hymenosepalus	Wild Rhubarb/ Canaigre
PORTULACACEAE	**PURSLANE FAMILY**
Calindrinia ciliata	Red Maids
RHAMNACEAE	**BUCKTHORN FAMILY**
Ceanothus leucodermis	Whitebark Wild-Lilac
SALICACEAE	**WILLOW FAMILY**
Salix lasiolepis	Arroyo Willow
SCROPHULARIACEAE	**FIGWORT FAMILY**
Penstemon spectabilis	Showy Penstemon
Scrophularia californica	California Bee Plant
*Verbascum thapsus**	Common Mullein
SOLANACEAE	**NIGHTSHADE FAMILY**
*Nicotiana glauca**	Tree Tobacco
TAMARICACEAE	**TAMARISK FAMILY**
Tamarix sp.*	Salt Cedar/ Tamarisk
ANGIOSPERMS - MONOCOTS	
POACEAE	**GRASS FAMILY**
*Avena barbata**	Slender Wild Oat
*Avena fatua**	Wild Oat
*Bromus diandrus**	Ripgut Grass
*Bromus hordeaceus**	Soft Chess
Bromus madritensis ssp. *rubens**	Red Brome
*Bromus tectorum**	Cheat Grass
Hordeum murinum ssp. *leporinum**	Mediterranean Barley
*Lamarckia aurea**	Goldentop
Nassella pulchra	Purple Needlegrass
*Poa annua**	Annual Bluegrass
*Schismus barbatus**	Mediterranean Grass
Vulpia myuros var. *hirsuta**	Foxtail Fescue

APPENDIX C: CHECKLIST FOR RIVERSIDE COUNTY SPECIES OR ENVIRONMENTAL ISSUES OF CONCERN

Species or Environmental Issues of Concern	Yes	No	N/A	Comments
Arroyo Southwestern Toad			X	No suitable habitat onsite
Blueline Stream(s)	X			Noble Creek is a blueline stream, as indicated on the USGS 7.5 minute quadrangle - Beaumont
Coachella Valley Fringed-Toed Lizard			X	No suitable habitat onsite
Coastal California Gnatcatcher		X		RSS limited in distribution, site near elevation limitations for species, surveys not recommended
Riversidean Coastal Sage Scrub	X			RSS present onsite
Delhi Sands Flower-Loving Fly			X	No suitable habitat onsite
Desert Pupfish			X	No suitable habitat onsite
Desert Slender Salamander			X	No suitable habitat onsite
Desert Tortoise			X	No suitable habitat onsite
Flat-Tailed Horned Lizard			X	No suitable habitat onsite
Least Bell's Vireo			X	No suitable habitat onsite
Oak Woodlands			X	No habitat onsite
Quino Checkerspot Butterfly			X	No suitable habitat onsite
Riverside Fairy Shrimp			X	No suitable habitat onsite
Santa Ana River Woolystar		X		None detected onsite
San Bernardino Kangaroo Rat	To be determined			Site to be trapped for SBKR
Slender Horned Spineflower		X		None detected onsite
Stephen's Kangaroo Rat	To be determined			Site to be trapped for SKR
Vernal Pools			X	None detected onsite
Wetlands	To be determined			Wetland delineation required

Presence/Absence Survey for Stephens Kangaroo Rat On Noble Creek Vistas Riverside County, California



Prepared for

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June, 2001

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Figure 1. Project Vicinity Map

Figure 2. Project Site and Trapping Locations

Table 1. Trapping Results

Pictures 1-6 Project Site Photos

EXECUTIVE SUMMARY

Philippe Vergne was contracted by Applied Planning, Inc, to conduct a trapping survey for Stephens' kangaroo rat-SKR (*Dipodomys stephensi*) on the Noble Creek Vistas site. The trapping survey was required due to the presence on the property of suitable SKR habitat, and the presence of kangaroo rat sign.

Following is a report describing the results of a trapping survey and habitat assessment for Stephens' kangaroo rats on the above-described property. The report is a summary of trapping surveys of the site performed for five consecutive days from June 12-16, 2001 by Philippe Vergne, a certified SKR biologists (PRT-831207).

Based on the available information and site conditions, there was a low probability that SKR might occur on the proposed project site. Good quality habitat was present on portions of the property and significant concentrations of kangaroo rat burrows and scat suggested that SKR might be present in at least some of the grasslands on the property. A non protocol survey performed by Steve Montgomery on the site in 1981 confirmed the presence of the Dulzura kangaroo rat-DKR (*Dipodomys* simulans)(than PKR) on the property.

Through protocol trapping on the current survey it was possible to verify the absence of SKR in those areas which initially exhibited potential habitat and k-rat sign. No SKR were captured during the trapping survey and therefore it is concluded that the site is not occupied by SKR.

Although out of the known distribution and range for the San Bernardino Kangaroo rat (*Dipodomys meriani parvus*) the noble creek channel which bisects the site was trapped since it contains suitable habitat for both SKR and SBKR. No SBKR were captured during the trapping survey.

PROJECT DESCRIPTION

The proposed development site occupies an estimated 332 acres between Brookside Avenue and 14 th Street, in an unincorporated area adjacent to the City of Beaumont, in Riverside County California (Figure 1). The property is located in sections 33 and 34, T2S, R1W, of the USGS 7.5" Beaumont Quadrangle. The project calls for the development single family homes, middle school, parks and open spaces.

METHODS

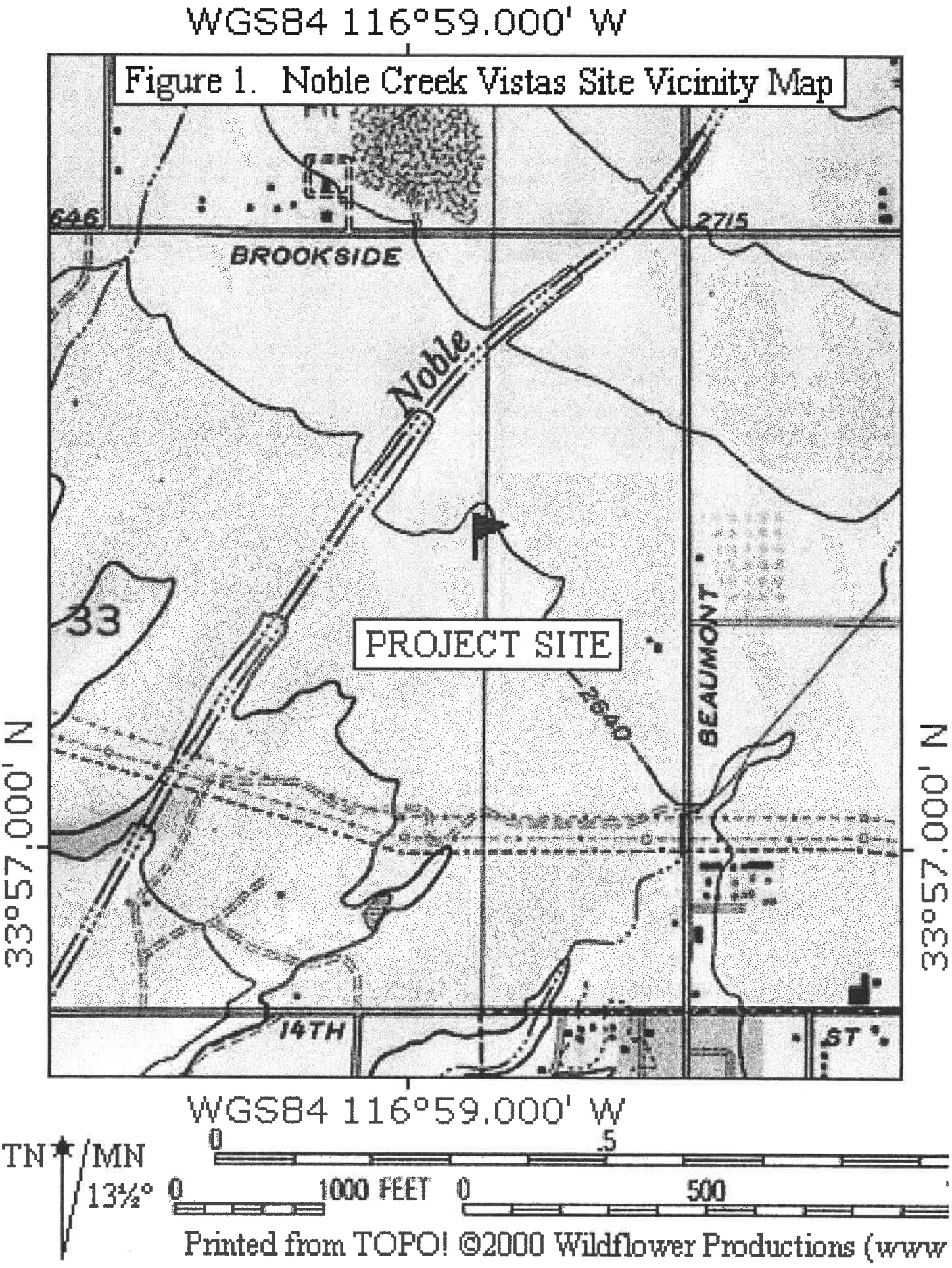
Stephens Kangaroo Rat

The Stephens' kangaroo rat is one of several kangaroo rat species in its range. The Dulzura (*Dipodomys* simulans), the Pacific kangaroo rat (*Dipodomys agilis*) and the Stephens kangaroo rat (*Dipodomys stephensi*) occur in overlapping ranges in southern California.

The Stephens kangaroo rat (SKR) prefers open areas with sparse perennial cover (Lackey 1967, Bleich 1977, Thomas 1975). They occur in areas of loose soil where the soil depth is at least 0.5 meters (Price and Endo, 1989). SKR will also inhabit disturbed areas such as fallow fields by using the burrows of other rodents, including pocket gophers (*Thomomys bottae*) (Bleich 1977) and the Beechey ground squirrel (*Spermophilus beecheyi*) (O'Farrell 1989).

Like all kangaroo rats, the SKR is primarily a seed eater, feeding on the seeds of both annual and shrub species. It also feeds on green vegetation and insects when these are available. Being primarily a dry biome species, kangaroo rats obtain nearly all of their water from the food they eat, and can subsist indefinitely on water extracted from dry seeds. They forage in open ground and underneath shrubs. Burrows are dug in loose soil.

Both the Dulzura and Pacific kangaroo rats are known to occasionally inhabit open grasslands more characteristic of SKR, while SKR are infrequently known to inhabit areas of denser vegetation.


WGS84 116°59.000' W
Figure 1. Noble Creek Vistas Site Vicinity Map
646
2715
BROOKSIDE
Noble
33
PROJECT SITE
2640
BEAUMONT
33°57.000' N
33°57.000' N
14TH
ST
WGS84 116°59.000' W
TN
MN
13½°
0
.5
0
1000 FEET
0
500
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Trapping is often the only definitive method of confirming the absence/presence, distribution, and abundance of SKR in areas where they are sympatric with other kangaroo rat species, or where trace sign is found.

The San Bernardino Kangaroo Rat

Both the Dulzura kangaroo rat and the Stephens kangaroo rat (Dipodomys stephensi) occur in areas occupied by the San Bernardino kangaroo rat, but these other two species have a wider habitat range. The habitat of the San Bernardino kangaroo rat is described as being confined to primary and secondary alluvial fan scrub habitats, with sandy soils deposited by fluvial (water) rather than aeolian (wind) processes.

Like all kangaroo rats, the San Bernardino kangaroo rat is primarily a seed eater, feeding on the seeds of both annual and shrub species. It also feeds on green vegetation and insects when these are available. Being primarily a desert species, the San Bernardino kangaroo rat obtains nearly all of its water from the food it eats, and can subsist indefinitely on water extracted from dry seeds. It forages in open ground and underneath shrubs. Burrows are dug in loose soil, usually near or beneath shrubs.

The San Bernardino kangaroo ratis one of three subspecies of the Merriam's kangaroo rat. The Merriam's kangaroo rat is a widespread species that can be found from the inland valleys to the deserts. The subspecies known as the San Bernardino kangaroo, however, is confined to inland valley scrub communities, and more particularly, to scrub communities occurring along rivers, streams and drainages. Most of these drainages have been historically altered as a result of flood control efforts and the resulting increased use of river resources, including mining, off-road vehicle use and road and housing development. This increased use of river resources has resulted in a reduction in both the amount and quality of habitat available for the San Bernardino kangaroo rat. The past habitat losses and potential future losses prompted the recent emergency listing of the San Bernardino kangaroo rat as an endangered species (U.S. Fish and Wildlife Service, 1998a).

Habitat Evaluation Surveys

We conducted a preliminary phase one walkover survey of the site to determine the habitat types on site and identify potential habitat for the kangaroo rat. Trace and low Kangaroo rat sign densities were observed in some of the disturbed annual grasslands, within the drainage area and in most of the sparse scrub habitat on the site.

As part of the habitat assessment, we conducted a focused evaluation of the on site habitats in order to identify the most suitable trap sites. We also recorded the various plant communities and condition of the habitats on site. Based on the field survey findings, we selected 6 areas for trapping (Figure Two).

Trapping Surveys

Trapping was conducted according to United States Fish and Wildlife Service-USFWS protocols established for the SKR. The protocol calls for five nights of trapping, conducted when the animal is active above-ground at night and preferably during a new moon phase The trapping sessions lasted from June 12 -16, 2001.

We placed the traps in suitable habitat areas on the project, concentrating on locating traps in areas containing soils and vegetation suitable for the SKR. Dirt trails and open areas with minimal disturbance were also targeted. Each trap was baited with a mixture of bird seed and rolled oats, placed at the back of the traps. The traps we reopened at dusk each night and inspected at night and dawn each morning. All animals were identified and released at the point of capture.

Notes were recorded on the habitats, soils and other relevant characteristics where the traps were placed. We also noted the weather conditions at the time of the trapping surveys.

RESULTS

Topography

Topography on the grassland areas of the site is primarily gently sloping terrain, with elevations ranging from 2580 to 2660 feet.

Soils

The soils on site range from fine to coarse sandy loams of the Hanford, Ramona, and Gorgonio type. The soil encountered on site are suitable for use by kangaroo rats.

Vegetation

Three major vegetation communities are present on the site: disturbed annual grasslands, sage scrub, and alluvial fan scrub.

The disturbed annual grasslands are dominated by filaree (*Erodium cicutarium*), bromes (*Bromus diandrus, B. madritensis, B. mollis*), wild oats (*Avena barbata*),popcorn flower (*Cryptantha intermedia*), fiddleneck (Amsinckia tessellata), and shortpod mustard (*Hirschfeldia incana*).Invasives such as annual sunflower (*Helianthus annuus*), telegraph weed (*Heterotheca grandiflora*) and ragweed (*Ambrosia psilostachya*) are found adjacent to the washes.

The open and disturbed sage scrub community is found in remnant locations within the grassland areas, and at the edge of the drainages. Dominant plant species in the sage scrub community are flat-top buckwheat (*Eriogonum fasciculatum*), horehound (*Marrubium vulgare*), California sagebrush (*Artemesia californica*. Shrub cover was low (<30%) with an undercover of bromes and filaree.

Also present on site is sparse and disturbed alluvial fan scrub along the main drainage and adjacent benches.The alluvial fan scrub at the time of the survey was limited to scattered individuals of flat-topped buckwheat (*Eriogonum fasciculatum*), scale broom (*Lessingia filaginifolia*), California sagebrush (*Artemisia californica*), and and mulefat (*Baccharis salicifolia*).

Disturbances on the site include power easements, grazing, disking and dry crop farming, a quarry, dirt roads, storm channels, old structures, grading, and limited off road activity.

Weather Conditions

Temperatures were in the low seventies throughout the survey. The moon was half and increasing.

Trapping Results

A total of 1,000 collapsible Sherman live-traps was set out over the 5-night effort at the 6 trapping localities exhibiting potential SKR habitat. Traps were set in the portions of the grasslands, sparse sage scrub and open alluvial fan scrub exhibiting the open (sparsely vegetated) habitat conditions typically preferred by SKR.

A total of 32 captures of the non-endangered Dulzura kangaroo rat (*Dipodomys simulans*) was recorded at the various grassland trap locations. Since captured animals were not individually marked, it is certain that this total represents fewer than 32 different individuals. Two sensitive species, the northwestern San Diego pocket mouse(*Chaetodipus fallax fallax*)and the Los Angeles pocket mouse (Perognathus longimembris brevinasus) were captured. The ubiquitous deer mouse (*Peromyscus maniculatus*)and the cactus mouse (*Peromyscus eremicus) were also captured* (Table One).

Trapping success was low over the entire trapping period. Table 1 provides information on the species trapped per trap area.

A description of the trapping site follows:

Site 1

Site 1 is comprised mostly of disturbed annual grassland,remnant sage scrub and sandy wash. Soils are coarse sands and sandy loams. The plant cover is less than 20% percent (Picture 1).

Site 2

Site 2 is comprised mostly of disturbed annual grasslands. Portions of the site contain remnant sage scrub and alluvial fan scrub. Vegetation cover is less than 30%. Soils are sandy (Picture 2).

Site 3

Site 3 is comprised mostly of disturbed annual grasslands.Vegetation cover varies from 20 to 30 percent . Soils are sandy (Picture 3).

Site 4

Site 4 is comprised mostly of disturbed annual grasslands. The Noble Creek drainage bisects the site.Portions of the site contain remnant sage scrub and alluvial fan scrub. Cover is less than 30 percent. Soils are sandy(Picture 4).

Site 5

Site 5 is dominated by disturbed annual grasslands with sage scrub remnants. Soils are sandy (Picture 5).

Site 6

Site 6 is comprised mostly of disturbed annual grasslands. Cover is less than 30 percent. Soils are sandy (Picture 6).

CONCLUSIONS

Based on the available information and site conditions, there was a low probability that the SKR might occur on the project site. Although outside of the known distribution area there was also a low probability, based on habitat, that SBKR might occur on the site.

No SKR were caught during the trapping studies, and therefore this species is not present on the proposed project site. No SBKR were captured and their absence from the project site and the general area continues to be confirmed.

Lands immediately surrounding the property vary in their suitability for potential occupation by SKR. The properties to the west, north and south have similar habitat to that found on site, and have low potential for occupancy. Lands to the east have been more impacted by dry crop farming and development and have very limited potential for occupancy.

Figure 2. Project Boundaries and Trapping Locations

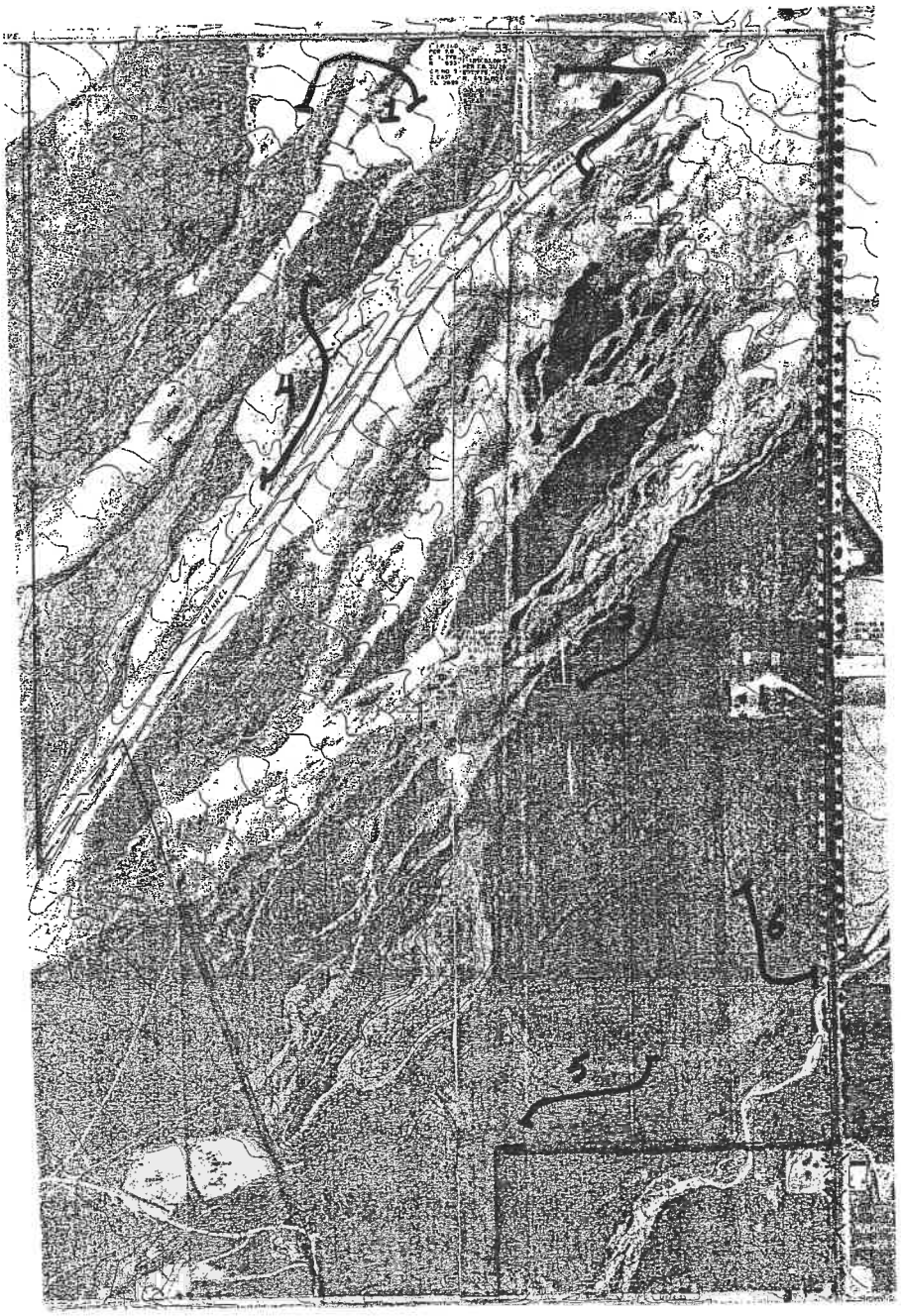


Figure 1. Trapping results for Noble Creek Vistas Project

Trap Site	Number of Traps	Dates of Set	*Di. si.*	*Pe.ma.*	*Ch.fa.*	*Pe.br.*	*Pe.er.*
1	35	June 12-16	6	9			
2	40		7	11	2	1	2
3	30		5	7			1
4	40		9	6	3		
5	35		3	9			
6	30		2	4			
TOTAL	**210**		**32**	**46**	**5**	**1**	**3**

Legend

Di.si = Dipodomys simulans
Pe. ma. = Peromyscus maniculatis
Ch. fa. = Chaetodipus fallax fallax
Pe. br. = Perognathus longimembris brevinasus
Pe. er. = Peromyscus eremicus

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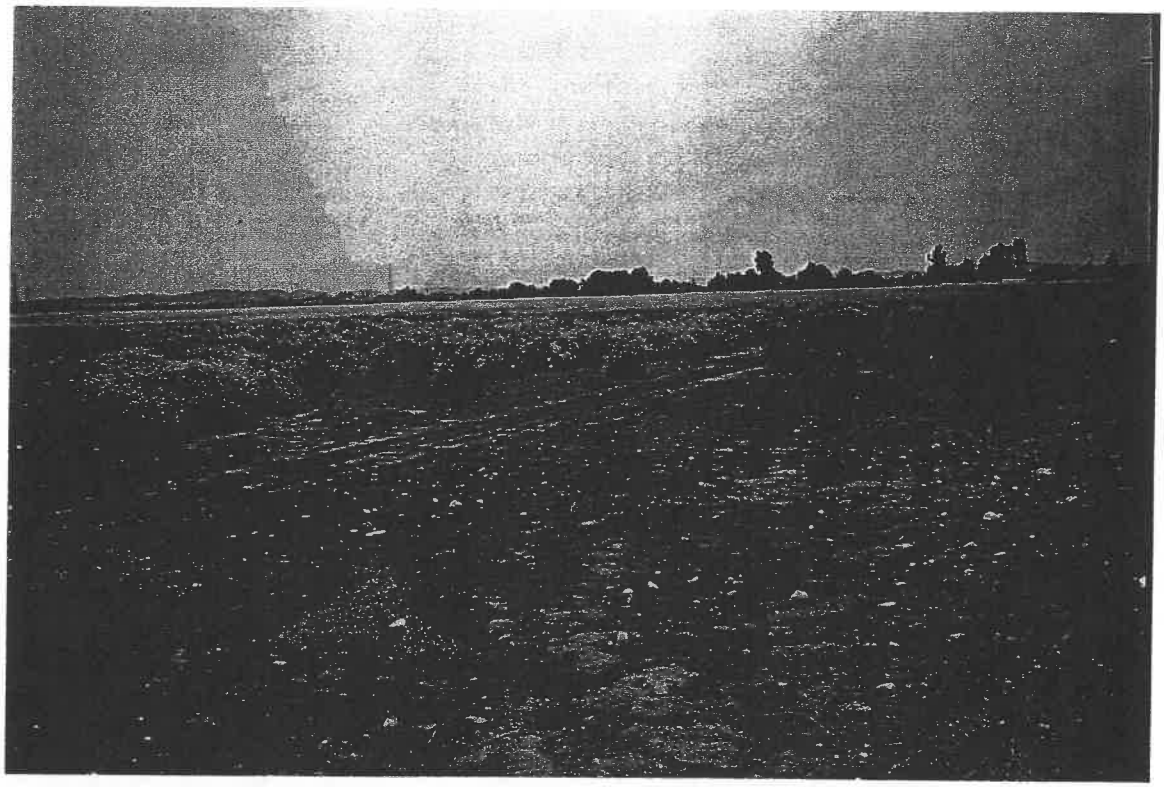
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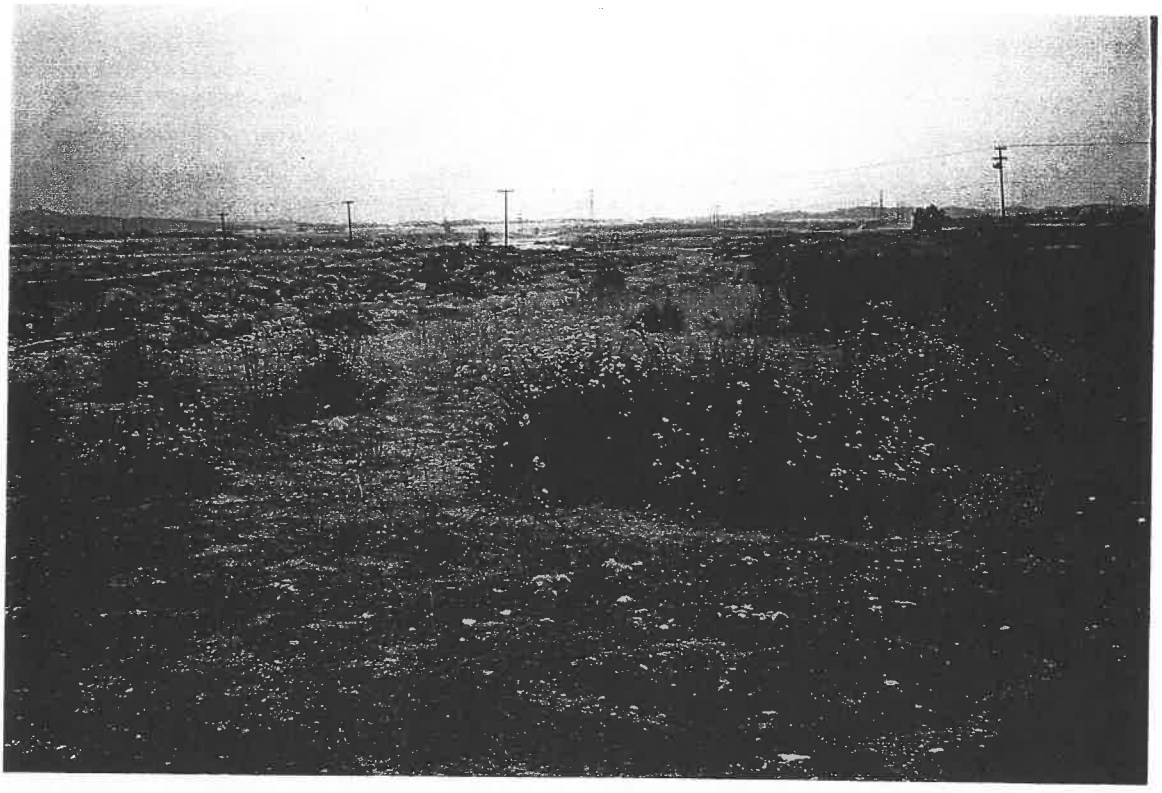
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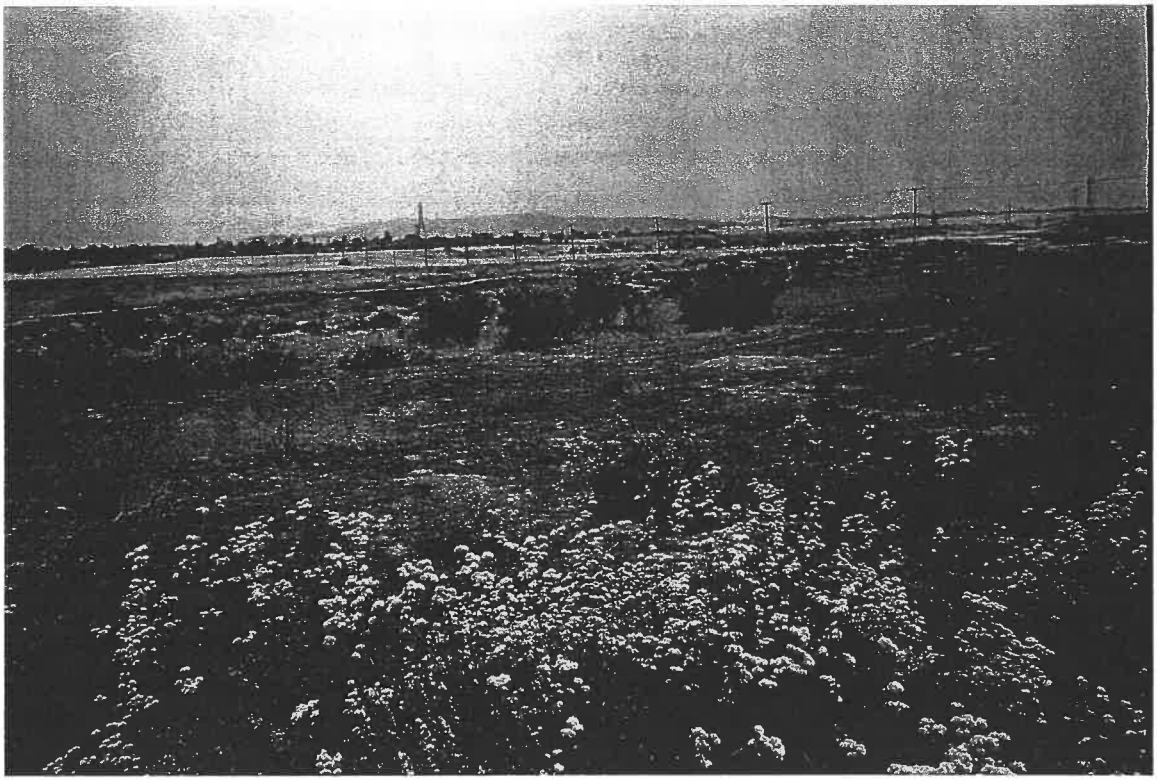
Picture 1. Trap Area 1 Looking Southeast



Picture 2. Trap Area 2 Looking Southeast



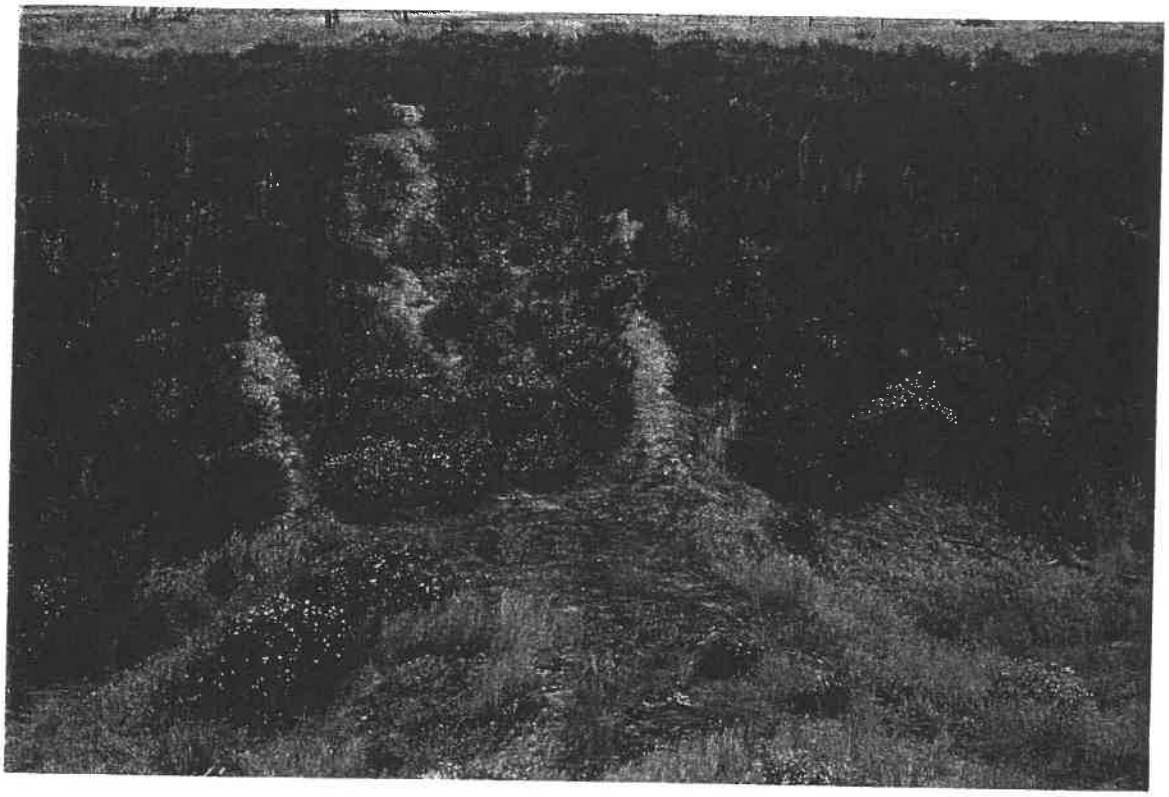
Picture 3. Trap Area 3 Looking North



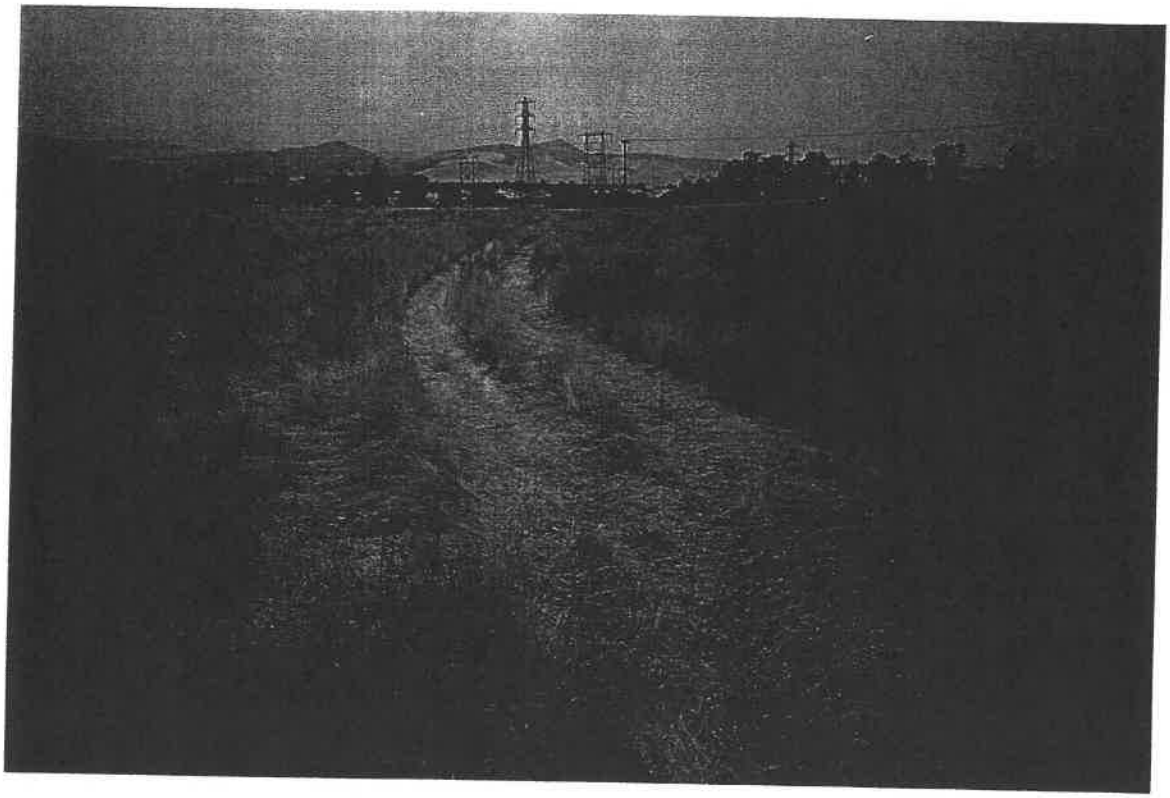
Picture 4. Trap Area 4 Looking South



Picture 5. Trap Area 5 Looking North



Picture 6. Trap Area 6 Looking North



E. TRAFFIC IMPACT ANALYSIS

Traffic Impact Analysis Addendum

URBAN
CROSSROADS

June 5, 2003

Mr. Ross Geller
APPLIED PLANNING, INC.
2151 E. Convention Way
Building C, #122W
Ontario, CA 91764

Subject: Noble Creek Vistas Specific Plan Traffic Study Response to Comments

Dear Mr. Geller:

Comment #1

Cherry Valley complains that the EIR concluded that traffic impacts would not be significant despite degradation of the level of service ("LOS") at certain County intersections from the County's acceptable level of service ("C") to the City's acceptable level of service ("D").

Response #1

The County of Riverside General Plan level of service criteria is "C" or better at study area intersections located more than a mile away from a freeway interchange. A peak hour analysis has been conducted for the intersection of Beaumont Avenue and Cherry Valley Boulevard for General Plan buildout conditions. The attached service level table and worksheets indicate that the following improvements (beyond existing conditions) would be required to allow this intersection to operate at an acceptable service level ("C" or better):

- Northbound Approach
  - Construct an additional left turn lane
  - Construct an additional through lane
  - Construct a right turn lane

- Southbound Approach
  - Construct an additional left turn lane
  - Construct an additional through lane

41 Corporate Park ▲ Suite 300 ▲ Irvine, CA 92606 ▲ p:949.660.1994 ▲ f:949.660.1911
▸urbanxroads.com

- Eastbound Approach
  - Construct an additional through lane
  - Construct a right turn lane

- Southbound Approach
  - Construct an additional left turn lane
  - Construct an additional through lane
  - Construct a right turn lane

It is important to note that these long range future improvements are needed with or without the project, as indicated in Table 1. If you have any questions regarding this analysis, please do not hesitate to call at (949) 660-1994.

Sincerely,

URBAN CROSSROADS, INC.

Scott Sato, P.E.
Associate Principal

SS:nm
JN:00021-10

Attachments

TABLE 1

INTERSECTION ANALYSIS FOR BUILDOUT WITH AND WITHOUT PROJECT WITH IMPROVEMENTS

INTERSECTION	TRAFFIC CONTROL[3]	INTERSECTION APPROACH LANES[1]												DELAY[2] (SECS.)		LEVEL OF SERVICE	
		NORTH-BOUND			SOUTH-BOUND			EAST-BOUND			WEST-BOUND						
		L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
Beaumont Ave. (NS) at:																	
• Cherry Valley Blvd. (EW)																	
- Without Improvements	TS	1	1	0	1	1	1	1	1	0	1	1	0	--[4]	--	F	F
- Without Project With Improvements	TS	2	2	1	2	2	1	1	2	1	2	2	1	29.8	34.3	C	C
- With Project With Improvements	TS	2	2	1	2	2	1	1	2	1	2	2	1	29.9	34.6	C	C

---

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.
L = Left; T = Through; R = Right; >> = Free Right Turn; 2 = Lane Improvement

[2] Delay and level of service calculated using the following analysis software: Traffix, Version 7.1.0607 (1999). Per the 1997 Highway Capacity Manaul, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal

[4] -- = Delay High Intersection Unstable, Level of Serivce = "F".

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ATTACHMENT A

Noble Creek Specific Plan
Buildout Without Project With Improvements
AM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Future Volume Alternative)

Intersection #1 Beaumont Ave. (NS) / Cherry Valley Blvd. (EW)

Cycle (sec): 70 Critical Vol./Cap. (X): 0.700
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 29.8
Optimal Cycle: 70 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	10	15	15	10	15	15	10	15	15	10	15	15
Lanes:	2 0	2 0	1	2 0	2 0	1	1 0	2 0	1	2 0	2 0	1
Volume Module:												
Base Vol:	84	502	198	97	702	290	118	496	331	273	1086	154
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	84	502	198	97	702	290	118	496	331	273	1086	154
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	84	502	198	97	702	290	118	496	331	273	1086	154
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	84	502	198	97	702	290	118	496	331	273	1086	154
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	84	502	198	97	702	290	118	496	331	273	1086	154
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	84	502	198	97	702	290	118	496	331	273	1086	154
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Lanes:	2.00	2.00	1.00	2.00	2.00	1.00	1.00	2.00	1.00	2.00	2.00	1.00
Final Sat.:	3686	3610	1900	3686	3610	1900	1900	3610	1900	3686	3610	1900
Capacity Analysis Module:												
Vol/Sat:	0.02	0.14	0.10	0.03	0.19	0.15	0.06	0.14	0.17	0.07	0.30	0.08
Crit Moves:	****				****		****				****	
Green/Cycle:	0.14	0.21	0.21	0.14	0.21	0.21	0.14	0.28	0.28	0.19	0.33	0.33
Volume/Cap:	0.16	0.65	0.49	0.18	0.91	0.71	0.43	0.49	0.62	0.39	0.92	0.25
Delay/Veh:	26.5	27.0	25.0	26.6	41.3	31.3	28.5	21.2	23.9	25.3	33.6	17.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	26.5	27.0	25.0	26.6	41.3	31.3	28.5	21.2	23.9	25.3	33.6	17.4
DesignQueue:	3	16	6	3	23	9	4	14	10	9	31	4

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Noble Creek Specific Plan
Buildout Without Project With Improvements
PM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Future Volume Alternative)

Intersection #1 Beaumont Ave. (NS) / Cherry Valley Blvd. (EW)

Cycle (sec): 95 Critical Vol./Cap. (X): 0.798
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 34.3
Optimal Cycle:OPTIMIZED Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	10	15	15	10	15	15	10	15	15	10	15	15
Lanes:	2 0	2 0	1	2 0	2 0	1	1 0	2 0	1	2 0	2 0	1
Volume Module:												
Base Vol:	208	941	248	306	798	194	208	1070	312	212	869	252
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	208	941	248	306	798	194	208	1070	312	212	869	252
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	208	941	248	306	798	194	208	1070	312	212	869	252
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	208	941	248	306	798	194	208	1070	312	212	869	252
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	208	941	248	306	798	194	208	1070	312	212	869	252
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	208	941	248	306	798	194	208	1070	312	212	869	252
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Lanes:	2.00	2.00	1.00	2.00	2.00	1.00	1.00	2.00	1.00	2.00	2.00	1.00
Final Sat.:	3686	3610	1900	3686	3610	1900	1900	3610	1900	3686	3610	1900
Capacity Analysis Module:												
Vol/Sat:	0.06	0.26	0.13	0.08	0.22	0.10	0.11	0.30	0.16	0.06	0.24	0.13
Crit Moves:		****		****				****		****		
Green/Cycle:	0.11	0.31	0.31	0.11	0.31	0.31	0.14	0.35	0.35	0.11	0.31	0.31
Volume/Cap:	0.54	0.84	0.42	0.79	0.71	0.33	0.76	0.84	0.47	0.55	0.76	0.42
Delay/Veh:	41.8	36.4	26.5	51.8	31.2	25.5	51.3	33.4	24.3	42.0	32.5	26.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	41.8	36.4	26.5	51.8	31.2	25.5	51.3	33.4	24.3	42.0	32.5	26.2
DesignQueue:	10	37	9	15	31	7	10	39	11	10	33	9

Noble Creek Specific Plan
Buildout With Project With Improvements
AM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Future Volume Alternative)

Intersection #1 Beaumont Ave. (NS) / Cherry Valley Blvd. (EW)

Cycle (sec):	70	Critical Vol./Cap. (X):	0.704
Loss Time (sec):	12 (Y+R = 4 sec)	Average Delay (sec/veh):	29.9
Optimal Cycle:	70	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	10	15	15	10	15	15	10	15	15	10	15	15
Lanes:	2 0	2 0	1	2 0	2 0	1	1 0	2 0	1	2 0	2 0	1
Volume Module:												
Base Vol:	84	509	199	100	705	286	123	494	342	281	1085	166
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	84	509	199	100	705	286	123	494	342	281	1085	166
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	84	509	199	100	705	286	123	494	342	281	1085	166
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	84	509	199	100	705	286	123	494	342	281	1085	166
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	84	509	199	100	705	286	123	494	342	281	1085	166
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	84	509	199	100	705	286	123	494	342	281	1085	166
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Lanes:	2.00	2.00	1.00	2.00	2.00	1.00	1.00	2.00	1.00	2.00	2.00	1.00
Final Sat.:	3686	3610	1900	3686	3610	1900	1900	3610	1900	3686	3610	1900
Capacity Analysis Module:												
Vol/Sat:	0.02	0.14	0.10	0.03	0.20	0.15	0.06	0.14	0.18	0.08	0.30	0.09
Crit Moves:	****				****		****				****	
Green/Cycle:	0.14	0.21	0.21	0.14	0.21	0.21	0.14	0.28	0.28	0.19	0.33	0.33
Volume/Cap:	0.16	0.66	0.49	0.19	0.91	0.70	0.45	0.48	0.64	0.40	0.91	0.27
Delay/Veh:	26.5	27.2	25.1	26.6	41.8	30.9	28.7	21.2	24.5	25.3	33.5	17.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	26.5	27.2	25.1	26.6	41.8	30.9	28.7	21.2	24.5	25.3	33.5	17.5
DesignQueue:	3	16	6	3	23	9	4	14	10	9	31	4

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Noble Creek Specific Plan
Buildout With Project With Improvements
PM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Future Volume Alternative)

****

Intersection #1 Beaumont Ave. (NS) / Cherry Valley Blvd. (EW)

****

Cycle (sec):	83	Critical Vol./Cap. (X):	0.824	
Loss Time (sec):	12 (Y+R = 4 sec)	Average Delay (sec/veh):	34.6	
Optimal Cycle:	77	Level Of Service:	C	

****

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	10	15	15	10	15	15	10	15	15	10	15	15
Lanes:	2 0	2 0	1	2 0	2 0	1	1 0	2 0	1	2 0	2 0	1
Volume Module:												
Base Vol:	253	957	268	309	827	190	211	1073	355	217	875	257
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	253	957	268	309	827	190	211	1073	355	217	875	257
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	253	957	268	309	827	190	211	1073	355	217	875	257
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	253	957	268	309	827	190	211	1073	355	217	875	257
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	253	957	268	309	827	190	211	1073	355	217	875	257
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	253	957	268	309	827	190	211	1073	355	217	875	257
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Lanes:	2.00	2.00	1.00	2.00	2.00	1.00	1.00	2.00	1.00	2.00	2.00	1.00
Final Sat.:	3686	3610	1900	3686	3610	1900	1900	3610	1900	3686	3610	1900
Capacity Analysis Module:												
Vol/Sat:	0.07	0.27	0.14	0.08	0.23	0.10	0.11	0.30	0.19	0.06	0.24	0.14
Crit Moves:		****		****				****		****		
Green/Cycle:	0.12	0.29	0.29	0.12	0.29	0.29	0.12	0.32	0.32	0.12	0.32	0.32
Volume/Cap:	0.57	0.92	0.49	0.70	0.79	0.35	0.92	0.92	0.58	0.49	0.75	0.42
Delay/Veh:	36.2	40.7	25.1	39.8	31.3	23.6	74.7	38.0	24.6	35.0	27.6	22.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	36.2	40.7	25.1	39.8	31.3	23.6	74.7	38.0	24.6	35.0	27.6	22.3
DesignQueue:	10	34	9	13	29	6	9	36	12	9	29	8

****

NOBLE CREEK SPECIFIC PLAN
TRAFFIC STUDY (REVISED)
BEAUMONT, CALIFORNIA

Prepared for:

Mr. Ross Geller
APPLIED PLANNING, INC.
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NOBLE CREEK SPECIFIC PLAN
TRAFFIC STUDY (REVISED)
BEAUMONT, CALIFORNIA

1.0 INTRODUCTION

A. Purpose of Report and Study Objectives

The purpose of this revised traffic study is to evaluate the development of the Noble Creek Specific Plan project from a traffic circulation standpoint. The proposed development is located within the City of Beaumont.

Study objectives include (1) documentation of existing traffic conditions in the vicinity of the site; (2) evaluation of traffic conditions for buildout using the Beaumont Traffic Model; and (3) determination of off-site improvements and system management actions needed to achieve City of Beaumont level of service requirements.

B. Executive Summary

1. Site Location and Study Area

The project site is located adjacent to Beaumont Avenue between Brookside Avenue and 14th Street in the City of Beaumont. Exhibit 1-A illustrates the traffic analysis study area.

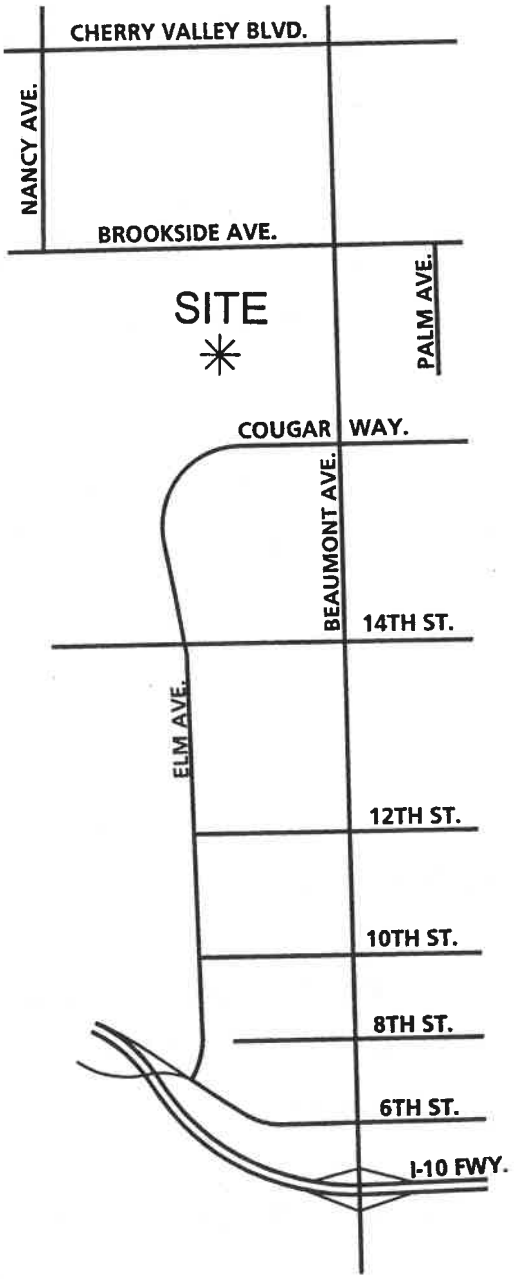
The study area includes the following intersections:

Beaumont Avenue (NS) at:

- Cherry Valley Boulevard (EW)
- 14th Street (EW)

EXHIBIT 1-A

LOCATION MAP



- I-10 Freeway WB Ramps - 5th Street (EW)
- I-10 Freeway EB Ramps - 4th Street (EW)

Currently the intersections of Beaumont Avenue at the I-10 Freeway WB Ramps - 5th Street and Beaumont Avenue at the I-10 Freeway EB Ramps - 4th Street are operating at Level of Service "E" during the PM peak hour.

2. Development Description

The approximately 332.3 acre project site is proposed for single-family detached residential and junior high school uses.

3. Principal Findings

a. Required Level of Service: "D"

b. Level of Service With Proposed Development: For Buildout traffic conditions with the project, the following study area intersections are projected to operate at Level of Service "F" during the peak hours, without improvements:

Beaumont Avenue (NS) at:

- Cherry Valley Boulevard (EW)
- 14th Street (EW)
- I-10 Freeway WB Ramps - 5th Street (EW)
- I-10 Freeway EB Ramps – 4th Street (EW)

c. Level of Service With Proposed Development and With Additional Improvements: For Buildout traffic conditions with the project, study area intersections are projected to operate at Level of Service "D" or better during the peak hours with the following off-site improvements:

Beaumont Avenue (NS) at:

- Cherry Valley Boulevard (EW)
  - Construct a second through lane for all approaches
  - Provide an additional southbound left turn lane
  - Provide an eastbound right turn lane
- 14th Street (EW)
  - Construct a second through westbound through lane
  - Provide a second left turn lane for the northbound, southbound and westbound approaches
  - Provide a right turn lane for the northbound, southbound, and eastbound approaches
- I-10 Freeway WB Ramps (EW)
  - Restrict 5th Street access to/from Beaumont Avenue
  - Construct a loop ramp in the northeast quadrant to provide westbound access onto the I-10 Freeway. This improvement will eliminate the northbound left turn lane at this location
  - Provide a southbound right turn lane
  - Provide a shared westbound lane for left and right turns

- I-10 Freeway EB Ramps (EW)
  - Restrict 4th Street access to/from Beaumont Avenue at this location
  - Construct additional northbound through and right turn lanes

- Construct a second southbound left turn lane and a second eastbound left turn lane
- Provide an eastbound free right turn lane

4. Conclusions

The proposed site is projected to generate a total of approximately 10,395 trip-ends per day with 1,091 vehicles per hour during the AM peak hour and 1,102 vehicles per hour during the PM peak hour.

The proposed project will have access to Beaumont Avenue, Brookside Avenue, Cougar Way and 14th Street.

The project's fair share contribution to the study area are presented in Table 5-5. The PM peak hour (typically the period when the traffic volumes are the greatest) has been used for the calculations. As indicated in Table 5-5, the project traffic contributes approximately two percent of the cumulative traffic growth at the Beaumont Avenue/I-10 interchange.

5. Recommendations

Construct Beaumont Avenue south of Brookside Avenue to the south project boundary at its ultimate half-section width as a Major highway in conjunction with development.

Construct Brookside Avenue from the west project boundary to Beaumont Avenue at its ultimate half-section width as a Secondary highway.

Construct Cougar Way from Beaumont Avenue to 14th Street at its ultimate cross-section width as a Collector in conjunction with development.

Construct 14th Street from Cougar Way to the east project boundary at its ultimate half-section width as an Arterial highway in conjunction with development.

Site-specific circulation recommendations are depicted on Exhibit 6-A. Precise access locations shall be determined at the plot plan or tentative tract map level, subject to approval by the City of Beaumont.

The project should contribute towards a citywide roadway improvement program, as a result of infrastructure development fees for the City of Beaumont.

Sight distance at each project entrance should be reviewed with respect to standard Caltrans/City of Beaumont sight distance standards at the time of preparation of final grading, landscape and street improvement plans.

Participate in the phased construction of traffic signals through payment of established fees.

The City of Beaumont should upgrade the classification of Beaumont Avenue from Cherry Valley Boulevard to 6th Street as a Major highway. This roadway is currently classified as a Secondary highway. These classification changes are required with or without the Noble Creek Specific Plan project.

2.0 PROPOSED DEVELOPMENT

A. Location

The approximately 332.3 acre project site is located adjacent to Beaumont Avenue between Brookside Avenue and 14th Street in the City of Beaumont.

B. Land Use and Intensity

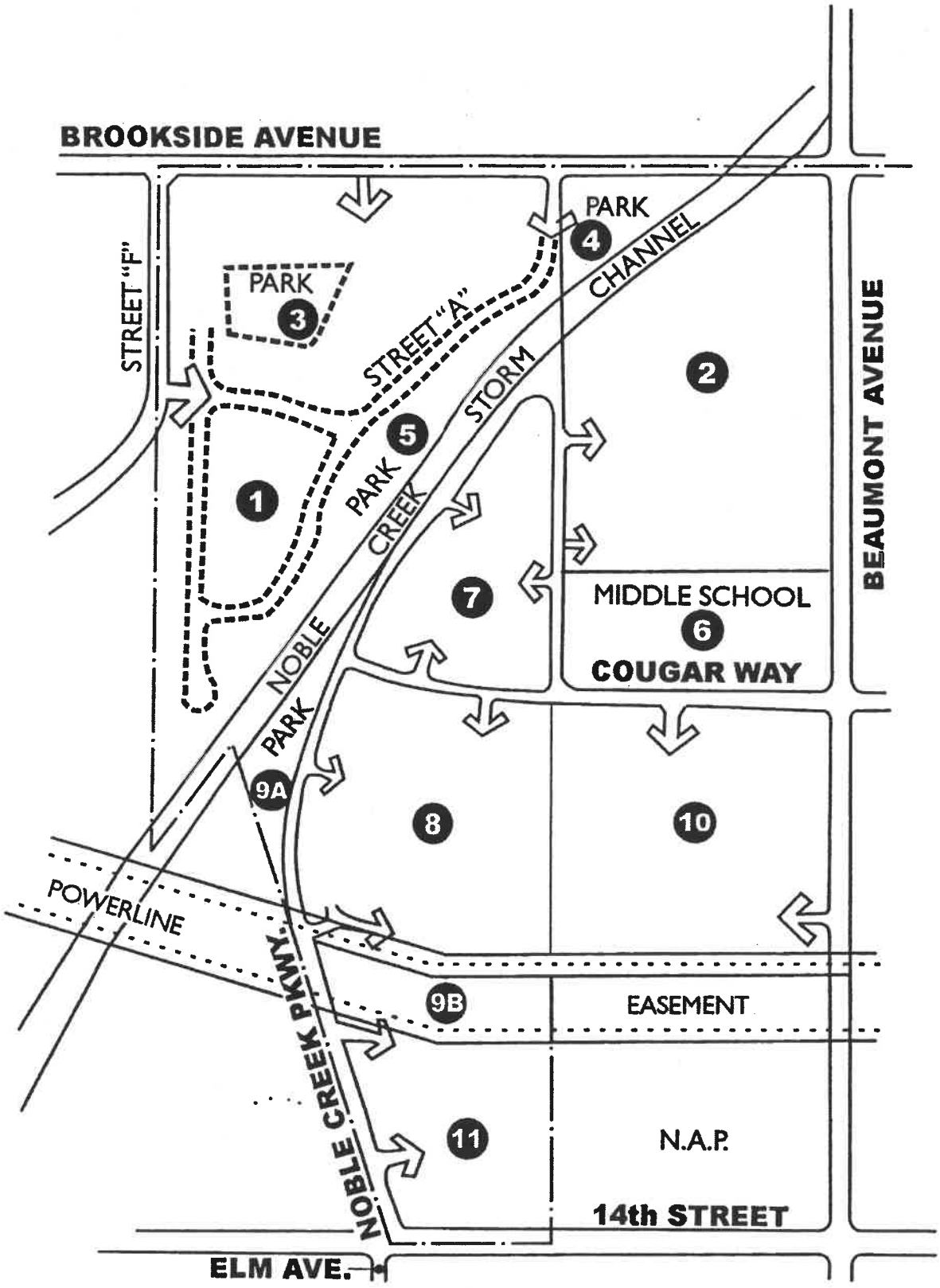
The project site is proposed to be developed with single-family detached residential and junior high school land uses.

C. Site Plan

Exhibit 2-A illustrates the site plan.

EXHIBIT 2-A

SITE PLAN



3.0 AREA CONDITIONS

A. Study Area

1. Area of Significant Traffic Impact

The study area includes the following intersections:

Beaumont Avenue (NS) at:

- Cherry Valley Boulevard (EW)
- 14th Street (EW)
- I-10 Freeway WB Ramps - 5th Street (EW)
- I-10 Freeway EB Ramps - 4th Street (EW)

B. Study Area Land Use

1. Existing Land Uses

The site is currently vacant and relatively low traffic generation is currently being generated from the project.

2. Other Development

The analysis by Urban Crossroads, Inc. uses the City of Beaumont Traffic Model with modifications to include the proposed project to forecast buildout traffic impacts.

C. Site Accessibility

1. Area Roadway System

Exhibit 3-A identifies the existing roadway conditions for study area roadways. The number of through traffic lanes for existing roadways and the existing intersection controls are identified.

The City of Beaumont General Plan Circulation Element is depicted on Exhibit 3-B. Similarly, Exhibit 3-C illustrates the Riverside County General Plan Circulation Element.

2. Traffic Volumes and Conditions

Existing average daily traffic (ADT) on arterial highways throughout the study area are shown on Exhibit 3-D. ADT's are based upon traffic data indicated in the 1999 Traffic Volumes on California State Highways by Caltrans, the Riverside County Traffic Count database and factored up from peak hour counts conducted by Urban Crossroads, Inc., using the following formula for each intersection leg:

PM Peak Hour (Approach Volume + Exit Volume) * 12 = Leg Volume

The current technical guide to the evaluation of traffic operations is the 1997 Highway Capacity Manual (HCM) (Transportation Research Board Special Report 209). The 1997 HCM defines level of service as a qualitative measure which describes operational conditions within a traffic stream, generally in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. The criteria used to evaluate LOS (Level of Service) conditions vary

EXHIBIT 3-A

EXISTING NUMBER OF THROUGH LANES AND INTERSECTION CONTROLS

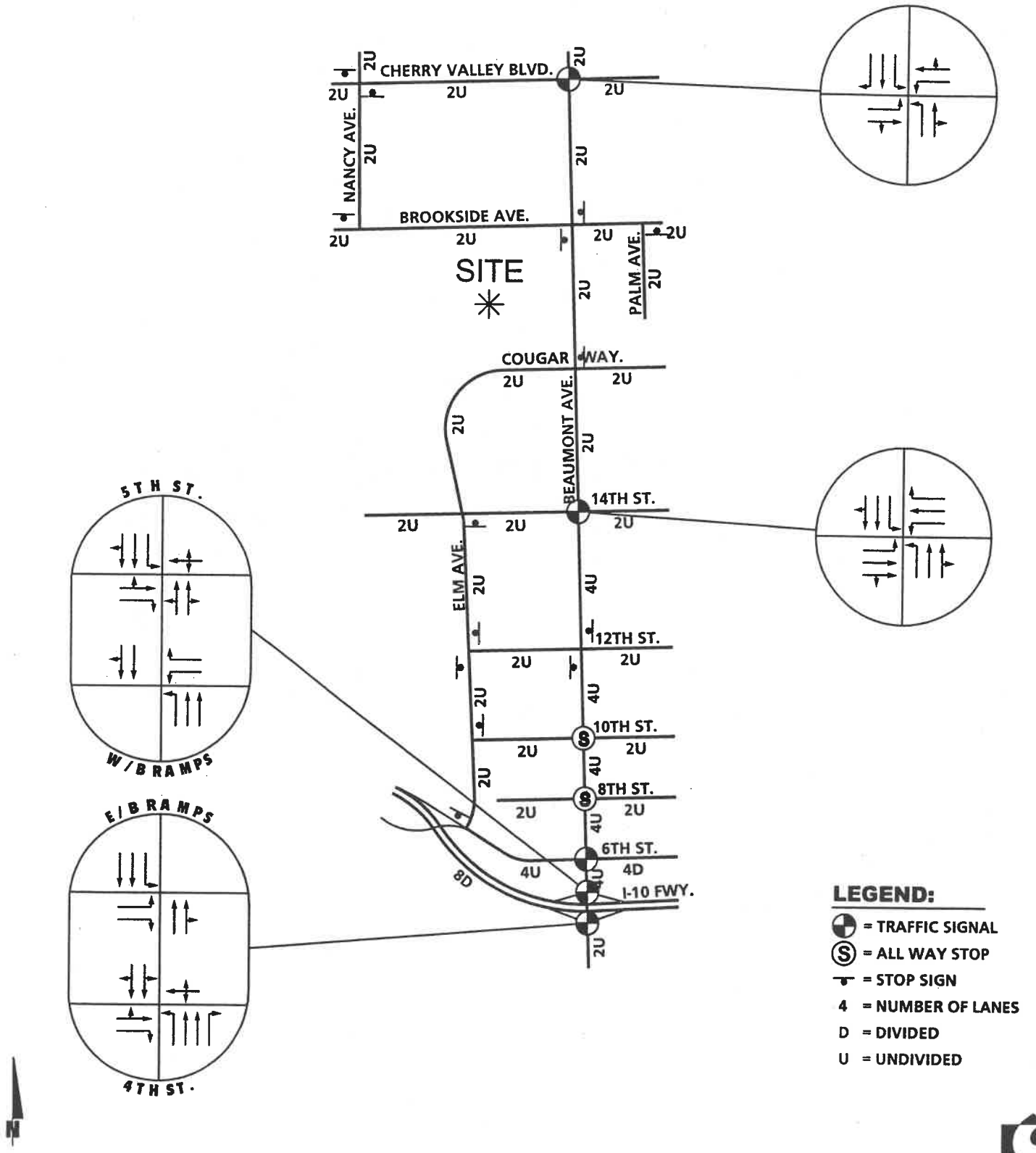
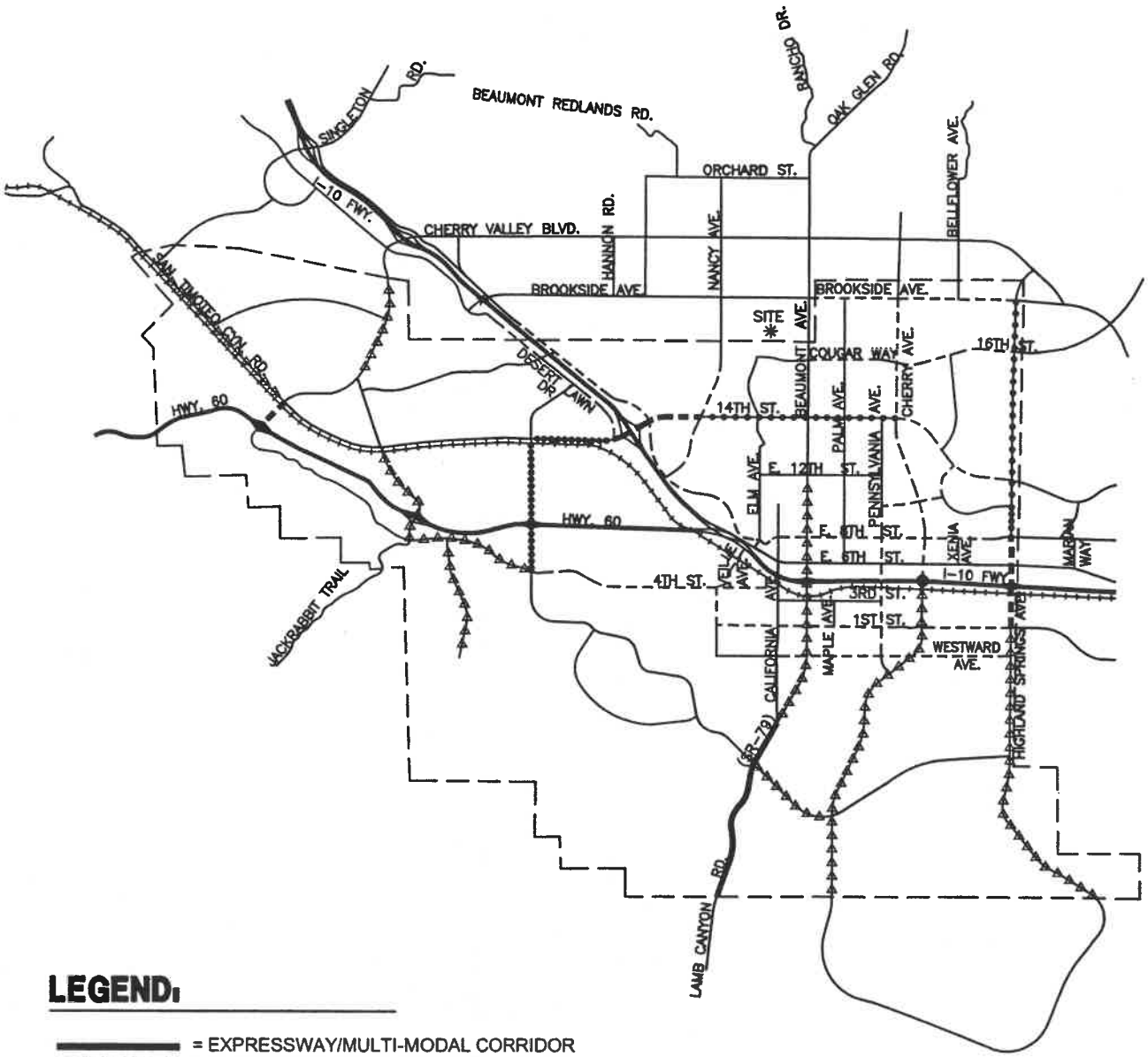


EXHIBIT 3-B

CITY OF BEAUMONT
GENERAL PLAN CIRCULATION ELEMENT



LEGEND:

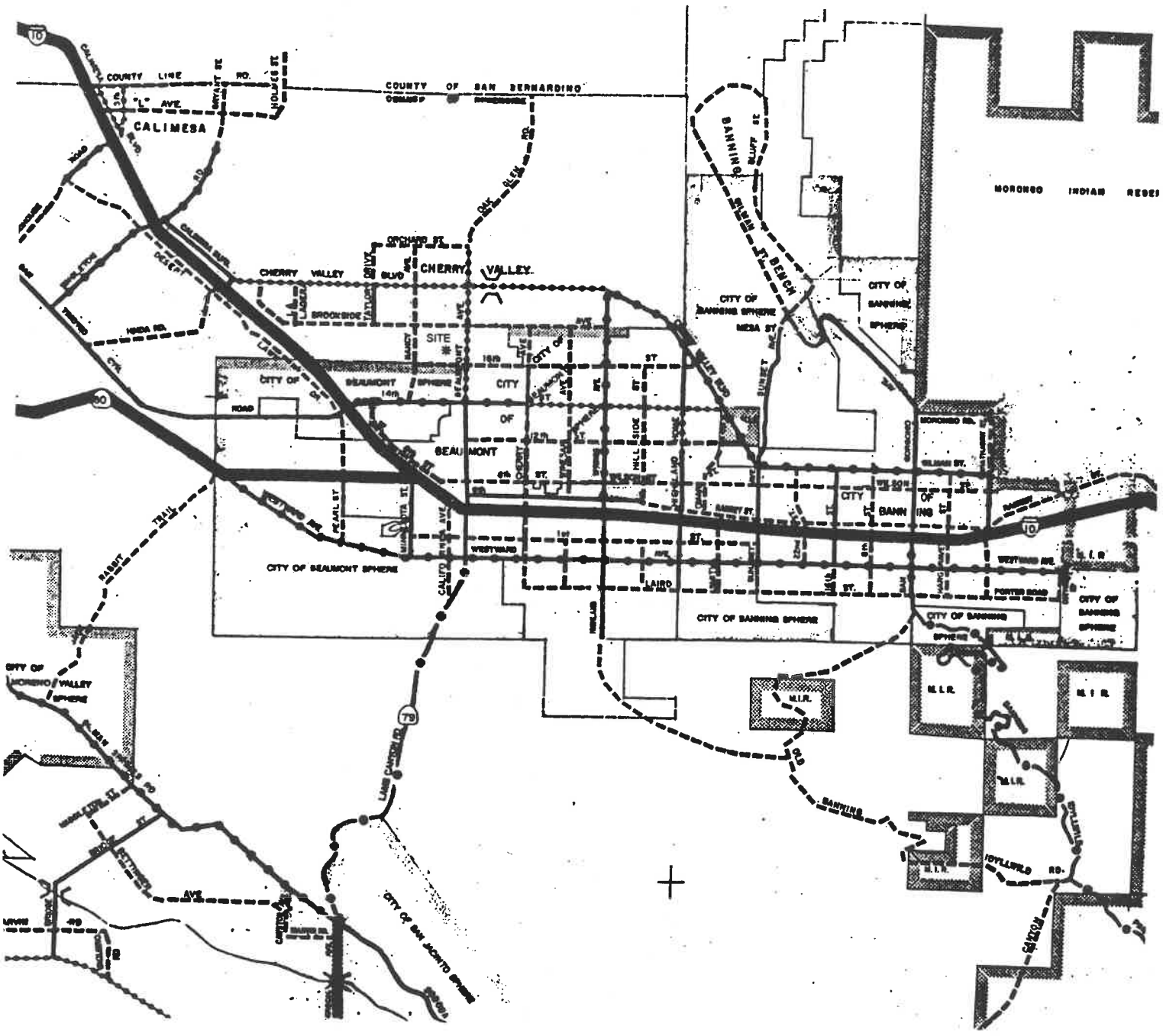
- = EXPRESSWAY/MULTI-MODAL CORRIDOR
- = AUGMENTED URBAN ARTERIAL
- = URBAN ARTERIAL
- = ARTERIAL
- = AUGMENTED MAJOR
- = MAJOR
- = SECONDARY
- = PROPOSED ADDITIONAL INTERCHANGE

N

SOURCE: CITY OF BEAUMONT

EXHIBIT 3-C

RIVERSIDE COUNTY GENERAL PLAN CIRCULATION ELEMENT



LEGEND:

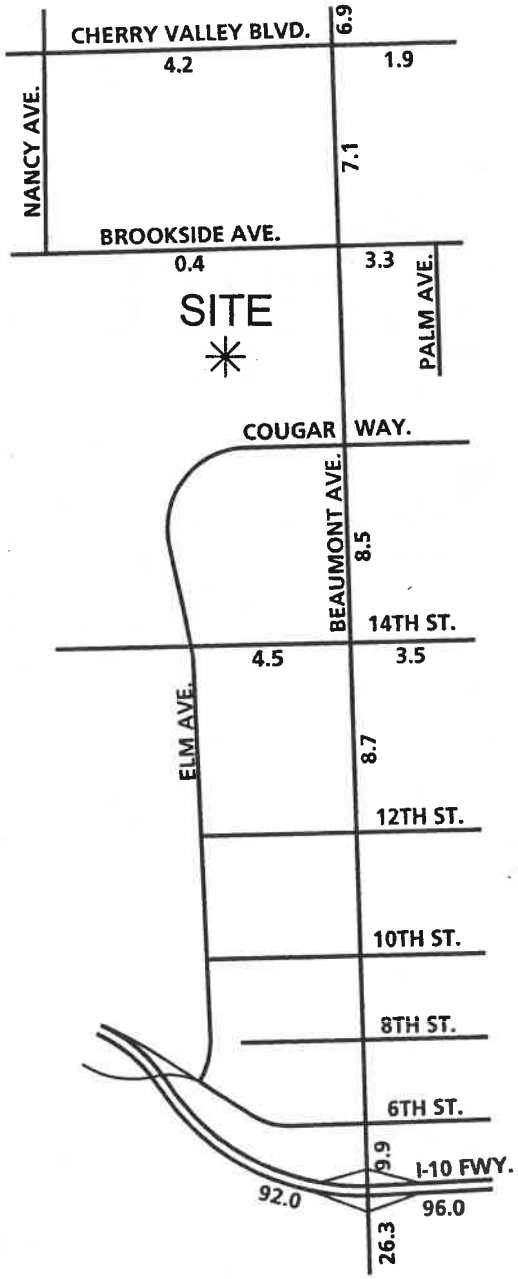
CLASSIFICATION	RIGHT OF WAY
SECONDARY	88'
MAJOR	100'
ARTERIAL	110'
MOUNTAIN ARTERIAL	110'
URBAN ARTERIAL	134'
EXPRESSWAY	VARIABLE
FREEWAY	VARIALBE
SPECIFIC PLAN ROAD	VARIABLE
BRIDGE	
SPHERE OF INFLUENCE	
STATE AND FEDERAL LANDS	
1/2 MILE ACCESS RESTRICTION	
25' TRANSPORTATION EASEMENT	

N

URBAN CROSSROADS

EXHIBIT 3-D

EXISTING AVERAGE DAILY TRAFFIC (ADT)



LEGEND:

26.3 = VEHICLES PER DAY (1000'S)

based on the type of roadway and whether the traffic flow is considered interrupted or uninterrupted.

The definitions of level of service for uninterrupted flow (flow unrestrained by the existence of traffic control devices) are:

- LOS "A" represents free flow. Individual users are virtually unaffected by the presence of others in the traffic stream.

- LOS "B" is in the range of stable flow, but the presence of other users in the traffic stream begins to be noticeable. Freedom to select desired speeds is relatively unaffected, but there is a slight decline in the freedom to maneuver.

- LOS "C" is in the range of stable flow, but marks the beginning of the range of flow in which the operation of individual users becomes significantly affected by interactions with others in the traffic stream.

- LOS "D" represents high-density but stable flow. Speed and freedom to maneuver are severely restricted, and the driver experiences a generally poor level of comfort and convenience.

- LOS "E" represents operating conditions at or near the capacity level. All speeds are reduced to a low, but relatively uniform value. Small increases in flow will cause breakdowns in traffic movement.

- LOS "F" is used to define forced or breakdown flow. This condition exists wherever the amount of traffic approaching a point exceeds the amount which can traverse the point. Queues form behind such locations.

The definitions of level of service for interrupted traffic flow (flow restrained by the existence of traffic signals and other traffic control devices) differ slightly depending on the type of traffic control.

The level of service is typically dependent on the quality of traffic flow at the intersections along a roadway. The 1997 Highway Capacity Manual (HCM) methodology expresses the level of service at an intersection in terms of delay time for the various intersection approaches. The HCM uses different procedures depending on the type of intersection control. The levels of service determined in this study are determined using the HCM methodology.

For signalized intersections, average delay per vehicle is used to determine level of service. Levels of service at signalized study intersections have been evaluated using the HCM intersection analysis program.

The level of services are defined as follows:

LEVEL OF SERVICE	AVERAGE TOTAL DELAY PER VEHICLE (SECONDS)	
	SIGNALIZED	UNSIGNALIZED
A	0 to 10.00	0 to 10.00
B	10.01 to 20.00	10.01 to 15.00
C	20.01 to 35.00	15.01 to 25.00
D	35.01 to 55.00	25.01 to 35.00
E	55.01 to 80.00	35.01 to 50.00
F	80.01 and up	50.01 and up

The LOS analysis for signalized intersections has been performed using optimized signal timing. This analysis has included an assumed lost time of three seconds per phase in accordance with 1997 HCM recommended default values. Signal timing optimization has considered pedestrian safety and signal coordination requirements. Appropriate time for pedestrian crossings have also been considered in the signalized intersection analysis. Saturation flow rates of 1,900 vehicles per hour of green (vphg) have been assumed for all capacity analysis.

Existing peak hour traffic operations have been evaluated for study area intersections. The results of this analysis are summarized in Table 3-1, along with the existing intersection geometrics and traffic control devices at each analysis location. Existing intersection level of service calculations are based upon manual AM and PM peak hour turning movement counts made for Urban Crossroads, Inc. in March, 2001 (see Exhibits 3-E and 3-F). The turning movement counts have accounted for the additional traffic due to the frontage roads at both 4th and 5th Streets. Manual adjustments have been performed to increase volumes at the I-10 ramps to account for conservation of flow and daily traffic variations.

For existing traffic conditions, the study area intersections of Beaumont Avenue at the I-10 westbound and eastbound ramps operate at Level of Service "E" during the peak hours, as shown in Table 3-1. Traffic count worksheets are included in Appendix "A". Existing HCM calculation worksheets are provided in Appendix "B".

TABLE 3-1

INTERSECTION ANALYSIS FOR EXISTING CONDITIONS

INTERSECTION	TRAFFIC CONTROL[3]	INTERSECTION APPROACH LANES[1]												DELAY[2] (SECS.)		LEVEL OF SERVICE	
		NORTH-BOUND			SOUTH-BOUND			EAST-BOUND			WEST-BOUND						
		L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
Beaumont Ave. (NS) at:																	
• Cherry Valley Blvd. (EW)	TS	1	1	0	1	1	1	1	1	0	1	1	0	20.8	21.2	C	C
• 14th St. (EW)	TS	1	2	0	1	2	0	1	2	0	1	1	1	14.7	14.8	B	B
• 1-10 Fwy. WB Ramps - 5th St. (EW)	TS	1	2	0	1	2	0	0	1	0	1	0	1	54.0	63.6	D	E
• 1-10 Fwy. EB Ramps - 4th St. (EW)	TS	1	2	0	1	2	0	0	1	1	0	1	0	52.5	57.8	D	E

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[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.
L = Left; T = Through; R = Right

[2] Delay and level of service calculated using the following analysis software: Traffix, Version 7.1.0607 (1999). Per the 1997 Highway Capacity Manaul, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal

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EXHIBIT 3-E

EXISTING AM PEAK HOUR INTERSECTION VOLUMES

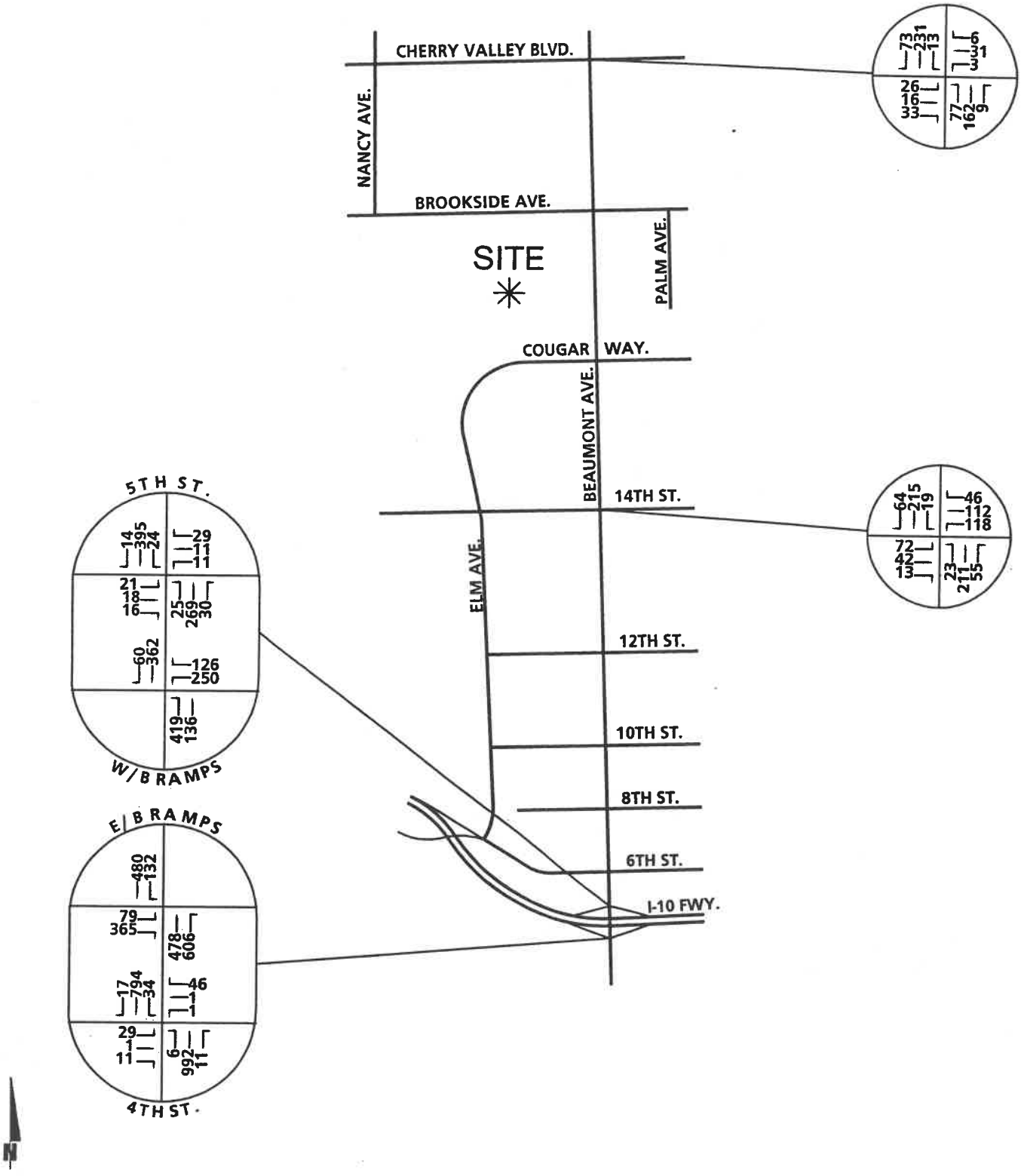
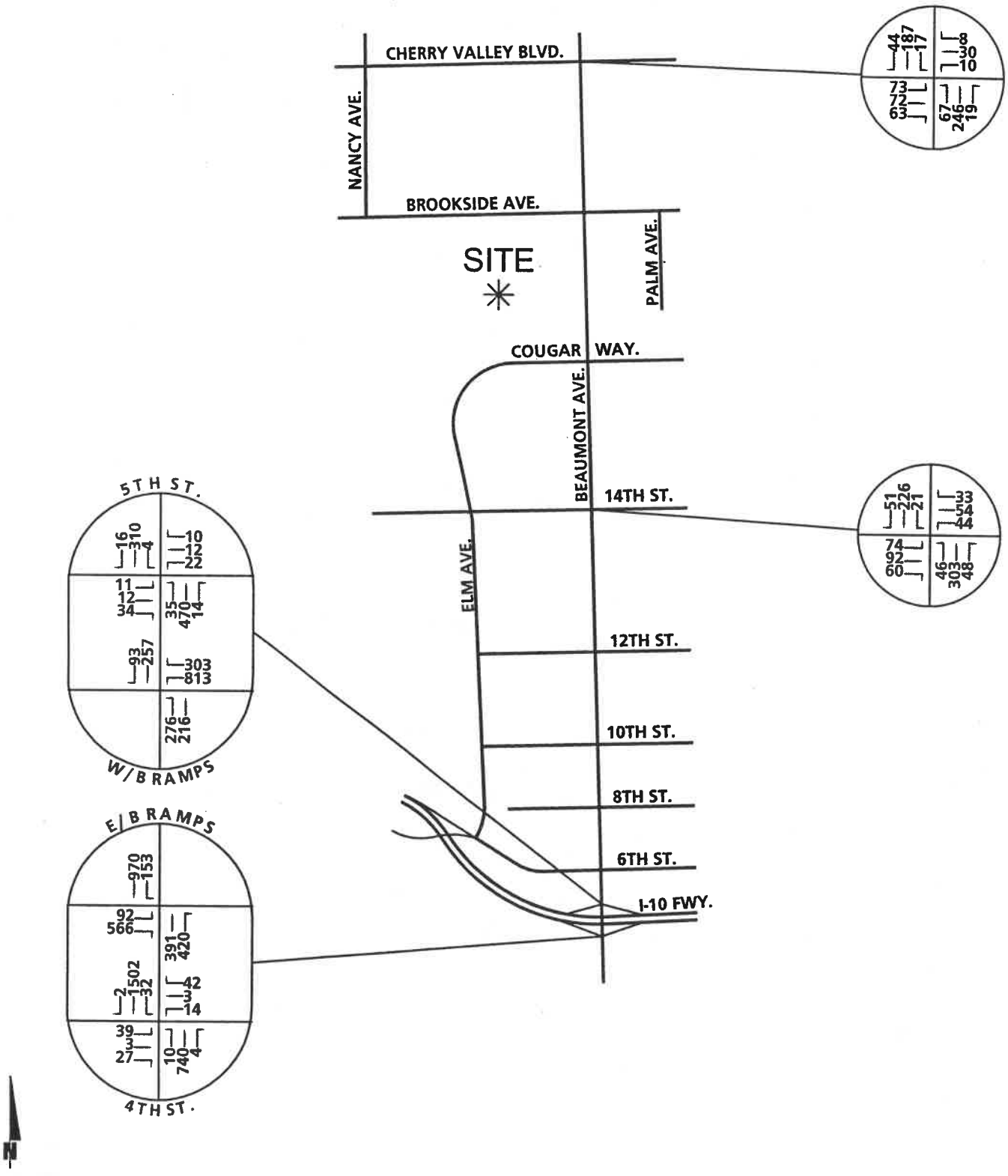


EXHIBIT 3-F

EXISTING PM PEAK HOUR INTERSECTION VOLUMES



4.0 PROJECTED TRAFFIC

A. Site Traffic

1. Trip Generation

Trip generation represents the amount of traffic which is attracted and produced by a development. The traffic generation for the project is based upon the specific land uses which have been planned for the development. The approximately 332.3 acre project site is assumed to be developed with single-family detached residential and junior high school land uses.

Trip generation rates for this project are shown in Table 4-1. The trip generation rates are based upon data collected by the Institute of Transportation Engineers (ITE).

Both daily and peak-hour trip generation for the proposed project are shown in Table 4-2. The proposed development is projected to generate a total of approximately 10,395 trip-ends per day with 1,091 vehicles per hour during the AM peak hour and 1,102 vehicles per hour during the PM peak hour.

B. Traffic Model

This section of the report describes the operational procedures and data input formats of the model. The subdivision of the modeling area into a representative zone system, and the creation of the roadway network are described. The procedures utilized for trip generation and distribution, and assignment of traffic to the roadway network are discussed.

TABLE 4-1

TRIP GENERATION RATES[1]

LAND USE	UNITS[2]	PEAK HOUR				DAILY
		AM		PM		
		IN	OUT	IN	OUT	
Single Family	DU	0.19	0.56	0.65	0.36	9.57
Jr. High School	ST	0.26	0.20	0.08	0.08	1.45

---

1 Source: Institute of Transportation Engineers (ITE), Trip Generation, Sixth Edition, 1997, Land Use Categories 210 and 522.

2 DU = Dwelling Units
ST = Students

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TABLE 4-2

PROJECT TRIP GENERATION

LAND USE	QUANTITY	UNITS[1]	PEAK HOUR				DAILY
			AM		PM		
			IN	OUT	IN	OUT	
Single Family	965	DU	183	540	627	347	9,235
Jr. High School	800	ST	208	160	64	64	1,160
TOTAL			391	700	691	411	10,395

[1] DU = dwelling units
ST = students

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The computer modeling process consists generally of seven individual but interrelated steps. These are:

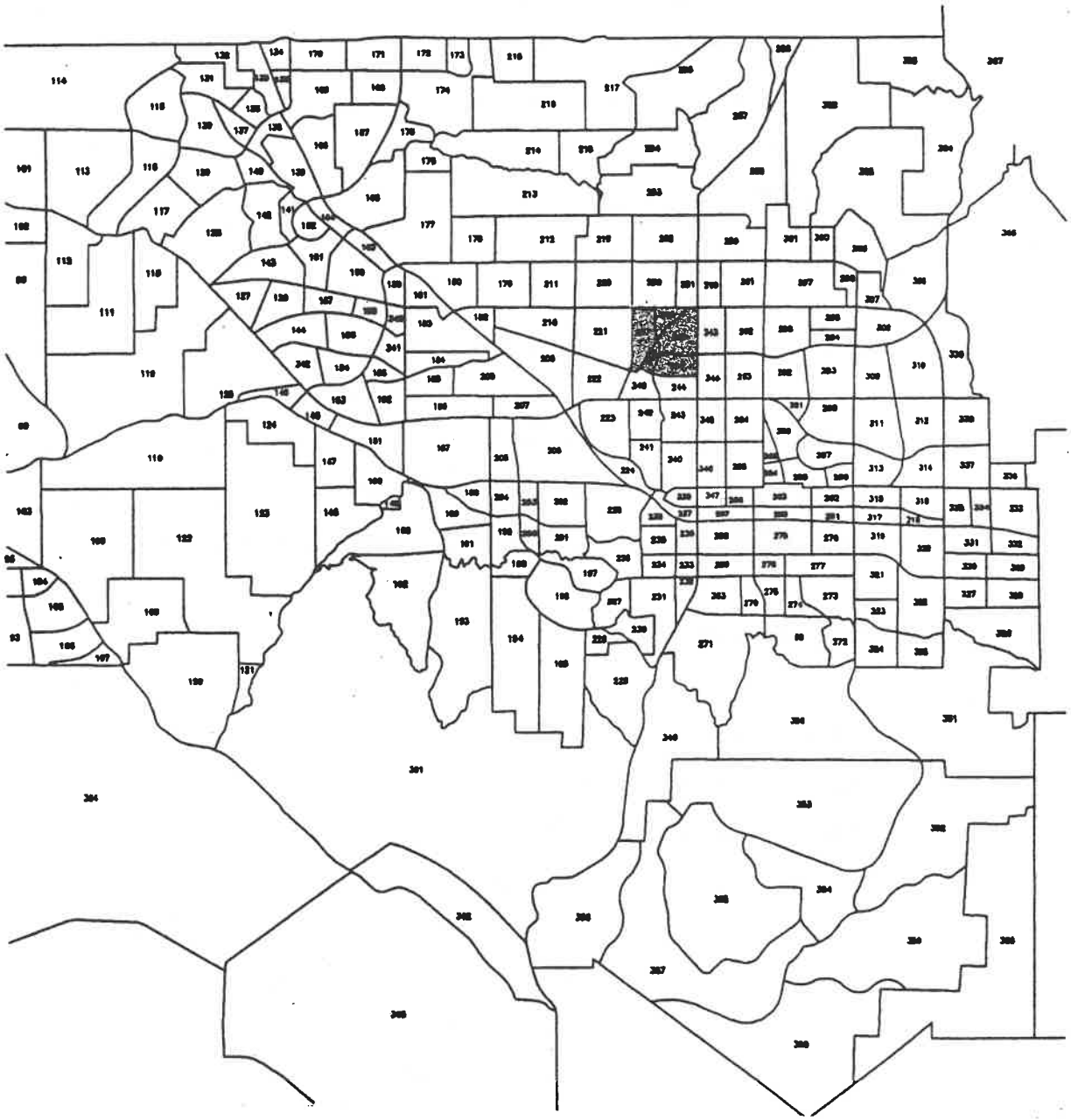
- Definition of a traffic analysis zone system;
- Compilation of land use data for each of the traffic analysis zones;
- Definition of a roadway network to serve the zone system;
- Determination of efficient and logical route paths through the network between the individual traffic analysis zones;
- Determination of trip generation within each traffic analysis zone;
- Determination of the distribution of trip-ends between the traffic analysis zones for three individual trip purposes; and
- Assignment of trips to the individual roadway segments of the overall roadway network.

1. Zone System

To produce a forecast of traffic volumes within the modeling area, traffic must be loaded onto the roadway network in a manner which approximates how real traffic enters and uses the real roadway system. To accomplish this, the Beaumont Traffic Model study area is divided into a traffic analysis zone (TAZ) system as shown on Exhibit 4-A. The project site consists of TAZ 245, 246, 247, 248, 249.

EXHIBIT 4-A

TRAFFIC ANALYSIS ZONES (TAZ'S)



Each TAZ represents the area where traffic is generated (expressed as a number of trip "productions" and "attractions") by the land uses in that TAZ. During the trip distribution stage of the process, traffic is distributed from each "production" zone to all other zones of the modeling area based on the "attractiveness" of each other zone. In this way, the zones interact with each other. To insure that there is adequate interaction, the zone system must be subdivided into areas which are small enough to accurately represent the distribution process and the manner in which traffic loads to the roadway network.

The study area is tied to the outside world through external zones called cordon stations. Traffic enters and leaves the study area through the cordon stations. In addition, traffic which passes through the study area, but does not interact with it, (termed "through" traffic) is represented as traffic which passes directly from one cordon station to another.

2. Roadway Network

The roadway network generally excludes local level streets, because it is impractical to model traffic at that level of detail. The network is described in the model as a series of roadway links connected at node points. Traffic generated within each internal TAZ is introduced to the roadway network through one or more zone "centroid" connectors. These are fictitious roadway links which connect the zone center (the idealized point of zone trip generation) to the arterial roadway system. In a similar manner, cordon zones have special connectors termed cordon links.

Each roadway link is defined in terms of its link end points (nodes), a unique length and a facility code. The facility codes for the network, which define an initial link speed and capacity, are listed in Table 4-3. The Beaumont

TABLE 4-3

BEAUMONT TRAFFIC MODEL NETWORK CODING CONVENTIONS

CTP MODEL CHARACTERISTICS		BATMAN FACILITY CODE	SPEEDS			HOURLY CAPACITY PER LANE	FACILITY DESCRIPTION
FACILITY TYPE	AREA TYPE		FREE FLOW	OBS. PEAK	OBS. OFF PEAK		
1	3	11	55	40	55	1950	2-lane fwy
1	3	12	55	40	55	1950	3 lane fwy
1	4	13	55	55	55	1950	3-lane fwy
1	4	14	55	55	55	1950	4-lane fwy
1	4	15	55	55	55	1950	5-lane fwy
1	4	16	55	55	55	1950	6-lane fwy
General Plan Only		20	35	30	35	550	2 lane Collector
4	3	21	30	25	30	550	2-lane Collector
4	4	22	35	40	40	800	2-lane Collector
4	5	23	40	50	55	900	2-lane Collector
3	3	24	40	25	30	625	2-lane Arterial
3	4	25	45	40	40	800	2-lane Arterial
3	5	26	45	50	55	900	2-lane Arterial
General Plan Only		30	35	25	40	625	4-U Secondary
3	3	31	30	25	30	625	4-U Secondary
4	3	32	30	25	30	550	4-U Secondary
3	4	33	40	40	45	800	4-D Primary/ Arterial
4	4	34	35	40	40	800	4-D Primary/ Arterial
3	5	35	45	50	55	900	4-D Primary/ Arterial
4	5	36	40	50	55	900	4-D Primary/ Arterial
Genral Plan Only		40	45	35	45	625	6-D Major
Genral Plan Only		41	50	30	50	800	6-D Major
Genral Plan Only		60	25	25	30	10000	Centroid Connect
6	3	61	25	25	30	10000	Centroid Connect
6	4	62	30	35	40	10000	Centroid Connect
6	5	63	35	35	40	10000	Centroid Connect
7	4	71	55	55	55	1950	Fwy-Fwy Connector
8	3	81	20	20	25	10000	1-lane Fwy. Ramp
8	3	82	20	20	25	10000	2-lane Fwy. Ramp
8	4	83	25	25	25	100000	2-lane Fwy. Ramp

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Traffic Model network plot depicting the roadways assumed within the traffic model are shown on Exhibit 4-B.

3. Trip Generation

Trip generation is the process of determining the overall magnitude of travel demand (trip making) within the study area. The trip generation procedure included in the Beaumont Traffic Model is dependent on the analysis time frame under consideration. The build-out trip generation forecasts within the study area are based on projected land uses as contained in the City of Beaumont General Plan Land Use Element (or the most appropriate jurisdiction outside of the City of Beaumont).

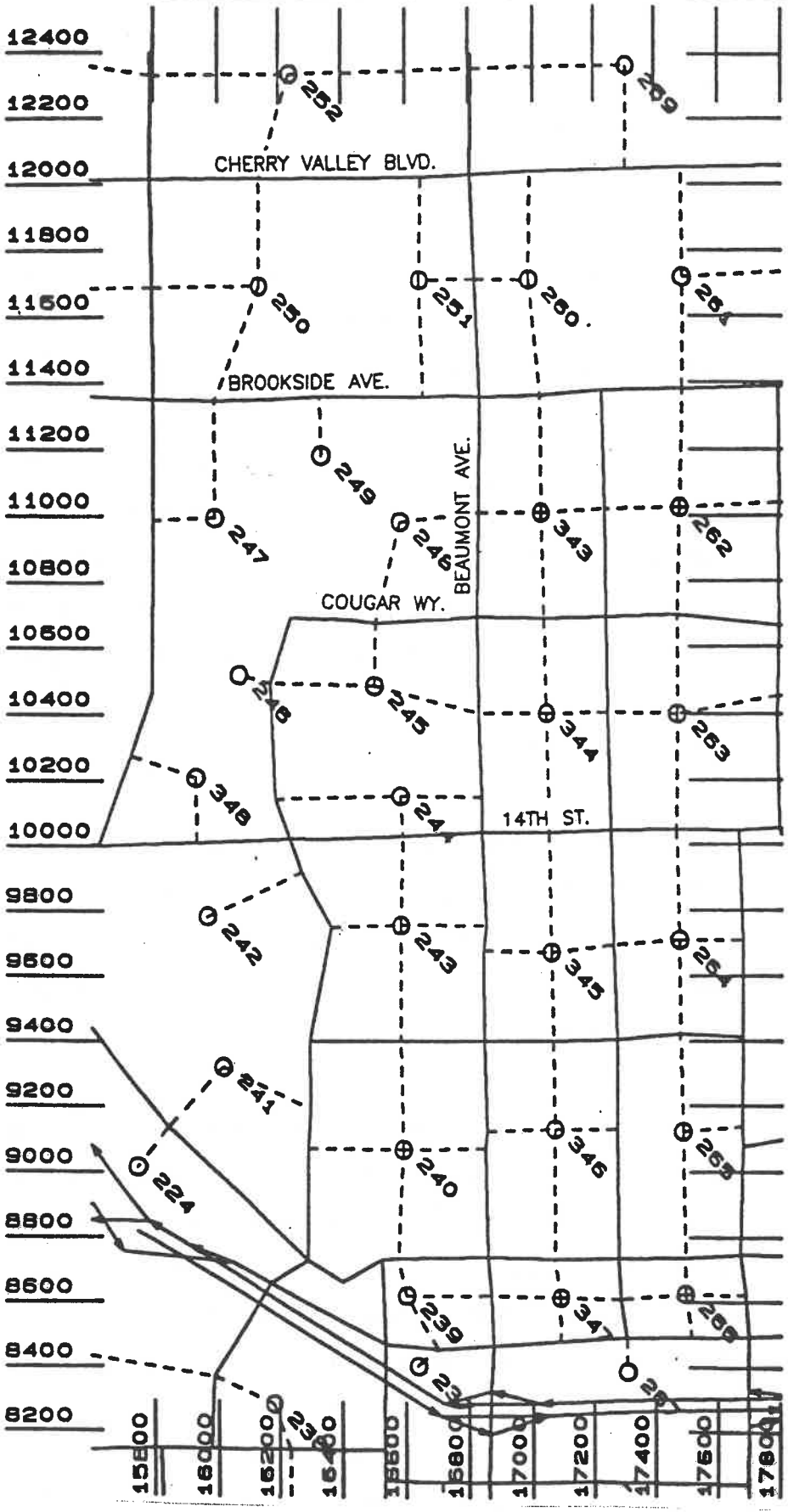
The following three trip purposes are used in the Beaumont Traffic Model:

- Home-Work Trips
- Other-Work Trips
- Non-Work Trips

The trip-ends for each purpose (and by production/attraction end) have been disaggregated for use by the Beaumont Traffic Model. Trip generation is expressed in terms of "productions" and "attractions". Each trip made in the model has two "trip-ends", a production end and an attraction end. The production trip-ends in the model are related to residential dwelling units for "home-based" trip purposes. Regardless of whether the direction of the trip is from the residence to a shopping location, or from the shopping location to the residence, it is expressed as a home-based production at the residence end of the trip. Retail land uses on the other hand, have no production trip-ends for "home-based" trip purposes; they attract trips made from residential land uses. All residential uses utilize

EXHIBIT 4-B

GENERAL PLAN BUILDOUT NETWORK PLOT



the explanatory variable dwelling units, while all other land uses are expressed in acres of use.

4. Trip Distribution

The trip distribution process employed in the Beaumont Traffic Model employs a gravity model formulation. The Beaumont Traffic Model uses the three purposes described previously.

The friction factors for the non-work trip purpose in the Beaumont Traffic Model have been developed by adding the friction factors for the three purposes. The resulting friction factors were then divided by a constant to provide the same proportional attractiveness by trip length, but using values within the range that the modeling software (TRANPLAN) allows.

5. Trip Table Development

The trip table development process converts the production and attraction format trip table which is output from the Beaumont Traffic Model trip distribution process into an origin and destination format trip table by time of day. The end result is a trip table which can be assigned to the roadway network by time of day.

The Beaumont Traffic Model has been developed with the goal of providing AM and PM peak hour forecasts, along with daily traffic volume forecasts. The Beaumont Traffic Model daily assignment is obtained by adding an additional off-peak assignment together with the previously mentioned AM and PM peak period assignments. The factors used by the Beaumont Traffic Model in the trip table development process are summarized in Table 4-4.

TABLE 4-4

BEAUMONT TRAFFIC MODEL TRIP TABLE DEVELOPMENT FACTORS

FACTORS	PURPOSE					
	HOME-WORK		OTHER-WORK		NON-WORK	
	P = = > A	A = = > P	P = = > A	A = = > P	P = = > P	A = = > P
AM Peak	0.3403	0.0152	0.1492	0.0166	0.0939	0.0210
PM Peak	0.0196	0.3215	0.0343	0.3089	0.1309	0.1962
Off-Peak	0.173	0.1304	0.2455	0.2455	0.2680	0.2900
SUM BY PURPOSE	0.5329	0.4671	0.4290	0.5710	0.4928	0.5072
TOTAL		0.9342		1.142		1.0144

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6. Traffic Assignment

The traffic assignment process for the Beaumont Traffic Model has also been adapted from the equilibrium assignment procedure available in the TRANPLAN modeling software package. It is used for all three assignment periods (AM, PM, and off-peak) included in the Beaumont Traffic Model. The detailed Beaumont Traffic Model zone structure "spreads" traffic more evenly, and the use of the equilibrium assignment procedure also allows for more flexibility in performing specialized model analyses.

A select zone assignment for the project site has been completed utilizing the Beaumont Traffic Model. The generalized trip distribution pattern for the project is graphically depicted on Exhibit 4-C.

C. Total Traffic, Buildout

The Buildout traffic volumes without the project have been derived from the subregional travel demand model currently being used for long range planning in the City of Beaumont. All Buildout ADT forecasts have been developed from the Beaumont Traffic Model by Urban Crossroads, Inc..

Exhibit 4-D shows the ADT's which can be expected for Buildout traffic conditions without the project. Exhibit 4-E shows the ADT's which can be expected for Buildout traffic conditions with the project.

EXHIBIT 4-C

GENERALIZED PROJECT TRIP DISTRIBUTION



LEGEND:

10 = PERCENT TO/FROM PROJECT

N

EXHIBIT 4-D

BUILDOUT WITHOUT PROJECT AVERAGE DAILY TRAFFIC (ADT)



LEGEND:

63.0 = VEHICLES PER DAY (1000'S)

EXHIBIT 4-E

BUILDOUT WITH PROJECT AVERAGE DAILY TRAFFIC (ADT)



LEGEND:

63.0 = VEHICLES PER DAY (1000'S)

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5.0 TRAFFIC ANALYSIS

A. Capacity and Level of Service and Improvement Analysis, Buildout

1. Level of Service at Buildout Without Project

Buildout intersection levels of service for the existing network without the proposed project are shown in Tables 5-1 and 5-2. Table 5-1 shows HCM calculations based on the geometrics at the study area intersections without improvements. HCM calculations with improvements are shown in Table 5-2. Buildout without project HCM calculation worksheets are provided in Appendix "C". Buildout AM and PM peak hour intersection turning movement volumes are shown on Exhibits 5-A and 5-B without the project, respectively.

2. Level of Service at Buildout With Project and Roadway Improvements

Buildout intersection levels of service for the existing network with the proposed project are shown in Tables 5-3 and 5-4. Table 5-3 shows HCM calculations based on the geometrics at the study area intersections without improvements. HCM calculations with improvements are shown in Table 5-4. Buildout with the project HCM calculation worksheets are provided in Appendix "D". Buildout AM and PM peak hour intersection turning movement volumes with the project are shown on Exhibits 5-C and 5-D, respectively.

TABLE 5-1

INTERSECTION ANALYSIS FOR BUILDOUT WITHOUT PROJECT WITHOUT IMPROVEMENTS

INTERSECTION	TRAFFIC CONTROL[3]	INTERSECTION APPROACH LANES[1]												DELAY[2] (SECS.)		LEVEL OF SERVICE	
		NORTH-BOUND			SOUTH-BOUND			EAST-BOUND			WEST-BOUND						
		L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
Beaumont Ave. (NS) at:																	
• Cherry Valley Blvd. (EW)	TS	1	1	0	1	1	1	1	1	0	1	1	0	--[4]	--	F	F
• 14th St. (EW)	TS	1	2	0	1	2	0	1	2	0	1	1	1	--	--	F	F
• 1-10 Fwy. WB Ramps - 5th St. (EW)	TS	1	2	0	1	2	0	0	1	0	1	0	1	--	--	F	F
• 1-10 Fwy. EB Ramps - 4th St. (EW)	TS	1	2	0	1	2	0	0	1	1	0	1	0	--	--	F	F

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.
L = Left; T = Through; R = Right

[2] Delay and level of service calculated using the following analysis software: Traffix, Version 7.1.0607 (1999). Per the 1997 Highway Capacity Manaul, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal

[4] -- = Delay High Intersection Unstable, Level of Service "F".

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TABLE 5-2

INTERSECTION ANALYSIS FOR BUILDOUT WITHOUT PROJECT WITH IMPROVEMENTS

INTERSECTION	TRAFFIC CONTROL[3]	INTERSECTION APPROACH LANES[1]												DELAY[2] (SECS.)		LEVEL OF SERVICE	
		NORTH-BOUND			SOUTH-BOUND			EAST-BOUND			WEST-BOUND						
		L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
Beaumont Ave. (NS) at:																	
• Cherry Valley Blvd. (EW)	TS	1	2	0	2	2	1	1	2	1	1	2	0	42.6	51.5	D	D
• 14th St. (EW)	TS	2	2	1	2	2	1	1	2	1	2	2	1	44.1	47.7	D	D
• 1-10 Fwy. WB Ramps - 5th St. (EW)	TS	0	2	1>>	0	2	1	0	0	0	1	1	1	16.8	33.8	B	D
• 1-10 Fwy. EB Ramps - 4th St. (EW)	TS	0	3	1	2	2	0	2	0	1>>	0	0	0	22.7	12.8	C	B

---

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.
L = Left; T = Through; R = Right; >> = Free Right Turn; 2 = Lane Improvement

[2] Delay and level of service calculated using the following analysis software: Traffix, Version 7.1.0607 (1999). Per the 1997 Highway Capacity Manaul, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal

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EXHIBIT 5-A

BUILDOUT WITHOUT PROJECT AM PEAK HOUR INTERSECTION VOLUMES

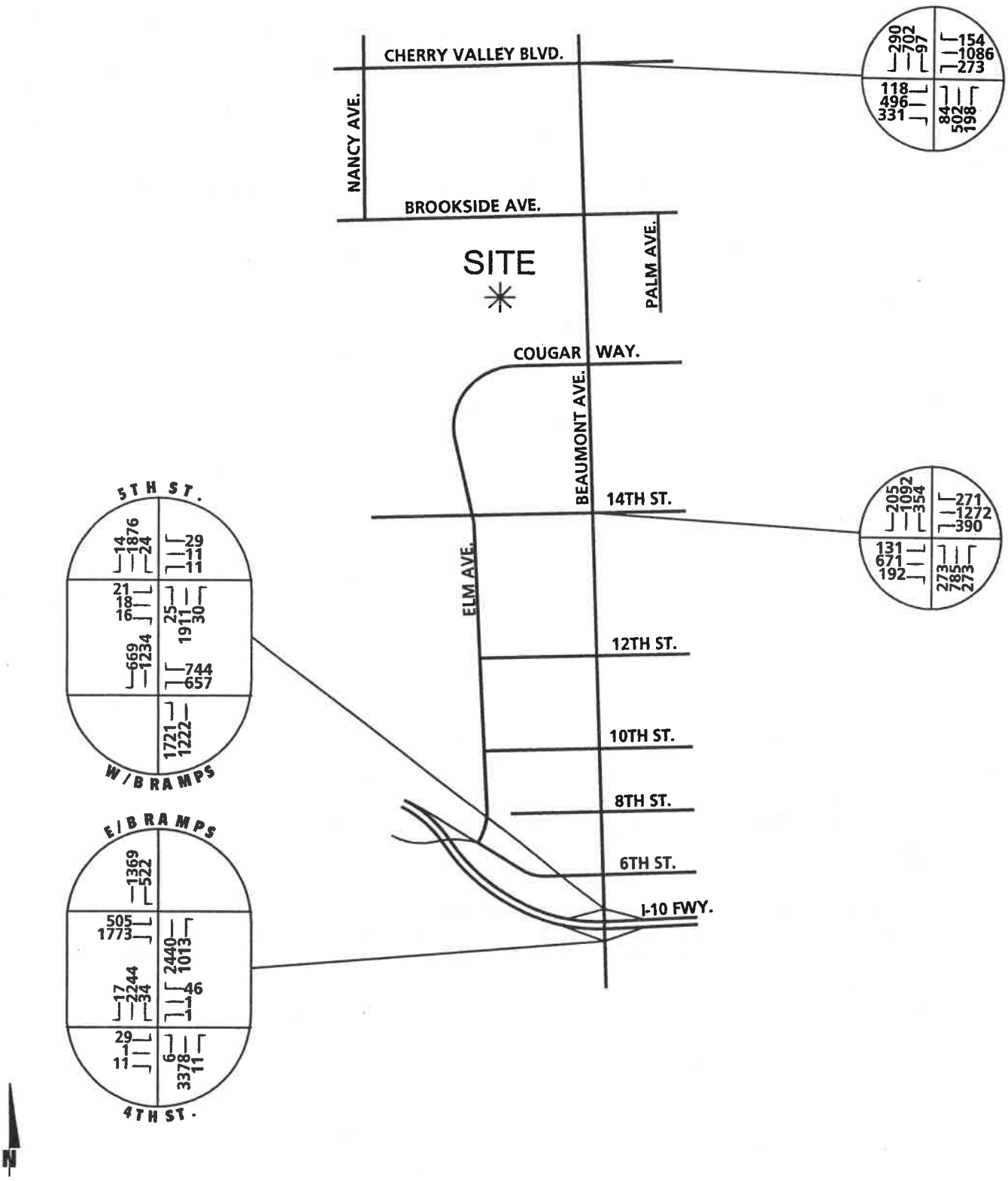


EXHIBIT 5-B

BUILDOUT WITHOUT PROJECT
PM PEAK HOUR INTERSECTION VOLUMES

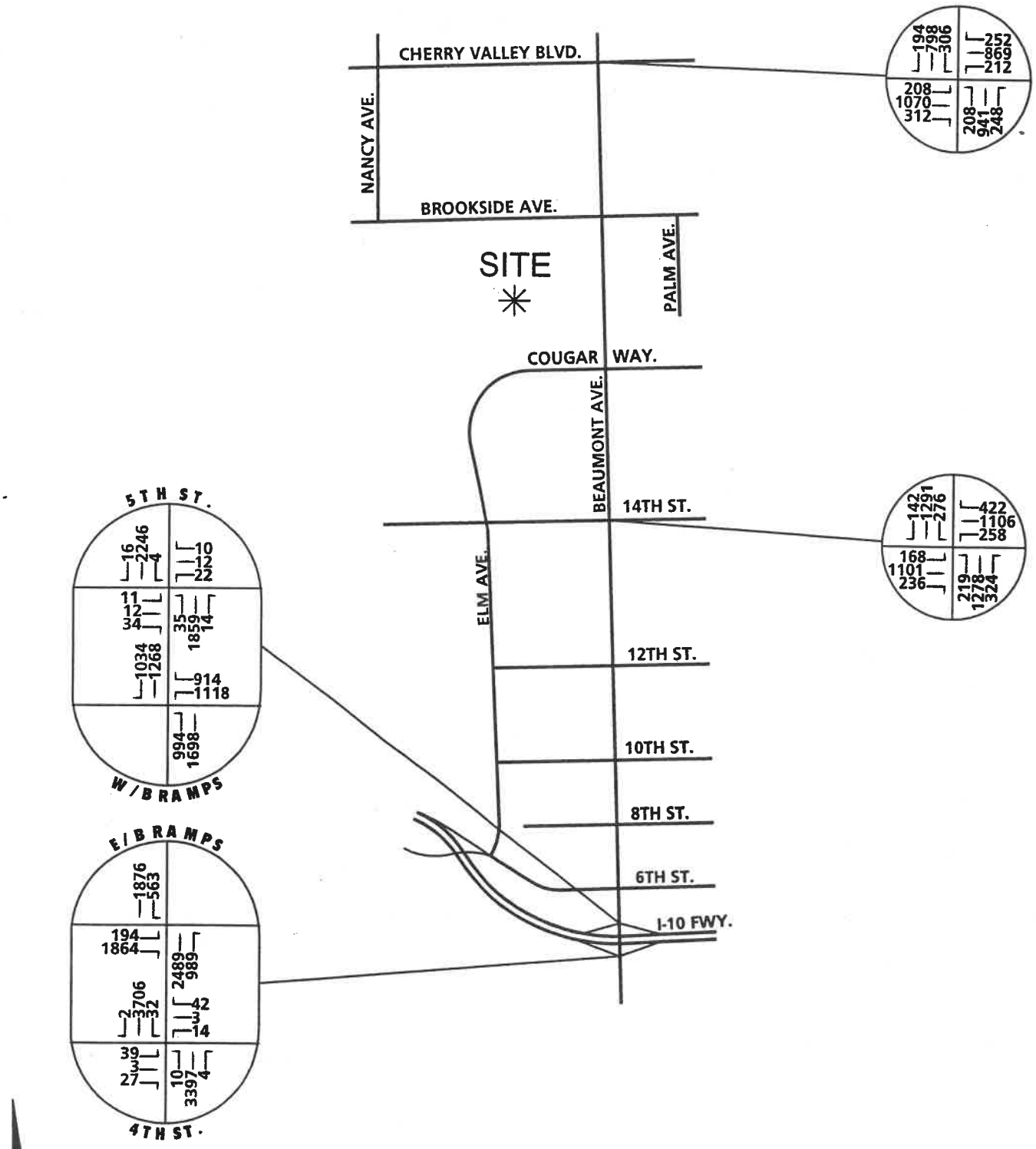


TABLE 5-3

INTERSECTION ANALYSIS FOR BUILDOUT WITH PROJECT WITHOUT IMPROVEMENTS

INTERSECTION	TRAFFIC CONTROL[3]	INTERSECTION APPROACH LANES[1]												DELAY[2] (SECS.)		LEVEL OF SERVICE	
		NORTH-BOUND			SOUTH-BOUND			EAST-BOUND			WEST-BOUND						
		L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
Beaumont Ave. (NS) at:																	
• Cherry-Valley Blvd. (EW)	TS	1	1	0	1	1	1	1	1	0	1	1	0	--[4]	--	F	F
• 14th St. (EW)	TS	1	2	0	1	2	0	1	2	0	1	1	1	--	--	F	F
• 1-10 Fwy. WB Ramps - 5th St. (EW)	TS	1	2	0	1	2	0	0	1	0	1	0	1	--	--	F	F
• 1-10 Fwy. EB Ramps - 4th St. (EW)	TS	1	2	0	1	2	0	0	1	1	0	1	0	--	--	F	F

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.
L = Left; T = Through; R = Right

[2] Delay and level of service calculated using the following analysis software: Traffix, Version 7.1.0607 (1999). Per the 1997 Highway Capacity Manaul, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal

[4] -- = Delay High, Intersection Unstable, Level of Service "F".

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TABLE 5-4

INTERSECTION ANALYSIS FOR BUILDOUT WITH PROJECT WITH IMPROVEMENTS

INTERSECTION	TRAFFIC CONTROL[3]	INTERSECTION APPROACH LANES[1]												DELAY[2] (SECS.)		LEVEL OF SERVICE	
		NORTH-BOUND			SOUTH-BOUND			EAST-BOUND			WEST-BOUND						
		L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
Beaumont Ave. (NS) at:																	
• Cherry Valley Blvd. (EW)	TS	1	2	0	2	2	1	1	2	1	1	2	0	44.0	54.2	D	D
• 14th St. (EW)	TS	2	2	1	2	2	1	1	2	1	2	2	1	45.0	50.8	D	D
• I-10 Fwy. WB Ramps - 5th St. (EW)	TS	0	2	1>>	0	2	1	0	0	0	1	1	1	16.4	34.1	B	C
• I-10 Fwy. EB Ramps - 4th St. (EW)	TS	0	3	1	2	2	0	2	0	1>>	0	0	0	24.1	13.5	C	B

---

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.
L = Left; T = Through; R = Right; >> = Free Right Turn; 2 = Lane Improvement

[2] Delay and level of service calculated using the following analysis software: Traffix, Version 7.1.0607 (1999). Per the 1997 Highway Capacity Manaul, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[3] TS = Traffic Signal

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EXHIBIT 5-C

BUILDOUT WITH PROJECT AM PEAK HOUR INTERSECTION VOLUMES

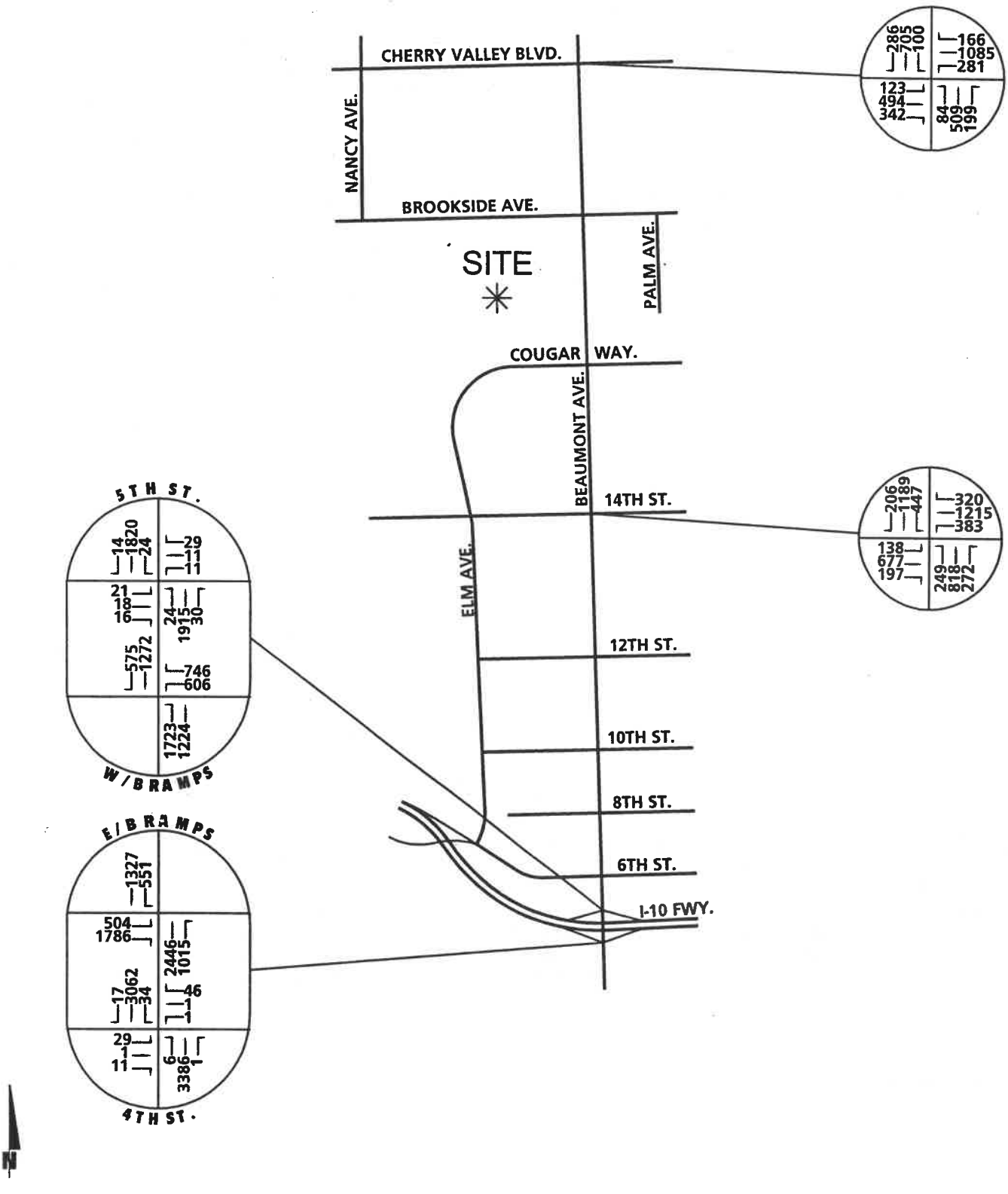
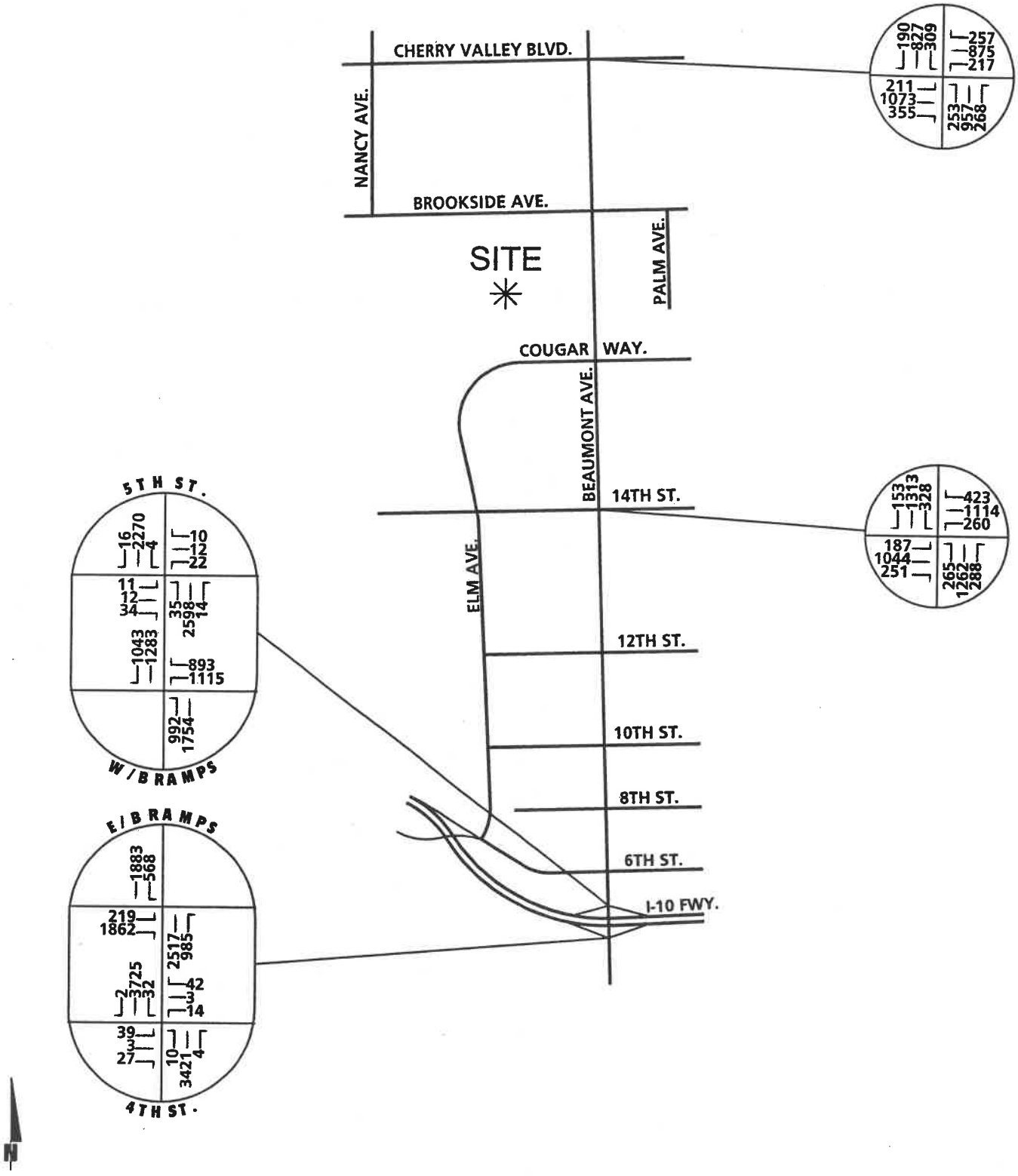


EXHIBIT 5-D

BUILDOUT WITH PROJECT PM PEAK HOUR INTERSECTION VOLUMES



3. Level of Service at Buildout With Additional Improvements

For Buildout traffic conditions with the project, study area intersections are projected to operate at Level of Service "D" or better during the peak hours with the following off-site improvements:

Beaumont Avenue (NS) at:

- Cherry Valley Boulevard (EW)
  - Construct a second through lane for all approaches
  - Provide an additional southbound left turn lane
  - Provide an eastbound right turn lane
- 14th Street (EW)
  - Construct a second through westbound through lane
  - Provide a second left turn lane for the northbound, southbound and westbound approaches
  - Provide a right turn lane for the northbound, southbound, and eastbound approaches
- I-10 Freeway WB Ramps (EW)
  - Restrict 5th Street access to/from Beaumont Avenue
  - Construct a loop ramp in the northeast quadrant to provide westbound access onto the I-10 Freeway. This improvement will eliminate the northbound left turn lane at this location
  - Provide a southbound right turn lane
  - Provide a shared westbound lane for left and right turns

- I-10 Freeway EB Ramps (EW)
  - Restrict 4th Street access to/from Beaumont Avenue at this location
  - Construct an additional northbound through and right lane
  - Construct a second southbound and eastbound left turn lane
  - Provide an eastbound free right turn lane

It should also be noted that I-10 Freeway/Beaumont Avenue interchange improvements were previously recommended in the original traffic study prepared for Noble Creek. Access to the frontage roads at 4th Street and 5th Street should be restricted to accommodate improvements at the Beaumont Avenue/I-10 Ramps.

4. Fair Share Contribution

The project's fair share contribution to the study area are presented in Table 5-5. The PM peak hour (typically the period when the traffic volumes are the greatest) has been used for the calculations. As indicated in Table 5-5, the project traffic contributes approximately two percent of the cumulative traffic growth at the Beaumont Avenue/I-10 interchange.

TABLE 5-5

PROJECT FAIR SHARE CALCULATIONS

INTERSECTION	EXISTING TRAFFIC[1]	BUILDOUT WITH PROJECT TRAFFIC	PROJECT TRAFFIC	GROWTH	PROJECT FAIR SHARE PERCENTAGE
Beaumont Ave. (NS) at:					
• Cherry Valley Blvd. (EW)	836	5792	265	4956	5.35%
• 14th St. (EW)	1052	6888	320	5836	5.48%
• 1-10 Fwy. WB Ramps - 5th St. (EW)	2181	7080	99	4899	2.02%
• 1-10 Fwy. EB Ramps - 4th St. (EW)	3117	8034	69	4917	1.40%

[1] The PM peak hour has been used for determining the project fair share contributions.

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6.0 SUMMARY

A. Traffic Impacts

The proposed site is projected to generate a total of approximately 10,395 trip-ends per day with 1,091 vehicles per hour during the AM peak hour and 1,102 vehicles per hour during the PM peak hour.

B. Need for Improvements Off-Site to Achieve Required Level of Service

For Buildout traffic conditions with the project, study area intersections are projected to operate at Level of Service "D" or better during the peak hours with the following off-site improvements:

Beaumont Avenue (NS) at:

- Cherry Valley Boulevard (EW)
  - Construct a second through lane for all approaches
  - Provide an additional southbound left turn lane
  - Provide an eastbound right turn lane
- 14th Street (EW)
  - Construct a second through westbound through lane
  - Provide a second left turn lane for the northbound, southbound and westbound approaches
  - Provide a right turn lane for the northbound, southbound, and eastbound approaches

- I-10 Freeway WB Ramps (EW)
  - Restrict 5th Street access to/from Beaumont Avenue
  - Construct a loop ramp in the northeast quadrant to provide westbound access onto the I-10 Freeway. This improvement will eliminate the northbound left turn lane at this location
  - Provide a southbound right turn lane
  - Provide a shared westbound lane for left and right turns

- I-10 Freeway EB Ramps (EW)
  - Restrict 4th Street access to/from Beaumont Avenue at this location
  - Construct additional northbound through and right turn lanes
  - Construct a second southbound left turn lanes and a second eastbound left turn lane
  - Provide an eastbound free right turn lane

C. Roadway Improvements

1. On-Site

Construct Beaumont Avenue south of Brookside Avenue to the south project boundary at its ultimate half-section width as a Major highway in conjunction with development.

Construct Brookside Avenue from the west project boundary to Beaumont Avenue at its ultimate half-section width as a Secondary highway.

Construct Cougar Way from Beaumont Avenue to 14th Street at its ultimate cross-section width as a Collector in conjunction with development.

Construct 14th Street from Cougar Way to the east project boundary at its ultimate half-section width as an Arterial highway in conjunction with development.

Site-specific circulation recommendations are depicted on Exhibit 6-A. Precise access locations shall be determined at the plot plan or tentative tract map level, subject to approval by the City of Beaumont.

Sight distance at each project entrance should be reviewed with respect to standard Caltrans/City of Beaumont sight distance standards at the time of preparation of final grading, landscape and street improvement plans.

2. Off-Site

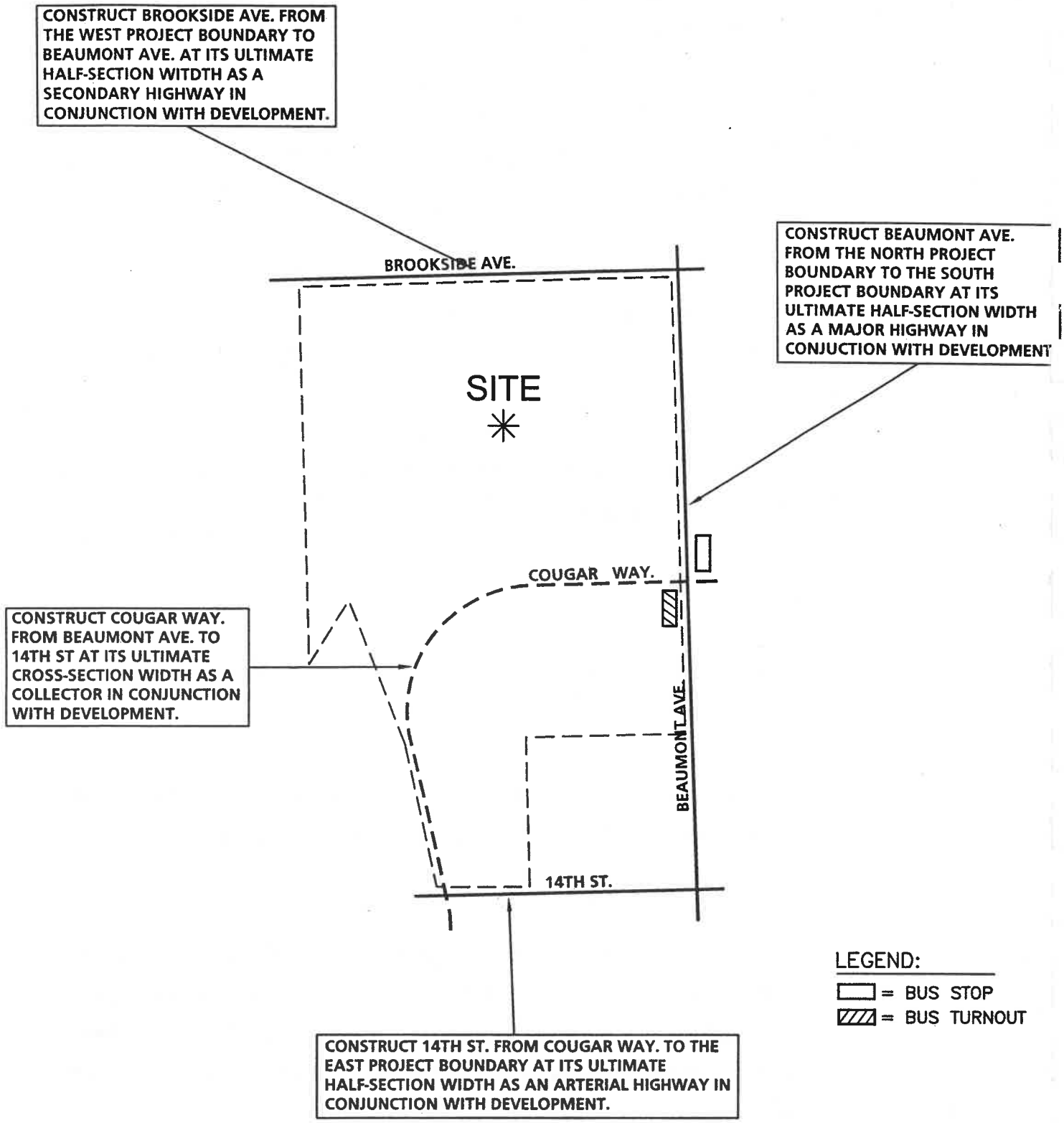
Participate in the phased construction of traffic signals through payment of established fees.

The project should contribute towards a citywide roadway improvement program, as a result of infrastructure development fees for the City of Beaumont.

The City of Beaumont should upgrade the classification of Beaumont Avenue from Cherry Valley Boulevard to 6th Street as a Major highway. This roadway is currently classified as a Secondary highway. These classification changes are required with or without the Noble Creek Specific Plan project.

EXHIBIT 6-A

CIRCULATION RECOMMENDATIONS



As future transit service expands in this area, bus stops should be provided at the far side of intersections. At the Cougar Way/Beaumont Avenue intersection, a bus turnout is recommended (see Exhibit 6-A).

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APPENDIX A

TRAFFIC COUNT WORKSHEETS

SOUTHLAND CAR COUNTERS
VEHICLE AND MANUAL COUNTS

N-S STREET: BEAUMONT DATE: 3/8/2001 CITY: BEAUMONT

E-W STREET: CHERRY VALLEY DAY: THURSDAY

PROJECT# 0279001A

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	0	1	1	0	1	1	0	
6:00 AM													
15 AM													
30 AM													
45 AM													
7:00 AM	18	18	0	4	42	30	1	2	11	1	28	1	156
15 AM	16	20	0	1	49	18	7	2	13	6	13	0	145
30 AM	14	31	0	2	61	27	8	7	9	0	8	0	167
45 AM	29	45	3	4	61	14	1	3	10	0	8	0	178
8:00 AM	22	43	3	4	55	19	10	3	6	1	10	3	179
15 AM	12	43	3	3	54	13	7	3	8	2	5	3	156
30 AM	11	35	1	1	36	17	6	4	12	1	11	4	139
45 AM	13	41	2	2	36	6	6	6	12	3	9	5	141
9:00 AM													
15 AM													
30 AM													
45 AM													
10:00 AM													
15 AM													
30 AM													
45 AM													
TOTAL VOLUMES =	135	276	12	21	394	144	46	30	81	14	92	16	1261

AM Peak Hr Begins at 730 AM

PEAK VOLUMES =	77	162	9	13	231	73	26	16	33	3	31	6	680

ADDITIONS: SIGNALIZED

SOUTHLAND CAR COUNTERS
VEHICLE AND MANUAL COUNTS

N-S STREET: BEAUMONT DATE: 3/8/2001 CITY: BEAUMONT

E-W STREET: CHERRY VALLEY DAY: THURSDAY

PROJECT# 0279001P

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	0	1	1	0	1	1	0	
2:00 PM													
15 PM													
30 PM													
45 PM													
3:00 PM													
15 PM													
30 PM													
45 PM													
4:00 PM	24	65	6	7	35	9	11	10	11	4	18	4	204
15 PM	8	40	3	2	46	11	18	19	23	3	6	4	183
30 PM	19	53	5	6	48	11	14	12	18	1	14	2	203
45 PM	16	60	3	6	43	9	22	15	20	4	4	2	204
5:00 PM	16	57	7	1	59	16	19	23	12	2	7	1	220
15 PM	16	76	4	4	37	8	18	22	13	3	5	3	209
30 PM	14	47	6	1	36	12	14	18	16	3	8	1	176
45 PM	15	48	7	2	36	10	21	12	16	1	5	1	174
6:00 PM													
15 PM													
30 PM													
45 PM													
TOTAL VOLUMES =	128	446	41	29	340	86	137	131	129	21	67	18	1573

PM Peak Hr Begins at 430 PM

PEAK VOLUMES =	67	246	19	17	187	44	73	72	63	10	30	8	836

ADDITIONS: SIGNALIZED

SOUTHLAND CAR COUNTERS
VEHICLE AND MANUAL COUNTS

N-S STREET: BEAUMONT DATE: 3/8/2001 CITY: BEAUMONT

E-W STREET: 14TH ST DAY: THURSDAY

PROJECT# 0279002A

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	0	1	2	0	1	2	0	
6:00 AM													
15 AM													
30 AM													
45 AM													
7:00 AM	7	25	11	3	38	18	7	9	2	9	27	2	158
15 AM	10	40	13	5	38	25	13	9	6	17	38	7	221
30 AM	5	68	19	5	62	17	17	16	2	45	30	16	302
45 AM	7	61	13	6	47	18	29	10	2	41	30	12	276
8:00 AM	1	42	10	3	68	4	13	7	3	15	14	11	191
15 AM	6	33	8	4	70	14	10	5	2	6	6	13	177
30 AM	9	40	5	6	56	4	5	1	5	8	13	9	161
45 AM	3	48	6	4	73	6	10	3	3	11	9	10	186
9:00 AM													
15 AM													
30 AM													
45 AM													
10:00 AM													
15 AM													
30 AM													
45 AM													
TOTAL VOLUMES =	48	357	85	36	452	106	104	60	25	152	167	80	1672

AM Peak Hr Begins at 715 AM

PEAK VOLUMES =	23	211	55	19	215	64	72	42	13	118	112	46	990

ADDITIONS: SIGNALIZED

SOUTHLAND CAR COUNTERS
VEHICLE AND MANUAL COUNTS

N-S STREET: BEAUMONT DATE: 3/8/2001 CITY: BEAUMONT

E-W STREET: 14TH ST DAY: THURSDAY

PROJECT# 0279002P

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	0	1	2	0	1	2	0	
2:00 PM													
15 PM													
30 PM													
45 PM													
3:00 PM													
15 PM													
30 PM													
45 PM													
4:00 PM	16	76	19	7	46	12	1	18	12	13	21	12	253
15 PM	18	78	8	11	63	14	2	20	10	4	17	11	256
30 PM	6	57	7	8	58	17	11	25	12	7	22	8	238
45 PM	13	78	8	6	66	12	10	22	17	10	9	11	262
5:00 PM	14	85	14	6	57	13	26	16	10	14	20	4	279
15 PM	14	61	13	5	56	14	20	22	18	6	8	10	247
30 PM	5	79	13	4	47	12	18	32	15	14	17	8	264
45 PM	13	65	13	4	60	7	10	30	20	6	16	10	254
6:00 PM													
15 PM													
30 PM													
45 PM													
TOTAL VOLUMES =	99	579	95	51	453	101	98	185	114	74	130	74	2053

PM Peak Hr Begins at 445 PM

PEAK VOLUMES =	46	303	48	21	226	51	74	92	60	44	54	33	1052

ADDITIONS: SIGNALIZED

SOUTHLAND CAR COUNTERS
VEHICLE AND MANUAL COUNTS

N-S STREET: BEAUMONT DATE: 3/20/2001 CITY: BEAUMONT

E-W STREET: 5TH ST DAY: TUESDAY

PROJECT# 0331002A

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 0	NT 2	NR 0	SL 1	ST 2	SR 0	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL
6:00 AM													
15 AM													
30 AM													
45 AM													
7:00 AM	5	49	8	4	93	2	4	8	4	2	1	6	186
15 AM	6	59	10	2	88	3	5	7	6	3	2	8	199
30 AM	7	60	9	6	105	5	3	6	3	2	3	10	219
45 AM	5	66	8	6	95	4	6	5	6	4	2	6	213
8:00 AM	6	70	7	7	95	2	5	4	4	2	2	7	211
15 AM	7	73	6	5	100	3	7	3	3	3	4	6	220
30 AM	5	59	8	3	94	2	5	2	2	1	2	9	192
45 AM	6	65	11	5	93	1	6	1	2	2	3	8	203
9:00 AM													
15 AM													
30 AM													
45 AM													
10:00 AM													
15 AM													
30 AM													
45 AM													
TOTAL VOLUMES =	NL 47	NT 501	NR 67	SL 38	ST 763	SR 22	EL 41	ET 36	ER 30	WL 19	WT 19	WR 60	TOTAL 1643

AM Peak Hr Begins at 730 AM

PEAK VOLUMES =	25	269	30	24	395	14	21	18	16	11	11	29	863

ADDITIONS: SIGNALIZED

SOUTHLAND CAR COUNTERS
VEHICLE AND MANUAL COUNTS

N-S STREET: BEAUMONT DATE: 3/20/2001 CITY: BEAUMONT

E-W STREET: 5TH ST DAY: TUESDAY PROJECT# 0331002P

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	2	0	1	2	0	0	1	0	0	1	0	
2:00 PM													
15 PM													
30 PM													
45 PM													
3:00 PM													
15 PM													
30 PM													
45 PM													253
4:00 PM	11	118	5	2	90	3	3	2	10	5	1	3	206
15 PM	9	112	3	0	62	2	2	1	8	6	0	1	246
30 PM	7	132	4	1	74	4	2	2	7	8	3	2	232
45 PM	12	109	5	2	70	5	3	3	11	6	2	4	249
5:00 PM	9	117	2	1	90	3	4	4	10	3	3	3	223
15 PM	7	112	3	0	76	4	2	3	6	5	4	1	219
30 PM	10	112	2	2	67	5	2	2	5	6	3	3	189
45 PM	8	106	1	1	52	3	2	1	7	5	1	2	
6:00 PM													
15 PM													
30 PM													
45 PM													
TOTAL VOLUMES =	NL 73	NT 918	NR 25	SL 9	ST 581	SR 29	EL 20	ET 18	ER 64	WL 44	WT 17	WR 19	TOTAL 1817

PM Peak Hr Begins at 430 PM

PEAK VOLUMES =	35	470	14	4	310	16	11	12	34	22	12	10	950

ADDITIONS: SIGNALIZED

SOUTHLAND CAR COUNTERS
VEHICLE AND MANUAL COUNTS

N-S STREET: BEAUMONT DATE: 3/8/2001 CITY: BEAUMONT

E-W STREET: I-10 WB RAMPS DAY: THURSDAY

PROJECT# 0279003A

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2			2	0				0	1	0	
6:00 AM													
15 AM													
30 AM													
45 AM													
7:00 AM	122	28			60	20				38	0	17	285
15 AM	121	34			59	14				64	0	25	317
30 AM	126	30			72	19				69	0	23	339
45 AM	70	37			69	14				61	0	34	285
8:00 AM	102	35			67	13				56	0	44	317
15 AM	86	36			78	21				53	0	35	309
30 AM	85	37			66	21				69	0	25	303
45 AM	82	46			62	20				70	0	35	315
9:00 AM													
15 AM													
30 AM													
45 AM													
10:00 AM													
15 AM													
30 AM													
45 AM													

TOTAL VOLUMES =	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	794	283	0	0	533	142	0	0	0	480	0	238	2470

AM Peak Hr Begins at 715 AM

PEAK VOLUMES =	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	419	136	0	0	267	60	0	0	0	250	0	126	1258

ADDITIONS:SIGNALIZED

SOUTHLAND CAR COUNTERS
VEHICLE AND MANUAL COUNTS

N-S STREET: BEAUMONT DATE: 3/8/2001 CITY: BEAUMONT

E-W STREET: I-10 WB RAMPS DAY: THURSDAY PROJECT# 0279003P

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2			2	0				0	1	0	
2:00 PM													
15 PM													
30 PM													
45 PM													
3:00 PM													
15 PM													
30 PM													
45 PM													
4:00 PM	86	59			74	29				214	0	47	509
15 PM	75	61			60	14				183	0	46	439
30 PM	67	66			57	18				171	0	53	432
45 PM	77	53			62	20				187	0	51	450
5:00 PM	56	49			79	22				182	0	55	443
15 PM	67	51			61	23				245	1	57	505
30 PM	76	63			55	28				199	0	42	463
45 PM	57	56			38	28				194	0	50	423
6:00 PM													
15 PM													
30 PM													
45 PM													
TOTAL VOLUMES =	561	458	0	0	486	182	0	0	0	1575	1	401	3664

PM Peak Hr Begins at 445 PM

PEAK VOLUMES =	276	216	0	0	257	93	0	0	0	813	1	205	1861

ADDITIONS: SIGNALIZED

SOUTHLAND CAR COUNTERS
VEHICLE AND MANUAL COUNTS

N-S STREET: BEAUMONT DATE: 3/8/2001 CITY: BEAUMONT

E-W STREET: I-10 EB RAMPS DAY: THURSDAY

PROJECT# 0279004A

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:		2	1	1	2		1	0	1				
6:00 AM													
15 AM													
30 AM													
45 AM													
7:00 AM		143	108	29	82		18	3	46				429
15 AM		131	151	28	121		21	3	91				546
30 AM		167	211	34	129		15	3	109				668
45 AM		71	110	34	79		18	2	82				396
8:00 AM		109	134	36	100		25	0	83				487
15 AM		108	122	29	103		18	0	58				438
30 AM		113	98	50	88		22	0	58				429
45 AM		126	71	53	82		25	0	40				397
9:00 AM													
15 AM													
30 AM													
45 AM													
10:00 AM													
15 AM													
30 AM													
45 AM													
TOTAL VOLUMES =	0	968	1005	293	784	0	162	11	567	0	0	0	3790

AM Peak Hr Begins at 715 AM

PEAK VOLUMES =	0	478	606	132	429	0	79	8	365	0	0	0	2097

ADDITIONS: SIGNALIZED

SOUTHLAND CAR COUNTERS
VEHICLE AND MANUAL COUNTS

N-S STREET: BEAUMONT DATE: 3/8/2001 CITY: BEAUMONT

E-W STREET: I-10 EB RAMPS DAY: THURSDAY

PROJECT# 0279004P

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:		2	1	1	2		1	0	1				
2:00 PM													
15 PM													
30 PM													
45 PM													
3:00 PM													
15 PM													
30 PM													
45 PM													
4:00 PM		113	107	42	155		19	0	109				545
15 PM		121	112	30	232		34	0	128				657
30 PM		116	103	32	200		25	1	153				630
45 PM		94	121	41	243		23	3	114				639
5:00 PM		73	83	47	245		19	2	143				612
15 PM		108	113	33	282		25	1	156				718
30 PM		97	76	42	195		19	1	153				583
45 PM		106	88	16	220		20	1	156				607
6:00 PM													
15 PM													
30 PM													
45 PM													
TOTAL VOLUMES =	0	828	803	283	1772	0	184	9	1112	0	0	0	4991

PM Peak Hr Begins at 430 PM

PEAK VOLUMES =	0	391	420	153	970	0	92	7	566	0	0	0	2599

ADDITIONS: SIGNALIZED

SOUTHLAND CAR COUNTERS
VEHICLE AND MANUAL COUNTS

N-S STREET: BEAUMONT DATE: 3/20/2001 CITY: BEAUMONT

E-W STREET: 4TH ST DAY: TUESDAY

PROJECT# 0331001A

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	0	0	1	0	0	1	0	
6:00 AM													
15 AM													
30 AM													
45 AM													
7:00 AM	0	226	2	9	140	6	5	0	2	0	0	12	402
15 AM	1	255	4	10	170	4	7	1	3	0	1	11	467
30 AM	2	275	3	8	175	3	8	0	2	1	0	10	487
45 AM	3	236	2	7	160	4	9	0	4	0	0	13	438
8:00 AM	0	183	1	9	150	5	10	0	5	0	0	12	375
15 AM	2	190	2	8	155	2	11	2	6	1	0	11	390
30 AM	1	191	3	7	140	4	12	1	3	2	0	10	374
45 AM	2	175	2	4	131	3	12	0	6	0	1	9	345
9:00 AM													
15 AM													
30 AM													
45 AM													
10:00 AM													
15 AM													
30 AM													
45 AM													
TOTAL VOLUMES =	11	1731	19	62	1221	31	74	4	31	4	2	88	3278

AM Peak Hr Begins at 700 AM

PEAK VOLUMES =	6	992	11	34	645	17	29	1	11	1	1	46	1794

ADDITIONS: SIGNALIZED

SOUTHLAND CAR COUNTERS
VEHICLE AND MANUAL COUNTS

N-S STREET: BEAUMONT DATE: 3/20/2001 CITY: BEAUMONT

E-W STREET: 4TH ST DAY: TUESDAY

PROJECT# 0331001P

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	0	0	1	0	0	1	0	
2:00 PM													
15 PM													
30 PM													
45 PM													
3:00 PM													
15 PM													
30 PM													
45 PM													
4:00 PM	2	178	0	7	341	1	7	0	0	3	0	11	550
15 PM	3	176	2	7	335	0	8	0	5	3	0	13	552
30 PM	2	193	1	8	360	0	9	1	6	2	1	12	595
45 PM	1	195	2	6	331	1	10	0	7	3	1	11	568
5:00 PM	4	178	0	8	344	0	11	0	8	5	0	10	568
15 PM	3	174	1	10	360	1	9	2	6	4	1	9	580
30 PM	2	184	0	9	334	2	9	1	6	3	0	8	558
45 PM	1	158	2	8	341	0	8	0	7	2	0	7	534
6:00 PM													
15 PM													
30 PM													
45 PM													
TOTAL VOLUMES =	NL 18	NT 1436	NR 8	SL 63	ST 2746	SR 5	EL 71	ET 4	ER 45	WL 25	WT 3	WR 81	TOTAL 4505

PM Peak Hr Begins at 430 PM

PEAK VOLUMES =	10	740	4	32	1395	2	39	3	27	14	3	42	2311

ADDITIONS:SIGNALIZED

APPENDIX B

CALCULATION OF INTERSECTION LEVEL OF SERVICE
- EXISTING

Noble Creek Specific Plan
Existing
AM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

Intersection #1 Beaumont Ave. (NS) / Cherry Valley Blvd. (EW)

Cycle (sec): 62 Critical Vol./Cap. (X): 0.273
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 20.8
Optimal Cycle: 62 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	10	15	15	10	15	15	10	15	15	10	15	15
Lanes:	1 0	0 1	0	1 0	1 0	1	1 0	0 1	0	1 0	0 1	0
Volume Module:												
Base Vol:	77	162	9	13	231	73	73	26	16	3	31	6
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	77	162	9	13	231	73	73	26	16	3	31	6
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	77	162	9	13	231	73	73	26	16	3	31	6
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	77	162	9	13	231	73	73	26	16	3	31	6
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	77	162	9	13	231	73	73	26	16	3	31	6
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	0.95	0.05	1.00	1.00	1.00	1.00	0.62	0.38	1.00	0.84	0.16
Final Sat.:	1900	1800	100	1900	1900	1900	1900	1176	724	1900	1592	308
Capacity Analysis Module:												
Vol/Sat:	0.04	0.09	0.09	0.01	0.12	0.04	0.04	0.02	0.02	0.00	0.02	0.02
Crit Moves:	****				****		****				****	
Green/Cycle:	0.16	0.24	0.24	0.16	0.24	0.24	0.16	0.24	0.24	0.16	0.24	0.24
Volume/Cap:	0.25	0.37	0.37	0.04	0.50	0.16	0.24	0.09	0.09	0.01	0.08	0.08
Delay/Veh:	23.2	20.1	20.1	22.0	21.2	18.7	23.1	18.3	18.3	21.9	18.2	18.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	23.2	20.1	20.1	22.0	21.2	18.7	23.1	18.3	18.3	21.9	18.2	18.2
DesignQueue:	2	4	0	0	6	2	2	1	0	0	1	0

Noble Creek Specific Plan
Existing
AM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

Intersection #2 Beaumont Ave. (NS) / 14th St. (EW)

Cycle (sec): 60 Critical Vol./Cap. (X): 0.175
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 14.7
Optimal Cycle: 60 Level Of Service: B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	10	15	15	10	15	15	20	20	20	20	20	20
Lanes:	1 0	1 1	0	1 0	1 1	0	1 0	1 1	0	1 0	1 0	1
Volume Module:												
Base Vol:	23	211	55	19	215	64	72	42	13	118	112	46
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	23	211	55	19	215	64	72	42	13	118	112	46
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	23	211	55	19	215	64	72	42	13	118	112	46
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	23	211	55	19	215	64	72	42	13	118	112	46
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	23	211	55	19	215	64	72	42	13	118	112	46
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00
Lanes:	1.00	1.59	0.41	1.00	1.54	0.46	1.00	1.53	0.47	1.00	1.00	1.00
Final Sat.:	1900	2864	746	1900	2782	828	1900	2757	853	1900	1900	1900
Capacity Analysis Module:												
Vol/Sat:	0.01	0.07	0.07	0.01	0.08	0.08	0.04	0.02	0.02	0.06	0.06	0.02
Crit Moves:	****				****						****	
Green/Cycle:	0.17	0.31	0.31	0.21	0.35	0.35	0.33	0.33	0.33	0.33	0.33	0.33
Volume/Cap:	0.07	0.24	0.24	0.05	0.22	0.22	0.11	0.05	0.05	0.19	0.18	0.07
Delay/Veh:	21.2	15.5	15.5	19.1	13.8	13.8	13.9	13.6	13.6	14.4	14.3	13.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	21.2	15.5	15.5	19.1	13.8	13.8	13.9	13.6	13.6	14.4	14.3	13.7
DesignQueue:	1	5	1	1	5	1	2	1	0	3	3	1

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Noble Creek Specific Plan
Existing
AM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

****

Intersection #3 Beaumont Ave. (NS) / I-10 Fwy. WB Ramps (EW)

****

Cycle (sec): 85 Critical Vol./Cap. (X): 0.624
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 54.0
Optimal Cycle: 85 Level Of Service: D

****

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	10	15	15	10	15	15	20	20	20	20	20	20
Lanes:	1 0	1	1 0	1 0	1	1 0	0 0	1!	0 0	0 1	0	0 1
Volume Module:												
Base Vol:	444	136	30	24	395	74	21	18	16	261	11	155
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	444	136	30	24	395	74	21	18	16	261	11	155
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	444	136	30	24	395	74	21	18	16	261	11	155
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	444	136	30	24	395	74	21	18	16	261	11	155
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	444	136	30	24	395	74	21	18	16	261	11	155
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.64	0.36	1.00	1.68	0.32	0.38	0.33	0.29	0.96	0.04	1.00
Final Sat.:	1900	2958	652	1900	3040	570	725	622	553	1823	77	1900
Capacity Analysis Module:												
Vol/Sat:	0.23	0.05	0.05	0.01	0.13	0.13	0.03	0.03	0.03	0.14	0.14	0.08
Crit Moves:	****				****		****			****		
Green/Cycle:	0.21	0.23	0.23	0.16	0.18	0.18	0.24	0.24	0.24	0.24	0.24	0.24
Volume/Cap:	1.10	0.20	0.20	0.08	0.74	0.74	0.12	0.12	0.12	0.61	0.61	0.35
Delay/Veh:	109.4	26.3	26.3	30.8	37.6	37.6	25.7	25.7	25.7	31.4	31.4	27.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	109.4	26.3	26.3	30.8	37.6	37.6	25.7	25.7	25.7	31.4	31.4	27.5
DesignQueue:	18	5	1	1	16	3	1	1	1	10	0	6

****

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Noble Creek Specific Plan
Existing
AM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

Intersection #4 Beaumont Ave. (NS) / I-10 Fwy. EB Ramps (EW)

Cycle (sec): 120 Critical Vol./Cap. (X): 0.840
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 52.5
Optimal Cycle: 120 Level Of Service: D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	10	15	15	10	15	15	20	20	20	20	20	20
Lanes:	1 0	1	1 0	1 0	1	1 0	0 1	0	0 1	0 0	1! 0	0
Volume Module:												
Base Vol:	6	992	617	166	794	17	108	1	376	1	1	46
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	6	992	617	166	794	17	108	1	376	1	1	46
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	6	992	617	166	794	17	108	1	376	1	1	46
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	6	992	617	166	794	17	108	1	376	1	1	46
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	6	992	617	166	794	17	108	1	376	1	1	46
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.23	0.77	1.00	1.96	0.04	0.99	0.01	1.00	0.02	0.02	0.96
Final Sat.:	1900	2226	1384	1900	3534	76	1883	17	1900	40	40	1821
Capacity Analysis Module:												
Vol/Sat:	0.00	0.45	0.45	0.09	0.22	0.22	0.06	0.06	0.20	0.03	0.03	0.03
Crit Moves:		****		****					****		****	
Green/Cycle:	0.45	0.45	0.45	0.09	0.53	0.53	0.20	0.20	0.20	0.17	0.17	0.17
Volume/Cap:	0.01	1.00	1.00	1.00	0.42	0.42	0.29	0.29	1.00	0.15	0.15	0.15
Delay/Veh:	18.4	54.7	54.7	123.5	16.9	16.9	41.3	41.3	93.5	43.0	43.0	43.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	18.4	54.7	54.7	123.5	16.9	16.9	41.3	41.3	93.5	43.0	43.0	43.0
DesignQueue:	0	41	26	10	26	1	6	0	21	0	0	3

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Noble Creek Specific Plan
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PM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

Intersection #1 Beaumont Ave. (NS) / Cherry Valley Blvd. (EW)

Cycle (sec): 0 Critical Vol./Cap. (X): 0.279
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 21.2
Optimal Cycle: 62 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	10	15	15	10	15	15	10	15	15	10	15	15
Lanes:	1 0	0 1	0	1 0	1 0	1	1 0	0 1	0	1 0	0 1	0
Volume Module:												
Base Vol:	67	246	19	17	187	44	73	72	63	10	30	8
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	67	246	19	17	187	44	73	72	63	10	30	8
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	67	246	19	17	187	44	73	72	63	10	30	8
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	67	246	19	17	187	44	73	72	63	10	30	8
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	67	246	19	17	187	44	73	72	63	10	30	8
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	0.93	0.07	1.00	1.00	1.00	1.00	0.53	0.47	1.00	0.79	0.21
Final Sat.:	1900	1764	136	1900	1900	1900	1900	1013	887	1900	1500	400
Capacity Analysis Module:												
Vol/Sat:	0.04	0.14	0.14	0.01	0.10	0.02	0.04	0.07	0.07	0.01	0.02	0.02
Crit Moves:		****		****				****		****		
Green/Cycle:	0.16	0.24	0.24	0.16	0.24	0.24	0.16	0.24	0.24	0.16	0.24	0.24
Volume/Cap:	0.22	0.58	0.58	0.06	0.41	0.10	0.24	0.29	0.29	0.03	0.08	0.08
Delay/Veh:	23.0	22.5	22.5	22.1	20.3	18.3	23.1	19.5	19.5	22.0	18.3	18.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	23.0	22.5	22.5	22.1	20.3	18.3	23.1	19.5	19.5	22.0	18.3	18.3
DesignQueue:	2	7	1	0	5	1	2	2	2	0	1	0

Noble Creek Specific Plan
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PM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

Intersection #2 Beaumont Ave. (NS) / 14th St. (EW)

Cycle (sec): 60 Critical Vol./Cap. (X): 0.177
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 14.8
Optimal Cycle: 60 Level Of Service: B

Approach:	North Bound						South Bound						East Bound						West Bound					
Movement:	L	-	T	-	R		L	-	T	-	R		L	-	T	-	R		L	-	T	-	R	
Control:	Protected						Protected						Permitted						Permitted					
Rights:	Include						Include						Include						Include					
Min. Green:	10		15		15		10		15		15		20		20		20		20		20		20	
Lanes:	1	0	1	1	0		1	0	1	1	0		1	0	1	1	0		1	0	1	0	1	
Volume Module:																								
Base Vol:	46		303		48		21		226		51		74		92		60		44		54		33	
Growth Adj:	1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00	
Initial Bse:	46		303		48		21		226		51		74		92		60		44		54		33	
User Adj:	1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00	
PHF Adj:	1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00	
PHF Volume:	46		303		48		21		226		51		74		92		60		44		54		33	
Reduct Vol:	0		0		0		0		0		0		0		0		0		0		0		0	
Reduced Vol:	46		303		48		21		226		51		74		92		60		44		54		33	
PCE Adj:	1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00	
MLF Adj:	1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00	
Final Vol.:	46		303		48		21		226		51		74		92		60		44		54		33	
Saturation Flow Module:																								
Sat/Lane:	1900		1900		1900		1900		1900		1900		1900		1900		1900		1900		1900		1900	
Adjustment:	1.00		0.95		0.95		1.00		0.95		0.95		1.00		0.95		0.95		1.00		1.00		1.00	
Lanes:	1.00		1.73		0.27		1.00		1.63		0.37		1.00		1.21		0.79		1.00		1.00		1.00	
Final Sat.:	1900		3116		494		1900		2945		665		1900		2185		1425		1900		1900		1900	
Capacity Analysis Module:																								
Vol/Sat:	0.02		0.10		0.10		0.01		0.08		0.08		0.04		0.04		0.04		0.02		0.03		0.02	
Crit Moves:			****				****								****									
Green/Cycle:	0.21		0.35		0.35		0.17		0.31		0.31		0.33		0.33		0.33		0.33		0.33		0.33	
Volume/Cap:	0.12		0.28		0.28		0.07		0.25		0.25		0.12		0.13		0.13		0.07		0.09		0.05	
Delay/Veh:	19.5		14.2		14.2		21.2		15.6		15.6		14.0		14.0		14.0		13.7		13.8		13.6	
User DelAdj:	1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00	
AdjDel/Veh:	19.5		14.2		14.2		21.2		15.6		15.6		14.0		14.0		14.0		13.7		13.8		13.6	
DesignQueue:	1		7		1		1		5		1		2		2		1		1		1		1	

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Noble Creek Specific Plan
Existing
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Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

****

Intersection #3 Beaumont Ave. (NS) / I-10 Fwy. WB Ramps (EW)

****

Cycle (sec): 120 Critical Vol./Cap. (X): 0.839
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 63.6
Optimal Cycle: 120 Level Of Service: E

****

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	10	15	15	10	15	15	20	20	20	20	20	20
Lanes:	1 0	1	1 0	1 0	1	1 0	0 0	1!	0 0	0 1	0	0 1
Volume Module:												
Base Vol:	311	216	14	4	310	109	11	12	34	835	12	313
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	311	216	14	4	310	109	11	12	34	835	12	313
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	311	216	14	4	310	109	11	12	34	835	12	313
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	311	216	14	4	310	109	11	12	34	835	12	313
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	311	216	14	4	310	109	11	12	34	835	12	313
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.88	0.12	1.00	1.48	0.52	0.19	0.21	0.60	0.99	0.01	1.00
Final Sat.:	1900	3390	220	1900	2671	939	367	400	1133	1873	27	1900
Capacity Analysis Module:												
Vol/Sat:	0.16	0.06	0.06	0.00	0.12	0.12	0.03	0.03	0.03	0.45	0.45	0.16
Crit Moves:	****				****		****				****	
Green/Cycle:	0.16	0.17	0.17	0.12	0.13	0.13	0.17	0.17	0.17	0.44	0.44	0.44
Volume/Cap:	1.00	0.37	0.37	0.02	0.93	0.93	0.18	0.18	0.18	1.00	1.00	0.37
Delay/Veh:	101.8	44.2	44.2	47.1	77.5	77.5	43.2	43.2	43.2	64.7	64.7	22.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	101.8	44.2	44.2	47.1	77.5	77.5	43.2	43.2	43.2	64.7	64.7	22.4
DesignQueue:	18	12	1	0	19	7	1	1	2	35	1	12

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Noble Creek Specific Plan
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Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

Intersection #4 Beaumont Ave. (NS) / I-10 Fwy. EB Ramps (EW)

Cycle (sec): 120 Critical Vol./Cap. (X): 0.848
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 57.8
Optimal Cycle: 120 Level Of Service: E

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	10	15	15	10	15	15	20	20	20	20	20	20
Lanes:	1 0	1 1	0	1 0	1 1	0	0 1	0 0	1	0 0	1! 0	0
Volume Module:												
Base Vol:	10	740	424	185	970	2	131	3	593	14	3	42
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	10	740	424	185	970	2	131	3	593	14	3	42
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	10	740	424	185	970	2	131	3	593	14	3	42
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	10	740	424	185	970	2	131	3	593	14	3	42
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	10	740	424	185	970	2	131	3	593	14	3	42
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.27	0.73	1.00	1.99	0.01	0.98	0.02	1.00	0.24	0.05	0.71
Final Sat.:	1900	2295	1315	1900	3603	7	1857	43	1900	451	97	1353
Capacity Analysis Module:												
Vol/Sat:	0.01	0.32	0.32	0.10	0.27	0.27	0.07	0.07	0.31	0.03	0.03	0.03
Crit Moves:		****		****					****		****	
Green/Cycle:	0.32	0.32	0.32	0.10	0.42	0.42	0.31	0.31	0.31	0.17	0.17	0.17
Volume/Cap:	0.02	1.00	1.00	1.00	0.64	0.64	0.23	0.23	1.00	0.19	0.19	0.19
Delay/Veh:	27.7	66.4	66.4	119.6	28.5	28.5	30.7	30.7	77.6	43.3	43.3	43.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	27.7	66.4	66.4	119.6	28.5	28.5	30.7	30.7	77.6	43.3	43.3	43.3
DesignQueue:	0	36	21	11	40	0	6	0	30	1	0	2

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APPENDIX C

CALCULATION OF INTERSECTION LEVEL OF SERVICE
- BUILDOUT WITHOUT PROJECT

Noble Creek Specific Plan
Buildout Without Project
AM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

****

Intersection #1 Beaumont Ave. (NS) / Cherry Valley Blvd. (EW)

****

Cycle (sec):	120	Critical Vol./Cap. (X):	1.260	
Loss Time (sec):	12 (Y+R = 4 sec)	Average Delay (sec/veh):	167.3	
Optimal Cycle:	120	Level Of Service:	F	

****

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	10	15	15	10	15	15	10	15	15	10	15	15
Lanes:	1 0	0 1	0	1 0	1 0	1	1 0	0 1	0	1 0	0 1	0
Volume Module:												
Base Vol:	84	502	198	97	702	290	118	496	331	273	1086	154
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	84	502	198	97	702	290	118	496	331	273	1086	154
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	84	502	198	97	702	290	118	496	331	273	1086	154
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	84	502	198	97	702	290	118	496	331	273	1086	154
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	84	502	198	97	702	290	118	496	331	273	1086	154
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	0.72	0.28	1.00	1.00	1.00	1.00	0.60	0.40	1.00	0.88	0.12
Final Sat.:	1900	1363	537	1900	1900	1900	1900	1140	760	1900	1664	236
Capacity Analysis Module:												
Vol/Sat:	0.04	0.37	0.37	0.05	0.37	0.15	0.06	0.44	0.44	0.14	0.65	0.65
Crit Moves:		****		****			****				****	
Green/Cycle:	0.08	0.26	0.26	0.08	0.26	0.26	0.08	0.42	0.42	0.14	0.47	0.47
Volume/Cap:	0.53	1.39	1.39	0.61	1.40	0.58	0.75	1.05	1.05	1.05	1.39	1.39
Delay/Veh:	56.1	233	232.6	60.0	234	40.0	71.2	80.7	80.7	120.9	215	215.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	56.1	233	232.6	60.0	234	40.0	71.2	80.7	80.7	120.9	215	215.3
DesignQueue:	5	27	11	6	38	15	7	22	15	16	46	7

****

Noble Creek Specific Plan
Buildout Without Project
AM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

Intersection #2 Beaumont Ave. (NS) / 14th St. (EW)

Cycle (sec): 120 Critical Vol./Cap. (X): 1.268
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 122.6
Optimal Cycle: 120 Level Of Service: F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	10	15	15	10	15	15	20	20	20	20	20	20
Lanes:	1 0	1 1	0	1 0	1 1	0	1 0	1 1	0	1 0	1 0	1
Volume Module:												
Base Vol:	273	785	273	354	1092	205	131	671	192	390	1272	271
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	273	785	273	354	1092	205	131	671	192	390	1272	271
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	273	785	273	354	1092	205	131	671	192	390	1272	271
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	273	785	273	354	1092	205	131	671	192	390	1272	271
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	273	785	273	354	1092	205	131	671	192	390	1272	271
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00
Lanes:	1.00	1.48	0.52	1.00	1.68	0.32	1.00	1.56	0.44	1.00	1.00	1.00
Final Sat.:	1900	2678	932	1900	3039	571	1900	2807	803	1900	1900	1900
Capacity Analysis Module:												
Vol/Sat:	0.14	0.29	0.29	0.19	0.36	0.36	0.07	0.24	0.24	0.21	0.67	0.14
Crit Moves:	****				****						****	
Green/Cycle:	0.11	0.24	0.24	0.15	0.28	0.28	0.53	0.53	0.53	0.53	0.53	0.53
Volume/Cap:	1.27	1.21	1.21	1.21	1.27	1.27	0.13	0.45	0.45	0.39	1.27	0.27
Delay/Veh:	205.0	150	149.8	171.9	171	171.2	14.4	17.7	17.7	17.1	157	15.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	205.0	150	149.8	171.9	171	171.2	14.4	17.7	17.7	17.1	157	15.7
DesignQueue:	17	43	15	21	57	11	4	22	6	13	49	9

Noble Creek Specific Plan
Buildout Without Project
AM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

Intersection #3 Beaumont Ave. (NS) / I-10 Fwy. WB Ramps (EW)

Cycle (sec): 120 Critical Vol./Cap. (X): 2.293
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 677.8
Optimal Cycle: 120 Level Of Service: F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	10	15	15	10	15	15	20	20	20	20	20	20
Lanes:	1 0	1 1	0	1 0	1 1	0	0 0	1! 0	0	0 1	0 0	1
Volume Module:												
Base Vol:	1746	1222	30	24	1876	683	21	18	16	668	11	773
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	1746	1222	30	24	1876	683	21	18	16	668	11	773
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	1746	1222	30	24	1876	683	21	18	16	668	11	773
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	1746	1222	30	24	1876	683	21	18	16	668	11	773
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	1746	1222	30	24	1876	683	21	18	16	668	11	773
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.95	0.05	1.00	1.47	0.53	0.38	0.33	0.29	0.98	0.02	1.00
Final Sat.:	1900	3523	87	1900	2646	964	725	622	553	1869	31	1900
Capacity Analysis Module:												
Vol/Sat:	0.92	0.35	0.35	0.01	0.71	0.71	0.03	0.03	0.03	0.36	0.36	0.41
Crit Moves:	****				****		****					****
Green/Cycle:	0.32	0.48	0.48	0.08	0.25	0.25	0.17	0.17	0.17	0.17	0.17	0.17
Volume/Cap:	2.87	0.72	0.72	0.15	2.87	2.87	0.17	0.17	0.17	2.14	2.14	2.44
Delay/Veh:	888.0	26.0	26.0	51.5	891	891.0	43.2	43.2	43.2	575.3	575	708.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	888.0	26.0	26.0	51.5	891	891.0	43.2	43.2	43.2	575.3	575	708.0
DesignQueue:	105	46	1	1	114	42	1	1	1	41	1	48

Noble Creek Specific Plan
Buildout Without Project
AM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

Intersection #4 Beaumont Ave. (NS) / I-10 Fwy. EB Ramps (EW)

Cycle (sec):	120	Critical Vol./Cap. (X):	2.751
Loss Time (sec):	12 (Y+R = 4 sec)	Average Delay (sec/veh):	860.4
Optimal Cycle:	120	Level Of Service:	F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	10	15	15	10	15	15	20	20	20	20	20	20
Lanes:	1 0	1 1	0	1 0	1 1	0	0 1	0 0	1	0 0	1! 0	0
Volume Module:												
Base Vol:	6	3378	1024	556	1369	17	534	1	1784	1	1	46
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	6	3378	1024	556	1369	17	534	1	1784	1	1	46
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	6	3378	1024	556	1369	17	534	1	1784	1	1	46
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	6	3378	1024	556	1369	17	534	1	1784	1	1	46
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	6	3378	1024	556	1369	17	534	1	1784	1	1	46
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.53	0.47	1.00	1.98	0.02	0.99	0.01	1.00	0.02	0.02	0.96
Final Sat.:	1900	2770	840	1900	3566	44	1896	4	1900	40	40	1821
Capacity Analysis Module:												
Vol/Sat:	0.00	1.22	1.22	0.29	0.38	0.38	0.28	0.28	0.94	0.03	0.03	0.03
Crit Moves:		****		****					****		****	
Green/Cycle:	0.36	0.36	0.36	0.09	0.45	0.45	0.28	0.28	0.28	0.17	0.17	0.17
Volume/Cap:	0.01	3.34	3.34	3.34	0.85	0.85	1.00	1.00	3.34	0.15	0.15	0.15
Delay/Veh:	24.3	1094	1094	1124	33.6	33.6	82.7	82.7	1102	43.0	43.0	43.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	24.3	1094	1094	1124	33.6	33.6	82.7	82.7	1102	43.0	43.0	43.0
DesignQueue:	0	206	62	37	55	1	28	0	114	0	0	3

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Noble Creek Specific Plan
Buildout Without Project
PM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

Intersection #1 Beaumont Ave. (NS) / Cherry Valley Blvd. (EW)

Cycle (sec): 120 Critical Vol./Cap. (X): 1.806
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 324.1
Optimal Cycle: 120 Level Of Service: F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	10	15	15	10	15	15	10	15	15	10	15	15
Lanes:	1 0	0 1	0	1 0	1 0	1	1 0	0 1	0	1 0	0 1	0
Volume Module:												
Base Vol:	208	941	248	306	798	194	208	1070	312	212	869	252
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	208	941	248	306	798	194	208	1070	312	212	869	252
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	208	941	248	306	798	194	208	1070	312	212	869	252
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	208	941	248	306	798	194	208	1070	312	212	869	252
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	208	941	248	306	798	194	208	1070	312	212	869	252
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	0.79	0.21	1.00	1.00	1.00	1.00	0.77	0.23	1.00	0.78	0.22
Final Sat.:	1900	1504	396	1900	1900	1900	1900	1471	429	1900	1473	427
Capacity Analysis Module:												
Vol/Sat:	0.11	0.63	0.63	0.16	0.42	0.10	0.11	0.73	0.73	0.11	0.59	0.59
Crit Moves:		****		****				****		****		
Green/Cycle:	0.09	0.34	0.34	0.09	0.34	0.34	0.07	0.39	0.39	0.08	0.40	0.40
Volume/Cap:	1.25	1.85	1.85	1.85	1.25	0.30	1.47	1.85	1.85	1.34	1.47	1.47
Delay/Veh:	206.2	430	430.1	461.5	164	29.7	301.6	426	426.0	243.8	255	254.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	206.2	430	430.1	461.5	164	29.7	301.6	426	426.0	243.8	255	254.9
DesignQueue:	13	50	13	19	40	9	13	54	16	13	41	12

Noble Creek Specific Plan
Buildout Without Project
PM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

Intersection #2 Beaumont Ave. (NS) / 14th St. (EW)

Cycle (sec): 120 Critical Vol./Cap. (X): 1.266
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 106.7
Optimal Cycle: 120 Level Of Service: F

Approach:	North Bound				South Bound				East Bound				West Bound			
Movement:	L	- T	-	R	L	- T	-	R	L	- T	-	R	L	- T	-	R
Control:	Protected				Protected				Permitted				Permitted			
Rights:	Include				Include				Include				Include			
Min. Green:	10	15		15	10	15		15	20	20		20	20	20		20
Lanes:	1	0 1	1	0	1	0 1	1	0	1	0 1	1	0	1	0 1	0	1
Volume Module:																
Base Vol:	219	1278		324	276	1291		142	168	1101		236	258	1106		422
Growth Adj:	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
Initial Bse:	219	1278		324	276	1291		142	168	1101		236	258	1106		422
User Adj:	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
PHF Adj:	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
PHF Volume:	219	1278		324	276	1291		142	168	1101		236	258	1106		422
Reduct Vol:	0	0		0	0	0		0	0	0		0	0	0		0
Reduced Vol:	219	1278		324	276	1291		142	168	1101		236	258	1106		422
PCE Adj:	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
MLF Adj:	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
Final Vol.:	219	1278		324	276	1291		142	168	1101		236	258	1106		422
Saturation Flow Module:																
Sat/Lane:	1900	1900		1900	1900	1900		1900	1900	1900		1900	1900	1900		1900
Adjustment:	1.00	0.95		0.95	1.00	0.95		0.95	1.00	0.95		0.95	1.00	1.00		1.00
Lanes:	1.00	1.60		0.40	1.00	1.80		0.20	1.00	1.65		0.35	1.00	1.00		1.00
Final Sat.:	1900	2880		730	1900	3252		358	1900	2973		637	1900	1900		1900
Capacity Analysis Module:																
Vol/Sat:	0.12	0.44		0.44	0.15	0.40		0.40	0.09	0.37		0.37	0.14	0.58		0.22
Crit Moves:		****			****									****		
Green/Cycle:	0.10	0.35		0.35	0.11	0.36		0.36	0.46	0.46		0.46	0.46	0.46		0.46
Volume/Cap:	1.10	1.27		1.27	1.27	1.10		1.10	0.19	0.81		0.81	0.30	1.27		0.48
Delay/Veh:	147.1	165		165.1	204.0	95.8		95.8	19.3	30.8		30.8	20.5	161		22.9
User DelAdj:	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00		1.00
AdjDel/Veh:	147.1	165		165.1	204.0	95.8		95.8	19.3	30.8		30.8	20.5	161		22.9
DesignQueue:	13	62		16	17	61		7	6	44		9	10	47		16

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Noble Creek Specific Plan
Buildout Without Project
PM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

****

Intersection #3 Beaumont Ave. (NS) / I-10 Fwy. WB Ramps (EW)

****

Cycle (sec): 120 Critical Vol./Cap. (X): 2.323
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 666.2
Optimal Cycle: 120 Level Of Service: F

****

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	10	15	15	10	15	15	20	20	20	20	20	20
Lanes:	1 0	1 1	0	1 0	1 1	0	0 0	1! 0	0	0 1	0 0	1
Volume Module:												
Base Vol:	1029	1698	14	4	2246	1050	11	12	34	1140	12	924
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	1029	1698	14	4	2246	1050	11	12	34	1140	12	924
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	1029	1698	14	4	2246	1050	11	12	34	1140	12	924
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	1029	1698	14	4	2246	1050	11	12	34	1140	12	924
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	1029	1698	14	4	2246	1050	11	12	34	1140	12	924
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.98	0.02	1.00	1.36	0.64	0.19	0.21	0.60	0.99	0.01	1.00
Final Sat.:	1900	3580	30	1900	2460	1150	367	400	1133	1880	20	1900
Capacity Analysis Module:												
Vol/Sat:	0.54	0.47	0.47	0.00	0.91	0.91	0.03	0.03	0.03	0.61	0.61	0.49
Crit Moves:	****				****		****				****	
Green/Cycle:	0.19	0.43	0.43	0.08	0.32	0.32	0.17	0.17	0.17	0.22	0.22	0.22
Volume/Cap:	2.81	1.09	1.09	0.03	2.81	2.81	0.18	0.18	0.18	2.81	2.81	2.25
Delay/Veh:	870.7	86.2	86.2	50.6	858	857.5	43.2	43.2	43.2	868.5	868	619.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	870.7	86.2	86.2	50.6	858	857.5	43.2	43.2	43.2	868.5	868	619.2
DesignQueue:	65	73	1	0	131	61	1	1	2	71	1	55

****

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Noble Creek Specific Plan
Buildout Without Project
PM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

Intersection #4 Beaumont Ave. (NS) / I-10 Fwy. EB Ramps (EW)

Cycle (sec):	120	Critical Vol./Cap. (X):	2.839
Loss Time (sec):	12 (Y+R = 4 sec)	Average Delay (sec/veh):	894.0
Optimal Cycle:	120	Level Of Service:	F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	10	15	15	10	15	15	20	20	20	20	20	20
Lanes:	1 0	1	1 0	1 0	1	1 0	0 1	0	0 1	0 0	1! 0	0
Volume Module:												
Base Vol:	10	3397	993	595	1876	2	233	3	1891	14	3	42
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	10	3397	993	595	1876	2	233	3	1891	14	3	42
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	10	3397	993	595	1876	2	233	3	1891	14	3	42
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	10	3397	993	595	1876	2	233	3	1891	14	3	42
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	10	3397	993	595	1876	2	233	3	1891	14	3	42
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.55	0.45	1.00	1.99	0.01	0.99	0.01	1.00	0.24	0.05	0.71
Final Sat.:	1900	2793	817	1900	3606	4	1876	24	1900	451	97	1353
Capacity Analysis Module:												
Vol/Sat:	0.01	1.22	1.22	0.31	0.52	0.52	0.12	0.12	1.00	0.03	0.03	0.03
Crit Moves:		****		****					****		****	
Green/Cycle:	0.35	0.35	0.35	0.09	0.44	0.44	0.29	0.29	0.29	0.17	0.17	0.17
Volume/Cap:	0.01	3.44	3.44	3.44	1.17	1.17	0.43	0.43	3.44	0.19	0.19	0.19
Delay/Veh:	25.2	1140	1140	1168	117	117.4	35.2	35.2	1146	43.3	43.3	43.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	25.2	1140	1140	1168	117	117.4	35.2	35.2	1146	43.3	43.3	43.3
DesignQueue:	0	211	62	39	80	0	11	0	122	1	0	2

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APPENDIX D

CALCULATION OF INTERSECTION LEVEL OF SERVICE
- BUILDOUT WITHOUT PROJECT WITH IMPROVEMENTS

Noble Creek Specific Plan
Buildout Without Project With Improvements
AM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

Intersection #1 Beaumont Ave. (NS) / Cherry Valley Blvd. (EW)

Cycle (sec):	70	Critical Vol./Cap. (X):	0.778
Loss Time (sec):	12 (Y+R = 4 sec)	Average Delay (sec/veh):	42.6
Optimal Cycle:	70	Level Of Service:	D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	10	15	15	10	15	15	10	15	15	10	15	15
Lanes:	1 0	1	1 0	2 0	2	0 1	1 0	2	0 1	1 0	1	1 0
Volume Module:												
Base Vol:	84	502	198	97	702	290	118	496	331	273	1086	154
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	84	502	198	97	702	290	118	496	331	273	1086	154
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	84	502	198	97	702	290	118	496	331	273	1086	154
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	84	502	198	97	702	290	118	496	331	273	1086	154
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	84	502	198	97	702	290	118	496	331	273	1086	154
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.95	0.95	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Lanes:	1.00	1.43	0.57	2.00	2.00	1.00	1.00	2.00	1.00	1.00	1.75	0.25
Final Sat.:	1900	2589	1021	3686	3610	1900	1900	3610	1900	1900	3162	448
Capacity Analysis Module:												
Vol/Sat:	0.04	0.19	0.19	0.03	0.19	0.15	0.06	0.14	0.17	0.14	0.34	0.34
Crit Moves:	****				****		****				****	
Green/Cycle:	0.14	0.21	0.21	0.14	0.21	0.21	0.14	0.21	0.21	0.26	0.33	0.33
Volume/Cap:	0.31	0.90	0.90	0.18	0.91	0.71	0.43	0.64	0.81	0.56	1.05	1.05
Delay/Veh:	27.6	40.9	40.9	26.6	41.3	31.3	28.5	26.9	38.0	24.0	62.3	62.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	27.6	40.9	40.9	26.6	41.3	31.3	28.5	26.9	38.0	24.0	62.3	62.3
DesignQueue:	3	16	6	3	23	9	4	16	11	8	31	4

Noble Creek Specific Plan
Buildout Without Project With Improvements
AM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

Intersection #2 Beaumont Ave. (NS) / 14th St. (EW)

Cycle (sec):	120	Critical Vol./Cap. (X):	0.887
Loss Time (sec):	12 (Y+R = 4 sec)	Average Delay (sec/veh):	44.1
Optimal Cycle:	113	Level Of Service:	D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	10	15	15	10	15	15	10	20	20	10	20	20
Lanes:	2 0	2 0	1	2 0	2 0	1	1 0	2 0	1	2 0	2 0	1
Volume Module:												
Base Vol:	273	785	273	354	1092	205	131	671	192	390	1272	271
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	273	785	273	354	1092	205	131	671	192	390	1272	271
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	273	785	273	354	1092	205	131	671	192	390	1272	271
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	273	785	273	354	1092	205	131	671	192	390	1272	271
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	273	785	273	354	1092	205	131	671	192	390	1272	271
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Lanes:	2.00	2.00	1.00	2.00	2.00	1.00	1.00	2.00	1.00	2.00	2.00	1.00
Final Sat.:	3686	3610	1900	3686	3610	1900	1900	3610	1900	3686	3610	1900
Capacity Analysis Module:												
Vol/Sat:	0.07	0.22	0.14	0.10	0.30	0.11	0.07	0.19	0.10	0.11	0.35	0.14
Crit Moves:	****				****		****				****	
Green/Cycle:	0.08	0.29	0.29	0.13	0.34	0.34	0.08	0.30	0.30	0.17	0.39	0.39
Volume/Cap:	0.89	0.74	0.49	0.74	0.89	0.32	0.83	0.61	0.33	0.61	0.89	0.36
Delay/Veh:	79.9	41.2	35.7	56.5	46.2	29.7	82.9	36.7	32.6	47.6	41.5	25.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	79.9	41.2	35.7	56.5	46.2	29.7	82.9	36.7	32.6	47.6	41.5	25.9
DesignQueue:	17	39	13	21	52	9	8	33	9	22	56	11

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Noble Creek Specific Plan
Buildout Without Project With Improvements
AM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

****

Intersection #3 Beaumont Ave. (NS) / I-10 Fwy. WB Ramps (EW)

****

Cycle (sec):	0	Critical Vol./Cap. (X):		0.654
Loss Time (sec):	6 (Y+R = 4 sec)	Average Delay (sec/veh):		16.8
Optimal Cycle:	85	Level Of Service:		B

****

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Ignore			Include			Include			Include		
Min. Green:	0	15	0	0	15	15	0	0	0	0	0	0
Lanes:	0 0	2 0	1	0 0	2 0	1	0 0	0 0	0	1 0	1! 0	1
Volume Module:												
Base Vol:	0	1222	1721	0	1234	669	0	0	0	657	0	744
Growth Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1222	0	0	1234	669	0	0	0	657	0	744
User Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	1222	0	0	1234	669	0	0	0	657	0	744
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1222	0	0	1234	669	0	0	0	657	0	744
PCE Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	1222	0	0	1234	669	0	0	0	657	0	744
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	2.00	1.00	0.00	2.00	1.00	0.00	0.00	0.00	1.47	0.00	1.53
Final Sat.:	0	3610	1900	0	3610	1900	0	0	0	2791	0	2909
Capacity Analysis Module:												
Vol/Sat:	0.00	0.34	0.00	0.00	0.34	0.35	0.00	0.00	0.00	0.24	0.00	0.26
Crit Moves:						****						****
Green/Cycle:	0.00	0.54	0.00	0.00	0.54	0.54	0.00	0.00	0.00	0.39	0.00	0.39
Volume/Cap:	0.00	0.63	0.00	0.00	0.63	0.65	0.00	0.00	0.00	0.60	0.00	0.65
Delay/Veh:	0.0	14.4	0.0	0.0	14.5	15.5	0.0	0.0	0.0	21.1	0.0	21.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	14.4	0.0	0.0	14.5	15.5	0.0	0.0	0.0	21.1	0.0	21.9
DesignQueue:	0	29	0	0	29	16	0	0	0	20	0	23

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Noble Creek Specific Plan
Buildout Without Project With Improvements
AM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

Intersection #4 Beaumont Ave. (NS) / I-10 Fwy. EB Ramps (EW)

Cycle (sec): 0 Critical Vol./Cap. (X): 0.893
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 22.7
Optimal Cycle: 99 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Protected			Permitted			Permitted		
Rights:	Include			Include			Ignore			Include		
Min. Green:	0	15	15	10	15	0	0	0	0	0	0	0
Lanes:	0 0 3	0 1		2 0 2	0 0		2 0	0 0	1	0 0	0 0	0
Volume Module:												
Base Vol:	0	2440	1013	522	1369	0	505	0	1773	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Initial Bse:	0	2440	1013	522	1369	0	505	0	0	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Volume:	0	2440	1013	522	1369	0	505	0	0	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	2440	1013	522	1369	0	505	0	0	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Final Vol.:	0	2440	1013	522	1369	0	505	0	0	0	0	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.91	1.00	0.97	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	3.00	1.00	2.00	2.00	0.00	2.00	0.00	1.00	0.00	0.00	0.00
Final Sat.:	0	5187	1900	3686	3610	0	3686	0	1900	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.47	0.53	0.14	0.38	0.00	0.14	0.00	0.00	0.00	0.00	0.00
Crit Moves:			****	****			****					
Green/Cycle:	0.00	0.60	0.60	0.16	0.76	0.00	0.15	0.00	0.00	0.00	0.00	0.00
Volume/Cap:	0.00	0.79	0.89	0.89	0.50	0.00	0.89	0.00	0.00	0.00	0.00	0.00
Delay/Veh:	0.0	16.6	26.4	56.8	4.9	0.0	57.5	0.0	0.0	0.0	0.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	16.6	26.4	56.8	4.9	0.0	57.5	0.0	0.0	0.0	0.0	0.0
DesignQueue:	0	61	26	25	20	0	24	0	0	0	0	0

Noble Creek Specific Plan
Buildout Without Project With Improvements
PM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

Intersection #1 Beaumont Ave. (NS) / Cherry Valley Blvd. (EW)

Cycle (sec): 120 Critical Vol./Cap. (X): 0.925
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 51.5
Optimal Cycle: 120 Level Of Service: D

Approach:	North Bound						South Bound						East Bound						West Bound					
Movement:	L	-	T	-	R		L	-	T	-	R		L	-	T	-	R		L	-	T	-	R	
Control:	Protected						Protected						Protected						Protected					
Rights:	Include						Include						Include						Include					
Min. Green:	10		15		15		10		15		15		10		15		15		10		15		15	
Lanes:	1	0	1	1	0		2	0	2	0	1		1	0	2	0	1		1	0	1	1	0	
Volume Module:																								
Base Vol:	208		941		248		306		798		194		208		1070		312		212		869		252	
Growth Adj:	1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00	
Initial Bse:	208		941		248		306		798		194		208		1070		312		212		869		252	
User Adj:	1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00	
PHF Adj:	1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00	
PHF Volume:	208		941		248		306		798		194		208		1070		312		212		869		252	
Reduct Vol:	0		0		0		0		0		0		0		0		0		0		0		0	
Reduced Vol:	208		941		248		306		798		194		208		1070		312		212		869		252	
PCE Adj:	1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00	
MLF Adj:	1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00	
Final Vol.:	208		941		248		306		798		194		208		1070		312		212		869		252	
Saturation Flow Module:																								
Sat/Lane:	1900		1900		1900		1900		1900		1900		1900		1900		1900		1900		1900		1900	
Adjustment:	1.00		0.95		0.95		0.97		0.95		1.00		1.00		0.95		1.00		1.00		0.95		0.95	
Lanes:	1.00		1.58		0.42		2.00		2.00		1.00		1.00		2.00		1.00		1.00		1.55		0.45	
Final Sat.:	1900		2857		753		3686		3610		1900		1900		3610		1900		1900		2798		812	
Capacity Analysis Module:																								
Vol/Sat:	0.11		0.33		0.33		0.08		0.22		0.10		0.11		0.30		0.16		0.11		0.31		0.31	
Crit Moves:			****				****						****								****			
Green/Cycle:	0.15		0.36		0.36		0.09		0.30		0.30		0.12		0.33		0.33		0.12		0.34		0.34	
Volume/Cap:	0.74		0.92		0.92		0.92		0.74		0.34		0.92		0.90		0.50		0.90		0.92		0.92	
Delay/Veh:	59.1		48.4		48.4		85.0		40.7		33.3		92.2		47.6		32.9		84.7		50.3		50.3	
User DelAdj:	1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00	
AdjDel/Veh:	59.1		48.4		48.4		85.0		40.7		33.3		92.2		47.6		32.9		84.7		50.3		50.3	
DesignQueue:	12		44		12		19		40		9		13		52		15		13		42		12	

Noble Creek Specific Plan
Buildout Without Project With Improvements
PM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

Intersection #2 Beaumont Ave. (NS) / 14th St. (EW)

Cycle (sec):	120	Critical Vol./Cap. (X):	0.902
Loss Time (sec):	12 (Y+R = 4 sec)	Average Delay (sec/veh):	47.7
Optimal Cycle:	120	Level Of Service:	D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	10	15	15	10	15	15	10	20	20	10	20	20
Lanes:	2 0	2 0	1	2 0	2 0	1	1 0	2 0	1	2 0	2 0	1
Volume Module:												
Base Vol:	219	1278	324	276	1291	142	168	1101	236	258	1106	422
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	219	1278	324	276	1291	142	168	1101	236	258	1106	422
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	219	1278	324	276	1291	142	168	1101	236	258	1106	422
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	219	1278	324	276	1291	142	168	1101	236	258	1106	422
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	219	1278	324	276	1291	142	168	1101	236	258	1106	422
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Lanes:	2.00	2.00	1.00	2.00	2.00	1.00	1.00	2.00	1.00	2.00	2.00	1.00
Final Sat.:	3686	3610	1900	3686	3610	1900	1900	3610	1900	3686	3610	1900
Capacity Analysis Module:												
Vol/Sat:	0.06	0.35	0.17	0.07	0.36	0.07	0.09	0.30	0.12	0.07	0.31	0.22
Crit Moves:	****				****		****				****	
Green/Cycle:	0.08	0.39	0.39	0.08	0.39	0.39	0.10	0.35	0.35	0.08	0.33	0.33
Volume/Cap:	0.71	0.91	0.44	0.90	0.92	0.19	0.92	0.88	0.36	0.84	0.92	0.67
Delay/Veh:	61.3	44.0	27.5	81.7	45.2	24.4	98.5	44.8	29.7	72.5	50.1	37.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	61.3	44.0	27.5	81.7	45.2	24.4	98.5	44.8	29.7	72.5	50.1	37.1
DesignQueue:	14	57	14	17	58	6	10	52	11	16	53	20

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Noble Creek Specific Plan
Buildout Without Project With Improvements
PM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

****

Intersection #3 Beaumont Ave. (NS) / I-10 Fwy. WB Ramps (EW)

****

Cycle (sec): 120 Critical Vol./Cap. (X): 0.972
Loss Time (sec): 6 (Y+R = 4 sec) Average Delay (sec/veh): 33.8
Optimal Cycle: 120 Level Of Service: C

****

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Ignore			Include			Include			Include		
Min. Green:	0	15	15	0	15	15	0	0	0	0	0	0
Lanes:	0 0	2 0	1	0 0	2 0	1	0 0	0 0	0	1 0	1! 0	1
Volume Module:												
Base Vol:	0	1698	994	0	1268	1034	0	0	0	1118	0	914
Growth Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1698	0	0	1268	1034	0	0	0	1118	0	914
User Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	1698	0	0	1268	1034	0	0	0	1118	0	914
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1698	0	0	1268	1034	0	0	0	1118	0	914
PCE Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	1698	0	0	1268	1034	0	0	0	1118	0	914
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	2.00	1.00	0.00	2.00	1.00	0.00	0.00	0.00	1.55	0.00	1.45
Final Sat.:	0	3610	1900	0	3610	1900	0	0	0	2945	0	2755
Capacity Analysis Module:												
Vol/Sat:	0.00	0.47	0.00	0.00	0.35	0.54	0.00	0.00	0.00	0.38	0.00	0.33
Crit Moves:						****				****		
Green/Cycle:	0.00	0.56	0.00	0.00	0.56	0.56	0.00	0.00	0.00	0.39	0.00	0.39
Volume/Cap:	0.00	0.84	0.00	0.00	0.63	0.97	0.00	0.00	0.00	0.97	0.00	0.85
Delay/Veh:	0.0	25.3	0.0	0.0	18.6	46.6	0.0	0.0	0.0	49.7	0.0	36.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	25.3	0.0	0.0	18.6	46.6	0.0	0.0	0.0	49.7	0.0	36.5
DesignQueue:	0	57	0	0	41	35	0	0	0	50	0	41

****

Noble Creek Specific Plan
Buildout Without Project With Improvements
PM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

****

Intersection #4 Beaumont Ave. (NS) / I-10 Fwy. EB Ramps (EW)

****

Cycle (sec):	0	Critical Vol./Cap. (X):	0.837
Loss Time (sec):	9 (Y+R = 4 sec)	Average Delay (sec/veh):	12.8
Optimal Cycle:	68	Level Of Service:	B

****

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Protected			Permitted			Permitted		
Rights:	Include			Include			Ignore			Include		
Min. Green:	0	15	15	10	15	0	0	0	0	0	0	0
Lanes:	0 0	3 0	1	2 0	2 0	0	2 0	0 0	1	0 0	0 0	0
Volume Module:												
Base Vol:	0	2489	989	563	1876	0	194	0	1864	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Initial Bse:	0	2489	989	563	1876	0	194	0	0	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Volume:	0	2489	989	563	1876	0	194	0	0	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	2489	989	563	1876	0	194	0	0	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Final Vol.:	0	2489	989	563	1876	0	194	0	0	0	0	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.91	1.00	0.97	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	3.00	1.00	2.00	2.00	0.00	2.00	0.00	1.00	0.00	0.00	0.00
Final Sat.:	0	5187	1900	3686	3610	0	3686	0	1900	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.48	0.52	0.15	0.52	0.00	0.05	0.00	0.00	0.00	0.00	0.00
Crit Moves:			****	****			****					
Green/Cycle:	0.00	0.62	0.62	0.18	0.80	0.00	0.06	0.00	0.00	0.00	0.00	0.00
Volume/Cap:	0.00	0.77	0.84	0.84	0.65	0.00	0.84	0.00	0.00	0.00	0.00	0.00
Delay/Veh:	0.0	10.5	15.5	35.8	3.2	0.0	54.0	0.0	0.0	0.0	0.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	10.5	15.5	35.8	3.2	0.0	54.0	0.0	0.0	0.0	0.0	0.0
DesignQueue:	0	40	16	18	16	0	7	0	0	0	0	0

****

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APPENDIX E

CALCULATION OF INTERSECTION LEVEL OF SERVICE
- BUILDOUT WITH PROJECT

Noble Creek Specific Plan
Buildout With Project
AM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

****

Intersection #1 Beaumont Ave. (NS) / Cherry Valley Blvd. (EW)

****

Cycle (sec): 120 Critical Vol./Cap. (X): 1.276
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 171.7
Optimal Cycle: 120 Level Of Service: F

****

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	10	15	15	10	15	15	10	15	15	10	15	15
Lanes:	1 0	0 1	0	1 0	1 0	1	1 0	0 1	0	1 0	0 1	0
Volume Module:												
Base Vol:	84	509	199	100	705	286	123	494	342	281	1085	166
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	84	509	199	100	705	286	123	494	342	281	1085	166
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	84	509	199	100	705	286	123	494	342	281	1085	166
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	84	509	199	100	705	286	123	494	342	281	1085	166
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	84	509	199	100	705	286	123	494	342	281	1085	166
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	0.72	0.28	1.00	1.00	1.00	1.00	0.59	0.41	1.00	0.87	0.13
Final Sat.:	1900	1366	534	1900	1900	1900	1900	1123	777	1900	1648	252
Capacity Analysis Module:												
Vol/Sat:	0.04	0.37	0.37	0.05	0.37	0.15	0.06	0.44	0.44	0.15	0.66	0.66
Crit Moves:		****		****			****				****	
Green/Cycle:	0.08	0.27	0.27	0.08	0.27	0.27	0.08	0.41	0.41	0.14	0.47	0.47
Volume/Cap:	0.53	1.41	1.41	0.63	1.40	0.57	0.78	1.07	1.07	1.07	1.41	1.41
Delay/Veh:	56.1	238	238.4	61.2	236	39.7	75.1	86.3	86.3	125.6	221	221.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	56.1	238	238.4	61.2	236	39.7	75.1	86.3	86.3	125.6	221	221.3
DesignQueue:	5	28	11	6	38	15	8	22	15	17	47	7

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Noble Creek Specific Plan
Buildout With Project
AM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

Intersection #2 Beaumont Ave. (NS) / 14th St. (EW)

Cycle (sec): 120 Critical Vol./Cap. (X): 1.272
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 125.0
Optimal Cycle: 120 Level Of Service: F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Permitted			Permitted		
Rights:	Include			Include			Include			Include		
Min. Green:	10	15	15	10	15	15	20	20	20	20	20	20
Lanes:	1 0	1	1 0	1 0	1	1 0	1 0	1	1 0	1 0	1	0 1
Volume Module:												
Base Vol:	249	818	272	447	1189	206	138	677	197	383	1215	320
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	249	818	272	447	1189	206	138	677	197	383	1215	320
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	249	818	272	447	1189	206	138	677	197	383	1215	320
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	249	818	272	447	1189	206	138	677	197	383	1215	320
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	249	818	272	447	1189	206	138	677	197	383	1215	320
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00
Lanes:	1.00	1.50	0.50	1.00	1.70	0.30	1.00	1.55	0.45	1.00	1.00	1.00
Final Sat.:	1900	2709	901	1900	3077	533	1900	2796	814	1900	1900	1900
Capacity Analysis Module:												
Vol/Sat:	0.13	0.30	0.30	0.24	0.39	0.39	0.07	0.24	0.24	0.20	0.64	0.17
Crit Moves:		****		****							****	
Green/Cycle:	0.11	0.24	0.24	0.18	0.32	0.32	0.50	0.50	0.50	0.50	0.50	0.50
Volume/Cap:	1.23	1.27	1.27	1.27	1.23	1.23	0.14	0.48	0.48	0.40	1.27	0.34
Delay/Veh:	190.6	177	177.3	191.9	150	150.5	16.1	19.8	19.8	18.9	161	18.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	190.6	177	177.3	191.9	150	150.5	16.1	19.8	19.8	18.9	161	18.1
DesignQueue:	15	45	15	26	60	10	5	24	7	13	48	11

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Noble Creek Specific Plan
Buildout With Project
AM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

****

Intersection #3 Beaumont Ave. (NS) / I-10 Fwy. WB Ramps (EW)

****

Cycle (sec): 120 Critical Vol./Cap. (X): 2.249
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 648.3
Optimal Cycle: 120 Level Of Service: F

****

Approach:	North Bound						South Bound						East Bound						West Bound					
Movement:	L	-	T	-	R		L	-	T	-	R		L	-	T	-	R		L	-	T	-	R	
Control:	Protected						Protected						Split Phase						Split Phase					
Rights:	Include						Include						Include						Include					
Min. Green:	10		15		15		10		15		15		20		20		20		20		20		20	
Lanes:	1	0	1	1	0		1	0	1	1	0		0	0	1!	0	0		0	1	0	0	1	
Volume Module:																								
Base Vol:	1748		1224		30		24		1820		589		21		18		16		617		11		775	
Growth Adj:	1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00	
Initial Bse:	1748		1224		30		24		1820		589		21		18		16		617		11		775	
User Adj:	1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00	
PHF Adj:	1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00	
PHF Volume:	1748		1224		30		24		1820		589		21		18		16		617		11		775	
Reduct Vol:	0		0		0		0		0		0		0		0		0		0		0		0	
Reduced Vol:	1748		1224		30		24		1820		589		21		18		16		617		11		775	
PCE Adj:	1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00	
MLF Adj:	1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00	
Final Vol.:	1748		1224		30		24		1820		589		21		18		16		617		11		775	
Saturation Flow Module:																								
Sat/Lane:	1900		1900		1900		1900		1900		1900		1900		1900		1900		1900		1900		1900	
Adjustment:	1.00		0.95		0.95		1.00		0.95		0.95		1.00		1.00		1.00		1.00		1.00		1.00	
Lanes:	1.00		1.95		0.05		1.00		1.51		0.49		0.38		0.33		0.29		0.98		0.02		1.00	
Final Sat.:	1900		3524		86		1900		2727		883		725		622		553		1867		33		1900	
Capacity Analysis Module:																								
Vol/Sat:	0.92		0.35		0.35		0.01		0.67		0.67		0.03		0.03		0.03		0.33		0.33		0.41	
Crit Moves:	****								****				****										****	
Green/Cycle:	0.33		0.48		0.48		0.08		0.24		0.24		0.17		0.17		0.17		0.17		0.17		0.17	
Volume/Cap:	2.80		0.72		0.72		0.15		2.80		2.80		0.17		0.17		0.17		1.98		1.98		2.45	
Delay/Veh:	855.3		26.0		26.0		51.5		859		859.5		43.2		43.2		43.2		503.6		504		710.8	
User DelAdj:	1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00	
AdjDel/Veh:	855.3		26.0		26.0		51.5		859		859.5		43.2		43.2		43.2		503.6		504		710.8	
DesignQueue:	103		46		1		1		111		36		1		1		1		38		1		48	

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Noble Creek Specific Plan
Buildout With Project
AM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

Intersection #4 Beaumont Ave. (NS) / I-10 Fwy. EB Ramps (EW)

Cycle (sec):	120	Critical Vol./Cap. (X):	2.779
Loss Time (sec):	12 (Y+R = 4 sec)	Average Delay (sec/veh):	877.6
Optimal Cycle:	120	Level Of Service:	F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	10	15	15	10	15	15	20	20	20	20	20	20
Lanes:	1 0	1 1	0	1 0	1 1	0	0 1	0 0	1	0 0	1! 0	0
Volume Module:												
Base Vol:	6	3386	1026	585	1327	17	533	1	1797	1	1	46
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	6	3386	1026	585	1327	17	533	1	1797	1	1	46
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	6	3386	1026	585	1327	17	533	1	1797	1	1	46
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	6	3386	1026	585	1327	17	533	1	1797	1	1	46
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	6	3386	1026	585	1327	17	533	1	1797	1	1	46
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.53	0.47	1.00	1.97	0.03	0.99	0.01	1.00	0.02	0.02	0.96
Final Sat.:	1900	2771	839	1900	3564	46	1896	4	1900	40	40	1821
Capacity Analysis Module:												
Vol/Sat:	0.00	1.22	1.22	0.31	0.37	0.37	0.28	0.28	0.95	0.03	0.03	0.03
Crit Moves:		****		****					****		****	
Green/Cycle:	0.36	0.36	0.36	0.09	0.45	0.45	0.28	0.28	0.28	0.17	0.17	0.17
Volume/Cap:	0.01	3.38	3.38	3.38	0.82	0.82	1.00	1.00	3.38	0.15	0.15	0.15
Delay/Veh:	24.5	1110	1110	1138	32.0	32.0	83.0	83.0	1117	43.0	43.0	43.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	24.5	1110	1110	1138	32.0	32.0	83.0	83.0	1117	43.0	43.0	43.0
DesignQueue:	0	208	63	39	53	1	28	0	115	0	0	3

Noble Creek Specific Plan
Buildout With Project
PM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

****

Intersection #1 Beaumont Ave. (NS) / Cherry Valley Blvd. (EW)

****

Cycle (sec):	120	Critical Vol./Cap. (X):	1.859
Loss Time (sec):	12 (Y+R = 4 sec)	Average Delay (sec/veh):	345.5
Optimal Cycle:	120	Level Of Service:	F

****

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	10	15	15	10	15	15	10	15	15	10	15	15
Lanes:	1 0	0 1	0	1 0	1 0	1	1 0	0 1	0	1 0	0 1	0
Volume Module:												
Base Vol:	253	957	268	309	827	190	211	1073	355	217	875	257
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	253	957	268	309	827	190	211	1073	355	217	875	257
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	253	957	268	309	827	190	211	1073	355	217	875	257
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	253	957	268	309	827	190	211	1073	355	217	875	257
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	253	957	268	309	827	190	211	1073	355	217	875	257
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	0.78	0.22	1.00	1.00	1.00	1.00	0.75	0.25	1.00	0.77	0.23
Final Sat.:	1900	1484	416	1900	1900	1900	1900	1428	472	1900	1469	431
Capacity Analysis Module:												
Vol/Sat:	0.13	0.64	0.64	0.16	0.44	0.10	0.11	0.75	0.75	0.11	0.60	0.60
Crit Moves:		****		****				****		****		
Green/Cycle:	0.10	0.34	0.34	0.09	0.32	0.32	0.07	0.39	0.39	0.08	0.40	0.40
Volume/Cap:	1.34	1.91	1.91	1.91	1.34	0.31	1.48	1.91	1.91	1.37	1.48	1.48
Delay/Veh:	239.9	455	454.6	486.1	206	30.8	305.9	450	450.4	256.5	260	259.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	239.9	455	454.6	486.1	206	30.8	305.9	450	450.4	256.5	260	259.7
DesignQueue:	16	51	14	20	42	9	13	54	18	14	41	12

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Noble Creek Specific Plan
Buildout With Project
PM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

Intersection #2 Beaumont Ave. (NS) / 14th St. (EW)

Cycle (sec): 120 Critical Vol./Cap. (X): 1.285
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 117.2
Optimal Cycle: 120 Level Of Service: F

Approach:	North Bound						South Bound						East Bound						West Bound					
Movement:	L	-	T	-	R		L	-	T	-	R		L	-	T	-	R		L	-	T	-	R	
Control:	Protected						Protected						Permitted						Permitted					
Rights:	Include						Include						Include						Include					
Min. Green:	10		15		15		10		15		15		20		20		20		20		20		20	
Lanes:	1	0	1	1	0		1	0	1	1	0		1	0	1	1	0		1	0	1	0	1	
Volume Module:																								
Base Vol:	265		1262		288		328		1313		153		187		1044		251		260		1114		423	
Growth Adj:	1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00	
Initial Bse:	265		1262		288		328		1313		153		187		1044		251		260		1114		423	
User Adj:	1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00	
PHF Adj:	1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00	
PHF Volume:	265		1262		288		328		1313		153		187		1044		251		260		1114		423	
Reduct Vol:	0		0		0		0		0		0		0		0		0		0		0		0	
Reduced Vol:	265		1262		288		328		1313		153		187		1044		251		260		1114		423	
PCE Adj:	1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00	
MLF Adj:	1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00	
Final Vol.:	265		1262		288		328		1313		153		187		1044		251		260		1114		423	
Saturation Flow Module:																								
Sat/Lane:	1900		1900		1900		1900		1900		1900		1900		1900		1900		1900		1900		1900	
Adjustment:	1.00		0.95		0.95		1.00		0.95		0.95		1.00		0.95		0.95		1.00		1.00		1.00	
Lanes:	1.00		1.63		0.37		1.00		1.79		0.21		1.00		1.61		0.39		1.00		1.00		1.00	
Final Sat.:	1900		2939		671		1900		3233		377		1900		2910		700		1900		1900		1900	
Capacity Analysis Module:																								
Vol/Sat:	0.14		0.43		0.43		0.17		0.41		0.41		0.10		0.36		0.36		0.14		0.59		0.22	
Crit Moves:			****				****														****			
Green/Cycle:	0.12		0.33		0.33		0.13		0.35		0.35		0.46		0.46		0.46		0.46		0.46		0.46	
Volume/Cap:	1.16		1.28		1.28		1.28		1.16		1.16		0.22		0.79		0.79		0.30		1.28		0.49	
Delay/Veh:	164.0		174		174.5		206.4		122		122.0		19.8		30.2		30.2		20.7		169		23.2	
User DelAdj:	1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00	
AdjDel/Veh:	164.0		174		174.5		206.4		122		122.0		19.8		30.2		30.2		20.7		169		23.2	
DesignQueue:	16		63		14		20		63		7		7		42		10		10		48		16	

Noble Creek Specific Plan
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Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

Intersection #3 Beaumont Ave. (NS) / I-10 Fwy. WB Ramps (EW)

Cycle (sec): 120 Critical Vol./Cap. (X): 2.330
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 666.5
Optimal Cycle: 120 Level Of Service: F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	10	15	15	10	15	15	20	20	20	20	20	20
Lanes:	1 0	1 1	0	1 0	1 1	0	0 0	1! 0	0	0 1	0 0	1
Volume Module:												
Base Vol:	1027	1754	14	4	2270	1059	11	12	34	1137	12	903
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	1027	1754	14	4	2270	1059	11	12	34	1137	12	903
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	1027	1754	14	4	2270	1059	11	12	34	1137	12	903
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	1027	1754	14	4	2270	1059	11	12	34	1137	12	903
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	1027	1754	14	4	2270	1059	11	12	34	1137	12	903
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.98	0.02	1.00	1.36	0.64	0.19	0.21	0.60	0.99	0.01	1.00
Final Sat.:	1900	3581	29	1900	2462	1148	367	400	1133	1880	20	1900
Capacity Analysis Module:												
Vol/Sat:	0.54	0.49	0.49	0.00	0.92	0.92	0.03	0.03	0.03	0.60	0.60	0.48
Crit Moves:	****				****		****			****		
Green/Cycle:	0.19	0.44	0.44	0.08	0.33	0.33	0.17	0.17	0.17	0.21	0.21	0.21
Volume/Cap:	2.82	1.12	1.12	0.03	2.82	2.82	0.18	0.18	0.18	2.82	2.82	2.22
Delay/Veh:	874.7	98.9	98.9	50.6	861	861.4	43.2	43.2	43.2	872.6	873	602.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	874.7	98.9	98.9	50.6	861	861.4	43.2	43.2	43.2	872.6	873	602.1
DesignQueue:	65	75	1	0	133	62	1	1	2	71	1	54

Noble Creek Specific Plan
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Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

Intersection #4 Beaumont Ave. (NS) / I-10 Fwy. EB Ramps (EW)

Cycle (sec):	120	Critical Vol./Cap. (X):	2.847
Loss Time (sec):	12 (Y+R = 4 sec)	Average Delay (sec/veh):	895.1
Optimal Cycle:	120	Level Of Service:	F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	10	15	15	10	15	15	20	20	20	20	20	20
Lanes:	1 0	1 1	0	1 0	1 1	0	0 1	0 0	1	0 0	1! 0	0
Volume Module:												
Base Vol:	10	3421	989	600	1883	2	258	3	1889	14	3	42
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	10	3421	989	600	1883	2	258	3	1889	14	3	42
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	10	3421	989	600	1883	2	258	3	1889	14	3	42
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	10	3421	989	600	1883	2	258	3	1889	14	3	42
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	10	3421	989	600	1883	2	258	3	1889	14	3	42
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.55	0.45	1.00	1.99	0.01	0.99	0.01	1.00	0.24	0.05	0.71
Final Sat.:	1900	2800	810	1900	3606	4	1878	22	1900	451	97	1353
Capacity Analysis Module:												
Vol/Sat:	0.01	1.22	1.22	0.32	0.52	0.52	0.14	0.14	0.99	0.03	0.03	0.03
Crit Moves:		****		****					****		****	
Green/Cycle:	0.35	0.35	0.35	0.09	0.45	0.45	0.29	0.29	0.29	0.17	0.17	0.17
Volume/Cap:	0.01	3.45	3.45	3.45	1.17	1.17	0.48	0.48	3.45	0.19	0.19	0.19
Delay/Veh:	25.2	1144	1144	1172	118	117.9	35.9	35.9	1151	43.3	43.3	43.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	25.2	1144	1144	1172	118	117.9	35.9	35.9	1151	43.3	43.3	43.3
DesignQueue:	0	213	61	40	80	0	13	0	122	1	0	2

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APPENDIX F

CALCULATION OF INTERSECTION LEVEL OF SERVICE
- BUILDOUT WITH PROJECT WITH IMPROVEMENTS

Noble Creek Specific Plan
Buildout With Project With Improvements
AM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

Intersection #1 Beaumont Ave. (NS) / Cherry Valley Blvd. (EW)

Cycle (sec): 70 Critical Vol./Cap. (X): 0.785
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 44.0
Optimal Cycle: 70 Level Of Service: D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	10	15	15	10	15	15	10	15	15	10	15	15
Lanes:	1 0	1 1	0	2 0	2 0	1	1 0	2 0	1	1 0	1 1	0
Volume Module:												
Base Vol:	84	509	199	100	705	286	123	494	342	281	1085	166
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	84	509	199	100	705	286	123	494	342	281	1085	166
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	84	509	199	100	705	286	123	494	342	281	1085	166
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	84	509	199	100	705	286	123	494	342	281	1085	166
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	84	509	199	100	705	286	123	494	342	281	1085	166
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.95	0.95	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Lanes:	1.00	1.44	0.56	2.00	2.00	1.00	1.00	2.00	1.00	1.00	1.73	0.27
Final Sat.:	1900	2595	1015	3686	3610	1900	1900	3610	1900	1900	3131	479
Capacity Analysis Module:												
Vol/Sat:	0.04	0.20	0.20	0.03	0.20	0.15	0.06	0.14	0.18	0.15	0.35	0.35
Crit Moves:	****				****		****				****	
Green/Cycle:	0.14	0.21	0.21	0.14	0.21	0.21	0.14	0.21	0.21	0.26	0.33	0.33
Volume/Cap:	0.31	0.92	0.92	0.19	0.91	0.70	0.45	0.64	0.84	0.58	1.05	1.05
Delay/Veh:	27.6	42.3	42.3	26.6	41.8	30.9	28.7	26.8	40.7	24.3	65.3	65.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	27.6	42.3	42.3	26.6	41.8	30.9	28.7	26.8	40.7	24.3	65.3	65.3
DesignQueue:	3	16	6	3	23	9	4	16	11	8	31	5

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Noble Creek Specific Plan
Buildout With Project With Improvements
AM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

Intersection #2 Beaumont Ave. (NS) / 14th St. (EW)

Cycle (sec): 120 Critical Vol./Cap. (X): 0.896
Loss Time (sec): 12 (Y+R = 4 sec) Average Delay (sec/veh): 45.0
Optimal Cycle: 118 Level Of Service: D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	10	15	15	10	15	15	10	20	20	10	20	20
Lanes:	2 0	2 0	1	2 0	2 0	1	1 0	2 0	1	2 0	2 0	1
Volume Module:												
Base Vol:	249	818	272	447	1189	206	138	677	197	383	1215	320
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	249	818	272	447	1189	206	138	677	197	383	1215	320
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	249	818	272	447	1189	206	138	677	197	383	1215	320
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	249	818	272	447	1189	206	138	677	197	383	1215	320
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	249	818	272	447	1189	206	138	677	197	383	1215	320
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Lanes:	2.00	2.00	1.00	2.00	2.00	1.00	1.00	2.00	1.00	2.00	2.00	1.00
Final Sat.:	3686	3610	1900	3686	3610	1900	1900	3610	1900	3686	3610	1900
Capacity Analysis Module:												
Vol/Sat:	0.07	0.23	0.14	0.12	0.33	0.11	0.07	0.19	0.10	0.10	0.34	0.17
Crit Moves:	****				****		****				****	
Green/Cycle:	0.08	0.29	0.29	0.16	0.36	0.36	0.08	0.29	0.29	0.16	0.37	0.37
Volume/Cap:	0.81	0.78	0.49	0.78	0.91	0.30	0.87	0.64	0.35	0.64	0.91	0.45
Delay/Veh:	69.0	42.9	35.9	55.5	45.8	27.6	91.6	38.4	33.9	49.4	45.1	29.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	69.0	42.9	35.9	55.5	45.8	27.6	91.6	38.4	33.9	49.4	45.1	29.0
DesignQueue:	15	41	13	26	55	9	9	34	10	22	56	14

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Noble Creek Specific Plan
Buildout With Project With Improvements
AM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

Intersection #3 Beaumont Ave. (NS) / I-10 Fwy. WB Ramps (EW)

Cycle (sec):	0	Critical Vol./Cap. (X):	0.651
Loss Time (sec):	6 (Y+R = 4 sec)	Average Delay (sec/veh):	16.4
Optimal Cycle:	85	Level Of Service:	B

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Ignore			Include			Include			Include		
Min. Green:	0	15	0	0	15	15	0	0	0	0	0	0
Lanes:	0 0	2 0	1	0 0	2 0	1	0 0	0 0	0	1 0	1! 0	1
Volume Module:												
Base Vol:	0	1224	1723	0	1272	575	0	0	0	606	0	746
Growth Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1224	0	0	1272	575	0	0	0	606	0	746
User Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	1224	0	0	1272	575	0	0	0	606	0	746
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1224	0	0	1272	575	0	0	0	606	0	746
PCE Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	1224	0	0	1272	575	0	0	0	606	0	746
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	2.00	1.00	0.00	2.00	1.00	0.00	0.00	0.00	1.45	0.00	1.55
Final Sat.:	0	3610	1900	0	3610	1900	0	0	0	2752	0	2948
Capacity Analysis Module:												
Vol/Sat:	0.00	0.34	0.00	0.00	0.35	0.30	0.00	0.00	0.00	0.22	0.00	0.25
Crit Moves:					****							****
Green/Cycle:	0.00	0.54	0.00	0.00	0.54	0.54	0.00	0.00	0.00	0.39	0.00	0.39
Volume/Cap:	0.00	0.63	0.00	0.00	0.65	0.56	0.00	0.00	0.00	0.57	0.00	0.65
Delay/Veh:	0.0	14.2	0.0	0.0	14.6	13.5	0.0	0.0	0.0	20.7	0.0	22.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	14.2	0.0	0.0	14.6	13.5	0.0	0.0	0.0	20.7	0.0	22.0
DesignQueue:	0	29	0	0	30	14	0	0	0	19	0	23

Noble Creek Specific Plan
Buildout With Project With Improvements
AM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

Intersection #4 Beaumont Ave. (NS) / I-10 Fwy. EB Ramps (EW)

Cycle (sec): 0 Critical Vol./Cap. (X): 0.898
Loss Time (sec): 9 (Y+R = 4 sec) Average Delay (sec/veh): 24.1
Optimal Cycle: 104 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Protected			Permitted			Permitted		
Rights:	Include			Include			Ignore			Include		
Min. Green:	0	15	15	10	15	0	0	0	0	0	0	0
Lanes:	0 0	3 0	1	2 0	2 0	0	2 0	0 0	1	0 0	0 0	0
Volume Module:												
Base Vol:	0	2446	1015	551	1327	0	504	0	1786	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Initial Bse:	0	2446	1015	551	1327	0	504	0	0	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Volume:	0	2446	1015	551	1327	0	504	0	0	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	2446	1015	551	1327	0	504	0	0	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Final Vol.:	0	2446	1015	551	1327	0	504	0	0	0	0	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.91	1.00	0.97	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	3.00	1.00	2.00	2.00	0.00	2.00	0.00	1.00	0.00	0.00	0.00
Final Sat.:	0	5187	1900	3686	3610	0	3686	0	1900	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.47	0.53	0.15	0.37	0.00	0.14	0.00	0.00	0.00	0.00	0.00
Crit Moves:			****	****			****					
Green/Cycle:	0.00	0.59	0.59	0.17	0.76	0.00	0.15	0.00	0.00	0.00	0.00	0.00
Volume/Cap:	0.00	0.79	0.90	0.90	0.48	0.00	0.90	0.00	0.00	0.00	0.00	0.00
Delay/Veh:	0.0	17.6	28.0	58.5	4.8	0.0	60.5	0.0	0.0	0.0	0.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	17.6	28.0	58.5	4.8	0.0	60.5	0.0	0.0	0.0	0.0	0.0
DesignQueue:	0	65	28	28	20	0	26	0	0	0	0	0

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Noble Creek Specific Plan
Buildout With Project With Improvments
PM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

****

Intersection #1 Beaumont Ave. (NS) / Cherry Valley Blvd. (EW)

****

Cycle (sec):	120	Critical Vol./Cap. (X):	0.942	
Loss Time (sec):	12 (Y+R = 4 sec)	Average Delay (sec/veh):	54.2	
Optimal Cycle:	120	Level Of Service:	D	

****

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L -	T -	R	L -	T -	R	L -	T -	R	L -	T -	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	10	15	15	10	15	15	10	15	15	10	15	15
Lanes:	1 0	1 1	0	2 0	2 0	1	1 0	2 0	1	1 0	1 1	0
Volume Module:												
Base Vol:	253	957	268	309	827	190	211	1073	355	217	875	257
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	253	957	268	309	827	190	211	1073	355	217	875	257
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	253	957	268	309	827	190	211	1073	355	217	875	257
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	253	957	268	309	827	190	211	1073	355	217	875	257
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	253	957	268	309	827	190	211	1073	355	217	875	257
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.95	0.95	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Lanes:	1.00	1.56	0.44	2.00	2.00	1.00	1.00	2.00	1.00	1.00	1.55	0.45
Final Sat.:	1900	2820	790	3686	3610	1900	1900	3610	1900	1900	2790	820
Capacity Analysis Module:												
Vol/Sat:	0.13	0.34	0.34	0.08	0.23	0.10	0.11	0.30	0.19	0.11	0.31	0.31
Crit Moves:		****		****			****				****	
Green/Cycle:	0.17	0.36	0.36	0.09	0.28	0.28	0.12	0.33	0.33	0.13	0.33	0.33
Volume/Cap:	0.81	0.94	0.94	0.94	0.81	0.35	0.94	0.91	0.57	0.91	0.94	0.94
Delay/Veh:	62.4	50.6	50.6	89.1	44.7	34.6	96.6	49.6	34.9	87.5	53.2	53.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	62.4	50.6	50.6	89.1	44.7	34.6	96.6	49.6	34.9	87.5	53.2	53.2
DesignQueue:	15	45	12	19	42	9	13	52	17	13	42	12

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Noble Creek Specific Plan
Buildout With Project With Improvments
PM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

Intersection #2 Beaumont Ave. (NS) / 14th St. (EW)

Cycle (sec):	120	Critical Vol./Cap. (X):	0.940
Loss Time (sec):	12 (Y+R = 4 sec)	Average Delay (sec/veh):	50.8
Optimal Cycle:	120	Level Of Service:	D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	10	15	15	10	15	15	10	20	20	10	20	20
Lanes:	2 0	2 0	1	2 0	2 0	1	1 0	2 0	1	2 0	2 0	1
Volume Module:												
Base Vol:	265	1262	288	328	1313	153	187	1044	251	260	1114	423
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	265	1262	288	328	1313	153	187	1044	251	260	1114	423
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	265	1262	288	328	1313	153	187	1044	251	260	1114	423
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	265	1262	288	328	1313	153	187	1044	251	260	1114	423
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	265	1262	288	328	1313	153	187	1044	251	260	1114	423
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Lanes:	2.00	2.00	1.00	2.00	2.00	1.00	1.00	2.00	1.00	2.00	2.00	1.00
Final Sat.:	3686	3610	1900	3686	3610	1900	1900	3610	1900	3686	3610	1900
Capacity Analysis Module:												
Vol/Sat:	0.07	0.35	0.15	0.09	0.36	0.08	0.10	0.29	0.13	0.07	0.31	0.22
Crit Moves:		****		****			****				****	
Green/Cycle:	0.08	0.37	0.37	0.09	0.38	0.38	0.10	0.35	0.35	0.08	0.33	0.33
Volume/Cap:	0.86	0.94	0.41	0.94	0.95	0.21	0.94	0.83	0.38	0.85	0.94	0.68
Delay/Veh:	75.7	49.2	28.3	86.8	49.6	24.9	100.1	40.3	29.6	73.3	53.2	37.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	75.7	49.2	28.3	86.8	49.6	24.9	100.1	40.3	29.6	73.3	53.2	37.8
DesignQueue:	16	58	13	20	59	6	11	49	11	16	54	20

Noble Creek Specific Plan
Buildout With Project With Improvements
PM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

Intersection #3 Beaumont Ave. (NS) / I-10 Fwy. WB Ramps (EW)

Cycle (sec): 120 Critical Vol./Cap. (X): 0.975
Loss Time (sec): 6 (Y+R = 4 sec) Average Delay (sec/veh): 34.1
Optimal Cycle: 120 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Permitted			Permitted		
Rights:	Ignore			Include			Include			Include		
Min. Green:	0	15	15	0	15	15	0	0	0	0	0	0
Lanes:	0 0	2 0	1	0 0	2 0	1	0 0	0 0	0	1 0	1! 0	1
Volume Module:												
Base Vol:	0	1754	992	0	1283	1043	0	0	0	1115	0	893
Growth Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1754	0	0	1283	1043	0	0	0	1115	0	893
User Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	1754	0	0	1283	1043	0	0	0	1115	0	893
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1754	0	0	1283	1043	0	0	0	1115	0	893
PCE Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Vol.:	0	1754	0	0	1283	1043	0	0	0	1115	0	893
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	2.00	1.00	0.00	2.00	1.00	0.00	0.00	0.00	1.56	0.00	1.44
Final Sat.:	0	3610	1900	0	3610	1900	0	0	0	2955	0	2745
Capacity Analysis Module:												
Vol/Sat:	0.00	0.49	0.00	0.00	0.36	0.55	0.00	0.00	0.00	0.38	0.00	0.33
Crit Moves:						****				****		
Green/Cycle:	0.00	0.56	0.00	0.00	0.56	0.56	0.00	0.00	0.00	0.39	0.00	0.39
Volume/Cap:	0.00	0.86	0.00	0.00	0.63	0.98	0.00	0.00	0.00	0.98	0.00	0.84
Delay/Veh:	0.0	26.4	0.0	0.0	18.4	47.0	0.0	0.0	0.0	50.6	0.0	36.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	26.4	0.0	0.0	18.4	47.0	0.0	0.0	0.0	50.6	0.0	36.3
DesignQueue:	0	58	0	0	41	36	0	0	0	51	0	40

Noble Creek Specific Plan
Buildout With Project With Improvements
PM Peak Hour

Level Of Service Computation Report
1997 HCM Operations Method (Base Volume Alternative)

****

Intersection #4 Beaumont Ave. (NS) / I-10 Fwy. EB Ramps (EW)

****

Cycle (sec):	0	Critical Vol./Cap. (X):	0.842
Loss Time (sec):	9 (Y+R = 4 sec)	Average Delay (sec/veh):	13.5
Optimal Cycle:	69	Level Of Service:	B

****

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Protected			Permitted			Permitted		
Rights:	Include			Include			Ignore			Include		
Min. Green:	0	15	15	10	15	0	0	0	0	0	0	0
Lanes:	0 0	3 0	1	2 0	2 0	0	2 0	0 0	1	0 0	0 0	0
Volume Module:												
Base Vol:	0	2517	985	568	1883	0	219	0	1862	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Initial Bse:	0	2517	985	568	1883	0	219	0	0	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
PHF Volume:	0	2517	985	568	1883	0	219	0	0	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	2517	985	568	1883	0	219	0	0	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Final Vol.:	0	2517	985	568	1883	0	219	0	0	0	0	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.91	1.00	0.97	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	3.00	1.00	2.00	2.00	0.00	2.00	0.00	1.00	0.00	0.00	0.00
Final Sat.:	0	5187	1900	3686	3610	0	3686	0	1900	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.49	0.52	0.15	0.52	0.00	0.06	0.00	0.00	0.00	0.00	0.00
Crit Moves:			****	****			****					
Green/Cycle:	0.00	0.62	0.62	0.18	0.80	0.00	0.07	0.00	0.00	0.00	0.00	0.00
Volume/Cap:	0.00	0.79	0.84	0.84	0.65	0.00	0.84	0.00	0.00	0.00	0.00	0.00
Delay/Veh:	0.0	11.3	16.2	36.6	3.5	0.0	52.9	0.0	0.0	0.0	0.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	11.3	16.2	36.6	3.5	0.0	52.9	0.0	0.0	0.0	0.0	0.0
DesignQueue:	0	42	17	19	17	0	8	0	0	0	0	0

****

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F. AIR QUALITY IMPACT URBEMIS7G MODELING

URBEMIS 7G For Windows 5.1.0

File Name: C:\Program Files\URBEMIS 7G For Windows\Projects\noble.urb
Project Name: Noble Creek Vistas
Project Location: South Coast Air Basin (Los Angeles area)

DETAIL REPORT
(Pounds/Day - Winter)

Total Land Use Area to be Developed (Estimated): 193 acres
Retail/Office/Institutional Square Footage: 0
Single Family Units: 965 Multi-family Units: 0

CONSTRUCTION EMISSION ESTIMATES

Source	ROG	NOx	CO	PM10	SOX
Demolition	-	-	-	0.00	-
Site Grading	3.29	30.86	-	102.56	3.06
Const. Worker Trips	5.70	8.06	15.29	1.55	-
Stationary Equip	1.85	1.51	-	0.09	0.02
Mobile Equip. - Gas	0.00	0.00	-	0.00	0.00
Mobile Equip. - Diesel	4.24	58.00	-	3.57	3.60
Architectural Coatings	0.00	-	-	-	-
Asphalt Offgassing	0.00	-	-	-	-
TOTALS(lbs/day,unmitigated)	15.08	98.43	15.29	107.76	6.68

Changes made to the default values for Construction

The asphalt option switch changed from on to off.
The architectural coating option switch changed from on to off.
The construction year changed from 2000 to 2010.
The construction mitigation measure option switch changed from on to off.
The site grading max daily acreage estimate changed from to 10.
The site grading annual days earth moving changed from 250 to 22.
The site grading tracked loader total vehicles changed from to 2.
The site grading tracked loader hours/day changed from 8 to 6.
The site grading wheeled loader total vehicles changed from to 2.
The site grading wheeled loader hours/day changed from 8 to 4.
The site grading motor grader total vehicles changed from to 2.
The site grading motor grader hours/day changed from 8 to 4.
The worker construction year changed from 2000 to 2005.
The stationary equipment equipment units changed from 2 to 11.
The mobile diesel fork lift 175 HP total vehicles changed from to 4.
The mobile diesel fork lift 175 HP hours/day changed from 8 to 4.
The mobile diesel truck: off hwy total vehicles changed from to 2.
The mobile diesel truck: off hwy hours/day changed from 8 to 4.
Changes made to the default values for Area

The wood stove option switch changed from on to off.
The fireplcase option switch changed from on to off.
Mitigation measure Orient Buildings North/South: Rsdntl Space Heat.
     has been changed from off to on.
Mitigation measure Increase Insulation Beyond Title 24: Rsdntl Space Heat.
     has been changed from off to on.
Changes made to the default values for Operations

The pass by trips option switch changed from on to off.
The mitigation option switch changed from on to off.
The operational emission year changed from 2000 to 2010.
The double counting internal work trip limit changed from to 232.
The double counting shopping trip limit changed from to 116.
The double counting other trip limit changed from to 812.
The travel mode environment settings changed from both to: both



California Air Resources Board

View this page for another pollutant:

Hourly O_3 | 8-Hour O_3 | PM 10 | Fine PM | CO | NO_2 | SO_2 | H_2S

Start Over: Data Statistics Home

Highest 4 Daily Maximum Hourly Ozone Measurements

and Number of Days Above the Hourly Standards at Banning Airport

parts per million

	1998		1999		2000	
High	Aug 3	0.168	Jun 30	0.144	Sep 19	0.138
2nd High	Aug 5	0.160	Jun 29	0.141	Jun 13	0.137
3rd High	Jul 14	0.156	Jun 12	0.135	Aug 5	0.129
4th High	Aug 6	0.155	Jun 28	0.130	Jun 4	0.125
*Days > State Standard	53		55		53	
*Days > National Standard	21		5		4	
**Year Coverage	75		97		100	

← Go Backward a Year | Go Forward a Year →

Make a New Request

* The number of days at least one measurement was greater than the level of the state hourly standard (0.09 parts per million) or the national hourly standard (0.12 parts per million). The number of days above the standard is not necessarily the number of violations of the standard for the year.

** Year Coverage is an indicator of how extensive monitoring was during the time of year when high pollutant concentrations are expected. Year coverage ranges from 0 to 100. For example, a Year Coverage of 75 indicates that monitoring occurred 75% of the time when high pollutant concentrations are expected. For the current year, Year Coverage will be 0 at the beginning of the year and will increase as the data for the year become available.



California Air Resources Board

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View this page for another pollutant:

Hourly O_3 | 8-Hour O_3 | PM 10 | Fine PM | CO | NO_2 | SO_2 | H_2S

Start Over:

Data Statistics Home

Highest 4 Daily Maximum 8-Hour Carbon Monoxide Averages

and Number of Days Above the 8-Hour Standards

at Riverside-Rubidoux

parts per million

	1998		1999		2000	
High	Dec 30	4.78	Jan 7	4.43	Jan 11	3.63
2nd High	Dec 31	4.10	Jan 5	3.93	Jan 10	3.43
3rd High	Nov 25	3.88	Jan 18	3.66	Jan 9	3.09
4th High	Nov 24	3.79	Jan 13	3.60	Feb 9	2.99
*Days > State Standard		0		0		0
*Days > Nat'l Standard		0		0		0
**Year Coverage		85		98		54

← Go Backward a Year | Go Forward a Year →

Make a New Request

---

* The number of days at least one non-overlapping 8-hour average was greater than the level of the state 8-hour standard (9.0 parts per million) or the national 8-hour standard (9 parts per million). The number of days above the standard is not necessarily the number of violations of the standard for the year.

** Year Coverage is an indicator of how extensive monitoring was during the time of year when high pollutant concentrations are expected. Year coverage ranges from 0 to 100. For example, a Year Coverage of 75 indicates that monitoring occurred 75% of the time when high pollutant concentrations are expected. For the current year, Year Coverage will be 0 at the beginning of the year and will increase as the data for the year become available.

G. SCAG POLICIES CONSISTENCY ASSESSMENT

APPENDIX G-SCAG POLICY CONSISTENCY ANALYSIS

INTRODUCTION

Consistent with the Southern California Association of Governments (SCAG) February 20, 2001 response to the project NOP, the following discussions specifically cite policies listed in the SCAG NOP response, and address the manner in which the project is consistent with applicable core policies or supportive of applicable ancillary policies. Specifically, the following discussion evaluate of the project's consistency with applicable regional land use plans/policies, and with the City of Beaumont's General Plan goals, objectives and supporting policies. Each policy discussion concludes with a finding of consistency or inconsistency of the project with stated plans and/or policies. This finding of consistency/inconsistency is considered a preliminary interpretation only. The City of Beaumont, through the public hearing process, is responsible for making the final determination of project consistency. Based on the following discussions, the project is considered to be substantially consistent with applicable regional plans/policies and with relevant City General Plan Land Use Element Goals, Objectives and Policies.

Consistency with Regional Comprehensive Plan and Guide Policies

Policy Statement 3.01: The population, housing and jobs forecasts, which are adopted by SCAG's Regional Council and that reflect local plans and policies, shall be used by SCAG in all phases of implementation and review. The SCAG forecasts presented in Table G-1 are based on ultimate Buildout of the City, including the City Sphere of Influence (SOI) consistent with the adopted/updated General Plan. As relevant, SCAG population, housing, and jobs forecasts were employed in analyses presented in the Noble Creek Vistas Specific Plan EIR. The project is considered consistent with Policy Statement 3.01.

Table G-1
Southern California Association of Governments (SCAG)
Population, Housing and Employment Projections

	2000	2005	2010	2015	2020
WRCOG					
Population	1,315,300	1,564,900	1,814,100	2,033,900	2,204,000
Employment	366,700	454,800	563,200	644,900	740,300
Households	424,600	504,800	585,000	647,800	730,900
City of Beaumont					
Population	18,500	26,600	34,700	41,800	49,200
Employment	6,900	10,300	13,800	16,600	20,100
Households	6,200	9,700	11,200	13,200	15,800

Source: SCAG, 1998 RTP Adopted Forecast, from NOP Response Letter dated February 20, 2001.

Policy Statement 3.03: The timing, financing and location of public facilities, utility systems, and transportation systems shall be used by SCAG to implement the region's growth policies. The Noble Creek Vistas Specific Plan is a 322-acre, master planned residential community placed near existing and programmed transportation, infrastructure, and all necessary supporting municipal facilities. Development of this residential community is governed by a Specific Plan, which is a detailed plan for the development of an area. The Specific Plan directs all facets of development, from the distribution of land uses to the location and sizing of supporting infrastructure, from methods of financing public improvements to development standards within the Specific Plan area. In short, the Noble Creek Vistas Specific Plan governs the timing, financing and location of all needed utility and transportation systems in order to ensure that such services are provided concurrent with the need for such facilities. Through the use of a Specific Plan, the project makes best use of, and minimizes impacts to, existing infrastructure. The project will is considered consistent with Policy Statement 3.03.

Consistency with Core Regional Transportation Plan Policies

Policy Statement 4.01: Transportation investments shall be based on SCAG's adopted Regional Performance Indicators:

> ***Mobility - Transportation Systems should meet the public need for improved access, and for safe, comfortable, convenient and economical movements of people and goods.***
> - ***Average Work Trip Travel Time in Minutes - 22 minutes***
> - ***PM Peak Highway Speed - 33 mph***
> - ***Percent of PM Peak Travel in Delay (All Trips) - 33 percent***

***Accessibility** - Transportation Systems should ensure the ease with which opportunities are reached. Transportation and land use measures should be employed to ensure minimal time and cost.*

- *Work Opportunities within 25 Minutes - 88 percent*

***Environment** - Transportation Systems should sustain development and preservation of the existing system and the environment. (All Trips).*

- *Meeting Federal and State Standards - Meet Air Plan Emission Budgets*

***Reliability** - Reasonable and dependable levels of service by mode. (All Trips).*

- *Transit - 63 percent*
- *Highway - 76 percent*

***Safety** - Transportation Systems should provide minimal, risk, accident, death and injury. (All Trips).*

- *Fatalities Per Million Passenger Miles - 0.008*
- *Injury Accidents - 0.929*

***Livable Communities** - Transportation Systems should facilitate Livable Communities in which all residents have access to opportunities with minimal travel time. (All Trips).*

- *Vehicle Trip Reduction - 1.5 percent*
- *Vehicle Miles Traveled Reduction - 10.0 percent*

***Equity** - The benefits of transportation investments should be equitably distributed among all ethnic, age and income groups. (All Trips).*

- *Low-Income (Household Income $12,000) Share of Net Benefits - Equitable Distribution of Benefits*

***Cost-Effectiveness** - Maximize return on transportation investment. (All Trips).*

- *Net Present Value - Maximum Return on Transportation Investment*
- *Value of a Dollar Invested - Maximum Return on Transportation Investment*

A comprehensive project traffic study was prepared for the proposed project, and was the basis for traffic impacts analysis presented in this Draft EIR. The full analysis is included as Appendix E to this document.

The projected level of mass transit use by patrons and employees of the proposed Specific Plan is speculative. The traffic study assessed potential impacts to the roadway system without any special mass transit consideration. The traffic impact analysis clearly demonstrates that the presented mitigation measures will reduce potential traffic impacts of the project below levels of significance. Compliance with SCAG's adopted Regional Performance Indicators, are discussed below.

Mobility: The project has direct access to major arterial roadways, State Routes 60 and 79 and the Interstate 10 Freeway corridor, facilitating mobility of Specific Plan residents.

Accessibility/Liveable Communities: Consistent with the above discussion on "mobility," the proposed Specific Plan area is proximate to existing employment opportunities in The City of Beaumont. Further, within a an approximate 25-mile radius defined by Palm Springs to the west, Hemet to the south and San Bernardino and Riverside to the east, other cities offer employment opportunities available to the Specific Plan residents. These job opportunities are well served by existing arterial highways that interconnect the subarea and the entire Inland Empire

Environment: As presented in the project Specific Plan, the proposed development represents an efficient and complementary land use, especially in relation to the use of roadway and other existing or programmed infrastructure. The project will logically provide access to the surrounding region via the existing and planned highway system. The project site is also readily accessible to vicinity patrons via the existing local circulation system. The project is conveniently located in relation to its identified market area. Siting of the project as described reduces vehicle travel miles and associated air pollutants.

Reliability: The project site is located proximate to established transit services. As described above and in the project Traffic Study, the subject site has direct access to a highly-developed subregional and regional roadway system. The City of Beaumont and other WRCOG members have coordinated a backbone system of arterial and major roadways that will help assure reasonable and dependable levels of service for private and mass transit vehicles.

Safety: There are clear and obvious elements proposed in the Specific Plan design and/or required by existing City, County and State design standards, which provide empirical information sufficient to characterize the project as having a diminished risk of accident, death and injury. Please refer also to the project Specific Plan, the attached Initial Study, the assessment of potential geologic hazards

presented in EIR Section 4.2, the analysis of potential flood hazards/water resources impacts presented in EIR Section 4.3, and the analysis of potential traffic and circulation impacts presented in EIR Section 4.6. Please refer also to the relating supporting EIR technical appendices.

Equity: Implementation of the project will require and facilitate transportation improvements on abutting roadways, as well as at regionally significant intersections. Improvements resulting from the project will be equally available to all residents of the City and region.

Cost-Effectiveness: Implementation of the project transportation improvements consistent with the design presented in the Specific Plan, and the area-wide improvements plan recommended by the Beaumont Traffic Model and Capital Improvements Program(s) adopted by the City facilitates comprehensive, coordinated planing of transportation improvements, minimizing redundant or inefficient efforts, thereby and maximizing returns on transportation investments.

As supported by the preceding discussions, the project is consistent with the Policy Statement 4.01.

Policy Statement 4.02: Transportation investments shall mitigate environmental impacts to an acceptable level. Potential direct, indirect and cumulative environmental impacts related to the proposed project have been addressed and mitigated, where applicable, in the Draft EIR for the Noble Creek Vistas Specific Plan. Please refer also to EIR Section 4.6, and the project Traffic Study presented in EIR Appendix E. The proposed project is consistent with Policy Statement 4.02.

Policy Statement 4.04: Transportation Control Measures shall be a priority.
Please refer also to EIR Section 4.6, and the project Traffic Study presented in EIR Appendix E. The proposed project is consistent with Policy Statement 4.04.

Policy Statement 4.16: Maintaining and operating the existing transportation system will be a priority over expanding capacity. The proposed project represents buildout of the City consistent with the adopted/updated General Plan. To a large degree the project will utilize existing roadways and/or previously planned/programmed roadway improvements as reflected in the General Plan Circulation Element, as modified by updates to the Beaumont Traffic Model. Improvements required by the project are incorporated in the Beaumont Traffic Model as revised to incorporate the Noble Creek Vistas Specific Plan. The proposed project is substantially consistent with Policy Statement 4.16.

Consistency with Growth Management Policies Related to the Regional Comprehensive Plan Goal to Improve the Regional Standard of Living

Policy Statement 3.04: Encourage local jurisdictions' efforts to achieve a balance between the types of jobs they seek to attract and housing prices. As presented in EIR Section 4.1.2.3, "Population, Employment, and Housing," projected employment/housing trends for the County, WRCOG, and the City indicate a continuing "imbalance" within the subregion, although the degree of imbalance will be alleviated to some extent by an anticipated long-term influx of jobs. SCAG projections for the region anticipate that housing-rich areas will persist in the Inland Empire and peripheral areas of northern Los Angeles County and southern Orange County, with the majority of job creation occurring in central/southern Los Angeles and Orange counties.

The proposed project would contribute more to the housing side of the jobs/housing equation, and in this sense would not alleviate the projected continuation of the housing/jobs imbalance within the subregion. Housing created by the project is however, consistent with SCAG projected housing/employment trends for the City and region. Further, as indicated by SCAG projections, by 2020 the City will approximate SCAG's regionally established employment/housing balance.

Policy Statement 3.05: Encourage patterns of urban development and land use, which reduce costs on infrastructure construction and make better use of existing facilities; Policy Statement 3.09: Support local jurisdictions' efforts to minimize the cost of infrastructure and public service delivery, and efforts to seek new sources of funding for development and the provision of services. Please refer to the Specific Plan, and EIR Sections 4.9 "Utilities/Public Services/Energy," and 7.0 "Alternatives Analysis." The project is consistent with Policy Statements 3.05 and 3.09.

Policy Statement 3.10: Support local jurisdictions' actions to minimize red tape and expedite the permitting process to maintain economic vitality and competitiveness. Future development within the Specific Plan area that is in substantial conformance with the development standards and land use regulations of the Specific Plan may proceed with minimal additional entitlement enactments. For example, the EIR adopted for a Specific Plan may streamline the processing of subsequent discretionary actions by obviating the need for additional environmental documentation. Further, the Specific Plan is an inclusive document wherein development policies, land use regulations, capital improvement programs, and financing methods are all contained in one location, thereby facilitating reference to applicable regulations governing a specific aspect of the development proposal. The project is consistent with Policy Statement 3.10.

Consistency with Growth Management Policies Related to the Regional Comprehensive Plan Goal to Improve the Regional Quality of Life

Policy Statement 3.12: Encourage existing or proposed local jurisdictions' programs aimed at designing land uses which encourage the use of transit and thus reduce the need for roadway expansion, reduce the number of auto trips and vehicle miles traveled, and create opportunities for residents to walk and bike. The proposed project includes land uses that are consistent with the Circulation Element of the Beaumont General Plan's goals and policies supporting the development of public transportation facilities, and providing a safe environment for pedestrians and bicyclists. Further the Specific Plan incorporates bike, pedestrian and equestrian trails and paths. The proposed project is consistent with Policy Statement 3.12.

Policy Statement 3.13: Encourage local jurisdictions' plans that maximize the use of existing urbanized areas accessible to transit through infill and redevelopment; Policy Statement 3.14: Support local plans to increase density of future development located at strategic points along the regional commuter rail, transit systems, and activity centers. Transit opportunities within the City of Beaumont are provided primarily by Dial-A-Ride Service. Regional transit is provided by the Riverside Transit Agency, which provides buses from the corner of 14th Street and Beaumont Avenue hourly, from approximately 7:00 a.m. to 6:00 p.m. Monday through Saturday. The nearest transfer point is approximately 15 minutes away, at San Gorgonio Hospital on Highland Springs Road. The project will have no adverse impact on the provision of this transit service, and future residents of the Noble Creek Vistas community will be well positioned to take advantage of existing transit opportunities. Additionally, a new transit stop is recommended at the project Cougar Way-Beaumont Avenue intersection. The proposed project is consistent with Policy Statements 3.13 and 3.14.

Policy Statement 3.16: Encourage developments in and around activity centers, transportation corridors, underutilized infrastructure systems, and areas needing recycling and redevelopment. Please refer to the Specific Plan and consistency statements for policies 3.05, 3.09, 3.13, 3.14, and 4.01.

Policy Statement 3.17: Support and encourage settlement patterns which contain a range of urban densities. The Noble Creek Vistas Specific Plan will provide low density, single-family residences, consistent with the City's General Plan and Zoning designations for the project site. Elsewhere within the City and region, varied urban densities are evident. The proposed project is consistent with Policy Statement 3.17.

Policy Statement 3.18: Encourage planned development in locations least likely to cause environmental impact. Please refer to the consideration of project alternatives, Section 7 of this EIR. The project is consistent with Policy Statement 3.18.

Policy Statement 3.19: Support policies and actions that preserve open space areas identified in local, state and federal plans. The project will not affect open space areas identified in local, state and federal plans. The project is consistent with Policy Statement 3.19.

Policy Statement 3.20: Support the protection of vital resources such as wetlands, groundwater recharge areas, woodlands, production lands, and land containing unique and endangered plants and animals. Please refer to the discussion of hydrology/water resources presented in EIR Section 4.3, and the discussion of biologic resources presented in EIR Section 4.5.

Policy Statement 3.21: Encourage the implementation of measures aimed at the preservation and protection of recorded and unrecorded cultural resources and archaeological sites. The project site is devoid of recorded cultural resources and archaeological sites. Please refer to EIR Section 4.4 "Cultural Resources." As yet unknown historic resources that may be identified in the course of project implementation will be avoided, or appropriately relocated and preserved. Appropriate mitigation measures have been proposed to address any potentially significant impacts to paleontological, archaeological or historical resources. The project is consistent with Policy Statement 3.21.

Policy Statement 3.22: Discourage development, or encourage the use of special design requirements, in areas with steep slopes, high fire, flood and seismic hazards. The project site does not contain steep slopes, nor is it considered especially susceptible to high fire danger or seismic hazards. Design of the project together with incorporation of proposed mitigation measures will protect structures from potential seismic/geologic hazards and potential flooding of Noble Creek. Please refer also to the Specific Plan and EIR Sections 4.2, "Earth Resources" and 4.3, "Hydrology/Water Resources." The proposed project is substantially consistent with Policy Statement 3.22.

Policy Statement 3.23: Encourage mitigation measures that reduce noise in certain locations, measures aimed at preservation of biological and ecological resources, measures that would reduce exposure to seismic hazards, minimize earthquake damage, and to develop emergency response and recovery plans. Each of these issues is addressed in this EIR (please refer to Section

4.02, "Earth Resources"; Section 4.05, "Biologic Resources"; Section 4.08, "Noise"; and Section 4.10, "Public Services). Mitigation measures have been developed and will be implemented where appropriate. The proposed project is consistent with Policy Statement 3.23.

Consistency with Growth Management Policies Related to the Regional Comprehensive Plan Goal to Provide Social, Political and Cultural Equity

Policy Statement 3.24: Encourage efforts of local jurisdictions in the implementation of programs that increase the supply and quality of housing and provide affordable housing as evaluated in the Regional Housing Needs Assessment. The proposed project will, upon buildout, provide 965 single-family residences to meet the population demands of the City and region as projected by the General Plan and SCAG's growth management plan. Affordable housing is not included as a component of this project but its provision is appropriately addressed in the City General Plan Housing Element. The proposed project is consistent with Policy Statement 3.24.

Policy Statement 3.27: Support local jurisdictions and other service providers in their efforts to develop sustainable communities and provide, equally to all members of society, accessible and effective services such as: public education, housing, health care, social services, recreational facilities, law enforcement, and fire protection. Upon approval, the proposed project would be annexed into the City of Beaumont, where all residents have an equal opportunity to obtain all available public services. Please refer also to EIR Section 4.9, "Utilities/Public Services/Energy." The proposed project is consistent with Policy Statement 3.27.

Air Quality Chapter Core Actions

Policy Statement 5.07: Determine specific programs and associated actions needed (e.g., indirect source rules, enhanced use of telecommunications, provision of community-based shuttle services, provision of demand management-based programs, or vehicle-miles-traveled/emission fees) so that options to command and control regulations can be assessed. Please refer to the above previous discussions of the relevant SCAG policies and consistency statements and the EIR in total. More specifically, please refer to the project mitigation measures summary presented in EIR Section 1.0, "Executive Summary." The proposed project is consistent with Policy Statement 5.07.

Policy Statement 5.11: Through the environmental document review process, ensure that plans at all levels of government (regional, air basin, county, subregional and local) consider air quality, land use, transportation and economic relationships to ensure consistency and minimize conflicts. Potential direct, indirect and cumulative impacts relative to Land Use, Transportation and Air Quality have been addressed and mitigated, where applicable, in the Draft EIR for the Noble Creek Vistas Specific Plan. The proposed project is consistent with Policy Statement 5.11.

Water Quality Chapter Recommendations and Policy Options

Policy Statement 11.02: Encourage "Watershed Management" programs and strategies, recognizing the primary role of local governments in such efforts; Policy Statement 11.06: Clean up the contamination in the region's major groundwater aquifers since its water supply is critical to the long-term economic and environmental health of the region. The financing of such cleanups should leverage state and federal resources and minimize significant impacts on the local economy. Please refer to the Specific Plan and EIR Section 4.3, "Hydrology/Water Resources." The project is consistent with Policy Statements 11.02 and 11.06.

Policy Statement 11.05: Support regional efforts to identify and cooperatively plan for wetlands to facilitate both sustaining the amount and quality of wetlands in the region and expediting the process for obtaining wetlands permits. Please refer to the Specific plan and EIR Sections 4.3, "Hydrology/Water Resources," and 4.5, "Biologic Resources." The project is consistent with Policy Statement 11.05.

Policy Statement 11.07: Encourage water reclamation throughout the region where it is cost-effective, feasible, and appropriate to reduce reliance on imported water and wastewater discharges. Current administrative impediments to increased use of wastewater should be addressed. The City actively employs recycled/reclaimed water where appropriate. Please refer also to the Specific Plan, EIR Section 4.3, "Water Resources," and EIR Section 4.9, "Utilities/Public Services/Energy." The project is consistent with Policy Statement 11.07.

Policy Statement 11.08: Ensure wastewater treatment agency facility planning and facility development be consistent with population projection contained in the RCPG, while taking into account the need to build wastewater treatment facilities in cost-effective increments of capacity, the need to build well enough in advance to reliably meet unanticipated service and storm water demands, and the need to provide standby capacity for public safety and environmental protection objectives. Please refer to the Specific Plan, EIR Section 4.3, "Water Resources," and EIR Section 4.9, "Utilities/Public Services/Energy." The project is consistent with Policy Statement 11.08.

Open Space Chapter Ancillary Goals - Outdoor Recreation

Policy Statement 9.01: Provide adequate land resources to meet the outdoor recreation needs of the present and future residents in the region and to promote tourism in the region; Policy Statement 9.02: Increase the accessibility to open space lands for outdoor recreation; Policy Statement 9.03: Promote self-sustaining regional recreation resources and facilities. The proposed project contains approximately 49 acres of parks and open space including connecting bike, pedestrian, and equestrian paths and trails. Parklands and improved open space provided by the project is more than double State Quimby Act or City requirements for parkland dedications. Parklands proposed by the project will be either naturally self-sustaining unimproved open spaces, or will be improved and maintained by HOA's and/or CFD's structured and implemented concurrent with approval of the project. Please refer also to the Specific Plan and EIR 4.9, "Utilities/Public Services/Energy." The proposed project is consistent with Policy Statement 9.01.

Open Space Chapter Ancillary Goals - Public Health and Safety

Policy Statement 9.04: Maintain open space for adequate protection of lives and properties against natural and man-made hazards; Policy Statement 9.05: Minimize potentially hazardous developments in hillsides, canyons, areas susceptible to flooding, earthquakes, wildfire and other known hazards, and areas with limited access for emergency equipment; Policy Statement 9.06: Minimize public expenditure for infrastructure and facilities to support urban type uses in areas where public health and safety could not be guaranteed. The project does not propose habitable structures within areas of known hazards. Potential seismic effects and flood hazards are mitigated as outlined in EIR Sections 4.2 and 4.3 respectively. Adequate areas clear of flammable growth will be maintained around residential structures consistent with Riverside County Fire Department requirements, thereby reducing potential wildfire hazards. The project site is currently accessible to emergency equipment, and the project does not propose elements or aspects that would adversely affect emergency access. The project is consistent with Policy Statements 9.04, 9.05 and 9.06.

Open Space Chapter Ancillary Goals - Resource Production

Policy Statement 9.07: Maintain adequate viable resource production lands, particularly lands devoted to commercial agriculture and mining operations. The proposed Specific Plan site is has limited agricultural value, and is not defined by the State as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. Limited sand and gravel mining currently occurs within the project site, however, no mineral resources are known to exist on the project site that would be of State or regional importance. The project is consistent with Policy Statement 9.07.

Open Space Chapter Ancillary Goals - Resource Protection

Policy Statement 9.08: Develop well-managed, viable ecosystems or known habitats of rare, threatened and endangered species, including wetlands. Please refer to the Specific plan and the discussion of biologic resources presented in EIR Section 4.5. The project is consistent with Policy Statement 9.08

H. WATER SERVICE ASSESSMENT

Project Water Supply Agreement

DRAFT
8-8-03

WATER SUPPLY AGREEMENT BETWEEN THE SAN GORGONIO PASS WATER AGENCY AND THE CITY OF BEAUMONT

THIS AGREEMENT is entered into this 1st day of September, 2003, by and between the **SAN GORGONIO PASS WATER AGENCY,** a public agency (the "Pass Agency"), and **THE CITY OF BEAUMONT**, a municipal corporation ("Beaumont").

RECITALS

WHEREAS, the Pass Agency was formed by special act of the California Legislature (Stats. 1961, ch. 1435, West's Water Code Appendix §§101-1 et seq. "the SGPWA Act"), which granted it express authority to "contract with the State of California for delivery of water under the State Water Plan." (Water Code Appendix § 101.15); and,

WHEREAS, the SGPWA Act further provides that it was the intent of the Legislature that, "in allocating water received from the State Water Project ... the highest priority shall be given to eliminating groundwater overdraft conditions within any agency or district receiving the water"; and,

WHEREAS, a study conducted by the Pass Agency indicates that there is currently an overdraft condition within the Beaumont Basin; the groundwater basin from which water is extracted to serve the City of Beaumont; and,

WHEREAS, Beaumont desires to participate with the Pass Agency in measures to address the overdraft condition with the ultimate goal of eliminating the continuing overdraft and providing sufficient water supplies to permit growth within its area; and

WHEREAS, the Pass Agency has recently completed the initial phases of its East Branch Extension Project, which consists of a pipeline, pumping stations and other facilities, to transmit State Water Project water into the Pass Agency and into spreading grounds capable of percolating a portion of the State Water Project supply water into the Beaumont Basin for replenishment of the groundwater basin; and,

WHEREAS, the capacity of the East Branch Extension pipeline is sufficient ultimately to import the Pass Agency's Table A allocation of the State Water Project water of 17,300 acre-feet per year which, by a combination of direct groundwater replenishment and by surface deliveries in-lieu of pumping by groundwater producers, is expected to completely eliminate the current overdraft condition and to provide a sufficient supply to avoid future overdraft as a result of new development within the Pass Agency's jurisdiction; and,

WHEREAS, The Pass Agency has commenced a program to percolate 2,000 acre-feet of State Water Project water per year into the Beaumont Basin, but lacks sufficient funding to purchase additional State Water Project water to expand its groundwater replenishment program; and,

WHEREAS, the Pass Agency is currently limited at this stage of its program to completely eliminate the overdraft of the Beaumont Basin, by the capacity of its spreading facilities, but the Pass Agency does have sufficient capacity for percolating a limited amount of additional State Water Project water with funding made available to the Pass Agency by Beaumont; and,

WHEREAS, Beaumont has received an application for development approval for the Noble Creek Vista Specific Plan Project ("Project"), comprised of 965 residential units, which is proposed to be supplied water by the retail water purveyor by increasing the pumping from the Beaumont Basin; and,

WHEREAS, each residential unit of the Project is expected to create an additional demand of .64 acre-feet per year, per unit for a total demand of 618 acre-feet annually for the Project; and,

WHEREAS, the purchase of 618 acre-feet per year of imported State Water Project water for the additional demand of the Project, plus an additional 124 acre-feet per year of imported State Water Project supply, for a total of 742 acre-feet per year for replenishment of the Beaumont Basin, would offset additional pumping from the Beaumont Basin by the retail water purveyor necessary to supply the Project and would provide additional replenishment to help alleviate current overdraft conditions in accordance with the SGPWA Act; and,

WHEREAS, if the approval of the Project by Beaumont is made subject to the yearly purchase of the additional water for replenishment, the Project will not contribute to the overdraft and will promote the Pass Agency's objective of eliminating overdraft of the Beaumont Basin;

NOW THEREFORE, the Parties agree as follows:

1. **CONSISTENCY WITH PRIORITY FOR USE OF STATE PROJECT SUPPLY.**

   The Pass Agency finds and determines that the purchase of additional imported State Water Project water for replenishment of the Beaumont Basin groundwater basin, in an amount which is calculated as 120% of the anticipated annual water demand of the Project, more than offsets the additional pumping that would be required by the retail water agency serving the Project, and that the excess replenishment will partially mitigate the

overdraft of the Beaumont Basin which currently exists without the proposed development. The total amount of State Water Project water to be purchased annually for groundwater replenishment in connection with the Project is 742 acre-feet per year, calculated as follows: 965 residential units × 0.64 af/unit per year = 618 acre-feet per year × 20% = 124 acre-feet per year of additional water to partially mitigate the existing overdraft. The Board of Directors of the Pass Agency therefore finds and determines that by permitting the Pass Agency to purchase and percolate into the Beaumont Storage Unit an additional 742 acre-feet per year of additional water from the State Water Project (618 acre-feet to offset the Project demand and 124 acre-feet for additional mitigation), the use of State Water Project water as provided in this Agreement is consistent with requirements of the SGPWA Act that priority for the use of water delivered under the State Water Plan be given to the elimination of overdraft.

2. PURCHASE OF WATER FOR REPLENISHMENT OF BEAUMONT STORAGE UNIT

From and after the effective date of this agreement, the Pass Agency shall order, purchase and take delivery of 742 acre-feet per year of water from its Table A allocation under its contract with the State of California (hereinafter referred to as the "Purchased Water"), in addition to those quantities of water it would otherwise purchase to conduct its current direct replenishment and in-lieu delivery programs and such future programs that the Pass Agency may undertake with other funding sources. The Purchased Water will be used exclusively for direct replenishment of the Beaumont Basin by percolation, provided that, if direct replenishment is or becomes infeasible as a result of any cause, the Pass Agency may use said Purchased Water for surface deliveries under agreements providing for reduction of pumping in the Beaumont Basin on a one-to-one ratio to the amount of surface water delivered. Alternatively, in the Pass Agency's sole discretion, it may carry over any amount of the Purchased Water that it was not able to use for replenishment in one year to a subsequent year. In the event a portion of the Purchased Water amount is carried over to a subsequent year payment for that water will be deferred to the year in which it is actually used.

3. PAYMENT FOR PURCHASED WATER

The Pass Agency shall have sole control over the timing and method of replenishment operations whether by spreading or in lieu deliveries, including the Purchased Water. The Pass Agency shall invoice Beaumont on a semi-annual basis for the Purchased Water, at a rate that reflects all variable costs of the Purchased Water delivered to the spreading grounds, as provided in Resolution No. 2003-09 including the costs of power, operation &

maintenance, and administration. The costs invoiced to Beaumont shall not include any charges for capital facilities or debt service on capital facilities. Beaumont shall pay for the Purchased Water within 30 days of after the Pass Agency invoices Beaumont for one-half of the total annual amount of Purchased Water provided hereunder. The rate for Purchased Water shall be adjusted annually by the Pass Agency to reflect the actual costs of providing such water in the most recent period.

4. CONSUMPTIVE USE BY THE NOBLE CREEK VISTA SPECIFIC PLAN PROJECT

If, after completion of the Project and the connection to the retail water system, the actual recorded demand of the Project should exceed 618 (965 units × .64 af/unit) acre-feet per year, the amount of Purchased Water Beaumont is required to purchase hereunder shall be increased proportionately, so that the amount of Purchased Water exceeds actual demand by 20 %. For example, if actual water demand associated with the Project is 640 acre-feet per year, the amount Purchased Water Beaumont will be obligated to purchase in the following year shall be increased to 768 acre-feet. However, if the amount of water used by the Project is less than 618 acre-feet per year, Beaumont will nevertheless be obligated to purchase a minimum amount of 742 acre-feet per year during the term of this Agreement.

5. STATUS OF PURCHASED WATER

The Parties acknowledge that the Pass Agency's sole obligation hereunder is to purchase the 742 acre-feet per year of imported State Water Project water and use it for replenishment of the Beaumont Basin. Once the Purchased Water is used for replenishment the Pass Agency shall have no further obligation or liability with respect to the Purchased Water, including but not limited to the extraction or use of the Purchased Water for the Project or otherwise. It is the intent of this agreement that, whatever the ultimate disposition of the Purchased Water, the use of the Purchased Water for replenishment of the Beaumont Basin will more than offset the additional demand created by the Project and as a result the approval of the Project by Beaumont will not exacerbate the existing overdraft condition and will mitigate existing and future overdraft of the Beaumont Basin.

6. TERM

The term of this Agreement will commence September 1, 2003, however the obligations of the Parties will commence upon the date that final tract map approval is given for the Project by Beaumont. This Agreement will continue in effect until such time as it is determined by the Pass Agency that the Beaumont Storage Unit is no longer in overdraft.

7. OTHER AGREEMENTS

It is understood by the Parties that the Pass Agency may enter into other agreements and implement other programs for replenishment of the Beaumont Storage Unit groundwater basin, as funding becomes available for facilities and water purchases, and that the Purchased Water under this Agreement shall be in addition to such other replenishment activities.

8. ADDITIONAL WATER

Nothing herein shall be construed to limit the terms of any future agreements for the purchase of additional State Project Water for replenishment of the Beaumont Basin by the Pass Agency with Beaumont or any other person or entity.

9. REMEDIES FOR BREACH

In addition to other remedies the Pass Agency may have under law, damages or for collection of payments due hereunder for Purchased Water; in the event Beaumont fails or refuses to pay invoices properly submitted by the Pass Agency for Purchased Water, within 60 days after notice of delinquency from the Pass Agency, the Pass Agency may discontinue the spreading or delivery of the Purchased Water, or may reallocate the credit for the Purchased Water to any other agency which produces groundwater from the Beaumont Storage Unit, and agrees to pay for the delinquent charges. In addition, the Pass Agency may refuse to certify an adequate water supply for any future development or project for which development approval by the City of Beaumont is required, until such time as all delinquencies and other breaches have been cured, and sufficient water is replenished into the Beaumont Storage Unit to offset the water demand of all projects approved by Beaumont plus additional amounts to mitigate the overdraft, at Beaumont's sole cost and expense.

10. NOTICES

Any notices required or permitted to be given under this Agreement shall be given or delivered by personal delivery, by facsimile, or by depositing the same in the United States Mail depository, first class postage prepaid, and addressed to the Party to which to notice is directed, as follows:

If to the Pass Agency:
San Gorgonio Pass Water Agency
P.O. Box 520
Beaumont, CA 92223
Attn: General Manager

If to Beaumont:

City of Beaumont
550 East Sixth Street
Beaumont, CA 92223
Attn: City Manager

11. COMPLIANCE WITH THE CALIFORNIA ENVIRONMENTAL QUALITY ACT

The potential environmental impacts of the replenishment of the Beaumont Basin provided for in this Agreement were addressed in the Environmental Impact Report for the San Gorgonio Pass Water Agency Water Importation Plan adopted in April 1994, as amended per the Addendum adopted June 1996. This Agreement makes no changes or additions to the project described in the EIR as amended, therefore, no additional environmental review is required under the California Environmental Quality Act.

12. INTEGRATION

This Agreement represents the entire understanding of the Parties as to those matters contained herein. No prior written or oral understanding shall be of any force or effect with respect to those matters covered by this Agreement.

13. INTERPRETATION AND GOVERNING LAW

This Agreement shall be governed by the laws of the State of California, and construed as if drafted by both Parties. The headings contained within this Agreement are for convenience only, and shall have no force or effect in the construction of this Agreement.

14. MODIFICATION

This Agreement may not be modified, altered or amended except in writing, signed by authorized officials of each Party.

15. NO THIRD PARTY BENEFICIARIES

This Agreement is made and entered into for the sole benefit of the Parties hereto. No other person or entity shall have any right of action based upon the provisions of this Agreement.

16. ASSIGNMENT

Beaumont shall have the right to assign its interest in this Agreement to the Beaumont-Cherry Valley Water District, provided that such assignment shall not relieve Beaumont from any of its obligations hereunder or constitute a waiver of any remedy that the Pass Agency may have to enforce this Agreement against Beaumont or Beaumont-Cherry Valley Water District or both. Except as provided herein, neither Party shall transfer this Agreement, in whole or in part, or any interest hereunder, to any other person or entity,

without the prior written consent of the other party. Any attempt to transfer or assign this Agreement, or any privilege hereunder, without such written consent shall be void and confer no right on any person or entity that is not a party to this Agreement.

Dated: _____

SAN GORGONIO PASS WATER AGENCY

_____
President of the Board of Directors

Dated: _____

CITY OF BEAUMONT

_____
Mayor

SGPWA-WatSupAgmt-Beaumont(8-7clean)

Project Water Supply Reimbursement Agreement

REIMBURSEMENT AGREEMENT

THIS AGREEMENT TO PURCHASE WATER (this "**Agreement**") is made and entered into as of September ___, 2003, by and between Nobel Creek Meadows, LLC ("**Nobel Creek**"), Leonard B. Olinger Family Trust ("**Olinger**"), and D. Donald Lonie ("**Lonie**") (collectively, "**Developers**"), and the City of Beaumont, a municipal corporation (the "**City**").

WITNESSETH:

WHEREAS, Developers have applied for development approval for the Noble Creek Vista Specific Plan Project ("**Project**"), comprising of 965 residential units ("Residential Units");

WHEREAS, Nobel Creek owns the property within the Project identified as Assessor's Parcel Number 406-070-024 upon which 333 of the Residential Units will be constructed;

WHEREAS, Olinger owns the property within the Project identified as Assessor's Parcel Number 406-070-021 upon which 298 of the Residential Units will be constructed;

WHEREAS, Lonie owns the property within the Project identified as Assessor's Parcel Number 406-080-010 upon which 201 of the Residential Units will be constructed;

WHEREAS, 133 of the Residential Units are to be constructed on the property within the Project identified as Assessor's Parcel Number 406-130-007 and which and is not owned by Developers ("Non-Owned Units");

WHEREAS, Developers have proposed that the Project be supplied water from the Beaumont Basin, which is the groundwater basin from which water is extracted to serve the City;

WHEREAS, the City has, subject to approval of the Project and Developers' agreement to reimburse the City, entered into an agreement with the San Gorgonio Pass Water Agency, a public agency (the "**Pass Agency**") under which the City agrees to purchase 742 acre-feet per year for the replenishment of the Beaumont Basin (a copy of the Water Supply Agreement is attached hereto as Exhibit "A" and is incorporated herein by this reference);

WHEREAS, Developers, subject to the approval of the Project, desire to purchase 618 acre-feet per year for use by the Project ("**Project Water Supply**") subject to a pro rata off set for each Residential Unit which is "Transferred," as that term is defined herein;

WHEREAS, the City, subject to the approval of the Project, desires to provide the Project Water Supply to the Project; all as more particularly described in this Agreement.

AGREEMENT

NOW, THEREFORE, for and in consideration of the foregoing promises, the mutual covenants and agreements contained herein, and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Developers and the City hereby covenant and agree as follows:

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1. Purchase of Project Water Supply. Subject to the approval of the Project, the City agrees to provide and continue to provide the Project with the Project Water Supply. Subject to the approval of the Project, the Developers agree to reimburse the City for the Project Water Supply in the amount of $92,640 per year (617.6 acre feet per year x $150 per acre foot). Developers agree that this amount is in addition to the fees to be paid by Developers for the facilities necessary to provide the Project Water Supply. Developers shall reimburse the City for the Project Water Supply provided each year by no later than January 31st of the following year. The amount to be reimbursed by each Developer (subject to reduction pursuant to Section 2) shall be as follows:

Developer Name	**Annual Amount Due**
Nobel Creek	$36,224
Olinger	$32,864
Lonie	$23,552
Total Amount Due	$92,640

2. Reduction of Reimbursement as Residential Units Receive Water Meters. The City agrees that the cost of the Project Water Supply will ultimately be borne by owners of the Residential Units. Accordingly, at the end of each year, the Developers' total annual payment amount will be decreased based upon the number of Residential Units that have been "Transferred" within the previous year. Once such reduction is made, the Developers will have no further obligation to pay for that portion of the Project Water Supply. For the purposes of this Agreement, the term "Transferred" means that a water meter has been paid for and installed in the Residential Unit. The reduction in payment will be applied as between Developers as follows:

2.1. Units Owned by Developers. A Developer shall receive a $96 reduction to its Project Water Supply payment for each Residential Unit on that Developer's property which is Transferred in the previous year.

2.2. Non-Owned Units. Each of the three Developers will receive $32 reduction to its Project Water Supply payment for each Non-Owned Unit which is Transferred in the previous year.

3. Completion of Fewer than 965 Residential Units. The Project, as currently proposed, consists of 965 Residential Units. However, the parties agree that should the Project be lawfully completed with fewer than 965 Residential Units, Developers shall have no obligation to reimburse the City for the Project Water Supply once all Residential Units within the Project, as built, have been Transferred.

4. Right to Require Water Supply from Other Source. The City may, in its sole and absolute discretion, obtain the Project Water Supply from a source other than Pass Agency.

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5. Assignment. This Agreement may be assigned to the Beaumont-Cherry Valley Water District in the City's sole and absolute discretion. A Developer may, without the approval of the City, assign this Agreement to (a) an affiliated entity of such Developer, or (b) to any person or entity in the event of the sale or transfer of such Developer's portion of the Project to such person or entity. All other assignments by any of the Developers shall require the written consent of the City, which consent shall not be unreasonably withheld. All other assignments by the City shall require the written consent of the Developers, which consent shall not be unreasonably withheld.

6. Successors. This Agreement shall be binding upon the heirs, administrators, executors, successors and assigns of each of the parties hereto.

7. Waiver. The waiver by either party of a breach of any provision of this Agreement shall not be deemed a waiver of any subsequent breach whether of the same of another provision of this Agreement.

8. Governing Law. This Agreement shall be construed, enforced and interpreted in accordance with the laws of the State of California.

9. Counterparts. This Agreement may be executed in several counterparts, each of which shall be deemed an original, and all of which together shall constitute one and the same instrument.

10. No Obligation to Third Parties. The execution and delivery of this Agreement shall not be deemed to confer any rights upon, nor obligate either of the parties hereto to any person or entity not a party to this Agreement.

11. Complete Agreement. This Agreement supersedes any prior negotiation, discussions or communications by and between the City and the Developers and constitutes the entire agreement between the City and the Developers with respect to the subject matter hereof.

12. Amendments in Writing. The provisions of this Agreement may not be altered except by a written instrument duly executed by each of the parties hereto.

13. Notices. All notices, demands or other communications given hereunder shall be in writing and shall be deemed to have been duly delivered upon the receipt by facsimile transmission as evidenced by a receipt transmission report, or upon the delivery by overnight express delivery service, addressed as follows:

If to Nobel Creek, to:

Nobel Creek Meadows, LLC
577 North D Street
San Bernardino, CA 92401
Attn.: Jack Vander Woude
Fax: (909) 381-4286

Oct 08 03 02:08p Tahiti Group 909 381 4286 p.4

If to Olinger:	Leonard B. Olinger Family Trust 462 N. Linden Drive #435 Beverly Hills, CA 90212 Attn.: Leonard B. Olinger Fax: _____
If to Lonie:	D. Donald Lonie 411 West State St., Suite B Redlands, CA 92373 Attn.: Fax:_____
If to City:	City of Beaumont 550 East Sixth Street Beaumont, CA 92223 Attn.: City Manager Fax:_____

14. Interpretation. This Agreement is the product of negotiation and preparation by and among the parties. The parties therefore expressly acknowledge and agree that this Agreement shall not be deemed prepared or drafted by one party or another, or its attorneys, and will be construed accordingly.

[This Space Intentionally Left Blank; Signatures Begin On The Next Page]

Oct 08 03 02:08p Tahiti Group 909 381 4286 p.5

IN WITNESS WHEREOF, the City and the Developers have caused this Agreement to be executed and sealed, all the day and year first written above.

DEVELOPERS:

NOBEL CREEK MEADOW, LLC

By: _____

Name: _____

Title: _____

LEONARD B. OLINGER FAMILY TRUST

By: _____

Name: _____

Title: _____

D. DONALD LONIE

By: _____

Name: _____

Title: _____

CITY:

THE CITY OF BEAUMONT, a municipal corporation

By: _____

Name: _____

Title: _____

Oct 08 03 02:08p Tahiti Group 909 381 4286 p.6

EXHIBIT A

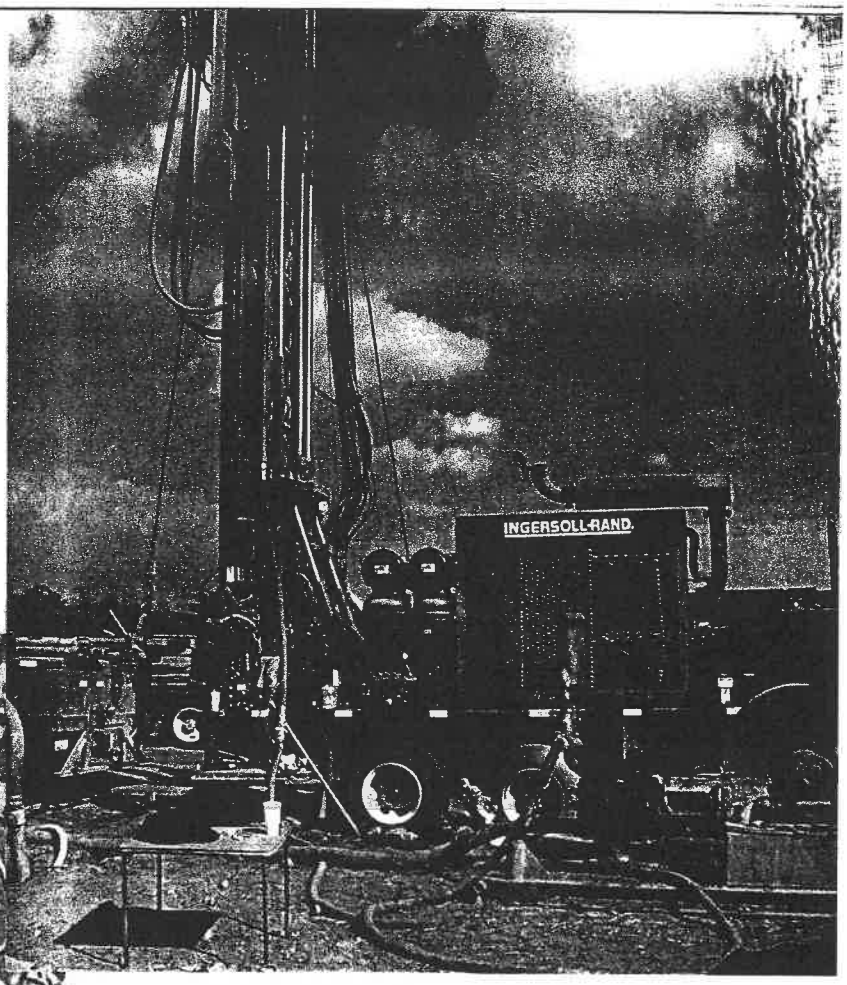
WATER SUPPLY AGREEMENT

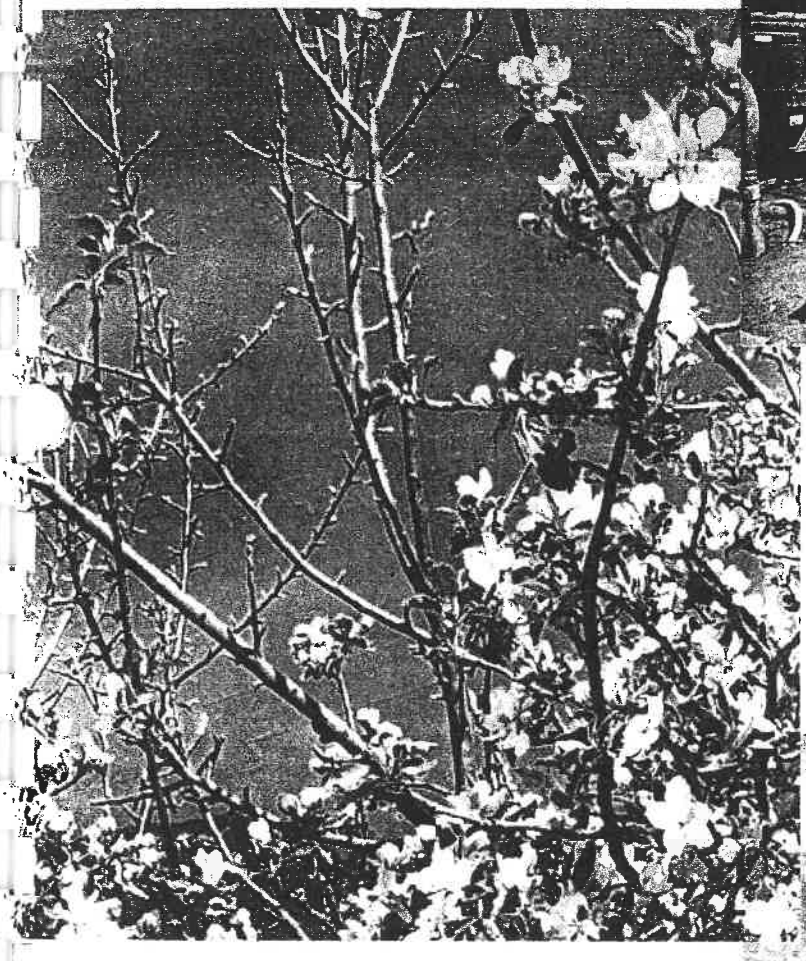
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Urban Water Management Plan

FINAL
2000 URBAN WATER MANAGEMENT PLAN UPDATE

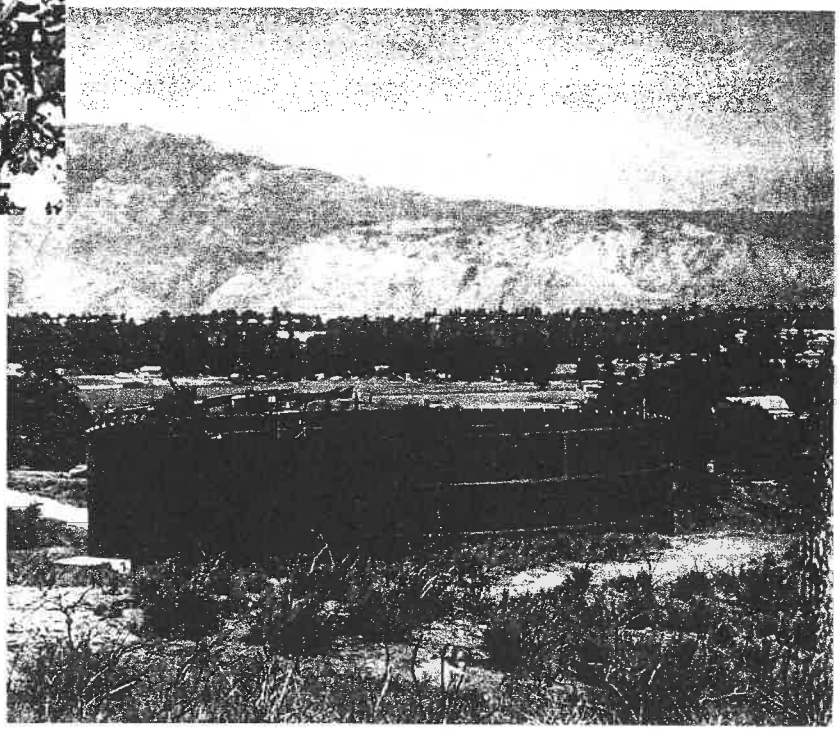




BEAUMONT-CHERRY VALLEY WATER DISTRICT

Beaumont, California

AUGUST 2002



PARSONS

100 West Walnut Street • Pasadena, California 91124 • (626) 440-2000 • Fax: (626) 440-2630 • www.parsons.com

August 7, 2002

Mr. Charles J. Butcher
General Manager
Beaumont-Cherry Valley Water District
560 Magnolia Avenue
Beaumont, CA 92223

Subject: Final 2000 Urban Water Management Plan update, (August 2002)"

Dear Mr. Butcher:

Parsons is pleased to submit the Final Urban Water Management Plan Update (UWMP) dated August, 2002. It incorporates the necessary revisions and reorganization of the Draft UWMP. Enclosed are 10 copies of the Final UWMP for your use and distribution. After final adoption by the Board of Directors at the next scheduled meeting, a copy should be submitted to the State. Prior to submitting the State's copy, the final resolution needs to be inserted into Appendix B and the placeholder removed.

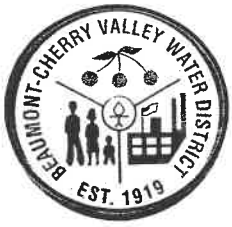
If you have any questions, please feel free to call me at 626-440-6211 or Joy de Graaf at 626-440-6071.

Very truly yours,

Joseph C. Reichenberger, P.E.
District Engineer



FINAL
2000 URBAN WATER MANAGEMENT PLAN UPDATE



BEAUMONT-CHERRY VALLEY WATER DISTRICT
560 N. MAGNOLIA AVENUE
BEAUMONT, CALIFORNIA 92220

AUGUST 2002

BEAUMONT-CHERRY VALLEY WATER DISTRICT

2000 URBAN WATER MANAGEMENT PLAN UPDATE

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BEAUMONT-CHERRY VALLEY WATER DISTRICT
2000 URBAN WATER MANAGEMENT PLAN UPDATE

ABBREVIATIONS AND ACRONYMS

AD	Assessment District
AF	Acre Feet
AF/Day	Acre Feet Per Day
AFY	Acre Feet Per Year
BMP	Best Management Practices
BSU	Beaumont Storage Unit
CFD	Community Facilities District
Company	Beaumont Land and Water Company
District	Beaumont-Cherry Valley Water District
DWR	Department of Water Resources
EDU	Equivalent Dwelling Unit
EMWD	Eastern Municipal Water District
GIS	Geographic Information System
GPCD	Gallons Per Capita Per Day
GPD	Gallons Per Day
GPF	Gallons Per Flush
GPM	Gallons Per Minute
GWMP	Groundwater Management Plan
HP	Horsepower
JPA	Joint Powers Agency
LAFCO	Local Agency Formation Commissions
MAX	Maximum
MCL	Maximum Contaminant Level
MF	Microfiltration
MG	Million Gallons
MGD	Million Gallons Per Day
MIH	Miners Inch Hours

BEAUMONT-CHERRY VALLEY WATER DISTRICT
2000 URBAN WATER MANAGEMENT PLAN UPDATE

ABBREVIATIONS AND ACRONYMS (CONTINUED)

MIN	Minutes / Minimum
MOU	Memorandum of Understanding
MSL	Mean Sea Level
N/A	Not Available/Not Applicable
Pass	San Gorgonio Pass
Pass Agency	San Gorgonio Pass Water Agency
RCFCD	Riverside County Flood Control and Water Conservation District
Recharge Program	Stormwater Runoff and Groundwater Recharge Program
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Board
SAR	Sodium Adsorption Ratio
SCAG	Southern California Association of Governments
SCPGA	Southern California Professional Golf Association
SOI	Sphere of Influence
STWMA	San Timoteo Watershed Management Authority
SWP	State Water Project
TDS	Total Dissolved Solids
THM	Trihalomethane
TOC	Total Organic Carbon
UF	Ultra-filtration
ULFT	Ultra-Low-Flush Toilet
USGS	United States Geological Survey
UWCP/UWMP	Urban Water Conservation Plan/Urban Water Management Plan
WWTP	Wastewater Treatment Plant
YVWD	Yucaipa Valley Water District

SECTION 1
BACKGROUND, PUBLIC INVOLVEMENT, AND BASIS FOR PLANNING

1.1 INTRODUCTION

The California Water Code requires all urban water suppliers within the state to prepare urban water management plans and update them every five years. These plans satisfy the requirements of the Urban Water Management Planning Act of 1983 including amendments that have been made to the Act. Sections 10610 through 10657 of the Water Code detail the information that must be included in these plans, as well as who must file them. Appendix A contains the text of the Act. This report constitutes the 2000 update to the Beaumont-Cherry Valley Water District's (District's) 1995 Urban Water Management Plan (UWMP).

Recent amendments to the Act now require that total projected water use be compared to water supply sources over the next 20 years in 5-year increments. The Act also requests the information be shown for a single dry water year and multiple dry water years. Additional amendments to the Act now require that all plans include a detailed water recycling analysis that includes a description of the wastewater collection and treatment system within the agency's service area along with current and potential recycled water uses.

According to the Act, "The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level." The Act requires that each urban water supplier, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, shall prepare, update and adopt its urban water management plan at least once every five years or before December 31, in years ending in five and zero. The Plan may be updated at any time when the Urban Water Supplier believes significant changes have occurred in population, land use, and/or water sources that may affect the contents in the Plan.

1.2 LAW

> 10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

1.3 PUBLIC PARTICIPATION

Prior to adopting the UWMP, the UWMP is made available for public review and hearing. Notification of the hearing is made pursuant to Section 6066 of the Government Code. Publication of notice pursuant to this Section shall be "once a week for two successive weeks. Two publications in a newspaper published once a week or oftener, with at least five days intervening between the respective publication dates not counting such publication dates, are sufficient. The period of notice commences upon the first day of publication and terminates at the end of the fourteenth day, including herein the first day." Upon completion of the hearing, the District shall adopt the plan as prepared or as modified after the hearing. Within 30 days of adoption of the UWMP by the District, a copy of the UWMP is to be filed with the State of California, Department of Water Resources (DWR).

1.4 PUBLIC HEARING

A public hearing was held at the District offices at 7:00 pm on July 9, 2002. A summary of the public hearing and comments received is provided in Appendix O and this UWMP has been amended as appropriate.

1.5 ADOPTION RESOLUTION

The District prepared this update of its UWMP in March through July 2002. The updated plan is proposed to be adopted by the Board of Directors in early August 2002 (Appendix B) and will be submitted to the California Department of Water Resources within 30 days of Board approval thereafter. This plan includes all information necessary to meet the requirements of California Water Code Division 6, Part 2.6 (Urban Water Management Planning).

1.6 AGENCY COORDINATION

1.6.1 Law

> Describe the coordination of the plan preparation. 10620 (d) (2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

1.6.2 Coordination Within the District

Several agreements with the District and other agencies have been established in order to manage and preserve existing groundwater supplies. In addition, agreements have been developed to put into place mechanisms for development of new sources of water, including facilities for the distribution of recycled water.

The District first developed a needs study in 1980 to identify immediate infrastructure needs to supply water and meet fire flow requirements. This was then developed into a master plan in 1986, which was followed by updates in 1990 and 1994. In each of these plans, the City of Beaumont's General Plan and pending development projects were addressed along with the necessary water supply projects to meet these projected needs. The District has been very proactive in ensuring water supplies are available for all new development.

Senate Bill SB 901 (Costa), chaptered in 1995, required coordination between adopted community general plans and water supply. It also requires the water purveyor to assess the reliability of water supply for all projects, which were above a certain threshold level of development. The Local Government Reorganization Act of 2000 required local agencies, such as the District, to prepare a "Plan of Service" to assess the ability of the agency (District) to provide reliable and cost effective service to the proposed annexation. The District reviews the environmental documents associated with each project and provide comments as appropriate relative to water supply. Appropriate reports and studies are provided as required.

Recent legislation, SB 221 (Kuehl) now requires that the District provide written verification that a sufficient water supply is available or will be available prior to completion of any project with 500 or more homes. The companion bill, SB 610 (Costa), requires specific information to be included in the urban water management plan whenever groundwater is a source of water supply. This Urban Water Management Plan Update conforms to SB 610 and addresses the issues in SB 221.

The District is also a member of the San Timoteo Watershed Management Authority (STWMA). The STWMA is a joint powers agency (JPA) consisting of Yucaipa Valley Water District, City of Beaumont, Beaumont-Cherry Valley Water District, and the South Mesa Water Company. The goal of the JPA is the development of a watershed management program for the San Timoteo watershed area. This program includes specific elements to manage surface water, groundwater, imported water, and recycled water resources.

Table 1-1 summarizes the efforts the District has taken to include various agencies and the community in the Urban Water Management planning process.

Table 1-1
Coordination and Public Involvement

	Helped write the plan	Was contacted for assistance	Was sent a copy of the draft	Commented on the draft	Attended public meetings	Was sent a notice of intention to adopt
San Gorgonio Pass Water Agency (Wholeseller)		√	√	√	√	√
City of Beaumont (Wastewater Agency)		√	√			√
Yucaipa Valley Water District (Water & Wastewater Agency)		√	√			√
San Timoteo Watershed Management Authority		√	√	√		√
Citizen Groups				√	√	√
General Public			√	√	√	
Public Library						√
Various Developers		√	√	√	√	√

1.6.3 Cooperative Agreements with Local Agencies

The District entered into several separate cooperative agreements with the City of Beaumont, San Gorgonio Pass Water Agency (Pass Agency), Riverside County Flood

Control and Water Conservation District (RCFCD), and others as described below to construct predefined improvements including water supply facilities.

- In March of 1993, the District and the City of Beaumont entered into a cooperative agreement to facilitate implementation of the City's General Plan and Public Facilities Financing Program to ensure logical and orderly economic development within the City and the City sphere of influence (SOI) and safe groundwater management practices in the service areas of the District. Included was the need to cooperate in a long-term program to maintain safe groundwater management practices in the service area of the District and recognize the need to establish funding mechanisms to provide for the acquisition and development of certain new sources of water supply, including the use of recycled water and imported water, in such a way as to protect and preserve the existing water supply. A copy is attached in Appendix C.

- In March of 1993, the District and City of Beaumont entered into a cooperative agreement with the Pass Agency to ensure cooperation in developing a long-term program to maintain safe groundwater management practices, to establish funding mechanisms to provide for the acquisition and development of new sources of water supply, including recycled water and imported water, in such a way as to protect and preserve the existing water supply through the importation of supplemental water from the State Water Project (SWP) for direct use and/or groundwater recharge. A copy of the San Gorgonio Pass Water Agency Water Facilities Master Plan Cooperative Agreement is provided in Appendix D.

- In March of 1998, the District and City entered into the Implementation Memorandum of Understanding Relating to Cooperative Agreement Between the City of Beaumont and the District (Reclaimed Water Implementation Memorandum of Understanding) to provide for the construction, ownership, operation, and maintenance by the City of necessary modifications to the wastewater treatment plant and a recycled water distribution system for the City to deliver recycled water to customers and potential customers within the City, the City's SOI, and the District's SOI. A copy is attached in Appendix E.

- In January of 1999, the District, Pass Agency and the RCFCD entered into a cooperative agreement for joint use of existing percolation ponds known as Little San Gorgonio Creek Spreading Grounds. The agreement was formed to ensure that the percolation ponds would be operated in a coordinated manner to allow recharge of both local and supplemental waters to maximize public benefit while preserving existing rights of the District and RCFCD. A copy is attached in Appendix F.

- In November of 2000, the District, along with the City of Beaumont, Yucaipa Valley Water District (YVWD), and the South Mesa Mutual Water Company entered into an agreement to form a JPA, known as the STWMA to implement a regional water resource management program in the upper parts of the San Timoteo and San Gorgonio watersheds that would ensure current and future water supply availability, optimal use of water resources, with an emphasis on maximizing the use of local resources. A copy of this agreement is attached in Appendix G.

1.6.4 Financing Agreement with Local Agencies

- In June of 1993, the City of Beaumont Community Facilities District No. 93-1 (CFD No. 93-1) and the District entered into a financing agreement for the purpose of financing the acquisition and construction of certain public facilities within the boundaries of the City of Beaumont. Certain predefined improvements to be funded by CFD No. 93-1 include recycled water facilities. A copy of the Joint Financing Agreement is provided in Appendix H.
- In December of 1999, the District and the City of Beaumont Community Facilities District No. 93-1 entered into a financing agreement to amend and restate the above joint financing agreement to provide for the issuance of bonds by the City with respect to Assessment District No. 98-1 (AD No. 98-1) to fund water and recycled water improvements and to provide for the annexation of property to CFD No. 93-1, AD No. 98-1 or the creation by the City of another financing district in the future. A copy of the Joint Financing Agreement to reinstate CFD No. 93-1 is provided in Appendix I.

1.6.5 Settlement Agreement with Yucaipa Valley Water District

In January of 1994, the District and YVWD entered into a Settlement Agreement. This agreement was formed as a result of litigation between the two parties regarding extraction of groundwater from the Beaumont Storage Unit (BSU). The agreement set forth the groundwork for a time schedule in developing and implementing a Basin Management Plan for the joint use and management of the BSU. The agreement between the two parties also set forth defined limits on the allowable annual production of groundwater from the BSU. A copy of the Settlement Agreement is provided in Appendix J.

1.7 SUPPLIER SERVICE AREA

1.7.1 Law

> 10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
>
> 10631. (a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

1.7.2 Description

The District owns approximately 2,800 acres of watershed land north of Cherry Valley along the Little San Gorgonio Creek (also known as Edgar Canyon) and Noble Creek. This land has pre-1914 recorded water rights amounting to 3,000 miners inch hours (MIH) or approximately 45,000 acre-feet per year (AFY) of right for diversion of water for domestic and irrigation uses. However, the District has never had a demand that requires such large quantities of water supply; and the watersheds may not be capable of supplying such quantities during an average year. The creeks/canyons have been used for

water development via diversions for irrigation and domestic service since the latter part of the 1800s.

At the turn of the Twentieth Century the District's service area was provided water by the Beaumont Land and Water Company (Company) via diversions along the Little San Gorgonio Creek. This Company owned the land that would become the Beaumont Irrigation District in 1919 and the Beaumont-Cherry Valley Water District in 1920. Even though the name has changed, the District's authority comes from the Irrigation District Law of the State of California

As the Company's land began to develop, the need for water grew. To answer the new demands the Company began the construction of wells in 1907 on the watershed lands. With the construction of the new wells the Company began to divert water for recharge in the canyon areas rather than through the direct diversions, which began in 1902. The diversions allowed the Company to recharge the underground aquifers during storm events and pump the water as needed. With the diversions the Company also purchased the riparian water rights from downstream landowners. The purchases required the Company to deliver some amount of water on a regular basis. The District today continues deliveries of water as required by agreements dating back to the early 1900s. At the present time the District is not operating the wells in Noble Canyon.

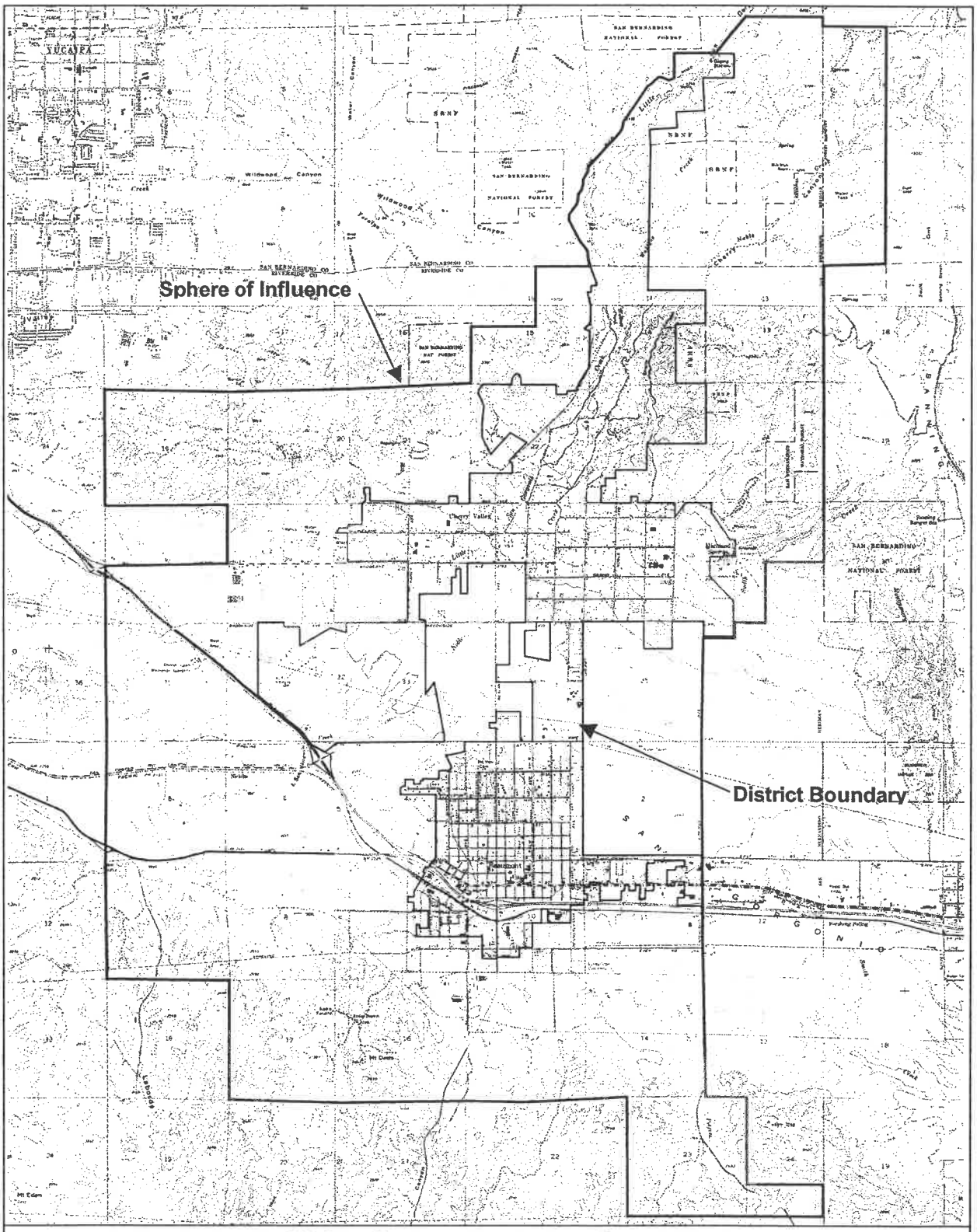
Figure 1-1 shows the District's present service boundary and SOI. The District's present service area covers approximately ten square miles, virtually all of which is in Riverside County and includes the City of Beaumont and the community of Cherry Valley. The District owned land in San Bernardino County is located just north of the Riverside-San Bernardino County line in Edgar Canyon where the District operates a number of wells and a reservoir.

The District's SOI, or ultimate service planning area, encompasses an area of approximately 40 square miles. This SOI was established by the Riverside and San Bernardino County Local Agency Formation Commissions (LAFCOs). SOIs are established as a planning tool and help establish agency boundaries and avoid problems in service, unnecessary duplication of costs, and inefficiencies associated with overlapping service.

The District's SOI is bounded on the west and north by the YVWD and on the east by the City of Banning. The northerly boundary of Eastern Municipal Water District (EMWD) is one-mile south of the District's southerly SOI boundary. The area between EMWD and the District's SOI is not within any SOI and could be annexed to either the District or EMWD.

In 1982, the District petitioned San Bernardino LAFCO to extend the District's SOI into the area west of Oak Glen Road known as the Wildwood Canyon area. YVWD opposed that extension, and after much discussion, the District and YVWD entered into an agreement which limited the District's SOI in San Bernardino County to the area east of Oak Glen Road in exchange for the agreement that YVWD would not export water from Wildwood Canyon.

In Riverside County, the north half of Section 30, T2S, R1E is not presently in the SOI of either YVWD or the District. This area was disputed and claimed by both agencies. Representatives of the YVWD and the District have met to discuss this area. Meetings and negotiations are currently being held which will reestablish a comprehensive SOI



Source: modified from USGS 1:24 000 topographic maps of Beaumont, Forest Falls, Yucaipa, and El Casco, CA

NORTH

0 8000

Approximate Scale in Feet

Figure 1-1
District Boundary and Sphere of Influence
Beaumont Cherry Valley Water District
Beaumont, California

between the two Districts. As of this date no formal agreement has been drawn up, however, taking a conservative planning approach, the north half of Section 30 is included in the District's service area for water service.

The service area ranges in elevation from 2,600 feet above mean sea level in Beaumont, to 2,800 feet in Cherry Valley, and over 4,000 feet in the upper reaches of the SOI.

1.7.3 Climate Characteristics

1.7.3.1 Temperature

In Beaumont, mean daily minimum and maximum temperatures in January are 37°F and 58°F, respectively, and in July, 58°F and 95°F, respectively. However, temperatures below freezing are common in winter in the upper elevations of the service area. Temperatures over 100°F are also common in the summer.

1.7.3.2 Precipitation

Virtually all the precipitation occurs during the months of November through April; most of the precipitation is in the form of rain, but snow is common in higher elevations of the service area during the winter. Annual precipitation in Beaumont averages approximately 18.5 inches, with increasing amounts of precipitation with increasing elevation.

1.7.4 Demographic Characteristics

1.7.4.1 Population Density

1.7.4.1.1 Current

The District's present service area includes approximately 6,173 service connections. The US Census data for the year 2000 was adjusted to estimate the actual population located within the District boundary using a Geographic Information System (GIS) model along with District information on services outside the current District boundary. The population served within the District service area was approximately 14,550 with an estimated 9,650[1] in the City of Beaumont, 320 in unincorporated areas, and 4,580 in Cherry Valley[2,3]. It should be noted that the Census 2000 data for the City of Beaumont totals 11,384 and for Cherry Valley totals 5,891; however, not all of the population within the City of Beaumont and Cherry Valley is currently served by the District.

1.7.4.1.2 Projected

Based on the Southern California Association of Governments (SCAG) 2001 Regional Transportation Plan (RTP) Growth Forecast[4] the forecasted population for the City of Beaumont is presented in Table 1-2 for the years of 2010 through 2025. It is assumed that the entire City of Beaumont will be served by the District by the year 2005. Overall, the average estimated growth is forecast to be approximately 2,000 people per year through 2025. Based on these forecasts as well as past and present population estimates, population, housing, and corresponding Equivalent Dwelling Unit (EDU) projections

were estimated and provided in Table 1-2. This represents a forecasted linear increase in the population as shown in Figure 1-2.

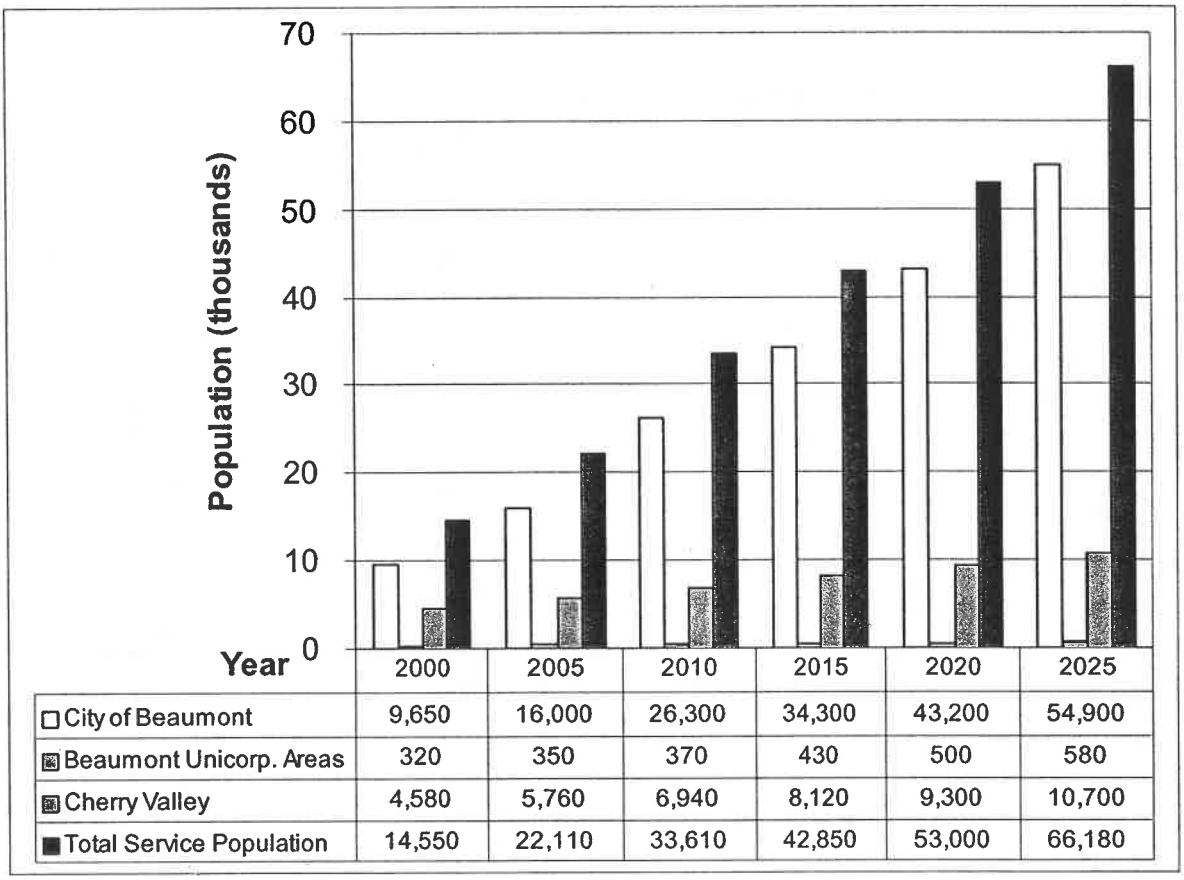
Table 1-2
Population, Housing, and EDU Projections

	2000	2005	2010	2015	2020	2025
City of Beaumont[1,5]						
Population	9,650	16,000	26,300	34,300	43,200	54,900
Households	3,293	5,500	9,200	12,400	16,300	20,500
People / EDU	2.93	2.90	2.86	2.77	2.65	2.68
Beaumont Unincorporated Areas[2]						
Population	320	350	370	430	500	580
Households	100	110	120	140	160	190
People / EDU	3.11	3.08	3.06	3.02	3.04	3.03
Cherry Valley[3]						
Population	4,580	5,760	6,940	8,120	9,300	10,700
Households	1,700	1,900	2,300	2,700	3,100	3,500
People / EDU	2.70	3.08	3.06	3.04	3.04	3.03
TOTALS						
Population	14,550	22,110	33,610	42,850	53,000	66,180
Households	5,093	7,510	11,620	15,240	19,560	24,190
People / EDU	2.86	2.94	2.89	2.81	2.71	2.74

The population forecast for Cherry Valley is based on the Cherry Valley Community Policies of one-acre single-family residential lots, which would forecast for an ultimate growth of approximately 24,700. The forecasted growth from 2005 through 2025 for both the unincorporated area of the City of Beaumont and Cherry Valley is based on the forecasted, equivalent rate of growth of the unincorporated areas of West Riverside County[6]. Most development is occurring within the City of Beaumont, and the forecast for these areas coincides with SCAG's forecast for all unincorporated cities in west Riverside County.

Based on these projections the total service area population for the District will increase by more than 2.3 times the current population in 2010, and by 2025, it is projected to increase by more than 4.5 times the current population.

Figure 1-2
Population Growth Past, Present, and Forecast



	2000	2005	2010	2015	2020	2025
City of Beaumont	9,650	16,000	26,300	34,300	43,200	54,900
Beaumont Unicorp. Areas	320	350	370	430	500	580
Cherry Valley	4,580	5,760	6,940	8,120	9,300	10,700
Total Service Population	14,550	22,110	33,610	42,850	53,000	66,180

1.7.4.2 Land Development

Historically, the principal industry in the Beaumont and Cherry Valley area has been agriculture and agriculture related services, particularly those associated with fruit production (cherries) and egg ranching. Current trends suggest that more and more agricultural areas are being converted to residential uses as new buyers are seeking more affordable homes. Several major development projects have already been started or are in the planning phase. These include the Oak Valley Greens, Three Rings Ranch, Noble Creek Vistas, Oak Valley Partners Champion Development, Hovchild Sunburst Development, and the Rolling Hills projects, just to name a few. These projects and others will have a major impact on the District's water supply system and the water resources in the entire San Gorgonio Pass (Pass) area. Table 1-3 lists the projected number of water user connections by customer type.

Table 1-3
Number of Connections by Customer Type

Customer Type	1990	1995	2000	2005	2010	2015	2020	2025
Residential	N/A	N/A	5,555	8,378	11,962	15,076	17,633	19,337
Commercial	N/A	N/A	263	368	383	389	403	426
Industrial	N/A	N/A	7	10	11	11	12	13
Landscape/ Recycled Water Users	N/A	N/A	108	163	343	505	505	514
Agriculture	N/A	N/A	147	131	123	115	113	95
Other								
Total	**N/A**	**N/A**	**6,080**	**9,050**	**12,821**	**16,096**	**18,666**	**20,385**

A number of proposed developments that have requested water service are shown in Table 1-4.

Future water demands can be developed using either population or land development rate of growth (EDU growth). Both methods are used in this UWMP update.

Using the SCAG estimates for the District SOI, the development growth rate would be approximately 764 EDUs per year over the next 25 years. This estimate greatly exceeds the City of Beaumont's approximation of 600 EDUs per year. Using the known land developments in the District's SOI and projecting their completion, the estimated growth rate over the next 25 years averages approximately 533 EDUs per year; 699 EDUs/year over the next 10 years and 593 EDUs/year over the next 20 years. SCAG estimates have a tendency to be a little higher than actual growth as shown in this example.

Based on the District's knowledge of the service area in concert with the City of Beaumont, the District believes the population growth model developed by SCAG over estimates growth in the service area. The District believes the land development rate better reflects water demand increases in the service area. Therefore, for planning purposes the land development based estimated water supply and demand were used to generate the projected water supply and demands presented in Sections 2 and 3.

Table 1-4
Developments Requesting Service

Project Name	Entitlement Status	Jurisdictional Status	Development Plan	Number of EDUs	Estimated Years to Build Out	Estimated Start Date
Deutsch - Pardee	SP Approved; Tentative Tract Approval in Process	City	Develop Master Plan	4,640	31	2002
Noble Creek Villages	Final Commercial PM in Approved	City	Develop Commercial Lots	140	2	2003
Coscan Stewart, Three Rings Ranch	Final Maps Approved	City	Market Finished Lots / Builder	393	3	2002
Cougar Crossing	Tentative Tract Map Amendment in Process	City	Builder	164	2	2003
Cougar Ranch	Final Map in Process	City	Builder	67	1	2002
Heartland California Beaumont LP	SP/Tentative Tract Map Approved	City	Bulk Sale of JP Offered	1,484	10	2004
Hovchild	SP Approved	City	Bulk Sale Offered	2,305	10	Beyond 2025
Lockhead Aircraft, Beaumont Gateway	SP Amendment in Process	City	In Escrow for Industrial	400	3	2005
Loma Linda	SP / Tentative Commercial PM Approved	City	72 Acres in Escrow for Commercial	2,723	11	Beyond 2025
Noble Creek (Lone, Donald D.)	Tentative Tract Approved; SP Amendment in Process	Annexation in Process	In Escrow with Builder	200	2	2003
Noble Creek Meadows, LLC	Tentative Tract Approved; SP Amendment in Process	Annexation in Process	Market Finished Lots	300	2	2003
Oak Valley Partners LP / SCPGA	SP Amendment in Process	City Sphere	Portion in Escrow, Bulk Sale; Golf Course Completed	4,250	30	2003
Olinger Commercial	General Plan / Zoning	City	Market Commercial Parcels	84	1	2003
Precision 1 & 2 LLC	Final Map in Process	City	Builder	71	1	2005
Rolling Hills Ranch	Tentative Tract Map Approved	City	In Escrow with Builder	546	4	2003
Westbrook Oak Valley Greens	PUD / Tentative Tract Approved; Final Maps Approved	City	Market Finished Lots	2,740	18	2002
Beaumont Mesa, Nejedly	General Plan / Zoning	City	Finished RV Lots and Single-Family Lots	850	4	Beyond 2025
Willow Springs Area	SP on Hold	Annexation on Hold	Market Finished Lots	3,010	13	Beyond 2025
Mission Viejo Co., Jack Rabbit	SP / Tentative Tract on Hold	Annexation on Hold	Unknown	1,200	5	Beyond 2025
Tract 24933	Tract Maps Approved	City Sphere	Unknown	28	1	2002
Tract 30388	Tract Maps Approved	City Sphere	Unknown	59	1	2003
Tract 25272	Tract Maps Approved	City Sphere	Unknown	20	1	2002
Tract 30131	Tract Maps Approved	City Sphere	Unknown	35	1	2002
Tract 30132	Tract Maps Approved	City Sphere	Unknown	36	1	2002
TOTALS				**25,745**		
OTHER POTENTIAL FUTURE PROJECTS, UNSCHEDULED (Assumed to occur beyond 2025)				**9,880**		Beyond 2025
OVERALL POTENTIAL FUTURE DEVELOPMENT TOTALS				**35,625**		

1.8 PROJECT TEAM

The 2000 Urban Water Management Plan Update was prepared under the direction of Mr. Joseph C. Reichenberger, P.E., District Engineer with assistance from Mr. Steve Gratwick, P.E., Mr. Joseph Walters, P.E., and Ms. Joy de Graaf.

1.9 ACKNOWLEDGEMENTS

The District Engineer would like to express appreciation for the help and assistance given by the Beaumont-Cherry Valley Water District in the study, particularly Mr. C. J. Butcher, General Manager; Julie Audet, Administrative Assistant, Jay Wilfley, General Superintendent, Tony Lara, Production Superintendent, and the rest of the District staff.

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1 http://www.dof.ca.gov/HTML/DEMOGRAP/E5a.xls, California State Department of Finance, Demographic Research Unit, City/County Population and Housing Estimates, 2000 and 2001.

2 *http://www.pe.net/~rksnow/cacountycherryvalleymis.htm*, The Press Enterprise Company, "Key to the City",

3 *http://plue.sedac.ciesin.org/plue/geocorr/htmls/placesCA.html*

4 *http://www.scag.ca.gov/growthforecast/City%20Projections%20for%20Web%20Site.xls*

5 *Basis = http://www.scag.ca.gov/ for population and households*

6 *http://www.scag.ca.gov/growthforecast/City%20Projections%20for%20Web%20Site.xls*

SECTION 2

WATER SOURCES

2.1 LAW

> 10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
>
> 10631 (b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments [to 20 years or as far as data is available.]

2.2 WATER SUPPLY SOURCES

As discussed in Section 1, the District has historically served its customers with groundwater produced from Edgar Canyon and the BSU. Wells in the canyon were supplemented by surface water capture and percolation. The District recognizes the continuing need for development of new water supplies for the planned growth of Cherry Valley and Beaumont. This section of the UWMP provides the existing, planned and ultimate water sources that the District intends to use for distribution to its service area.

2.2.1 Ultimate Supply Sources

The total potential ultimate water available to the District to accommodate growth and new development is as shown in Table 2-1.[1] The ultimate build out condition is not anticipated to occur until approximately 2050 or beyond. The timeline for availability of these water sources is discussed further in this section.

The urban runoff and associated groundwater recharge for the potential ultimate available water source is estimated using all of the undeveloped portions of the District's SOI and factoring out evapotranspiration during the wet season months. Urban runoff would be a new source of water supply not currently available. The availability of this urban runoff will depend heavily on what runoff controls (e.g., capture ponds for recharge) are implemented for all future developments. The City of Beaumont in cooperation with the District and RCFCD has plans to implement retention projects along Noble, Marshall, and Potrero Creeks for capture and recharge of urban runoff. The City of Beaumont requires new developments to include retention basins that recharge stormwater.

Table 2-1
Potential Ultimate District Available Water Sources (Average Years)

Source	Annual Yield (AF)
Groundwater, BSU[2]	2,300 to 4,300[a]
Groundwater, Edgar Canyon	2,600 to 1,800[b]
Imported SWP[3]	6,500
Return Flows from Septic Systems	1,200[c]
Stormwater Capture and Groundwater Recharge	4,100
Capture Infiltration (shallow groundwater)	300
Urban Runoff/Groundwater Recharge	6,800[d]
Well Transfers from Recycled Water Users	4,500
Conversion of Existing Potable Water Uses to Recycled Water and/ Replenishment Groundwater Using Recycled Water[4]	8,700
Total Potential Ultimate Available Water Supply	**37,400**

a For planning purposes 3,500 AFY will be used. Ultimately the District will acquire a larger portion of the annual yield of the BSU.
b Reduction in annual yield anticipated to occur with implementation of stormwater capture program and the reduction in recharge in Edgar Canyon. Therefore for planning purposes 1,800 AFY will be used.
c Based on an ultimate build-out of 1 EDU/acre and 0.15 AFY/septic system.
d Based on urban runoff calculations for all undeveloped areas within the District SOI.

2.2.2 Existing and Planned Supply Sources

Table 2-2 provides a summary breakdown of current and projected available water supply for the next 20+ years based on planned developments. The District currently receives all of its potable water supply from wells. For as long as the District has been serving the local community, the wells, supplemented with captured surface flows, have been capable of meeting the increase in demands for potable water. However, the District's service area is undergoing rapid development and population growth, which creates a higher potable water demand. In association with the potable demand, the area has also had an increase in landscaped areas such as golf courses. Non-potable demands will be met with recycled water supply where possible. The planned community growth and associated demands for water supply have generated the District's need to find new sources of supply. The timeline for these new sources is provided in Table 2-2 by the planned years in which these sources become available.

The District will initially utilize recycled water from the City of Beaumont's wastewater treatment plant as well as the percolation of stormwater in groundwater basins to meet the increased demands projected through the year 2025. Thereafter, supplemental SWP water may be utilized to supplement the remaining water supply needs.

The estimates provided in Table 2-2 for urban runoff were calculated using the Deutsch-Pardee and Oak Valley Partners LP/SCPGA developments. It was assumed that 25% of the developed acreages were impermeable. The wet season pan evaporation[5] was used to estimate evapotranspiration and adjust the available runoff for groundwater recharge. The wet season was assumed to occur between November and April. Annual average precipitation in Beaumont was estimated at 18 inches (1.5 ft). Figure 2-1 shows the current and projected available water supplies in a graphical format.

Table 2-2
Current and Projected Available Water Supplies – Development Basis

Water Supply Sources	2000[a]	2005	2010	2015	2020	2025
SWP Via Pass Agency (Estimated Available)	0	5,000	5,000	5,000	5,000	5,000
Groundwater Extractions (Edgar Canyon)	2,671	1,800	1,800	1,800	1,800	1,800
Groundwater Extractions (BSU)	3,637	3,500	3,500	3,500	3,500	3,500
Return Flows from Septic Systems	0	280	350	400	460	520
Urban Runoff/Groundwater Recharge[b]	0	400	1,000	1,100	1,200	1,300
Captured Infiltration (shallow groundwater)	0	0	300	300	300	300
Stormwater Capture / Groundwater Recharge	0	2,600	4,100	4,100	4,100	4,100
Recycled Water Users -Well Transfers[c]	0	800	2,600	4,500	4,500	4,500
Recycled Water Supply / Use[d]	0	1,000	3,200	4,100	4,600	5,100
Total Forecasted	**6,308**	**15,380**	**21,850**	**24,800**	**25,460**	**26,120**
Units of Measure: **Acre-feet/Year**						

a Current water supply indicates actual water production for year 2000 and may not include all available water supply.
b Includes 500 AFY estimated urban runoff at Cherry Ave and Brookside Ave starting around 2010.
c Acquisition of potable water supply wells from potential recycled water users as they become District customers.
d Recycled water supply that would be in demand for non-potable use by various potential users including but not limited to: Oak Valley Greens-800 AFY, Oak Valley Golf and Resort (SCPGA)-800*2 AFY, Highland Springs North-200 AFY, SunnyCal-1900 AFY.

Figure 2-1
Current and Projected Available Water Supplies

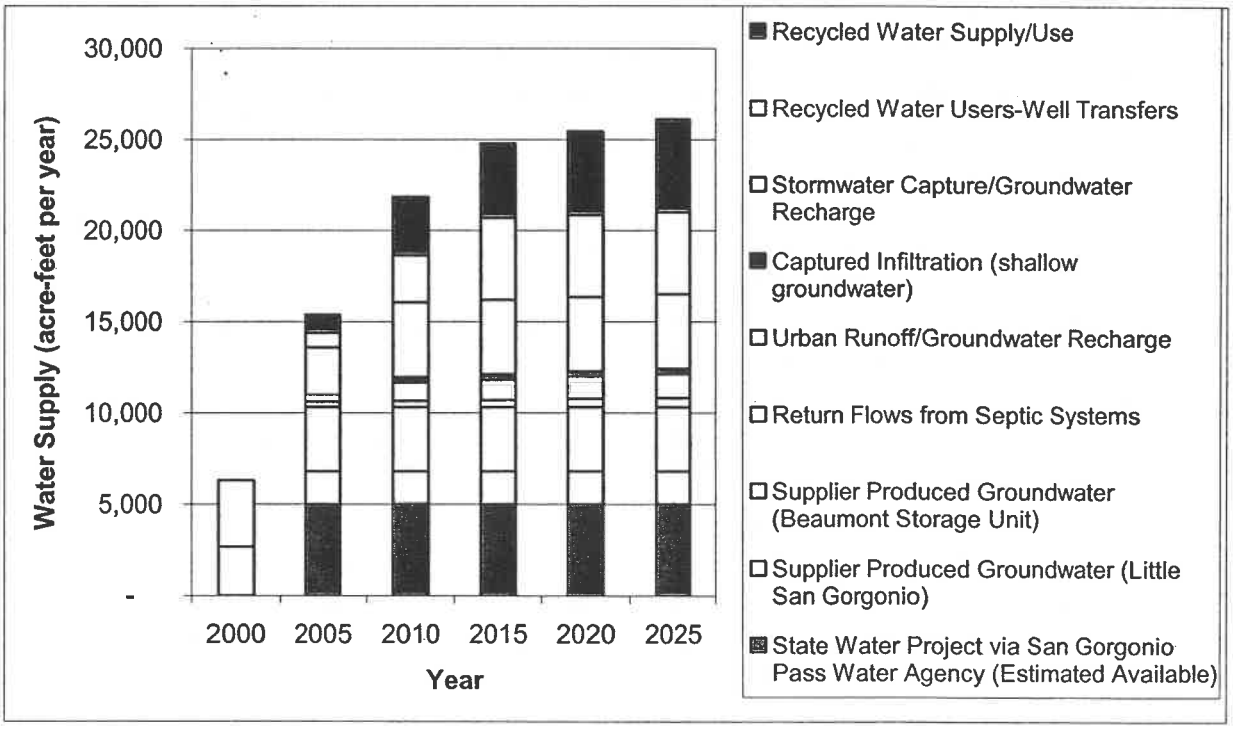


Table 2-3 below provides a summary breakdown of current and projected available water supply for the next 20+ years based on population growth. As discussed in Section 1 of this UWMP, the population growth estimates outpace the planned development estimates provided by the City of Beaumont and the District. All of the water supply estimates remain the same when comparing the land development based and population based water sources with the exception of recycled water available. Due to the increased growth rate of population as provided by SCAG, there would be an increase in wastewater generation and therefore additional recycled water available for reuse. All of the subsequent discussion in Section 2 refers to the planned development based estimates.

Table 2-3
Current and Projected Available Water Supplies – Population Basis

Water Supply Sources	2000[a]	2005	2010	2015	2020	2025
SWP Via Pass Agency (Estimated Available)	0	5,000	5,000	5,000	5,000	5,000
Groundwater Extractions (Edgar Canyon)	2,671	1,800	1,800	1,800	1,800	1,800
Groundwater Extractions (BSU)	3,637	3,500	3,500	3,500	3,500	3,500
Return Flows from Septic Systems	0	280	350	400	460	520
Urban Runoff/Groundwater Recharge[b]	0	400	1,000	1,100	1,200	1,300
Captured Infiltration (shallow groundwater)	0	0	300	300	300	300
Stormwater Capture / Groundwater Recharge	0	2,600	4,100	4,100	4,100	4,100
Recycled Water Users -Well Transfers[c]	0	800	2,600	4,500	4,500	4,500
Recycled Water Supply / Use[d]	0	1,000	3,600	4,800	5,700	6,000
Total Forecasted	**6,308**	**15,380**	**22,250**	**25,500**	**26,560**	**27,020**
Units of Measure: **Acre-feet/Year**						

a Current water supply indicates actual water production for year 2000 and may not include all available water supply.
b Includes 500 AFY estimated urban runoff at Cherry Ave and Brookside Ave starting around 2010.
c Acquisition of potable water supply wells from potential recycled water users as they become District customers.
d Recycled water supply that would be in demand for non-potable use by various potential users including but not limited to: Oak Valley Greens-800 AFY, Oak Valley Golf and Resort (SCPGA)-800*2 AFY, Highland Springs North-200 AFY, SunnyCal-1900 AFY.

Presently the BSU is not adjudicated. Through the efforts of the STWMA, the BSU is expected to be adjudicated as early as the end of 2002 or the beginning of 2003. Therefore for planning 3,780 to 4,020 acre-feet including septic system return flows will be used as the District's available BSU supply. This amount is believed to be conservative and possibly the amount allocated to the District may be higher. Taking into consideration the additional groundwater that will be available to the District, over the next twenty-five years as the recycle water use increases, the available supply will increase to 8,520 AFY from the BSU.

Presently potable water is being supplied by wells not owned or operated by the District for irrigation of the Oak Valley Golf Course, SCPGA and Highland Springs, North Golf Course. As these potable water irrigation demands are replaced with recycled water, the amount of groundwater previously pumped for irrigation will be available to the District for meeting potable water demands over the next twenty-five years. It is anticipated that approximately 4,500 AFY of potable water use for irrigation will be replaced with recycled water for irrigation of these golf courses. This amount is above the 1,100 AFY of potable water presently supplied by the District to irrigation users that will also be

included in the Recycled Water in lieu Program.

2.2.3 Groundwater

2.2.3.1 Existing Sources

Table 2-4 presents a summary of the District's wells and their current capacity.

The District currently owns and operates a total of 23 groundwater wells of which only 19 are used to any great degree. These 19 wells have a total production capability of approximately 20 million gallons per day (mgd).

The District's wells are located in four areas:

- Upper Edgar Canyon (San Bernardino County)
- Middle Edgar Canyon (San Bernardino County)
- Lower Edgar Canyon (Riverside County)
- BSU (Riverside County)

Note that "Edgar Canyon" is synonymous with "Little San Gorgonio Creek".

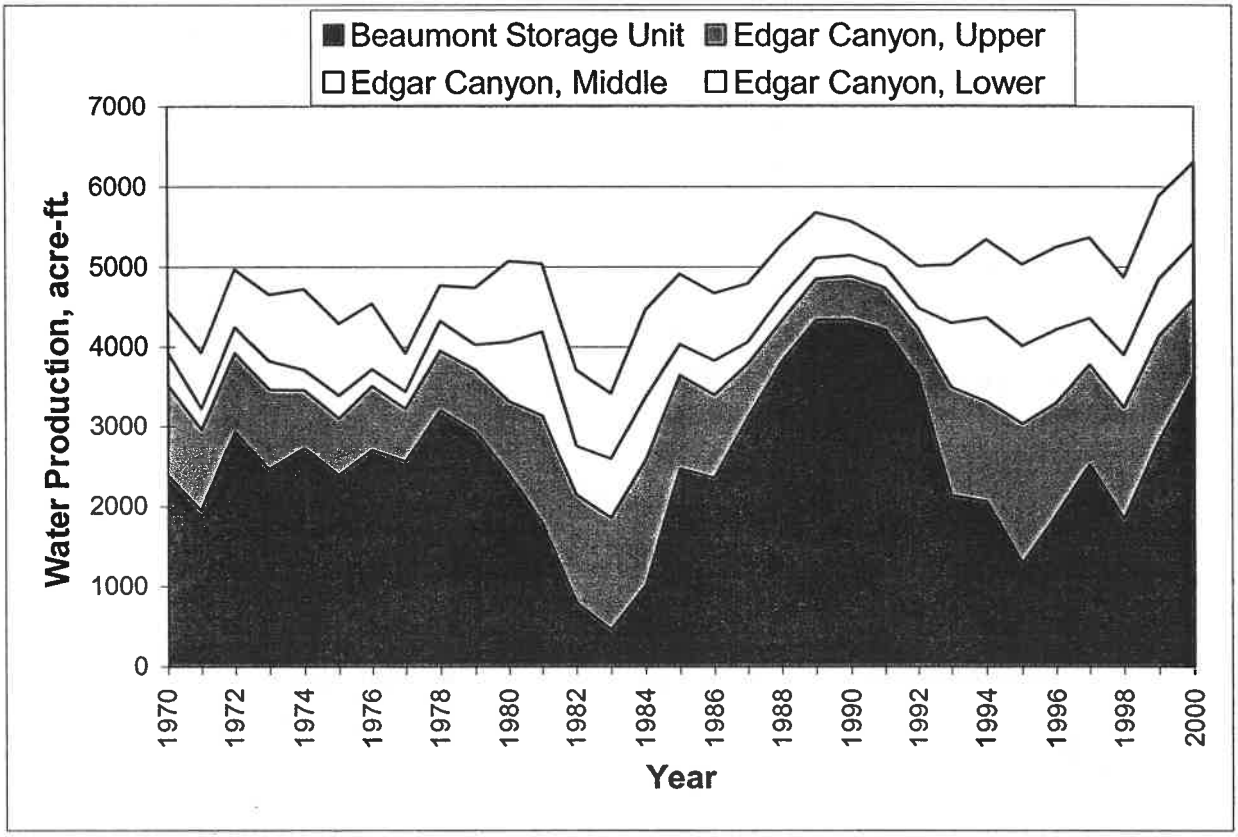
Table 2-4
Groundwater Well Capacity Summary

Area / Location	No. of Wells	Pump Capacity	
		(mgd)	(AFY)
Upper Edgar Canyon	9	2.88	3,230
Middle Edgar Canyon	1	0.86	960
Lower Edgar Canyon	3	1.65	1,850
BSU	6	14.83	16,610
TOTALS	**19**	**20.22**	**22,650**

Not included above is the District's recently drilled well in the BSU, which has been test pumped to 3,000 gallons per minute (gpm). This well is anticipated to be on-line in late 2002 or early 2003. The District's current maximum day demand is approximately 11 mgd. Production capacity currently exceeds maximum day demand.

The District's annual groundwater production from 1970 through 2000 is depicted in Figure 2-2. From 1970 to 2000, the District's average annual production was 4,873 acre-feet. The minimum annual production of 3,417 acre-feet occurred in 1983 and the maximum annual production of 6,308 acre-feet resulted in 2000. For the 1970 – 2000 period, the BSU supplied approximately 53% of the total groundwater production while 21%, 10%, and 16% were produced from the Upper, Middle, and Lower Edgar Canyon areas, respectively. Total production in any given year is a function of the hydrologic conditions and usually mirrors the annual rainfall.

Figure 2-2
Groundwater Production from 1970 through 2000



The BSU is a large underground storage reservoir with at least 1.1 million acre-feet of water in storage and about 200,000 to 400,000 acre-feet of unused groundwater storage. The groundwater recharge projects being implemented by the District and the City of Beaumont will increase the recharge of the BSU. The District will recover this new recharge through wells as part of their normal supply. The BSU will also be used to store supplemental water during years of surplus that will subsequently be used during dry years (local dry-year yield or conjunctive use). The STWMA has indicated that between 1980 and 2000 the BSU has generally been in equilibrium; during wet years the BSU has been recharged by rainfall percolation to offset extractions during dry years.

An important element in maintaining present water supplies, especially in the BSU, is cooperative use of the available groundwater. The District and affected agencies, such as, the City of Beaumont and YVWD, formed mutual two-party agreements, similar to agreements discussed in Section 1, and the STWMA to manage the BSU in order to preserve and protect the BSU at current levels.

2.2.3.2 Planned Sources

The District currently maintains 40 to 50 ponds in Upper Edgar Canyon to capture and recharge winter runoff on Little San Gorgonio Creek in an effort to supplement the groundwater in the canyon and minimize the amount of water extracted from the BSU.[6]

The Upper Edgar Canyon ponds have historically shown an increase in production in the canyon of approximately 800 AFY, however the District estimates that approximately 2,600 AFY has been captured and percolated in the Upper Edgar Canyon ponds. The resulting production from Little San Gorgonio Creek, adjusted for the reduction in stormwater percolation, is therefore approximately 1,800 AFY (2,600 AFY less 800 AFY). This estimate is based on historic pumping records and evaluation of the corresponding weather conditions. It could be overly conservative due to the fact that the historic pumping records matched the water demand on the system.

For planning purposes, the District estimates 5,580 AFY, including return flows, to be the available yield from the BSU and Edgar Canyon areas in 2005. Return flows from septic systems are expected to increase as development planned for 1 EDU/acre increases within the District's SOI. By 2025, the return flows are expected to reach approximately 520 AFY. Over the next twenty-five years the District estimates the yield from both groundwater sources to increase to 10,320 AF annually as the recycled water system comes on line (well transfers to the District) and return flows from septic systems increase due to development. This estimate assumes that the District will be allocated 3,500 AFY in extractions from the BSU once the STWMA has adjudicated the basin. This estimate is considered quite conservative and does not include the additional extractions that would be acquired by the District through the capture and recharge programs involving stormwater and urban runoff, which are discussed under Section 2.2.4.2.

To further accommodate the new development water demands the STWMA plans to develop a watershed management plan for the 140 square mile area, which includes the service area of the members. One of the projects that STWMA is currently working on is the development of a plan for urban stormwater collection and groundwater recharge. This project is jointly funded by STWMA and a grant from the State Water Resources Control Board.

2.2.4 Surface Water

2.2.4.1 Existing

Presently there are no facilities that capture local surface water for direct reuse. As discussed previously, the District owns and operates 40 to 50 ponds in Upper Edgar Canyon to capture and percolate storm runoff. These ponds have contributed to the productivity of the Edgar Canyon wells since early in the Twentieth Century, however the amount of runoff percolated does not correlate well to the amount of additional production in the canyon wells.

2.2.4.2 Planned

The District has been diverting surface flows in Edgar Canyon for groundwater recharge since 1902. Over the last twenty years the District has found that the amount of water diverted was considerably more than the amount that could be retrieved via the District wells. The District Engineer has determined that a large quantity of the diverted and percolated water flow is lost from the service area due to the severely faulted underground geology of Edgar Canyon.

In 2000 the District Engineer was directed to undertake a study of the Little San Gorgonio Creek and Noble Creek watershed areas to determine the amount of available runoff. Based on historic precipitation and stormwater drainage patterns in Little San Gorgonio and Noble Creeks for the years of 1956 through 1983, expected water yields were estimated for capture potential as provided in Table 2-5. The study determined that from the Little San Gorgonio Creek watershed there are approximately 2,600 AFY long-term average runoff and 1,500 AFY long-term average runoff from the Noble Creek watershed tributary up to Orchard Avenue. This study is the basis for the District's Stormwater Runoff and Groundwater Recharge Program (Recharge Program).

Table 2-5
Estimated Diversion Potential

Watershed Area	Average Annual Precipitation, inches	Average Annual Water Yield, AF
Noble Creek	23	1,500
Little San Gorgonio Creek	26	2,600
TOTAL		4,100

Once the Recharge Program is implemented as planned, the quantity of recoverable water supply would increase since only an estimated 800 AFY of 2600 AFY is actually realized as well production in Edgar Canyon currently.

The District is currently in the preliminary design stages for the Recharge Program, which would utilize the Little San Gorgonio spreading grounds at the mouth of Edgar Canyon. The Recharge Program has been developed to implement plans for new source water. Once this program is in place, the quantity of surface flow captured in Upper Edgar Canyon would be minimized. Under the Recharge Program, the Little San Gorgonio Creek spreading grounds would be modified for use as desilting basins. These desilting basins would capture stormwater runoff from Little San Gorgonio Creek and the adjoining Wallace Canyon. Stormwater currently captured in Upper Edgar Canyon would be allowed to flow down to the modified spreading grounds unless the Upper Edgar ponds are required for flood control.

The District also plans the construction of wetlands habitat areas on Noble Creek, and pipelines to transfer captured and desilted stormwater flows from Little San Gorgonio and Noble Creeks to the proposed community park/groundwater recharge site located downstream for direct recharge into the BSU. The groundwater recharge facilities would be developed into a recreational park for additional beneficial use by the surrounding community. Figure 2-3 provides the general locations for the Recharge Program planned facilities. At the present time, the District is performing a pilot test to determine percolation rates at the proposed community park/groundwater recharge site.[7]

The capture of shallow groundwater or infiltration appears feasible based on the operation of the District's resource recovery well RR1, which captures underflow of unknown origin during the winter months in the lower Edgar Canyon. There is an estimated 300 AFY, which could be captured by additional recovery wells. This water is

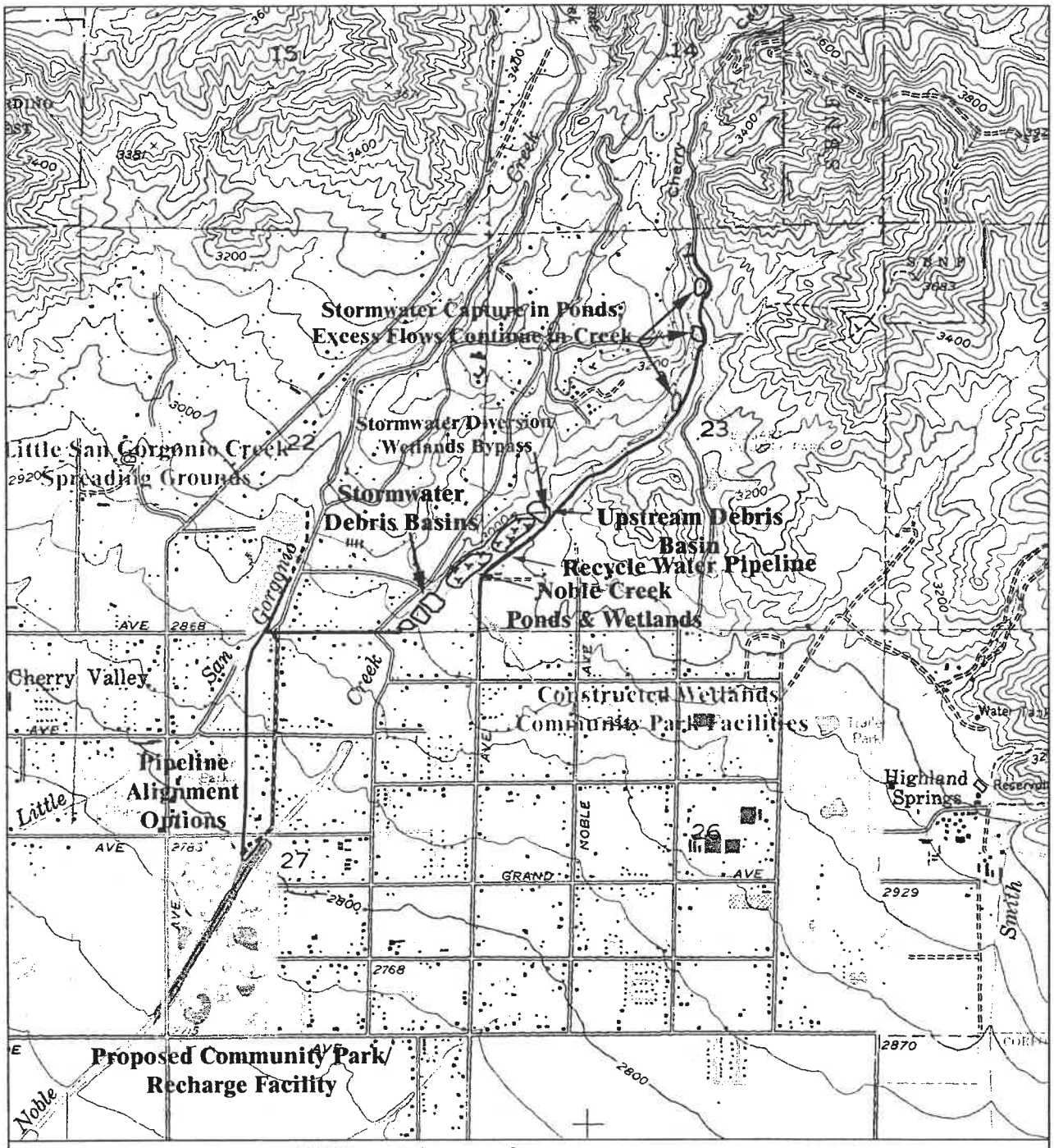


Figure 2-3
Proposed Recharge Program
Beaumont Cherry Valley Water District
Beaumont, California

not included in the yield from lower Edgar Canyon as determined by the District's long-term historic pumping records. It is a new source of supply.

The City of Beaumont is developing plans and requirements for urban stormwater management that will require new development to construct recharge structures along Noble, Marshall, and Potrero Creeks. This will allow for collection of storm flows for recharge from the developed areas of Cherry Valley and Beaumont, as well as from the new construction currently being planned. An estimated 1,300 AFY of captured urban runoff is anticipated for groundwater recharge by 2025.

These additional sources of surface water contributing to groundwater recharge along with captured infiltration (shallow groundwater), would contribute an additional 5,700 AFY of potable water supply by the year 2025.

2.2.5 Recycled Water

2.2.5.1 Existing

Currently, the District is installing recycled water pipelines as part of the overall recycled water distribution system. The pipelines and appurtenances are being installed as development occurs.

Currently the City of Beaumont treats all of the wastewater to meet Title 22 regulations for recycled use. Presently all flows are being discharged to Cooper Creek which is tributary to San Timoteo Creek.

2.2.5.2 Planned

The District is working with the City of Beaumont to develop a program that will replace existing potable water demand used for irrigation with recycled water. Currently, there is approximately 1,100 AFY of potable water delivered by the District used for existing irrigation demands on the golf courses (Highland Springs Golf Course, South), parks, schools, cemeteries, medians and other green belt areas within the District's service area. There are two additional golf courses and a poultry operation within and adjacent to the District's SOI that have their own wells that could use recycled water in lieu of groundwater once available.

Including all planned and existing facilities within the District's SOI, the irrigation demand is an additional 4,500 AFY. Although the total recycled water demand is 5,600 AFY, only 5,100 AFY of recycled water will be available by the year 2025. It is conceivable that the District may offset 5,600 AFY of potable water demand by 2025 if adequate recycled water supply (wastewater) is found.

In addition to capturing and percolating storm runoff, the District intends to recharge surplus recycled water into the BSU as part of the Recharge Program discussed earlier. The recycled water would pass through natural nitrate removal facilities proposed by the District on land currently owned in Noble Canyon and is expected to begin by 2010. Recharge with recycled water will require blending with natural runoff and/or imported water to meet California Department of Health and Safety regulations.

Refer to Section 8 for the current installation and plan details of water recycling projects.

2.2.6 Imported Water

2.2.6.1 Existing Sources

The District is eligible to receive imported water from the Pass Agency. In addition to the District, other eligible agencies include the YVWD and City of Banning and the Cabazon Water District. The Pass Agency has a contract with the State of California Department of Water Resources (DWR) for 17,300 AFY of SWP water from Silverwood Reservoir via the Devil's Canyon Power Plant. This amount of water should be shared among all of the eligible agencies.

A method of allocating water among the various agencies within the Pass Agency service area could be on the basis of assessed valuation. For example, if a water purveyor has 40 percent of the Pass Agency's total assessed valuation, then the water purveyor could be entitled up to 40 percent of the Pass Agency's available supply. A draft report, using the assessed valuation method, prepared May 1988 by the Pass Agency's engineer has indicated the District is "entitled" to 37.8 percent or 6,540 AFY of the Pass Agency's entitlement. If other areas of the Pass Agency do not require their full "allocation", any "unallocated" water could be available to the District.

The Pass Agency's contract entitlement is not guaranteed every year. At one time, during the initial planning stages of the SWP, this was virtually guaranteed. However the inability to construct all of the SWP facilities, environmental concerns, and the need to provide more water through the Delta to maintain water quality for fish and wildlife, have all contributed to decreasing the long-term yield from the SWP. Reports have indicated that the dependable yield from the SWP is on average approximately 75 percent of its contracted obligation. Based on this then, the District's allocation could be only about 4,900 AFY. For planning purposes, it will be assumed that 5,000 AFY would be available from the Pass Agency on a long-term average supply condition. The annual allocation from the DWR varies from year to year depending on hydrologic conditions. Over the last 13 years, (1990 through 2002), the allocation for municipal and industrial purposes ("M&I") ranged from a low of 30% to 100% of the contract amount. The average for the period was 75%; the median was 90%.

2.2.6.2 Planned

In order to bring imported water into the Beaumont and Cherry Valley areas, pipeline and appurtenant facility construction is needed.

The Pass Agency has recently completed construction of the East Branch Extension – Phase 1 to Noble Creek. The Cherry Valley Pump Station near the District's Taylor Tank is nearing completion. The Pass Agency is proposing to deliver untreated SWP water as early as summer 2002 to the existing Little San Gorgonio spreading grounds for percolation into the local BSU. The East Branch extension presently ends at Noble Creek where water can be released into the creek for percolation into the BSU.

The new system will initially have the capability of delivering 8,650 acre-feet annually. With the cooperation of the Pass Agency and the joint use of the District's runoff and recharge facilities, the Pass Agency will be able to store imported SWP water in the BSU for current and future uses. This will eliminate the reliability issues associated with the

SWP as the Pass Agency will have as many as twenty years to recharge the groundwater basin, which has an estimated unused storage capacity of between 200,000 and 400,000 acre-feet. This banked water in the near term can be saved to meet demands after the water from the District, City of Beaumont and STWMA projects have been utilized.

2.3 TRANSFER OR EXCHANGE OPPORTUNITIES

> 10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
>
> 10631 (d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

Pending changes in the State Water Contracts will make water transfers among State Water Contractors easier. The District, in coordination with the Pass Agency, could pursue transfer of water from other State Water Contractors or their subagencies either on a permanent basis or temporary basis.

In addition, water transfers from non-SWP service areas are possible. This water could be conveyed in SWP facilities with the cost of transport paid by the Pass Agency.

The District, through the adoption Facility Fees, collects fees from developers to finance additional water and recycled water facilities, sources of water supply, such as excess water entitlements from the SWP or additional water right entitlements. The fees collected also allow the District to participate in other projects such as desalination in exchange for imported water.

2.4 SUMMARY

The key elements for supporting the continued growth in the District are the construction of a recycled water distribution system, the implementation of the Recharge Program, the development of an urban runoff program, and the delivery and recharge of SWP water. With these projected available water sources along with the incidental water sources planned for the next twenty-five years, the District will have 26,120 AFY available in 2025.

Construction of a recycled water distribution system to make recycled water available to parks, playgrounds, golf courses, street medians, and freeway landscaping, will save valuable potable water resources for their highest and best use (domestic consumption). The implementation of the recycled water system is projected to conserve 5,100 AFY of potable water in the year 2025. Based on the District's average annual usage per EDU of 0.61 AFY, the potable water savings will provide water to 8,360 EDU.

The District's proposed Recharge Program, as discussed in Section 2.2.4.2, will also provide new water supply to the District for potable use. The Recharge Program with an estimated 4,100 AFY will provide 6,700 EDU with potable water. Both the Recharge Program and recycled water distribution combined will provide a total water source for over 15,000 EDU. Section 5 of this UWMP provides a comparison of the available water sources and the projected demands.

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[1] *1994 Water System Master Plan Update* (September 1995). Prepared by Parsons Engineering Science Inc. for Beaumont-Cherry Valley Water District, pg. 4-21.

[2] *1994 Water System Master Plan Update* (September 1995). Prepared by Parsons Engineering Science Inc. for Beaumont-Cherry Valley Water District.

[3] Ibid. pg. 4-17.

[4] Ibid. pgs. 7-14 to 7-17.

[5] *http://www.wrcc.dri.edu/htmlfiles/westevap.final.html, .Western Regional Climate Center (WRCC) – Pan Evaporation for the Western States.*

[6] *1994 Water System Master Plan Update* (September 1995). Prepared by Parsons Engineering Science Inc. for Beaumont-Cherry Valley Water District, page 4-17.

[7] *Resource Development: Surface Water Capture for Little San Gorgonio Creek & Other Locations* (September 12, 2000), Prepared by Parsons Engineering Science Inc. for Beaumont-Cherry Valley Water District.

SECTION 3

WATER USE

3.1 LAW

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

10631 (e) (1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the following uses:

(A) Single-family residential; (B) Multifamily; (C) Commercial; (D) Industrial; (E) Institutional and governmental; (F) Landscape; (G) Sales to other agencies; (H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof; and (I) Agricultural.

(2) The water use projections shall be in the same 5-year increments to 20 years or as far as data is available.

3.2 PAST, CURRENT, AND PROJECTED WATER USE

3.2.1 Past and Current Water Use

In 1990 the demand on the District supply was approximately 5,572 acre-feet, and the water demand in the year 2000 was 6,308 acre-feet. The population during this time period grew from an estimated 12,850 to about 14,550 with an estimated 850 services added. Water use for agricultural purposes has been and is a significant water demand within the District at approximately 4% of the total demand; however, land-use trends suggest that agricultural demand is diminishing and the percent of the District's demand which is agricultural will become relatively insignificant by the year 2025.

Although the water demand is based on well production records, the amount of average daily pumpage exceeds that of the average daily demand. This is due to several factors including inaccurate meters, fire flows, main flushing, leaks, and accidental main breaks, etc. Unaccounted for water is approximately 5 to 7 percent of the total water pumped. This is easily within the range of a well-operated water system.

Table 3-1 illustrates past, current, and projected water use from 1990 to the year 2025 in AFY by planned development.

Table 3-1
Past, Current, and Projected Water Use – Development Basis

Water Use Sectors	1990	1995	2000	2005	2010	2015	2020	2025
Single & Multi-family residential	2,984	2,608	3,297	5,135	7,332	9,256	10,808	11,852
Commercial	556	503	630	882	917	926	965	1,020
Industrial	187	169	212	303	324	338	367	408
Landscape / Recycled Water Users	900	900	1,100	1,900	4,000	5,900	5,900	6,000
Agriculture	223	201	252	224	212	197	193	163
Other	722	652	817	1,355	1,316	1,291	1,065	957
Total	**5,572**	**5,033**	**6,308**	**9,800**	**14,100**	**17,900**	**19,300**	**20,400**

Units of Measure: **Acre-feet/Year**

Past and current land use based water demands were calculated using the year 2000 land use % demand; projected land use based demands were calculated using the year 2000 and forecast land use % demand.

3.2.2 Projected Water Demands by Land Development

The various land use zones within the District's sphere of influence, based upon the City of Beaumont's General Land Use Plan and the County of Riverside General Plans, were used as the basis for water system planning. Considering full development of the land within the District's SOI, estimates of future water demand can be made. Table 3-2, Figure 3-1, and Figure 3-2 illustrate the percent of total water use by land use designation estimated within the District's SOI for both the current and future conditions.

Table 3-2
Total Projected Water Use by Land Use Zoning Designation

TYPE	Present Use (%)	Future Use (%)
Residential (Single & Multifamily)	52%	58%
Commercial	10%	5%
Industrial	3%	2%
Landscaping / Recycled Water Users e.g. parks, medians, cemeteries, golf courses, egg ranch, groundwater recharge, etc.	17%	29%
Agriculture	4%	1%
Other e.g. construction, fire, maintenance, system losses, etc.	13%	5%

Figure 3-1
Total Water Use by Land Use Designation in 2000

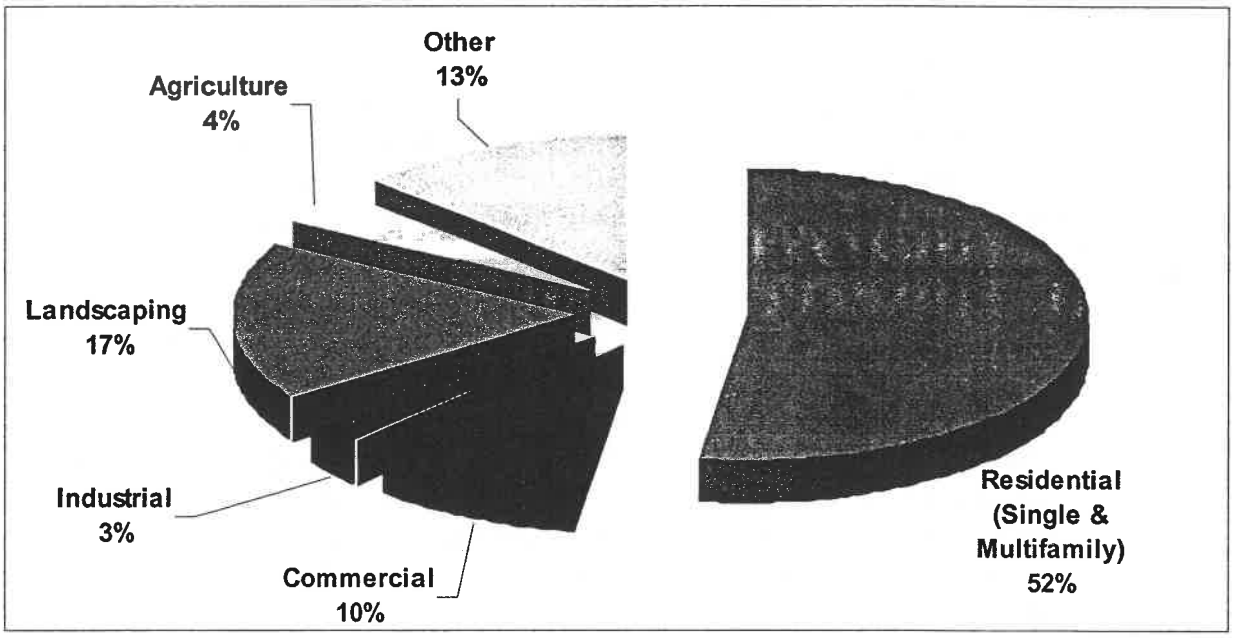
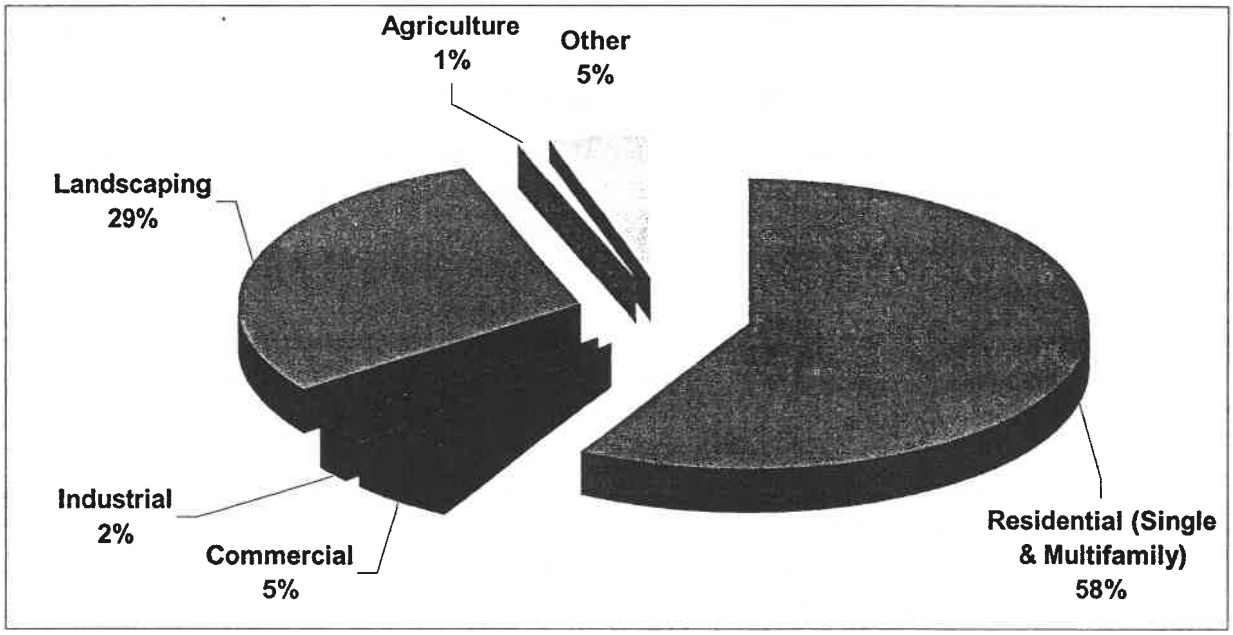


Figure 3-2
Total Water Use by Land Use Designation in 2025



Based upon present trends, the agricultural lands are being developed into residential uses; ultimate development projections are based upon residential use for presently zoned agricultural lands. Table 3-3 provides the water demands based upon the developments provided in Section 1 and provided again here for convenience.

In the District service area, residential customers average 2.90 persons per connection. Total system per capita water use (excluding agricultural water use) averages 190 gallons per capita per day. The average daily demand for water is estimated to increase from the current value of approximately 5.6 MGD to nearly 33 MGD at build out, a nearly six-time increase as the District's SOI is developed. This complete build out of the SOI, however, will probably not occur until approximately 2050 or beyond. The cause for the substantial increase is (1) continued development of existing pressure zones, (2) expansion of the pressure zones to serve areas not now served by the District, and (3) addition of a new pressure zone, the 2650 Zone, to serve a portion of the SOI.

The residential, commercial, and industrial developments listed in Table 3-3 will add approximately 9,780 gpm or about 15,770 AFY to the current demand. This is based on a water demand of 0.38 gpm/EDU. Analyses of water meter records for three recent projects in Beaumont totaling 392 units indicated a range from 0.34 gpm/unit to 0.39 gpm/unit. The average of the projects studied was 0.37 gpm/unit. For the purposes of planning 0.38 gpm/EDU is used.

As listed in Table 3-2, residential land use is projected to be the primary component of future water demands, which comprises an estimated 58% of the total projected water use for the District service area. Based on a forecast average of 0.38 gpm/EDU or 550 gpd/EDU water demand, the projected, equivalent EDUs of 25,745 would equate to an additional water demand of approximately 15,770 AFY. Adding on the existing water usage of 6,308 acre-feet for the year 2000 results in a forecast usage of approximately 22,080 AFY. However this would not occur until sometime after 2025 when all of the projects identified in Table 3-3 are completed.

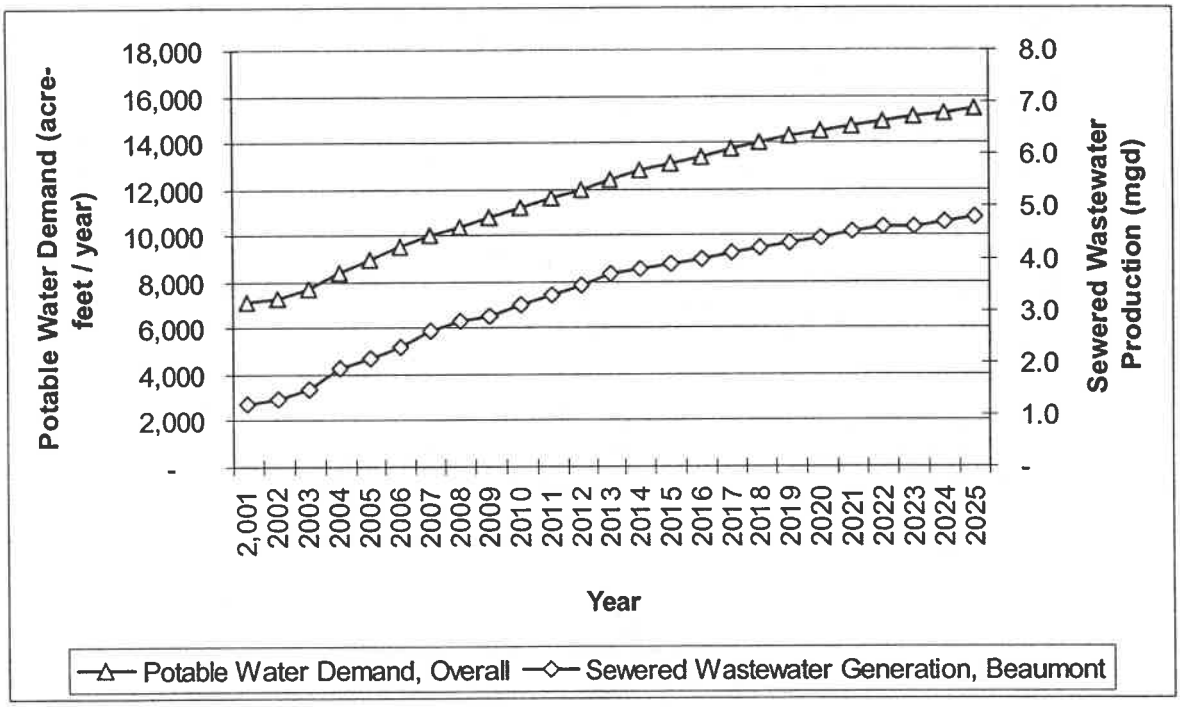
To further assess the water demand from forecasted property development, the potable water demand was plotted based on the "Estimated Start Date" for construction and the "Estimated Years to Build-Out" for the developments listed in Table 3-3. This estimated water demand assumes that demand will generally begin one year after the estimated start date of construction. The demand is equally distributed over the number of years to completion of the development. Therefore, the projected demand for each year of construction is based on the total number of EDUs and the estimated years to completion of the development. As referenced above, 0.38 gpm/EDU (i.e., 550 gpd/EDU) was used to estimate the projected water demand. To estimate the projected wastewater generated for residential and commercial/industrial development, 0.19 gpm/EDU (280 gpd/EDU) and 0.17 gpm/EDU (250 gpd/EDU), respectively, were used. The water demand projection based on development does not include some of the large recycled water users (e.g. golf courses) and is therefore mostly potable water demand. The known developments will also be served by the City of Beaumont's Wastewater Treatment Plant (WWTP). The calculation tables are provided in Appendix K and the results of the potable water demand and sewered wastewater production are shown in Figure 3-3.

Table 3-3
Water Demands for Developments Requesting Service

Project Name	EDUs, Residential	EDUs, Commercial & Industrial	Number of EDUs	Average Water Demand (AFY)	Estimated Years to Build Out	Estimated Start Date
Deutsch - Pardee	4,500	140	4,640	2,840	31	2002
Noble Creek Villages	-	140	140	90	2	2003
Coscan Stewart, Three Rings Ranch	393	-	393	240	3	2002
Cougar Crossing	164	-	164	100	2	2003
Cougar Ranch	67	-	67	40	1	2002
Heartland California Beaumont LP	994	490	1,484	910	10	2004
Hovchild	2,217	88	2,305	1,410	10	Beyond 2025
Lockhead Aircraft, Beaumont Gateway	-	400	400	250	3	2005
Loma Linda	1,078	1,645	2,723	1,670	11	Beyond 2025
Noble Creek (Lone, Donald D.)	200	-	200	120	2	2003
Noble Creek Meadows, LLC	300	-	300	180	2	2003
Oak Valley Partners LP / SCPGA	4,000	250	4,250	2,610	30	2003
Olinger Commercial	-	84	84	50	1	2003
Precision 1 & 2 LLC	71	-	71	40	1	2005
Rolling Hills Ranch	546	-	546	330	4	2003
Westbrook Oak Valley Greens	2,600	140	2,740	1,680	18	2002
Beaumont Mesa, Nejedly	650	200	850	520	4	Beyond 2025
Willow Springs Area	2,800	210	3,010	1,840	13	Beyond 2025
Mission Viejo Co., Jack Rabbit	1,200	-	1,200	740	5	Beyond 2025
Tract 24933	28	-	28	20	1	2002
Tract 30388	59	-	59	40	1	2003
Tract 25272	20	-	20	10	1	2002
Tract 30131	35	-	35	20	1	2002
Tract 30132	36	-	36	20	1	2002
TOTALS			**25,745**	**15,770**		
OTHER POTENTIAL FUTURE PROJECTS, UNSCHEDULED			**9,880**	**6,050**		Beyond 2025
OVERALL POTENTIAL FUTURE DEVELOPMENT TOTALS			**35,625**	**21,820**		

The City of Beaumont's WWTP receives wastewater from almost all of the City of Beaumont and the northeast portion of Cherry Valley. The remainder of Cherry Valley is currently unsewered; all parcels are on septic tanks. Development in Cherry Valley is limited to 1 EDU/acre, and it is assumed that septic tanks will continue to be permitted for this planned level of development.

Figure 3-3
Potable Water Demand and Sewered Wastewater Generation Projected from Development



3.2.2.1 Multiple and Single-Family Residential

Residential water consumption is composed of both indoor and outdoor uses. Indoor water use includes sanitation, bathing, laundry, cooking and drinking. Most outdoor water use is to meet domestic landscaping irrigation requirements. Other minor outdoor uses include car washing, surface cleaning, and similar activities.

Water efficiency improvements appear to be reducing per capita water use. Single-family residences generally contain larger landscaped areas versus multi-family or mobile home areas, and require more water for outdoor landscaping in comparison to other types of housing. Residential area water demands are expected to increase slightly to 58% of the total demand within the District's SOI.

3.2.2.2 Commercial

The District has a mix of commercial customers, ranging from markets, restaurants, stores, insurance offices, beauty shops, and gas stations to office buildings, shopping centers and other facilities serving the population. The commercial sector is growing each year. The planned development as shown in Table 3-3 includes planned areas of commercial land use to serve the proposed increasing population. The commercial water demands are expected to decrease to 5% of the total demand within the District's SOI, however the total demand will actually increase over the next 25 years.

3.2.2.3 Industrial

The District has a small industrial sector, primarily centered on manufacturing and light manufacturing. The industrial sector has not grown much in the last decade. While there will likely be a few additions to the industrial areas within the District's SOI, the impact on water demands are expected to be small. The industrial development envisioned for Beaumont is low water-using industry.

3.2.2.4 Institutional and Governmental

The District service area has a stable institutional/governmental sector, primarily local government and schools. This sector will keep pace with the growth of the city.

3.2.2.5 Landscape / Open Space

Landscaped areas including parks, medians, schools, green belt areas, and executive golf courses in the District currently consume approximately 1,100 AFY. These will be supplied by recycled water once it is available. In addition to the current water demand, there are three championship golf courses, several ready-mix concrete facilities, groundwater recharge facilities, and an egg ranch within the District's SOI that could be served with recycled water as it becomes available. Landscape and recycled water customer demand is expected to increase significantly by approximately 12% over the next 25 years. These current and planned increases in landscape areas account for the increase in irrigation demands and represent a viable use of recycled water to offset those demands.

3.2.2.6 Agricultural

Agricultural water demand is projected to decrease in the next 25 years as the agricultural land is developed within the City of Beaumont and Cherry Valley. The City of Beaumont's General Plan reflects local citizen interest preserving open space and agriculture outside of the city.

3.2.3 Projected Water Demands by Population

The SCAG estimates presented in Section 1 were used to provide water demand estimates for comparison with the planned development estimates. This comparison is outlined in Section 5 of this UWMP. Table 3-4 below illustrates projected water use from 2000 to the year 2025 in AFY by population growth.

Table 3-4
Projected Water Use – Population Basis

Year	2000	2005	2010	2015	2020	2025
Total Population	14,550	22,110	33,610	42,850	53,000	66,180
# People/EDU	2.86	2.94	2.89	2.81	2.71	2.74
Forecast Population Demand[a]	N/A	4,600	7,200	9,400	12,100	14,900
Forecast Overall Use[b]	N/A	6,500	10,100	13,200	17,000	21,000
Recycled Water Demand	N/A	800	3,300	4,800	4,800	4,900
Total	**6,308**	**7,300**	**13,400**	**18,000**	**21,800**	**25,900**

Units of Measure: **Acre-feet/Year**

a Projected population based demands were calculated using 550 gpd/EDU, the estimated SCAG population and SCAG density factors.
b Existing District records show that residential (population) demand represent 71% of total demand.

3.3 POTENTIAL RECYCLED WATER USERS

Section 8 of this plan discusses in more detail the potential users of recycled water within the District's service area.

SECTION 4

WATER RESOURCE RELIABILITY

4.1 LAW

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

10631 (c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable.

10631 (c) For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to replace that source with alternative sources or water demand management measures, to the extent practicable.

10631 (c) Provide data for each of the following: (1) An average water year, (2) A single dry water year, (3) Multiple dry water years.

10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:

10632 (b) An estimate of the minimum water supply available during each of the next three-water years based on the driest three-year historic sequence for the agency's water supply.

4.2 RELIABILITY

Despite rapidly growing demands from residential development in the District service area, a number of opportunities exist to provide a reliable water supply for the community through to the area's ultimate buildout, which is not expected to occur until 2050 or later. In the near term, the District will stabilize its demands on the BSU and Edgar Canyon areas, develop recycled water use, capture and percolate stormwater, and use imported water for water supply to customers. Available water supply from the SWP, stormwater capture, and recycled water use can be used interchangeably depending upon local and statewide hydrologic conditions to supplement a stable local groundwater yield.

In the near term, the District Recharge Program is expected to be complete by the winter of 2004-2005. In an average rainfall year, the BSU can be recharged over and above the District's extractions. The surplus recharge will become accumulated storage, which can be extracted during dry years and/or for future water demands. Reports by DWR[1] and the USGS[2] estimate that the volume of groundwater in storage is approximately 1.1 million acre-feet. USGS, in 1971, reported that 160,000 acre-feet of available storage capacity exists in the BSU. DWR, in 1987, indicated the available storage may be even higher, approaching 383,000 acre-feet. This is over and above the 1.1 million acre-feet currently

in storage. STWMA has indicated that the BSU has been in or near equilibrium for twenty years from 1980 to 2000.[3]

SWP water can be recharged for many years before the demand increases to meet the available supply. Since the BSU has a large amount of available capacity, this recharged water will essentially be banked for future use. Combining the runoff and recharge projects planned by the District and the recharge of SWP water, reliability of water supply in the area appears to be more than adequate over the next 25 years.

To further stabilize the local groundwater use in the Beaumont/ Yucaipa area STWMA is developing a Watershed Management Plan for the 140 square mile area that includes the service area and SOI of the District. The Plan will include all necessary components that will establish how the member agencies will protect water quality and manage the areas local water resources to allow for its best and most beneficial use.

STWMA has completed the first phase of a four phase program to produce the watershed management plan. STWMA, as part of phase 2 is currently in discussion with area groundwater users working toward an amicable settlement on the pumping rights of all of the BSU users. With an agreement in place, which is anticipated for late 2002 or early 2003, groundwater extractions of the BSU will be coordinated and stabilized through a court appointed Water Master.

The District will continue to incorporate recycled water delivery systems into new development, focusing on servicing new irrigation demands with recycled water and converting existing irrigation uses to recycled water. Recycled water will provide the District a new local source of water of high reliability, both lessening the dependence on imported sources and increasing reliability of the District's total supply.

4.3 FREQUENCY AND MAGNITUDE OF SUPPLY DEFICIENCIES

The District experienced extended droughts during 1950 – 1969; 1976 – 1977; and 1987 – 1992. In all of these drought events the BSU and Edgar Canyon areas continued to provide adequate water quantities without the need to ration water supply and with continued supply to all customers. This can be attributed to the large amount of groundwater in storage in the BSU. This stored water is replenished during wet years. Approximately 53% of the District's current water supply comes from the BSU. From 1950 to 1993, the groundwater level has declined about an average of 1.4 feet per year to a groundwater elevation of approximately 2,260 feet above mean sea level (msl). However, from 1980 to 1999 the rate of decline slowed to nearly a steady state condition[4] with essentially no qualitative change in groundwater storage in the BSU[5]. This clearly demonstrates the ability of the BSU to provide adequate water during extended drought periods.

4.4 PLANS TO AFFIRM A RELIABLE WATER SUPPLY

The main operational goal of the District is to use the surface water runoff, recycled water, and groundwater basins conjunctively. The current and future supply projections through 2025 are provided in Table 2-2 and a discussion is provided Section 2.2, which summarizes future plans to affirm a reliable water supply.

As a means of addressing any future BSU overdraft conditions, the Pass Agency has constructed water transmission facilities initially capable of delivering a minimum average flow of approximately 8,650 AFY from northern California to spreading grounds for recharge of the BSU, and for direct delivery to a proposed treatment plant located in Yucaipa.[6] Of this, an estimated 6,500 AFY will likely be available to the District. However, because the Pass Agency contract entitlement is not a guaranteed amount available, the allocation during critical dry years could be only about 3,300 AFY.[7] The Pass Agency's State Water Contract Entitlement is 17,300 AFY. To provide this much water, the current pump station capacity would need to be increased.

4.5 RELIABILITY COMPARISON

The data in Table 4-1 shows the minimum available water supply to the District for a theoretical drought in the next three water years, an average/normal water year in 2010, and a single dry year in 2010. The anticipated dry-year supply in 2010 was used for the single dry-year analysis in order to show the results of local and imported water supply development up through 2010. If projected recycle and import supplies are developed as indicated, no shortages are anticipated within the District service area in the dry-year scenarios analyzed. This assumes 5,000 acre-feet of SWP water can be purchased and/or accumulated groundwater storage can be extracted. As indicated in Section 2 and accounted for in Table 4-1, 8,250 acre-feet is deemed as the District available perennial yield of the BSU, well transfers from the recycled water in lieu program, septic system return flows, and Edgar Canyon groundwater supplies. It should be noted that additional water supplies will be available upon implementation of the recycle water use program projected to begin in 2003, which have been included for the 2010 analysis but not for the multiple dry year scenario. The multiple dry year scenario uses years 2001 through 2003 and would not have the benefit of an implemented recycled water program. Figure 4-1 provides a bar chart of the available water supply for a single normal year and single dry year using 2010 as a basis for comparison.

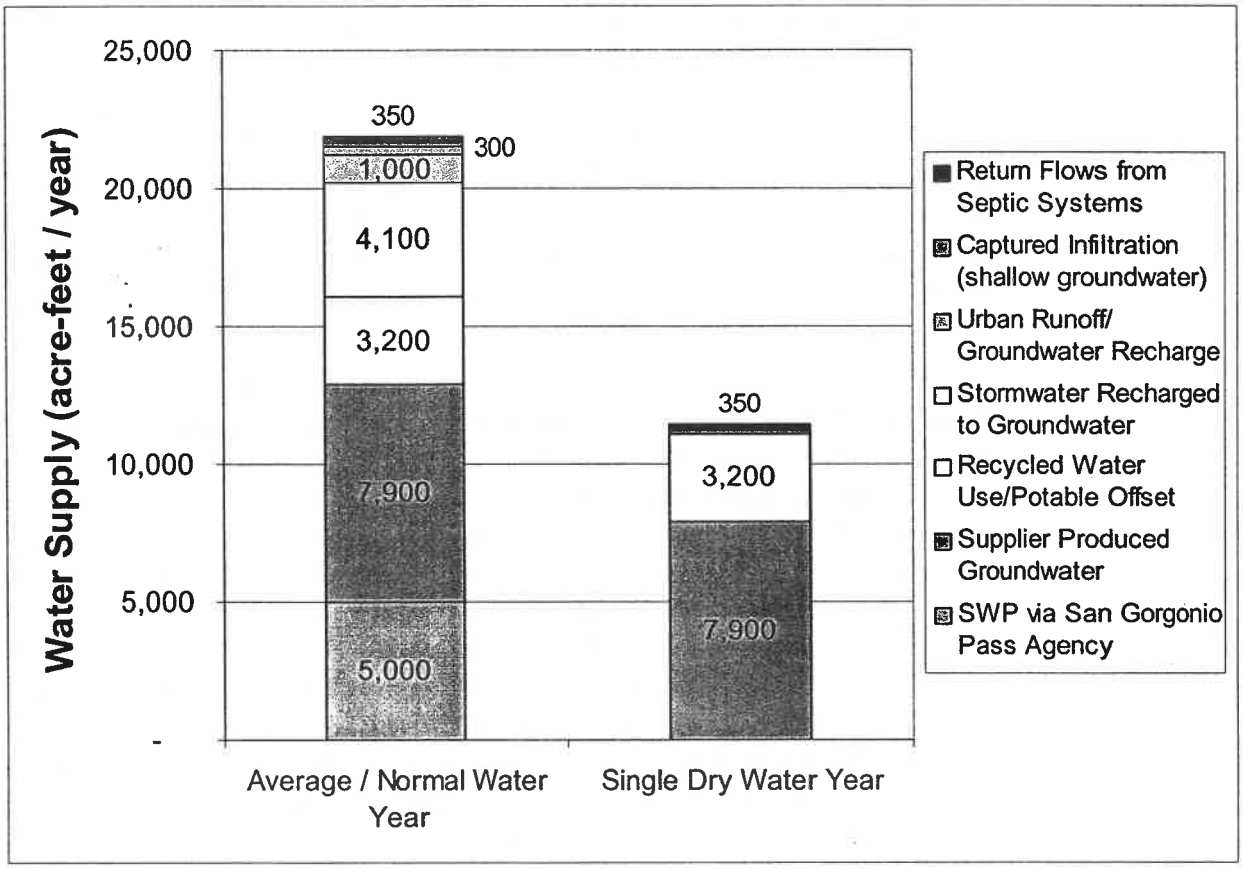
The year 2010 was used to run a single-dry water year supply reliability analysis. It was found that if the year 2010 is an average, normal water year and the planned conservation and water resource development programs are implemented within the District, then the available supply is projected to be 21,850 acre-feet using all available water resources. In the event of an extreme drought, assuming no rainfall, it is projected that a supply of approximately 11,450 acre-feet would be available for 2010 as a dry water year or about 50% of the projected non-drought, available water supply. This takes into account 5,650 acre-feet being available from the groundwater supplies including return flow from septic systems, 3,200 acre-feet of recycled water, and 2,600 acre-feet from users outside of the District, which have converted to recycle water, such as Oak Valley Golf Course and SCPGA. The dry year reliability analysis is extremely conservative in that it assumes that there will be no runoff for recharge to the BSU. It also assumes that there will be no use of SWP water. In reality, there may be several years of above normal rainfall and/or SWP purchases that provide accumulated supply in the BSU, which can be extracted during a dry year. Also, even historic dry years have limited amounts of rainfall and runoff that could be recharged to the BSU. Of the water supply sources discussed in Section 2, the District intends to utilize available water supply in the following order: Edgar Canyon

wells, BSU wells (including groundwater recharged from stormwater capture and urban runoff), recycled water, and SWP water, transfers and exchanges into the District's supply.

Table 4-1
Available Water Supply Reliability

		Multiple Dry Water Years		
Average / Normal Water Year ***2010***	**Single Dry Water Year** ***2010***	**Year 1** ***2001***	**Year 2** ***2002***	**Year 3** ***2003***
21,850	11,450	6,450	6,450	6,450
Units of Measure: **Acre-feet/Year**				

Figure 4-1
Available Water Supply Reliability for 2010



As provided in Table 3-1 of this document, the projected water demand is forecasted to be approximately 14,100 acre-feet for the year 2010. For this case study, there is

sufficient water supply to meet the water demand for the year 2010 for a normal water year.

The BSU can be used during dry years to provide water supply from groundwater storage. The District does not anticipate the need to reduce water deliveries during a drought unless the drought lasts for many years and the groundwater levels decline to very low levels. The District will however encourage water conservation. The BSU would be recharged during wet years through the use of imported water, increased rainfall percolation, and stormwater runoff recharge. The BSU acts as a large reservoir for the District. For example, if the demand were to exceed the available water supply by 7,000 acre-feet, and this water demand were to be produced from the groundwater basin, the level of the basin would drop approximately 1.3 feet in the water table assuming 28 square miles and a 25% porosity. The District is capable of handling many dry years in a row before the extractions would result in a measurable impact. Storage in the BSU will cycle between more storage and less storage with no adverse impact to the equilibrium of the BSU due to hydrologic conditions.

Similarly, if the water supply were unable to meet water demand within the District's service area, water shortage contingencies, as provided in Section 6, could be implemented on a temporary basis to accommodate such short-term supply deficiencies. These measures would only be implemented if considered to be necessary.

The emphasis of the District is to develop the recycled water infrastructure and stormwater capture recharge programs. The immediate benefit for additional water resource is the capture of stormwater runoff for percolation into the BSU. The first phase of the project (2,600 AFY) is scheduled for completion by about 2005. It can be seen from Figure 4-1 that full implementation of the project, which is anticipated for completion by 2010, will generate 4,100 AFY of additional water supply. Obviously the anticipated stormwater runoff during a dry year is not expected to match the long-term average of 4,100 AFY, however, the runoff is also expected to be greater during heavy rainfall years. The accumulated storage from heavy rainfall years and surplus storage from typical years can be extracted during dry years when necessary.

4.6 INCONSISTENT WATER SOURCES

4.6.1 Law

> 10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
>
> 10631 (c) For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to replace that source with alternative sources or water demand management measures, to the extent practicable.

All current water sources are available consistently. The District can for short periods of time, extract greater quantities of groundwater in the BSU knowing that during wet years the basin will be replenished. Section 6 discusses water shortage contingencies that can be implemented on a short-term basis to assist during periods of water supply shortages.

4.7 THREE YEAR MINIMUM WATER SUPPLY

4.7.1 Law

> 10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:
>
> 10632 (b) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.

Based on experiences during the recent and historic droughts, the District can expect to use groundwater as well as future recycled water, banked stormwater runoff capture, and banked imported SWP water to provide adequate water for meeting all of the community's needs during future droughts. The estimated three-year minimum water supply is the same as the multiple dry water years provided in Table 4-1.

---

[1] *Ground Water Storage, Movement, and Quality Data, San Gorgonio Pass Water Agency* (September 1987). Letter Report prepared by Department of Water Resources, page 25.

[2] *Underground Storage of Imported Water in the San Gorgonio Pass Area, Southern California,* Geological Survey Water-Supply Paper 1999-D (1971). Prepared by R.M. Bloyd, Jr., page D29.

[3] San Timoteo Watershed Management Authority, *Watershed Management Program, Phase I* (March 2002). Prepared by Wildermuth Environmental Inc., Section 2.3.2.2, page 2-7.

[4] *1994 Water System Master Plan Update* (September 1995). Beaumont-Cherry Valley Water District. Prepared by Parsons Engineering Science Inc. Pages 4-13 through 4-15.

[5] San Timoteo Watershed Management Authority, *Watershed Management Program, Phase I* (March 2002). Prepared by Wildermuth Environmental Inc., Section 2.3.2.3, page 2-8.

[6] *Noble Creek Vistas Specific Plan Draft Environmental Impact Report* (September 2001). City of Beaumont. Prepared by Applied Planning Inc. Pages 4.3-4 and 4.3-5.

[7] *1994 Water System Master Plan Update* (September 1995). Beaumont-Cherry Valley Water District. Prepared by Parsons Engineering Science Inc. Page 4-18.

SECTION 5

SUPPLY AND DEMAND COMPARISON PROVISIONS

5.1 LAW

> 10635 (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from the state, regional, or local agency population projections within the service area of the urban water supplier.

5.2 TWENTY-FIVE YEAR COMPARISION

The forecast population growth and the forecast land development presented in Section 4 potentially create two different scenarios for water demand versus supply over time. Population growth information was provided by SCAG, the developers provided land development data, and the City of Beaumont provided land development data based on the developer's sales forecasts. In addition to the inherent uncertainties of population growth, it is also uncertain if the forecast land development may influence or accelerate the rate of growth in other places within the service area. The twenty-five year comparison of water demand versus supply therefore takes these two scenarios into consideration.

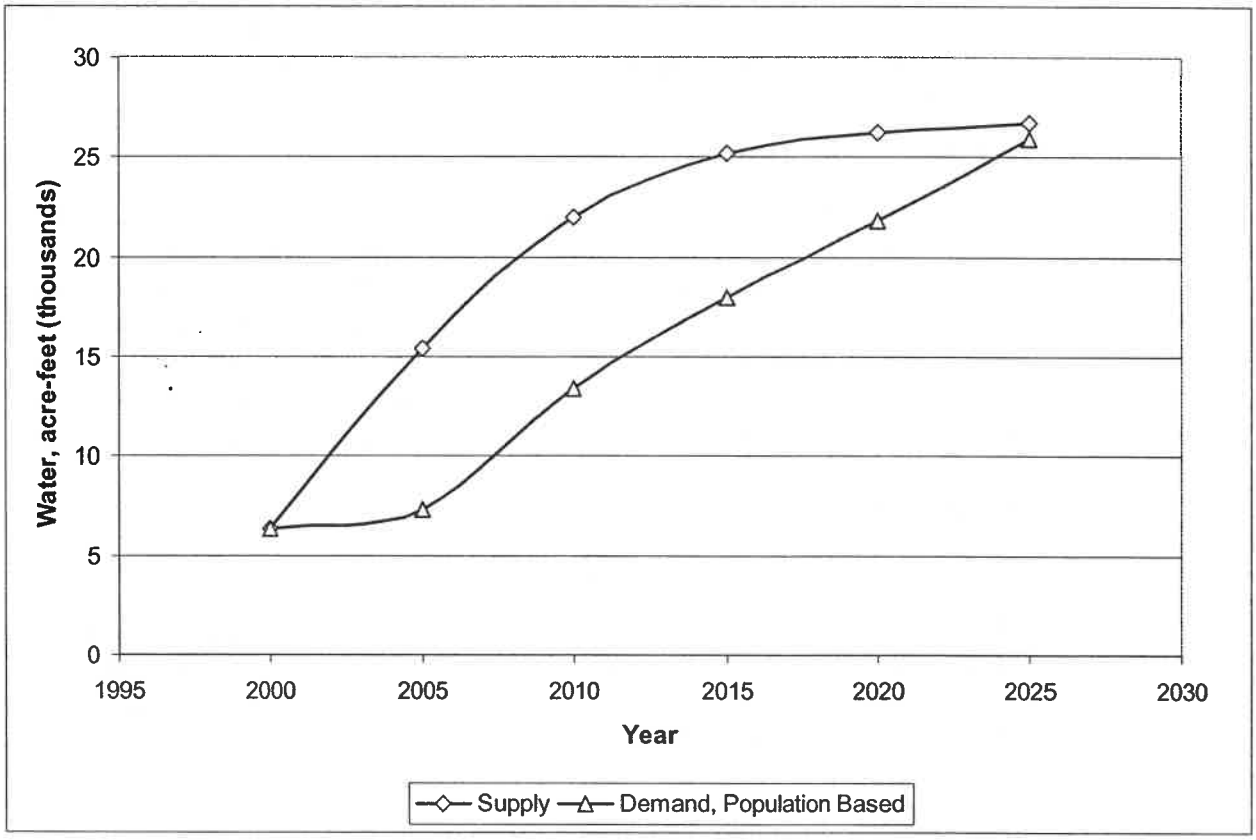
5.2.1 Supply vs. Demand by Population

Table 5-1 compares current, and projected water supply and demand based on the forecast increase in population, and Figure 5-1 depicts the corresponding water demand versus supply. The individual components for the water supply totals are provided in Table 2-3, and the individual components for determining the demand totals are shown in Table 3-1.

Table 5-1
Projected Supply and Demand Comparison By Population Growth

	2000	2005	2010	2015	2020	2025
Supply totals	6,308	15,380	21,950	25,200	26,260	26,720
Demand totals	6,308	7,300	13,400	18,000	21,800	25,900
Supply Surplus	(0)	8,080	8,550	7,200	4,460	820
Units of Measure: **Acre-feet/Year**						

Figure 5-1
Supply Reliability and Demand Comparison By Population Growth



The comparison of water supply versus demand by population reflects that in average precipitation years, the District has sufficient water to meet its customers' needs through 2025. This is based on continued commitment to conservation programs, additional recycle water becoming available, development of additional stormwater capture and percolation systems, and the import of SWP water. It should be noted that future

It should be noted that the additional supplies necessary to meet future demands in dry years beyond 2010 will be obtained by further developing recycled water resources, as discussed in Sections 3 and 8, the District's Recharge Program, and supplemental use of banked SWP water if needed.

5.4 STWMA COMPARISONS

The STWMA has prepared a memorandum[2], which provides water demand, water supplies, and supplemental water demand for the District from the year 2000 through 2050. Table 5-4 provides a comparison of the STWMA projections with the land development projections discussed in Section 5.2.2 within this report.

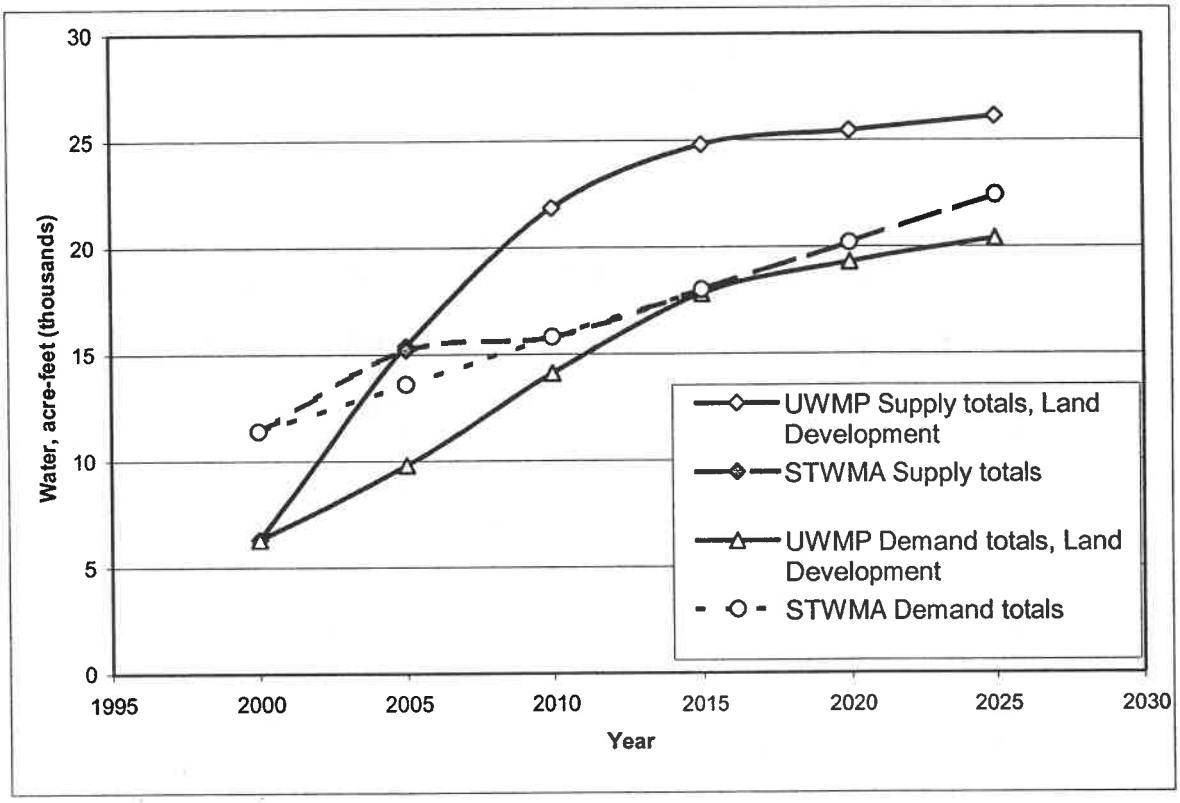
Table 5-4
STWMA Compared to Estimates By Land Development

Basis Years =>	2000	2005	2010	2015	2020	2025
Supply totals						
UWMP	6,308	15,380	21,850	24,800	25,460	26,120
STWMA[a]	11,400	15,200	15,800	18,000	20,200	22,400
Demand totals						
UWMP	6,308	9,800	14,100	17,800	19,300	20,400
STWMA[b]	11,400	13,600	15,800	18,000	20,200	22,400
Units of Measure: **Acre-feet/Year**						

As shown in Table 5-4, the STWMA report matches the demand with supply. Any difference between demand and supply was handled by increasing the available supply with imported water to satisfy the demand. Only year 2005 is shown to have a surplus in water supply. Interestingly, the STWMA demand estimates are higher than the estimates used for this UWMP, and the STWMA supply estimates are lower than the estimates used for this UWMP. Figure 5-3 provides a graphical comparison of the two estimates. The STWMA projections and the District's UWMP projections correlate reasonably well.

[a] Includes supplemental water demand satisfied with imported water after 2002.
[b] Includes both potable and non-potable demands.

Figure 5-3
STWMA and UWMP Land Development Estimates



[1] *2000 Urban Water Management Plan* (December 2000), Carlsbad Municipal Water District, Chapter 6, pg. 28.
[2] San Timoteo Watershed Management Authority, *Watershed Management Program,Phase 1* (March 2002). Prepared by Wildermuth Environmental Inc., Table 4-2.

SECTION 6

WATER SHORTAGE CONTINGENCY PLAN

6.1 LAW

> 10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:
>
> 10632 (c) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

6.2 PREPARATION FOR CATASTROPHIC WATER SUPPLY INTERUPTIONS

Water supplies may be interrupted or reduced significantly in a number of ways - drought, an earthquake that damages water delivery or storage facilities, or a toxic spill that affects water quality. This section of the UWMP describes how the District plans to respond to such emergencies so that emergency needs are met promptly and equitably.

6.2.1 Drought Conditions

The Pass Agency is the wholesale contractor for delivery of SWP water to the District. The DWR has prepared a study, which projects the probability of delivering the full entitlement to its wholesale contractors. The State Water Project has been able to deliver to their member Agencies approximately 75 percent of the water requested between 1990 and 2001. At such time when the District receives SWP water it is estimated that the District would receive approximately 5,000 AFY on a long-term basis. During times of drought the SWP may only deliver about 10%-20% of the amount requested.

As discussed in Section 2, the storage within BSU can be used in times of continued drought and would be recharged with natural water, recycled water and/or imported water during wet years or years of surplus water supply.

6.2.2 Earthquake or other Natural Disasters

The San Andreas Fault passes through the Pass area. If a major earthquake were to occur along the San Andreas Fault in the Pass area many of the District's facilities could be affected.

The California Aqueduct could be ruptured by displacement on the San Andreas Fault, and supply may not be restored for a three to six week period. The situation would be further complicated by physical damage to the pumping equipment and local loss of electrical power. The DWR has a contingency Aqueduct Outage Plan for bringing the California Aqueduct back on line should a major break occur, which they estimate would take approximately four months to repair.

Experts agree it may be at least 72 hours after the earthquake before outside help could get into the local area. Extended supply shortages of both groundwater and imported water, due to power outages and/or equipment damage resulting from a natural disaster, would be severe until the water supply could be restored.

The District's recently constructed storage tanks have been fitted with flexible couplings, which should reduce the damage to local storage. The public would be asked to reduce consumption to minimum health and safety levels. This would provide sufficient time to restore groundwater production, if interrupted.

The District is also working on emergency interties at various locations along Highland Springs Road such that water can be supplied in either direction between the City of Banning and the District.

6.2.3 Contamination

The local water sources are of very good quality, with no problems related to industrial or agricultural contamination. If contamination did result from a toxic spill or similar accident, the contamination would be isolated and should not significantly impact the total water supply.

6.3 BEAUMONT-CHERRY VALLEY WATER DISTRICT EMERGENCY FACILITIES

To meet emergency water needs the District has a multi-tiered system. First, approximately 12.65 MG (38.8 acre-feet) of gravity storage is available as listed in Table 6-1. Second, emergency engine generators and backup systems are available for the wells and locations provided in Table 6-2; the wells can supply up to a maximum of 6,200 gpm, or 27.4 acre-feet per day (AF/Day). Note that the year 2001 average demand of 7,134 acre-feet is equivalent to 19.5 AF/Day as a comparison.

Table 6-1
Available Emergency Reservoir Storage

Available Reservoirs	Total Aboveground Storage (MG)	Total Aboveground Storage (acre-feet))
Upper Edgar	0.75	2.3
Lower Edgar	1.0	3.1
Noble & Highland Springs	2.0	6.1
Vineland	1.0	3.1
Cherry	2.0	6.1
Taylor (under const., est. to complete 10/02)	3.9	12.0
Vineland II (in design)	2.0	6.1
TOTAL	12.65	38.8

The above reservoir storage capacity does not include the Twelfth and Palm Reservoir (0.4 MG). This serves as an equalization tank for the Twelfth and Palm Boosters. A second Vineland Reservoir with a capacity of 2 MG is in design and proposed to be on-line in 2003. This would increase the storage to 14.65 MG or 45.0 acre-feet.

Table 6-2
Wells With Emergency Generators and Backup Systems

Wells No.	Location	Total Capacity GPM	Total Capacity AF/Day	Remarks
12	Upper Edgar Canyon	400	1.8	Auxiliary engine drive
14	Upper Edgar Canyon	500	2.2	Portable generator connection
6	Middle Edgar Canyon	600	2.7	Auxiliary engine drive
4A	Lower Edgar Canyon	650	2.9	Portable generator connection
2	BSU	2,200	9.7	Portable generator connection
16	BSU	1,250	5.5	Portable generator connection
21	BSU	2,200	9.7	Portable generator connection
22	BSU	1,750	7.7	Portable generator connection
TOTAL		9,550	42.2	

Well Nos. 6 and 12 have auxiliary engine-drives, which can be used in the event of an electrical failure. Well Nos. 2, 4A, 14, 16, 21, and 22 have provisions for portable generator hook-up. The District has three portable and two stationary generators. The portable units have the capability of running up to 50, 350 and 550 horsepower (hp)

motors. The Cherry Yard Booster station also has a natural gas driven pump that has a capability of pumping 1,500 gpm from the Cherry reservoir to the Noble reservoir. There is an emergency booster at the Well 4A site with a 100 hp motor; which is rated at 500 gpm and delivers water to the Upper Edgar Tank. In addition, the 50 hp Noble Tank Booster, which has a rated capacity of 500 gpm, serves as a backup to the Mesa Pressure Zone and Lower Edgar Tank. In 1998 and 1999, Boosters 21A and 21B which pump from the Cherry Reservoir to Noble Reservoir were also retrofited with transfer switches. In 2001 the District installed stationary backup generators with automatic transfer switches at the headquarters and at Highland Springs Hydropneumatic system.

6.4 STAGES OF ACTION

As mentioned earlier, the District presently receives all of its water supply from underground sources. Although the District presently has a relatively uninterrupted source of water to meet water demands, water shortage contingency planning is still of utmost importance to the District in order to meet future water demands during a prolonged drought condition. The District proposes a four-stage plan of action in the event of a long-term drought condition or loss of supply. The action levels for each stage are presented in the subsections that follow, and the water supply rationing stages are provided in Table 6-3.

Table 6-3
Water Supply Shortage Stages and Conditions

RATIONING STAGES				
Rationing Stages	1	2	3	4
Water Supply Conditions (% Total Reduction)	10%^{v}	10%^{m} / 20%^{v}	20%^{m} / 30%^{v}	20%^{m} / 30%^{v}

v = voluntary reduction
m = mandatory reduction

6.4.1 Stage 1

Stage 1 occurs when the District declares a water shortage and imposes voluntary water conservation. In this stage the District shall notify all its customers that water deliveries may be reduced. The District will recommend a voluntary 10 percent water use reduction based on an established base year to be determined by the District at the time Stage 1 is implemented. At the same time the District shall start its own public awareness program to encourage the efficient use of water. This will be accomplished by printing articles in the local newspaper and distributing literature and publications to its customers. Public awareness programs will also include educational conservation programs that would be introduced in the schools.

6.4.2 Stage 2

Stage 2 occurs when the District determines voluntary water reduction goals are not being met and the declared water shortage has been in effect for two consecutive years. In this stage the District will recommend a 10 percent mandatory reduction in water use and

continue its public awareness efforts and conduct a survey on a 20 percent voluntary water use reduction program. The District at this time will begin to establish a water conservation advisory committee. This committee will comprise of officials from the District, the City of Beaumont, and the Cherry Valley community.

6.4.3 Stage 3

Stage 3 occurs if the water shortage continues for four consecutive years. In this stage the District will recommend a mandatory 20 percent and a voluntary 30 percent water use reduction from the established base year. The District will adopt a rate structure with financial incentives to encourage efficient water use. The District will also develop a plan and ordinance to enforce penalties for excessive water use and include prohibition against specific wasteful practices such as gutter flooding, open hose car washing, and driveway washdown, etc. The District will analyze the impacts of the plan on the revenues and expenditures of the District and propose measures to overcome those impacts, such as adjustments in customer rates, to help pay for additional sources of water.

6.4.4 Stage 4

Stage 4 occurs if the declared water shortage continues for one year after Stage 3. In this stage the District shall conduct a survey on the mandatory 20 percent and voluntary 30 percent water use reduction programs and consider enforcing penalties described in the ordinance developed under Stage 3.

6.4.5 Implementation

It is highly unlikely that the District will need to implement any of these stages within the next 20 to 25 years since the available water supply even under worst case conditions is nearly equal to or greater than the demand for the next 3 years. Because of this it is not possible to link specific water supply quantities with "stages" at this time. The District recognizes the importance of long-term groundwater management and to that end has taken steps to implement a Basin Wide (AB3030) Groundwater Management Plan (GWMP) through the participation in the STWMA. As part of the STWMA, data on the BSU characteristics would be collected and analyzed to better understand basin performance under varying hydrologic (wet/dry) conditions. This information could be used to determine if specific trigger mechanisms are necessary to protect the BSU.

6.5 METHODS OF DEMAND REDUCTION

6.5.1 Health and Safety Requirements for Residential Households

Based on commonly accepted estimates of interior residential water use in the United States, Table 6-4 indicates minimum per capita health and safety water requirements. In Stage 1 shortages, customers may adjust either interior or outdoor water use or both, in order to meet the voluntary water reduction goals. Where mandatory reduction is required, Stages 2, 3, and 4, the District staff may recommend to the Board that

residential customers meet the interior water use shown below or be subject to penalties and charges.

Table 6-4
Per Capita Health & Safety Water Quantity Calculations

	Non-Conserving Fixtures		Habit Changes[1]		Conserving Fixtures[2]	
Toilets	5 flushes x 5.5 gpf	27.5	3 flushes x 5.5 gpf	16.5	5 flushes x 1.6 gpf	8.0
Shower	5 min x 4.0 gpm	20.0	4 min x 3.0 gpm	12.0	5 min x 2.0 gpm	10.0
Washer	12.5 gpcd (1/3 load)	12.5	11.5 gpcd (1/3 load)	11.5	11. 5 gpcd (I /3 load)	11.5
Kitchen	4 gpcd	4.0	4 gpcd	4.0	4 gpcd	4.0
Other	4 gpcd	4.0	4 gpcd	4.0	4 gpcd	4.0
Total	gpcd	68.0	Total	48.0	Total	37.5

[1] Reduced shower use results from shorter and reduced flow. Reduced washer use results from fuller loads.
[2] Fixtures include ULF 1.6 gpf toilets, 2.0 gpm showerheads, and efficient clothes washers.

6.5.2 Consumption Reduction Methods and Prohibitions

The City of Beaumont Water Use Regulations Ordinances (Appendices L-M) include prohibitions on various wasteful water uses such as washing sidewalks and driveways with potable water, and allowing plumbing leaks to go uncorrected more than 48 hours after customer notification.

6.5.3 Penalties or Charges

Any customer violating the regulations and restrictions on water use set forth in the Water Use Ordinance shall receive a written warning for the first such violation. Upon a second violation, the customer shall receive a written warning and the City may cause a flow-restrictor to be installed in the service. If a flow-restrictor is placed, the violator shall pay the cost of the installation and removal. Any willful violation occurring subsequent to the issuance of the second written warning shall constitute a misdemeanor and may be referred to the City of Beaumont Police Department for prosecution.

Table 6-5
Penalties and Charges

Examples of Penalties and Charges	Stage When Penalty May Take Effect
Penalties for not reducing consumption	4
Charges for excess use	4
Flat fine	4
Charge per unit over allotment	4
Flow restriction	4

6.5.4 Water Use Restrictions for New Construction

In Stage 4, it may be necessary to discontinue all use of construction water (unless recycled water is used), even if a permit has been issued, and consider banning all use of water for nonessential uses, such as new landscaping and filling pools.

6.6 MONITORING WATER DEMANDS & USAGE TRENDS

The District keeps historic and current pumping records on all of its wells and implemented a computer accounting system on its customer's water usage. These records are then used to determine seasonal and annual fluctuations in water use. Within the District, since total water pumped closely approximates water use, the District can compare pumping records from one year to the next to determine actual reductions in water use. The District also, through its accounting system, is able to determine historic and current use by service account and therefore track customer usage during a drought and evaluate the effectiveness of each conservation measure implemented under this plan.

SECTION 7

WATER DEMAND MANAGEMENT MEASURES

7.1 LAW

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

(f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:

(A) Water survey programs for single-family residential and multifamily residential customers.

(B) Residential plumbing retrofit.

(C) System water audits, leak detection, and repair.

(D) Metering with commodity rates for all new connections and retrofit of existing connections.

(E) Large landscape conservation programs and incentives.

(F) High-efficiency washing machine rebate programs.

(G) Public information programs.

(H) School education programs.

(I) Conservation programs for commercial, industrial, and institutional accounts.

(J) Wholesale agency programs.

(K) Conservation pricing.

(L) Water conservation coordinator.

(M) Water waste prohibitions.

(N) Residential ultra-low-flush toilet replacement programs.

(2) A schedule of implementation for all water demand management measures proposed or described in the plan.

(3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.

(4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of such savings on the supplier's ability to further reduce demand.

(g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, which offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:

(1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.

(2) Include a cost-benefit analysis, identifying total benefits and total costs.

(3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.

(4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.

(h) Urban water suppliers that are members of the California Urban Water Conservation Council and submit annual reports to the council in accordance with the "Memorandum of Understanding Regarding Urban Water Conservation in California," dated September 1991, may submit the annual reports identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g).

7.2 WATER DEMAND MANAGEMENT MEASURES

The District has implemented several water conservation measures beginning as early as the 1980 Immediate Needs Study. Presently the District is not signatory to the Memorandum of Understanding (MOU) regarding Urban Water Conservation in California but the District does implement several of the Best Management Practices (BMP) identified in the MOU.

The District's 1986 Urban Water Conservation Plan (UWCP) took a list of conservation methods and assessed whether they were currently being implemented and, if not, what level of effort was required. This was also conducted for the District's 1990 UWCP and 1995 UWMP along with an initial screening and assessment. Table 7-1 lists a summary of conservation methods from the 1986 UWCP.

The 1986 and 1990 UWCPs focused on measures that reduced and/or regulated the water used for agricultural and landscape purposes. This was, and still is, the area with the greatest potential for water conservation. Such measures as the installation of drip irrigation systems and restructuring of water rates for irrigation have been implemented. The conservation measures focused on in the 1990 UWCP took three approaches: system modification, conservation incentives, and public education. Because of the extent of orchard irrigation within the District, it was believed that the greatest potential for current water conservation through system modification existed in the conversion to drip irrigation systems. Other measures recommended were: the use of low flow equipment in

Table 7-1
Status of 1986 Water Conservation Measures

	1995 Status	Current Status
I. Education and Public Information		
A. Local Water Conservation Advisory Committee	X	+
B. Conservation Literature		
1. General Water Conservation Brochure	O	O+
2. Landscape Brochure with Plant List	+	+
3. Brochures for Specific Water Users	+	+
C. Previous Year's Use on Water Bills	X	X
1. Public Relations	O	O+
2. Public Speaking Presentations	O	O+
3. Demonstration Low Water-Using Landscapes	X	X
4. Promotional Campaign with Nurseries and Irrigators	X	X
5. Awards for Conservation Developments	X	X
D. Work with Large Water Users (Landscapers, Agriculture, and Parks)	+	O+
E. In-School Education	X	+
F. Information on Federal and State Laws and Programs	+	+
II. Water Management Programs		
A. Water Loss Reduction Techniques		
1. System-Wide Water Audit	+	O
2. Leak Detection Program		
a. For BCVWD's System	O	O+
b. For Customer's Side	X	O+
3. Meter Calibration and Replacement Program	O	O+
4. Corrosion Control	O	O+
5. Valve Mapping and Exercising Program	O	O+
B. Metering Existing Customers	O	O+
C. Device Distribution	+	+
D. Meter Loan Program, Construction Water Users	O	O
E. Water Waste Prohibition	O	O
F. Conservation Pricing	O	O
G. Financial Incentives	O	O
III. Regulations		
A. Environmental Impact Reports/Statements	O	O
B. Water Waste Reduction Program	+	+
C. Water Conservation Ordinances	+	+
1. Requirements for Large Water Users (Landscape, Agriculture, and Parks)	O	O
2. Self-closing Faucets - Commercial and Institutional	X	X
3. Low Water-Using Landscapes	X	+
4. Metering New Customers	O	O
5. Ultra-low-flow Toilets	X	+
IV. Water Shortage Contingency Plan	+	+

X = Recommended Implementation
+ = Recommend Increased Effort
O = Currently Implemented
O+= Continue to Implement

new developments (i.e., ultra-low-flow water use toilets, shower flow restrictors, and self closing faucets), conservation incentives (which take the form of water rate increases and seem to have the greatest impact on reducing water consumption), and public education (which is used to emphasize a relationship between the individual consumer and the District). The latter also informs customers of conservation methods as well as instills conservation ethics.

As indicated in the 1995 UWMP, the District was and is experiencing much new land development, which previously was used for agricultural purposes. This land is in the process of being turned into commercial and residential uses.

The District is requiring developers to install separate recycled water pipelines to serve street medians, parks, playgrounds, schoolyards and common areas. Initially these areas will be served with potable water, but eventually will be converted over to recycled water. In addition the District is looking for opportunities to use recycled water for other non-potable uses. For example, the District has an agreement with an existing concrete "ready mix" plant to use recycled water as soon as it is available. This should occur within the next few years.

Table 7-2 summarizes and briefly describes the water demand management measures and indicates if the District in some form has implemented the measure.

Table 7-2
Recommended Water Demand Management Measure and Their Status as of 2000

Measure	Definition	Implemented (Y/N)
Water Survey Audits for Single-Family and Multi-Family Residential Customers	Inspect for leaks in households and to improve the efficiency of landscape irrigation water use.	N
Residential Plumbing Retrofits	Replace devices with high efficiency (low flow) devices. Retrofitting of residential toilets and showers with water saving devices.	N
Distribution System Water Audits	Reduce system leakage. Repair pipes.	Y
Metering with Commodity Rates	Test and replace defective meters. Meter all new connections.	Y
Large Landscapes Conservation Programs	Review water irrigation techniques such as water cycle times for golf courses, schools, parks, and cemeteries. Establish rotating use schedules for irrigation, which reduces the impact of peak demands. Convert to recycled water wherever possible.	Y
High-Efficiency Washing Machine Rebate	Customer rebates for high-efficiency (horizontal-axis) clothes washers.	N

Table 7-2 (Continued)
Recommended Water Demand Management Measure and Their Status as of 2000

Measure	Definition	Implemented (Y/N)
Public Information Programs	Describe and make available water conservation information. Emphasize the relationship between the individual consumer water use to the total District water demand.	Y
School Education Programs	Teach water conservation methods and instill a conservation ethics.	Y
Conservation Programs for Commercial and Industrial Users	Evaluate existing sites water needs and recommend water efficiency measures. Look at opportunities to use recycled water.	Y
Wholesale Agency Assistance	Wholesale water suppliers to provide incentives or equivalent resources to benefit their retail suppliers. The District is not a wholesale water supplier.	N
Conservation Pricing	Charge irrigators for actual amount of water used. Eliminate reduced rate for irrigation water.	Y
Conservation Coordinator	Designate a water conservation coordinator to promote and enforce conservation programs	N
Water Waste Prohibitions	Develop methods to prohibit gutter flooding and single pass cooling systems and develop measures to encourage, recirculating water systems in conveyor car wash, commercial laundry systems, and in decorative fountains.	N
Ultra-Low-Flush Toilets	Incentive programs to replace high-water-using toilets.	N

Measures considered for this 2000 UWMP update fall into six categories: (1) inside residential, (2) industrial and commercial measures, (3) landscape measures, (4) distribution system measures, (5) public relation and education measures, and (6) pricing measures. The majority of the programs recommended will focus on regulating new developments. The new developments place additional strain on existing water supplies. Water conservation measures are easiest and most cost effective to install in new construction because there are no removal or replacement costs. A large percent of the total population increase in the City of Beaumont in the next 10 to 15 years will be as a result of new development; therefore less emphasis is placed on measures involving existing residential, industrial, and commercial customers.

7.3 BMP 1-WATER SURVEYS PROGRAMS FOR SINGLE-FAMILY RESIDENTIAL AND MULTI-FAMILY RESIDENTIAL CUSTOMERS

The District presently does not implement this demand management measure in performing water audits for single-family and multi-family residential sites.

7.3.1 Implementation or Scheduled Implementation

The District's long range goal is to develop guidelines for implementing a water survey for single and multi-family residential customers. Initially this will be in the form of information items, bill stuffers, etc. to inform customers how to monitor their consumption. Some guidelines will be provided so those customers can compare themselves to a "baseline".

7.4 BMP 2-RESIDENTIAL PLUMBING RETROFIT

Minimal (Limited) Kit Delivery Program; this type of kit may include a variety of water saving devices. A limited kit could contain shower flow restrictors, toilet tank displacement bag, and toilet tank leak detection dye tablets together with installation information, leak detection, and repair tips. These kits are intended for use in non-conserving showerheads and toilets in accordance with City and county ordinances.

7.4.1 Implementation or Scheduled Implementation

This measure is not presently implemented. The District will be considering providing Minimal (Limited) Kits in the implementation of such a measure for existing devices. New residential construction already incorporates low flow fixtures.

7.4.2 Methods to Evaluate Effectiveness

The technology for each of the items in the kit has been successfully demonstrated. Shower flow restrictors constrict the flow rate to 3 gpm compared to unrestricted showerheads that have a rated flow of 5 to 8 gpm. Toilet tank displacement bags lessen the amount of water used to flush by holding a small amount of water out of use. Non-conserving toilets fitted with tank displacement bags use 4.8 gallons per flush, versus 5.5 gallons per flush for non-conserving toilet. Toilet leaks are detected using leak detection tablets. The tablets are placed in the toilet tank, turning the water a bright color. If the water is leaking from the tank to the toilet bowl, the water in the toilet bowl will turn color.

7.4.3 Estimate of Existing Conservation Savings

This program is cost effective to consumers. The installation of these fixtures will reduce current water and wastewater flows significantly and will have direct economic benefits in deferred sewage treatment facility enlargement and deferred water supply alternatives.

Water and monetary savings offset the cost to the District and the consumer for the purchase and installation of the retrofit kits.

7.5 BMP 3- SYSTEM WATER AUDITS, LEAKS DETECTION AND REPAIR

Water distribution lines are routinely checked and/or tested for leaks; when leaks are found they are promptly repaired.

The distribution system water audit compares the amount of water produced (from wells, surface supplies) by the District to the amount of water used by consumers (as reported by metering readings). The difference is unmetered water. After allowing for authorized unmetered uses such as fire fighting, main flushing, and public use, it can be assumed that the remaining unmetered water is explained by inaccurate meter readings, malfunctioning valves and leakage, and theft.

7.5.1 Implementation or Scheduled Implementation

The District has an ongoing schedule to inspect facilities and periodically calibrate master water meters. The District has already implemented leak detection. Water system audits are generally done at least once a year

7.5.2 Methods to Evaluate Effectiveness

The District annually reviews data records to confirm that unaccounted for water losses stay within an acceptable range of 5% to 7%.

7.6 BMP 4-METERING WITH COMMODITY RATES FOR ALL NEW CONNECTIONS AND RETROFIT OF EXISTING CONNECTIONS

Purveyors are required to place water meters on all new service connections per California State law. The District fully meters all customer sectors.

7.6.1 Implementation or Scheduled Implementation

Prior to the 1980s, the District's method of billing on any land 0.81 acres or more was a fixed rate schedule independent of water use. In 1982 the District changed the billing method to reflect a varying rate structure based on water use.

The District presently replaces old meters under the Meter Exchange Program, which started in the early 1980s. The District continues to change out every meter on ten year intervals. The District plans to continue to conduct its meter calibration and replacement program.

7.6.2 Methods to Evaluate Effectiveness

Use daily District-wide pumping records to evaluate consumption. Utilize customer water bills to analyze water use consumption patterns.

7.7 BMP 5-LARGE LANDSCAPE CONSERVATION PROGRAMS AND INCENTIVES

Presently the City of Beaumont reviews, on a project-by-project basis, the conditions of approval for landscape practices. This approved Landscape Ordinance for New Construction encourages landscaping using low-water-using plants. Irrigation systems

with automatic controllers and valves are required on all commercial and industrial developments to control excessive water use. Landscaping practices that require excessive water use will be re-evaluated on a project-by-project basis.

The District also establishes rotating use of schedules for irrigation for those irrigation customers, which reduces the impact of peak demands. The District is encouraging the use of recycled water for these areas.

7.7.1 Implementation or Scheduled Implementation

The City of Beaumont's landscape ordinance has been implemented and in effect since 1995.

7.7.2 Methods to Evaluate Effectiveness

Water usage in new landscaped areas particularly during the typical dry months from May through September may be compared on a "per acre" basis with existing landscaped areas, which were not affected nor required prior to the implementation of the Landscape Ordinance.

Surveys, landscape information training, water bill historical water use and other programs will also assess effectiveness.

7.7.3 Estimate of Existing Conservation Savings

A 20 percent savings in water use through water efficient landscape is possible, compared to traditional landscaping water use for existing commercial, industrial, or governmental landscape.

7.7.4 Evaluation

Because many new developments are currently under construction, a current evaluation of the method has not been determined. However, future assessments should be possible to more accurately estimate the cost savings and water demand reduction of this method.

7.8 BMP 6-HIGH-EFFICIENCY WASHING MACHINE REBATE PROGRAMS

The District and the City of Beaumont presently do not have a rebate program in place for the replacement of old clothes washers.

7.9 BMP 7-PUBLIC INFORMATION PROGRAMS

The District participates and exhibits at public events such as fairs to provide information and promote water conservation. At these events the District provides information on water consumption, costs, and water quality. The District also has available brochures that provide the general public with information on water quality and water conservation.

7.9.1 Implementation or Scheduled Implementation

The public information programs are ongoing and information is provided as needed.

7.10 BMP 8-SCHOOL EDUCATION PROGRAMS

The District presently does not make a special effort to promote water conservation at local schools. Teachers at the schools may periodically discuss with students, awareness and importance of water conservation.

7.10.1 Implementation or Scheduled Implementation

District staff may consider coordinating with School District staff, events where information packets on water conservation and water savings techniques can be distributed to students.

7.11 BMP 9-CONSERVATION PROGRAMS FOR COMMERCIAL, INDUSTRIAL, AND INSTITUTIONAL (CII) ACCOUNTS

The District does not make a special effort to audit water use by commercial and industrial users but does work with local commercial and industrial users to promote water conservation as needed particularly with recycled water use. The District "standard" metering practice for large commercial/industrial customers is to install multiple, parallel small diameter (2-in) meters. These meters are more accurate at low flows than larger meters and provide an opportunity to monitor consumption. Malfunctioning meters are easily detected. If any of the meters read "high" or "low" they are replaced. The District works with existing and new commercial and industrial users to determine if recycled water can be incorporated and used in their operation such as a concrete ready mix business.

7.11.1 Implementation or Scheduled Implementation

The District will continue to implement this measure on an as need basis.

7.11.2 Methods to Evaluate Effectiveness

Water bills show the water customer the amount of water used in previous billing period. All commercial and industrial users are provided with historical usage on their bill. This allows customers to compare their water usage with the same period of the previous year and to monitor their water usage over time. The District is available to assist customers, if requested, to review methods to improve water use effectiveness.

7.12 BMP 10-WHOLESALE AGENCY ASSISTANCE PROGRAMS

The District is not a wholesale water supplier and therefore does not provide financial assistance or resources to advance water conservation efforts to retail water suppliers.

7.13 BMP 11-CONSERVATION PRICING

The District has eliminated a reduced water rate for high agricultural water users. These users pay the prevailing rate as set by the District for the volume of water used.

7.13.1 Implementation or Scheduled Implementation

The District will continue to review their rate structure to eliminate non-conserving pricing structures.

7.13.2 Methods to Evaluate Effectiveness

Review billing records and pricing structures.

7.14 BMP 12-CONSERVATION COORDINATOR

The District presently does not have a designated conservation coordinator.

7.14.1 Implementation or Scheduled Implementation

The District will review staff needs and make recommendation to the Board to possibly implement this measure. The District is a small agency and funding a full time water conservation coordinator would have significant financial impacts. The District will investigate opportunities to incorporate water conservation "duties" within the existing staffing or if this can be accomplished regionally through the STWMA.

7.15 BMP 13-WATER WASTE PROHIBITION

Section 9.6 of the District's Rules Governing Water Service states the following:

> It is a violation of these Regulations:
>
> 3) To cause or permit the waste of water from the water system or to maintain or cause or permit to be maintained any leaky outlets, apparatus or plumbing fixtures through which water is permitted to waste;
>
> 4) To use water for washing sidewalks and driveways in a manner that prevents the usual and customary use of public streets and sidewalks by others;
>
> 5) To permit water sprinklers to spray onto sidewalks and streets or to permit water to run from the consumer's property onto public sidewalks and streets to cause risk and/or damage to the public or to public and private property;

Section 15 of the District's Rules Governing Water Service states the following:

> No person, firm or corporation shall use, deliver, or apply waters received from this District in any manner that causes the loss, waste, or the application of water for unbeneficial purposes. Within the meaning of this Regulation, any waters that are allowed to escape, flow, and run into areas which do not make reasonable beneficial use of such waters, including but not limited to streets, gutters, drains, channels, and uncultivated lands, shall be presumed to be wasted contrary to the prohibitions of these Rules and Regulations.

The Regulations for Water Service have a series of warnings/penalties. The first notice is a written warning; the second offense results in a doubling of the water charges until full compliance is attained. After the third offense, the District can terminate water service to the customer.

7.15.1 Implementation or Scheduled Implementation

The District already has the ordinance regulation in place.

7.16 BMP 14-RESIDENTIAL ULTRA-LOW-FLUSH TOILETS (ULFT) REPLACEMENT PROGRAMS

The California Code of Regulations, Title 24, regulated by Part 5 of the California Plumbing Code, which is a division of the California Building Standards, requires ULFTs in all new construction starting January 1, 1994. The District does not presently have a program for replacement or a rebate program for replacement of old pre-1994 toilets.

7.16.1 Implementation or Scheduled Implementation

The City of Beaumont requires all new construction and remodel projects to install ULFTs.

SECTION 8

WATER RECYCLING

8.1 WASTEWATER SYSTEM DESCRIPTION

> 10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. To the extent practicable, the preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies and shall include all of the following:
>
> 10633 (a) A description of the wastewater collection and treatment systems in the supplier's service area...

The City of Beaumont's WWTP is within the service area of the District. The City of Beaumont is responsible for the collection and treatment of municipal wastewater. Although the District is not responsible for wastewater collection and treatment, the District is coordinating with the City of Beaumont on recycle water projects for reuse of treated wastewater. The present capacity of the plant is approximately 1.5 million gallons per day (mgd). The City of Beaumont is presently making modifications and enhancements to the plant to increase the plant capacity to 2 mgd. The ultimate capacity of the plant will be approximately 8 mgd. It is not known at this time when the next major expansion to the plant is scheduled.

Raw wastewater from the City of Beaumont enters the plant and flows through a mechanical screening and flow metering facility before flowing to the influent pumping station. From there the wastewater is pumped to a pair of combination flow equalization/aeration basins for secondary treatment. The effluent from the equalization/aeration basins flows to two secondary clarifiers where the activated sludge is separated and returned to the equalization/aeration basins. The plant will incorporate a centrifuge system for dewatering in their current modifications. The clarified secondary effluent flows to two shallow bed, traveling bridge filters then through an ultraviolet light facility for final disinfection. The disinfected effluent then flows through a metering flume and down a stair-step cascade aeration channel to Coopers Creek, which is tributary to San Timoteo Creek. It should be noted that the outfall to Coopers Creek is outside and not tributary to the BSU. The plant currently meets Title 22 requirements for unrestricted use and will provide tertiary treated effluent for water recycling. Additions will be made at the treatment facility for recycled water pumping and for chlorine application to maintain water quality within the recycled water distribution system.

8.2 WASTEWATER GENERATION, COLLECTION, AND TREATMENT

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. To the extent practicable, the preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies and shall include all of the following:

10633 (a) A [...] quantification of the amount of wastewater collected and treated...

Table 8-1 summarizes the estimated wastewater generation and collection within the existing service area of the District and estimated flows through 2025 based on known developments. Wastewater generation includes all flows received by the City of Beaumont's WWTP and estimated flows to on-site collection systems. Table 8-2 indicates the present flows to the City of Beaumont's WWTP.

Table 8-1
Wastewater Generation and Collection

	2000	2005	2010	2015	2020	2025
Wastewater collected and treated at City of Beaumont WWTP	1.2	2.1	3.1	3.9	4.4	4.8
Units of Measure: **Million Gallons per Day (mgd)**						

Table 8-2
Wastewater Treatment

Treatment Plant Name	Location (City)	Average Daily Flow (2000)	Maximum Daily Flow (2000)	Est. Year of Planned Build-out	Planned Ultimate Avg. Daily Flow
City of Beaumont WWTP	Beaumont	1.2	1.3	2050	8.0
Units of Measure: **Million Gallons per Day (mgd)**					

8.2.1 Overview of the Recycled Water Plan

The City of Beaumont has expanded and upgraded its WWTP to a full reclamation facility. This is in response to the California Regional Water Quality Control Board (RWQCB), Santa Ana River Region to upgrade the level of treatment to allow continued discharge to Cooper's Creek, a tributary of San Timoteo Creek. In lieu of discharging effluent to the creek, the City of Beaumont and District, through the two party Cooperative Agreement, have agreed to implement a water recycling project, since the effluent limits for discharge to the creek currently are equivalent to that required for water recycling.

All of the arrangements have not been finalized, but at this point it is believed the City of Beaumont will operate the treatment facility and deliver treated water to the District for recycling. The District will own and operate the recycled water pumping stations, storage

reservoirs and distribution piping. The District will then enter into agreements with various users, such as the City of Beaumont, Parks and Recreation District, Caltrans, Golf Courses, etc. for providing recycled water. The District will be responsible for metering and revenue collection as well as overall recycled water pumping, storage and distribution system operation and maintenance.

The District intends to serve recycled water to the full extent possible for non-potable uses and as permitted by law. This would make potable water, now used for irrigation, available for new development. As new development occurs, the new projects would include appropriate piping systems to permit the use of recycled water for irrigation of street medians, greenbelts, schools, parks and common areas. This concept then envisions limiting the use of potable quality water to potable water purposes to the extent practical. Surplus recycled water will be available during certain times of the year when normal irrigation demands are reduced. During these times, the surplus will be piped to spreading basins for surface spreading of recycled water for recharge to the BSU.

The recycled water system will be developed in phases to match both demand for recycled water and the availability of treated effluent to be recycled.

8.3 WASTEWATER DISPOSAL AND RECYCLED WATER USES

> 10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. To the extent practicable, the preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies and shall include all of the following:
>
> 10633 (a) A description of the [...] methods of wastewater disposal.
>
> 10633 (b) A description of the recycled water currently being used in the supplier's service area, including but not limited to, the type, place and quantity of use.
>
> 10633 (c) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.
>
> 10633 (d) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years.

8.3.1 History of Water Recycling in the Service Area

The District has considered the use of recycled water to supplement the water supply for a number of years. As early as 1987 the District began discussing water recycling in earnest with the City of Beaumont and the Pass Agency.

In June of 1989 the District prepared an internal memorandum on the potential for using recycled water in the Pass area. The report discussed the installation and operation of a conceptual project, which included treatment facilities serving the cities of Banning and Beaumont. Included in this plan were conceptual alignments for recycled water distribution and storage facilities. The concept involved the formation of a Joint Powers Reclamation Agency with each city operating its own treatment facilities. The effluent

would be provided to the JPA for distribution. Surplus recycled water was proposed to be percolated into the ground for recharge.

In August of 1989 the cities of Beaumont and Banning along with the District sent letters to the Pass Agency to have the Pass Agency take the lead on the conceptual project.

Since that time, the District, the City of Beaumont and several large developers took the lead in developing a conceptual regional wastewater collection and reclamation study. The District's Engineer completed the study in 1993. The plan envisioned a regional reclamation facility in San Timoteo Canyon in the vicinity of San Timoteo Canyon and Singleton Roads. The plan also envisioned continued use of the City of Beaumont's WWTP as a satellite reclamation plant. The current plan, however, is to keep the City of Beaumont's WWTP in operation supplying recycled water up to at least 8 mgd. Flow will not reach this level until well into the future.

With increasing interest in development in the City of Beaumont, the District and the City of Beaumont entered into a cooperative agreement that funded a new recycled water master plan from Community Facilities District Bonds. This work was completed as part of the 1995 Master Plan.

8.3.2 Type and Place of Recycled Water Currently Being Used

At the present time treated wastewater is not being used to offset potable water demands. Pipelines are being installed as development occurs in accordance with the District's Recycled Water Master Plan, which is presently being updated. Certain facilities need to be in place such as a booster station, chlorination facility, and water storage at the City of Beaumont's WWTP in addition to pipelines before water recycling can be begin. The chlorination facility is not for disinfection, but to provide a residual disinfectant in the recycled water to maintain water quality in the recycled water distribution system.

8.3.3 Recycled Water Quantity

Successful recycled water systems require the recycled water to be available not only in sufficient quantities, on demand, but also be of the highest quality possible.

With respect to quantity, the demand must not outpace the supply and sufficient storage must be provided to match hourly demand with supply.

Currently there is about 1.2 mgd of wastewater treated at the City of Beaumont's WWTP. This water, once treated, is discharged into Coopers Creek, which is tributary to San Timoteo Creek. Because it provides a portion of the streamflow to San Timoteo Creek, the RWQCB has indicated that some portion of the flow should continue to be discharged to the creek. For purposes of this plan this is assumed to be 20 percent of the current discharge or about 0.25 mgd. Based on this there is currently about 0.95 mgd available for recycling. Other alternative mitigation measures may be implemented such that the total present flow from the wastewater treatment plant, 1.2 mgd, would be available for recycling. Any mitigation measures would require approval by the RWQCB.

The initial recycled water system, then, must be designed to serve only facilities, which require less than 1.2 mgd. As development occurs, the recycled water distribution system

can be expanded to serve the ultimate plant capacity of 8 mgd.

8.3.4 Recycled Water Quality

Current users of potable water recognize the value of water quality; changes from potable water to recycled water are sometimes met with resistance, primarily due to the unknowns. These unknowns relate to both quality and quantity. Golf course superintendents are concerned about the mineral water quality and its impact on very sensitive grasses. Nursery owners are concerned about the impact of the water on sensitive ornamentals. School site administrators want to know how the play areas will react to recycled water.

8.3.4.1 Recycled Water Quality

Water quality parameters of interest to recycled water users are typically:

- Mineral content
- Metals
- Organics and pesticides
- Microbiological content

8.3.4.2 Mineral Content

The mineral content is extremely important to landscape irrigation, nursery users, irrigators and golf course superintendents. From an irrigation standpoint the important parameters are the total dissolved solids (TDS) concentration, the concentration of specific ions such as sodium, chloride, and boron; and the impact the use of the water will have on the soil structure as measured by the Sodium Adsorption Ratio (SAR) or the Modified SAR.

The mineral content is also of importance when groundwater recharge is considered. If the recycled water has excessive mineral content, the quality of the groundwater will eventually deteriorate. In groundwater recharge projects, the quality of the recharge water must be of such quality, that it will not cause the groundwater basin water quality objectives to be exceeded. Basin water quality objectives are established by the RWQCB and are published in the Basin Plan.

Table 8-3 presents a summary of the mineral quality characteristics of the wastewater currently being discharged by the City of Beaumont's WWTP between 1995 and 2001.

Table 8-3
Recycled Water Mineral Quality (1995-2001)

	RANGE			
PARAMETER	UNITS	MIN	MAX	AVERAGE
Total Hardness as CaCO3	mg/L	150	200	177
Calcium (Ca)	mg/L	39	53	46
Magnesium (Mg)	mg/L	12	18	15
Sodium (Na)	mg/L	57	82	68
Potassium (K)	mg/L	11	14	12
Ammonium Nitrogen (NH4-N)	mg/L	ND	8	0.62
Total Alkalinity as CaCO3	mg/L	160	250	202
Hydroxide (OH)	mg/L	ND	<3	0
Carbonate (CO3)	mg/L	ND	3	2
Bicarbonate (HCO3)	mg/L	140	310	247
Sulfate (SO4)	mg/L	36	67	46
Chloride (Cl)	mg/L	30	65	49
Nitrate Nitrogen (NO3-N)	mg/L	<1	20	7
Fluoride (F)	mg/L	0.4	2.0	0.66
Cyanide (CN)	mg/L	ND	0.02	<0.01
Total Phosphorus	mg/L	0.1	4.6	2.21
Nitrite Nitrogen (NO2-N)	mg/L	ND	0.8	0.18
Inorganic Nitrogen	mg/L	1	31	9
Total Dissolved Solids (TDS)	mg/L	360	510	428
Total Organic Carbon (TOC)	mg/L	3	24	6
Sodium Adsorption Ratio	meq/L	2.0	2.5	2.2

Overall the mineral water quality of the recycled water is excellent. The TDS ranges from 360 to 510 mg/L with an average of 428 mg/L. The TDS of the District supplied groundwater ranges from 220 to 320 mg/L and averages about 260 mg/L. The water quality varies depending on the source i.e. Edgar Canyon supply or the BSU. Water from Edgar Canyon has slightly lower mineral concentration than water pumped from the BSU. The recycled water concentration shows an increase of 168 mg/L from the supply water. This is lower than that typically experienced and is reflective of the good quality water source and the predominately residential character of the wastewater.

The concentration of sulfates, chlorides and sodium in the recycled water, of concern to irrigators, averages 46, 49 and 68 mg/L, respectively. In the District supplied groundwater these concentrations average 30, 10 and 20 mg/L, respectively. The recycled water concentrations show an increase of 16, 39, and 48 mg/L from the supply water. This is typical.

The SAR for the reclaimed water averages 2.2. SAR values less than 3 present a low risk

of decreasing soil permeability with long-term use of the water.

This water can be used for irrigation without any fear of damage to grasses or landscaping.

The recycled water contains a total phosphorus (as P) of 2.2 mg/L and total inorganic nitrogen (as N) of 9 mg/L. This translates into a fertilizer equivalent of 6 lb. of P/acre/foot of water applied and 25 lb. of N/acre/foot of water applied. On the basis that 5 feet of water will be applied per year per acre, the recycled water will supply about 30 lb. of P/acre/year and 125 lb. of N/acre/year. Use of the recycled water for irrigation will reduce the need to purchase and apply chemical fertilizers.

8.3.4.3 Metals

Table 8-4 presents the quality of the recycled water in terms of metals. Metals are present in only trace amounts and all comply with the maximum contaminant levels (MCLs) set for potable water.

The boron concentration ranges from <0.1 to 0.3 mg/L with an average of 0.22 mg/L. Boron is of concern in concentrations above about 0.75 mg/L.

8.3.4.4 Organics and Pesticides

Organics and pesticides are essentially below detection levels except for chloroform. Chloroform is a disinfection by-product formed during the disinfection process using chlorine and is a trihalomethane (THM). The WWTP uses ultraviolet disinfection so chloroform levels should be minimal. The chloroform concentration in recent samples was below 30 µg/L. The drinking water MCL for total trihalomethanes is 80 µg/L and hence the concentration in the recycled water would not appear to be of concern.

The total organic carbon (TOC) in the recycled water ranges from 3 to 24 mg/L with an average value of 6 mg/L. TOC is an important consideration in groundwater recharge involving recycled water because it is reflective of refractory organic material, which was not removed in the treatment process. This level of TOC may be an issue in groundwater recharge and some additional effluent "polishing" may be required.

8.3.4.5 Microbiological Content

The regulations for recycled water use are based on producing virus and pathogen free water. The upgraded and expanded WWTP will provide recycled water that meets these objectives.

Table 8-4
Recycled Water Metal Concentrations (1995-2001)

		RANGE		
PARAMETER	UNITS	MIN	MAX	AVERAGE
Antimony (Sb)	µg/L	<1	2	<1
Arsenic (As)	µg/L	<1	5	1
Barium (Ba)	µg/L	<20	24	<20
Beryllium (Be)	µg/L	<10	<10	<10
Boron (B)	mg/L	<0.1	0.3	0.22
Cadmium (Cd)	µg/L	<1	1	<1
Total Chromium (Cr)	µg/L	<10	10	<10
Cobalt (Co)	µg/L	<10	<10	<10
Copper (Cu)	µg/L	<10	15	<10
Iron (Fe)	µg/L	<20	110	20
Lead (Pb)	µg/L	<1	13	1
Manganese (Mn)	µg/L	<10	10	<10
Mercury (Hg)	µg/L	<0.5	0.5	<0.5
Nickel (Ni)	µg/L	<20	20	<20
Selenium (Se)	µg/L	<1	7	<1
Silver (Ag)	µg/L	<10	10	<10
Thallium (Tl)	µg/L	<5	200	<5
Zinc (Zn)	µg/L	35	150	60

8.3.4.6 Projected Water Quality

When the newly upgraded WWTP is on-line, it is expected that most of the mineral water quality constituents will not vary appreciably from those in Table 8-3. However, there could be a change in some of the constituents if treated SWP water is used in the service area for potable water.

SWP water contains higher concentrations of TDS, chlorides and sulfates than does the local groundwater. Table 8-5 presents data on the variation of these constituents in the SWP water from Silverwood Reservoir, the water source for the Pass Agency.

The variations of water quality are substantial and depend on the water supply conditions in Northern California. Drought conditions result in more intrusion of poor quality water into the Sacramento-San Joaquin River Delta, the source of the SWP exports. The expected value shown in Table 8-5 is not an average but rather is reflective of conditions believed to be representative in the future.

Table 8-5
State Water Project Water Quality

Parameter	Units	Range	Expected
TDS	mg/L	100 - 400	350
Chloride	mg/L	10 - 150	120
Sulfate	mg/L	30 - 120	80

If SWP water is used in the District water supply system, the concentrations of TDS, chlorides and sulfates in the recycled water will increase slightly; the amount of increase depends on the proportion of SWP water used. Most likely the water supply for the service area in the future will consist of a blend of local groundwater and SWP water, so the anticipated concentrations of TDS, chlorides and sulfates in the recycled water will be 490, 115 and 70 mg/L, respectively versus the 428, 49, and 46 mg/l respectively, currently experienced in the City of Beaumont's WWTP effluent.

8.3.5 Potential Uses of Recycled Water

8.3.5.1 Irrigation and Other Direct Uses

At the present time the only potential recycled water uses envisioned are those related to irrigation of freeway medians, golf courses, cemeteries, parks, playgrounds and schoolyards. Recycled water used for those purposes shall be disinfected tertiary recycled water. (Strictly speaking the irrigation of freeway medians and cemeteries only needs to be disinfected secondary effluent. Treating only a portion of the effluent to meet those reduced requirements is impractical and furthermore would require a separate piping system to distribute the water to those users.)

In the future the recycled water system could be expanded to irrigate cherry and other fruit orchards. The proposed requirement for this use is disinfected tertiary recycled water also. It is anticipated that future demand for irrigation of fruit trees will diminish as the orchards are replaced with other land uses.

The City of Beaumont's WWTP already produces effluent, which meets Title 22 requirements for unrestricted use. There are, however, a number of use area requirements and facility design requirements. These requirements assume disinfected tertiary recycled water is used.

1. No irrigation shall take place within 50 feet of any domestic, including municipal, water supply well and no impoundment shall occur within 100 feet of any domestic well.

2. Any irrigation runoff shall be confined to the use area and shall not enter a dwelling, outdoor eating area or a food handling facility. Drinking water fountains shall be protected against contact with recycled water spray, mist or runoff.

Irrigation of parks, playgrounds and schoolyards usually requires irrigation during the nighttime hours.

3. Recycled water use areas shall be posted with signs.
4. There shall be no physical connection between any recycled water system and a potable water system. Only an air gap separation is permitted on back-up supplies.
5. The recycled water system shall not have any hose bibs. Only quick couplers different from those used on the potable water system are permitted.
6. A reduced pressure principle backflow prevention device shall be placed on the potable water supply connection to each reuse area.
7. A detailed recycled water use report shall be prepared. This report shall contain
   - A detailed description of the use site including the person(s) responsible for operation and maintenance of the system,
   - Piping layout including backflow prevention devices, and
   - Methods used by the recycled water supplier to ensure no cross connections.

8.3.5.2 Groundwater Recharge by Surface Spreading

The following requirements, excerpted from the "Draft, dated April 23, 2001, Groundwater Recharge Reuse Regulations," affect the design and operation of a proposed recycled water project.

1. All reclaimed water shall be from a wastewater collection system operated under a comprehensive industrial pretreatment and pollutant source control program.

The City of Beaumont will have this in place, as it is part of the overall wastewater discharge permit.

2. Requires that the recycled water be oxidized, filtered and disinfected.

Essentially this is a filtered and disinfected secondary effluent. This is basically the same quality required for direct discharge to San Timoteo Creek. The current level of treatment meets this requirement.

Some polishing supplementary refractory organics removal may be needed.

3. The average quantity of recycled water in each aquifer shall be specified by the Department of Health Services. The amount will be a function of the TOC in the recycled water. The recycled water TOC shall not exceed 0.001 g TOC/L divided by the recycled water fraction, i.e., the fraction of the total aquifer that is recycled water.
4. Recycled water shall be retained underground a minimum of 6 months prior to being withdrawn at a domestic (municipal) water supply well.
5. The minimum horizontal separation between a surface spreading area and a domestic (municipal) water supply well shall be 500 feet.
6. A detailed engineering report shall be prepared and contain the following information as a minimum:
   - A plan of the treatment, storage, transmission, spreading and monitoring facilities,

- A project description,
- A detailed hydrogeologic study to address the aquifer travel time, percent recycled water intercepted by domestic wells, water quality impacts, etc.,
- A description of the operation and maintenance personnel, their qualifications, experience and responsibilities,
- A description of project operation including a contingency plan to preclude the recharge of water when conditions or quality does not meet requirements,
- A determination of anticipated TOC and total nitrogen levels, and
- A detailed mound monitoring plan.

Based on the requirements established above, there does not appear to be any reason why the surface spreading of recycled water would not be permitted.

8.3.6 Potential Recycled Water Demands

Table 8-6 summarizes the potential recycled water users in 5-year increments through 2025. To serve all of these users would involve a very extensive distribution and storage network. It is envisioned that the recycled water system could serve the entire area eventually.

Table 8-6
Potential Recycled Water Demands (2005 – 2025)

Year	2005	2010	2015	2020	2025
Recycled Water (Dist. Cust.) Potable Water Offsets[a]	0.2	0.3	0.6	1.0	1.0
Recycled Water Exchanges for Potable Water Offsets[b]	0.7[c]	2.3[d]	4.0[e]	4.0	4.0
Recycled Water Recharge	---	0.3	0.3	0.3	0.4
TOTALS	**0.9**	**2.9**	**4.9**	**5.3**	**5.4**

Units of Measure: **Million Gallons per Day (mgd)**
a Estimated offset demand for irrigation of parkways, medians, cemeteries, and parks.
b Estimated offset demand for irrigation of golf courses.
c Oak Valley Golf Course.
d Oak Valley, Highland Springs North, and PGA Golf Courses.
e Oak Valley, Highland Springs North, and PGA Golf Courses and Sunny Cal Egg Ranch.

Table 8-7 summarizes the comparison of recycled water available from the City of Beaumont's WWTP and the projected recycled water demands through 2025. It is estimated that by 2015 and beyond that the demand for recycled water will be greater than the supply. It may be possible for the District to work with neighboring agencies (e.g. YVWD) to increase the recycled water supply.

Table 8-7
Projected Recycled Water Supply and Projected Recycled Water Demands Comparison (2005 – 2025)

Year	2005	2010	2015	2020	2025
Projected Available Recycled Water Supply for Reuse[a]	1.9	2.9	3.7	4.1	4.6
Projected Recycled Water Demand	0.9	2.9	4.9	5.3	5.4

Units of Measure: **Million Gallons per Day (mgd)**

a Available supply equals total wastewater plant flows less 0.25 mgd flow to Coopers Creek.

8.4 CITY OF BEAUMONT RECYCLED WATER ORDINANCES

The City of Beaumont has adopted several ordinances regulating the use of recycled water. The City of Beaumont, in conjunction with the District, has adopted polices such that when recycled water becomes available, recycled water will be used for non-potable uses such as irrigation of landscape medians, cemeteries, golf courses, and parks. The City of Beaumont also has ordinances that adopt the District's UWMP and the water conservation measures and procedures stated in the UWMP. The City of Beaumont's ordinances applicable to recycled water are attached in Appendices L, M, and N.

Plan of Services

PLAN OF SERVICES

For

NOBLE CREEK VISTAS

PREPARED FOR

BEAUMONT CHERRY VALLEY WATER DISTRICT

December 2003

PREPARED BY:

PARSONS
100 West Walnut Street
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BEAUMONT CHERRY VALLEY WATER DISTRICT

PLAN OF SERVICES

for

NOBLE CREEK VISTAS

November 20, 2003

Introduction

Noble Creek Vistas (Project) is requesting annexation to the Beaumont Cherry Valley Water District (District) for their project. The Project will consist of a total of 965 single-family residential dwelling units, 20 acres for a middle school, and 50 acres of parks/open space. The general location of the Project is in a portion of the east half of Section 33, T2S, R1W SBB&M and a portion of the west quarter of Section 34, T2S, R1W SBB&M within the unincorporated area of Riverside County at the northerly limits of the city of Beaumont. The Project is within the city of Beaumont's Sphere of Influence and will ultimately be annexed to the city of Beaumont. Beaumont Avenue borders the Project on the east, Brookside Avenue on the north, Oak View Drive (Nancy Avenue) and future Noble Creek Parkway on the west, and Oak Valley Parkway (formally 14th Street) on the south. The annexation area consists of approximately 333 acres of currently undeveloped dry farming land. The Project will be served from the District's 2850 (Intermediate) Pressure Zone.

Tentative tracts have been developed for a portion of the project. They are:

Tract No. 28988 – 201 Residential Lots

Tract No. 29267 – 333 Residential Lots

Tract No. 29522 – 298 Residential Lots

There is a portion of the Project that has not been identified as a tentative tract but consists of 133 residential lots.

This Plan of Services utilizes information from the District's 1994 Water System Master Plan Update, which addresses water demands and master planned facilities for the project. This master plan is currently being updated. Land use information was obtained from the Riverside County General Plan, the city of Beaumont Planning Department's General Plan and Noble Creek Vistas Specific Plan Draft Environmental Impact Report, dated September 2001. The Project is zoned for single family residential development. The site currently consists of agricultural land and open space traversed by several natural runoff gullies. The tentative schedule for the Project has a start date of approximately 2003 with an estimated completion date of 2006-2007.

Overall Project Water System Improvements

The Project will be served from the District's 2850 (Intermediate) Pressure Zone. The proposed Noble Creek Vistas development is located outside of the District's existing service boundary. The District currently has no existing facilities to support the development of the Project. The required backbone pipeline facilities to serve potable and recycled water to the overall Project include the following and are shown in Exhibits A-1 and A-2:

2850 (Intermediate) Pressure Zone

Pipelines

1. Approximately 1,625 LF 8" in future "M" Street (Tract No. 28988)/"Y" Street (Tract No. 29267) from an existing 12" connection point in Cougar Way north to future Noble Creek Parkway.
2. Approximately 1,705 LF 12" in the future Noble Creek Parkway from future "M" Street (Tract No. 28988)/"Y" Street (Tract No. 29267) to a connection point at Brookside and Beaumont Avenues.
3. Approximately 3,250 LF 16" in Brookside Avenue from Beaumont Avenue to Oak View Drive.
4. Approximately 1,280 LF 12" in Beaumont Avenue from an existing 12" connection point approximately 1,320 LF north of Oak Valley Parkway (formally 14th Street) to Cougar Way.
5. Approximately 1,100 LF 8" in Cougar Way from an existing 12" connection point to future Noble Creek Parkway.
6. Approximately 2,830 LF 12" in future Noble Creek Parkway from Cougar Way to Oak Valley Parkway and Elm Street with a connection to the existing 10" water main in Oak Valley Parkway.
7. Approximately 100 LF 16" in Brookside Avenue from a connection point 100 feet east of Beaumont Avenue to Beaumont Avenue.
8. Reconnect 10" in Oak Valley Parkway and 12" in Beaumont Avenue to the 2850 Pressure Zone.

All other in-tract pipelines shall be minimum 8-inch mains.

All pipes shall be ductile iron pipe with push-on joints. The minimum pressure class of the pipe shall be Class 150. In addition, the applicant shall install fire hydrants or 4-inch blow-offs at the end of all lines in cul-de-sacs for line flushing.

The applicant shall install standard 6-inch fire hydrants with one 4" and two 2 1/2" outlets "super head" fire hydrants in accordance with District standards. The Fire Marshall shall approve all fire hydrant locations.

The applicant shall install 1" copper services from the water main to and including angle meter stop and coupling fitting for each residential lot in accordance with District's standard

drawings and specifications. All service laterals shall be located horizontally a minimum of 5 feet off property lines and minimum 10 feet clear of all sewer laterals

Recycled Water System Improvements

Pipelines

1. Approximately 3,250 LF 16" in Brookside Avenue from Beaumont Avenue to Oak View Drive with a connection to the existing 16" recycled water line in Oak View Dr.
2. Approximately 1,705 LF 16" in the future Noble Creek Parkway from future "M" Street (Tract No. 28988)/"Y" Street (Tract No. 29267) to the intersection of Brookside and Beaumont Avenues.
3. Approximately 1,625 LF 16" in future "M" Street (Tract No. 28988)/"Y" Street (Tract No. 29267) from an existing connection point in Cougar Way north to future Noble Creek Parkway.
4. Approximately 1,500 LF 8" in future Noble Creek Parkway from Cougar Way to the existing Southern California Edison easement.

Additional recycled distribution water lines shall be installed to all parks, green belt, and other landscape areas.

All recycled water pipes shall be ductile iron pipe with push-on joints and bagged with purple polyethylene bags per AWWA standards. The minimum pressure class of the pipe shall be Class 150. All above-ground appurtenances shall be color coded per AWWA standards. Signs shall be posted around the use area notifying that recycled water is being used and it is unsafe to drink. All signage shall be installed in accordance with AWWA standards.

It is noted that the Beaumont Unified School District recently constructed a 12-inch potable water line and 16" recycled water line in Cougar Way from Beaumont Avenue west to the westerly boundary of the proposed middle school.

Recent Legislation

As development increases, the need for additional potable water sources will increase. The District is actively pursuing additional water sources to meet the future demands within the District's service area. Recently passed legislation, effective January 1, 2002, includes Senate Bill No. 221, ("Kuehl") which stipulates that legislative bodies of a city, county, or public water system provide written verification that a sufficient water supply is available prior to completion of a project/subdivision. A subdivision is defined in the Kuehl Bill as "a proposed residential development of more than 500 dwelling units for a public water system with 5,000 services connections or more" which is applicable to the District. Senate Bill No. 610, ("Costa") requires the water supplier to prepare a water supply assessment. The above legislation bills are applicable to this Project.

Additional information to support this Plan of Services as required by LAFCO's *Local Government Reorganization Act of 2000* is provided below.

Beaumont Cherry Valley Water District Background

Beaumont Cherry Valley Water District (District) was first formed in April 1919, to provide domestic and irrigation water to the new community of Beaumont and the surrounding area. The District was originally named the Beaumont Irrigation District. In 1973 the name was changed to the Beaumont Cherry Valley Water District. However, even though the name has changed, the District's authority comes from the Irrigation District Law of the State of California.

The District's present service area covers about 10 square miles, virtually all of which is in Riverside County. The District's ultimate service planning area encompasses an area of about 40 square miles. (See Exhibit "B" attached)

Water Supply

The District presently extracts water from two local groundwater sources to meet the District's water demand, Edgar Canyon and the Beaumont Basin. The table below shows the total amount of water extracted over the previous five years from the two sources.

Year	Groundwater Production (ac-ft/yr)
2002	8,025
2001	7,134
2000	6,308
1999	5,887
1998	4,874

The Beaumont Basin is a very large groundwater source that the United States Geological Survey (USGS) estimates contains approximately 1.1 million acre-feet of groundwater in storage. This mid 1960s estimate was based on existing well data at the time. The report has been the basis for a general consensus that the base of useable water was 1,000' Below Ground Surface (BGS). The District, however has recently drilled a new test well in the Beaumont Basin at the District's newest recharge site to a depth of 1,500 feet BGS. As part of a draft report titled "Geohydrologic Investigation Noble Creek Artificial Recharge Study", dated July 1, 2002 prepared by Geoscience, (Appendix I, attached as Exhibit No. 1), results from pump test data suggests that high quality groundwater with a lower Total Dissolved Solids (TDS) and a different water chemistry exists in large quantities below the USGS previously theorized 1,000' base. Other deep wells drilled by Southern California Professional Golfers Association (SCPGA), Oak

Valley Greens and the Sunnycal Egg Ranch show that the deep source is relatively wide spread throughout the Beaumont Basin. This additional volume of water in storage greatly increases the reliability of the District's groundwater supply as presently believed.

Based on District studies and those prepared by San Gorgonio Pass Water Agency (Agency) and the San Timoteo Watershed Management Authority (STWMA), it is estimated that the long-term safe yield for the Edgar Canyon is 1,800 ac-ft/yr and Beaumont Basin is about 10,000 ac-ft/yr. These volumes should only be considered as estimates as the deep aquifer yields from the Beaumont Basin were not considered in these studies.

In 1902 the District's predecessor, Beaumont Land and Water Company (Company) began diversions of water in the Little San Gorgonio Creek and Noble Creek to supplement irrigation water demands using surface water rights that the Company had purchased with land accusations along the creeks. The Company also purchased down stream riparian water rights to allow full use of the surface flows of the creeks. The District's first shallow wells were built about this same time (1902) to augment surface water supplies and to provide a more reliable water supply to the growing community. As the wells came on line the Company began to impound the stream flows to recharge shallow aquifers the wells pumped from. This diversion has continued throughout the twentieth century and continues today. Through the last twenty or so years the District has closely monitored diversions and extractions determining that more water is recharged than is pumped from the canyon supply. The USGS in cooperation with the District and the San Gorgonio Pass Water Agency, has recently determined in a currently unpublished USGS report, that the recharged groundwater in the Little San Gorgonio Creek Canyon does not flow underground into the Beaumont Basin presumably because of the existing geology underlying alluvial fill in the canyon areas the District uses for recharge.

To augment existing water sources, which is presently totally groundwater extractions and capture lost recharge from the canyon recharge efforts, the District is developing a project that will capture stormwater flows in Little San Gorgonio and Noble Creeks and deliver the flows, through a pipeline, to recharge basins directly overlying the Beaumont Basin. A District engineering study titled "Resource Development–Surface Water Capture for Little San Gorgonio Creek and Other Locations", amended December 10, 2001 (attached as Exhibit No. 2) discusses in detail the recharge and recovery project. The recharge site will also be able to receive State Project Water from San Gorgonio Pass Water Agency for groundwater recharge and may be used for conjunctive use projects discussed later in this section. The estimated yearly average long-term capture of stormwater flows is 4,100 ac-ft/yr.

With projects like Noble Creek Vistas coming on line, the District has secured funding for the engineering design, completed a $1.6 million dollar recharge study, Exhibit No. 1, taken possession of the 78 acre recharge site that will be developed as a park/recharge facility and has completed the environmental impact report titled "Groundwater Recharge Program", March 2003 (attached as Exhibit No. 3) for the recharge project.

The District in cooperation with the City of Beaumont is also developing a recycled water distribution system for delivery of recycled water from the City's treatment facility. Currently the annual irrigation water demand supplied by the District is estimated to be approximately 1,100 ac-ft/yr, which includes irrigation of parks, schools, green belt areas, and a golf course. In addition it is estimated that about 4,000 ac-ft/yr of potable water is used to irrigate various golf courses in the area which will eventually be converted to recycled water as discussed in the District's 1994 Master Plan. Once these golf courses are converted, the current groundwater demand for irrigation would then be available to the District to meet domestic demands. These golf courses consist of three championship golf courses in the District's service area that pump from the Beaumont Basin, a smaller golf course, which is served by the District and a second small course served by a well outside of the Beaumont Basin in Marshall Canyon. One of the smaller golf courses is also receiving water from springs located northeast of the developed area of Cherry Valley. The District current recycled water plan also envisions recycled water service to the Banning Sun Lakes course.

The City of Beaumont estimates that the average annual wastewater collected per EDU is 0.19 gpm/EDU (0.31 ac-ft/yr/EDU.) This statistic indicates, when compared to the District's actual average deliveries of water to individual EDU on 10,000 square foot lots or less (.61 ac ft/yr/EDU) that 50% of the water delivered to an EDU is recycled under the new system plan. Portions of the recycled water system have recently been completed and pipeline construction continues as developing lands come on line.

The use of recycled water for the parks, golf courses, and other open space areas will "free-up" available potable water, which is presently being used for irrigation. It is estimated that presently there is approximately 800 acre-feet of recycled water available at the City of Beaumont's Wastewater Treatment Plant. The City is currently building a plant expansion that includes a reservoir for storage of recycled water at the plant along with a booster station to pump recycled water through the District's recycled water distribution system.

The District is currently constructing recycled water transmission mains for delivery of recycled water to existing irrigation users. The District is also installing a recycled water distribution system as new development occurs. The District continues to collect a Recycled Water Facility Fee from each new EDU to finance the improvements. This fee is providing the necessary capital for the District and the City of Beaumont to complete the recycled water system as development occurs. First deliveries of recycled water to the District's recycled water distribution system in the southern portion of the District will begin in late 2004 or early 2005.

The City of Beaumont and the District are also working together with developers throughout the District's service area to develop four "Incidental Recharge" areas. The largest of which is on Noble Creek that runs through the Noble Creek Vistas project. These areas will be developed to capture urban storm runoff for recharge to the groundwater basin. They will also be used for blending storm flows with surplus recycled water during winter months. The Noble Creek site may also be used to recharge various additional supplies that may be available from the District's recharge facility located directly up stream and adjacent to Noble Creek Vistas project.

The District in August 2002 approved its latest update to the "Urban Water Management Plan" (UWMP) (attached as Exhibit No. 4) which provides a complete detail of the District water resource plan and explains the where and how the District plans to serve development in the District's Sphere of Influence through 2025. This plan was certified by the California Department of Water Resources in 2003. Table 2-2 from the UWMP forecasts the water supply that the District will rely on as we move through the first 25 years of the 21-century. Based on the District's resource development plan, the District will reduce its dependency on the Beaumont Basin, which currently is relied on for most of our water supply and limit the District's reliance on State Project Water to approximately 20% of the District's overall water demand. Development of the water resources shown in Table 2-2 are dependent on development within the District's Sphere of Influence as it is the developing lands that will provide a majority of the funding for the expansion of the District's future water resources.

Table 2-2
Current and Projected Available Water Supplies – Development Basis

Water Supply Sources	2000[a]	2005	2010	2015	2020	2025
SWP Via Pass Agency (Estimated Available)	0	5,000	5,000	5,000	5,000	5,000
Groundwater Extractions (Edgar Canyon)	2,671	1,800	1,800	1,800	1,800	1,800
Groundwater Extractions (BSU)	3,637	3,500	3,500	3,500	3,500	3,500
Return Flows from Septic Systems	0	280	350	400	460	520
Urban Runoff/Groundwater Recharge	0	400	1,000	1,100	1,200	1,300
Captured Infiltration (shallow groundwater)	0	0	300	300	300	300
Stormwater Capture / Groundwater Recharge	0	2,600	4,100	4,100	4,100	4,100
Recycled Water Users -Well Transfers	0	800	2,600	4,500	4,500	4,500
Recycled Water Supply / Use	0	1,000	3,200	4,100	4,600	5,100
Total Forecasted	**6,308**	**15,380**	**21,850**	**24,800**	**25,460**	**26,120**
Units of Measure: **Acre-feet/Year**						

a Current water supply indicates actual water production for year 2000 and may not include all available water supply.
b Includes 500 AFY estimated urban runoff at Cherry Ave and Brookside Ave starting around 2010.
c Acquisition of potable water supply wells from potential recycled water users as they become District customers.

d Recycled water supply that would be in demand for non-potable use by various potential users including but not limited to: Oak Valley Greens-800 AFY, Oak Valley Golf and Resort (SCPGA)-800*2 AFY, Highland Springs North-200 AFY, SunnyCal-1900 AFY.

Additional sources of water for future development also include increased return flows from the development of lands overlying the Beaumont Basin. The San Timeteo Watershed Management Authority (STWMA) discussed later in this section is currently developing a study funded by STWMA and the Santa Ana Regional Water Quality Control Board that will study the relationship between recharge from vacant lands and developed lands that are irrigated regularly (lawn watering, golf course watering etc.). It will also give a better indication of the water supply that is being developed by the capture of runoff from impervious areas of both existing and

newly developing areas, which will better quantify the available water that is delivered to an EDU and returned to the groundwater source as return flow.

Based on the water projected forecast shown on Table 2-2, 80% of the District water demand will be supplied by local water sources as the various projects funded by development are constructed. The additional 20% of the District's water demand necessary for new development will be supplied by imported water that will come through a new water system that was built by the Department of Water Resources (DWR) in cooperation with the San Gorgonio Pass Water Agency (Agency).

Currently the Agency has an entitlement for import of 17,300 acre-feet of water from the State Water Project (SWP). It also has a requirement by Law to prioritize water delivered to offset overdraft that may exist in any agency or district receiving water.

Following is an excerpt from Chapter 101 of the San Gorgonio Pass Water Agency Law as stated in the California State Water Code Appendix:

"§ 101 – 15.5 Allocation of water from state water project

Sec. 15.5. It is the intent of the Legislature that, in allocating water received from the State Water Project pursuant to this act, the highest priority shall be given to eliminating groundwater overdraft conditions within any agency or district receiving the water."

The District, City of Beaumont, and the Agency are currently working out the details for an agreement for the purchase of 2,000 acre-feet of State Project Water for delivery to the District's service area for recharge of the groundwater area and irrigation deliveries to golf courses, schools, parks and green belt areas, and to offset existing overdraft. Along with the 2,000 acre-feet of water to be purchased by the District and City, the Agency will deliver to the District's non-potable water system an additional in-lieu water SPW delivery of 2,000 acre-feet for existing irrigation demands and for recharge at the District's recently acquired 78 acre recharge site at the corner of Beaumont and Brookside Avenues. Construction is under way on the first portion of the system, which will be in operation as early as summer 2004. This will serve the Oak Valley Greens golf course, the new high school and elementary school, the City of Beaumont Sports Park and green belt areas in the Oak Valley Greens and Noble Creek development areas. This first delivery will reduce the potable water pumped from the basin by approximately 1,200 acre-feet.

The remainder of the 4,000 acre-feet of SWP water delivered to the District will be recharged at one of two District recharge sites (the existing District site in upper Cherry Valley or the new site in lower Cherry Valley). With development funds from the various projects in the District, including Noble Creek Vistas, the District in cooperation with the City of Beaumont, will complete the next phase of the non-potable/ recycled water system in 2004-2005 to SCPGA and the City of Banning's Sun Lakes Golf Courses which will further reduce the use of potable water from the Beaumont Basin for irrigation. As more new development comes on line more recycled water will become available (approximately .30 acre-feet per EDU per year) to further reduce the SWP water demand for irrigation. This will increase the recharge of SWP water in to the Beaumont Basin until there is enough development to finance completion of the District's

Water Treatment Facility for direct deliveries of SWP water to the District's potable water system. The District currently has about $3,000,000 on deposit for construction of a Water Treatment Facility for direct deliveries of SP water.

The District is also in the process of implementing a Replenishment Assessment District in the developing areas including Noble Creek Vistas for the purpose of paying for the importation (delivery) of supplemental water supply annually based on the demand as the new units come on line. This replenishment fund will be used to further assist the Agency in paying for overdraft offset as required by 101-15.5.

Beyond the Replenishment Assessment, the District will be implementing a new addition to its current Facility Fee for the developing areas for the purpose of buying additional imported water (rights) supply beyond the Agency's current 17,300 acre-foot entitlement because the District expects all of the existing entitlement to be used to offset current and future overdraft throughout the Agency service area. The intent for this new water purchase fee is to pay for the water rights necessary to cover the 20% shown in Table 2-2 above as "SPW Via Pass Agency". The fee, which will be in place within the next 90 days from the date of this report, will provide the District with revenue to purchase, through the Agency, new entitlement beyond the current SWP entitlement. For example, there is currently 4,000 acre-feet of existing entitlement available for sale by one of the SWP contractors. Neither the City nor the District have available funds to purchase the water rights currently valued at $2,000 per acre foot. With the new fee added to the existing Facility Fee, the District in the future as demands grow will have the funds available to purchase additional water supply to augment the 80% local supply. In other words the new fee will allow the District to develop the revenue source to purchase and develop 100% of the water needed for new development without relying on existing SPW entitlements.

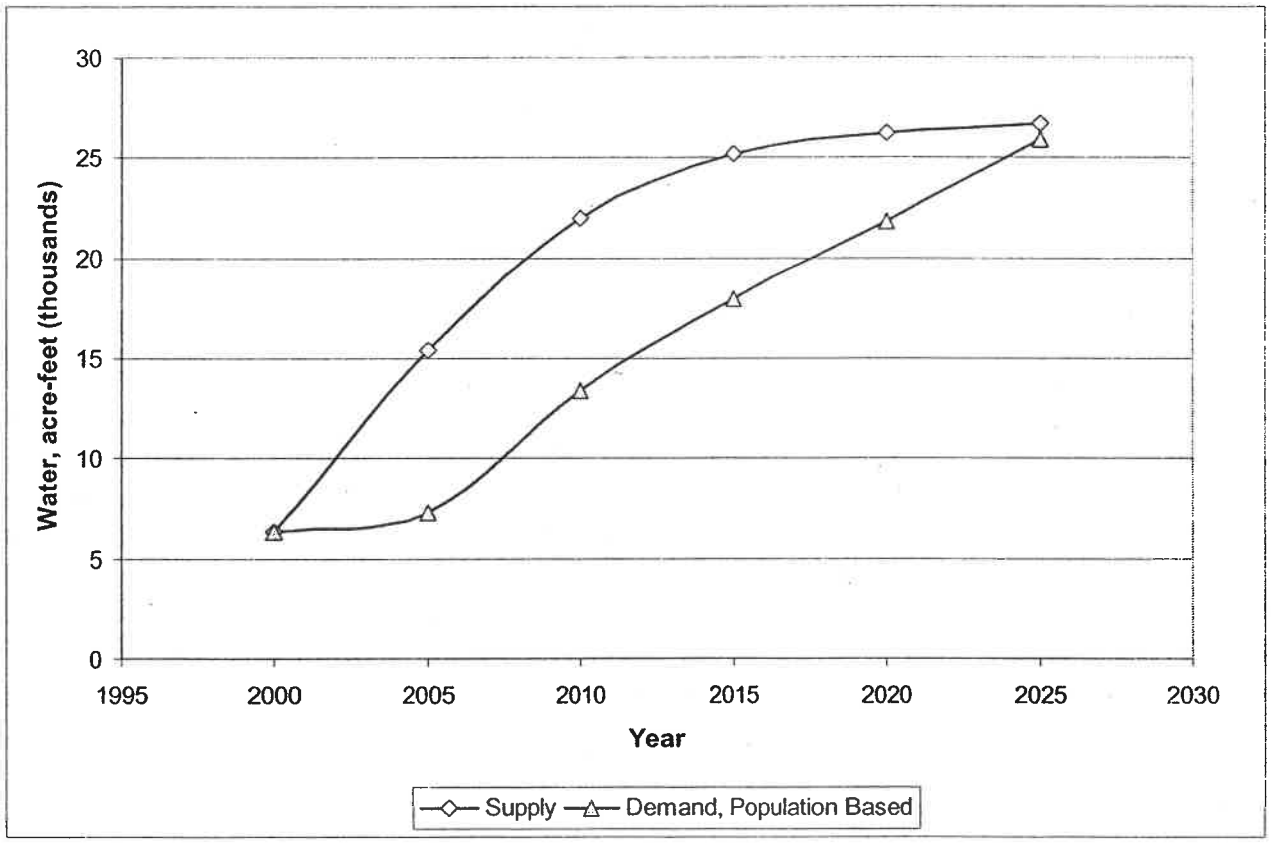
In 2001 the San Timeteo Watershed Management Authority (STWMA) was formed for the purpose of developing a watershed management plan for an area of over 120 square miles of the upper San Timeteo Creek drainage area. The Joint Powers Authority members include the City of Beaumont, Beaumont Cherry Valley Water District, South Mesa Water Company and Yucaipa Valley Water District. STWMA has completed its Phase 1 report toward development of a watershed management plan that includes all of the service area of the four member Agencies along with their respective water development areas. One of the most important issues facing STWMA was to implement management and control of the Beaumont Basin, which is the largest groundwater basin in the watershed and is relied upon by all members of STWMA as well as others for a majority of the watershed's water supply. To resolve the issues related to the Beaumont Basin including current and future overdraft, STWMA filed a legal action for adjudication of the water basin naming all extractors from the Beaumont Basin including the STWMA member agencies. Following intense negotiations for approximately one year, the extractors have developed a Stipulated Judgment that when filed will complete the adjudication of the Beaumont Basin and form a Water Master to manage the basins water supply.

Additional water supplies can be made available through a conjunctive use program. The USGS has indicated in previous reports that the Beaumont Basin currently has between 200 and 400,000 acre-feet of vacant storage space that can be used to store water for later use. With the

adjudication and the Water Master in place the management of the Beaumont Basin will include conjunctive use. This program involves the lease of vacant water storage space in the basin for use by a conjunctive use partner. A conjunctive use partner can be defined as an agency or entity from outside the area that pays to store supplemental water for later use. The Stipulated Judgment provides that there will be a "minimum of 200,000 acre-feet" of storage space for conjunctive use. Development of a conjunctive use program in the Beaumont Basin will benefit all "appropriators" using the basin as it will make available additional funds to complete local water resource projects purchase additional supplemental supplies.

In summary, Figure 5-1 of the UWMP shows water supply reliability and the water demand comparison by growth.

Figure 5-1
Supply Reliability and Demand Comparison By Population Growth



With the continued exploration of the deep aquifers discussed in Exhibit No. 1, the implementation of projects discussed in this report and discussed in detail in Exhibit No. 4, the implementation of the Replenishment Assessment District, the development of a new fee for

purchase of additional SPW entitlement, the soon to be filed Beaumont Basin adjudication, the creation of a Water Master to manage the basin and the development of a conjunctive use program, the District does have the sufficient water supply to serve this project with potable water and recycled water.

Water Demand Analysis

The District currently serves approximately 147 agriculture users, 267 commercial users, 7 industrial users, and 6,079 domestic residential and irrigation users. The following table shows the approximate amount of water used by each user classification in 2002.

User Category	Water Demand, 2002 (ac-ft/yr)
Agriculture	277
Commercial	640
Industrial	222
Residential & Irrigation	5,386
Other (Construction, Fire, Maintenance, System Losses, etc.)	1,500

The yearly average domestic water demand is based on a water demand factor of 0.38 gpm per EDU (Equivalent Dwelling Unit, residential units). The District's UWMP discusses the water demand requirements for the Project. The yearly average demand for the proposed Project is estimated to be 367 gpm or about 592 ac-ft/yr. The Riverside County Fire Department will stipulate the required fire flow requirements for the Project.

The District does have the sufficient water supply to serve this project with potable water.

The table below compares current and projected water supply and demand based on the forecast increase of known developments requesting service and water supplies discussed above. The individual components for the water supply and demand totals are discussed in the UWMP.

Projected Supply and Demand Comparison By Known Developments Requesting Service

	2000	2005	2010	2015	2020	2025
Supply totals	6,308	15,380	21,850	24,500	25,160	25,820
Demand totals	6,308	9,800	14,100	17,900	19,300	20,400
Supply Surplus	(0)	5,580	7,750	6,600	5,860	5,420
Units of Measure: **Acre-feet/Year**						

Source: BCVWD 2000 Urban Water Management Plan Update

The following comparisons for the normal water year, single dry year, and multiple dry years are based on the forecasted supply versus demand based upon planned development. The growth for the service area is an assessment based on the forecast planned and approved developments provided by the City of Beaumont and adjusted based on knowledge of the development specific plans and tract maps.

The supply reliability and demand comparison for the dry-year assessment is shown in the table below and includes demands and supplies during a single dry year (using 2010) and multiple dry water years using 2001, 2002 and 2003 as a basis. The years 2001 through 2003 were used as a basis because demand is anticipated to be met only by groundwater sources and would be the most critical three year period. Beyond 2003 additional water sources, such as recycled water, becomes available.

Supply Reliability and Demand Comparison

	Average / Normal Water Year	Single Dry Water Year	Multiple Dry Water Years		
			Year 1	Year 2	Year 3
Basis Years =>	**2010**	**2010**	**2001**	**2002**	**2003**
Supply totals	21,850	11,450	6,450	6,450	6,450
Demand totals	14,100	15,091	7,640	7,810	8,240
Surplus Supply	7,750	(3,641)	(1,190)	(1,360)	(1,790)
Units of Measure: **Acre-feet/Year**					

Source: BCVWD 2000 Urban Water Management Plan Update

The analysis predicts a water supply deficit for a dry year in 2010 of 3,641 acre-feet. This deficit can temporarily be over come by extracting additional groundwater from the Beaumont Basin for short periods of time along with implementation of some of the water shortage

contingency measures as discussed in the UWMP. The additional water extracted from the Beaumont Basin would be replenished during wet years. Recycled water sources were assumed to not be available until after 2003 for this analysis. At such time recycled water is available, this source, during low demand periods such as during winter months, can be percolated to increase the amount of groundwater stored in the basin.

The years 2001 through 2003 were evaluated for the multiple dry years supply reliability because demand will likely be met only by groundwater sources during this period. Other sources would not be available until several years later. The supply calculations for each year of the multiple year comparison show that available groundwater resources do not adequately meet the increased water demand posed by a theoretical drought or extended dry period conditions. Again, as indicated above, the water supply for the three successive years would be available from the perennial groundwater yield. When there is a need for additional water supply, the District has historically and plans to continue to draw on accumulated storage in the Beaumont Basin during critical supply years with plans to recharge the groundwater during wet years and with the percolation of recycled water.

It should be noted that the additional supplies necessary to meet future demands in dry years beyond 2010 will be obtained by further developing recycled water resources, and implementing the District's water resource projects as discussed above.

Fees

Fees such as facility fees are collected at the time a request for water service is made by the applicant for each proposed tract and a Water Main Extension and Facilities Construction Agreement with the District is executed. The fees are collected to secure funding for the purpose of constructing backbone master planned facilities. A component of the facility fees includes a new water source fee to construct or obtain additional water required as a result of the new development. Facility fees are based on domestic water usage per EDUs. The proposed Project is equivalent to 965 EDUs.

Other fees include connection and meter fees, which are paid by the developer at time of construction for each tract.

The present standard District charges are shown below. The charges are subject to change. All facility fees and other charges will be at the rate at the time of execution of the Water Main Extension and Facilities Construction Agreement.

Facilities Fee

$6,329 per EDU + Adjustment for fire flows

1 EDU = 0.38gpm (approx. 550 gpd)

District Charges

Connection Charge (≤8") ..... $19.00/LF (Front Footage)

Connection Charge (>8") ..... $26.00/LF (Front Footage)

Water Meter (1") Charge and Installation..... $329.00/meter

Other fees applicable to domestic retail service are:

Water Rates

$0.77 per CCF (hundred cubic feet)

Monthly Service Charge for 1" meter $14.00

Other fees applicable to domestic retail service are:

Additional Charges

Power ..... 1% to 3%
of total monthly water consumption charges.

Financing

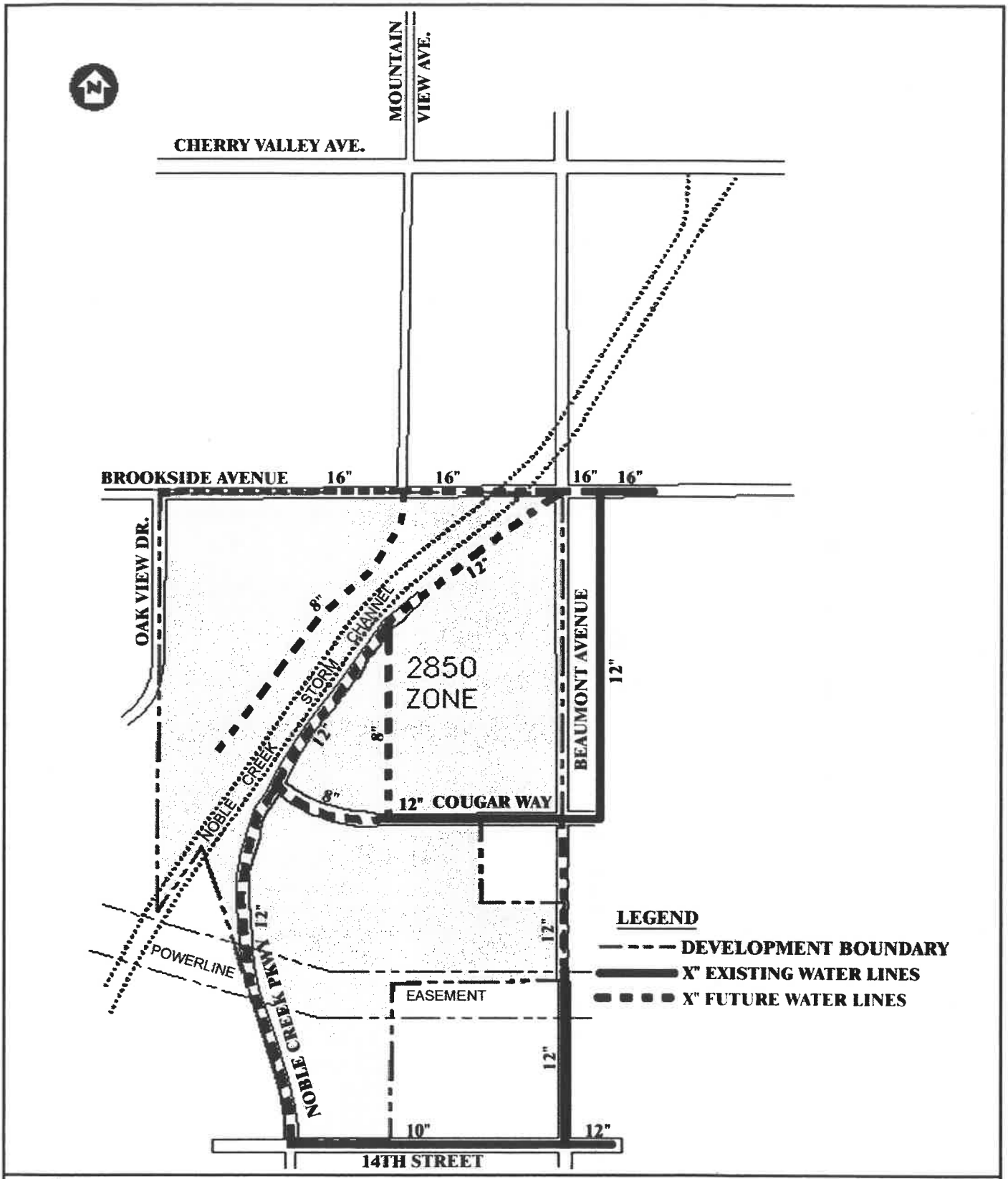
The water improvements required for annexation of the proposed Project will be paid by the developer and through collection of facility fees and/or water rate assessments.

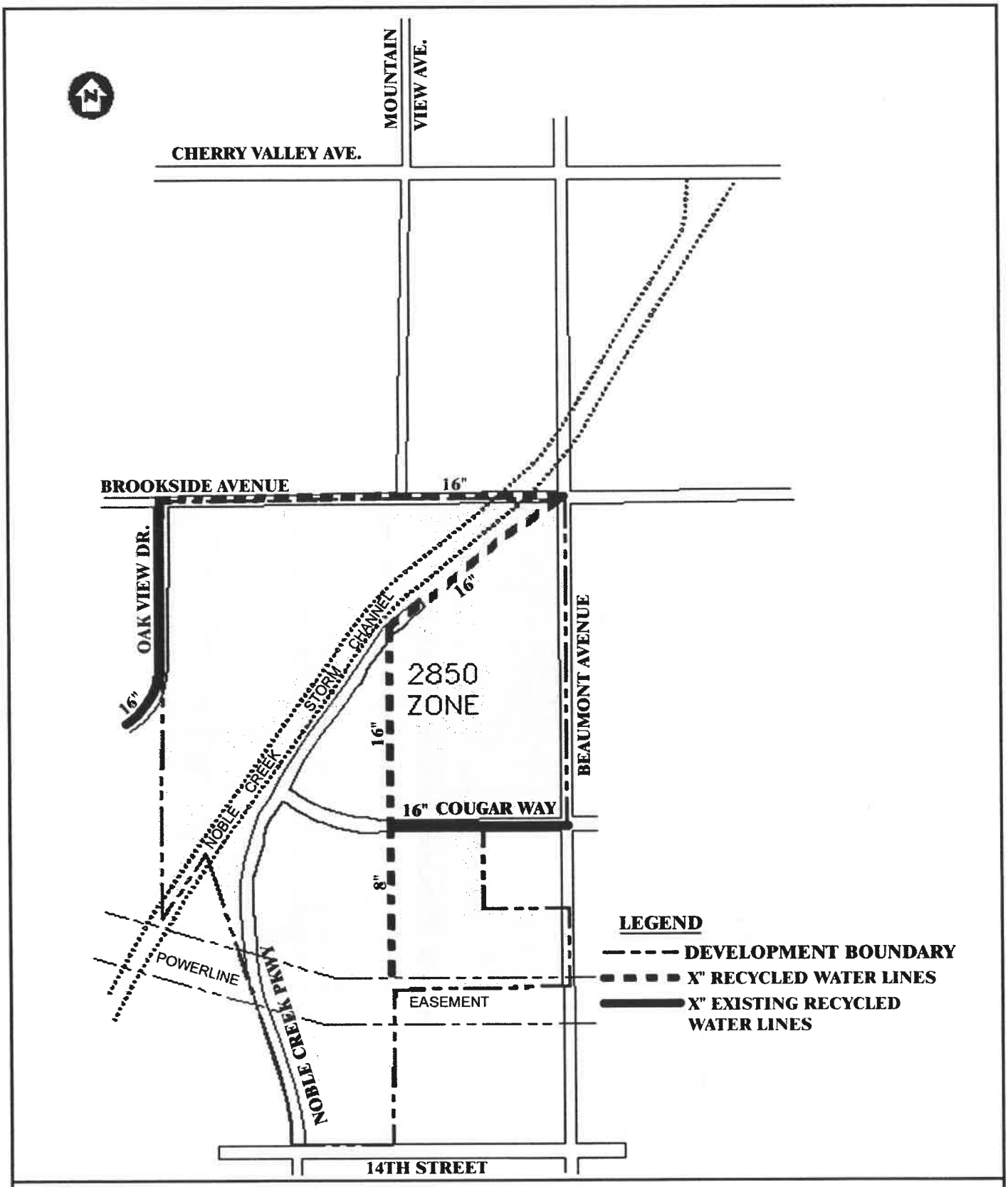
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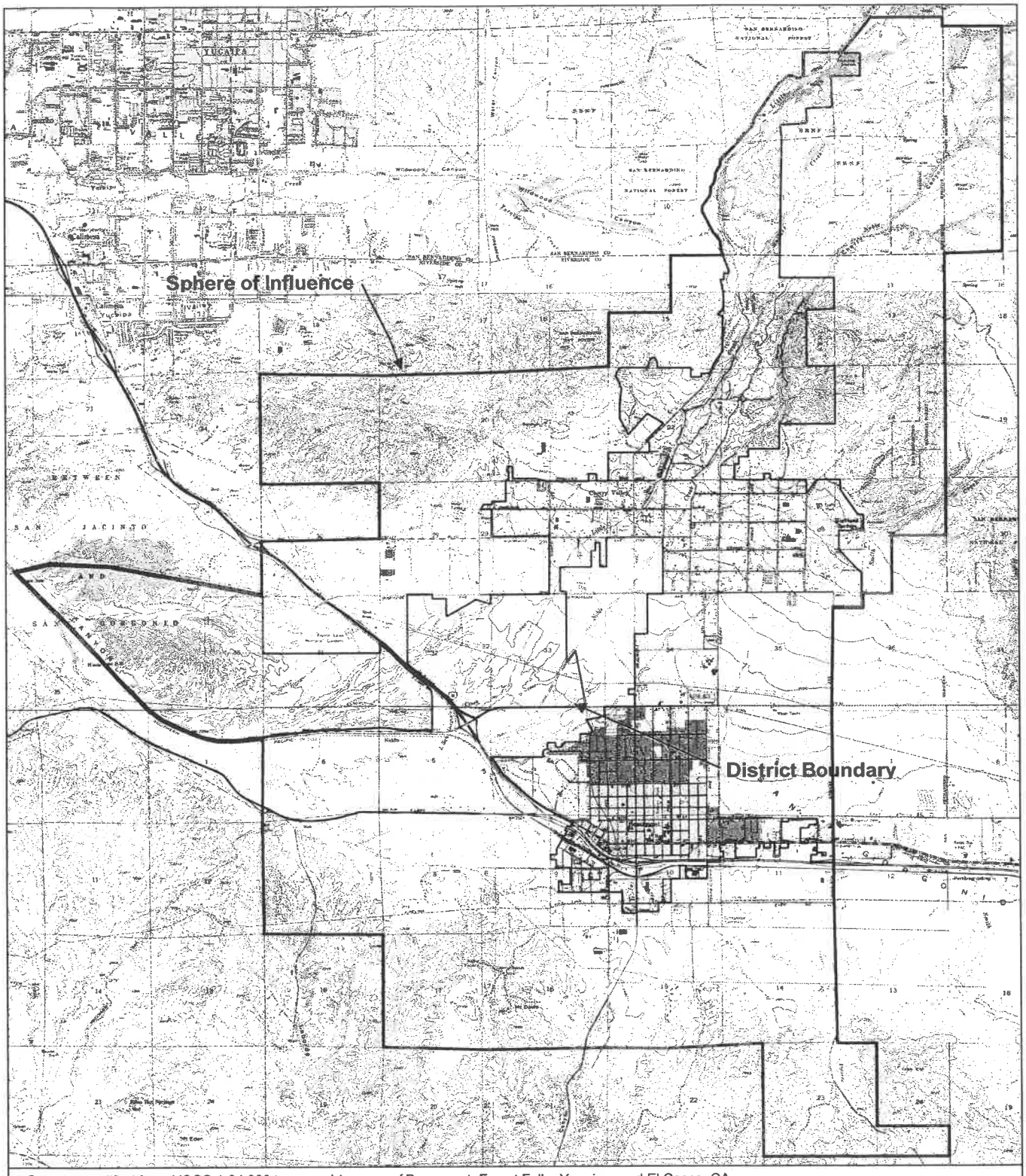
C. J. Butcher, General Manager
Beaumont Cherry Valley Water District

Date: _____


MOUNTAIN VIEW AVE.
CHERRY VALLEY AVE.
BROOKSIDE AVENUE
16"
16"
16"
16"
OAK VIEW DR.
8"
STORM CHANNEL
12"
2850 ZONE
12"
8"
BEAUMONT AVENUE
12"
NOBLE CREEK
8"
12" COUGAR WAY
POWERLINE
12"
12"
EASEMENT
NOBLE CREEK PKWY
12"
10"
12"
14TH STREET
LEGEND
DEVELOPMENT BOUNDARY
X" EXISTING WATER LINES
X" FUTURE WATER LINES
NORTH
NOT TO SCALE
NOBLE CREEK VISTAS
2850 PRESSURE ZONE
EXHIBIT A-1



NOBLE CREEK VISTAS
RECYCLE WATER PLAN
EXHIBIT A-2



Source: modified from USGS 1:24 000 topographic maps of Beaumont, Forest Falls, Yucaipa, and El Casco, CA

NORTH

0 8000

Approximate Scale in Feet

Exhibit B
District Boundary and Sphere of Influence
Beaumont Cherry Valley Water District
Beaumont, California