

Pierce County

ARTONDALE CREEK NEAR GIG HARBOR, WA

STATION ANALYSIS
2000 PARTIAL WATER YEAR
(5/3/00 TO 9/30/00)

Equipment. Design Analysis model H-500 electronic data logger (EDL) connected to Design Analysis model H-310 submersible pressure transducer and a ThermX water temperature probe. The EDL is housed in a 30 x 30 x 36 inch look-in type steel shelter. The transducer is referenced to a staff gage (OG). A crest-stage gage (CSG) is used to verify peaks.

Gage-Height Record. The EDL (15-minute scan cycle) provided a complete record from May 3 to June 2 and September 15-30.

There were problems associated with installing the transducer in the shallow water at the gage. The instrumentation uses water temperature measurements in conjunction with pressure measurements to compute accurate stage values. On some days water temperatures measured within the transducer were influenced by warmer air temperatures. This resulted in artificially high stage readings recorded by the EDL for short portions of several days between June 2 and September 14. The problem has been resolved by repositioning the transducer. The questionable stage values were deleted from the record and replaced by interpolated values.

The EDL and OG agreed within .02 ft on all visits to the station except for June 25 and September 18 when differences up to .04 were noted. No corrections were applied to the stage record.

Peak stage recorded (5.12 ft) and minimum recorded stage (4.24 ft) were not verified but appear reasonable.

Datum Corrections. Levels were run July 11, 2000 to establish arbitrary gage datum for three reference marks (RM 1-3), the staff gage, and the crest-stage gage.

Rating. The low-water control is a riffle in the bridge opening. It is located 20 ft below the gage. The streambed is composed of gravel and small cobble. At high flow the bridge opening becomes the control. At extremely high flow water may come in contact with the low chord of the bridge.

There is very thick grass along both banks between the gage and the bridge. Some of this grass overhangs into the low-water channel as it grows during the summer months. Most shifts to the rating will be due to varying amounts of vegetation in the channel.

Flow can enter the channel at the gage from the duck pond on the left bank and from a mostly buried 6 inch diameter culvert on the right bank. Discharge measurements should be made downstream from these sources if any flow is observed.

Seven discharge measurements (Nos. 1-7) were used for this analysis. Nos. 1-4 were made during the 2000 water year.

Rating No. 1 was developed from measurement Nos. 1-7.

Rating No. 1 with low-water stage shift (0 shift at 4.96 ft, -.30 shift at 4.10 ft and below) was used from May 3, when the station began operation, and continued in use until May 23 (1800). Shifts were prorated by time and stage as grass continued to grow in the channel to June 21 (1700) stage shift (0 shift at 5.05 ft, -.34 shift at 4.10 ft and below). This stage shift was continued in use until Sept. 17 (1500).

On Sept. 17 some of the grass was removed from the channel by the landowner. Stage shift (0 shift at 4.50 ft, -.14 shift at 4.10 ft and below) was used from Sept. 17 (1515) to Sept. 30 (2400).

Eight discharge measurements (Nos. 1-8) were used for this analysis. Nos. 1-4 were made during the 2000 water year.

Measurements made during the water year ranged in discharge from 1.91 to 3.74 cfs and checked Rating No. 1 within 1.9 percent with shifts applied. Computed discharge during the partial water year ranged from 0.83 to 25 cfs.

Discharge. Obtained by using Rating No. 1 either direct or with shifts as explained above. Hydrographic comparison was made with with Pierce County gaging stations Crescent Creek near Gig Harbor and McCormick Creek near Gig Harbor.

Remarks. Records good.

All data collection was done using USGS approved methods and equipment. Data computation was performed using licensed software from Western Hydrologic Systems. Data computation and analysis methods are compatible with those used by USGS.

S. A. Gustafson 01/25/02
HydroData LLC

Pierce County

ARTONDALE CREEK NEAR GIG HARBOR, WA

STATION ANALYSIS
2001 WATER YEAR
(10/01/00 TO 9/30/01)

Equipment. Design Analysis model H-500 electronic data logger (EDL) connected to Design Analysis model H-310 submersible pressure transducer and a ThermX water temperature probe. The EDL is housed in a 30 x 30 x 36 inch look-in type steel shelter. The transducer is referenced to a staff gage (OG). A crest-stage gage (CSG) is used to verify peaks.

Gage-Height Record. The EDL (15-minute scan cycle) provided a complete record except for Jan. 18 (1715) to Feb. 27 (1745) when there was a failure with the data card used to record data from the logger.

The EDL and OG agreed within .01 ft on all visits to the station. No corrections were applied.

Maximum recorded stage (5.25 ft) was checked by the CSG (5.27). Minimum recorded stage (4.23 ft) was not verified but appears reasonable.

Datum Corrections. Levels were last run July 11, 2000. No corrections were applied.

Rating. The low-water control is a riffle in the bridge opening. It is located 20 ft below the gage. The streambed is composed of gravel and small cobble. At high flow the bridge opening becomes the control. At extremely high flow water may come in contact with the low chord of the bridge.

There is very thick grass along both banks between the gage and the bridge. Some of this grass overhangs into the low-water channel as it grows during the summer months. Most shifts to the rating will be due to varying amounts of vegetation in the channel.

Flow can enter the channel at the gage from the duck pond on the left bank and from a mostly buried 6 inch diameter culvert on the right bank. Discharge measurements should be made downstream from these sources if any flow is observed.

Rating No. 1 was used for the entire year.

Stage shift (0 shift at 4.50 ft, -.14 shift at 4.10 ft and below) was continued from the previous water year until the Oct. 20 (1215) peak. The rating was used direct from Oct. 20 (1230) to the Nov. 26 (2100) peak. Stage shift (0 shift at 4.70 ft, -.20 shift at 4.10 ft and below) was used from Nov.26 (2115) to the Dec. 16 (2000) peak. Stage shift (0 shift

at 4.56 ft, -.16 shift at 4.10 ft and below) was used from Dec. 16 (2015) to Mar. 24 (1000).

Shifts were prorated by time and stage from Mar. 24 (1000) to stage shift (0 shift at 4.70 ft, -.20 shift at 4.10 ft and below) on May 1 (1045), to stage shift (0 shift at 4.85 ft, -.26 shift at 4.10 ft and below) on July 1 (1715), to stage shift (0 shift at 4.76 ft, -.23 shift at 4.10 ft and below) on August 22 (1445). This last stage shift was continued in use to Sept. 30 (2400).

Twelve discharge measurements (Nos. 4-15) were used for this analysis. Nos. 5-14 were made during the 2001 water year.

Measurements made during the water year ranged in discharge from 0.89 to 31.0 cfs. The measurements checked Rating No. 1 within 5.5 percent either direct or with shifts applied.

Computed discharge for the year ranged from 0.68 to 35 cfs.

Discharge. Obtained by using Rating No. 1 either direct or with shifts as explained above. Hydrographic comparison was made with with Pierce County gaging stations Crescent Creek near Gig Harbor and McCormick Creek near Gig Harbor.

Remarks. Records good.

All data collection was done using USGS approved methods and equipment. Data computation was performed using licensed software from Western Hydrologic Systems. Data computation and analysis methods are compatible with those used by USGS.

S. A. Gustafson 01/25/02
HydroData LLC

Pierce County

ARTONDALE CREEK NEAR GIG HARBOR, WA

STATION ANALYSIS
2002 PARTIAL WATER YEAR
(10/01/01 TO 1/4/02)

Equipment. Design Analysis model H-500 electronic data logger (EDL) connected to Design Analysis model H-310 submersible pressure transducer and a ThermX water temperature probe. The EDL is housed in a 30 x 30 x 36 inch look-in type steel shelter. The transducer is referenced to a staff gage (OG). A crest-stage gage (CSG) is used to verify peaks.

Gage-Height Record. The EDL (15-minute scan cycle) provided a complete record.

The EDL and OG agreed on all visits to the station. No corrections were applied.

Peak stage recorded (5.83 ft) was verified by the CSG (5.86). The minimum recorded stage (4.16 ft) was not verified but appears reasonable.

Datum Corrections. Levels were last run July 11, 2000. No corrections were applied.

Rating. The low-water control is a riffle in the bridge opening. It is located 20 ft below the gage. The streambed is composed of gravel and small cobble. At high flow the bridge opening becomes the control. At extremely high flow water may come in contact with the low chord of the bridge.

There is very thick grass along both banks between the gage and the bridge. Some of this grass overhangs into the low-water channel as it grows during the summer months. Most shifts to the rating will be due to varying amounts of vegetation in the channel.

Flow can enter the channel at the gage from the duck pond on the left bank and from a mostly buried 6 inch diameter culvert on the right bank. Discharge measurements should be made downstream from these sources if any flow is observed.

Rating No. 1 was used from the beginning of the year until the Nov. 14 (1315) peak. The channel scoured over this peak. Rating No.2 based on measurement Nos. 16, 18-20 was used for the remainder of the year. Rating Nos. 1 and 2 are the same above 5.40 ft.

Rating No. 1 with low-water stage shift (0 shift at 4.76 ft, -.23 shift at 4.10 ft and below) in use at the end of the previous year was continued until Nov. 14 (1300).

Rating No. 2 with stage shift (0 shift at 4.80 ft, -.03 shift at 4.30 ft and below) was used from Nov. 14 (1315) to the Dec.13 (1715) peak. Rating No. 2 was used direct for the remainder of the year.

Seven discharge measurements (Nos. 14-20) were used for this analysis. Nos. 15-20 were made during the 2002 water year.

Measurements made during the water year ranged in discharge from 1.05 to 49.5 cfs. The measurements, except for No. 17, checked Rating Nos. 1 or 2 within 2.2 percent either direct or with shifts applied.

The stage changed .20 ft during the 33 minutes it took to make measurement No. 17. Because the stage of this measurement is in question it was plotted but not directly used for rating purposes.

Computed discharge for the year ranged from 0.99 to 110 cfs.

Discharge. Obtained by using Rating Nos. 1 and 2 either direct or with shifts as explained above. Hydrographic comparison was made with Pierce County gaging stations Crescent Creek near Gig Harbor and McCormick Creek near Gig Harbor.

Remarks. Records good. Site will no longer be operated by HydroData, LLC after Jan. 4, 2002.

Remarks. Records good.

All data collection was done using USGS approved methods and equipment. Data computation was performed using licensed software from Western Hydrologic Systems. Data computation and analysis methods are compatible with those used by USGS.

**S. A. Gustafson 01/25/02
HydroData LLC**

Pierce County

CRESCENT CREEK NEAR GIG HARBOR, WA

STATION ANALYSIS
2000 PARTIAL WATER YEAR
(5/3/00 TO 9/30/00)

Equipment. Design Analysis model H-500 electronic data logger (EDL) connected to Design Analysis model H-310 submersible pressure transducer and a ThermX water temperature probe. The EDL is housed in a 30 x 30 x 36 inch look-in type steel shelter. The transducer is referenced to lower and upper staff gages (OG). A crest-stage gage (CSG) is used to verify peaks.

Gage-Height Record. The EDL (15-minute scan cycle) provided a complete record from May 3-24 and July 17 to September 30.

There were problems associated with installing the transducer in the shallow water at the gage. The instrumentation uses water temperature measurements in conjunction with pressure measurements to compute accurate stage values. On some days water temperatures measured within the transducer were influenced by warmer air temperatures. This resulted in artificially high stage readings recorded by the EDL for short portions of several days between May 25 and July 16. The problem has been resolved by repositioning the transducer. The questionable stage values were deleted from the record and replaced by interpolated values.

The EDL and OG agreed within .01 ft on all visits to the station except for June 21 and June 25 when differences up to .04 were noted.

The following corrections, prorated by time, were applied to the gage-height record:

<u>Dates</u>	<u>Corr.</u>
May 23 (1700)	0.00
June 21 (1130)	0.04
June 21 (1145)	0.00
June 25 (1215)	-0.02
June 25 (1230)	0.00

Maximum recorded stage (5.12 ft) was checked by the CSG (5.12 ft). Minimum recorded stage (4.37 ft) was not verified but appears reasonable.

Datum Corrections. Levels were run July 10, 2000 to establish arbitrary gage datum for three reference marks (RM 1-3), the two outside staff gages, and the crest-stage gage.

Rating. The low-water control is a riffle located 15 ft below the gage. The streambed is composed of gravel and small cobble which is stabilized by a partially buried concrete

sill and wood timber extending across the channel from the left wingwall of the bridge. At very high flow the rectangular concrete bridge opening located 25 ft below the gage becomes the control.

Rating No. 1 was developed from measurement Nos. 1-17 made during water years 2000-2002.

Rating No. 1 with stage shift (0 shift at 4.90 ft, +0.01 shift at 4.60 ft and below) was used from May 3, when the station began operation, and continued in use until the June 12 (0715) peak. Stage shift (0 shift at 4.90 ft, -0.01 shift at 4.60 ft and below) was used for the remainder of the water year.

Five discharge measurements (Nos. 1-5) were used for this analysis. Nos. 1-4 were made during the 2000 water year.

Measurements made during the water year ranged in discharge from 2.43 to 5.73 cfs and checked Rating No. 1 with shifts applied within 5.1 percent. Computed discharge during the partial water year ranged from 1.6 to 22 cfs.

Discharge. Obtained by using Rating No. 1 with shifts as explained above. Hydrographic comparison was made with Pierce County gaging stations Artondale Creek near Gig Harbor and McCormick Creek near Gig Harbor.

Remarks. Records good.

All data collection was done using USGS approved methods and equipment. Data computation was performed using licensed software from Western Hydrologic Systems. Data computation and analysis methods are compatible with those used by USGS.

S. A. Gustafson 01/17/02
HydroData LLC

Pierce County

CRESCENT CREEK NEAR GIG HARBOR, WA

STATION ANALYSIS

2001 WATER YEAR

(10/01/00 TO 9/30/01)

Equipment. Design Analysis model H-500 electronic data logger (EDL) connected to Design Analysis model H-310 submersible pressure transducer and a ThermX water temperature probe. The EDL is housed in a 30 x 30 x 36 inch look-in type steel shelter. The transducer is referenced to lower and upper staff gages (OG). A crest-stage gage (CSG) is used to verify peaks.

Gage-Height Record. The EDL (15-minute scan cycle) provided a complete record except for Jan. 17 (1700) to Feb. 27 (1515) when there was a failure with the data card used to record data from the logger.

The EDL and OG agreed within .01 ft on all visits to the station. No corrections were applied.

Maximum recorded stage (5.36 ft) was checked by the CSG (5.39 ft). Minimum recorded stage (4.30 ft) was not verified but appears reasonable.

Datum Corrections. Levels were last run July 10, 2000. No corrections were applied.

Rating. The low-water control is a riffle located 15 ft below the gage. The streambed is composed of gravel and small cobble which is stabilized by a partially buried concrete sill and wood timber extending across the channel from the left wingwall of the bridge. At very high flow the rectangular concrete bridge opening located 25 ft below the gage becomes the control.

Rating No. 1 was used for the entire water year.

Stage shift (0 shift at 4.90 ft, -0.01 shift at 4.60 ft and below) was continued is use from the previous water year until the Aug. 22 (1745) peak. Stage shift (0 shift at 5.50 ft, -0.04 shift at 4.70 ft and below) was used for the remainder of the water year.

Eleven discharge measurements (Nos. 4-14) were used for this analysis. Nos. 5-13 were made during the 2001 water year.

Measurements made during the water year ranged in discharge from 1.96 to 31.2 cfs and checked Rating No. 1 either direct or with shifts applied within 6.6 percent. Computed discharge during the year ranged from 0.89 to 33 cfs.

Discharge. Obtained by using Rating No. 1 either direct or with shifts as explained above. Discharge for Jan. 18 to Feb. 27 period of missing record was estimated by hydrographic comparison with Pierce County gaging stations Artondale Creek near Gig Harbor and McCormick Creek near Gig Harbor.

Remarks. Records good except estimated records which are fair.

All data collection was done using USGS approved methods and equipment. Data computation was performed using licensed software from Western Hydrologic Systems. Data computation and analysis methods are compatible with those used by USGS.

S. A. Gustafson 01/17/02
HydroData LLC

Pierce County

CRESCENT CREEK NEAR GIG HARBOR, WA

STATION ANALYSIS
2002 PARTIAL WATER YEAR
(10/01/01 TO 1/4/02)

Equipment. Design Analysis model H-500 electronic data logger (EDL) connected to Design Analysis model H-310 submersible pressure transducer and a ThermX water temperature probe. The EDL is housed in a 30 x 30 x 36 inch look-in type steel shelter. The transducer is referenced to lower and upper staff gages (OG). A crest-stage gage (CSG) is used to verify peaks.

Gage-Height Record. The EDL (15-minute scan cycle) provided a complete record.

The EDL and OG agreed on all visits to the station.

Maximum recorded stage (5.95 ft) was checked by the CSG (5.98 ft). Minimum recorded stage (4.37 ft) was not verified but appears reasonable.

Datum Corrections. Levels were last run July 10, 2000. No corrections were applied.

Rating. The low-water control is a riffle located 15 ft below the gage. The streambed is composed of gravel and small cobble which is stabilized by a partially buried concrete sill and wood timber extending across the channel from the left wingwall of the bridge. At very high flow the rectangular concrete bridge opening located 25 ft below the gage becomes the control.

Rating No. 1 was used for the entire water year.

Stage shift (0 shift at 5.50 ft, -0.04 shift at 4.70 ft and below) was continued in use from the previous water year until the Nov. 28 (1445) peak. Stage shift (0 shift at 5.80 ft, -0.10 shift at 4.80 ft and below) was used Nov. 28 (1500) to Dec. 16 (2230). Stage shift (0 shift at 5.50 ft, -0.04 shift at 4.70 ft and below) was for the remainder of the water year.

Five discharge measurements (Nos. 13-17) were used for this analysis. Nos. 14-17 were made during the 2002 water year.

Measurements made during the water year ranged in discharge from 1.40 to 60.4 cfs and checked Rating No. 1 either direct or with shifts applied within 1.3 percent. Computed discharge during the partial water year ranged from 1.3 to 69 cfs.

Discharge. Obtained by using Rating No. 1 with shifts as explained above. Hydrographic comparison was made with Pierce County gaging stations Artondale Creek near Gig Harbor and McCormick Creek near Gig Harbor.

Remarks. Records good. Site will no longer be operated by HydroData, LLC after Jan. 4, 2002.

All data collection was done using USGS approved methods and equipment. Data computation was performed using licensed software from Western Hydrologic Systems. Data computation and analysis methods are compatible with those used by USGS.

S. A. Gustafson 01/17/02
HydroData LLC

Pierce County

McCORMICK CREEK NEAR GIG HARBOR, WA

STATION ANALYSIS
2000 PARTIAL WATER YEAR
(5/6/00 TO 9/30/00)

Equipment. Design Analysis model H-500 electronic data logger (EDL) connected to Design Analysis model H-310 submersible pressure transducer and a ThermX water temperature probe. The EDL is housed in a 30 x 30 x 36 inch look-in type steel shelter. The transducer is referenced to lower and upper staff gages (OG). A crest-stage gage (CSG) is used to verify peaks.

Gage-Height Record. The EDL (15-minute scan cycle) provided a complete record from May 6 to June 15 and August 23 to September 30.

There were problems associated with installing the transducer in the shallow water at the gage. The instrumentation uses water temperature measurements in conjunction with pressure measurements to compute accurate stage values. On some days water temperatures measured within the transducer were influenced by warmer air temperatures. This resulted in artificially high stage readings recorded by the EDL for short portions of several days between June 16 and August 22. The problem has been resolved by repositioning the transducer. The questionable stage values were deleted from the record and replaced by interpolated values.

The EDL and OG agreed within .01 ft on all visits to the station not affected by the problem described above. No corrections were applied to the stage record.

Maximum recorded stage (4.77 ft) and minimum recorded stage (4.17 ft) were not verified but appear reasonable.

Datum Corrections. Levels were run July 10, 2000 to establish arbitrary gage datum for three reference marks (RM 1-3), the two outside staff gages, and the crest-stage gage.

Rating. The low-water control is located 10 ft below the gage. The streambed is composed of gravel and small cobble. This material will scour and fill with the rapid rises in stage and resulting high velocities that occur at this site following rain. The flow is confined between a stable vertical clay wall along the right bank and cobble and small boulders on the brushy left bank. The left bank is subject to overflow during floods.

Rating No. 1 was developed from measurement Nos. 1-19 made during water years 2000-2002.

Rating No. 1 with low-water stage shift (0 shift at 4.70 ft, +0.03 shift at 4.27 ft and below) was used from May 6, when the station began operation, and continued in use

until the June 12 (0645) peak. Rating No. 1 was used direct for the remainder of the water year.

Seven discharge measurements (Nos. 1-7) were used for this analysis. Nos. 1-3 were made during the 2000 water year.

Measurements made during the water year ranged in discharge from 1.00 to 2.30 cfs and checked Rating No. 1 within 2.2 percent either direct or with shifts applied. Computed discharge during the partial water year ranged from 0.57 to 14 cfs.

Discharge. Obtained by using Rating No. 1 either direct or with shifts as explained above. Discharge for May 6, June 16-18, and June 26 periods of missing record were estimated by hydrographic comparison with Pierce County gaging stations Crescent Creek near Gig Harbor and Artondale Creek near Gig Harbor.

Remarks. Records good except estimated records which are fair.

All data collection was done using USGS approved methods and equipment. Data computation was performed using licensed software from Western Hydrologic Systems. Data computation and analysis methods are compatible with those used by USGS.

**S. A. Gustafson 01/18/02
HydroData LLC**

Pierce County

McCORMICK CREEK NEAR GIG HARBOR, WA

STATION ANALYSIS
2001 WATER YEAR
(10/01/00 TO 9/30/01)

Equipment. Design Analysis model H-500 electronic data logger (EDL) connected to Design Analysis model H-310 submersible pressure transducer and a ThermX water temperature probe. The EDL is housed in a 30 x 30 x 36 inch look-in type steel shelter. The transducer is referenced to lower and upper staff gages (OG). A crest-stage gage (CSG) is used to verify peaks.

Gage-Height Record. The EDL (15-minute scan cycle) provided a complete record.

The EDL and OG agreed within .01 ft on all visits to the station. No corrections were applied.

Maximum recorded stage (5.39 ft) was checked by the CSG (5.39). Minimum recorded stage (4.15 ft) was not verified but appears reasonable.

Datum Corrections. Levels were last run July 10, 2000. No corrections were applied.

Rating. The low-water control is located 10 ft below the gage. The streambed is composed of gravel and small cobble. This material will scour and fill with the rapid rises in stage and resulting high velocities that occur at this site following rain. The flow is confined between a stable vertical clay wall along the right bank and cobble and small boulders on the brushy left bank. The left bank is subject to overflow during floods.

Rating No. 1 was used for the entire year.

Direct use of the rating was continued from the previous water year until the Oct. 20 (0830) peak. Stage shift (0 shift at 4.50 ft, -.01 shift at 4.24 ft and below) was used from Oct. 20 (0845) to the Nov. 26 (1915) peak. Stage shift (0 shift at 4.88 ft, +.03 shift at 4.43 ft and below) was used from Nov. 26 (1930) to the Dec. 16 (1630) peak. Between Dec. 16 (1645) and Mar. 18 (2115) the rating was used direct. Stage shift (0 shift at 4.70 ft, +.01 shift at 4.28 ft and below) was used from Mar. 18 (2130) to the May 15 (2045) peak. Between May 15 (2100) and the Aug. 22 (1700) peak the rating was used direct. Stage shift (0 shift at 5.20 ft, -.07 shift at 4.23 ft and below) was used from Aug. 22 (1715) to the Sept. 26 (1415). Shifts were prorated by time and stage to Oct. 8 (1530) stage shift (0 shift at 5.30 ft, -.11 shift at 4.23 ft and below) as leaves accumulated on the control.

Fourteen discharge measurements (Nos. 3-16) were used for this analysis. Nos. 4-15 were made during the 2001 water year.

Measurements made during the water year ranged in discharge from 0.68 to 54.2 cfs. The measurements, except for No. 12, checked Rating No. 1 within 5.2 percent either direct or with shifts applied.

Measurement No. 12 was made as the stage rose .15 ft in 11 minutes. Because the stage of this measurement is in question it was plotted but not directly used for rating purposes.

Computed discharge for the year ranged from 0.37 to 59 cfs.

Discharge. Obtained by using Rating No. 1 either direct or with shifts as explained above. Hydrographic comparison was made with Pierce County gaging stations Crescent Creek near Gig Harbor and Artondale Creek near Gig Harbor.

Remarks. Records good.

All data collection was done using USGS approved methods and equipment. Data computation was performed using licensed software from Western Hydrologic Systems. Data computation and analysis methods are compatible with those used by USGS.

S. A. Gustafson 01/18/02
HydroData LLC

Pierce County

McCORMICK CREEK NEAR GIG HARBOR, WA

STATION ANALYSIS
2002 PARTIAL WATER YEAR
(10/01/01 TO 1/4/02)

Equipment. Design Analysis model H-500 electronic data logger (EDL) connected to Design Analysis model H-310 submersible pressure transducer and a ThermX water temperature probe. The EDL is housed in a 30 x 30 x 36 inch look-in type steel shelter. The transducer is referenced to lower and upper staff gages (OG). A crest-stage gage (CSG) is used to verify peaks.

Gage-Height Record. The EDL (15-minute scan cycle) provided a complete record.

The EDL and OG agreed on all visits to the station. No corrections were applied.

Maximum stage occurred while a discharge measurement was being made. The stage was changing rapidly during this time with a very sharp peak between data logger scans. The peak data logger reading (5.35) was deleted from the record and replaced by the CSG reading (5.59). Minimum recorded stage (4.23 ft) was not verified but appears reasonable.

Datum Corrections. Levels were last run July 10, 2000. No corrections were applied.

Rating. The low-water control is located 10 ft below the gage. The streambed is composed of gravel and small cobble. This material will scour and fill with the rapid rises in stage and resulting high velocities that occur at this site following rain. The flow is confined between a stable vertical clay wall along the right bank and cobble and small boulders on the brushy left bank. The left bank is subject to overflow during floods.

Rating No. 1 was used for the entire year.

Shifts were prorated by time and stage from the Sept. 6 (1415) stage shift (0 shift at 5.20 ft, -.07 shift at 4.23 ft and below) in use the previous year to Oct. 8 (1530) stage shift (0 shift at 5.30 ft, -.11 shift at 4.23 ft and below). This shift curve was the result of leaves caught on the control. The leaves were removed on Oct. 8.

Stage shift (0 shift at 5.20 ft, -.07 shift at 4.23 ft and below) was used from Oct. 8 (1545) until the Nov. 14 (1230) peak. Stage shift (0 shift at 5.00 ft, +.04 shift at 4.36 ft and below) was used from Nov. 14 (1245) until the Dec. 13 (1500) peak. Stage shift (0 shift at 5.40 ft, -.13 shift at 4.51 ft and below) was used from Dec. 13 (1515) to Jan. 4 (1330).

Five discharge measurements (Nos. 15-19) were used for this analysis. Nos. 16-19 were made during the 2002 water year.

Measurements made during the water year ranged in discharge from 0.52 to 74.8 cfs. The measurements, except for No. 18, checked Rating No. 1 within 3.9 percent with shifts applied.

The stage changed .34 ft during the 25 minutes it took to make measurement No. 18. Because the stage of this measurement is in question it was plotted but not directly used for rating purposes.

Computed discharge for the year ranged from 0.41 to 84 cfs.

Discharge. Obtained by using Rating No. 1 either direct or with shifts as explained above. Hydrographic comparison was made with Pierce County gaging stations Crescent Creek near Gig Harbor and Artondale Creek near Gig Harbor.

Remarks. Records good. Site will no longer be operated by HydroData, LLC after Jan. 4, 2002.

All data collection was done using USGS approved methods and equipment. Data computation was performed using licensed software from Western Hydrologic Systems. Data computation and analysis methods are compatible with those used by USGS.

S. A. Gustafson 01/18/02
HydroData LLC