ADIRONDACK GEOLOGIC SERVICES DPC
CONTINENTAL PLACER INC.
21 Aviation Road • Albany, New York 12205
(518) 458-9203 *fax* (518) 458-9206
www.continentalplacer.com

DRAFT ENVIRONMENTAL IMPACT STATEMENT

FOR A MINED LAND USE PLAN MODIFICATION

DOLOMITE PRODUCTS COMPANY INC.
LEROY QUARRY
LEROY, NEW YORK

MLF #80019
PERMIT 8-1836-00001/00001

VOLUME 4

Appendix 8

Seismograph Results

Appendix 9

FEMA Data
HydroCAD Model

Appendix 10

Best Management Practice Plan

September 20, 2021
Revised July 18, 2022
Revised February 22, 2023

Appendix 8

Seismograph Results

20-LG-01

Hilltop Energy - Leroy
Hilltop Energy - Mineral City, Ohio

Location & Weather

Blast date: 21 May 2020
Blast time: 02:14 PM ET
Reference number: HTY 14008
Permit number: 9023-21-00
Blast location: 42° 59' 9.3" N 77° 56' 10" W
Elevation: N/A
Pit: Dolomite Products
Bench: ~~Leroy Gulf Road~~ - 9023-21-0019

Sky condition: Partly Cloudy
Temperature: 71 °F
Wind direction: Southeast
Wind velocity: 5 mph

Pattern

Blast type: Production
Total holes: 128
Rock type: Limestone
Rock density: 2.25 tons/yd³

Initiation type: Non-electric
Drill feet: 1,024 ft
Total rock weight: 8,000 tons Ony
Total rock volume: 3,556 yd³

# of rows	Row range	Pattern type	Holes per row	Hole diameter (in)	Burden (ft)	Spacing (ft)	Bench height (ft)	Avg hole depth (ft)	Subdrill or standoff (ft)
3	1 - 3	Square	26	6.25	10	10	8	8	0
2	4 - 5	Square	25	6.25	10	10	8	8	0

# of rows	Row range	Avg stemming height (ft)	Stemming material	Explosive decks per hole	Inert decks per hole	Avg inert deck height (ft)	Inert deck material
5	1 - 5	6	Crushed stone	1	0	N/A	N/A

Explosives & Initiation

Bulk

Product	Manufacturer	Weight (lb)
ANFO	Orica	3,400

Boosters

Product	Manufacturer	Size (lb)	Qty	Weight (lb)
PENTEX D	Orica	0.5	128	64

Initiation & accessories

Product	Manufacturer	Delay (ms)	Size	Qty
EXEL HANDIDET	Orica	25/500	24 ft	128
Exel Connectadet	Orica	42	30 ft	10
Connecting Wire	Orica	–	500 ft	1

Packaged products

Product	Manufacturer	Size	Weight per qty (lb)	Qty	Weight (lb)
PowerAN 500	Hilltop Energy	5 in x 34 in	30	23	690

Total product weight: 4,154 lb
Powder factor: 1.93 ton/lb, 0.52 lb/ton, 1.17 lb/yd³

Environmentals

Actual explosives charge weight per hole: 32 lb
Actual explosives charge weight per deck: 32 lb
Actual explosives charge weight per delay: 64 lb
Max # of decks per delay: 2
Delay Interval: 25 ms

Monitoring Point: Dolomite Leroy Gulf Rd/East of shot next to berm
Monitoring point location: 42° 59' 8.12" N 77° 56' 1.586" W
Distance from blast: 636 ft
Direction from blast: E

Min allowed scaled distance: 30 $ft/lb^{0.5}$
Actual scaled distance: 79.5 $ft/lb^{0.5}$
Allowed explosives charge weight per delay: 449.44 lb

Monitored: Yes

Instrument: 6766
Manufacturer: Instantel
Model: Mini Mates
Serial #: 6766
Calibration date: 24 Feb 2020
Operator name: DON P
Trigger source: Geophone
Geophone trigger level: 0.02 in/s
Microphone trigger level: 132 dB

Transverse PPV: 0.18 in/s
Transverse frequency: 30 Hz
Longitudinal PPV: 0.235 in/s
Longitudinal frequency: 37 Hz
Vertical PPV: 0.139 in/s
Vertical frequency: 37 Hz

Max PPV: 0.235 in/s
Peak air overpressure: 118.9 dB

Crew & Safety

Blaster in charge: Donald Parrott
License #: 97-4461
Crew: DAN , PAT, FRED
Total hours on site: 4
Blast comments: SHOT CLEARED

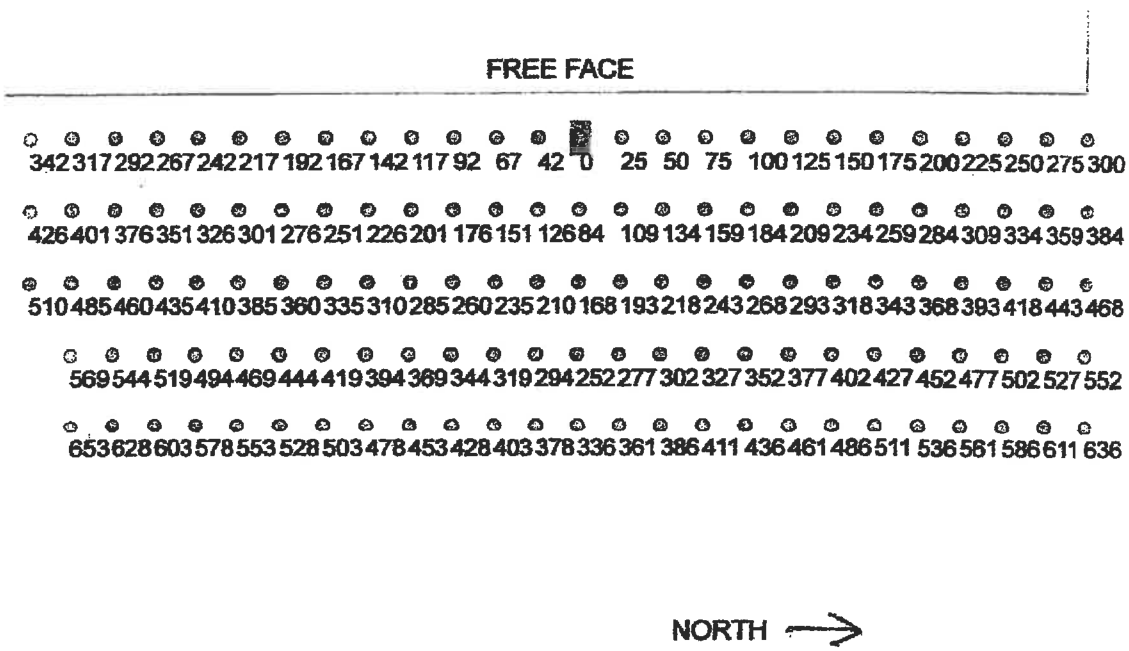
Customer representative: WOODY
Blasting Contractor: HTE
Workplace inspection: Yes
Post blast inspection: Yes
Blasting mats used: No
Safety meeting: Yes
Protective cover: Equipment

Signature of blaster in charge:

Donald Parrott

Signature of customer representative:

____


FREE FACE
342 317 292 267 242 217 192 167 142 117 92 67 42 0 25 50 75 100 125 150 175 200 225 250 275 300
426 401 376 351 326 301 276 251 226 201 176 151 126 84 109 134 159 184 209 234 259 284 309 334 359 384
510 485 460 435 410 385 360 335 310 285 260 235 210 168 193 218 243 268 293 318 343 368 393 418 443 468
569 544 519 494 469 444 419 394 369 344 319 294 252 277 302 327 352 377 402 427 452 477 502 527 552
653 628 603 578 553 528 503 478 453 428 403 378 336 361 386 411 436 461 486 511 536 561 586 611 636
NORTH

20-LG-03

Hilltop Energy - Leroy

Hilltop Energy - Mineral City, Ohio

Location & Weather

Blast date: 08 Jul 2020
Blast time: 10:38 AM ET
Reference number: HTY 14109
Permit number: 9023-21-00
Blast location: 42° 59' 8.2" N 77° 56' 9.7" W
Elevation: N/A
Pit: Dolomite Products
Bench: Leroy Gulf Road - 9023-21-0019

Sky condition: Sunny
Temperature: 88 °F
Wind direction: South
Wind velocity: 10 mph

Pattern

Blast type: Production
Total holes: 57
Rock type: Limestone
Rock density: 2.25 tons/yd³

Initiation type: Non-electric
Drill feet: 456 ft
Total rock weight: 3,533 tons
Total rock volume: 1,570 yd³

# of rows	Row range	Pattern type	Holes per row	Hole diameter (in)	Burden (ft)	Spacing (ft)	Bench height (ft)	Avg hole depth (ft)	Subdrill or standoff (ft)
3	1 - 3	Square	15	6.25	10	10	8	8	0
1	4 - 4	Square	12	6.25	10	10	8	8	0

# of rows	Row range	Avg stemming height (ft)	Stemming material	Explosive decks per hole	Inert decks per hole	Avg inert deck height (ft)	Inert deck material
4	1 - 4	6	Crushed stone	1	0	N/A	N/A

Explosives & Initiation

Bulk

Product	Manufacturer	Weight (lb)

Boosters

Product	Manufacturer	Size (lb)	Qty	Weight (lb)
PENTEX BC	Orica	0.5	56	28

Initiation & accessories

Product	Manufacturer	Delay (ms)	Size	Qty
EXEL HANDIDET	Orica	25/500	24 ft	27
Exel Connectadet	Orica	42	30 ft	7
Static Star	Austin Powder	0	35 ft	1
Connecting Wire	Orica	—	500 ft	1
EXEL HANDIDET	Orica	25/500	30 ft	29

Packaged products

Product	Manufacturer	Size	Weight per qty (lb)	Qty	Weight (lb)
PowerAN 500	Hilltop Energy	5 in x 34 in	30	48	1,440

Total product weight: 1,468 lb
Powder factor: 2.41 ton/lb, 0.42 lb/ton, 0.94 lb/yd³

Environmentals

Actual explosives charge weight per hole: 26.7 lb
Actual explosives charge weight per deck: 26.7 lb
Actual explosives charge weight per delay: 53 lb
Max # of decks per delay: 1
Delay interval: 25 ms

Monitoring Point: Dolomite Leroy Gulf Rd/East of shot next to berm
Monitoring point location: 42° 59' 8.12" N 77° 56' 1.586" W
Distance from blast: 604 ft
Direction from blast: E

Min allowed scaled distance: 30 ft/lb$^{0.5}$
Actual scaled distance: 82.97 ft/lb$^{0.5}$
Allowed explosives charge weight per delay: 405.35 lb

Monitored: Yes

Instrument: 8503
Manufacturer: instantel
Model: Mini Mates
Serial #: 8503
Calibration date: 24 Feb 2020
Operator name: DON P
Trigger source: Geophone
Geophone trigger level: 0.02 in/s
Microphone trigger level: 132 dB

Transverse PPV: 0.051 in/s
Transverse frequency: 34 Hz
Longitudinal PPV: 0.061 in/s
Longitudinal frequency: 37 Hz
Vertical PPV: 0.098 in/s
Vertical frequency: 34 Hz

Max PPV: 0.098 in/s
Peak air overpressure: 119.6 dB

Crew & Safety

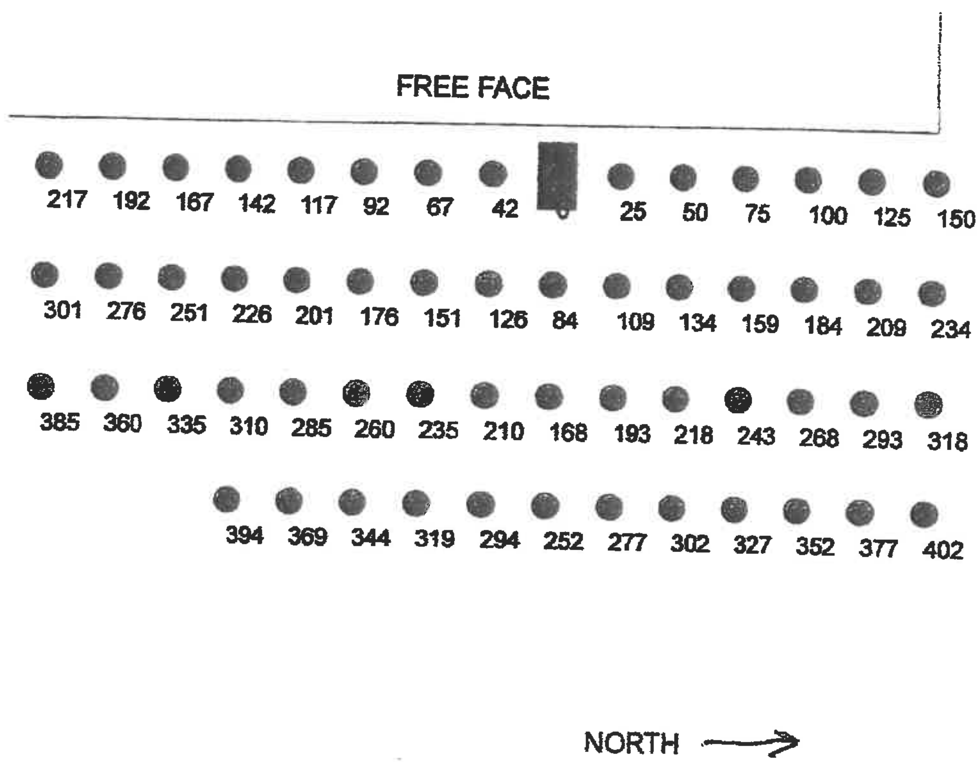
Blaster in charge: Donald Parrott
License #: 97-4461
Crew: DAN, PAT, RICKY, OH
Total hours on site: 5.5
Blast comments: SHOT CLEARED

Customer representative: WOODY
Blasting Contractor: HTE
Workplace inspection: Yes
Post blast inspection: Yes
Blasting mats used: No
Safety meeting: Yes
Protective cover: Equipment

Signature of blaster in charge:

Donald Parrott

Signature of customer representative:


FREE FACE
217 192 167 142 117 92 67 42 25 50 75 100 125 150
301 276 251 226 201 176 151 126 84 109 134 159 184 209 234
385 360 335 310 285 260 235 210 168 193 218 243 268 293 318
394 369 344 319 294 252 277 302 327 352 377 402
NORTH

20-LG-10

Hilltop Energy - Leroy
Hilltop Energy - Mineral City, Ohio

Location & Weather

Blast date: 09 Oct 2020
Blast time: 09:49 AM ET
Reference number: HTY14306
Permit number: 9023-21-00
Blast location: 42° 59' 6.5" N 77° 56' 37.3" W
Elevation: 634 ft
Pit: Dolomite Products
Bench: Leroy Gulf Road - 9023-21-0019

Sky condition: Sunny
Temperature: 50 °F
Wind direction: Southwest
Wind velocity: 5 mph

Pattern

Blast type: Production
Total holes: 85
Rock type: Limestone
Rock density: 2.25 tons/yd³

Initiation type: Electronic
Drill feet: 2,125 ft
Total rock weight: 34,531 tons
Total rock volume: 15,347 yd³

# of rows	Row range	Pattern type	Holes per row	Hole diameter (in)	Burden (ft)	Spacing (ft)	Bench height (ft)	Avg hole depth (ft)	Subdrill or standoff (ft)
2	1 - 2	Rectangle	28	6.25	15	13	25	25	0
1	3 - 3	Rectangle	29	6.25	15	13	25	25	0

# of rows	Row range	Avg stemming height (ft)	Stemming material	Explosive decks per hole	Inert decks per hole	Avg inert deck height (ft)	Inert deck material
3	1 - 3	7	Crushed stone	1	0	N/A	N/A

Explosives & Initiation

Bulk

Product	Manufacturer	Weight (lb)
ANFO	Orica	16,180

Boosters

Product	Manufacturer	Size (lb)	Qty	Weight (lb)
PENTEX BC	Orica	1	84	84

Initiation & accessories

Product	Manufacturer	Delay (ms)	Size	Qty
UNITronic detonator	Orica	Programmed	30 ft	84
Connecting Wire	Orica	—	500 ft	1
Harness Wire	Orica	—	656 ft	1

Packaged products

Product	Manufacturer	Size	Weight per qty (lb)	Qty	Weight (lb)
PowerAN 500	Hilltop Energy	5 in x 34 in	30	83	2,490

Total product weight: 18,754 lb
Powder factor: 1.84 ton/lb, 0.54 lb/ton, 1.22 lb/yd³

Environmentals

Actual explosives charge weight per hole: 223 lb
Actual explosives charge weight per deck: 223 lb
Actual explosives charge weight per delay: 223 lb
Max # of decks per delay: 1
Delay interval: 25 ms

Monitoring Point: Dolomite Leroy Gulf Rd/Leroy Recycling Center
Monitoring point location: 42° 59' 5.086" N 77° 57' 16.996" W
Distance from blast: 2,953 ft
Direction from blast: W

Min allowed scaled distance: 30 ft/lb$^{0.5}$
Actual scaled distance: 197.75 ft/lb$^{0.5}$
Allowed explosives charge weight per delay: 9,689.12 lb

Monitored: Yes

Instrument: 6766
Manufacturer: Instantel
Model: Mini Mates
Serial #: 6766
Calibration date: 24 Feb 2020
Operator name: DON P
Trigger source: Geophone
Geophone trigger level: 0.02 in/s
Microphone trigger level: 132 dB

Transverse PPV: 0.045 in/s
Transverse frequency: 19 Hz
Longitudinal PPV: 0.039 in/s
Longitudinal frequency: 18 Hz
Vertical PPV: 0.025 in/s
Vertical frequency: 30 Hz

Max PPV: 0.045 in/s
Peak air overpressure: 97.7 dB

Crew & Safety

Blaster in charge: Donald Parrott
License #: 97-4461
Crew: DAN, PAT
Total hours on site: 4
Blast comments: SHOT CLEARED/DID NOT SHOOT ONE HOLE

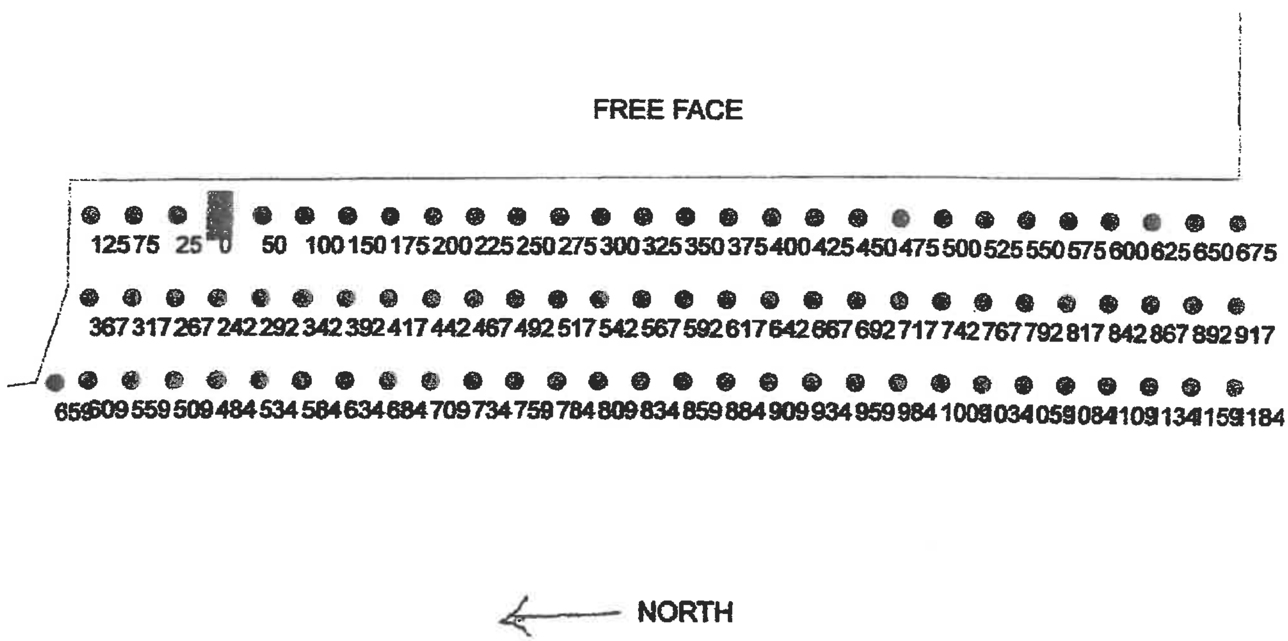
Customer representative: WOODY
Blasting Contractor: HTE
Workplace inspection: Yes
Post blast inspection: Yes
Blasting mats used: No
Safety meeting: Yes
Protective cover: Equipment

Signature of blaster in charge:

Donald Parrott

Signature of customer representative:

____



FREE FACE
125 75 25 0 50 100 150 175 200 225 250 275 300 325 350 375 400 425 450 475 500 525 550 575 600 625 650 675
367 317 267 242 292 342 392 417 442 467 492 517 542 567 592 617 642 667 692 717 742 767 792 817 842 867 892 917
659 609 559 509 484 534 584 634 684 709 734 759 784 809 834 859 884 909 934 959 984 1009 1034 1059 1084 1109 1134 1159 1184
NORTH

20-LG-11

Hilltop Energy - Leroy
Hilltop Energy - Mineral City, Ohio

Location & Weather

Blast date: 27 Oct 2020
Blast time: 08:59 AM ET
Reference number: HTY 14340
Permit number: 9023-21-00
Blast location: 42° 59' 7.6" N 77° 56' 38.5" W
Elevation: 634 ft
Pit: Dolomite Products
Bench: Leroy Gulf Road - 9023-21-0019

Sky condition: Mostly Cloudy
Temperature: 43 °F
Wind direction: West
Wind velocity: 5 mph

Pattern

Blast type: Production
Total holes: 75
Rock type: Limestone
Rock density: 2.25 tons/yd³

Initiation type: Electronic
Drill feet: 1,875 ft
Total rock weight: 35,200 tons Comp
Total rock volume: 15,644 yd³

# of rows	Row range	Pattern type	Holes per row	Hole diameter (in)	Burden (ft)	Spacing (ft)	Bench height (ft)	Avg hole depth (ft)	Subdrill or standoff (ft)
3	1 - 3	Rectangle	25	6.25	16	15	25	25	0

# of rows	Row range	Avg stemming height (ft)	Stemming material	Explosive decks per hole	Inert decks per hole	Avg inert deck height (ft)	Inert deck material
3	1 - 3	7	Crushed stone	1	0	N/A	N/A

Explosives & Initiation

Bulk

Product	Manufacturer	Weight (lb)
PowerAN 1500	Hilltop Energy	15,140

Boosters

Product	Manufacturer	Size (lb)	Qty	Weight (lb)
PENTEX BC	Orica	1	75	75

Initiation & accessories

Product	Manufacturer	Delay (ms)	Size	Qty
UNITronic detonator	Orica	Programmed	30 ft	75
Connecting Wire	Orica	–	500 ft	1
Harness Wire	Orica	–	656 ft	1

Packaged products

Product	Manufacturer	Size	Weight per qty (lb)	Qty	Weight (lb)
PowerAN 500	Hilltop Energy	5 in x 34 in	30	80	2,400

Total product weight: 17,615 lb
Powder factor: 2 ton/lb, 0.5 lb/ton, 1.13 lb/yd³

Environmentals

Actual explosives charge weight per hole: 235 lb
Actual explosives charge weight per deck: 235 lb
Actual explosives charge weight per delay: 235 lb
Max # of decks per delay: 1
Delay interval: 25 ms

Monitoring Point: Dolomite Leroy Gulf Rd/Leroy Recycling Center
Monitoring point location: 42° 59' 5.086" N 77° 57' 16.996" W
Distance from blast: 2,874 ft
Direction from blast: W
Min allowed scaled distance: 30 ft/lb$^{0.5}$
Actual scaled distance: 187.48 ft/lb$^{0.5}$
Allowed explosives charge weight per delay: 9,177.64 lb
Monitored: Yes

Instrument: 6766
Manufacturer: Instantel
Model: Mini Mates
Serial #: 6766
Calibration date: 24 Feb 2020
Operator name: DON P
Trigger source: Geophone
Geophone trigger level: 0.02 in/s
Microphone trigger level: 132 dB
Transverse PPV: 0.033 in/s
Transverse frequency: 18 Hz
Longitudinal PPV: 0.041 in/s
Longitudinal frequency: 13 Hz
Vertical PPV: 0.029 in/s
Vertical frequency: 9.3 Hz
Max PPV: 0.041 in/s
Peak air overpressure: 96.7 dB

Crew & Safety

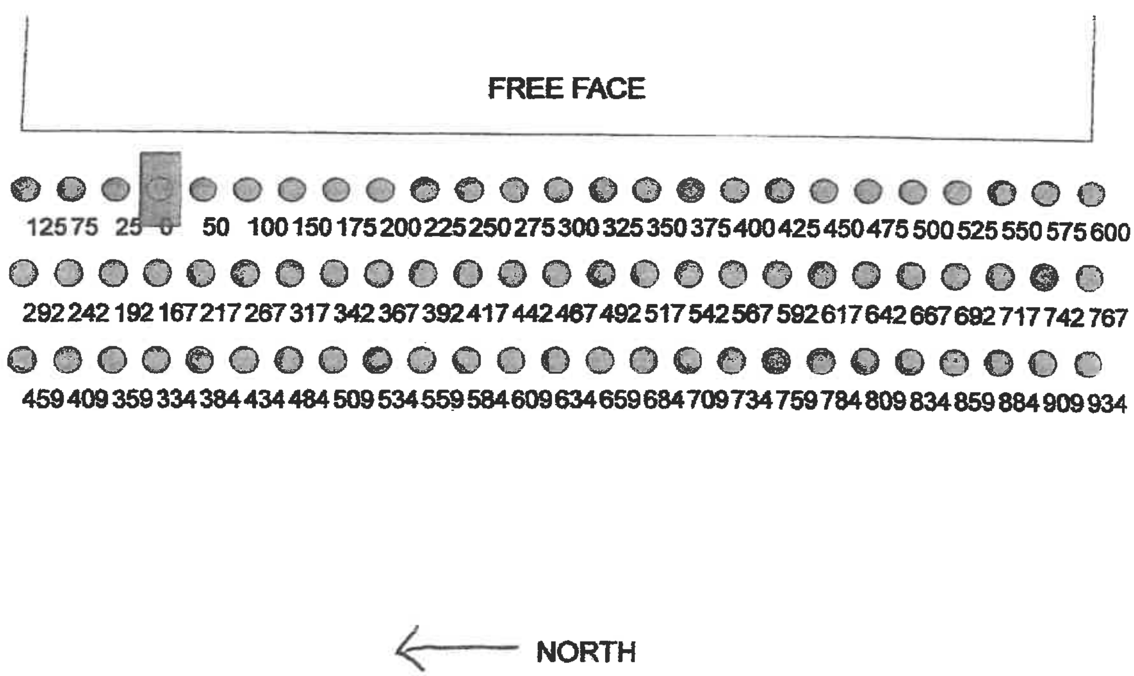
Blaster in charge: Donald Parrott
License #: 97-4461
Crew: DAN, PAT, RICKY
Total hours on site: 3.5
Post comments: SHOT CLEARED

Customer representative: WOODY
Blasting Contractor: HTE
Workplace inspection: Yes
Post blast inspection: Yes
Blasting mats used: No
Safety meeting: Yes
Protective cover: Equipment

Signature of blaster in charge:

Donald Parrott

Signature of customer representative:


FREE FACE
125 75 25 0 50 100 150 175 200 225 250 275 300 325 350 375 400 425 450 475 500 525 550 575 600
292 242 192 167 217 267 317 342 367 392 417 442 467 492 517 542 567 592 617 642 667 692 717 742 767
459 409 359 334 384 434 484 509 534 559 584 609 634 659 684 709 734 759 784 809 834 859 884 909 934
NORTH

Hilltop Energy - Leroy
Hilltop Energy - Mineral City, Ohio

Blast date: 27 Oct 2020
Blast time: 08:59 AM ET
Reference number: HTY 14340
Permit number: 9023-21-00
Blast location: 42° 59' 7.6" N 77° 56' 38.5" W
Elevation: 634 ft
Pit: Dolomite Products
Bench: Leroy Gulf Road - 9023-21-0019

Sky condition: Mostly Cloudy
Temperature: 43 °F
Wind direction: West
Wind velocity: 5 mph

Pattern

Blast type: Production
Total holes: 75
Rock type: Limestone
Rock density: 2.25 tons/yd³

Initiation type: Electronic
Drill feet: 1,875 ft
Total rock weight: 35200 tons Cmp
Total rock volume: 15,644 yd³

# of rows	Row range	Pattern type	Holes per row	Hole diameter (in)	Burden (ft)	Spacing (ft)	Bench height (ft)	Avg hole depth (ft)	Subdrill or standoff (ft)
3	1 - 3	Rectangle	25	6.25	16	15	25	25	0

# of rows	Row range	Avg stemming height (ft)	Stemming material	Explosive decks per hole	Inert decks per hole	Avg inert deck height (ft)	Inert deck material
3	1 - 3	7	Crushed stone	1	0	N/A	N/A

Explosives & Initiation

Bulk

Product	Manufacturer	Weight (lb)
PowerAN 1500	Hilltop Energy	15,140

Boosters

Product	Manufacturer	Size (lb)	Qty	Weight (lb)
PENTEX BC	Orica	1	75	75

Initiation & accessories

Product	Manufacturer	Delay (ms)	Size	Qty
UNITronic detonator	Orica	Programmed	30 ft	75
Connecting Wire	Orica	—	500 ft	1
Harness Wire	Orica	—	656 ft	1

Packaged products

Product	Manufacturer	Size	Weight per qty (lb)	Qty	Weight (lb)
PowerAN 500	Hilltop Energy	5 in x 34 in	30	80	2,400

Total product weight: 17,615 lb
Powder factor: 2 ton/lb, 0.5 lb/ton, 1.13 lb/yd³

Environmentals

Actual explosives charge weight per hole: 235 lb
Actual explosives charge weight per deck: 235 lb
Actual explosives charge weight per delay: 235 lb
Max # of decks per delay: 1
Delay interval: 25 ms

Monitoring Point: Dolomite Leroy Gulf Rd/Leroy Recycling Center
Monitoring point location: 42° 59' 5.086" N 77° 57' 16.996" W
Distance from blast: 2,874 ft
Direction from blast: W
Min allowed scaled distance: 30 ft/lb$^{0.5}$
Actual scaled distance: 187.48 ft/lb$^{0.5}$
Allowed explosives charge weight per delay: 9,177.64 lb
Monitored: Yes

Instrument: 6766
Manufacturer: Instantel
Model: Mini Mates
Serial #: 6766
Calibration date: 24 Feb 2020
Operator name: DON P
Trigger source: Geophone
Geophone trigger level: 0.02 in/s
Microphone trigger level: 132 dB
Transverse PPV: 0.033 in/s
Transverse frequency: 18 Hz
Longitudinal PPV: 0.041 in/s
Longitudinal frequency: 13 Hz
Vertical PPV: 0.029 in/s
Vertical frequency: 9.3 Hz
Max PPV: 0.041 in/s
Peak air overpressure: 96.7 dB

Crew & Safety

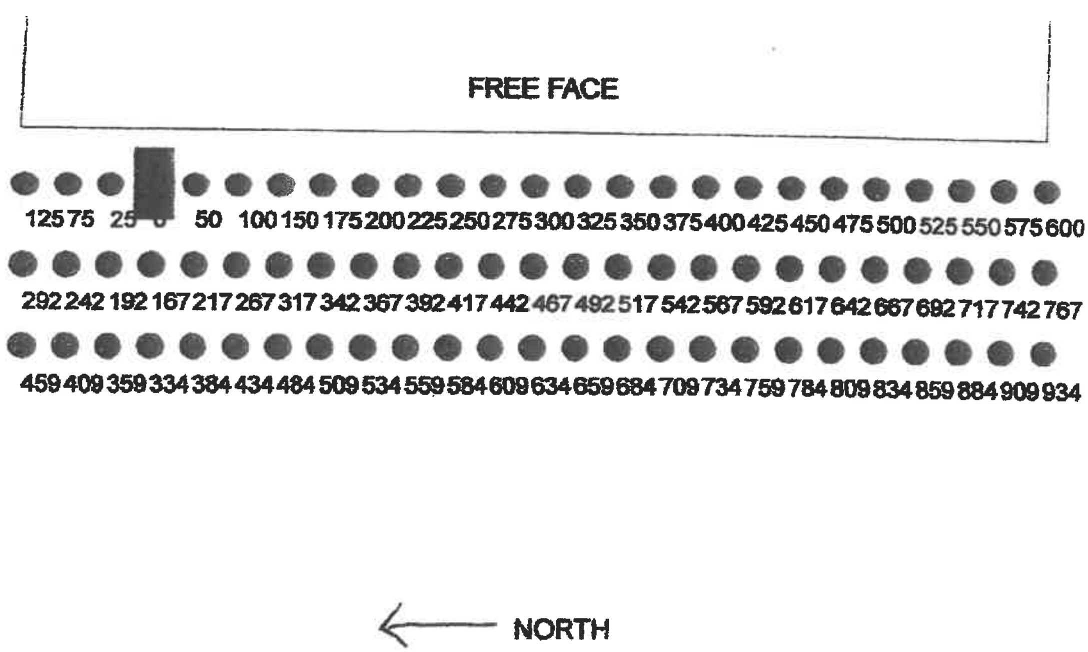
Blaster in charge: Donald Parrott
License #: 97-4461
Crew: DAN, PAT, RICKY
Total hours on site: 3.5
Blast comments: SHOT CLEARED

Customer representative: WOODY
Blasting Contractor: HTE
Workplace inspection: Yes
Post blast inspection: Yes
Blasting mats used: No
Safety meeting: Yes
Protective cover: Equipment

Signature of blaster in charge:

Donald Parrott

Signature of customer representative:


FREE FACE
125 75 25 50 100 150 175 200 225 250 275 300 325 350 375 400 425 450 475 500 525 550 575 600
292 242 192 167 217 267 317 342 367 392 417 442 467 492 517 542 567 592 617 642 667 692 717 742 767
459 409 359 334 384 434 484 509 534 559 584 609 634 659 684 709 734 759 784 809 834 859 884 909 934
NORTH

20-LG-09

Hilltop Energy - Leroy
Hilltop Energy - Mineral City, Ohio

Location & Weather

Blast date: 22 Sep 2020
Blast time: 08:59 AM ET
Reference number: HTY 14270
Permit number: 9023-21-00
Blast location: 42° 59' 5.2" N 77° 56' 37.5" W
Elevation: 727 ft
Pit: Dolomite Products
Bench: Leroy Gulf Road - 9023-21-0019

Sky condition: Sunny
Temperature: 50 °F
Wind direction: Southwest
Wind velocity: 5 mph

Pattern

Blast type: Production
Total holes: 72
Rock type: Limestone
Rock density: 2.25 tons/yd³

Initiation type: Electronic
Drill feet: 1,800 ft
Total rock weight: 36,000 tons
Total rock volume: 16,000 yd³

# of rows	Row range	Pattern type	Holes per row	Hole diameter (in)	Burden (ft)	Spacing (ft)	Bench height (ft)	Avg hole depth (ft)	Subdrill or standoff (ft)
3	1 - 3	Rectangle	24	6.25	16	15	25	25	0

# of rows	Row range	Avg stemming height (ft)	Stemming material	Explosive decks per hole	Inert decks per hole	Avg inert deck height (ft)	Inert deck material
3	1 - 3	7	Crushed stone	1	0	N/A	N/A

Explosives & Initiation

Bulk

Product	Manufacturer	Weight (lb)
ANFO	Orica	13,540

Boosters

Product	Manufacturer	Size (lb)	Qty	Weight (lb)
PENTEX BC	Orica	1	72	72

Initiation & accessories

Product	Manufacturer	Delay (ms)	Size	Qty
UNITronic detonator	Orica	Programmed	50 ft	72
Connecting Wire	Orica	—	500 ft	1
Harness Wire	Orica	—	656 ft	1

Packaged products

Product	Manufacturer	Size	Weight per qty (lb)	Qty	Weight (lb)
PowerAN 500	Hilltop Energy	5 in x 34 in	30	46	1,380

Total product weight: 14,992 lb
Powder factor: 2.4 ton/lb, 0.42 lb/ton, 0.94 lb/yd³

Environmentals

Actual explosives charge weight per hole: 208 lb
Actual explosives charge weight per deck: 208 lb
Actual explosives charge weight per delay: 208 lb
Max # of decks per delay: 1
Delay interval: 25 ms

Monitoring Point: Dolomite Leroy Gulf Rd/Leroy Recycling Center
Monitoring point location: 42° 59' 5.086" N 77° 57' 16.996" W
Distance from blast: 2,936 ft
Direction from blast: W

Min allowed scaled distance: 30 ft/lb$^{0.5}$
Actual scaled distance: 203.57 ft/lb$^{0.5}$
Allowed explosives charge weight per delay: 9,577.88 lb

Monitored: Yes

Instrument: 6766
Manufacturer: Instantel
Model: Mini Mates
Serial #: 6766
Calibration date: 24 Feb 2020
Operator name: DON P
Trigger source: Geophone
Geophone trigger level: 0.02 in/s
Microphone trigger level: 132 dB

Transverse PPV: 0.021 in/s
Transverse frequency: 16 Hz
Longitudinal PPV: 0.037 in/s
Longitudinal frequency: 20 Hz
Vertical PPV: 0.013 in/s
Vertical frequency: 17 Hz

Max PPV: 0.037 in/s
Peak air overpressure: 97.1 dB

Crew & Safety

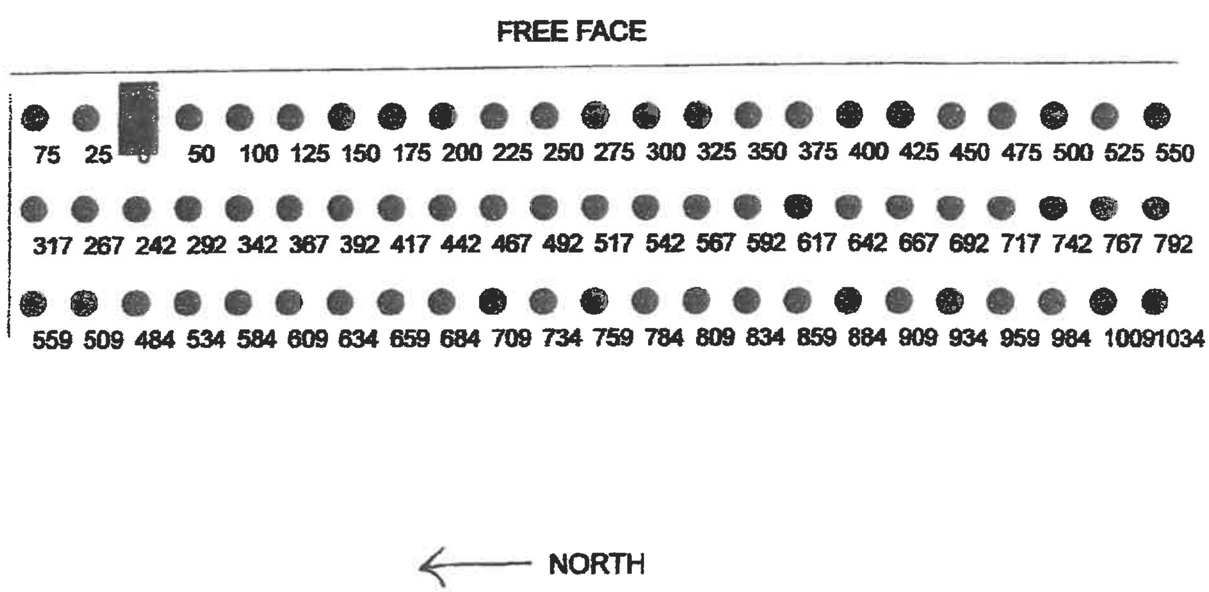
Blaster in charge: Donald Parrott
License #: 97-4461
Crew: DAN, PAT, RICKY
Total hours on site: 3.5
Blast comments: SHOT CLEARED

Customer representative: WOODY
Blasting Contractor: HTE
Workplace inspection: Yes
Post blast inspection: Yes
Blasting mats used: No
Safety meeting: Yes
Protective cover: Equipment

Signature of blaster in charge:

Donald Parrott

Signature of customer representative:


FREE FACE
75 25 0 50 100 125 150 175 200 225 250 275 300 325 350 375 400 425 450 475 500 525 550
317 267 242 292 342 367 392 417 442 467 492 517 542 567 592 617 642 667 692 717 742 767 792
559 509 484 534 584 609 634 659 684 709 734 759 784 809 834 859 884 909 934 959 984 1009 1034
NORTH

20-LG-06

Hilltop Energy - Leroy
Hilltop Energy - Mineral City, Ohio

Location & Weather

Blast date: 08 Sep 2020
Blast time: 01:14 PM ET
Reference number: HTY 14237
Permit number: 9023-21-00
Blast location: 42° 59' 6" N 77° 56' 36" W
Elevation: 691 ft
Pit: Dolomite Products
Bench: Leroy Gulf Road - 9023-21-0019

Sky condition: Partly Cloudy
Temperature: 74 °F
Wind direction: Northeast
Wind velocity: 10 mph

Pattern

Blast type: Production
Total holes: 327
Rock type: Limestone
Rock density: 2.25 tons/yd³

Initiation type: Non-electric
Drill feet: 3,597 ft
Total rock weight: 34,999 tons
Total rock volume: 15,555 yd³

# of rows	Row range	Pattern type	Holes per row	Hole diameter (in)	Burden (ft)	Spacing (ft)	Bench height (ft)	Avg hole depth (ft)	Subdrill or standoff (ft)
10	1 - 10	Square	32	6.25	11	11	11	11	0
	11 - 11	Square	7	6.25	11	11	11	11	0

# of rows	Row range	Avg stemming height (ft)	Stemming material	Explosive decks per hole	Inert decks per hole	Avg inert deck height (ft)	Inert deck material
11	1 - 11	7	Crushed stone	1	0	N/A	N/A

Explosives & Initiation

Bulk

Product	Manufacturer	Weight (lb)

Boosters

Product	Manufacturer	Size (lb)	Qty	Weight (lb)
PENTEX BC	Orica	1	327	327

Initiation & accessories

Product	Manufacturer	Delay (ms)	Size	Qty
EXEL HANDIDET	Orica	25/500	24 ft	326
Exel Connectadet	Orica	42	30 ft	25
Static Star	Austin Powder	0	35 ft	1
Connecting Wire	Orica	—	500 ft	2

Packaged products

Product	Manufacturer	Size	Weight per qty (lb)	Qty	Weight (lb)
PowerAN 500	Hilltop Energy	5 in x 34 in	30	484	14,520

T..al product weight: 14,847 lb
..der factor: 2.36 ton/lb, 0.42 lb/ton, 0.95 lb/yd³

Environmentals

ctual explosives charge weight per hole: 45.4 lb
ctual explosives charge weight per deck: 45.4 lb

Actual explosives charge weight per delay: 90.8 lb
Max # of decks per delay: 2

Delay interval: 25 ms

Monitoring Point: Dolomite Leroy Gulf Rd/Leroy Recycling Center
Monitoring point location: 42° 59' 5.086" N 77° 57' 16.996" W
Distance from blast: 3,048 ft
Direction from blast: W

Min allowed scaled distance: 30 ft/lb$^{0.5}$
Actual scaled distance: 319.87 ft/lb$^{0.5}$
Allowed explosives charge weight per delay: 10,322.56 lb

Monitored: Yes

Instrument: 6766
Manufacturer: Instantel
Model: Mini Mates
Serial #: 6766
Calibration date: 24 Feb 2020
Operator name: DON P
Trigger source: Geophone
Geophone trigger level: 0.02 in/s
Microphone trigger level: 132 dB

Transverse PPV: 0.205 in/s
Transverse frequency: 64 Hz
Longitudinal PPV: 0.22 in/s
Longitudinal frequency: 64 Hz
Vertical PPV: 0.256 in/s
Vertical frequency: 57 Hz

Max PPV: 0.256 in/s
Peak air overpressure: 125.1 dB

Crew & Safety

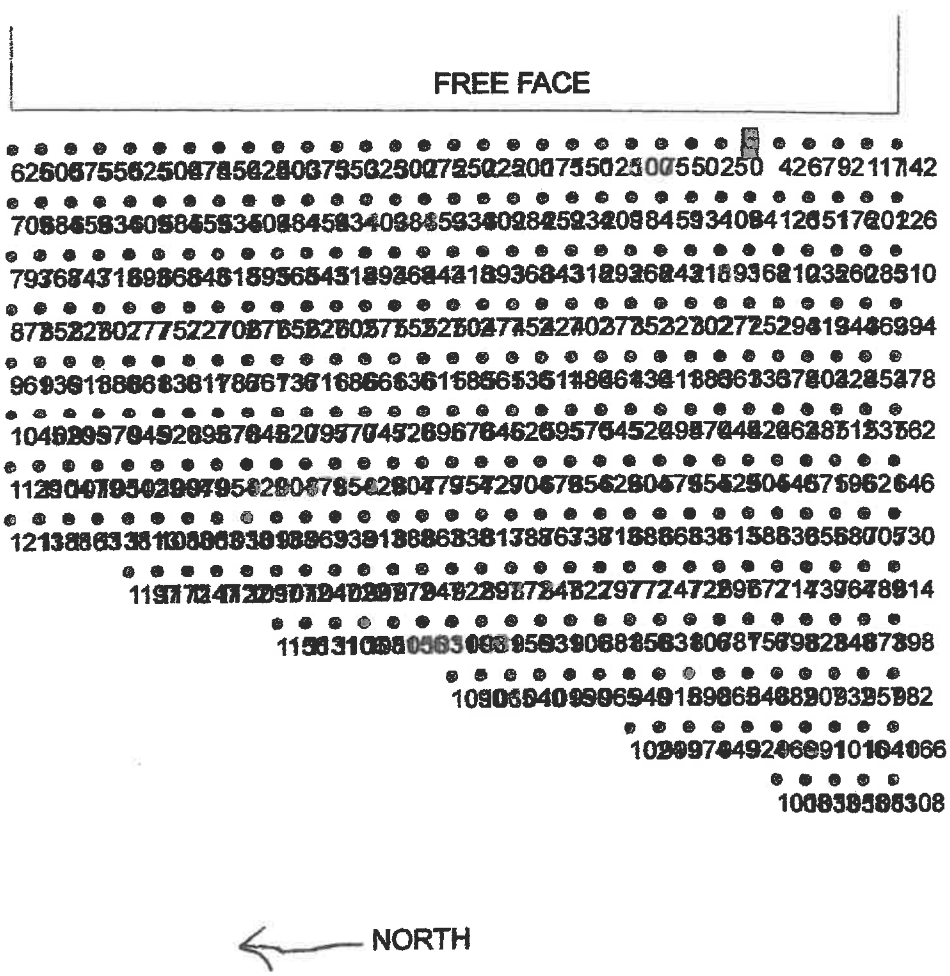
Blaster in charge: Donald Parrott
ense #: 97-4461
Crew: DAN, PAT, FRED
Total hours on site: 8
Blast comments: SHOT CLEARED

Customer representative: WOODY
Blasting Contractor: HTE
Workplace inspection: Yes
Post blast inspection: Yes
Blasting mats used: No
Safety meeting: Yes
Protective cover: Equipment

Signature of blaster in charge:

Donald Parrott

Signature of customer representative:


FREE FACE
NORTH

Appendix 9

FEMA Data

HydroCAD Model

Angela Fields

From:	Foote, Rochelle <Rochelle.Foote@atkinsglobal.com>
Sent:	Tuesday, January 12, 2021 12:04 PM
To:	supervisor@leroyny.org
Cc:	apodolak.code@leroyny.org; kelli.higgins-roche@dec.ny.gov; Brian Cote; Matthew Trueheart; jswierkosjr@dolomitegroup.com; Patel, Daven; Koper, Brian
Subject:	Issued (Conditional) Letter of Map Revision for Town of Le Roy, NY, Case No. 20-02-1048R
Attachments:	CL-20-02-1048R-360280.pdf; 20-02-1048R-360280.pdf

EXTERNAL

Attention:

Mr. James Farnholz
Supervisor, Town of Le Roy

Dear Mr. Farnholz:

On behalf of the Federal Emergency Management Agency, we are providing a pdf copy of the Conditional Letter of Map Revision (CLOMR) affecting your community, for your use and information. The original hardcopies of this CLOMR, dated January 6, 2021, have been mailed to all the recipients and should be delivered in the next several days. This electronic copy is being provided as a courtesy copy.

If you have any questions related to this CLOMR, please feel free to contact the undersigned by either email or telephone.

If you have any other questions regarding flood hazard mapping or insurance for the National Flood Insurance Program (NFIP), please e-mail FEMAMapSpecialist@riskmapcds.com, or call the FEMA Mapping and Insurance eXchange (FMIX) at 1-877-FEMA-MAP (1-877-336-2627).

Thank you.

Rochelle Foote
Senior Project Assistant
STARR II
Ph: 240.264.8059
www.STARR-Team.com | rochelle.foote@atkinsglobal.com

Federal Emergency Management Agency

Washington, D.C. 20472

January 6, 2021

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

IN REPLY REFER TO:
Case No.: 20-02-1048R
Community Name: Town of Le Roy, NY
Community No.: 360280

Mr. James Farnholz
Supervisor, Town of Le Roy
48 Main Street
Le Roy, NY 14482

Dear Mr. Farnholz:

We are providing our comments with the enclosed Conditional Letter of Map Revision (CLOMR) on a proposed project within your community that, if constructed as proposed, could revise the Flood Insurance Rate Map for your community.

If you have any questions regarding the floodplain management regulations for your community, the National Flood Insurance Program (NFIP) in general, or technical questions regarding this CLOMR, please contact the Director, Mitigation Division of the Federal Emergency Management Agency (FEMA) Regional Office in New York, NY at (347) 838-0427, or the FEMA Mapping and Insurance eXchange (FMIX) toll free at 1-877-336-2627 (1-877-FEMA MAP). Additional information about the NFIP is available on our website at https://www.fema.gov/flood-insurance.

Sincerely,

Patrick "Rick" F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration

List of Enclosures:
Conditional Letter of Map Revision Comment Document

cc: Ms. Anne Podolak
Code Enforcement Officer
Town of Le Roy

Ms. Kelli Higgins-Roche, P.E., CFM
State NFIP Coordinator
New York State Department of Environmental Conservation

Mr. Brian Cote, P.E.
Water Resources Project Engineer
Milone & Macbroom, Inc.

Mr. Matthew Trueheart
Water Resources Engineer
Milone & Macbroom, Inc.

Mr. John Swierkos, Jr.
Geologist
Dolomite Products Company, Inc.

Mud Creek CLOMR
20-02-1048R
Landowner Notification

Property Address	Reputed Owner (Address if Different)
8267 East Main Road, LeRoy NY 14482	LeRoy Aviation Services, Inc 283 West Minster Rd Rochester, NY 14607
8241 East Main Road, LeRoy NY 14482	Margaret Merica
8229 East Main Road, LeRoy NY 14482	Agostino Balsamo
8209 East Main Road, LeRoy NY 14482	Patricia Balsamo
Parcel 183689 – 26.-1-75, LeRoy NY 14482	Niagara Mohawk 300 Erie Blvd West Syracuse, NY 13202
Parcel 183689 – 26.-1-74, LeRoy NY 14482	New York Central Lines LLC CSX Corporation 901 E Cary St Richmond, VA 23219
Parcel 183689 – 26.-1-76, LeRoy NY 14482	Rochester and Southern Railroad Inc. 1372 Brooks Ave Rochester NY 14624
8259 Gulf Road, LeRoy NY 14482	Hanson Aggregates Inc. Attn: Marvin F. Poer & Company 3520 Piedmont Road, Suite 410 Atlanta, GA 30305

7019 0140 0000 1121 3271

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

Atlanta GA 30305

OFFICIAL USE

Certified Mail Fee $	$3.55	0625 31
Extra Services & Fees (check box, add fee as appropriate)	$2.85	
☐ Return Receipt (hardcopy)	$ ~~$0.00~~	
☐ Return Receipt (electronic)	$ $0.00	Postmark Here
☐ Certified Mail Restricted Delivery	$ $0.00	
☐ Adult Signature Required	$ ~~$0.00~~	
☐ Adult Signature Restricted Delivery	$	
Postage $	$0.55	11/10/2020
Total Postage and Fees $	$6.95	

Sent To HAWON

Street and Apt. No., or PO Box No. 3280 Peachtree Road Suite 410

City, State, ZIP+4® Atlanta GA 30305

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7019 0140 0000 1121 3264

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

Syracuse, NY 13202

OFFICIAL USE

Certified Mail Fee $	$3.55	0625 31
Extra Services & Fees (check box, add fee as appropriate)	$2.85	
☐ Return Receipt (hardcopy)	$ ~~$0.00~~	
☐ Return Receipt (electronic)	$ $0.00	Postmark Here
☐ Certified Mail Restricted Delivery	$ $0.00	
☐ Adult Signature Required	$ ~~$0.00~~	
☐ Adult Signature Restricted Delivery	$	
Postage $	$0.55	11/10/2020
Total Postage and Fees $	$6.95	

Sent To Niagara Mohawk

Street and Apt. No., or PO Box No. 300 Erie Blvd. West

City, State, ZIP+4® Syracuse NY 13202

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7019 0140 0000 1121 3257

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

Le Roy, NY 14482

OFFICIAL USE

Certified Mail Fee $	$3.55	0625 31
Extra Services & Fees (check box, add fee as appropriate)	$2.85	
☐ Return Receipt (hardcopy)	$ ~~$0.00~~	
☐ Return Receipt (electronic)	$ $0.00	Postmark Here
☐ Certified Mail Restricted Delivery	$ $0.00	
☐ Adult Signature Required	$ ~~$0.00~~	
☐ Adult Signature Restricted Delivery	$	
Postage $	$0.55	11/10/2020
Total Postage and Fees $	$6.95	

Sent To Ms. Delores Balsamo

Street and Apt. No., or PO Box No. 8702 Grand Meadow Road

City, State, ZIP+4® LeRoy NY 14482

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7019 0140 0000 1121 3288

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

Rochester, NY 14607

OFFICIAL USE

Certified Mail Fee $	$3.55	0625 31
Extra Services & Fees (check box, add fee as appropriate)	$2.85	
☐ Return Receipt (hardcopy)	$ ~~$0.00~~	
☐ Return Receipt (electronic)	$ $0.00	Postmark Here
☐ Certified Mail Restricted Delivery	$ $0.00	
☐ Adult Signature Required	$ ~~$0.00~~	
☐ Adult Signature Restricted Delivery	$	
Postage $	$0.55	11/10/2020
Total Postage and Fees $	$6.95	

Sent To Lenox Abstract Services

Street and Apt. No., or PO Box No. 203 Alex Munson Rd

City, State, ZIP+4® Rochester NY 14602

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7019 0140 0000 1121 3233

U.S. Postal Service

CERTIFIED MAIL® RECEIPT

Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

Le Roy, NY 14482

OFFICIAL USE

Certified Mail Fee $	$3.55	0625 31
Extra Services & Fees (check box, add fee as appropriate)	$2.85	
☐ Return Receipt (hardcopy)	$ ~~$0.00~~	
☐ Return Receipt (electronic)	$ ~~$0.00~~	Postmark Here
☐ Certified Mail Restricted Delivery	$ ~~$0.00~~	
☐ Adult Signature Required	$ ~~$0.00~~	
☐ Adult Signature Restricted Delivery	$	
Postage $	$0.55	11/10/2020
Total Postage and Fees $	$6.95	

Sent To Ms Marya Moore

Street and Apt. No., or PO Box No. 8241 East Main Rd

City, State, ZIP+4® Leroy NY 14482

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7019 0140 0000 1121 3226

U.S. Postal Service™

CERTIFIED MAIL® RECEIPT

Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

Rochester, NY 14621

OFFICIAL USE

Certified Mail Fee $	$3.55	0625 31
Extra Services & Fees (check box, add fee as appropriate)	$2.85	
☐ Return Receipt (hardcopy)	$ ~~$0.00~~	
☐ Return Receipt (electronic)	$ ~~$0.00~~	Postmark Here
☐ Certified Mail Restricted Delivery	$ ~~$0.00~~	
☐ Adult Signature Required	$ ~~$0.00~~	
☐ Adult Signature Restricted Delivery	$	
Postage $	$0.55	11/10/2020
Total Postage and Fees $	$6.95	

Sent To Rochester Seneca Realty

Street and Apt. No., or PO Box No. 1372 Brook Rd

City, State, ZIP+4® Rochester NY 14621

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7019 0140 0000 1121 3240

U.S. Postal Service™

CERTIFIED MAIL® RECEIPT

Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

Le Roy, NY 14482

OFFICIAL USE

Certified Mail Fee $	$3.55	0625 31
Extra Services & Fees (check box, add fee as appropriate)	$2.85	
☐ Return Receipt (hardcopy)	$ ~~$0.00~~	
☐ Return Receipt (electronic)	$ ~~$0.00~~	Postmark Here
☐ Certified Mail Restricted Delivery	$ ~~$0.00~~	
☐ Adult Signature Required	$ ~~$0.00~~	
☐ Adult Signature Restricted Delivery	$ ~~$0.00~~	
Postage $	$0.55	11/10/2020
Total Postage and Fees $	$6.95	

Sent To Mr. Roger Bulson

Street and Apt. No., or PO Box No. 8229 East Main Road

City, State, ZIP+4® Leroy NY 14482

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7019 0140 0000 1121 5763

U.S. Postal Service™

CERTIFIED MAIL® RECEIPT

Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

Richmond, VA 23219

OFFICIAL USE

Certified Mail Fee $	$3.55	0625 16
Extra Services & Fees (check box, add fee as appropriate)	$2.85	
☐ Return Receipt (hardcopy)	$ ~~$0.00~~	
☐ Return Receipt (electronic)	$ ~~$0.00~~	Postmark Here
☐ Certified Mail Restricted Delivery	$ ~~$0.00~~	
☐ Adult Signature Required	$ ~~$0.00~~	
☐ Adult Signature Restricted Delivery	$	
Postage $	$0.55	11/20/2020
Total Postage and Fees $	$6.95	

Sent To CSX Corporation

Street and Apt. No., or PO Box No. 901 E Cary St

City, State, ZIP+4® Richmond, VA 23219-4031

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

Dolomite Products Co., Inc.
Rochester Asphalt Materials
Northrup Materials

The DOLOMITE Group
A CRH COMPANY

Manitou Concrete Company
Iroquois Rock Products
A.L. Blades

11-5-2020

LeRoy Aviation Services, Inc.
283 West Minster Rd.
Rochester, NY 14607

Re: Notification of increases in 1-percent-annual-chance water-surface elevations and/or future flood hazard revisions

Dear LeRoy Aviation Services, Inc.

The Flood Insurance Rate Map (FIRM) for a community depicts the Special Flood Hazard Area (SFHA), the area that has been determined to be subject to a 1-percent or greater chance of flooding in any given year. The FIRM is used to determine flood insurance rates and to help the community with floodplain management.

Milone & MacBroom, Inc. is applying for a Conditional Letter of Map Revision (CLOMR) from the Federal Emergency Management Agency (FEMA) on behalf of Dolomite Products, Inc. to revise FIRM 360280 0004 B for Le Roy, NY along Mud Creek. Dolomite Products, Inc. is proposing to relocate Mud Creek to the margins of its property as part of a proposed quarry expansion.

Once the project has been completed, a Letter of Map Revision (LOMR) request should be submitted that will, in part, revise the following flood hazards along Mud Creek.

1. The Special Flood Hazard Area will increase along Mud Creek.

This letter is to inform you that while the proposed project is not expected to significantly affect flood elevations on your property at 8267 East Main Road, LeRoy NY 14482 as compared to the existing conditions, the results of detailed hydrologic and hydraulic analyses may result in inclusion of areas of your property in the revised SFHA. This letter is also to inform you of the potential changes to the effective flood hazard information that would result after the project is completed and a LOMR request is submitted to FEMA.

Maps and a detailed analysis of the proposed flood hazard revisions can be reviewed at the Le Roy Town Hall at 48 Main Street, Le Roy, NY 14482. If you have any questions or concerns about the proposed project or its effect on your property, you may contact Anne Podolak, Code Enforcement Officer of Le Roy at 585-768-6910.

Sincerely,

John Swierkos Jr.
Geologist PG & Environmental Coordinator
The Dolomite Group
1150 Penfield road
Rochester NY, 14625
(585) 749-2371

ESTIMATES

Flood Event (yr)	04230500 Oatka Creek Q_T(w) (cfs)*	Table 3 b (Region 6)	A_g (sq. mi.)	A_u (sq. mi.)	Mud Creek Project Area Q_T(U)g (cfs)
500	8400	0.826	200	11.4	**788**
100	6800	0.813	200	11.4	**662**
50	6100	0.807	200	11.4	**604**
10	4400	0.794	200	11.4	**452**

*Q_T(w) computed with USGS Bulletin 17B using accompanying HEC-SSP project file

OBSERVED

Flood Event	04230500 Oatka Creek Q_T(w) (cfs)	b (Region 6)	A_g (sq. mi.)	A_u (sq. mi.)	04230470 Mud Creek Gauge Q_T(U)g (cfs)	Observed (cfs)
1976 Peak Flow (March 5, 1976)	6090	0.807	200	10.2	**552**	550

<u>Equation 5 in USGS SIR 2006-5112</u>

$Q_{T(U)g}$ is the peak-flow estimate for recurrence interval T at the ungaged site, derived from the weighted estimate of peak discharge at the streamflow-gaging station, $Q_{T(w)}$ (see method for gaged sites), by adjusting for the effect of the difference in drainage area between the streamflow-gaging station and the ungaged site.

$Q_{T(U)g}$ is computed as:

$$Q_{T(U)g} = \left(\frac{A_u}{A_g}\right)^b \cdot Q_{T(w)} \quad (5)$$

where

depending on the hydrologic region and the recurrence interval T. b is the exponent from the appropriate drainage-area-only equation (table 3).

Table 3 in USGS SIR 2006-5112

Table 3. Regression equations based on drainage area only for estimating peak discharges for rural, unregulated streams in each of six hydrologic regions of New York, excluding Long Island.

[Corresponding full equations are given in table 1. Region boundaries are shown in figure 2. A, drainage area; Q, flow. Subscript is recurrence interval: thus, Q_2 refers to discharge with 2-year recurrence interval]

Region 1			Region 2			Region 3		
$Q_{1.25}$	=	$31.7\,(A)^{0.857}$	$Q_{1.25}$	=	$43.4\,(A)^{0.772}$	$Q_{1.25}$	=	$57.4\,(A)^{0.861}$
$Q_{1.5}$	=	$38.5\,(A)^{0.849}$	$Q_{1.5}$	=	$56.1\,(A)^{0.758}$	$Q_{1.5}$	=	$71.8\,(A)^{0.857}$
Q_{2}	=	$47.6\,(A)^{0.835}$	Q_{2}	=	$74.7\,(A)^{0.743}$	Q_{2}	=	$90.8\,(A)^{0.853}$
Q_{5}	=	$73.0\,(A)^{0.822}$	Q_{5}	=	$139\,(A)^{0.712}$	Q_{5}	=	$144\,(A)^{0.850}$
Q 10	=	$92.1\,(A)^{0.813}$	Q_{10}	=	$197\,(A)^{0.695}$	Q_{10}	=	$185\,(A)^{0.848}$
Q_{25}	=	$119\,(A)^{0.802}$	Q_{25}	=	$291\,(A)^{0.677}$	Q_{25}	=	$249\,(A)^{0.843}$
Q_{50}	=	$140\,(A)^{0.796}$	Q_{50}	=	$378\,(A)^{0.666}$	Q_{50}	=	$304\,(A)^{0.840}$
Q_{100}	=	$162\,(A)^{0.790}$	Q_{100}	=	$480\,(A)^{0.656}$	Q_{100}	=	$367\,(A)^{0.836}$
Q_{200}	=	$186\,(A)^{0.785}$	Q_{200}	=	$598\,(A)^{0.648}$	Q_{200}	=	$436\,(A)^{0.832}$
Q_{500}	=	$219\,(A)^{0.779}$	Q_{500}	=	$782\,(A)^{0.638}$	Q_{500}	=	$539\,(A)^{0.827}$
Region 4			**Region 5**			**Region 6**		
$Q_{1.25}$	=	$39.1\,(A)^{0.833}$	$Q_{1.25}$	=	$54.8\,(A)^{0.800}$	$Q_{1.25}$	=	$31.1\,(A)^{0.783}$
$Q_{1.5}$	=	$48.7\,(A)^{0.823}$	$Q_{1.5}$	=	$71.5\,(A)^{0.785}$	$Q_{1.5}$	=	$37.2\,(A)^{0.782}$
Q_{2}	=	$61.3\,(A)^{0.812}$	Q_{2}	=	$95.4\,(A)^{0.770}$	Q_{2}	=	$44.5\,(A)^{0.782}$
Q_{5}	=	$97.4\,(A)^{0.788}$	Q_{5}	=	$172\,(A)^{0.738}$	Q_{5}	=	$62.7\,(A)^{0.788}$
Q_{10}	=	$124\,(A)^{0.775}$	Q_{10}	=	$237\,(A)^{0.722}$	Q_{10}	=	$74.2\,(A)^{0.794}$
Q_{25}	=	$161\,(A)^{0.761}$	Q_{25}	=	$332\,(A)^{0.706}$	Q_{25}	=	$88.4\,(A)^{0.801}$
Q_{50}	=	$191\,(A)^{0.751}$	Q_{50}	=	$412\,(A)^{0.695}$	Q_{50}	=	$98.5\,(A)^{0.807}$
Q_{100}	=	$221\,(A)^{0.743}$	Q_{100}	=	$502\,(A)^{0.687}$	Q_{100}	=	$108\,(A)^{0.813}$
Q_{200}	=	$253\,(A)^{0.735}$	Q_{200}	=	$600\,(A)^{0.679}$	Q_{200}	=	$117\,(A)^{0.818}$
Q_{500}	=	$298\,(A)^{0.727}$	Q_{500}	=	$745\,(A)^{0.670}$	Q_{500}	=	$129\,(A)^{0.826}$

U.S. DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

OVERVIEW & CONCURRENCE FORM

O.M.B No. 1660-0016
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

ROUTINE USE(S): The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program (NFIP); Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.

DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a (NFIP) Flood Insurance Rate Maps (FIRM).

A. REQUESTED RESPONSE FROM DHS-FEMA

This request is for a (check one):

☒ CLOMR: A letter from DHS-FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision, or proposed hydrology changes (See 44 CFR Ch. 1, Parts 60, 65 & 72).

☐ LOMR: A letter from DHS-FEMA officially revising the current NFIP map to show the changes to floodplains, regulatory floodway or flood elevations. (See 44 CFR Ch. 1, Parts 60, 65 & 72)

B. OVERVIEW

1. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
Example: 480301 480287	City of Katy Harris County	TX TX	48473C 48201C	0005D 0220G	02/08/83 09/28/90
360281	Town of Le Roy Genesee County	NY	360280	0004B	09/14/79

2. a. Flooding Source: Mud Creek

   b. Types of Flooding: ☒ Riverine ☐ Coastal ☐ Shallow Flooding (e.g., Zones AO and AH)
   ☐ Alluvial fan ☐ Lakes ☐ Other (Attach Description)

3. Project Name/Identifier: **Mud Creek at Dolomite Products, Inc.**

4. FEMA zone designations affected: A (choices: A, AH, AO, A1-A30, A99, AE, AR, V, V1-V30, VE, B, C, D, X)

5. Basis for Request and Type of Revision:

   a. The basis for this revision request is (check all that apply)

   ☒ Physical Change ☒ Improved Methodology/Data ☐ Regulatory Floodway Revision ☐ Base Map Changes
   ☐ Coastal Analysis ☒ Hydraulic Analysis ☒ Hydrologic Analysis ☐ Corrections
   ☐ Weir-Dam Changes ☐ Levee Certification ☐ Alluvial Fan Analysis ☐ Natural Changes
   ☐ New Topographic Data ☐ Other (Attach Description)

   Note: A photograph and narrative description of the area of concern is not required, but is very helpful during review.

b. The area of revision encompasses the following structures (check all that apply)

Structures: ☒ Channelization ☐ Levee/Floodwall ☐ Bridge/Culvert

☐ Dam ☒ Fill ☐ Other (Attach Description)

6. ☒ Documentation of ESA compliance is submitted (required to initiate CLOMR review). Please refer to the instructions for more information.

C. REVIEW FEE

Has the review fee for the appropriate request category been included? ☐ Yes Fee amount: $_____

☐ No, Attach Explanation

Please see the DHS-FEMA Web site at http://www.fema.gov/plan/prevent/fhm/frm_fees.shtm **for Fee Amounts and Exemptions.**

D. SIGNATURE

All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: JOHN SWIERBOSS	Company: DOLOMITE PRODUCTS COMPANY INC.
Mailing Address: 1150 PENFIELD ROAD ROCHESTER NY 14625	Daytime Telephone No.: / Fax No.:
	E-Mail Address: JSWIERBOSS@dolomitegroup.com
Signature of Requester (required):	Date: 2/12/2020

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision (LOMR) or conditional LOMR request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all community floodplain management requirements, including the requirements for when fill is placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a conditional LOMR, will be obtained. For Conditional LOMR requests, the applicant has documented Endangered Species Act (ESA) compliance to FEMA prior to FEMA's review of the Conditional LOMR application. For LOMR requests, I acknowledge that compliance with Sections 9 and 10 of the ESA has been achieved independently of FEMA's process. For actions authorized, funded, or being carried out by Federal or State agencies, documentation from the agency showing its compliance with Section 7(a)(2) of the ESA will be submitted. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by FEMA, all analyses and documentation used to make this determination.

Community Official's Name and Title: Code Enforcement Officer: Anne Podolak	Community Name: Town of Le Roy, NY	
Mailing Address: **48 Main Street** **LeRoy, NY 14482**	Daytime Telephone No.: 585-768-6910 ext: 223	Fax No.:
	E-Mail Address:	
Community Official's Signature (required): Anne M Podolak	Date: 2-28-20	

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information data, hydrologic and hydraulic analysis, and any other supporting information as per NFIP regulations paragraph 65.2(b) and as described in the MT-2 Forms Instructions. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name: **Brian M. Cote**	License No.: **VT #9358**	Expiration Date: **07/31/2020**
Company Name: Milone & MacBroom, Inc.	Telephone No.: **802-882-8335**	Fax No.:
Signature: B M. Cote	Date: 03/12/2020	E-Mail Address: **bcote@mminc.com**

Ensure the forms that are appropriate to your revision request are included in your submittal.

Form Name and (Number)	Required if ...
☒ Riverine Hydrology and Hydraulics Form (Form 2)	New or revised discharges or water-surface elevations
☒ Riverine Structures Form (Form 3)	Channel is modified, addition/revision of bridge/culverts, addition/revision of levee/floodwall, addition/revision of dam
☐ Coastal Analysis Form (Form 4)	New or revised coastal elevations
☐ Coastal Structures Form (Form 5)	Addition/revision of coastal structure
☐ Alluvial Fan Flooding Form (Form 6)	Flood control measures on alluvial fans

Seal (Optional)

U.S. DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 1660-0016
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 3.5 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington VA 20958-3005, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

ROUTINE USE(S): The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program (NFIP); Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.

DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: Mud Creek

Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section B)   ☒ No existing analysis   ☐ Improved data
☐ Alternative methodology   ☒ Proposed Conditions (CLOMR)   ☒ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	Effective/FIS (cfs)	Revised (cfs)
Upstream - RS 4773	10.2	N/A	510
East Trib Conf - RS 1987	11.4	N/A	660

3. Methodology for New Hydrologic Analysis (check all that apply)

☒ Statistical Analysis of Gage Records   ☐ Precipitation/Runoff Model → Specify Model: ____________
☒ Regional Regression Equations   ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters), and documentation to support the new analysis.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Is the hydrology for the revised flooding source(s) affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation..

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Proposed/Revised
Downstream Limit*	Eastern quarry property line	41	N/A	765.31
Upstream Limit*	Rochester & Southern RR	4773	N/A	779.27

*Proposed/Revised elevations must tie-into the Effective elevations within 0.5 foot at the downstream and upstream limits of revision.

2. Hydraulic Method/Model Used: HEC RAS v.5.0.7

3. Pre-Submittal Review of Hydraulic Models*

DHS-FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS.

4.

Models Submitted	Natural Run File Name	Natural Run Plan Name	Floodway Run File Name	Floodway Run Plan Name	Datum
Duplicate Effective Model*	File Name: N/A	Plan Name: N/A	File Name: N/A	Plan Name: N/A	N/A
Corrected Effective Model*	File Name: N/A	Plan Name: N/A	File Name: N/A	Plan Name: N/A	N/A
Existing or Pre-Project Conditions Model	File Name: MudCreek_01.prj	Plan Name: ExistingCondtions	File Name: N/A	Plan Name: N/A	NAVD88 (ft)
Revised or Post-Project Conditions Model	File Name: MudCreek_01.prj	Plan Name: ProposedConditions	File Name: N/A	Plan Name: N/A	NAVD88 (ft)
Other - (attach description)	File Name:	Plan Name:	File Name:	Plan Name:	

* For details, refer to the corresponding section of the instructions.

☒ Digital Models Submitted? (Required)

C. MAPPING REQUIREMENTS

A **certified topographic work map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

☒ Digital Mapping (GIS/CADD) Data Submitted (preferred)

Topographic Information: Lidar-derived topographic mapping. NPS = 0.5 meter

Source: USDA NRCS in New York; northern Genesee County Date: Aerial mission: Dec. 2011 through Apr. 2012

Accuracy: Maximum vertical RMSE = 9.25 centimeters

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM**, at the same scale as the original, annotated to show the boundaries of the revised 1%-and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%-and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area on revision.

☒ Annotated FIRM and/or FBFM (Required)

D. COMMON REGULATORY REQUIREMENTS*

1. For LOMR/CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☒ No

   a. For CLOMR requests, if either of the following is true, please submit **evidence of compliance with Section 65.12 of the NFIP regulations**:

   - The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot compared to pre-project conditions.
   - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot compared to pre-project conditions.

   b. Does this LOMR request cause increase in the BFE and/or SFHA compared with the effective BFEs and/or SFHA? ☒ Yes ☐ No

   If Yes, please attach **proof of property owner notification and acceptance (if available)**. Elements of and examples of property owner notifications can be found in the MT-2 Form 2 Instructions.

2. Does the request involve the placement or proposed placement of fill? ☒ Yes ☐ No

   If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(A)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☐ Yes ☒ No

   If Yes, attach **evidence of regulatory floodway revision notification**. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being established. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For CLOMR requests, please submit documentation to FEMA and the community to show that you have complied with Sections 9 and 10 of the Endangered Species Act (ESA).

For actions authorized, funded, or being carried out by Federal or State agencies, please submit documentation from the agency showing its compliance with Section 7(a)(2) of the ESA. Please see the MT-2 instructions for more detail.

*ot inclusive of all applicable regulatory requirements. For details, see 44 CFR parts 60 and 65.

DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY
RIVERINE STRUCTURES FORM

O.M.B. NO. 1660-0016
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 7 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20598-3005, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

ROUTINE USE(S): The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program; Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.

DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: Mud Creek

Note: Fill out one form for each flooding source studied.

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:
- Channelization...............complete Section B
- Bridge/Culvert................complete Section C
- Dam...............................complete Section D
- Levee/Floodwall............complete Section E
- Sediment Transport........complete Section F (if required)

Description Of Modeled Structure

1. Name of Structure: Channel

   Type (check one): ☒ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: _____

   Downstream Limit/Cross Section: 993

   Upstream Limit/Cross Section: 3656

2. Name of Structure: _____

   Type (check one): ☐ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: _____

   Downstream Limit/Cross Section: _____

   Upstream Limit/Cross Section: _____

3. Name of Structure: _____

   Type (check one) ☐ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: _____

   Downstream Limit/Cross Section: _____

   Upstream Limit/Cross Section: _____

NOTE: FOR MORE STRUCTURES, ATTACH ADDITIONAL PAGES AS NEEDED.

B. CHANNELIZATION

Flooding Source: Mud Creek

Name of Structure: Channel

1. Hydraulic Considerations

The channel was designed to carry 660 (cfs) and/or the 100-year flood.
The design elevation in the channel is based on (check one):

☒ Subcritical flow ☐ Critical flow ☐ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions

☐ Other locations (specify): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections

☐ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator

☐ Weir ☒ Other (Describe): Left bank berm; not to be certified levee; modeled as floodplain fill

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: _____

Name of Structure: _____

1. This revision reflects (check one):

☐ Bridge/culvert not modeled in the FIS

☐ Modified bridge/culvert previously modeled in the FIS

☐ Revised analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): _____
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

☐ Dimensions (height, width, span, radius, length)

☐ Shape (culverts only)

☐ Material

☐ Beveling or Rounding

☐ Wing Wall Angle

☐ Skew Angle

☐ Distances Between Cross Sections

☐ Erosion Protection

☐ Low Chord Elevations – Upstream and Downstream

☐ Top of Road Elevations – Upstream and Downstream

☐ Structure Invert Elevations – Upstream and Downstream

☐ Stream Invert Elevations – Upstream and Downstream

☐ Cross-Section Locations

4. Sediment Transport Considerations

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☐ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

D. DAM/BASIN

Flooding Source: _____
Name of Structure: _____

1. This request is for (check one): ☐ Existing dam/basin ☐ New dam/basin ☐ Modification of existing dam/basin

2. The dam/basin was designed by (check one): ☐ Federal agency ☐ State agency ☐ Private organization ☐ Local government agency

   Name of the agency or organization: _____

3. The Dam was permitted as (check one): ☐ Federal Dam ☐ State Dam

   Provide the permit or identification number (ID) for the dam and the appropriate permitting agency or organization

   Permit or ID number __________________ Permitting Agency or Organization ______________________________

   a. ☐ Local Government Dam ☐ Private Dam

   Provided related drawings, specification and supporting design information.

4. Does the project involve revised hydrology? ☐ Yes ☐ No

   If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2).

   Was the dam/basin designed using critical duration storm? (must account for the maximum volume of runoff)

   ☐ Yes, provide supporting documentation with your completed Form 2.

   ☐ No, provide a written explanation and justification for not using the critical duration storm.

5. Does the submittal include debris/sediment yield analysis? ☐ Yes ☐ No

   If Yes, then fill out Section F (Sediment Transport). If No, then attach your explanation for why debris/sediment analysis was not considered?

6. Does the Base Flood Elevation behind the dam/basin or downstream of the dam/basin change? ☐ Yes ☐ No

   If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2) and complete the table below.

	Stillwater Elevation Behind the Dam/Basin	
FREQUENCY (% annual chance)	FIS	REVISED
10-year (10%)	_____	_____
50-year (2%)	_____	_____
100-year (1%)	_____	_____
500-year (0.2%)	_____	_____
Normal Pool Elevation	_____	_____

7. Please attach a copy of the formal Operation and Maintenance Plan

E. LEVEE/FLOODWALL

1. System Elements

a. This Levee/Floodwall analysis is based on (check one): ☐ upgrading of an existing levee/floodwall system ☐ a newly constructed levee/floodwall system ☐ reanalysis of an existing levee/floodwall system

b. Levee elements and locations are (check one):

☐ earthen embankment, dike, berm, etc. Station _____ to _____
☐ structural floodwall Station _____ to _____
☐ Other (describe): Station _____ to _____

c. Structural Type (check one): ☐ monolithic cast-in place reinforced concrete ☐ reinforced concrete masonry block ☐ sheet piling ☐ Other (describe): _____

d. Has this levee/floodwall system been certified by a Federal agency to provide protection from the base flood?

☐ Yes ☐ No

If Yes, by which agency? _____

e. Attach certified drawings containing the following information (indicate drawing sheet numbers):

1. Plan of the levee embankment and floodwall structures. Sheet Numbers: _____
2. A profile of the levee/floodwall system showing the Base Flood Elevation (BFE), levee and/or wall crest and foundation, and closure locations for the total levee system. Sheet Numbers: _____
3. A profile of the BFE, closure opening outlet and inlet invert elevations, type and size of opening, and kind of closure. Sheet Numbers: _____
4. A layout detail for the embankment protection measures. Sheet Numbers: _____
5. Location, layout, and size and shape of the levee embankment features, foundation treatment, Floodwall structure, closure structures, and pump stations. Sheet Numbers: _____

2. Freeboard

a. The minimum freeboard provided above the BFE is:

Riverine

3.0 feet or more at the downstream end and throughout ☐ Yes ☐ No

3.5 feet or more at the upstream end ☐ Yes ☐ No

4.0 feet within 100 feet upstream of all structures and/or constrictions ☐ Yes ☐ No

Coastal

1.0 foot above the height of the one percent wave associated with the 1%-annual-chance stillwater surge elevation or maximum wave runup (whichever is greater). ☐ Yes ☐ No

2.0 feet above the 1%-annual-chance stillwater surge elevation ☐ Yes ☐ No

Please note, occasionally exceptions are made to the minimum freeboard requirement. If an exception is requested, attach documentation addressing Paragraph 65.10(b)(1)(ii) of the NFIP Regulations.

If No is answered to any of the above, please attach an explanation.

b. Is there an indication from historical records that ice-jamming can affect the BFE? ☐ Yes ☐ No

If Yes, provide ice-jam analysis profile and evidence that the minimum freeboard discussed above still exists.

3. Closures

a. Openings through the levee system (check one): ☐ exists ☐ does not exist

If opening exists, list all closures:

Channel Station	Left or Right Bank	Opening Type	Highest Elevation for Opening Invert	Type of Closure Device

(Extend table on an added sheet as needed and reference)

Note: Geotechnical and geologic data

In addition to the required detailed analysis reports, data obtained during field and laboratory investigations and used in the design analysis for the following system features should be submitted in a tabulated summary form. (Reference U.S. Army Corps of Engineers [USACE] EM-1110-2-1906 Form 2086.)

4. Embankment Protection

a. The maximum levee slope land side is: _____

b. The maximum levee slope flood side is: _____

c. The range of velocities along the levee during the base flood is: _____ (min.) to _____ (max.)

d. Embankment material is protected by (describe what kind): _____

e. Riprap Design Parameters (check one): ☐ Velocity ☐ Tractive stress
Attach references

Reach		Sideslope	Flow Depth	Velocity	Curve or Straight	Stone Riprap			Depth of Toedown
						D_{100}	D_{50}	Thickness	
Sta	to								
Sta	to								
Sta	to								
Sta	to								
Sta	to								
Sta	to								

(Extend table on an added sheet as needed and reference each entry)

f. Is a bedding/filter analysis and design attached? ☐ Yes ☐ No

g. Describe the analysis used for other kinds of protection used (include copies of the design analysis):

Attach engineering analysis to support construction plans.

5. Embankment And Foundation Stability

a. Identify locations and describe the basis for selection of critical location for analysis:

_____

☐ Overall height: Sta.: _____, height _____ ft.

☐ Limiting foundation soil strength:

Strength ϕ = _____ degrees, c = _____ psf

Slope: SS = _____ (h) to _____ (v)

(Repeat as needed on an added sheet for additional locations)

b. Specify the embankment stability analysis methodology used (e.g., circular arc, sliding block, infinite slope, etc.):

_____

c. Summary of stability analysis results:

E. LEVEE/FLOODWALL (CONTINUED)

5. Embankment And Foundation Stability (continued)

Case	Loading Conditions	Critical Safety Factor	Criteria (Min.)
I	End of construction		1.3
II	Sudden drawdown		1.0
III	Critical flood stage		1.4
IV	Steady seepage at flood stage		1.4
VI	Earthquake (Case I)		1.0

(Reference: USACE EM-1110-2-1913 Table 6-1)

d. Was a seepage analysis for the embankment performed? ☐ Yes ☐ No

If Yes, describe methodology used:

e. Was a seepage analysis for the foundation performed? ☐ Yes ☐ No

f. Were uplift pressures at the embankment landside toe checked? ☐ Yes ☐ No

g. Were seepage exit gradients checked for piping potential? ☐ Yes ☐ No

h. The duration of the base flood hydrograph against the embankment is _____ hours.

Attach engineering analysis to support construction plans.

6. Floodwall And Foundation Stability

a. Describe analysis submittal based on Code (check one): ☐ UBC (1988) ☐ Other (specify): _____

b. Stability analysis submitted provides for: ☐ Overturning ☐ Sliding If not, explain: _____

c. Loading included in the analyses were: ☐ Lateral earth @ P_A = _____ psf; P_p = _____ psf

☐ Surcharge-Slope @ _____, ☐ surface _____ psf

☐ Wind @ P_w = _____ psf

☐ Seepage (Uplift); _____ ☐ Earthquake @ P_{eq} = _____ %g

☐ 1%-annual-chance significant wave height: _____ ft.

☐ 1%-annual-chance significant wave period: _____ sec.

d. Summary of Stability Analysis Results: Factors of Safety.
Itemize for each range in site layout dimension and loading condition limitation for each respective reach.

Loading Condition	Criteria (Min)		Sta	To	Sta	To
	Overturn	Sliding	Overturn	Sliding	Overturn	Sliding
Dead & Wind	1.5	1.5				
Dead & Soil	1.5	1.5				
Dead, Soil, Flood, & Impact	1.5	1.5				
Dead, Soil, & Seismic	1.3	1.3				

(Ref: FEMA 114 Sept 1986; USACE EM 1110-2-2502)
Note: (Extend table on an added sheet as needed and reference)

E. LEVEE/FLOODWALL (CONTINUED)

6. Floodwall And Foundation Stability (continued)

e. Foundation bearing strength for each soil type:

Bearing Pressure	Sustained Load (psf)	Short Term Load (psf)
Computed design maximum		
Maximum allowable		

f. Foundation scour protection ☐ is, ☐ is not provided. If provided, attach explanation and supporting documentation:

Attach engineering analysis to support construction plans.

7. Settlement

a. Has anticipated potential settlement been determined and incorporated into the specified construction elevations to maintain the established freeboard margin? ☐ Yes ☐ No

b. The computed range of settlement is _____ ft. to _____ ft.

c. Settlement of the levee crest is determined to be primarily from : ☐ Foundation consolidation ☐ Embankment compression ☐ Other (Describe): _____

d. Differential settlement of floodwalls ☐ has ☐ has not been accommodated in the structural design and construction.

Attach engineering analysis to support construction plans.

8. Interior Drainage

a. Specify size of each interior watershed:

Draining to pressure conduit: _____ acres
Draining to ponding area: _____ acres

b. Relationships Established

Ponding elevation vs. storage	☐ Yes	☐ No
Ponding elevation vs. gravity flow	☐ Yes	☐ No
Differential head vs. gravity flow	☐ Yes	☐ No

c. The river flow duration curve is enclosed: ☐ Yes ☐ No

d. Specify the discharge capacity of the head pressure conduit: _____ cfs

e. Which flooding conditions were analyzed?

• Gravity flow (Interior Watershed)	☐ Yes	☐ No
• Common storm (River Watershed)	☐ Yes	☐ No
• Historical ponding probability	☐ Yes	☐ No
• Coastal wave overtopping	☐ Yes	☐ No

If No for any of the above, attach explanation.

e. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection. ☐ Yes ☐ No If No, attach explanation.

g. The rate of seepage through the levee system for the base flood is _____ cfs

h. The length of levee system used to drive this seepage rate in item g: _____ ft.

E. LEVEE/FLOODWALL (CONTINUED)

8. Interior Drainage (continued)

i. Will pumping plants be used for interior drainage? ☐ Yes ☐ No

If Yes, include the number of pumping plants: _____ For each pumping plant, list:

	Plant #1	Plant #2
The number of pumps		
The ponding storage capacity		
The maximum pumping rate		
The maximum pumping head		
The pumping starting elevation		
The pumping stopping elevation		
Is the discharge facility protected?		
Is there a flood warning plan?		
How much time is available between warning and flooding?		

Will the operation be automatic? ☐ Yes ☐ No

If the pumps are electric, are there backup power sources? ☐ Yes ☐ No

(Reference: USACE EM-1110-2-3101, 3102, 3103, 3104, and 3105)

Include a copy of supporting documentation of data and analysis. Provide a map showing the flooded area and maximum ponding elevations for all interior watersheds that result in flooding.

9. Other Design Criteria

a. The following items have been addressed as stated:

Liquefaction ☐ is ☐ is not a problem

Hydrocompaction ☐ is ☐ is not a problem

Heave differential movement due to soils of high shrink/swell ☐ is ☐ is not a problem

b. For each of these problems, state the basic facts and corrective action taken:

Attach supporting documentation

c. If the levee/floodwall is new or enlarged, will the structure adversely impact flood levels and/or flow velocities floodside of the structure?
☐ Yes ☐ No Attach supporting documentation

d. Sediment Transport Considerations:

Was sediment transport considered? ☐ Yes ☐ No
If Yes, then fill out Section F (Sediment Transport). If No, then attach your explanation for why sediment transport was not considered.

10. Operational Plan And Criteria

a. Are the planned/installed works in full compliance with Part 65.10 of the NFIP Regulations? ☐ Yes ☐ No

b. Does the operation plan incorporate all the provisions for closure devices as required in Paragraph 65.10(c)(1) of the NFIP regulations?
☐ Yes ☐ No

c. Does the operation plan incorporate all the provisions for interior drainage as required in Paragraph 65.10(c)(2) of the NFIP regulations?
☐ Yes ☐ No If the answer is No to any of the above, please attach supporting documentation.

E. LEVEE/FLOODWALL (CONTINUED)

11. Maintenance Plan

Please attach a copy of the fomal maintenance plan for the levee/floodwall

12. Operations and Maintenance Plan

Please attach a copy of the formal Operations and Maintenance Plan for the levee/floodwall.

CERTIFICATION OF THE LEVEE DOCUMENTION

This certification is to be signed and sealed by a licensed registered professional engineer authorized by law to certify elevation information data, hydrologic and hydraulic analysis, and any other supporting information as per NFIP regulations paragraph 65.10(e) and as described in the MT-2 Forms Instructions. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name: _____ License No.: _____ Expiration Date: _____

Company Name: _____ Telephone No.: _____ Fax No.: _____

Signature: _____ Date: _____ E-Mail Address: _____

F. SEDIMENT TRANSPORT

Flooding Source: _____

Name of Structure: _____

If there is any indication from historical records that sediment transport (including scour and deposition) can affect the Base Flood Elevation (BFE); and/or based on the stream morphology, vegetative cover, development of the watershed and bank conditions, there is a potential for debris and sediment transport (including scour and deposition) to affect the BFEs, then provide the following information along with the supporting documentation:

Sediment load associated with the base flood discharge: Volume _____ acre-feet

Debris load associated with the base flood discharge: Volume _____ acre-feet

Sediment transport rate _____ (percent concentration by volume)

lethod used to estimate sediment transport: _____

Most sediment transport formulas are intended for a range of hydraulic conditions and sediment sizes; attach a detailed explanation for using the selected method.

Method used to estimate scour and/or deposition: _____

Method used to revise hydraulic or hydrologic analysis (model) to account for sediment transport: _____

Please note that bulked flows are used to evaluate the performance of a structure during the base flood; however, FEMA does not map BFEs based on bulked flows.

If a sediment analysis has not been performed, an explanation as to why sediment transport (including scour and deposition) will not affect the BFEs or structures must be provided.

ON THE IMPACT OF QUARRY ACTIVITIES TO MUD CREEK, LEROY, NY

Paul L. Richards
Associate Professor of Hydrogeology
Dept. of Earth Science
The College at Brockport
Brockport, NY 14420
prichard@brockport.edu
(585) 260-2988

INTRODUCTION

Concerns have been raised on the impact that dewatering activities at the Dolomite Products Quarry in Leroy New York may have on the water quality and flow in Mud Creek. These questions stem from the close proximity of the quarry to the Lehigh Valley Railroad Spill of 1970, an EPA managed superfund site which is currently under review for mitigation. This report is an attempt to pool all available data together to address the merit of these concerns. Some of this data was collected by the author and his students over a period of several years. Additional data was collected by consultants working on the spill site, such as Dunn Geoscience (1992), Dunn Geoscience (1996) and John Swierkos, chief geologist of Dolomite Products. The report addresses the following questions raised by the NYS DEC in a letter dated November 17, 2012.

1) *Will the quarry activities impact the water balance of Mud Creek ?*

2) *Will the quarry activities impact the water table outside of the Dolomite Products property ?*

3) *Will the quarry activities impact the plume of the remediation efforts of the LVRR superfund site. ?*

It should be noted that while the author has supervised and written several hydrogeology studies of the site, he is independent from Dolomite Products and has no stake as to whether or not the quarry should proceed with its permit request. The author has not collected any new data and is making use of data that has been previously collected and published in the following theses and reports (Richards, 2007; Daniluk et al, 2008; Richards et al, 2010; Simmons, 2011; Richards et al, 2012). This report represents the author's expert opinion on what this information means in the context of these questions.

BACKGROUND

The quarry is located in the Onondaga FM, a known karstic limestone that is present as a narrow band all the way across NYS (**Fig. 1**); Goodman et al, 1994). The unique position of this FM at the base of the Alleghany plateau and its interception of northward flowing streams in

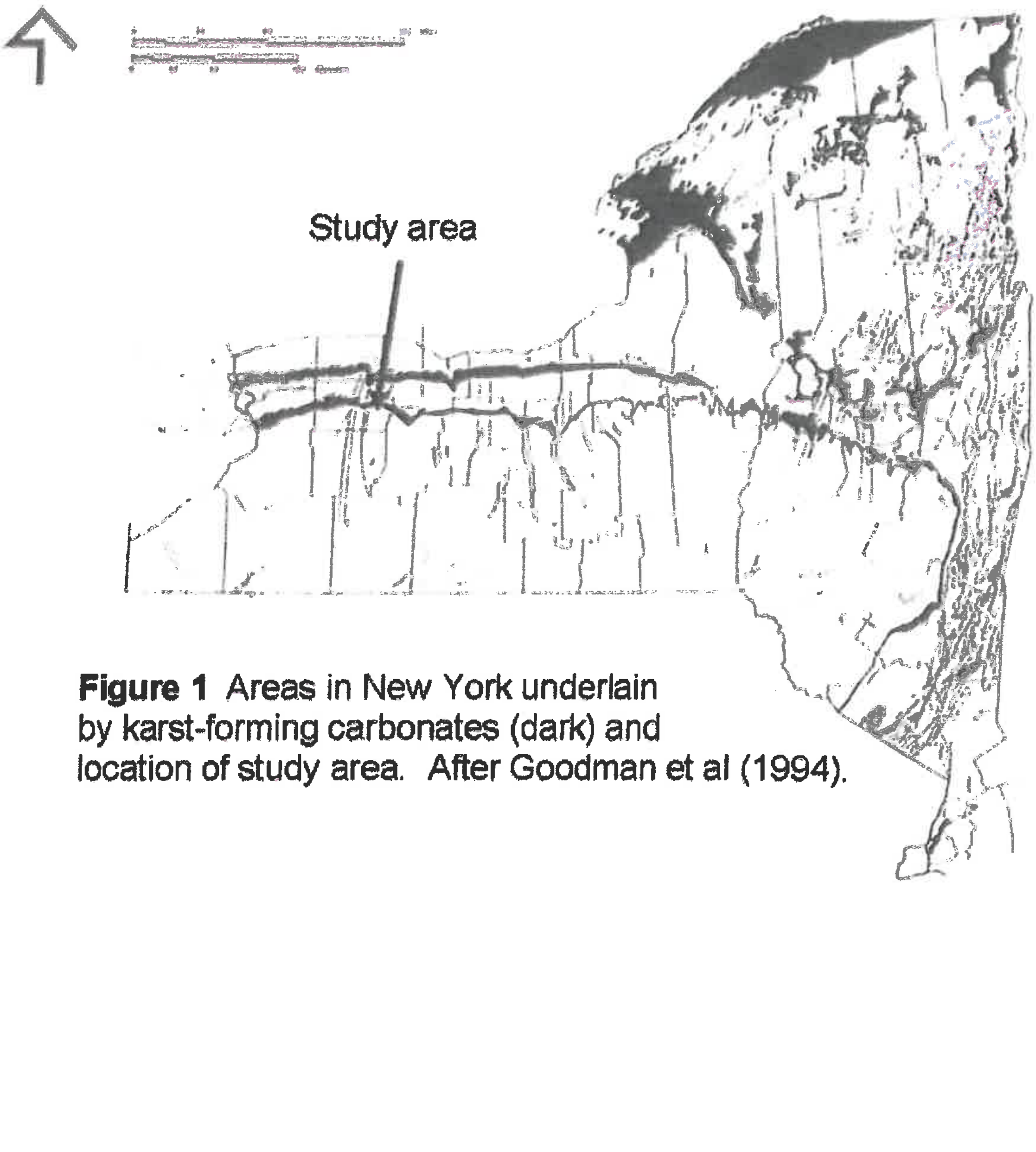
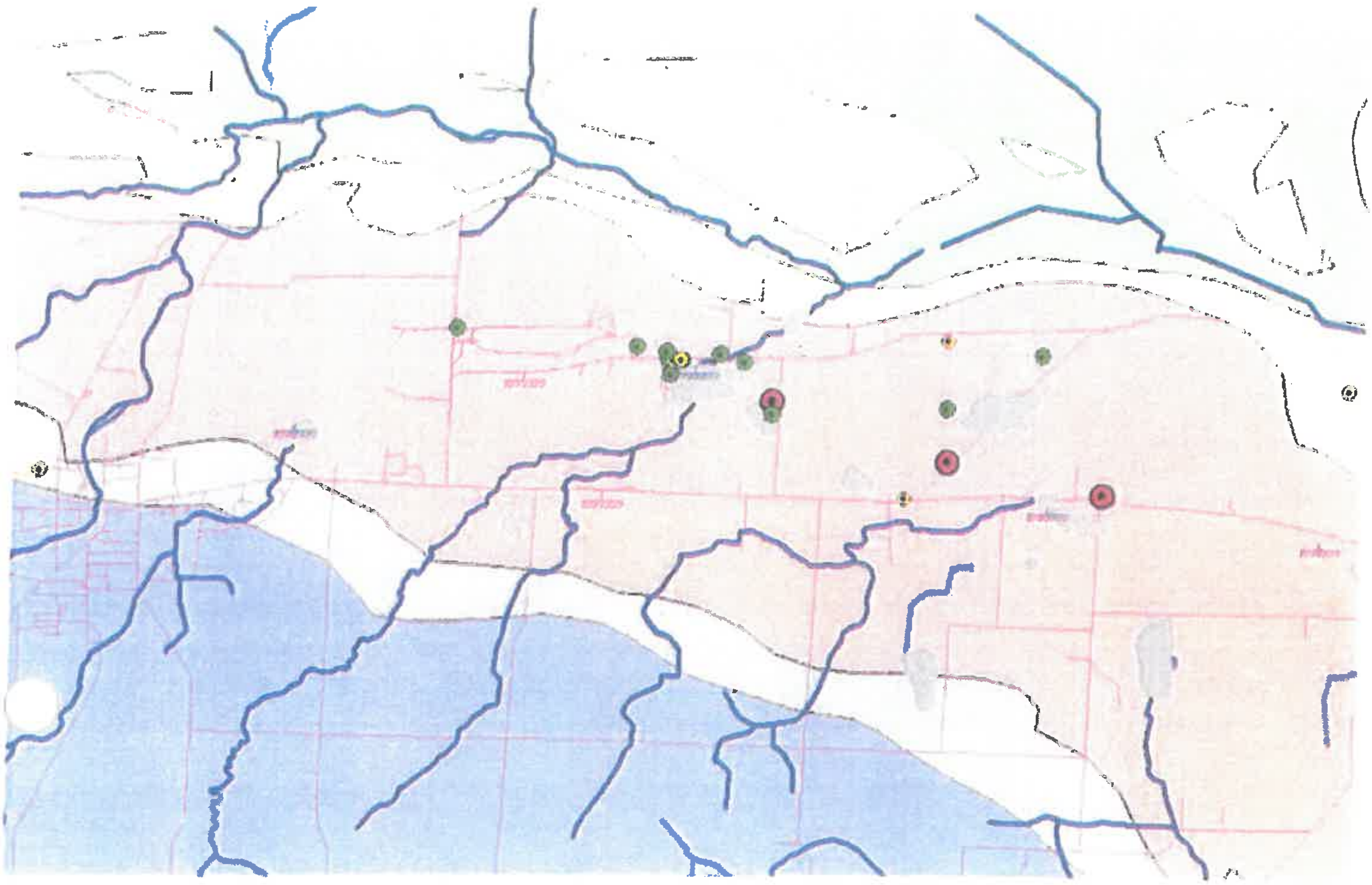


Figure 1 Areas in New York underlain by karst-forming carbonates (dark) and location of study area. After Goodman et al (1994).

western NY makes it important for regulating the flow of groundwater in the region. Highlands to the south provide extensive recharge areas and high water table gradients which causes this unit to intercept large groundwater fluxes seasonally. In the area between Leroy and Caledonia, glacial melt water stripped off much of the sediment overburden, leaving behind thin soils and large areas of exposed bedrock. This has made groundwater especially responsive to snowmelt events which is why many wells around the quarry have large seasonal extremes in water table height and are so responsive to meterologic events (**Fig. 2 and 3**). This mechanism also explains the karst related flooding that occurs in several sinkholes in the area including the Mud Creek sinkhole located just east of the Dolomite products quarry (Richards, 2007).

The groundwater flow direction is generally eastward towards Caledonia (**Fig.4**). This is much different than the flow path based on topographic contours and is supported by the following three observations. The first is that TCE concentration maps clearly show a plume leading from the spill site toward Spring Creek (Dunn Geoscience, 1992; 1996). The second line of evidence is the tight coupling in response between Well DC-5 and flow at Spring Creek (**Fig. 5**). Note how well the peaks in the water table match the flow peaks at Spring Creek. A comparison to the flow at USGS gage on Oatka Creek at Garbutt is much different (**Fig. 6**). This implies that spring creek is dominantly groundwater discharge. This is also supported by chemistry data that shows that groundwater from wells screened in the Akron Bertie and Camillus FM in are not significantly different than spring creek in terms of dissolved Ca, Sulfate and Mg (Simmons, 2011). Mackay spring, one of the major sources of spring creek water is located just below the basal Edgecliff and receives water from the Akron Bertie group. The third line of evidence is the high volume of flow that comes from Spring Creek (**Fig.7**). An analysis of average annual discharge to watershed ratios of eight nearby streams (including two gages on Oatka Creek, rural, mixed land use and one urban stream) suggests that their flow to watershed area range from 0.6 to 1.4 cfs / square mile of watershed area. Spring Creek is 12.4 cfs / square mile of watershed which is an outlier compared to these other streams. One way of explaining this anomaly is that spring creek picks up groundwater from outside the surface water divide from these sinkholes. A reanalysis of the flow data by adding in the catchment areas associated with Mud Creek, Gulf Creek and site 55 and 56 sinkholes (**Fig. 4**) reduces the discharge to area ratio to a level of 2.01 which is much more comparable to regional streams. Based on this information an eastward groundwater flow path lies underneath the Dolomite Products quarry. This means the quarry is located upgradient of the spill area and the plume moves away from the quarry.

A review of water level measurements taken by Dunn Geoscience (1996) in the mid 1990's suggests that vertical hydraulic gradients are dominantly downward through the Onondaga FM to the underlying Akron / Bertie group or Camillus FM. Some wells do have upward flow gradients from the Camillus FM to the Akron / Bertie Group. Based on voids and fractures observed in video logs and caliper data (Dunn Geoscience 1992, 1996), the general consensus is that the main flow path for water is through the Akron / Bertie group or Camillus



Water Level Range
0.1 - 2.1
2.1 - 6.5
6.5 - 12
12 - 36
36 - 56.3

Figure 2 Water table ranges for wells in the vicinity of The Dolomite Products quarry.

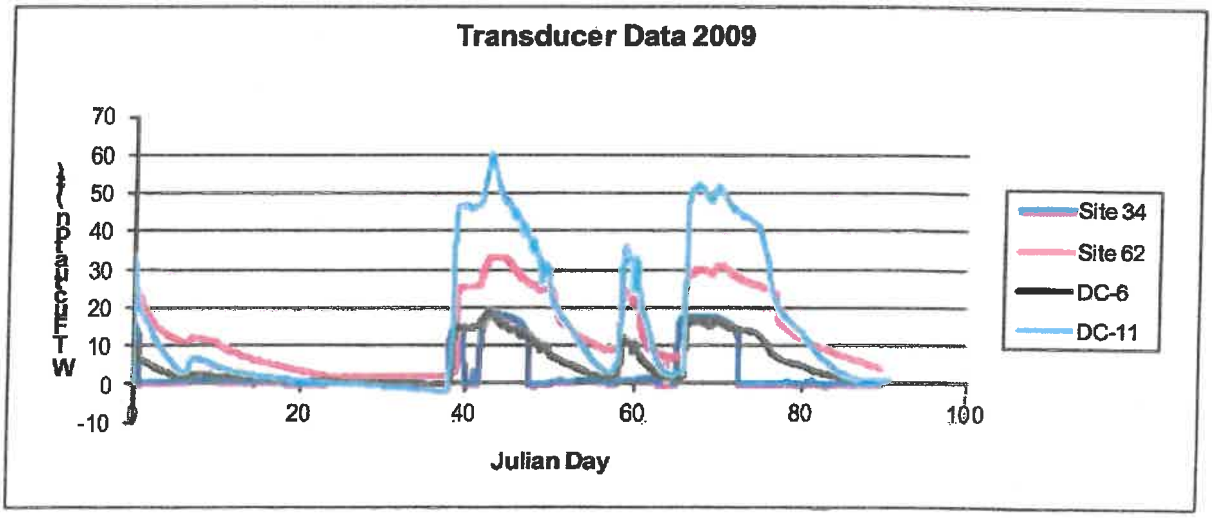


Fig. 3 Water levels in wells located close to the Dolomite Products Quarry. Note how responsive the water table is.

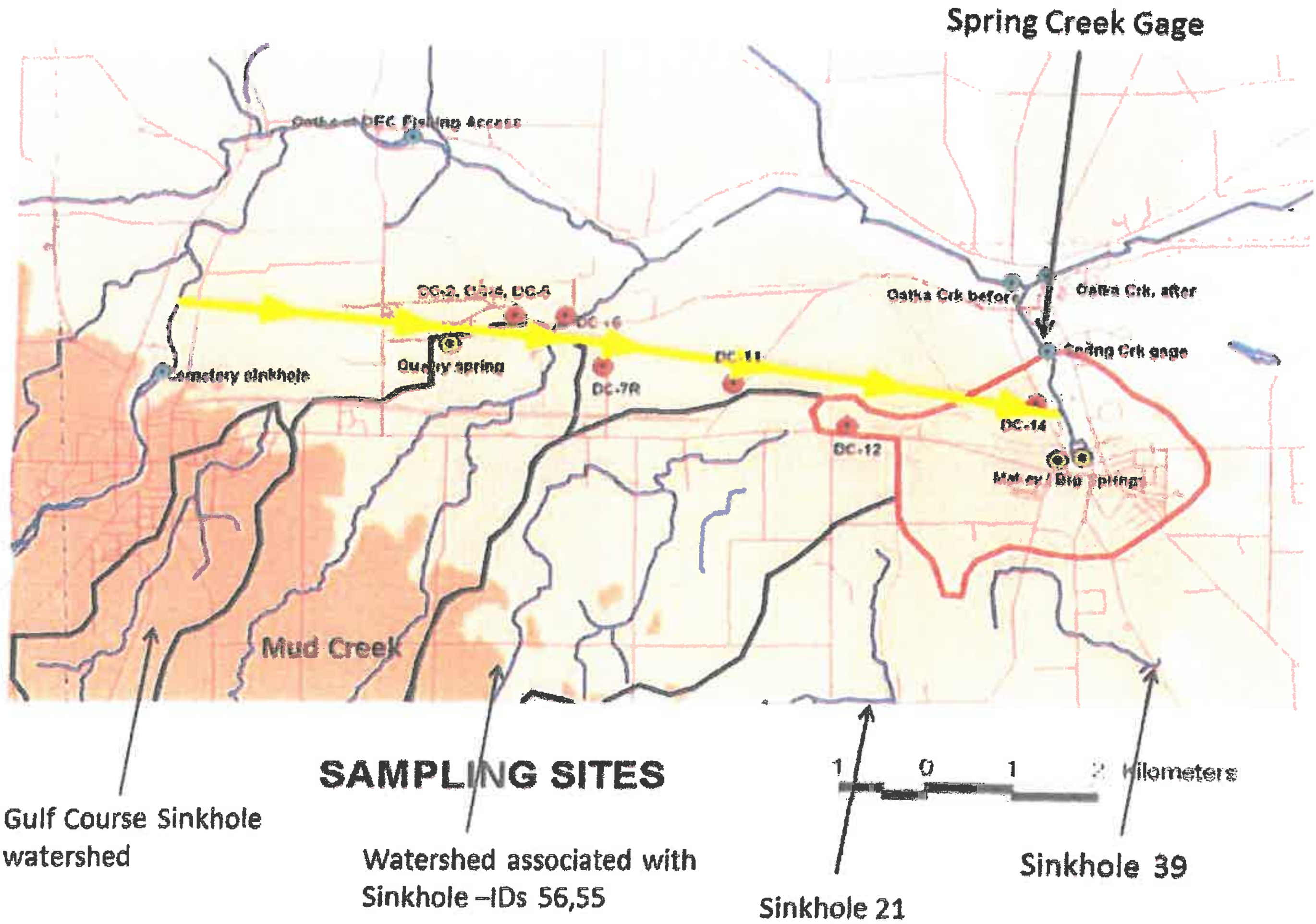


Fig. 4 Groundwater flowpath interpreted from plume data at the site. Dark lines are the catchments associated with major sinkholes. Mud Creek is believed to contribute to this flowpath except during periods of large events when a small portion of it flows directly to Oatka Creek at its outlet.

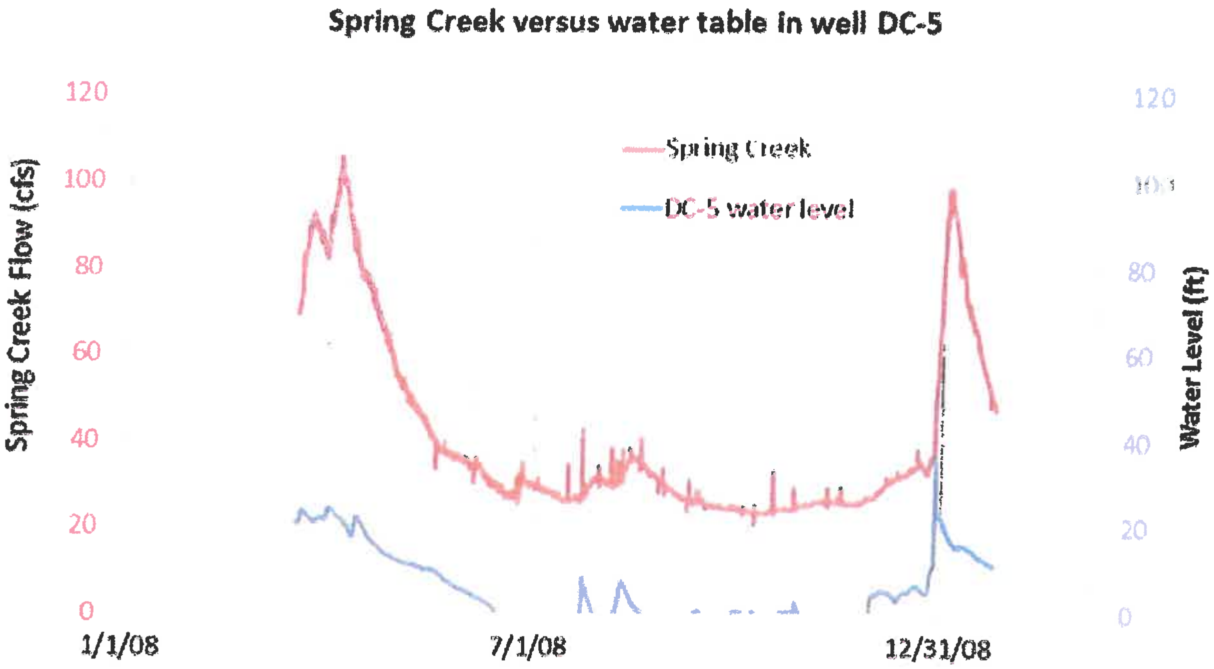
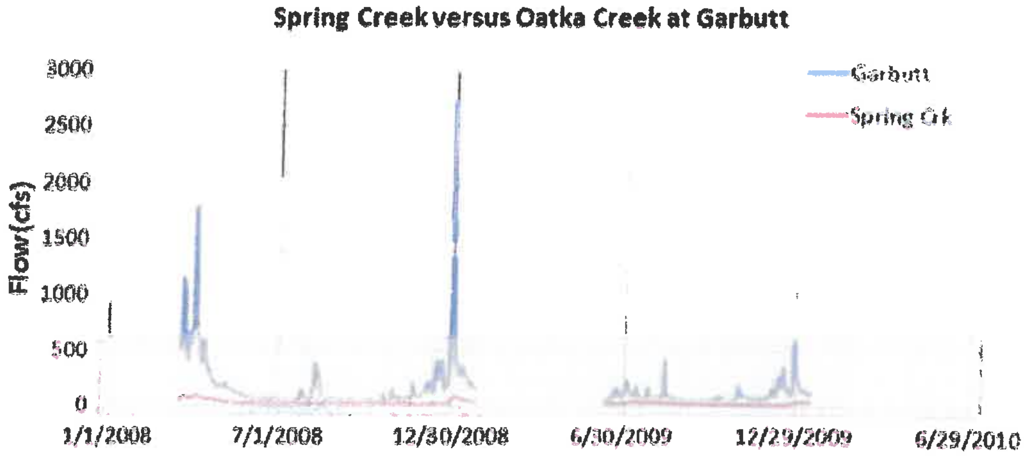


Fig. 5 Comparison of Spring Creek flow with the water table in DC-5 located just east of the quarry. Note how similar the curves are. Well DC-5 is located 5 miles west of Spring Creek and outside of its surface water divide.



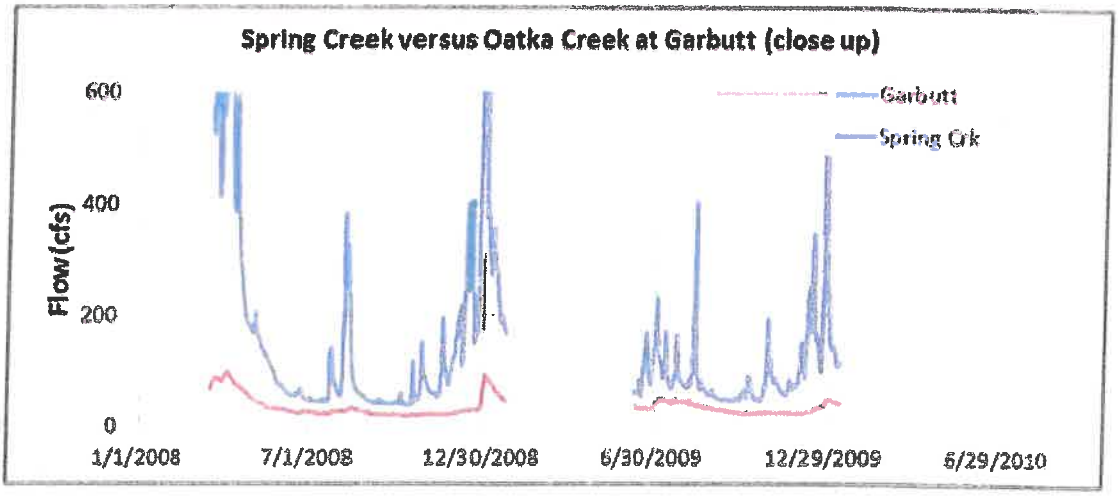


Fig. 6 Comparision of Spring Creek flow to the Oatka Creek at Garbutt. Spring creek does not respond to individual storm events and seems to be more comparable to changes In the groundwater table.

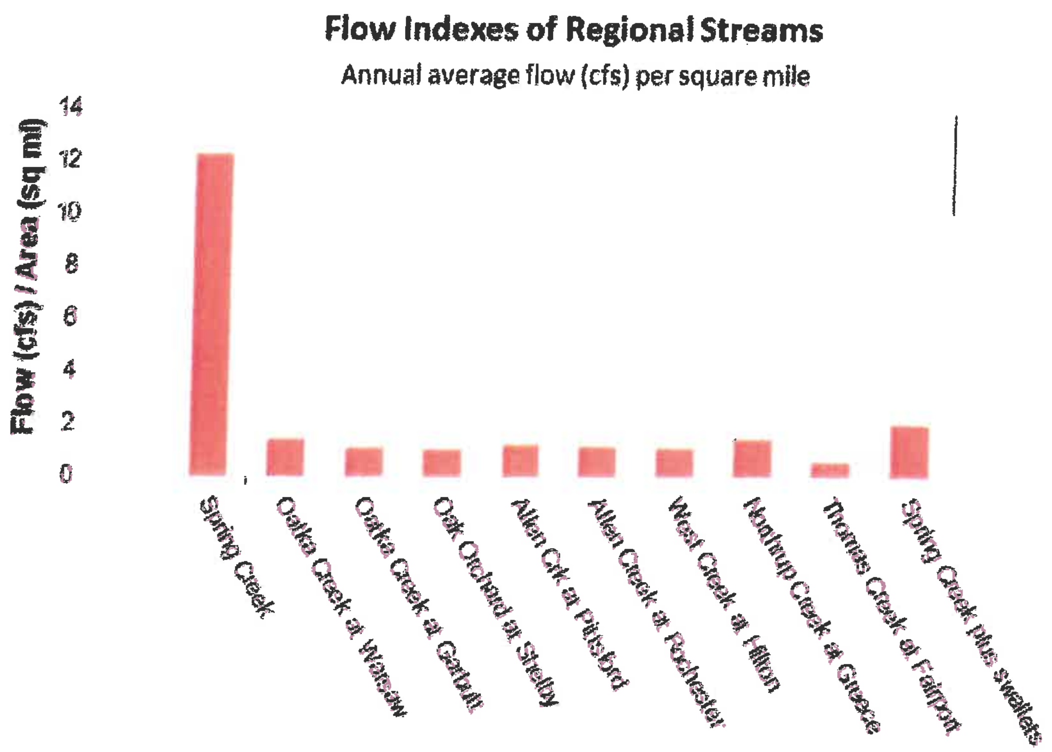


Fig. 7 Stream flow to area indexes associated with streams in the region. Spring Creek is clearly an outlier but when the watershed areas associated with sinkholes such as Mud Creek (last bar) the result is more comarible.

FM. Open fractures in the Akron / Bertie with water issuing forth in Mackey Spring in Caledonia constitute visual evidence for this.

Dewatering activities at the quarry are active primarily during the actual period of mining which takes place from March through October. However, if seasonal precipitation influxes are great, dewatering may also occur during the winter season (November through February). After the water is pumped from the ground, it passes through a suite of air strippers whose purpose is to strip off any volatile organic compounds. The water is then discharged into a bermed off area, where it re-infiltrates into the ground. The amount discharged will probably average 2000 gallons per minute however it could be as high as 2400 gal/min.

Question 1

A water balance study of Mud creek was conducted between 2008 and 2009 to understand how much enters the Mud Creek sinkhole and to determine if Mud Creek is a significant contributor of flow to Oatka Creek (Richards et al, 2012). A transducer was also installed within the Mud Creek sinkhole to evaluate the role that the water table has in controlling how much water passes downstream of the Mud Creek sinkhole. **Table 1** presents discharge data collected before and after the Mud Creek sinkhole. Mud Creek splits just north of Rte 5 so the total upstream flow of Mud Creek has to be estimated by summing the discharge from the west tributary and the east tributary (**Fig. 8a**). This is likely an underestimate because this sum does not include runoff from the Leroy Airport. It should be noted that the Dolomite Products quarry was not discharging during these years. The data suggest that Mud Creek is a losing stream and is only able to convey flow at very high transducer stages (greater than 90 cm). Even at high discharges (22.1 cfs), more than 50% of the flow is lost to the creek bed. Where this loss occurs is not known, however, there is at least one additional sinkhole in Mud Creek between Rte 5 and Gulf Rd (**Figs. 8b,c**). Observations support the existence of a set of open fractures capable of transporting a significant amount of water below the bed of the creek. For example, on 4/24 the water level had dropped below the base of the railroad tunnel implying that water is moving through bedrock below the foundation of the tunnel. This railroad tunnel is located downstream of the quarry discharge site and due east of the property. By 5/8 Mud Creek had dried up upstream of the railroad tunnel implying water is being lost before the railroad tunnel. Still water was present in the base of the sinkhole downstream of the railroad tunnel.

Table 1

Discharge measurements before and after the mud creek sinkhole

Date	Mud Creek West	East	Downstream	Difference Cfs	Loss to groundwater (%)	Transducer cm
2/28/2008	12.7	2.6				
3/6/2008	6.8	0	5.67	1.1	16.6	91.1
3/27/2008	41.7	3.85	22.1	23.5	51.5	118.6
4/3/2008	26.5	2.2	11.7	17.0	59.2	103.9

4/11/2008	11.73	3.72	0	15.5	100	45.7
4/24/2008	2.0	0.4	0	2.4	100	21.3
5/8/2008	2.1	0.6	0	2.7	100	below*

Inspection of the transducer data shows numerous discrete instances of positive low measurements that occurred during times that rainfall was not present and Mud Creek was not flowing. These values, when adjusted to 2008 transducer datum, create false positives that are interpreted to be noise from the transducer. They have been removed from the dataset (**Fig. 9**). If one assumes a transducer depth of 90 cm is required for the existence of flow that makes it to Oatka Creek, then 100% of the flow from Mud Creek is lost to the Onondaga FM during the late spring, summer, and early fall. This is supported by the absence of flow at the downstream site taken throughout 2008 and 2009 (**Table 2**). Only occasionally during early spring does Mud Creek have an active surface flow past the Mud Creek Sinkhole. This occurs when water tables in the Onondaga FM are high and karst-related flooding is activated.

A key question that needs to be addressed is the fate of the water after it enters the sinkhole. There are two possibilities. One possibility is that the water joins the regional groundwater flow path eastward toward the springs of Caledonia. The other possibility is that it flows through open voids and fractures underneath the creek bed along the creek's corridor directly to Oatka Creek. Dunn Geoscience (1996) report that springs are active in the Mud Creek gorge downstream of the Mud Creek sinkhole all year long, but did not measure the discharge. So it is unclear how significant this flow is. We can assess this question in two ways with our data. First, we can simply look at the discharge of Mud Creek at the outlet. Second, we can analyze the flow in Oatka Creek before and after the Mud Creek outlet to see if there is an increase. **Table 3** shows flow measurements taken at the outlet of Mud Creek during 2008 and 2009. Flows are all less than one cfs except for a measurement of 5 cfs taken on 3/25/2009. This input did not appear to be significant to Oatka creek as the flow measured downstream of the outlet was smaller than the flow measured upstream of it (**Table 4**). The 3/25 event coincided with the recession of two high water table events occurring in late February and early march 2009 in wells DC-7R, DC-12 . and DC-10. Flow measurements taken in Oatka Creek before and after the Mud Creek outlet reinforce the observations taken at the outlet (**Table 4**). Based on this information the contribution of Mud Creek to Oatka Creek is negligible except possibly during high water tables coinciding with karst flooding events. This implies that the bulk of flow of Mud Creek moves to Spring Creek in Caledonia via open fractures through the subsurface.

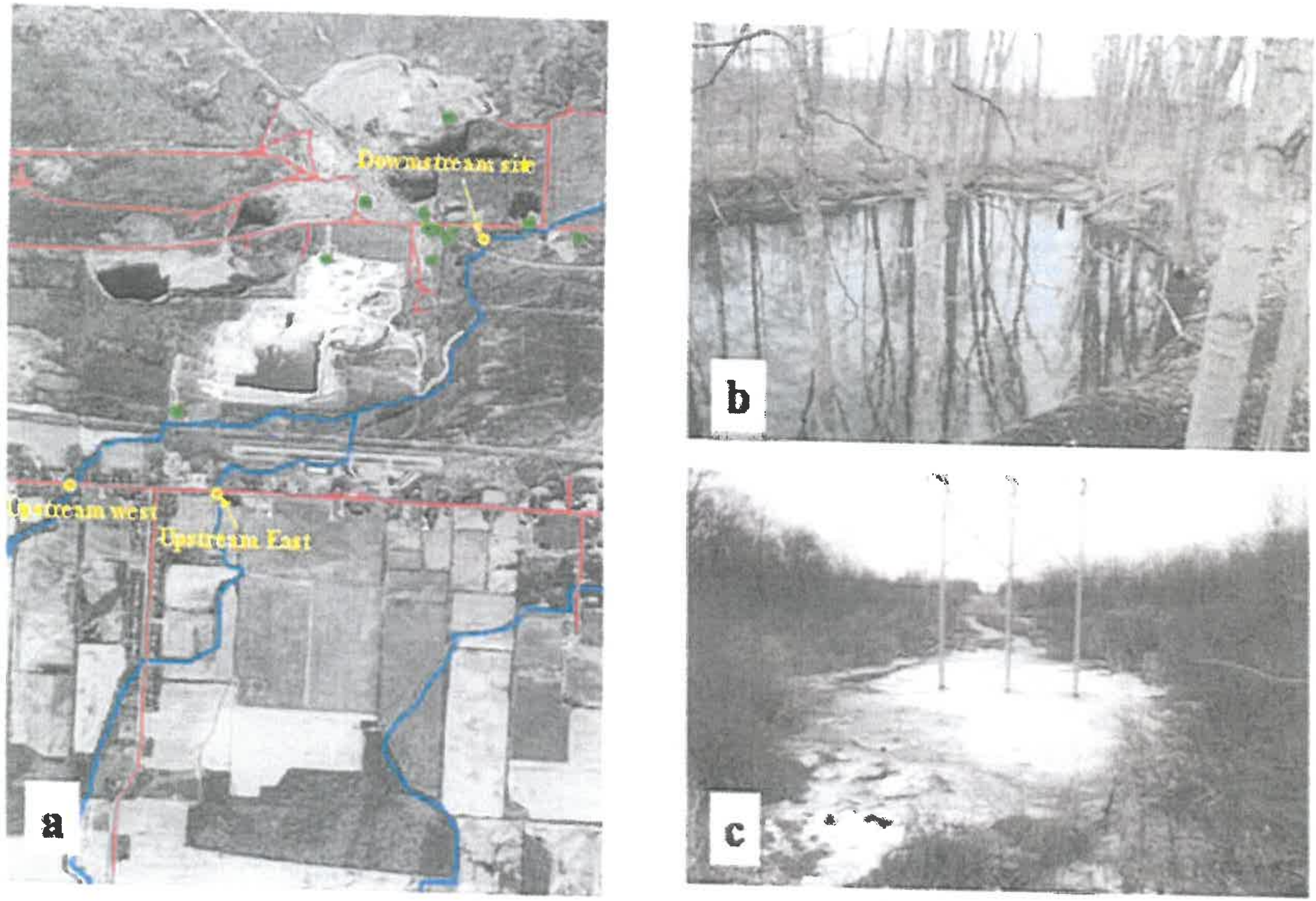


Fig. 8 a) Location of flow measurements taken in the Mud Creek water balance study. B-C) Mud creek sinkhole where much of the flow of Mud Creek disappears .

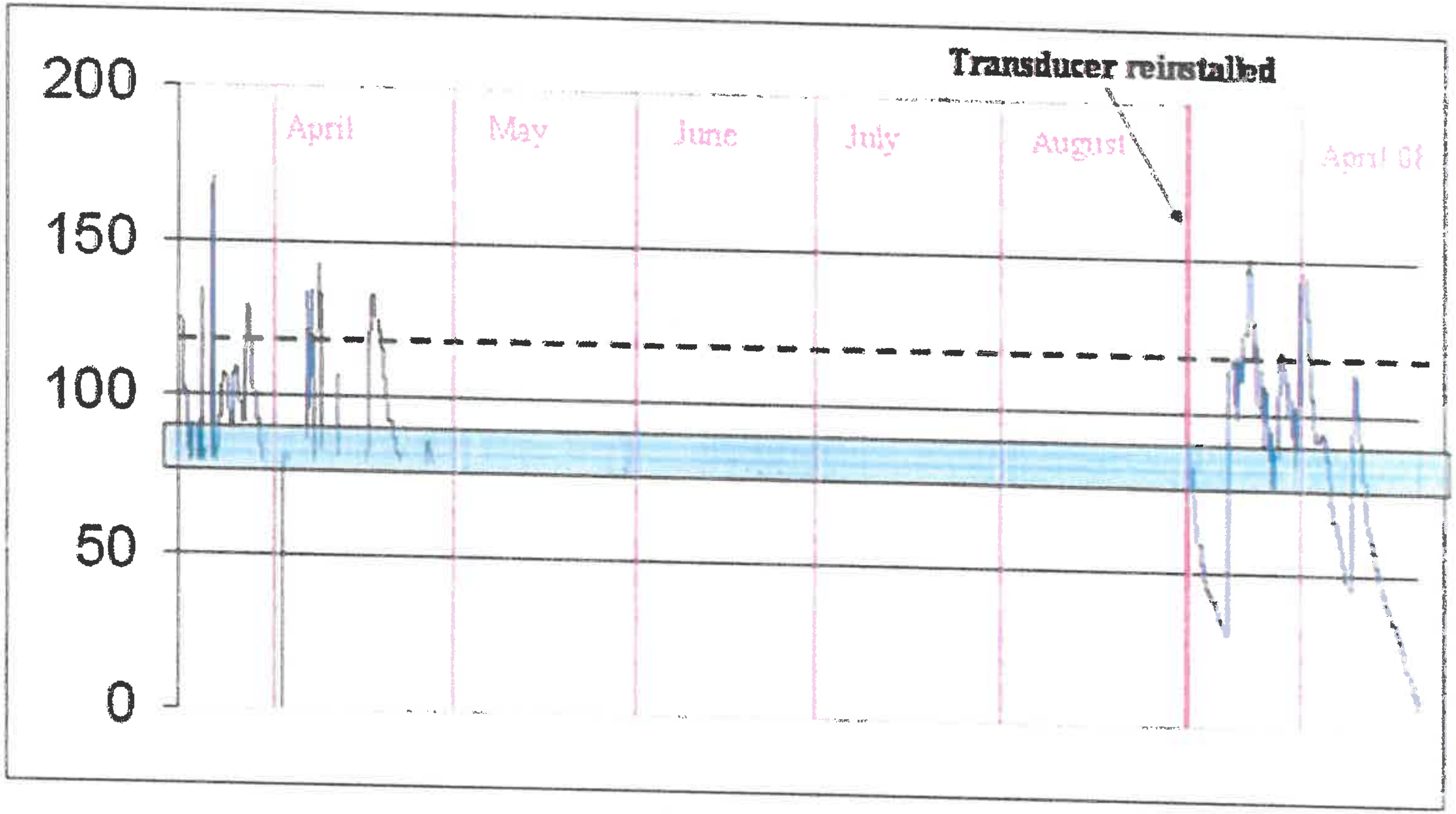


Fig. 9 Transducer collected since March 2007. Water level was below transducer from May 2007 to September 2007. Transducer was removed and reinstalled on March 6 2008 at a lower elevation (thick Pink line). All transducer data has been adjusted to the 2008 transducer datum to be internally consistant. Within the blue shaded region is a critical water level threshold when all discharge becomes lost to groundwater. Our limited discharge data suggests that Mud Creek loses 50% or more stream water even at high water levels (120 cm, dashed line).

Table 2

Discharge measurements after mud creek sinkhole taken at Gulf Rd.

Date	Flow (cfs)
4/11/2008	0.0
4/17/2008	0.0
4/24/2008	0.0
5/8/2008	0.0
5/15/2008	0.0
7/17/2008	0.0
7/28/2008	0.0
8/4/2008	0.0
8/26/2008	0.0
9/9/2008	0.0
9/20/2008	0.0
10/28/2008	0.0
11/4/2008	0.0
11/11/2008	0.0
12/2/2008	0.0
12/9/2008	0.0
2/17/2009	0.0
03/01/09	0.0
6/15/2009	0.0
6/22/2009	0.0
7/14/2009	0.0
7/20/2009	0.0

Table 3

Discharge measurements at the Mud Creek Outlet.

Date	Flow (cfs)
9/9/2008	0.14
9/20/2008	0.01
10/28/2008	0.82
11/4/2008	0.78
11/11/2008	0.90
12/2/2008	1.08
12/9/2008	0.55
3/25/2009	5.06
6/9/2009	0.70
6/15/2009	0.81
6/22/2009	0.50
7/14/2009	0.84
7/20/2009	0.99

Table 4

Discharge measurements taken at Oatka Creek before and after the Mud Creek outlet. Increases in flow not accounted for by Mud Creek inputs must be caused by springs that are numerous along the southern bank of Oatka.

Date	Oatka Creek before (cfs)	Oatka Creek after (cfs)	Mud Creek input (cfs)	Difference (cfs)
6/20/2008	21.5			
7/17/2008	9.9	11.4	0.78	+1.5
7/28/2008	33.6	30.2	0.0	-3.4
8/4/2008	9.6	9.5	0.0	-0.1
8/26/2008	11.2	10.6	0.0	-0.6
9/9/2008	8.6	7.0	0.14	-1.6
9/20/2008	7.3	7.3	0.01	0.0
10/28/2008	73.4	58.1	0.82	-15.3
11/4/2008	29.5	31.6	0.78	+1.1
11/11/2008	18.0	26.0	0.90	+8.0
12/2/2008	138.2	155.2	1.08	+17
12/9/2008	84.3	82.0	0.55	-2.3
2/22/2009	211.9	Inaccessible	Inaccessible	
3/25/2009	162.8	155.3	5.06	-7.5
6/9/2009	22.1	21.9	0.70	-0.2
6/15/2009	18.2	21.3	0.81	+3.1
6/22/2009	143.5	135.1	0.50	-8.4
7/14/2009	74.3	89.4	0.84	+15.1
7/20/2009	14.2	17.2	0.99	+3.0

The current maximum discharge rate for the Dolomite quarry is 2000 gal/min which is equivalent to 4.5 cfs. If we assume this type of outflow was taking place when the Mud Creek data was collected 2008 and 2009 (probably a conservative overestimate), it reinforces the interpretation that outflow from the quarry will not impact the flow in Mud Creek downstream of the Mud Creek sinkhole. The proposed permit could increase the flow from the quarry to 2400 gal /min, which increases the discharge in Mud Creek by only 1.8 cfs. This will likely occur during periods of high water tables when dewatering is necessary, which coincides when natural flows to Mud Creek are high anyway. Based on this information it seems likely that additional discharge from the quarry will not significantly impact the balance of flow in Mud Creek. Furthermore it suggests that most of the flow in mud creek will enter the mud creek sinkhole and rejoin the plume.

Question 2

Question 2 is being addressed by the accompanied document prepared by Continental Placers.

Question 3

It seems likely that the cone of depression from the dewatering will pick up some of the TCE from the spill site. Analyses of samples taken from the sump of the Dolomite Products quarry which show TCE concentrations as high as 74ppb confirm this. The result will be to move water to the pond where it will eventually be discharged back into Mud Creek upstream of the Mud Creek sinkhole. From there it will enter fractures in the base of mud creek and mud creek sinkhole and reenter the plume. Based on our previous analysis of Mud creek discharge and data before and after the sinkhole, only in the highest storm events will this water flow past the sinkhole to its outlet in Oatka Creek. This will only occur during periods of karst-related flooding from January to April when seasonally high water tables coincide with snowmelt events. This period coincides with the period when mining is not occurring and when dewatering activities are minimal. Thus it is likely that most of the pumped groundwater will go back into the aquifer with little, if any, flowing as surface water downstream of the Mud Creek sinkhole.

The installed air strippers will remediate some of the TCE brought through the diffusion of TCE into the air. This works because TCE is volatile and has a high henry's law constant. The vapor then reacts photolytically in the air to produce hydroxyl radicals which disperse in the atmosphere. Air strippers are an accepted and commonly used process for remediating TCE and VOCs in surface waters (Nyer, 1992; Russell et al, 2002). Sampling indicates that the TCE of water after the treatment of the strippers is at detection limit in TCE or below. It should be noted that this level (2ppb) is the smallest value possible by the analytical laboratory that ran the analysis. The actual value may be lower. A previous study by Chapman et al (2007) demonstrated that a pond intersecting a TCE plume significantly reduced the concentration on VOCs and TCEs. Their conclusion was that any type groundwater / surface water interaction enhances the natural degradation of TCE because it allows the TCE to diffuse in the air. Any groundwater recirculation by the quarry will thus improve the water quality of the groundwater before it enters Mud Creek.

Although it is rare that mud creek flows past the sinkhole, it is worth considering what will take place if it does. During a high flow event in March 2012, when Mud Creek was flowing downstream of the sinkhole, a flow measurement was taken at the entrance of the railroad tunnel. The maximum allowable discharge from the quarry is 2400 gal/min which is approximately 6.2 cfs. The measured flow of mud creek during this event was over 200 cfs. This implies that a large amount of dilution (0.031) takes place during these events. Quarry discharge at 74ppb TCE, the highest ever recorded by Dolomite Products, would be diluted to 2.3 ppb which is below the drinking water standard. Two things should be pointed out in this analysis however, the dilution factor will change during events (it can be smaller and greater depending on the total flow), and that 74ppb concentration is a overestimate. According to Dunn Geoscience (1996) there is some leakage of water from the spill site to springs located in the Mud Creek gorge downstream of Gulf Rd. The volume of this flow is not significant as indicated by the mud creek flow measurements made at the outlet (Table 1). It does contain some TCE, however. Surface samples taken at the Pond at the Dentrif residence, which collect the water from these springs, suggest that the concentration at the upstream edge of the pond is 76 ppb. The downstream edge of the pond in this round of sampling had a value of 2ppb. This reduction of TCE is not surprising given the propensity of TCE to diffuse into the atmosphere in surface waters (Chapman et al, 2007).

The state of the plume has not been conclusively determined yet, although the EPA is researching this through their ongoing Groundwater Remediation Investigation. As a consequence I can only speculate on this question based on the reports of Dunn, 1992 and 1996. The report by Dunn et al (1996) speculated that the plume had reached "some degree of equilibrium"; see page 5-4 in chapter 5. They speculated this based on the long period of time since the spill took place (24 years). As this report is almost 17 years old, the elapsed period is now 41 years. Dunn observed that domestic well sampling along Spring Creek was determined to be consistent in concentration during their period of monitoring. They interpreted this to be due to the distance from the spill and the "equilibrium" that has been established in the period since the spill took place. Sampling being conducted by the EPA will either support or refute this. Concentration iso-contour maps clearly show the plume moving toward the east which is away from the quarry. Utilizing head measurements from wells, Dunn (1996) suggests that groundwater flow direction appears to change direction between the low water level period and high water level period. Flow is generally southeast during the low water level period and northeast during the high water level period. In both situations, flow is away from the Dolomite Products Quarry. Dunn (1996) speculated that dewatering activities from the Dolomite Products quarry may elongate the shape of the plume to the southwest (see Fig 7-1 in their report); however as has already been discussed, the groundwater will be remediated by virtue of the air strippers and air-water exchange in the sump pond.

Currently no decision has been made yet as to what type of remediation will take place at the site. The EPA's Groundwater Remediation study of the site is slated to be finalized by spring 2013. A feasibility study of what types of remediation activities should be taken is scheduled to be completed by Fall, 2013. Only after these reports are completed, can the EPA present the information to the public and propose a preferred remedial course of action. There will then be a period open to public comment after which the EPA will render a final decision as to what remedial activities will be. It is thus not possible to determine the impact that the quarries dewatering activities will have on remediation activities. It is also not possible to determine when this decision will take place. Given the quarry is located up gradient of the spill site, and that any plume water recirculated by dewatering activities will undergo water quality improvement by reducing TCE and VOC concentration, the quarries activities will likely provide effective remediation at the spill site.

REFERENCES CITED

Chapman, S.W., Parker, B.L., Cherry, J.A., Aravena, R., Hunkeler, D. (2007) Groundwater–surface water interaction and its role on TCE groundwater plume attenuation, *Journal of Contaminant Hydrology* **91(3-4)**, 203-232.

Daniluk, T. L., Libby, J. L., Richards, P.L., Craft, J.H., and Noll,M. (2008) *Seasonal Water Table Variations in the Onondaga FM, Western NY*, 2008 Annual Meeting, GSA, Houston, TX, oral presentation. This talk was also presented at the 2008 Annual Conference of the Finger lakes Institute.

Dunn Geo. Eng. (1992) Task 2, Phase A Report State Superfund Standby Program Lehigh Valley Railroad Derailment Site RI/FS, Town of Leroy County of Genesee, New York, published by Dunn Geoscience Engineering Co., P.C. Albany, NY 12205 80pp.

Dunn Geo. Eng. (1996) Hydrogeologic Investigation and Fish and Wildlife Impact Analysis of the Lehigh Valley Railroad Derailment Site, Town of Leroy, published by Dunn Geoscience Engineering Co., P.C. Albany, NY 12205

Goodman, W.M., Cole, R.B., Lehmann, D.F. (1994) The Hydrogeology of Landfill Sites in Western, New York in EDS Brett, C.E. And Scatterday, J. Fieldtrip Guidebook New York State Geological Association 66th Annual Meeting. 5-85.

Kappel, W.M. and Miller, T.S. (1996) Geology, Hydrology and Ground-Water Flow near the Akron Municipal well, Erie County, New York, *USGS Water-Resources Investigation Report* 96-4193, 22pp.

Nyer, E.K. and Morello, B. (1993) Trichloroethylene Treatment and Remediation, *Groundwater Management Review*, Spring, 1993, 98-103.

Richards, P.L. (2007) Karst Related Flooding between Leroy and Caledonia, 2007 Annual conference of the Finger Lakes Institute, p32-35.

Richards, P.L., Libby, J. L., Kuhl, A., Daniluk, T., Lyzwa, M. (2010) Prediction of Areas Sensitive to Fertilizer in Thinly-soiled Karst, FINAL REPORT , New York State Water Resources Institute http://wri.eas.cornell.edu/grants.html 29pp.

Richards, P.L., Daniluk, T. and Libby, J. (2012) Water Balance at Mud Creek and Mud Creek Outlet, Unpublished paper prepared for the Oatka Creek Watershed Committee 6 pp.

Russell, H.H., Mathews, J.E. and Sewell, G.W. (1992) TCE Removal from contaminated soil and groundwater, EPA/540/S-92/002, 10pp.

Simmons, A. (2011) *Source of water for Spring Creek Caledonia, New York*, Undergraduate Thesis, The College at Brockport, Brockport, NY, 24pp.

Staubitz, W.W. And Miller, T.S. (1987) Geology and Hydrology of the Onondaga Aquifer in Eastern Erie County, New York, with emphasis on Ground-water-level declines since 1982, *USGS Water-Resources Investigation Report* 86-4317 44pp.

MILONE & MACBROOM

MEMORANDUM

TO:	FEMA Region 2
FROM:	MMI
RE:	20-02-1048R Mud Creek CLOMR: ESA Compliance
DATE:	September 10, 2020
MMI #:	6924-01

Per the attached documentation, there are no threatened, endangered, or candidate species listed within the proposed project area. Therefore, no "take" of threatened or endangered species will occur as a result of the proposed project. No threatened or endangered species located within the county will be harassed, harmed, pursued, hunted, shot, wounded, killed, trapped, captured, or collected, nor will any attempts be made to engage in such conduct.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New York Ecological Services Field Office
3817 Luker Road
Cortland, NY 13045-9385
Phone: (607) 753-9334 Fax: (607) 753-9699
http://www.fws.gov/northeast/nyfo/es/section7.htm

In Reply Refer To: January 15, 2020
Consultation Code: 05E1NY00-2020-SLI-1256
Event Code: 05E1NY00-2020-E-03939
Project Name: Mud Creek Conditional Letter of Map Revision - LeRoy, NY

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). This list can also be used to determine whether listed species may be present for projects without federal agency involvement. New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list.

Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the ESA, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC site at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list. If listed, proposed, or candidate species were identified as potentially occurring in the project area, coordination with our office is encouraged. Information on the steps involved with assessing potential impacts from projects can be found at: http://www.fws.gov/northeast/nyfo/es/section7.htm

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/

eagle_guidance.html). Additionally, wind energy projects should follow the Services wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the ESA. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New York Ecological Services Field Office
3817 Luker Road
Cortland, NY 13045-9385
(607) 753-9334

Project Summary

Consultation Code: 05E1NY00-2020-SLI-1256

Event Code: 05E1NY00-2020-E-03939

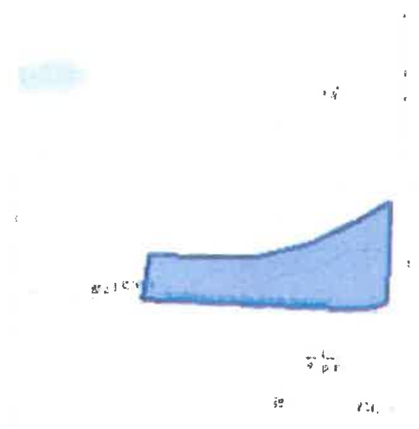
Project Name: Mud Creek Conditional Letter of Map Revision - LeRoy, NY

Project Type: STREAM / WATERBODY / CANALS / LEVEES / DIKES

Project Description: The Dolomite Products Company, Inc., is proposing to relocate approximately 2,500 linear feet of Mud Creek to facilitate expansion of the quarried area. Dolomite Products, Inc., proposes to relocate Mud Creek to a linear path along active and abandoned railroad grades that border the southern and eastern boundaries of the quarry, respectively. A 6 to 10 foot high berm is proposed along approximately 3,000 feet of the left bank of the stream to prevent spillover of floodwaters into the proposed quarry expansion area to the north. The berm will tie in to high elevations at its up- and downstream extents.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/42.9836783612176N77.93588817001316W



Counties: Genesee, NY

Endangered Species Act Species

There is a total of 0 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

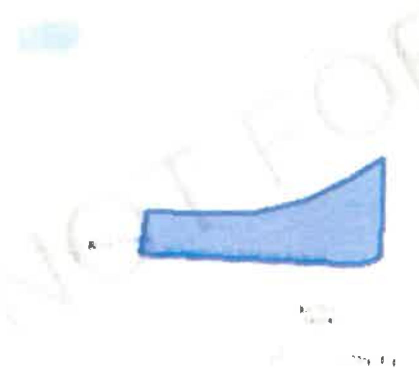
IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Genesee County, New York



Local office

New York Ecological Services Field Office

📞 (607) 753-9334
📠 (607) 753-9699

3817 Luker Road
Cortland, NY 13045-9385

http://www.fws.gov/northeast/nyfo/es/section7.htm

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

THERE ARE NO ENDANGERED SPECIES EXPECTED TO OCCUR AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS

A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

Bobolink Dolichonyx oryzivorus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31
Golden-winged Warbler Vermivora chrysoptera This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8745	Breeds May 1 to Jul 20
Snowy Owl Bubo scandiacus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Wood Thrush Hylocichla mustelina This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence ( )

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

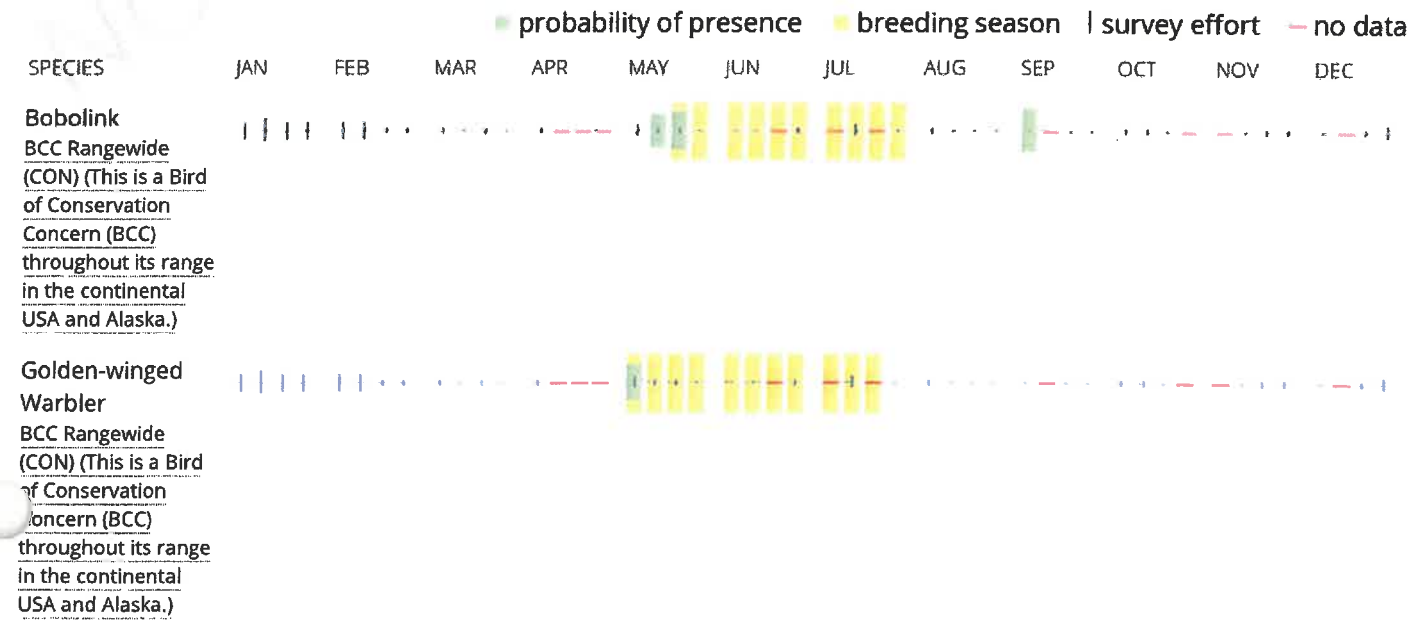
Breeding Season ( )
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (I)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

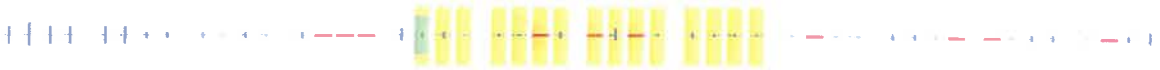
No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Snowy Owl
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Wood Thrush
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

RIVERINE

R5UBH

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged ıquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

MILONE & MACBROOM

MEMORANDUM

TO: FEMA Region II
FROM: Milone & MacBroom, Inc. on behalf of Dolomite Products, Inc.
RE: Narrative – Mud Creek CLOMR; Town of Le Roy, Genesee County, NY (360280)
DATE: January 22, 2020
MMI #: 6924-01

Introduction

Sheet 1: Overview, and Sheet 2: Layout present the features described or mentioned in this Introduction.

The Dolomite Products Company, Inc., is proposing to relocate approximately 2,500 linear feet of Mud Creek to facilitate expansion of the quarried area. The floodplain along Mud Creek has been mapped as a Zone A SFHA by approximate methods, with no floodway. The effective FIS for the Village of Le Roy, Genesee County, New York, is dated February 3, 1981. The relevant reach of Mud Creek is mapped on FIRM Panel 360280 0004 B, with an effective date of September 14, 1979. Mud Creek is mislabeled as "Mad Creek" on this product. This FIRM is not available digitally from FEMA, and was geolocated based on control points at six surrounding road/road and road/rail intersections.

The quarry is located on a 210 acre property at 8250 Gulf Rd., Le Roy, NY.

Dolomite Products, Inc., proposes to relocate Mud Creek to a linear path along active and abandoned railroad grades that border the southern and eastern boundaries of the quarry, respectively. A 6 to 10 foot high berm is proposed along approximately 3,000 feet of the left bank of the stream to prevent spillover of floodwaters into the proposed quarry expansion area to the north. The berm will tie in to high elevations at its up- and downstream extents. This will not be a certified levee.

Failure of this berm would flood only the applicant's undeveloped property and the quarry pit, which is frequently inundated due to groundwater seepage; there are no structures and equipment is not stored on the quarry floor (except what is associated with dewatering). In its present state, the quarry has approximately 2,700 acre-feet of volume available for floodwater storage; this is more than the entire volume of the estimated 24-hour, 100-year precipitation event in the contributing watershed estimated by NOAA's Atlas 14: Precipitation Frequency Data Server (2,400 acre-feet). Removal of additional overburden and reserves is expected to increase this ad hoc storage capacity. It is therefore concluded that berm failure may potentially impact only the applicant's property.

Mud Creek flows into a depression within the Dolomite Products property, where water often ponds and slowly infiltrates into the karst limestone bedrock. The streambed thalweg elevation is 3.5 feet lower in this area than at a grade control approximately 500 feet downstream, out of the proposed project area. The backwater from this downstream high point is the primary control of upstream flood depths, and the channel and overbank geometry within the proposed relocation project area are inconsequential to water surface elevations so long as conveyance is not reduced.

Immediately south of the proposed channel relocation, three parallel railroad grades run east-to-west; these were formerly the Baltimore & Ohio (B&O), New York Central, and Erie Railroads, listed from north to south. Only the northernmost railway, the B&O, now owned and operated by the Rochester & Southern Railroad (RSR), remains active. This track is approximately 2 to 3 feet higher in elevation than the derelict grades. The Le Roy airport runway is also oriented east-west, south of the three rail grades. Just east of the Dolomite Products quarry, a short, abandoned rail spur runs north-south, and once connected the old B&O rail to the now-defunct Lehigh Valley Railroad, which ran along the north side of the quarry. The old connector spur crosses Mud Creek as it exits the Dolomite Products property, although there is no longer a bridge span here.

Documentation of compliance with Section 7(a)(2) of the Endangered Species Act is included with this submission.

The Town of Le Roy has adopted a local Flood Damage Prevention Law as Local Law No. 2 of 1998. Relevant sections are reproduced below:

4. 3 Application for a Permit

(5) A description of the extent to which any watercourse will be altered or relocated as a result of the proposed development. Computations by a licensed professional engineer must be submitted that demonstrate that the altered or relocated segment will provide equal or greater conveyance than the original stream segment. The applicant must submit any maps, computations or other material required by the Federal Emergency Management Agency (FEMA) to revise the documents enumerated in Section 3.2, when notified by the Local Administrator, and must pay any fees or costs assessed by FEMA for this purpose. The applicant must also provide assurances that the conveyance capacity of the altered or relocated segment will be maintained.

(7) In Zone A, when no base flood elevation data are available from other sources, base flood elevation data shall be provided by the permit applicant for subdivision proposals and other proposed developments that are greater than either 50 lots or 5 acres.

4.4-3 Alteration of Watercourses

(1) Notification to adjacent communities and the New York State Department of Environmental Conservation prior to permitting any alteration or relocation of a watercourse, and submittal of evidence of such notification to the Regional Director, Region II, Federal Emergency Management Agency.

(2) Determine that the permit holder has provided for maintenance within the altered or relocated portion of said watercourse so that the flood carrying capacity is not diminished.

5.1-2 Encroachments

(1) Within Zones A1-A30 and AE, on streams without a regulatory floodway, no new construction, substantial improvements, or other development (including fill) shall be permitted unless:

(i) the applicant demonstrates that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any location, or,

(ii) the Town of LeRoy agrees to apply to the Federal Emergency Management Agency (FEMA) for a conditional FIRM revision, FEMA approval is received and the applicant provides all necessary data, analyses and mapping and reimburses the Town of Le Roy for all fees and other costs in relation to the application. The applicant must also provide all data, analyses and mapping and reimburse the Town of Le Roy for all costs related to the final map revision.

Hydrology

Groundwater flow dynamics in the area have been studied extensively due to the proximity of the Lehigh Valley Railroad Superfund Site (NPL/EPA ID: NYD986950251), immediately to the northeast of the Dolomite Products quarry, where one ton of cyanide crystals and 30,000 to 35,000 gallons of trichloroethene (TCE) were spilled in a derailment in 1970 (see Sheet 2: Layout). Groundwater flow paths, karst and sinkhole dynamics, remedial efforts at the spill site, and the effects of dewatering pumping at the quarry are summarized in a study conducted by Dr. Paul Richards of the SUNY College at Brockport, included with this submission for reference.

The hydrology of Mud Creek is highly complex due to the geologic characteristics of the underlying Onandaga Formation, a karstic limestone. This formation runs roughly east-west across the breadth of New York State, along the northern extent of the Alleghany Plateau. Ubiquitous sinkholes in the region intercept several northward flowing streams, Mud Creek included. Although Mud Creek ostensibly flows into Oatka Creek, the actual contribution of Mud Creek directly to Oatka Creek is negligible, except during high flow events that coincide with saturation of the underlying karst. Rather, hydrogeological investigations have revealed that a pair of sinkholes just to the east of the Dolomite Products quarry absorb the entirety of Mud Creek's discharge during normal flows, which exfiltrates the groundwater table at the headwaters of Spring Creek, approximately 4 miles to the east in the Village of Caledonia, and thence flows into Oatka Creek (see Sheet 1: Overview).

Between 1974 and 1977, a stream flow gauge was operated by the USGS on Mud Creek at Route 5, just upstream of the proposed stream relocation (04230470). Peak streamflow measurements were recorded for the years of 1975 and 1976, the latter of which was coincident with the peak flow measured at a downstream gauge on the Oatka Creek (04230500, active 1946-present). This was March 5, 1976, when Mud Creek reached 550 cfs, and Oatka Creek crested at 6,090 cfs. A USGS Bulletin 17B analysis of the 73 years of record at the Oatka Creek gauge indicates that this was almost exactly a 50-year flood (6,100 cfs), or 2 percent annual exceedance probability.

Equation 5 in Lumia et al. (USGS SIR 2006-5112) can be used to scale peak discharge estimates from a gauged site to an ungauged site based on the ratio of drainage areas and a scaling parameter that accounts for both hydrologic region in New York State (in this case, Region 6) and the specific recurrence interval of interest. This technique was applied to scale the long-term gauge record from Oatka Creek to the site of the former Mud Creek gauge. To assess the applicability of this method for these streams, the coincident peak flows in 1976 were compared. The estimate for this flood on Mud Creek was 552 cfs, while 550 cfs was observed. Although this comparison was only possible for a single event (the 1975 peak flows were not coincident at the two gauges), it proved to be extremely accurate. Applying this scaling equation to the 100-year discharge at Oatka Creek yields an estimated peak flow of 620 cfs at the site of the former Mud Creek gauge.

HEC-SSP files and return interval analysis scaling computations are included with this submission.

The USGS StreamStats program was used to estimate peak flows for comparison. Topographic mapping implemented in the StreamStats application appears to predate substantial quarrying activity by both Dolomite Products and Hanson Aggregates. Delineated watersheds follow unrealistic paths across the quarry pits, and were manually corrected. StreamStats at the former Mud Creek gauge site gives an estimate of 675 cfs for the 100-year peak flow, which is slightly greater in magnitude, but still in strong agreement with the 620 cfs estimated by scaling the peak flows computed for Oatka Creek.

Mud Creek's natural watershed is slightly larger within the project area than the site of the former gauge, as it collects a few small tributaries downstream. Measured at the downstream extent of the project area, Mud Creek has an approximately 15 square mile basin; the old gauge drained 10.2 square miles. However, not all of these 15 square miles actually drain into Mud Creek. Just under 3.5 square miles flow into the Mud Creek Tributary, discussed below. This waterway has no surface hydraulic connectivity to the main stem of the creek, and is therefore excluded from the contributing watershed, for a net area of about 11.4 square miles. The Mud Creek watershed is delineated on Sheet 6: Watershed.

Scaling the Oatka Creek 100-year peak flow estimate to the project site, excluding the disconnected tributary watershed, gives 660 cfs in Mud Creek. USGS Streamstats estimates are somewhat higher, at 810 cfs, again, excluding the Mud Creek Tributary watershed.

Another small tributary meets Mud Creek towards the east side of the Dolomite Products property (hereafter referred to as the "Eastern Tributary"). This watercourse drains just under 2 square miles, and is conveyed underneath the Le Roy Airport and the three parallel rail grades via a series of culverts. The confluence with Mud Creek is modeled at river station 1987 in the HEC RAS model, where its contributions are added with a change point.

Although the peak flows estimated by StreamStats are the more conservative values, the more rigorous approach of scaling the Bulletin 17B analysis of the Oatka Creek gauge appears to be the more accurate method, despite limited data available for verification. Further, using these gauge data are more appropriate given the complexity of the local hydrogeology that is not captured by the regional regressions, as well as the fact that scaling the Oatka Creek gauge analysis includes almost 15 years of additional data since the peak flow statistics regressions were developed by Lumia et al. for the USGS (2006). The scaled peak flow values are still within the standard error of prediction of the regressions.

Peak flow estimates employed for the modeled reach of Mud Creek are presented in Table 1.

Table 1: Peak flow estimates for Mud Creek

Flood Event (Years)	Mud Creek – Estimated Peak Flows (cfs)	
	RS 4773 (Upstream Boundary)	RS 1987 (Eastern Trib. Confluence)
10	390	450
50	470	610
100	520	660
500	690	800

Mud Creek Tributary

FEMA's 1981 FIS includes a detailed (HEC-2) study of the "Mud Creek Tributary" within the corporate limits of the Village of Le Roy, which is mapped on FIRM Panel 360281 0001 B, effective August 3, 1981. This stream would ostensibly meet Mud Creek just west of the Dolomite Products quarry, although mining activity has eliminated any possibility of surface water connectivity between the two watercourses.

Estimated peak discharges for this tributary employed for the FIS are presented along with Streamstats and Oatka Creek gauge scaling estimates for the same locations in Table 2.

Table 2: Peak flow estimates for the Mud Creek Tributary

Flood Event (Years)	Mud Creek Tributary – Estimated Peak Flows (cfs)					
	Upstream Corporate Limits			Downstream Corporate Limits		
	1981 FIS	StreamStats	Scaled 17B	1981 FIS	StreamStats	Scaled 17B
10	190	65	85	280	110	125
50	285	80	100	420	140	150
100	330	90	110	490	150	160
500	440	100	140	650	170	180

The estimated peak flow rates used in the effective FIS appear to be extremely conservative. These values were computed using: US Dept. of Commerce, Bureau of Public Roads, *Estimating peak rates of runoff from small watersheds in portions of New York State*, Washington DC, 1963. The StreamStats estimates are very comparable to the results of scaling the USGS Bulletin 17B analysis of the Oatka Creek gauge.

Discrepancies between peak flow rates notwithstanding, "Mud Creek Tributary" is something of a misnomer for this watercourse in its current condition, as its channel terminates at the southwest corner of another quarry, owned by Lehigh Hanson Aggregates, just to the west of the Dolomite Products property. The stream would presumably flow into this quarry, and likely be pumped out over time. However, a swallet (sinkhole) in the Le Roy Country Club golf course intercepts flows from the tributary before it even reaches this western quarry, except during high flow events and/or when the groundwater table is saturated (see Sheet 2: Layout).

Both the current National Hydrography Dataset and the relevant effective FIRM panel (360280 0004 B) show this tributary terminating at this sinkhole, however it does overflow into the Hanson Aggregates quarry on occasion. Figures 1 and 2 are aerial images acquired in May of 2011 and March of 2010, respectively (Google Earth). These images show the Mud Creek Tributary under a normal or dry condition, when all flows infiltrate into the sink hole, and a wet condition, where the sinkhole's infiltration capacity is exceeded and water flows into the Hanson Aggregates quarry – note the visible turbidity in the southwest corner of the quarry pit where the tributary spills over.

Assuming that maximum dewatering pump rates at either quarry are negligible in comparison to peak flood flows, abstractions to the golf course swallet and/or the Hanson Aggregates quarry pit are considered permanent relative to the timeframe of a flood event, and the Mud Creek Tributary watershed is therefore removed from the total contributing area at the project location.

Hydraulic Modeling

A HEC-RAS (v. 5.0.7) model was developed for approximately 5,000 linear feet of Mud Creek. 36 cross-sections define the model geometry, which extends approximately 900 feet up- and downstream of the proposed relocated reach of Mud Creek (Sheet 3: Topographic Work Map). Channel cross-sections were surveyed by BME Associates of Fairport, NY, in 2019 at 100 to 200 foot longitudinal spacing, and supplemented with 1-meter grid resolution lidar-derived topographic mapping of the overbank areas. Lidar elevation data for northern Genesee County were acquired in the winter of 2011 – 2012 for the USDA NRCS in New York. These data were collected at a nominal point spacing of 0.5 meters, and processed to a required vertical accuracy RMSE of 9.25 centimeters. Because Mud Creek is a losing stream and is often dry, reliable lidar ground returns were collected within the channel banks, and were used to augment the channel survey at several locations.

Manning's roughness coefficients were selected based on aerial imagery acquired by the New York Statewide Digital Orthoimagery Program, land cover classification in the 2016 National Land Cover Database, and engineering judgement.

Existing Conditions

Project: MudCreek_01.prj
Plan: ExistingConditions_2020-01-07 (.p12)*
Geometry: ExistingConditions_2020-01-07 (.g17)*
Flow: BaseFlood (.f03)*
Associated Terrain: ExistingTerrain

The effective FIRM is a very poor representation of the 100-year flood extents. In some locations, the approximately-mapped A Zone does not overlap with the current stream channel. FIRM Panel 360280 0004 B is annotated with the modeled existing SFHA on Sheet 4: Annotated FIRM.

Mud Creek has a very broad, well-connected floodplain in the project area; towards the eastern end of the quarry property, the channel loses definition somewhat as flows pond in the depressed area described above.

The channel has been dredged in several locations over the years; spoils have been stockpiled in intermittent berms along the channel banks. Several other berms have been constructed in the area from stripped overburden and quarry waste; ditches have been excavated for drainage and management of discharge from dewatering pumps. Dewatering at the quarry generally occurs while mining is active, from March through October; pump capacity is 2,000 to 2,400 gallons per minute (about 5 cfs).

Dolomite Products has stockpiled overburden and aggregate along the southern border of the actively quarried area. This too acts as a berm, and prevents floodwaters from spilling over into the quarry from Mud Creek. This area is very dynamic, as material is added, removed, or relocated as part of quarry operations. At the time of the 2011-2012 lidar mission, there was a low point, or gap, in this berm approximately 75 feet wide. This is between cross-sections 2834 and 2626. The modeled base flood elevation exceeds this low point elevation by up to 2.1 feet; floodwaters would presumably flow into the quarry. Spillover into the quarry was neglected, as the steady-state model would simply fill the pit with no impact on water surface elevations in Mud Creek. This is also the more conservative approach, as overflow abstractions into the quarry would presumably cause (slight) reductions in BFE.

Although the modeled base flood elevations do not exceed the RSR grade, the Le Roy Airport runway to the south is at a lower elevation, and would be partially inundated because of the tailwaters experienced by the Eastern Tributary to Mud Creek, or potential reverse flow through the culverts that carry it through the rail grades.

Two buildings are modeled as being within the existing SFHA that are not in the effective SFHA. These are a home and outbuilding (garage or barn) at 8241 East Main Rd, Le Roy; SWIS: 183689; Tax Map Parcel No.: 26.-1-49.122. Modeled depths are up to approximately 1.75 feet at the house and 2.7 feet at the outbuilding. First floor elevations of these structures were not surveyed; depths are approximated relative to the lidar-derived topographic mapping. These structures lie between cross sections 2291 and 2153, where modeled base flood elevations are 771.55 feet and 771.54 feet, respectively (Table 3).

Proposed Conditions

Project: MudCreek_01.prj
Plan: ProposedConditions_2020-01-07 (.p11)*
Geometry: ProposedConditions_2020-01-07 (.g16)*
Flow: BaseFlood (.f03)*
Associated Terrain: ProposedTerrain

Dolomite Products proposes relocating Mud Creek between river stations 3656 and 993. The stream would be straightened, and made to flow parallel to the Rochester & Southern Railroad grade in an easterly direction. At the southeast corner of the Dolomite Products property, the stream would be directed northwards, paralleling the abandoned rail spur that once connected the RSR line to the Lehigh Valley Railroad. The proposed channel would rejoin the existing channel at the eastern boundary of the Dolomite Products property. The proposed channel has a 30-foot top width, and is 3 feet deep with 2:1 side slopes, leaving a bottom width of 18 feet.

A 6 to 10 foot high berm is proposed along the left bank of the stream. The stream would be confined between this berm and the RSR grade, approximately 150 to 160 feet apart. This berm will not be a certified levee, and was therefore modeled as displacing cross-sectional area, but not detaining floodwaters. This berm also constitutes a necessary noise attenuation barrier as required to meet state environmental standards. An operation and maintenance plan for the proposed berm is forthcoming. The proposed berm was also modeled as a levee in a separate geometry and plan to be certain that there is no change in BFE compared to when it is modeled as floodplain fill. Because of the proposed quarry expansion, the extents of flooding in the area north of the berm may change over time. A conceptual typical cross-section for the proposed channel and berm is presented on Sheet 5.

Under proposed conditions, base flood elevations at the two buildings in the existing conditions SFHA remain virtually unchanged, shown in Table 3. Nowhere in the modeled reach do proposed modifications result in one foot or more of rise in BFE over existing conditions, and are therefore compliant with flood damage prevention code adopted by the Town of Le Roy.

Table 3: Modeled BFE at property in SFHA

RS	Existing BFE (ft)	Proposed BFE (ft)	Difference (ft)
2291	771.5508	771.5619	+0.0111
2153	771.5445	771.5521	+0.0076

Note that the proposed channel modifications shorten the overall length of this reach, which results in an inaccurate representation of water surface elevations when existing and proposed conditions are viewed together in HEC-RAS's profile plots.

Mapping Notes

Horizontal Datum: NAD83 StatePlane New York West FIPS 3103 (US Feet)

Vertical Datum: NAVD88 (US Feet)

Shapefiles provided:

- Dolomite Products, Inc. property boundary
- Geolocated Effective SFHA within the project area
- Modeled Existing SFHA
- Proposed berm alignment
- Modeled Proposed SFHA
  - SFHA protected by proposed berm
  - SFHA unprotected by proposed berm
- Topographic contours derived from lidar surface
  - 1 foot interval
  - 5 foot interval
- Geolocated Effective FIRM Panel

REFERENCES

Lumia, Richard, Freehafer, D.A., and Smith, M.J., (2006) Magnitude and Frequency of Floods in New York: U.S. Geological Survey Scientific Investigations Report 2006-5112, 152p.

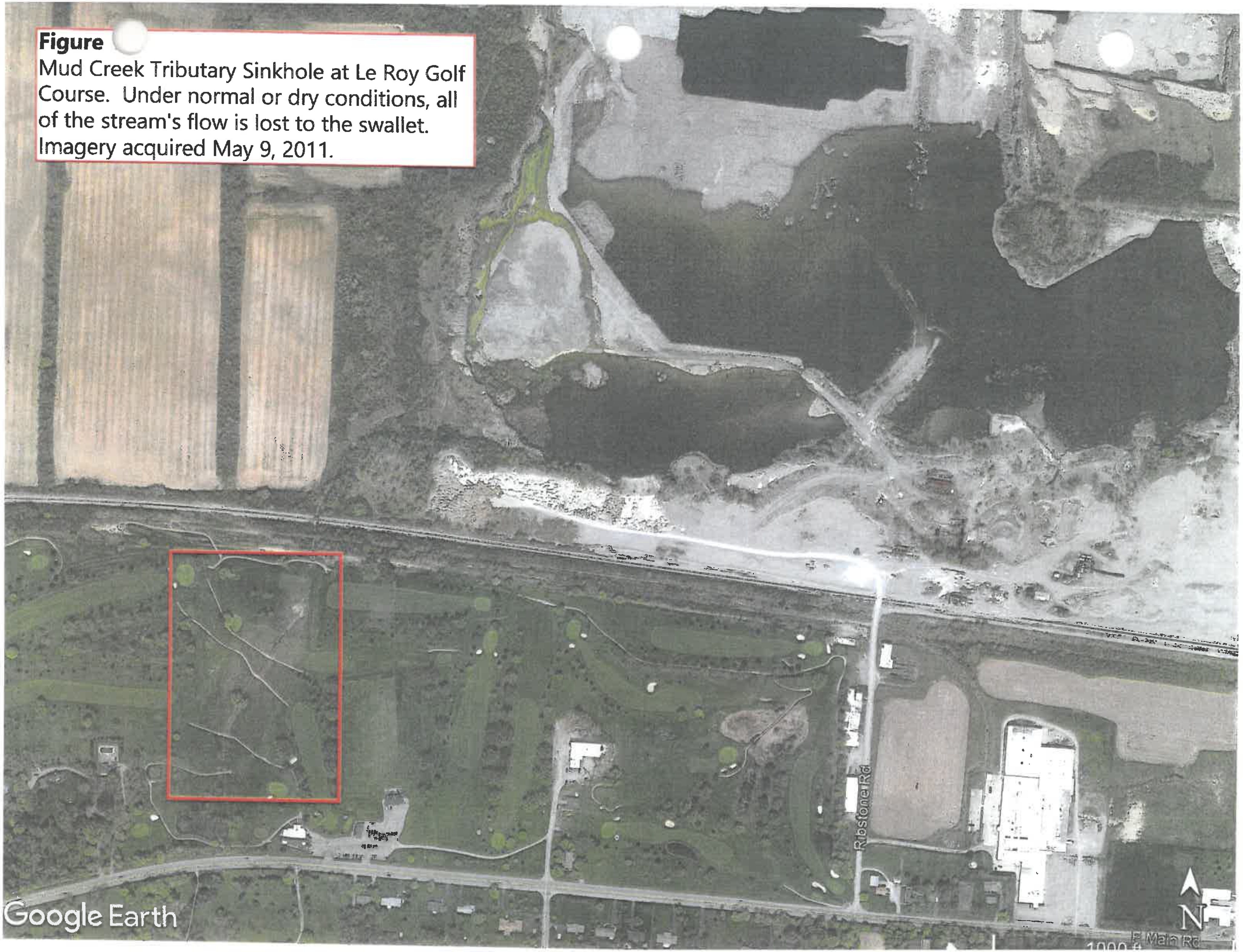
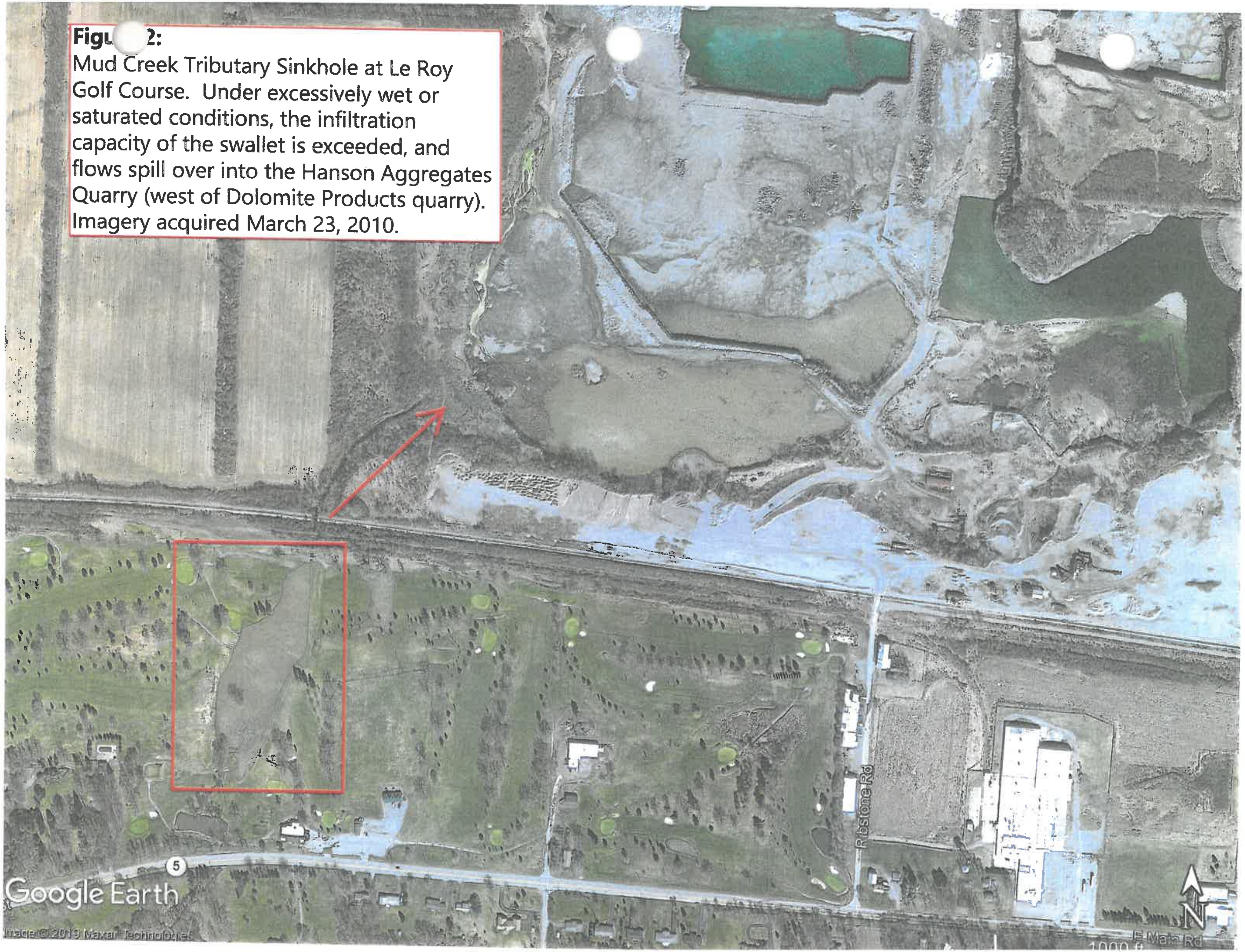
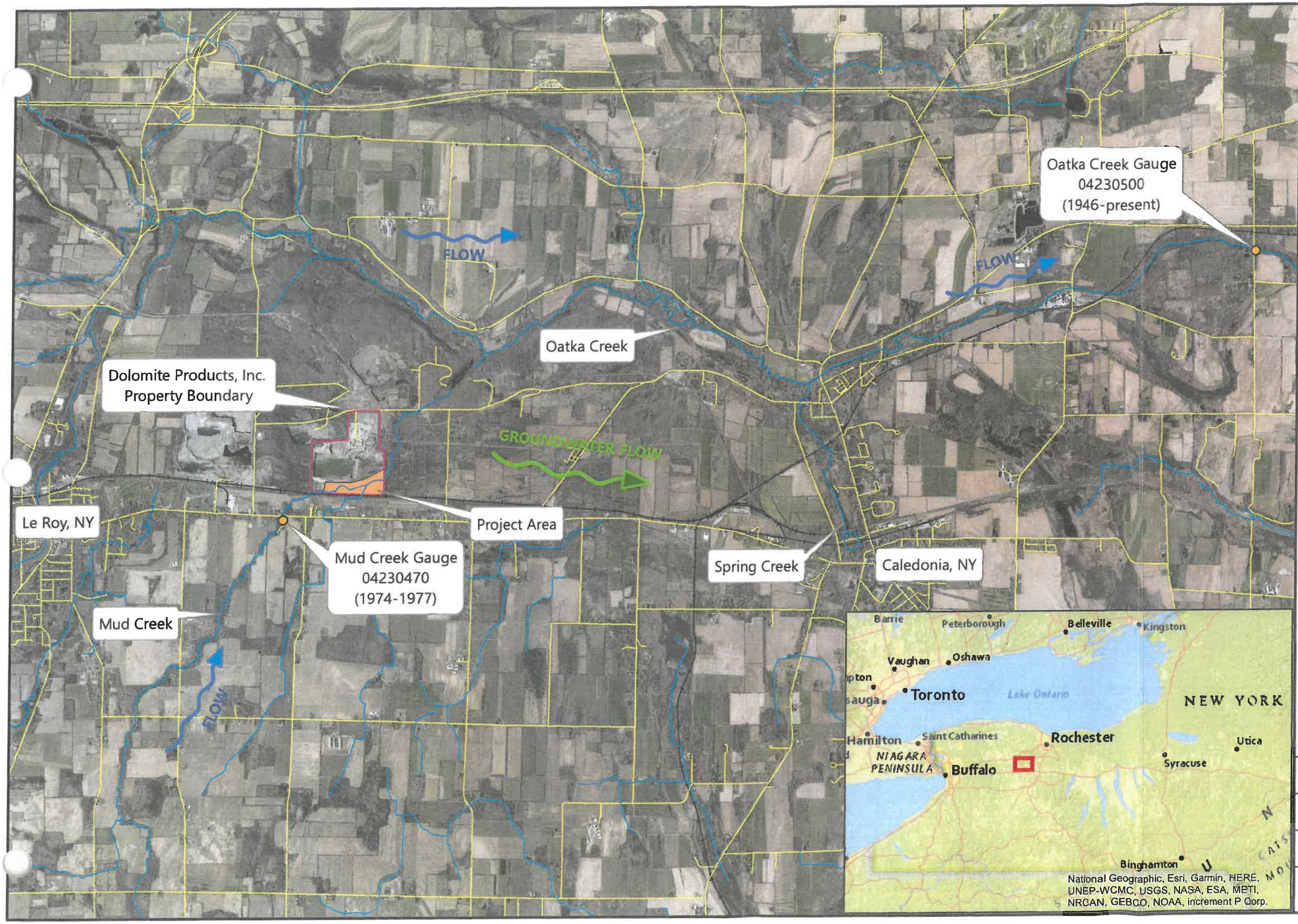


Figure
Mud Creek Tributary Sinkhole at Le Roy Golf Course. Under normal or dry conditions, all of the stream's flow is lost to the swallet. Imagery acquired May 9, 2011.



Figu 2:
Mud Creek Tributary Sinkhole at Le Roy Golf Course. Under excessively wet or saturated conditions, the infiltration capacity of the swallet is exceeded, and flows spill over into the Hanson Aggregates Quarry (west of Dolomite Products quarry). Imagery acquired March 23, 2010.



MILONE & MACBROOM
231 MAIN STREET
SUITE 102
NEW PALTZ, NY 12561
845.633.8153
WWW.MMINC.COM

Overview of Project Area

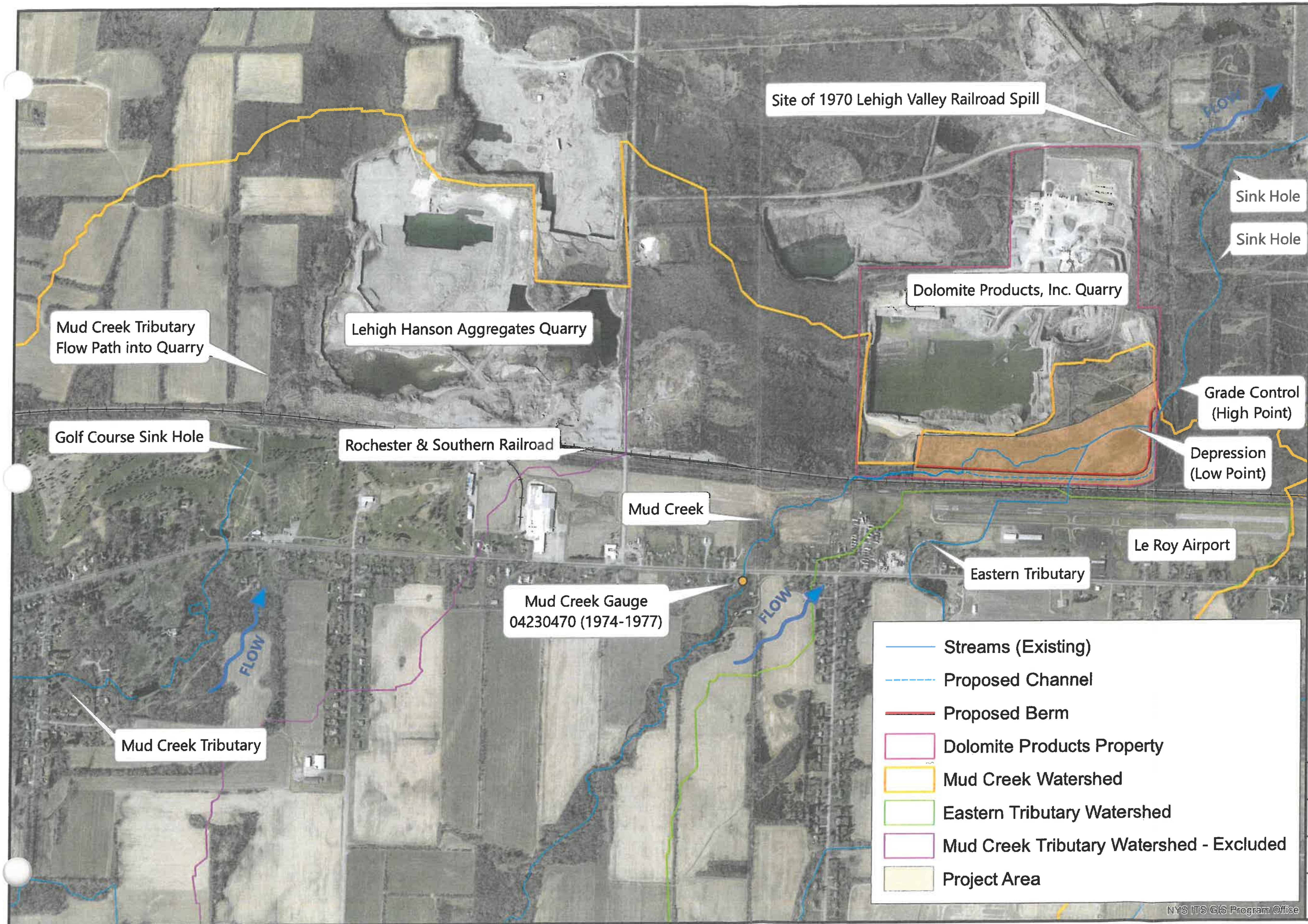
Mud Creek CLOMR
Dolomite Products, Inc.
Le Roy, NY

SCALE 1" = 4,000'

DATE 2020-01-07

PROJECT NO. 6924-01

Overview



N
0 0.25
Miles

MILONE & MACBROOM

231 MAIN STREET
SUITE 102
NEW PALTZ, NY 12561
845.633.8153
WWW.MMINC.COM

Overview of Project Area

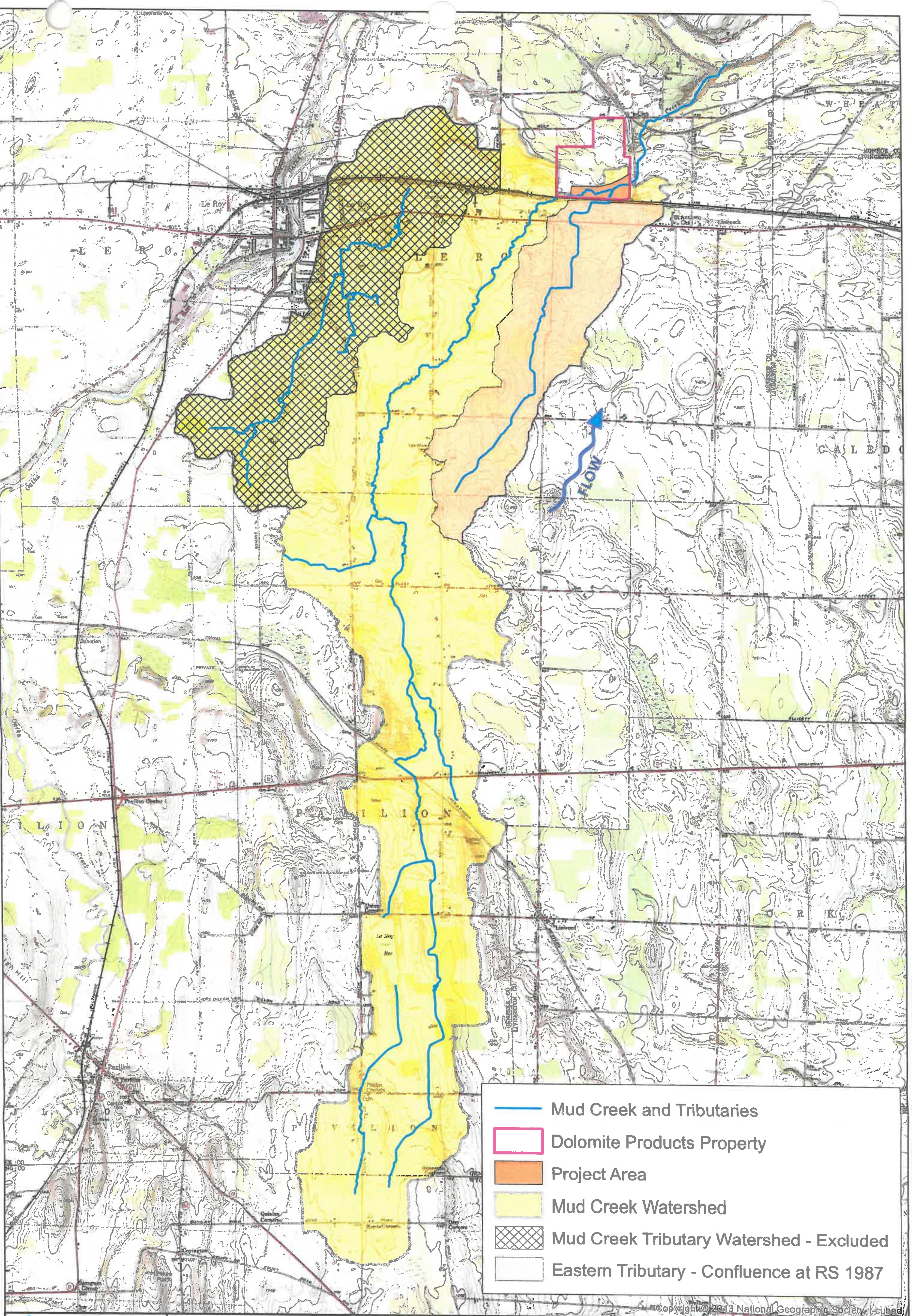
Mud Creek CLOMR
Dolomite Products, Inc.

Le Roy, NY

SCALE	1" = 1,000'
DATE	2020-01-07
PROJECT NO.	6924-01

Layout

Date Saved: 2020-01-07 MXD: Q:\Projects\6924-01 Mud Creek CLOMR\GIS\MXD\Mud_Creek_Layout.mxd



MILONE & MACBROOM
231 MAIN STREET
SUITE 102
NEW PALTZ, NY 12561
845.633.8153
WWW.MMINC.COM

Mud Creek Watershed

Mud Creek CLOMR
Dolomite Products, Inc.

Le Roy, NY

SCALE 1" = 4,000'
DATE 2020-01-22
PROJECT NO. 6924-01

Watershed

Document Path: Q:\Projects\6924-01 Mud Creek CLOMR\GIS\MXD\Mud_Creek_watershed.mxd Date Saved: 2020-01-07

TOPOGRAPHIC WORK MAP

Mud Creek CLOMR
Le Roy, New York

Dolomite Products, Inc.

Vertical Datum: NAVD88 (US Feet)
Horzontal Datum: NAD83 StatePlane New York West FIPS 3103 (US Feet)

Lidar-Derived Topography Acquired 2011-2012 for USDA NRCS in New York
Nominal Post Spacing: 0.5 m; Vertical Accuracy RMSE: 9.25 cm

Channel survey collected in 2019 by BME Associates of Fairport, NY.

Milone & MacBroom, Inc. accepts no responsibility for the accuracy of maps and data which have been supplied by others.

STATE OF VERMONT
BRIAN M. COTE
NO. 9358
CIVIL
LICENSED
PROFESSIONAL ENGINEER

0 100 200 300 400
Feet
1 inch = 200 feet

N

MILONE & MACBROOM
231 MAIN STREET
SUITE 102
NEW PALTZ, NY 12561
845.633.8153
WWW.MMINC.COM

TOPOGRAPHIC WORK MAP

Mud Creek CLOMR
Le Roy, New York

Dolomite Products, Inc.

Vertical Datum: NAVD88 (US Feet)
Horzontal Datum: NAD83 StatePlane New York West FIPS 3103 (US Feet)

Lidar-Derived Topography Acquired 2011-2012 for USDA NRCS in New York
Nominal Post Spacing: 0.5 m; Vertical Accuracy RMSE: 9.25 cm

Channel survey collected in 2019 by BME Associates of Fairport, NY.

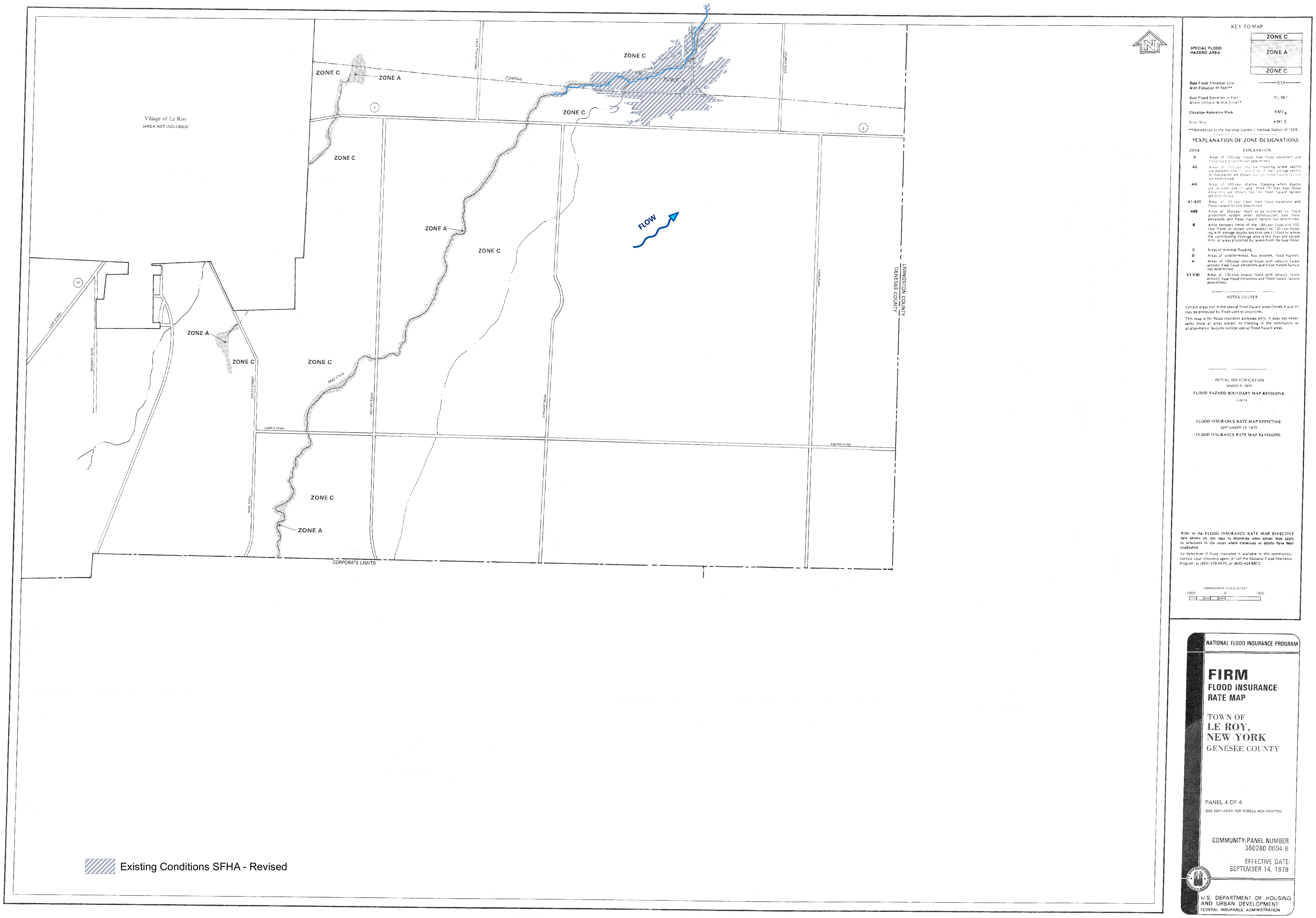
Milone & MacBroom, Inc. accepts no responsibility for the accuracy of maps and data which have been supplied by others.

STATE OF VERMONT
BRIAN M. COTE
NO. 9358
CIVIL
LICENSED
PROFESSIONAL ENGINEER

0 100 200 300 400
Feet
1 inch = 200 feet

N

MILONE & MACBROOM
231 MAIN STREET
SUITE 102
NEW PALTZ, NY 12561
845.633.8153
WWW.MMINC.COM



Annotated FIRM Panel 360280 0004 B

Mud Creek CLOMR

Dolomite Products, Inc.

Le Roy, New York

Effective FIRM Panel Georeferenced and Projected to Horizontal Datum:
NAD83 State Plane New York West FIPS 3103

0 0.1 0.2 0.3 0.4 0.5
MILES
1 inch = 1,250 feet

N

MILONE & MACBROOM
231 MAIN STREET
SUITE 102
NEW PALTZ, NY 12561
845.633.8153
WWW.MMINC.COM

Annotated FIRM Panel 360280 0002 B

Mud Creek CLOMR

Dolomite Products, Inc.

Le Roy, New York

Effective FIRM Panel Georeferenced and Projected to Horizontal Datum:
NAD83 State Plane New York West FIPS 3103

0 0.1 0.2 0.3 0.4 0.5
MILES
1 inch = 1,250 feet

N

MILONE & MACBROOM
231 MAIN STREET
SUITE 102
NEW PALTZ, NY 12561
845.633.8153
WWW.MMINC.COM

UNAUTHORIZED ALTERATION OR ADDITION TO THIS DRAWING IS A VIOLATION OF SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW

GREYSTONE ENGINEERING
4 FRANKLIN SQUARE
SARATOGA SPRINGS, NY 12866
(518) 682-2200 (OFFICE)
(518) 682-2202 (FAX)

Date	Revisions	By

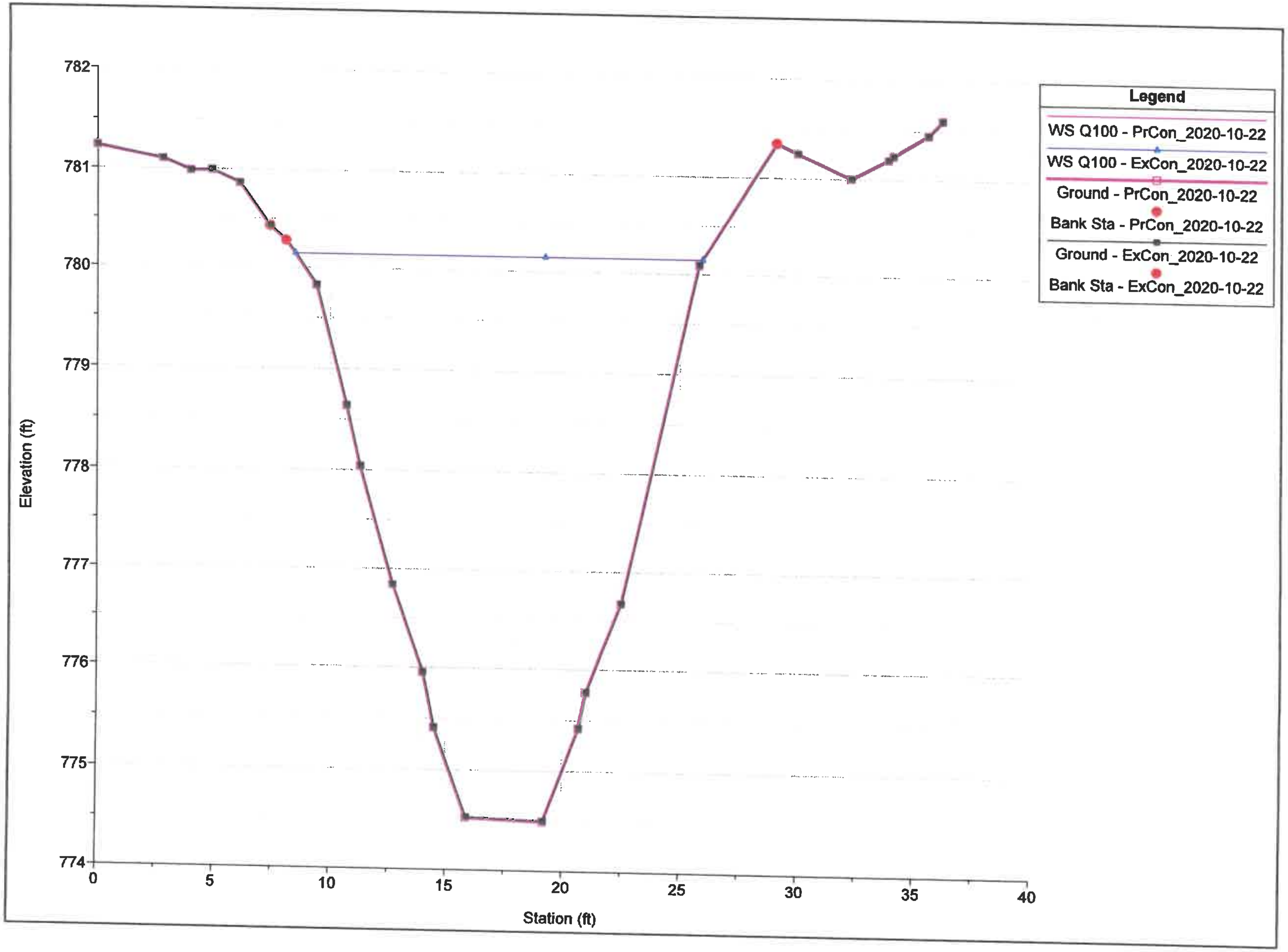
CONTINENTAL PLACER INC.
II Winners Circle, Albany, New York 12205
ph: 518/458-9203 fax: 518/458-9206

MUD CREEK RELOCATION PLAN
Dolomite Products Co., Inc.
LeRoy Quarry
Town of LeRoy Genesee Co., NY

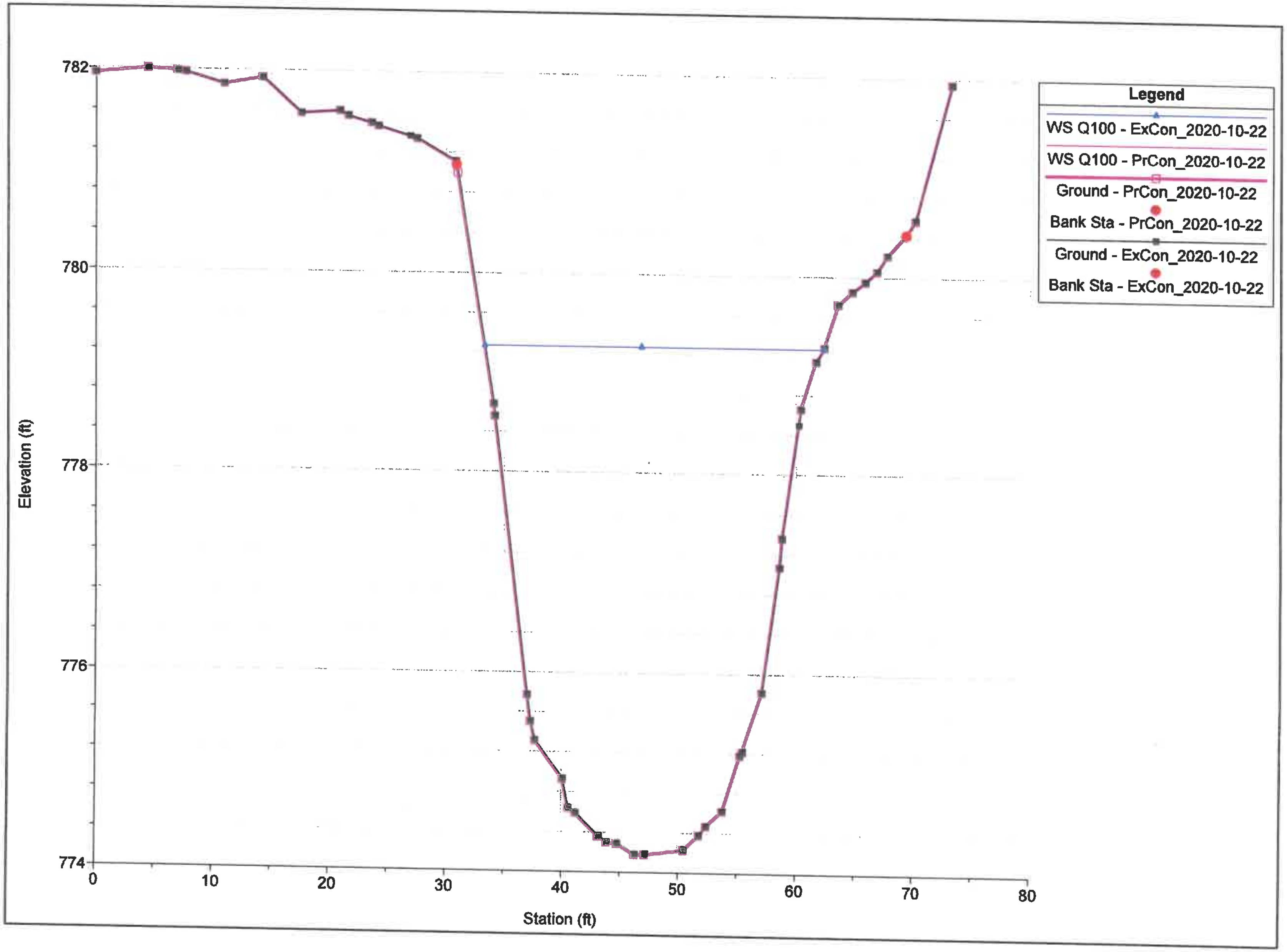
Project Manager:JRH
Prepared By:JAS
Drafted By:JAS
Reviewed By:JRH

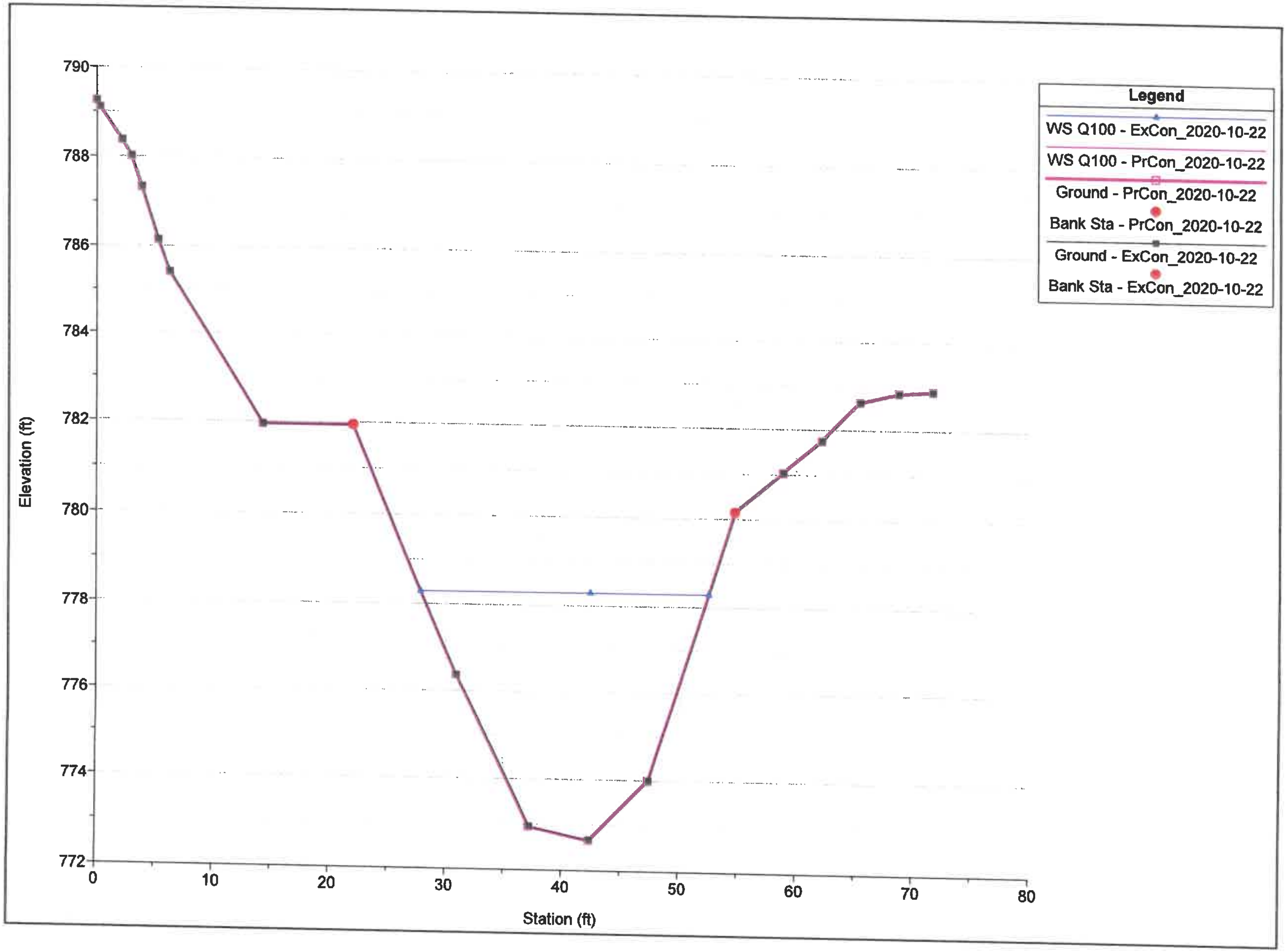
Date: September 30, 2020
Project No: 73-173-11-3887

Sheet No: 1 of 1

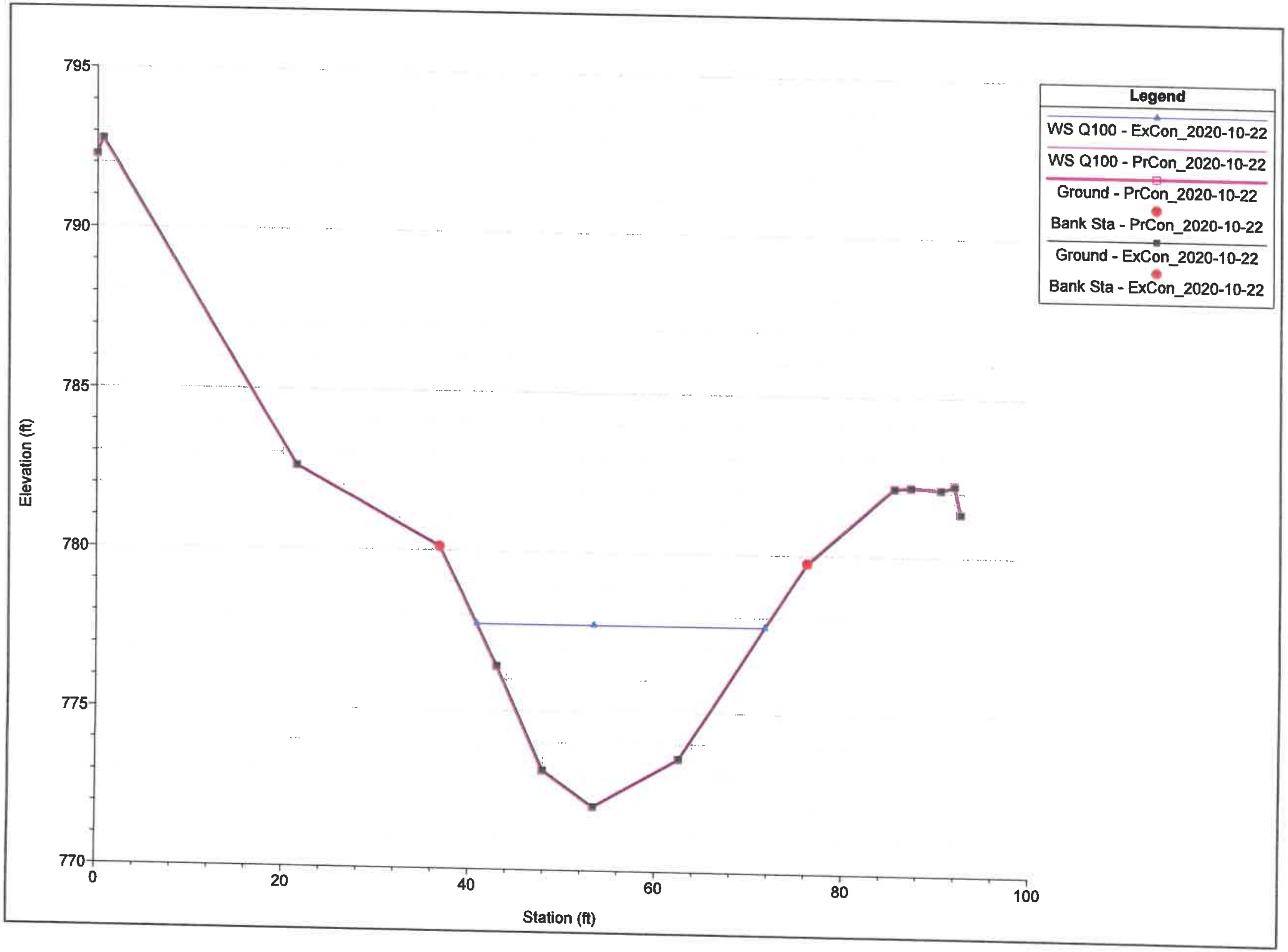


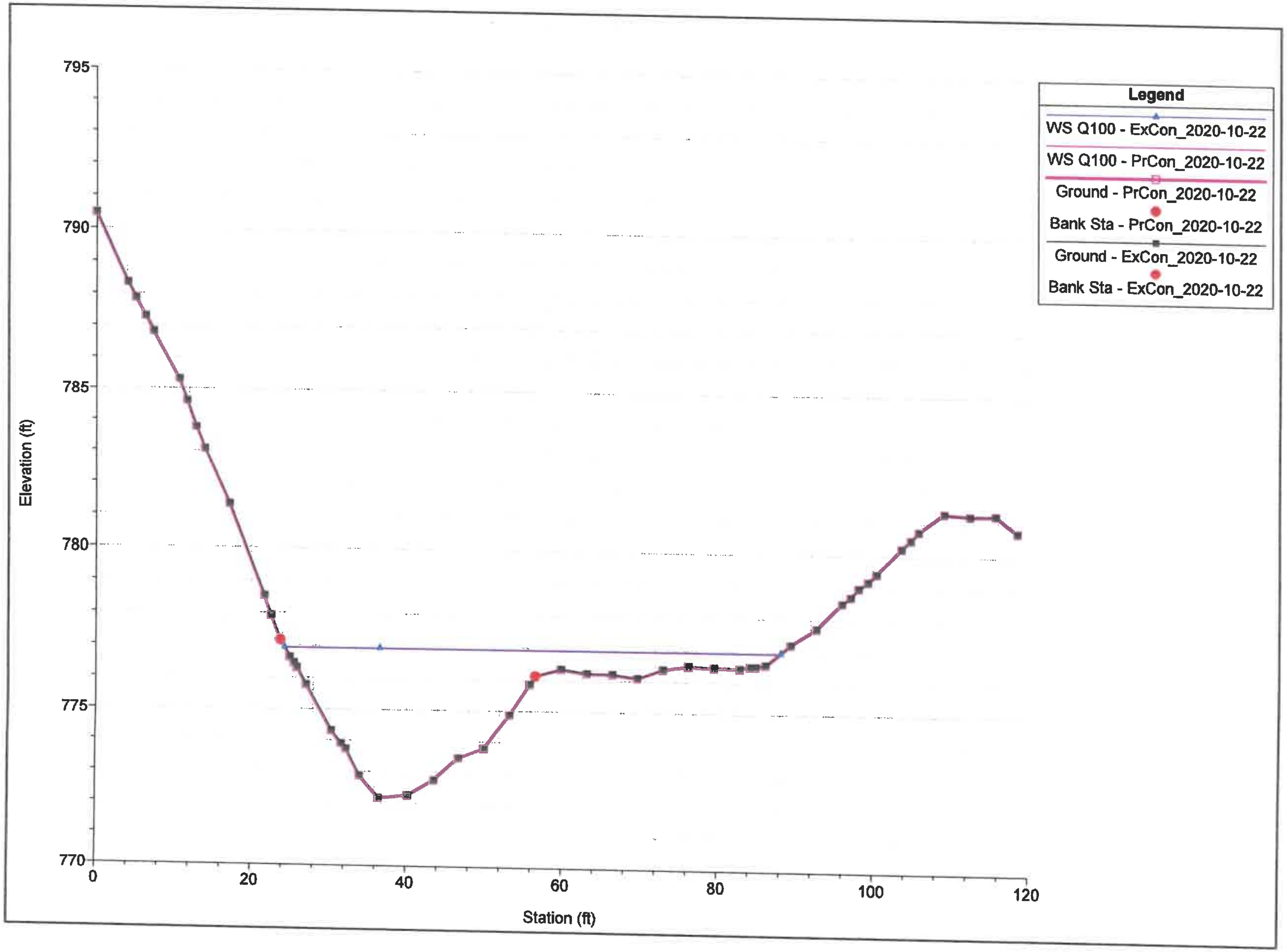
Legend
WS Q100 - PrCon_2020-10-22
WS Q100 - ExCon_2020-10-22
Ground - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
Ground - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22
Elevation (ft)
Station (ft)
782
781
780
779
778
777
776
775
774
0
5
10
15
20
25
30
35
40

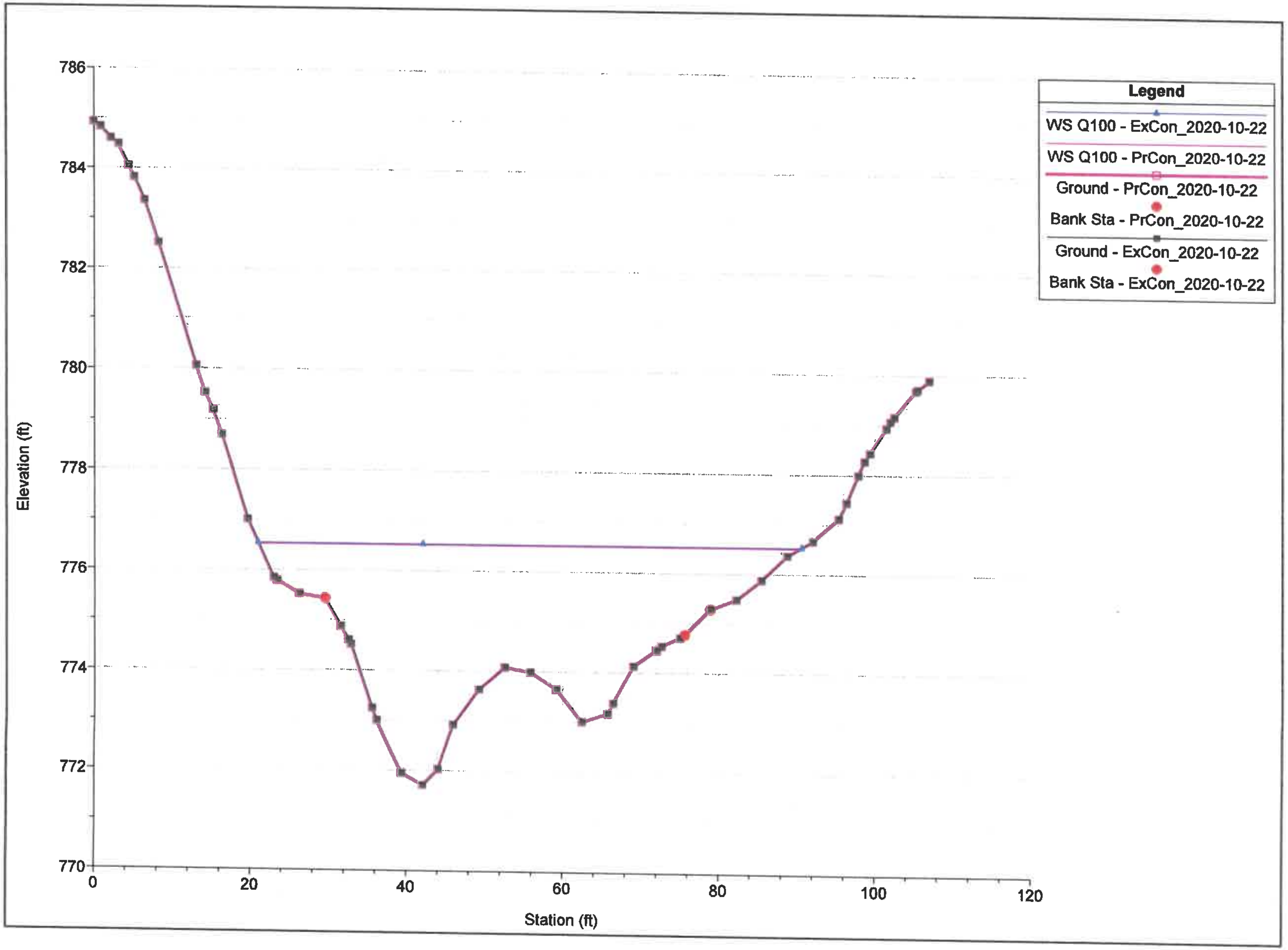

Legend
WS Q100 - ExCon_2020-10-22
WS Q100 - PrCon_2020-10-22
Ground - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
Ground - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22
Elevation (ft)
782
780
778
776
774
0
10
20
30
40
50
60
70
80
Station (ft)

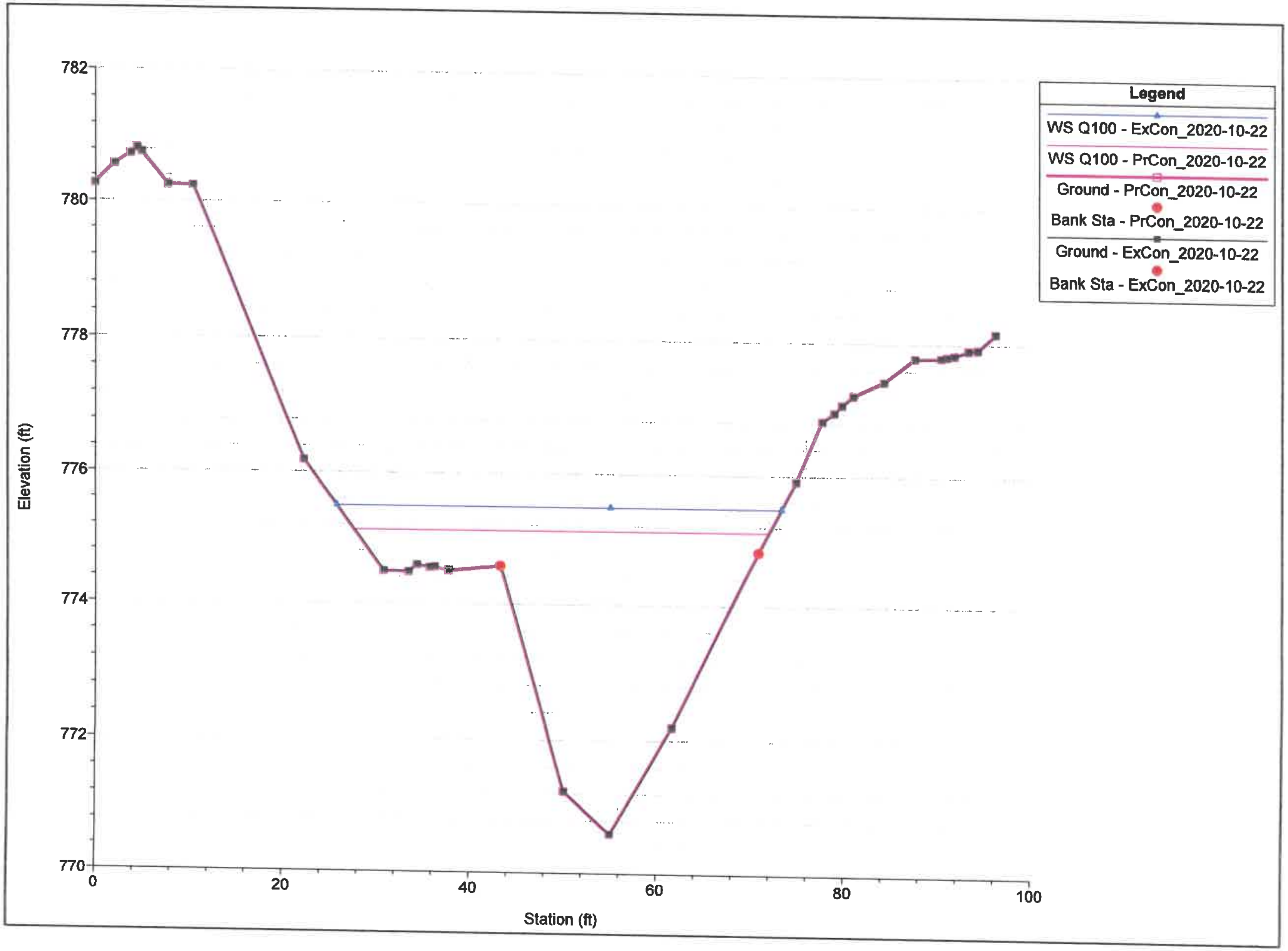


Legend
WS Q100 - ExCon_2020-10-22
WS Q100 - PrCon_2020-10-22
Ground - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
Ground - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22
Elevation (ft)
790
788
786
784
782
780
778
776
774
772
0
10
20
30
40
50
60
70
80
Station (ft)

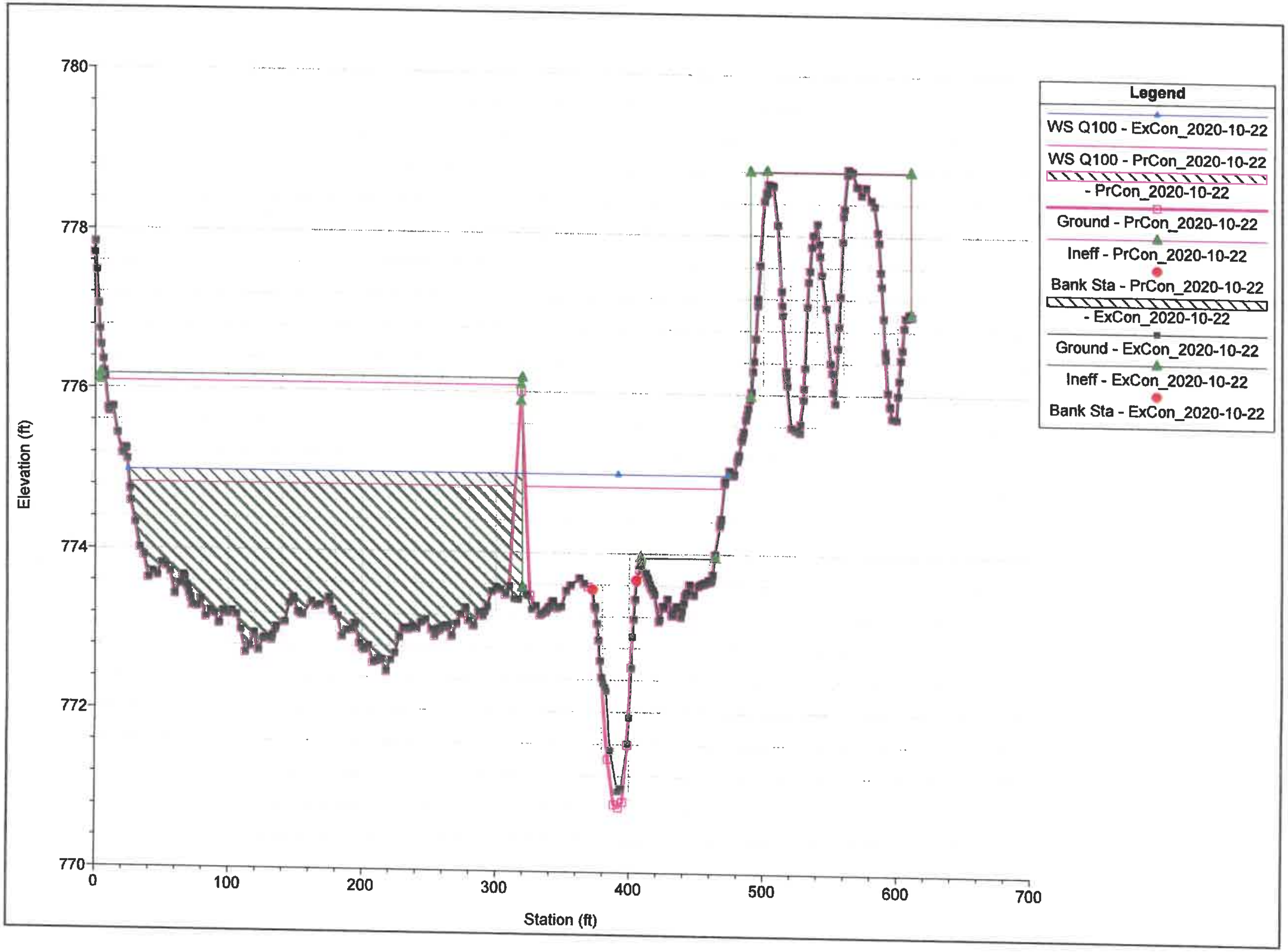

Legend
WS Q100 - ExCon_2020-10-22
WS Q100 - PrCon_2020-10-22
Ground - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
Ground - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22
Elevation (ft)
795
790
785
780
775
770
0
20
40
60
80
100
Station (ft)


Legend
WS Q100 - ExCon_2020-10-22
WS Q100 - PrCon_2020-10-22
Ground - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
Ground - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22
Elevation (ft)
Station (ft)
795
790
785
780
775
770
0
20
40
60
80
100
120

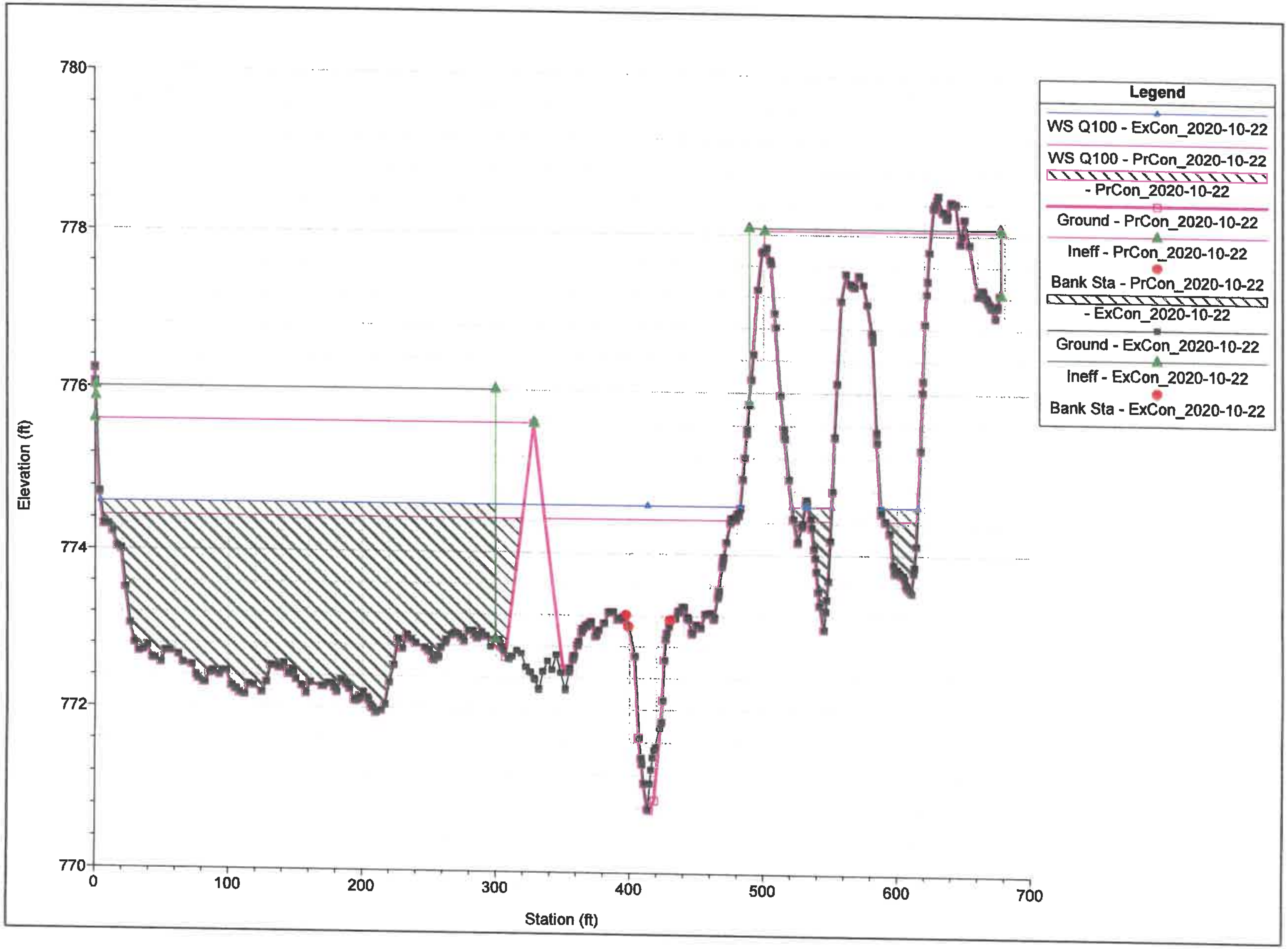

Legend
WS Q100 - ExCon_2020-10-22
WS Q100 - PrCon_2020-10-22
Ground - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
Ground - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22
Elevation (ft)
786
784
782
780
778
776
774
772
770
0
20
40
60
80
100
120
Station (ft)



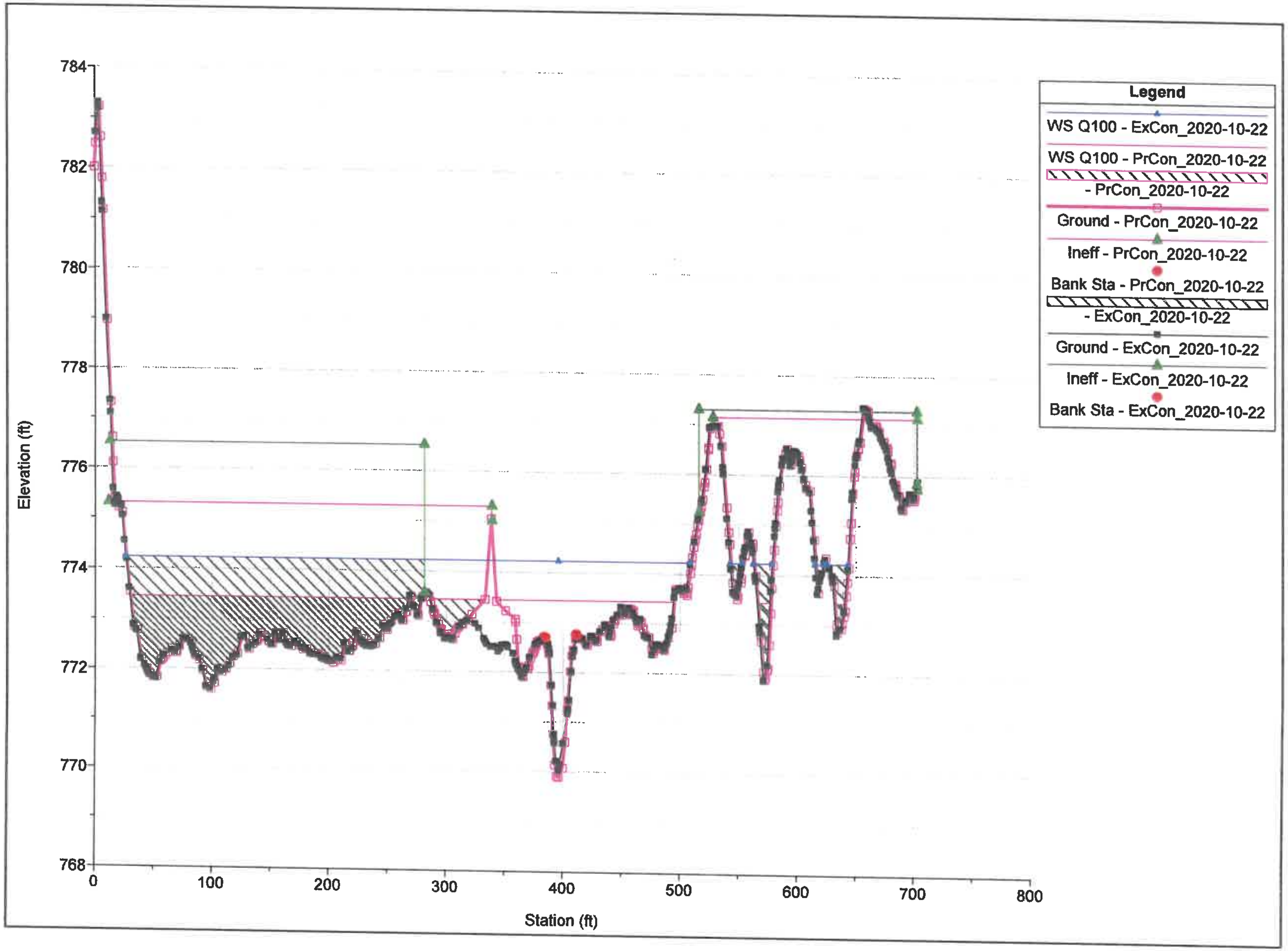
Legend
WS Q100 - ExCon_2020-10-22
WS Q100 - PrCon_2020-10-22
Ground - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
Ground - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22
Elevation (ft)
782
780
778
776
774
772
770
Station (ft)
0
20
40
60
80
100

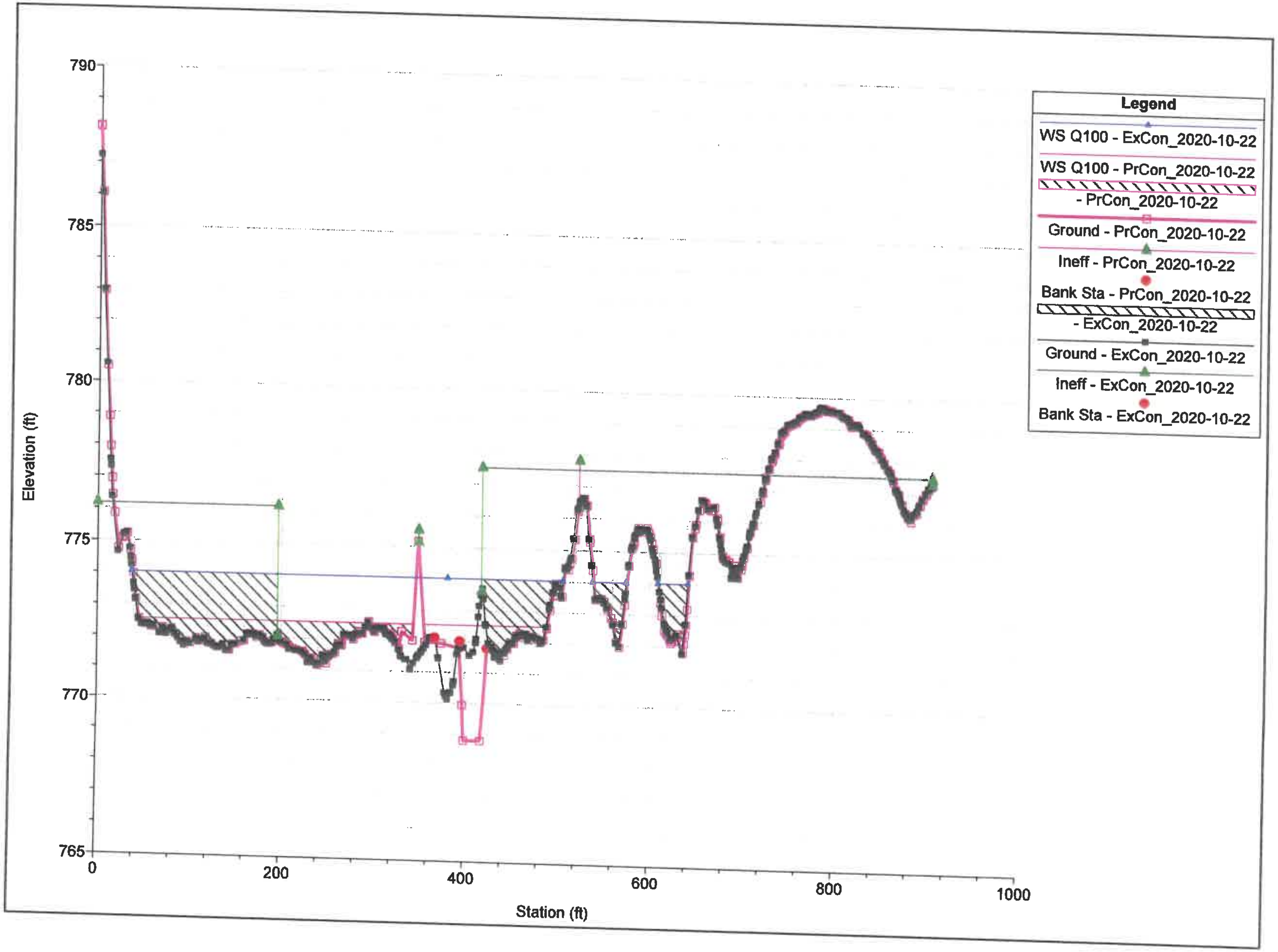


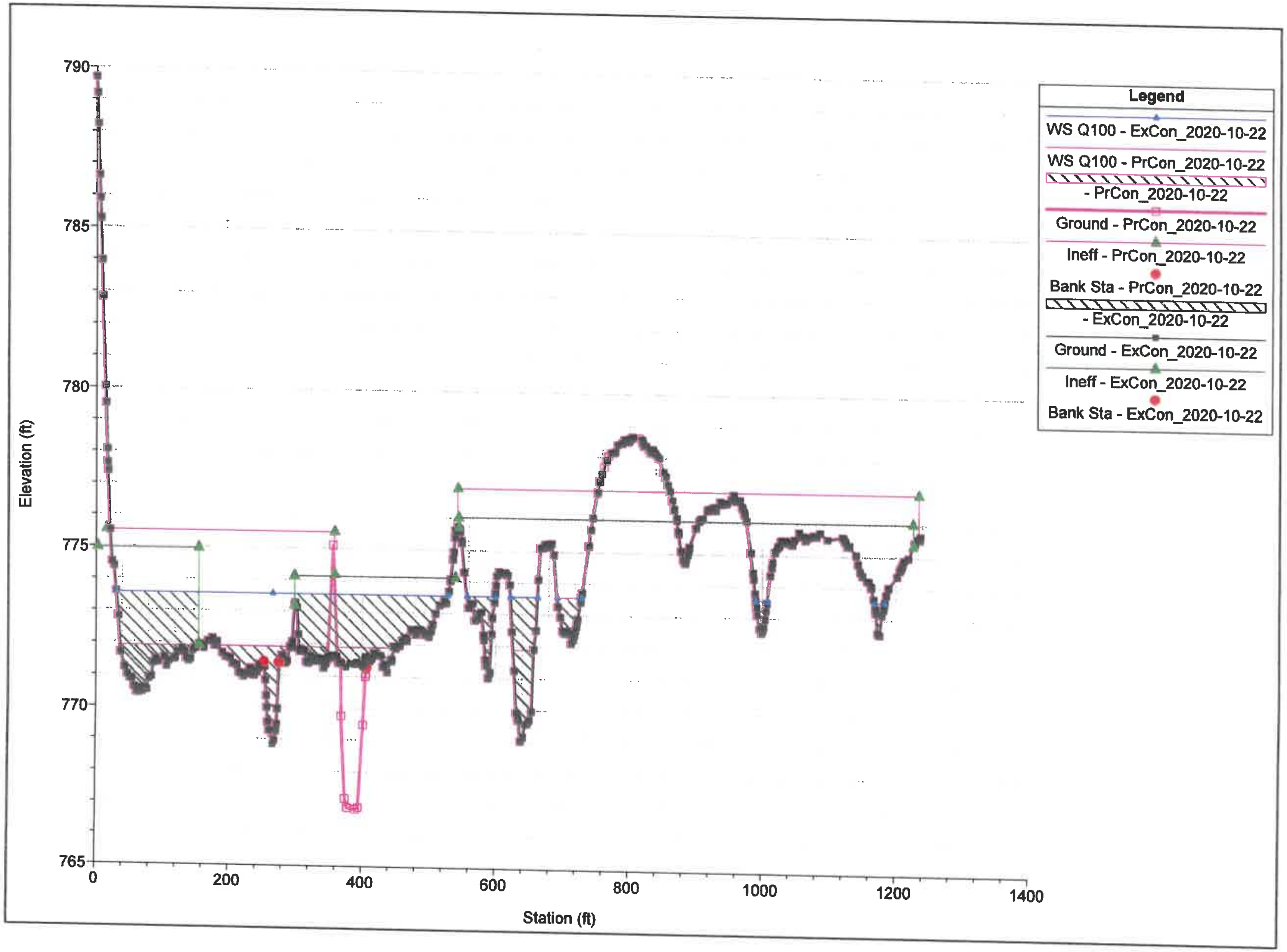
780
778
776
774
772
770
Elevation (ft)
0
100
200
300
400
500
600
700
Station (ft)
Legend
WS Q100 - ExCon_2020-10-22
WS Q100 - PrCon_2020-10-22
- PrCon_2020-10-22
Ground - PrCon_2020-10-22
Ineff - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
- ExCon_2020-10-22
Ground - ExCon_2020-10-22
Ineff - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22

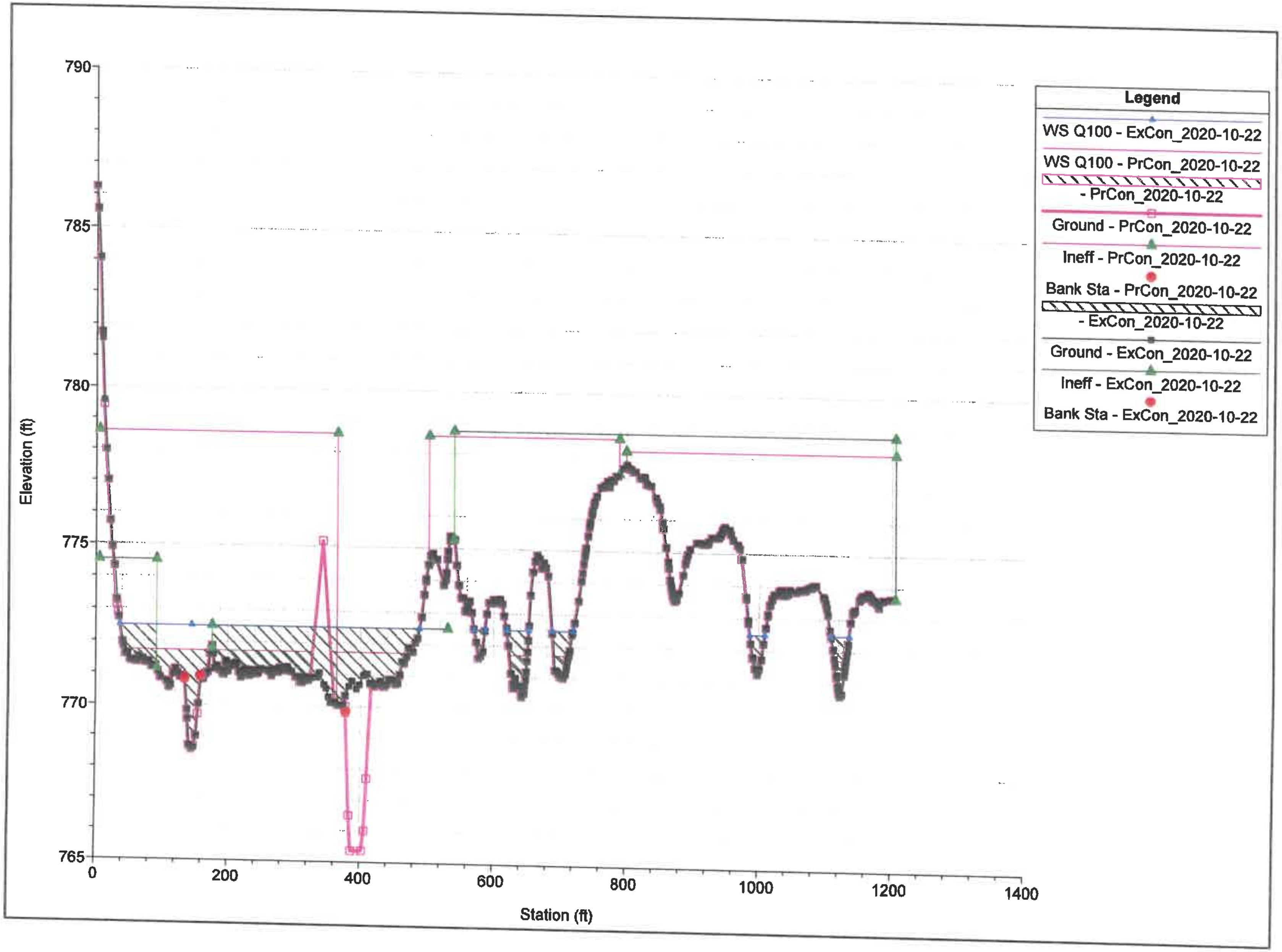


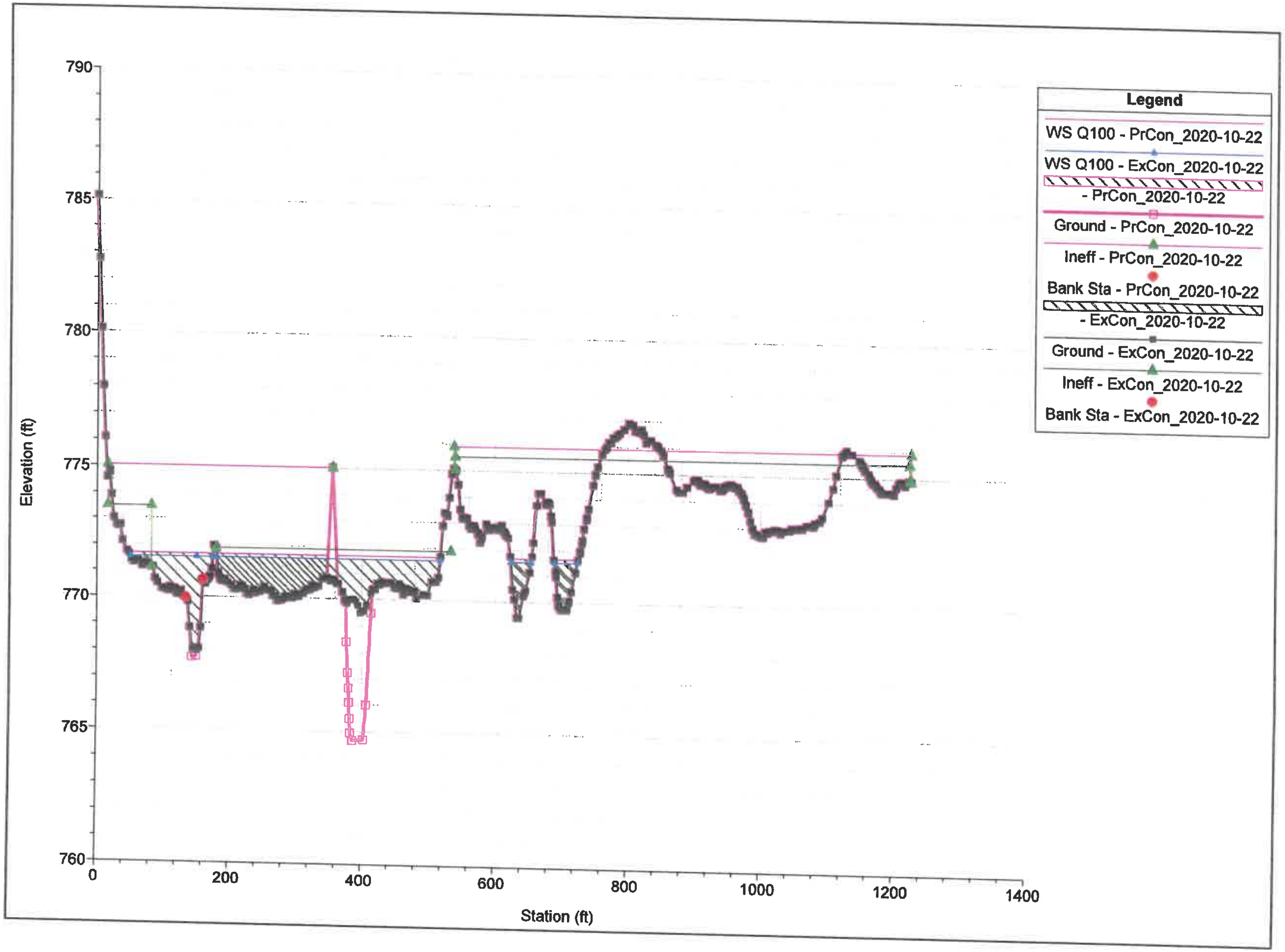
Legend
WS Q100 - ExCon_2020-10-22
WS Q100 - PrCon_2020-10-22
- PrCon_2020-10-22
Ground - PrCon_2020-10-22
Ineff - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
- ExCon_2020-10-22
Ground - ExCon_2020-10-22
Ineff - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22
Elevation (ft)
780
778
776
774
772
770
0
100
200
300
400
500
600
700
Station (ft)


784
782
780
778
776
774
772
770
768
Elevation (ft)
0
100
200
300
400
500
600
700
800
Station (ft)
Legend
WS Q100 - ExCon_2020-10-22
WS Q100 - PrCon_2020-10-22
- PrCon_2020-10-22
Ground - PrCon_2020-10-22
Ineff - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
- ExCon_2020-10-22
Ground - ExCon_2020-10-22
Ineff - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22

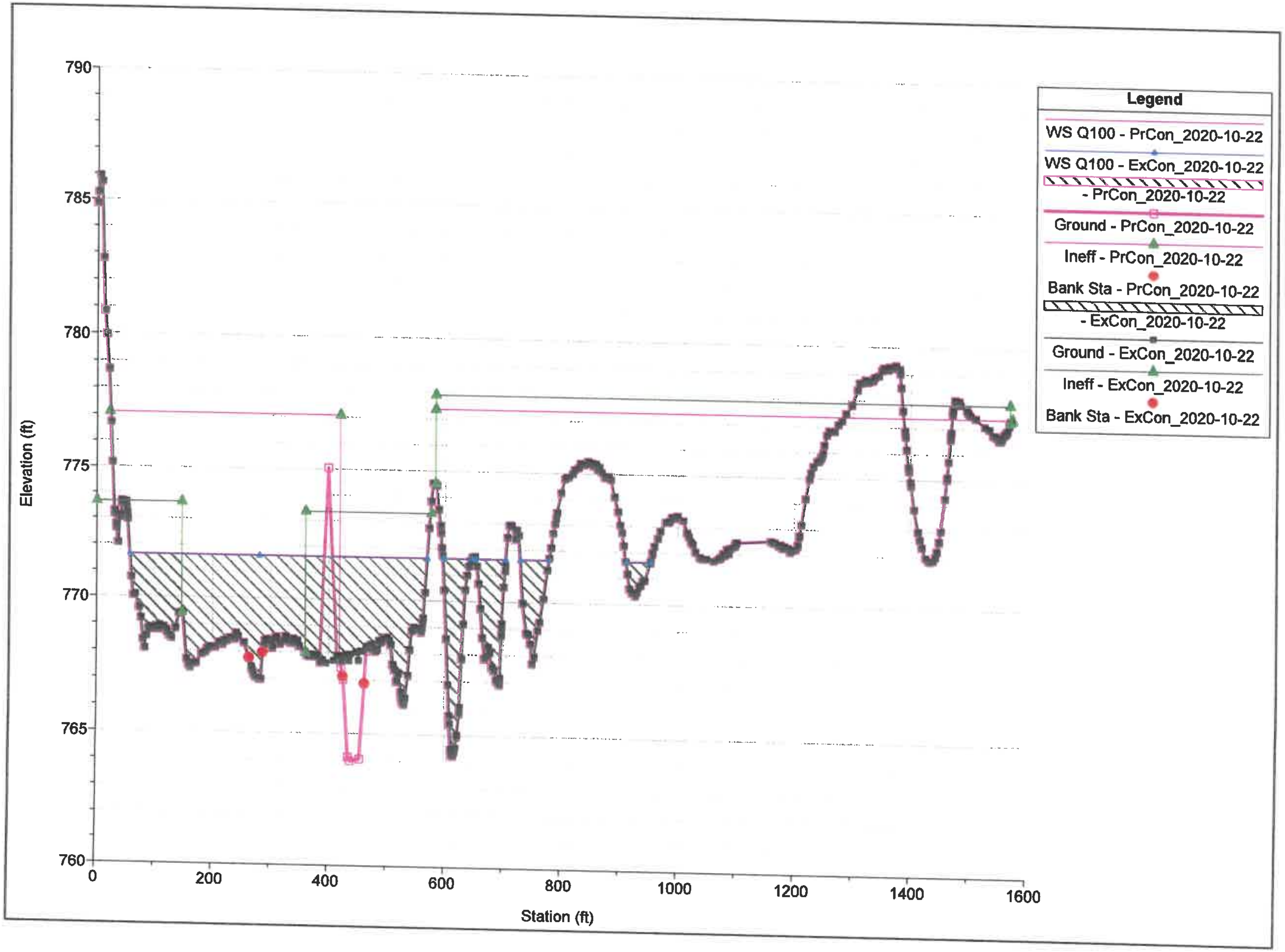

Legend
WS Q100 - ExCon_2020-10-22
WS Q100 - PrCon_2020-10-22
- PrCon_2020-10-22
Ground - PrCon_2020-10-22
Ineff - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
- ExCon_2020-10-22
Ground - ExCon_2020-10-22
Ineff - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22
Elevation (ft)
790
785
780
775
770
765
0
200
400
600
800
1000
Station (ft)


Legend
WS Q100 - ExCon_2020-10-22
WS Q100 - PrCon_2020-10-22
- PrCon_2020-10-22
Ground - PrCon_2020-10-22
Ineff - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
- ExCon_2020-10-22
Ground - ExCon_2020-10-22
Ineff - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22
Elevation (ft)
790
785
780
775
770
765
Station (ft)
0
200
400
600
800
1000
1200
1400

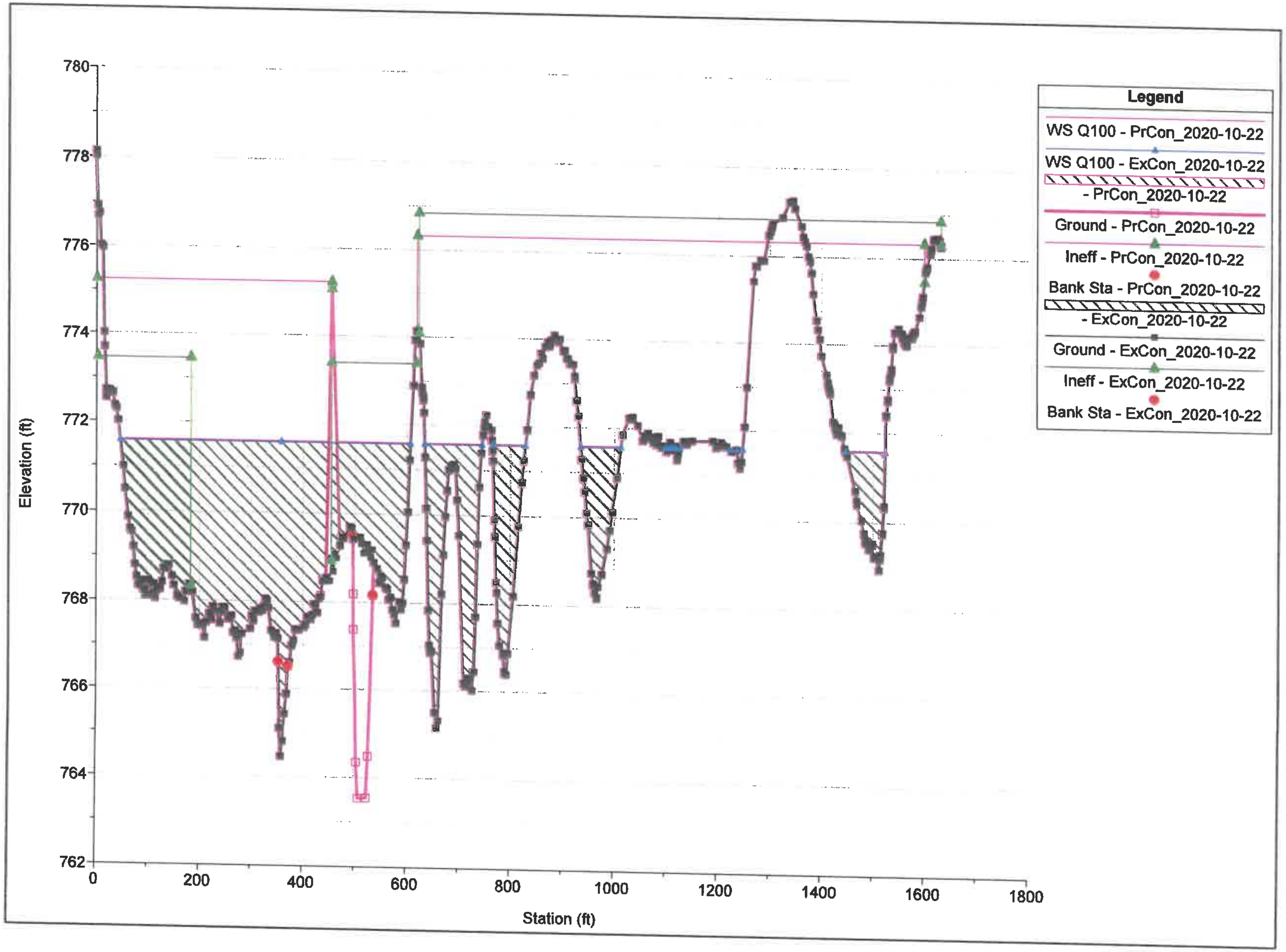

Legend
WS Q100 - ExCon_2020-10-22
WS Q100 - PrCon_2020-10-22
- PrCon_2020-10-22
Ground - PrCon_2020-10-22
Ineff - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
- ExCon_2020-10-22
Ground - ExCon_2020-10-22
Ineff - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22
790
785
780
775
770
765
Elevation (ft)
0
200
400
600
800
1000
1200
1400
Station (ft)

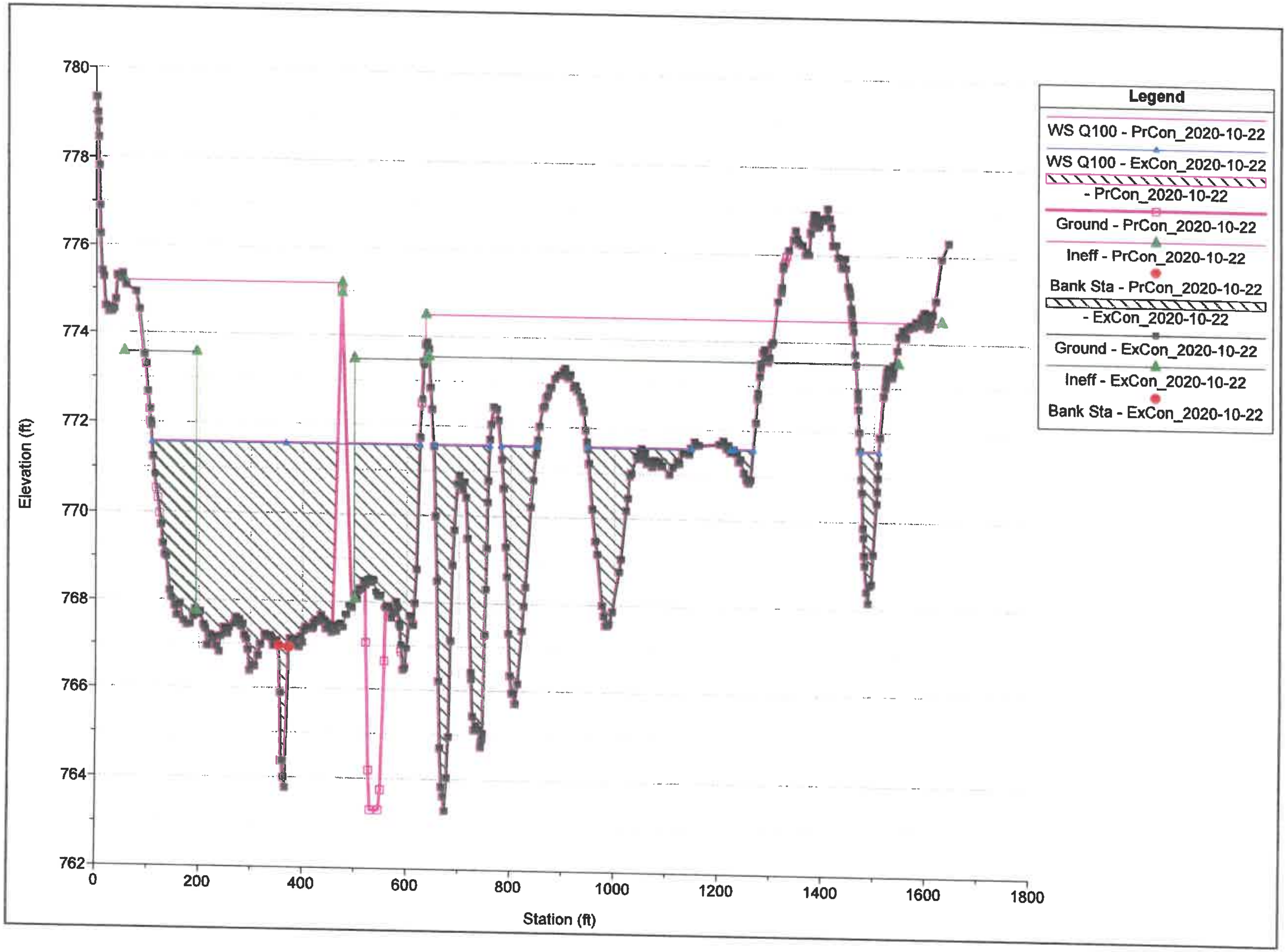


Legend
WS Q100 - PrCon_2020-10-22
WS Q100 - ExCon_2020-10-22
- PrCon_2020-10-22
Ground - PrCon_2020-10-22
Ineff - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
- ExCon_2020-10-22
Ground - ExCon_2020-10-22
Ineff - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22
Elevation (ft)
790
785
780
775
770
765
760
Station (ft)
0
200
400
600
800
1000
1200
1400

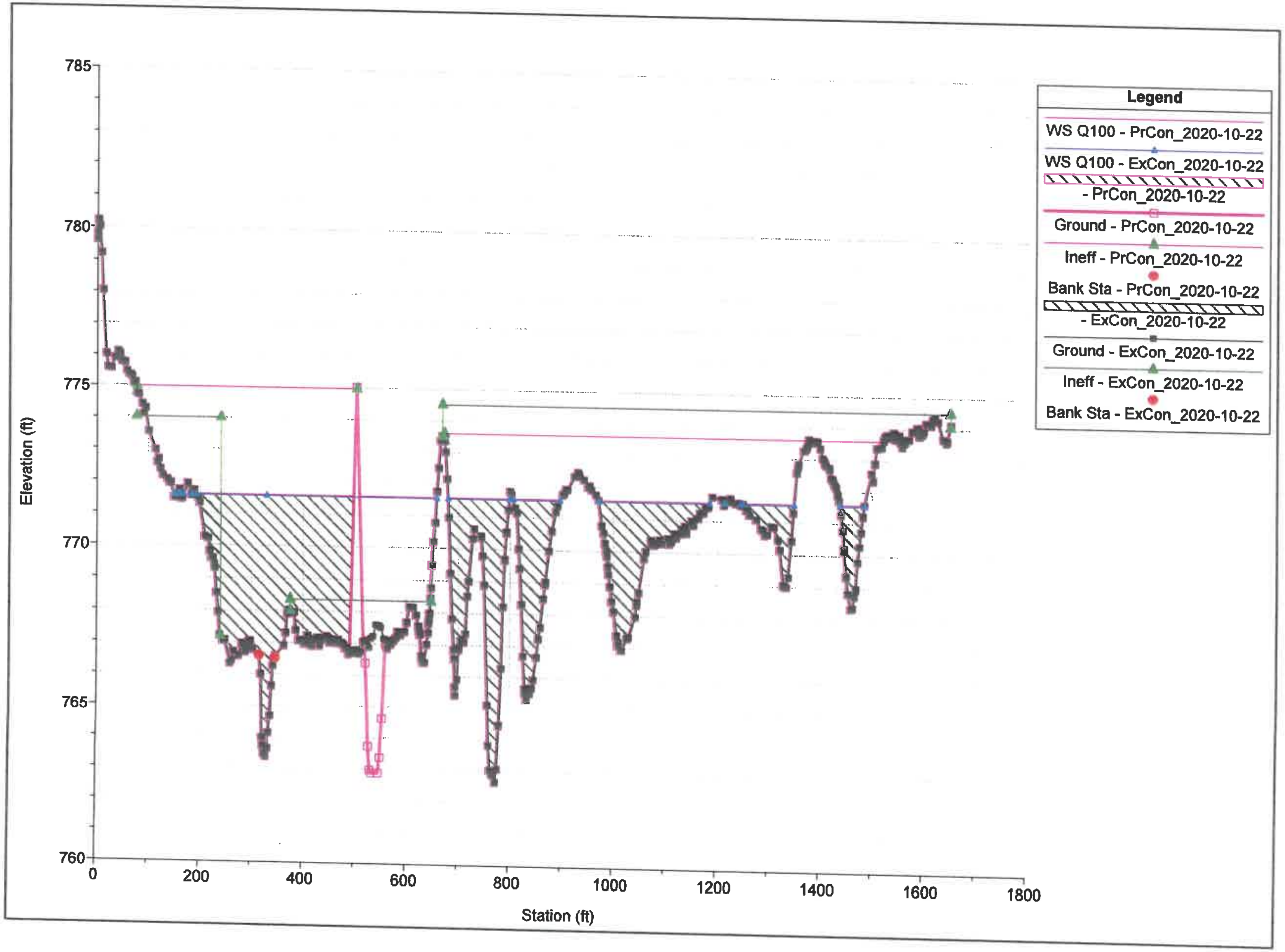


Legend
WS Q100 - PrCon_2020-10-22
WS Q100 - ExCon_2020-10-22
- PrCon_2020-10-22
Ground - PrCon_2020-10-22
Ineff - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
- ExCon_2020-10-22
Ground - ExCon_2020-10-22
Ineff - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22
Elevation (ft)
Station (ft)
790
785
780
775
770
765
760
0
200
400
600
800
1000
1200
1400
1600

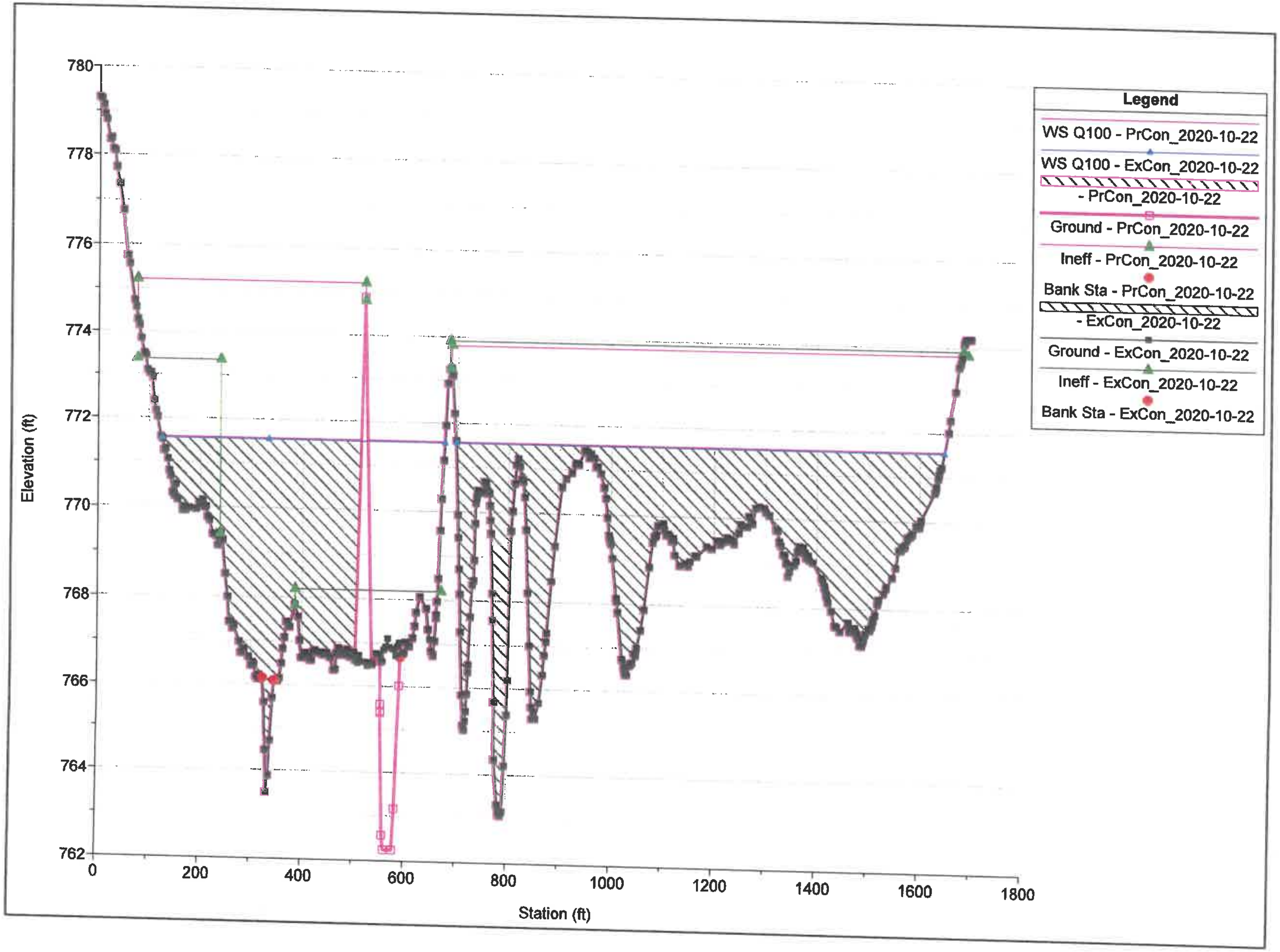

Legend
WS Q100 - PrCon_2020-10-22
WS Q100 - ExCon_2020-10-22
- PrCon_2020-10-22
Ground - PrCon_2020-10-22
Ineff - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
- ExCon_2020-10-22
Ground - ExCon_2020-10-22
Ineff - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22
Elevation (ft)
780
778
776
774
772
770
768
766
764
762
Station (ft)
0
200
400
600
800
1000
1200
1400
1600
1800

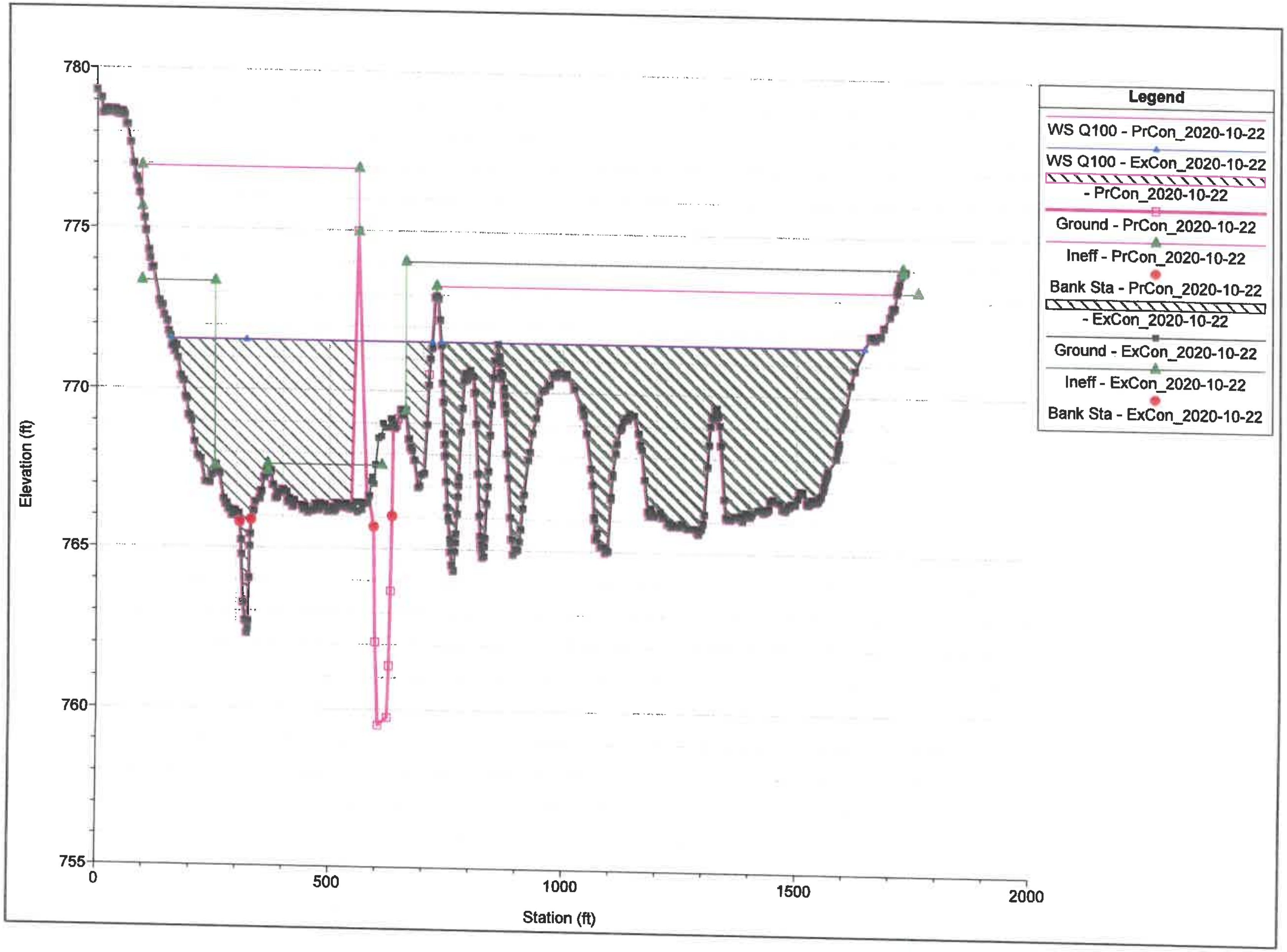


Legend
WS Q100 - PrCon_2020-10-22
WS Q100 - ExCon_2020-10-22
- PrCon_2020-10-22
Ground - PrCon_2020-10-22
Ineff - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
- ExCon_2020-10-22
Ground - ExCon_2020-10-22
Ineff - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22
Elevation (ft)
Station (ft)

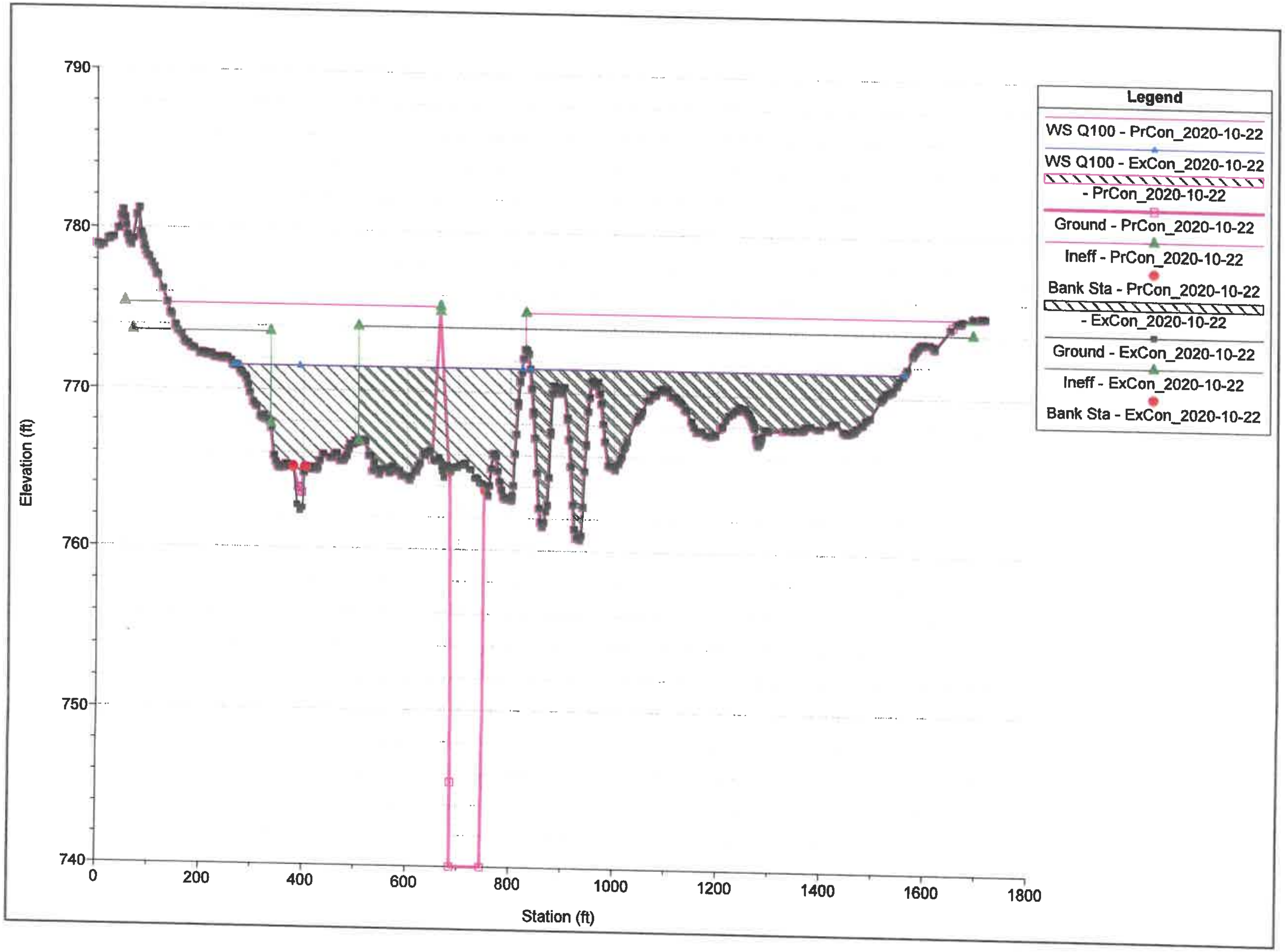


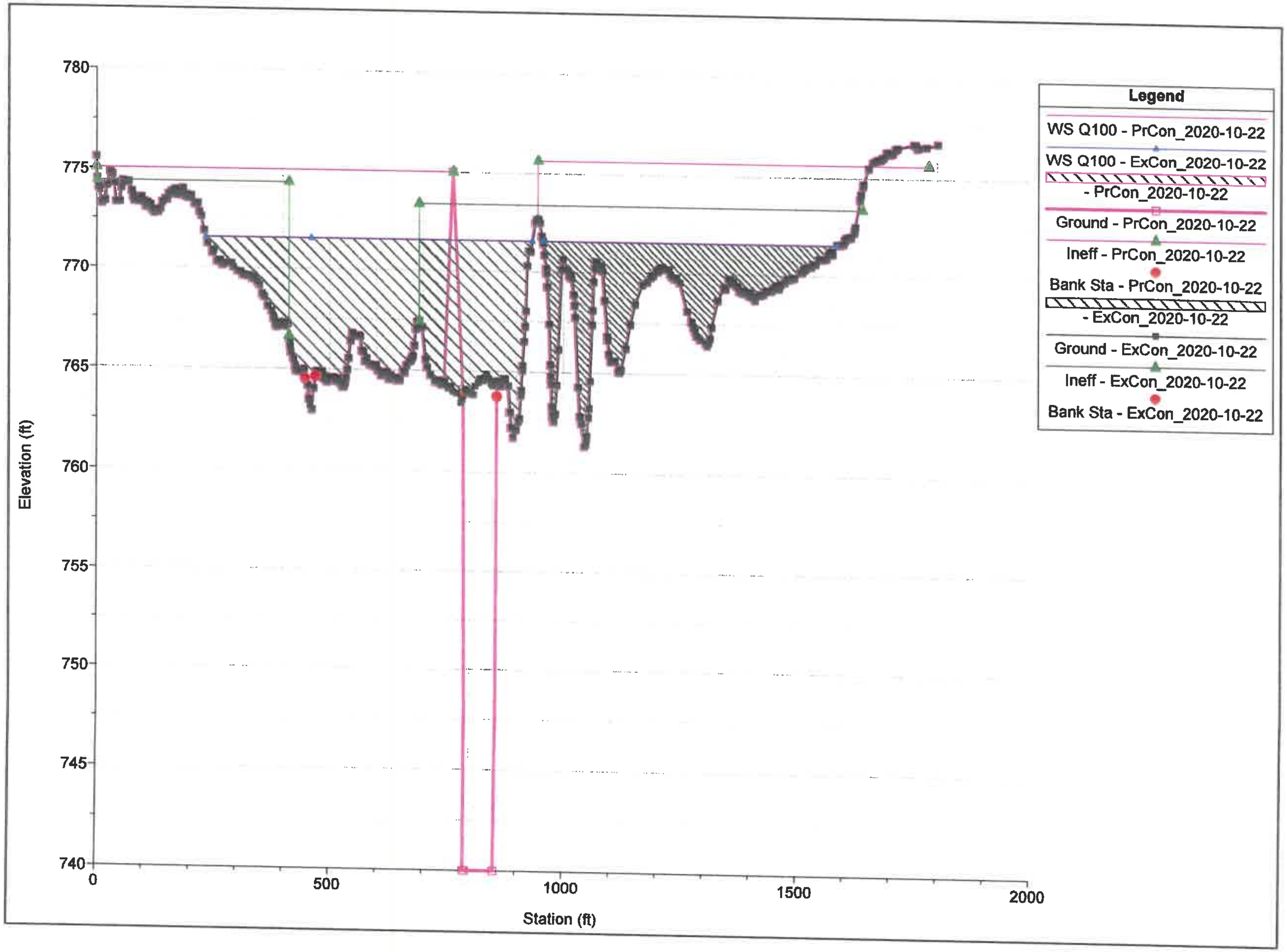
Legend
WS Q100 - PrCon_2020-10-22
WS Q100 - ExCon_2020-10-22
- PrCon_2020-10-22
Ground - PrCon_2020-10-22
Ineff - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
- ExCon_2020-10-22
Ground - ExCon_2020-10-22
Ineff - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22
Elevation (ft)
785
780
775
770
765
760
Station (ft)
0
200
400
600
800
1000
1200
1400
1600
1800

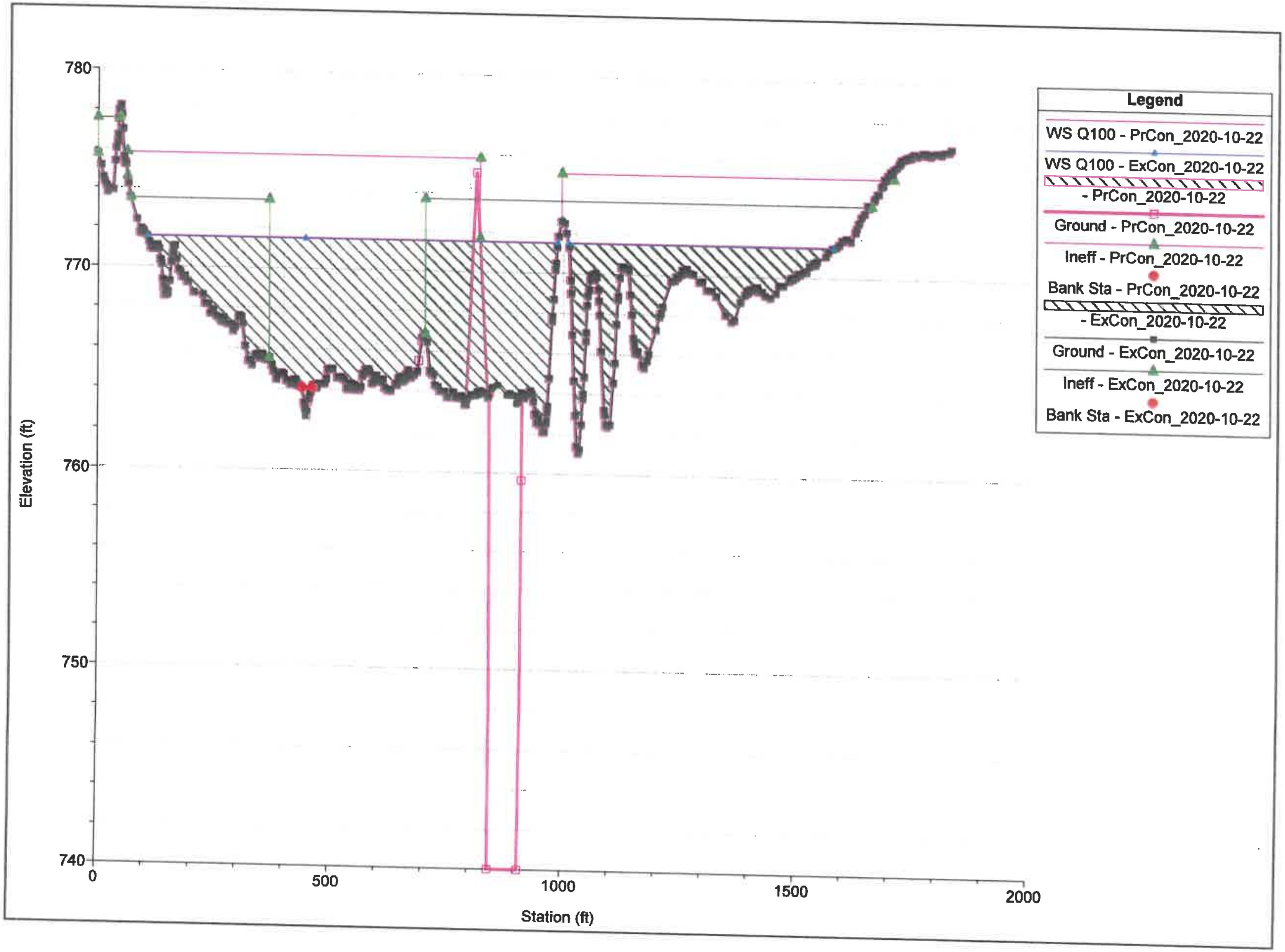

Legend
WS Q100 - PrCon_2020-10-22
WS Q100 - ExCon_2020-10-22
- PrCon_2020-10-22
Ground - PrCon_2020-10-22
Ineff - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
- ExCon_2020-10-22
Ground - ExCon_2020-10-22
Ineff - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22
Elevation (ft)
780
778
776
774
772
770
768
766
764
762
0
200
400
600
800
1000
1200
1400
1600
1800
Station (ft)



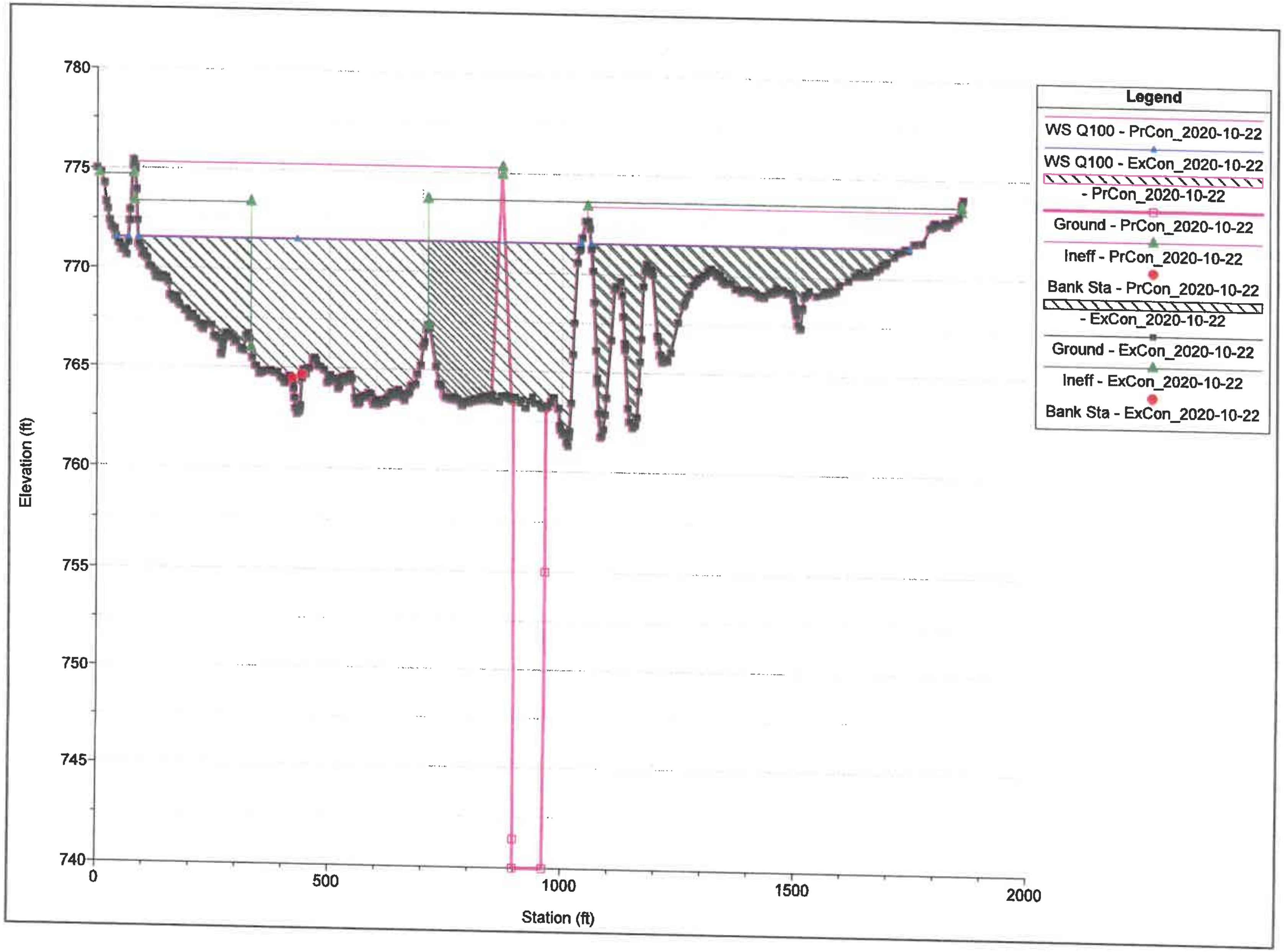
Legend
WS Q100 - PrCon_2020-10-22
WS Q100 - ExCon_2020-10-22
- PrCon_2020-10-22
Ground - PrCon_2020-10-22
Ineff - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
- ExCon_2020-10-22
Ground - ExCon_2020-10-22
Ineff - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22
Elevation (ft)
780
775
770
765
760
755
Station (ft)
0
500
1000
1500
2000

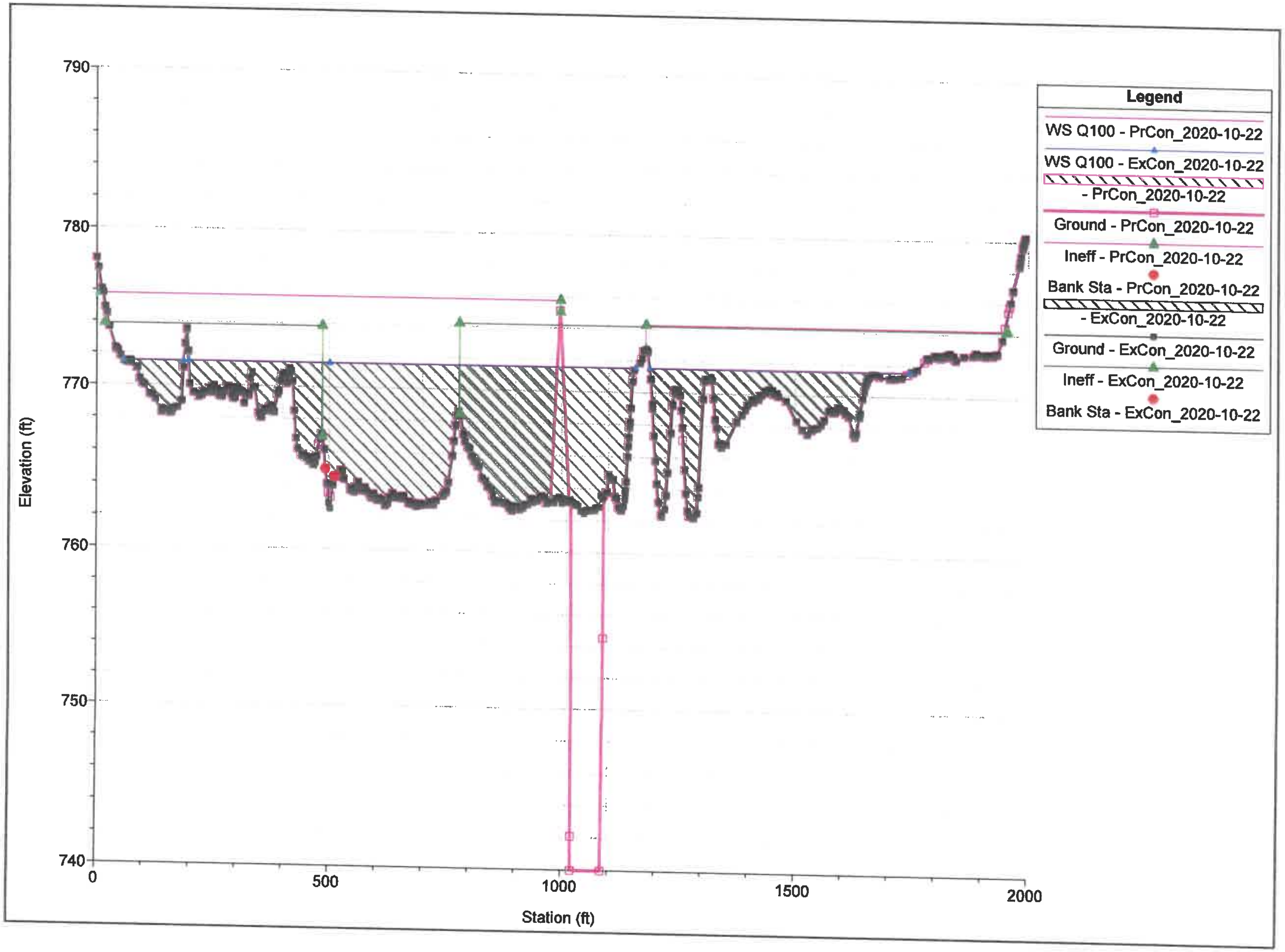

Legend
WS Q100 - PrCon_2020-10-22
WS Q100 - ExCon_2020-10-22
- PrCon_2020-10-22
Ground - PrCon_2020-10-22
Ineff - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
- ExCon_2020-10-22
Ground - ExCon_2020-10-22
Ineff - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22
Elevation (ft)
790
780
770
760
750
740
Station (ft)
0
200
400
600
800
1000
1200
1400
1600
1800


Legend
WS Q100 - PrCon_2020-10-22
WS Q100 - ExCon_2020-10-22
- PrCon_2020-10-22
Ground - PrCon_2020-10-22
Ineff - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
- ExCon_2020-10-22
Ground - ExCon_2020-10-22
Ineff - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22
Elevation (ft)
Station (ft)
780
775
770
765
760
755
750
745
740
0
500
1000
1500
2000

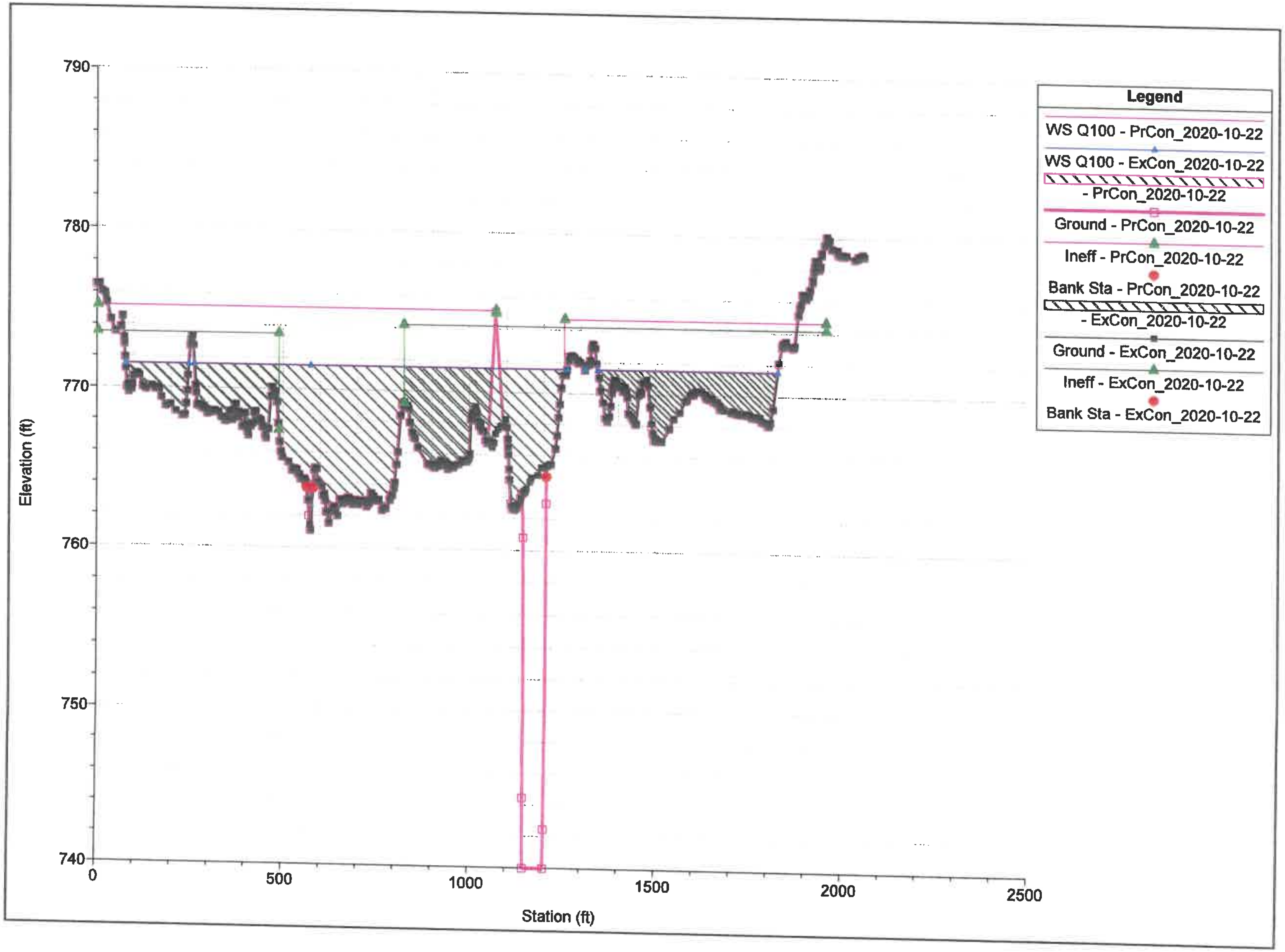


780
770
760
750
740
Elevation (ft)
0
500
1000
1500
2000
Station (ft)
Legend
WS Q100 - PrCon_2020-10-22
WS Q100 - ExCon_2020-10-22
- PrCon_2020-10-22
Ground - PrCon_2020-10-22
Ineff - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
- ExCon_2020-10-22
Ground - ExCon_2020-10-22
Ineff - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22

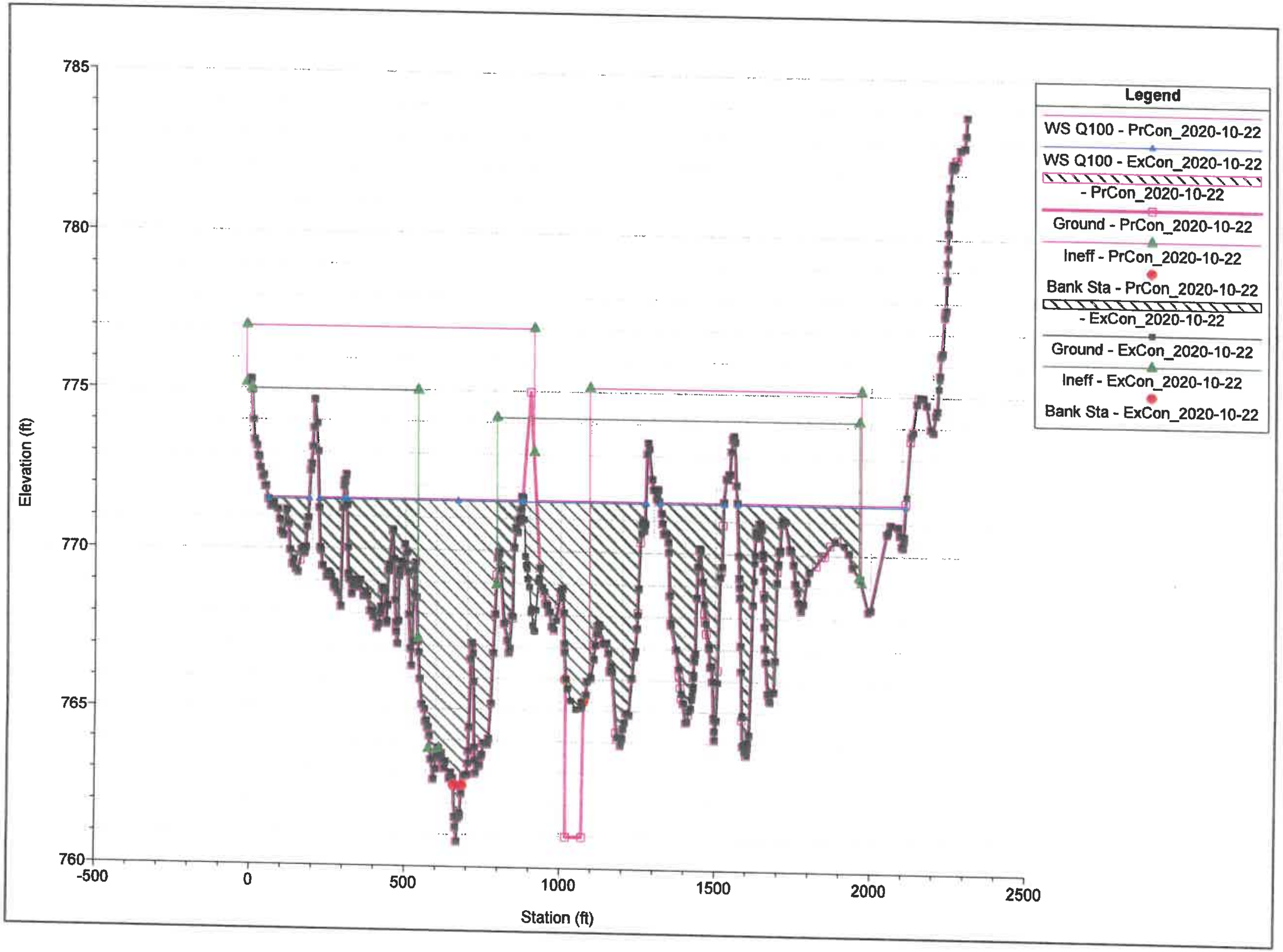

Legend
WS Q100 - PrCon_2020-10-22
WS Q100 - ExCon_2020-10-22
- PrCon_2020-10-22
Ground - PrCon_2020-10-22
Ineff - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
- ExCon_2020-10-22
Ground - ExCon_2020-10-22
Ineff - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22
Elevation (ft)
780
775
770
765
760
755
750
745
740
0
500
1000
1500
2000
Station (ft)

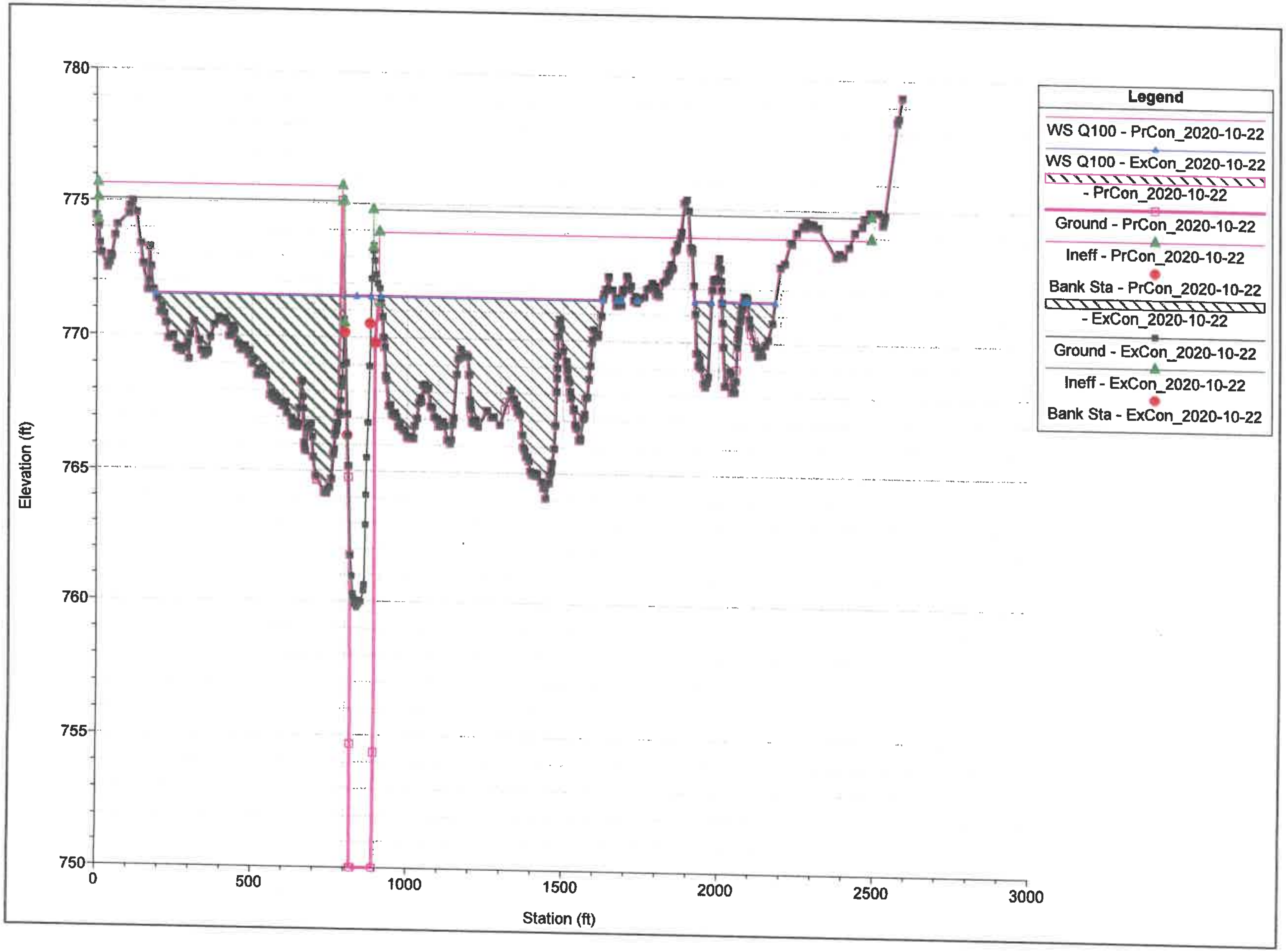


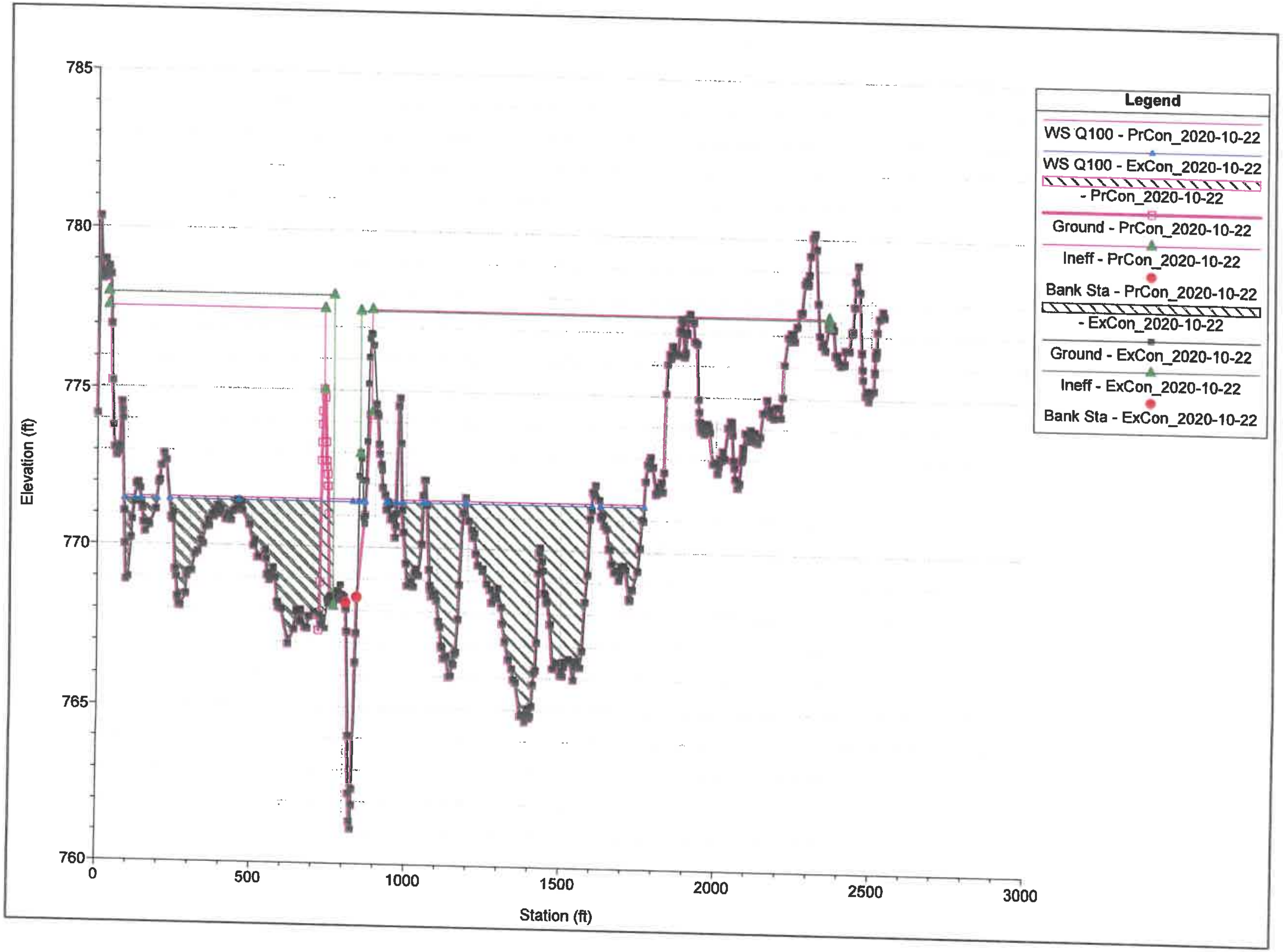
Legend
WS Q100 - PrCon_2020-10-22
WS Q100 - ExCon_2020-10-22
- PrCon_2020-10-22
Ground - PrCon_2020-10-22
Ineff - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
- ExCon_2020-10-22
Ground - ExCon_2020-10-22
Ineff - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22
Elevation (ft)
790
780
770
760
750
740
Station (ft)
0
500
1000
1500
2000



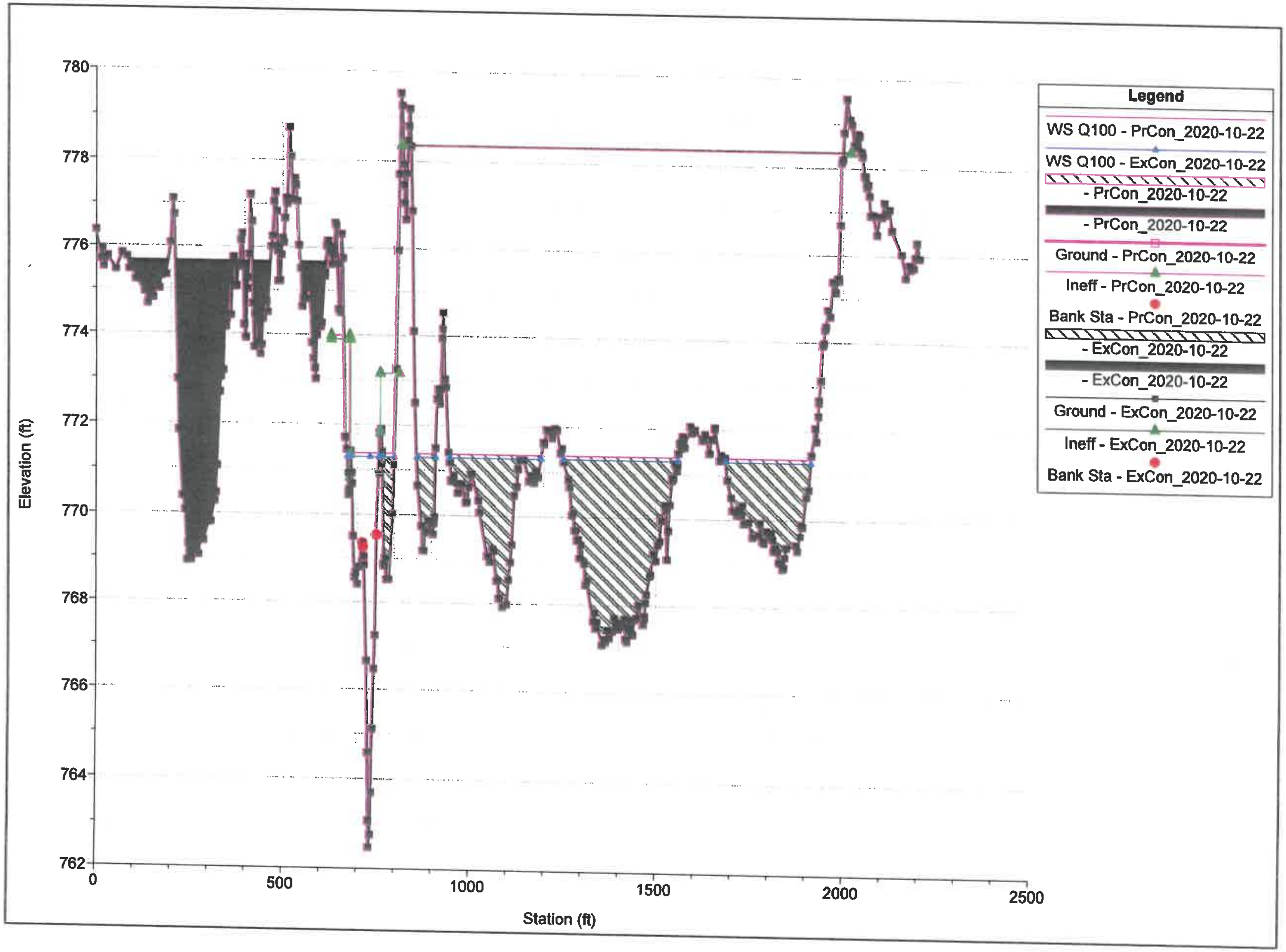
Legend
WS Q100 - PrCon_2020-10-22
WS Q100 - ExCon_2020-10-22
- PrCon_2020-10-22
Ground - PrCon_2020-10-22
Ineff - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
- ExCon_2020-10-22
Ground - ExCon_2020-10-22
Ineff - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22
Elevation (ft)
790
780
770
760
750
740
0
500
1000
1500
2000
2500
Station (ft)


Legend
WS Q100 - PrCon_2020-10-22
WS Q100 - ExCon_2020-10-22
- PrCon_2020-10-22
Ground - PrCon_2020-10-22
Ineff - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
- ExCon_2020-10-22
Ground - ExCon_2020-10-22
Ineff - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22
Elevation (ft)
785
780
775
770
765
760
Station (ft)
-500
0
500
1000
1500
2000
2500

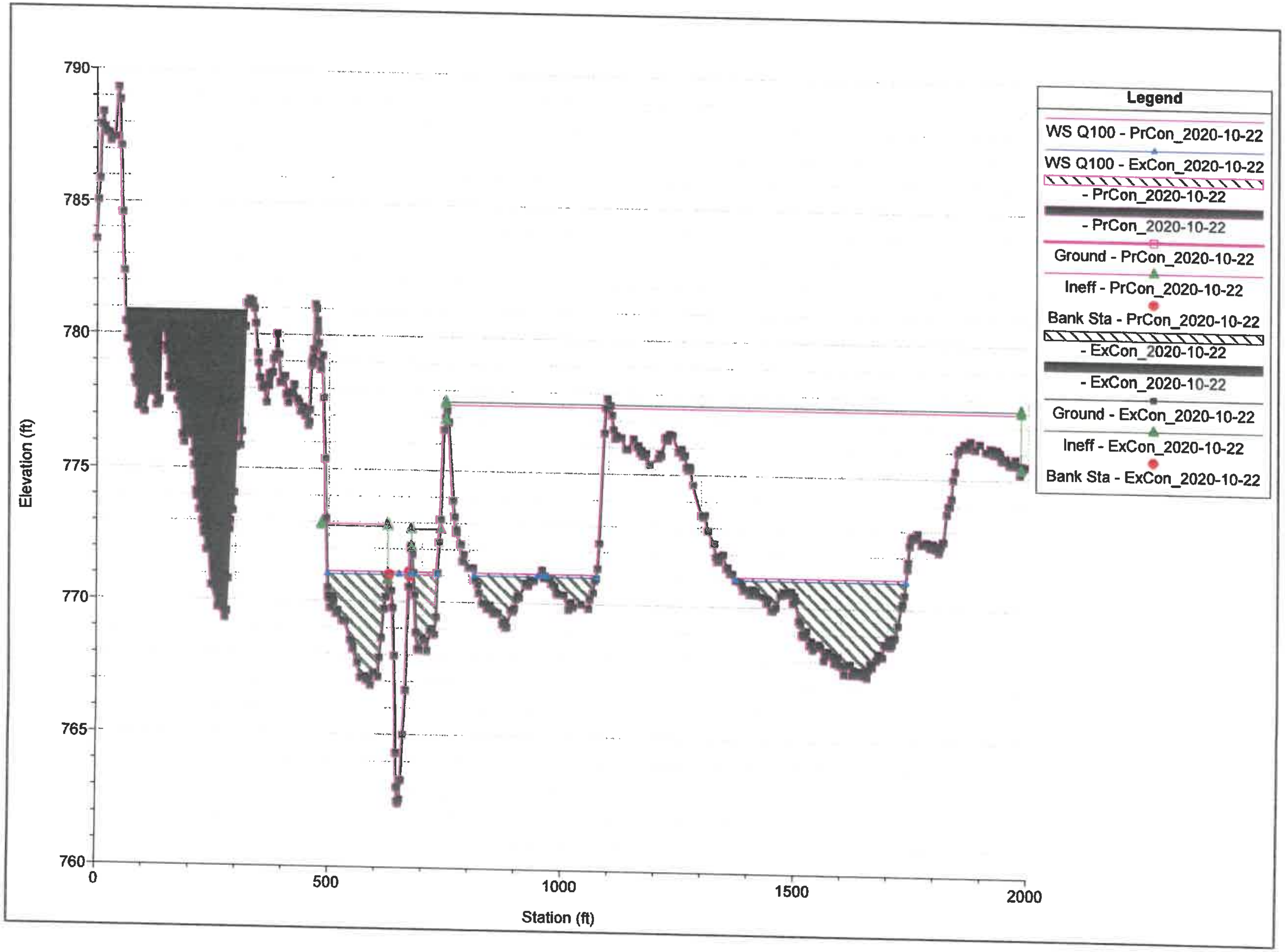

Legend
WS Q100 - PrCon_2020-10-22
WS Q100 - ExCon_2020-10-22
- PrCon_2020-10-22
Ground - PrCon_2020-10-22
Ineff - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
- ExCon_2020-10-22
Ground - ExCon_2020-10-22
Ineff - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22
Elevation (ft)
780
775
770
765
760
755
750
0
500
1000
1500
2000
2500
3000
Station (ft)



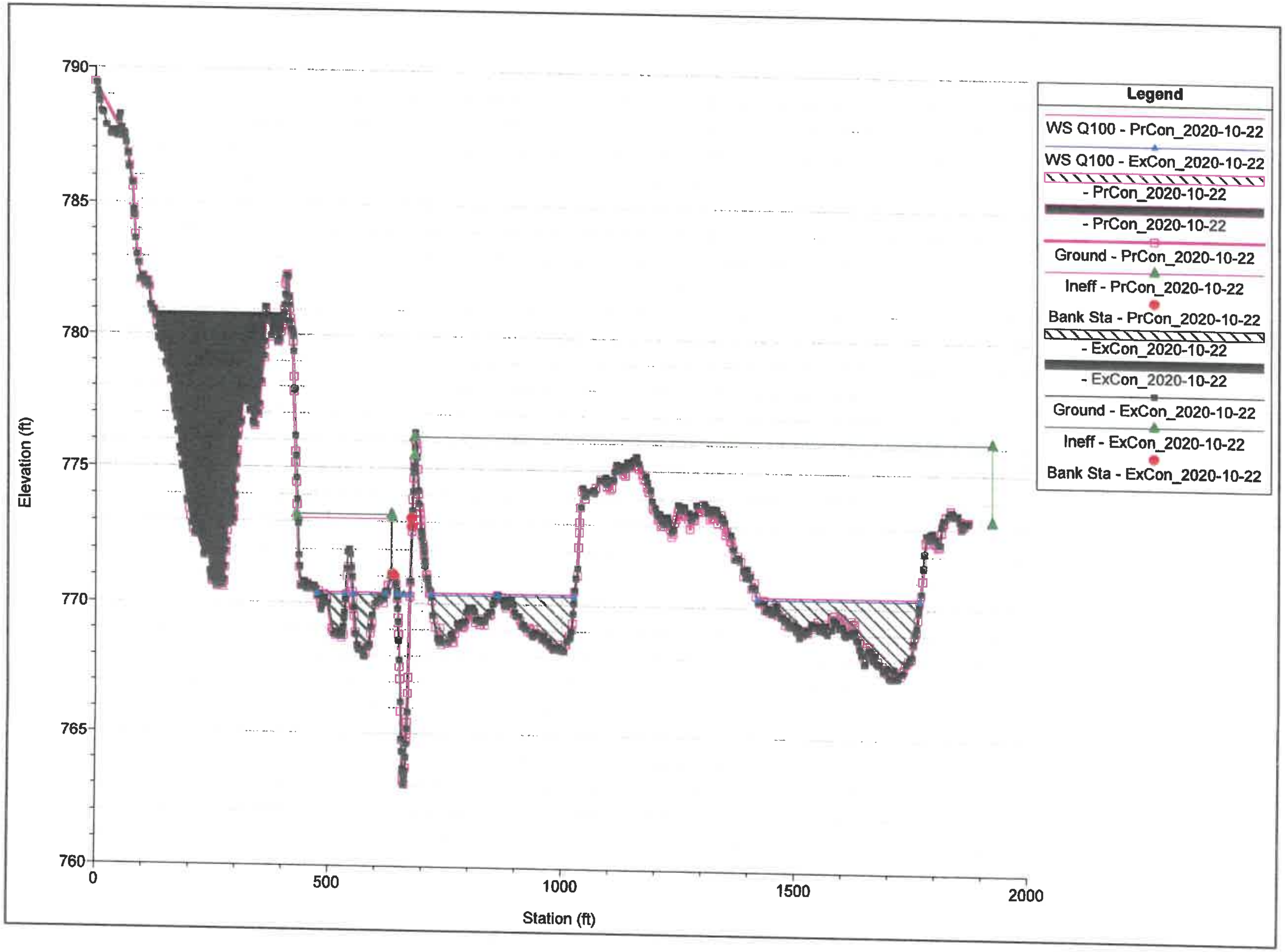
Legend
WS Q100 - PrCon_2020-10-22
WS Q100 - ExCon_2020-10-22
- PrCon_2020-10-22
Ground - PrCon_2020-10-22
Ineff - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
- ExCon_2020-10-22
Ground - ExCon_2020-10-22
Ineff - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22
Elevation (ft)
785
780
775
770
765
760
0
500
1000
1500
2000
2500
3000
Station (ft)

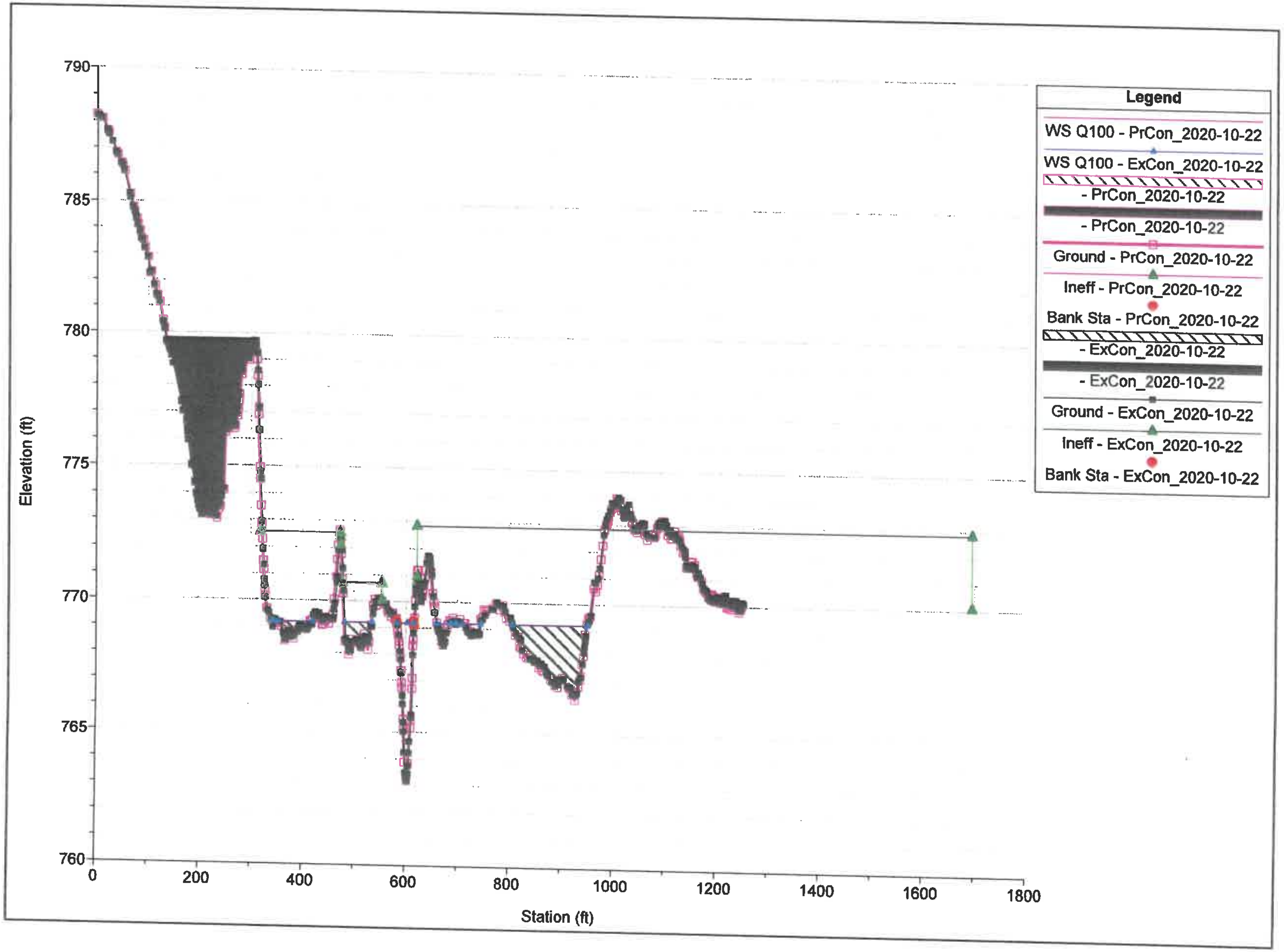


780
778
776
774
772
770
768
766
764
762
Elevation (ft)
0
500
1000
1500
2000
2500
Station (ft)
Legend
WS Q100 - PrCon_2020-10-22
WS Q100 - ExCon_2020-10-22
- PrCon_2020-10-22
- PrCon_2020-10-22
Ground - PrCon_2020-10-22
Ineff - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
- ExCon_2020-10-22
- ExCon_2020-10-22
Ground - ExCon_2020-10-22
Ineff - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22

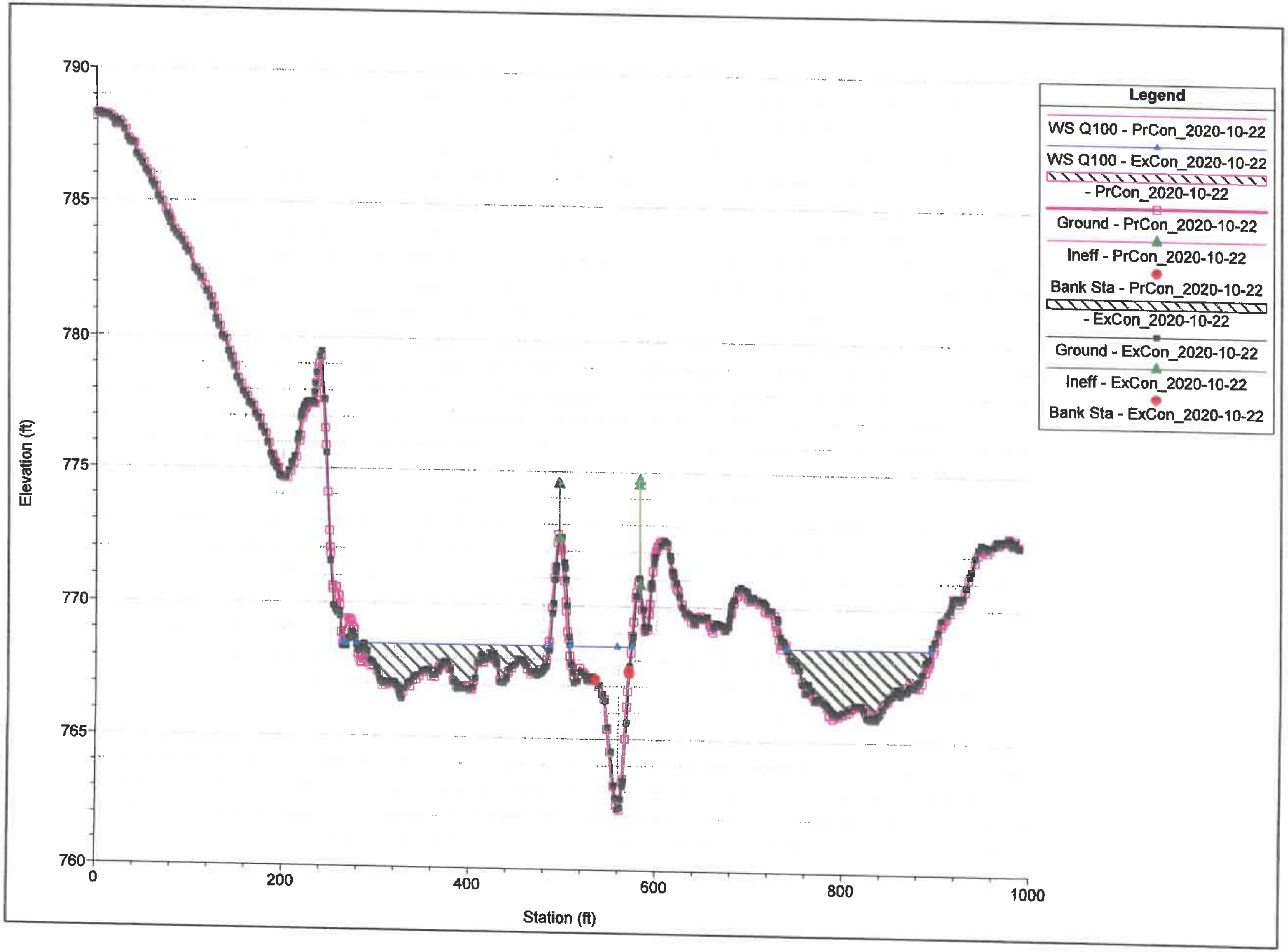


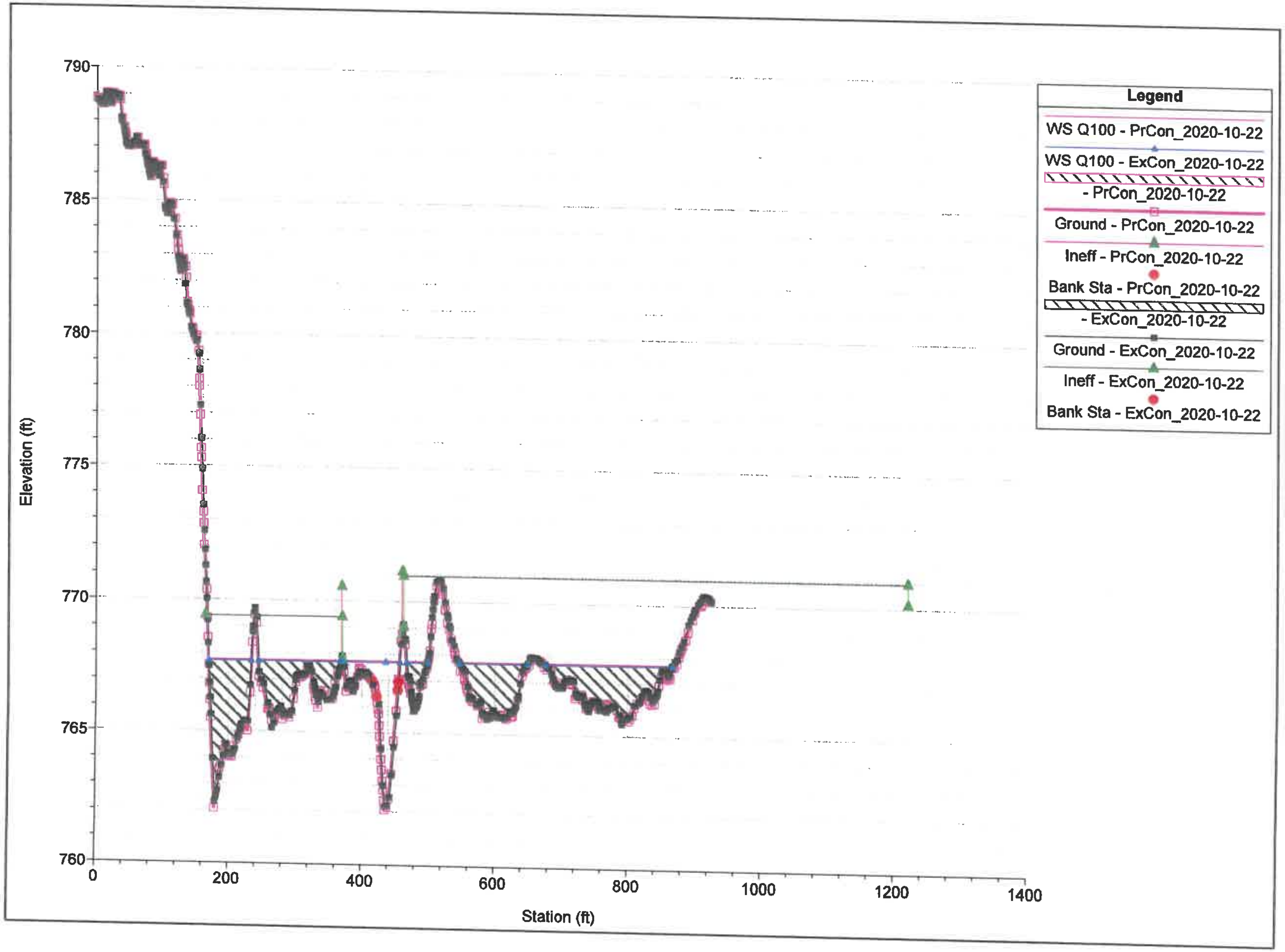
Legend
WS Q100 - PrCon_2020-10-22
WS Q100 - ExCon_2020-10-22
- PrCon_2020-10-22
- PrCon_2020-10-22
Ground - PrCon_2020-10-22
Ineff - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
- ExCon_2020-10-22
- ExCon_2020-10-22
Ground - ExCon_2020-10-22
Ineff - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22
Elevation (ft)
790
785
780
775
770
765
760
0
500
1000
1500
2000
Station (ft)


Legend
WS Q100 - PrCon_2020-10-22
WS Q100 - ExCon_2020-10-22
- PrCon_2020-10-22
- PrCon_2020-10-22
Ground - PrCon_2020-10-22
Ineff - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
- ExCon_2020-10-22
- ExCon_2020-10-22
Ground - ExCon_2020-10-22
Ineff - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22
Elevation (ft)
790
785
780
775
770
765
760
Station (ft)
0
500
1000
1500
2000

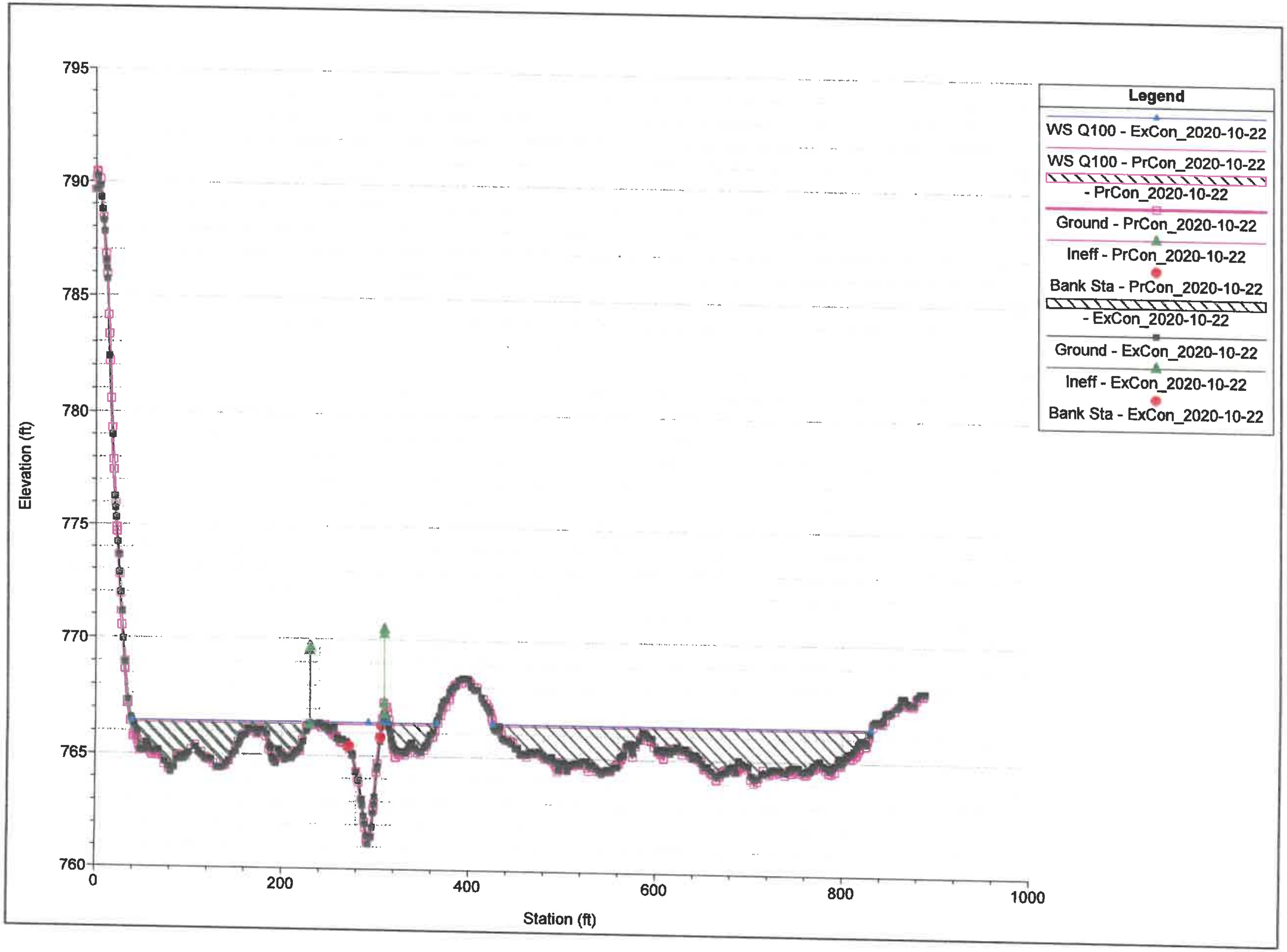


Elevation (ft)
790
785
780
775
770
765
760
0
200
400
600
800
1000
1200
1400
1600
1800
Station (ft)
Legend
WS Q100 - PrCon_2020-10-22
WS Q100 - ExCon_2020-10-22
- PrCon_2020-10-22
- PrCon_2020-10-22
Ground - PrCon_2020-10-22
Ineff - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
- ExCon_2020-10-22
- ExCon_2020-10-22
Ground - ExCon_2020-10-22
Ineff - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22

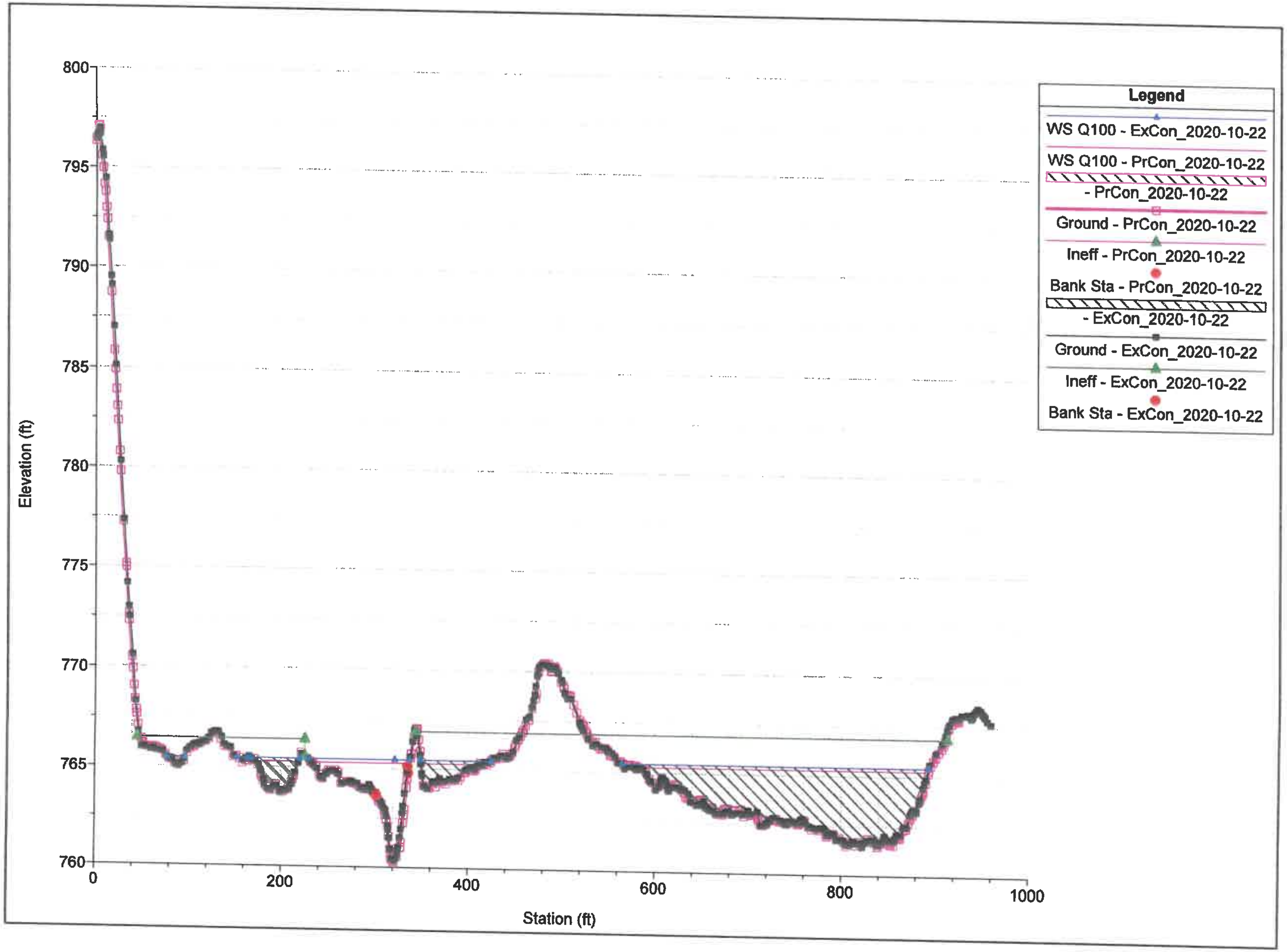

Legend
WS Q100 - PrCon_2020-10-22
WS Q100 - ExCon_2020-10-22
- PrCon_2020-10-22
Ground - PrCon_2020-10-22
Ineff - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
- ExCon_2020-10-22
Ground - ExCon_2020-10-22
Ineff - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22
Elevation (ft)
Station (ft)
790
785
780
775
770
765
760
0
200
400
600
800
1000

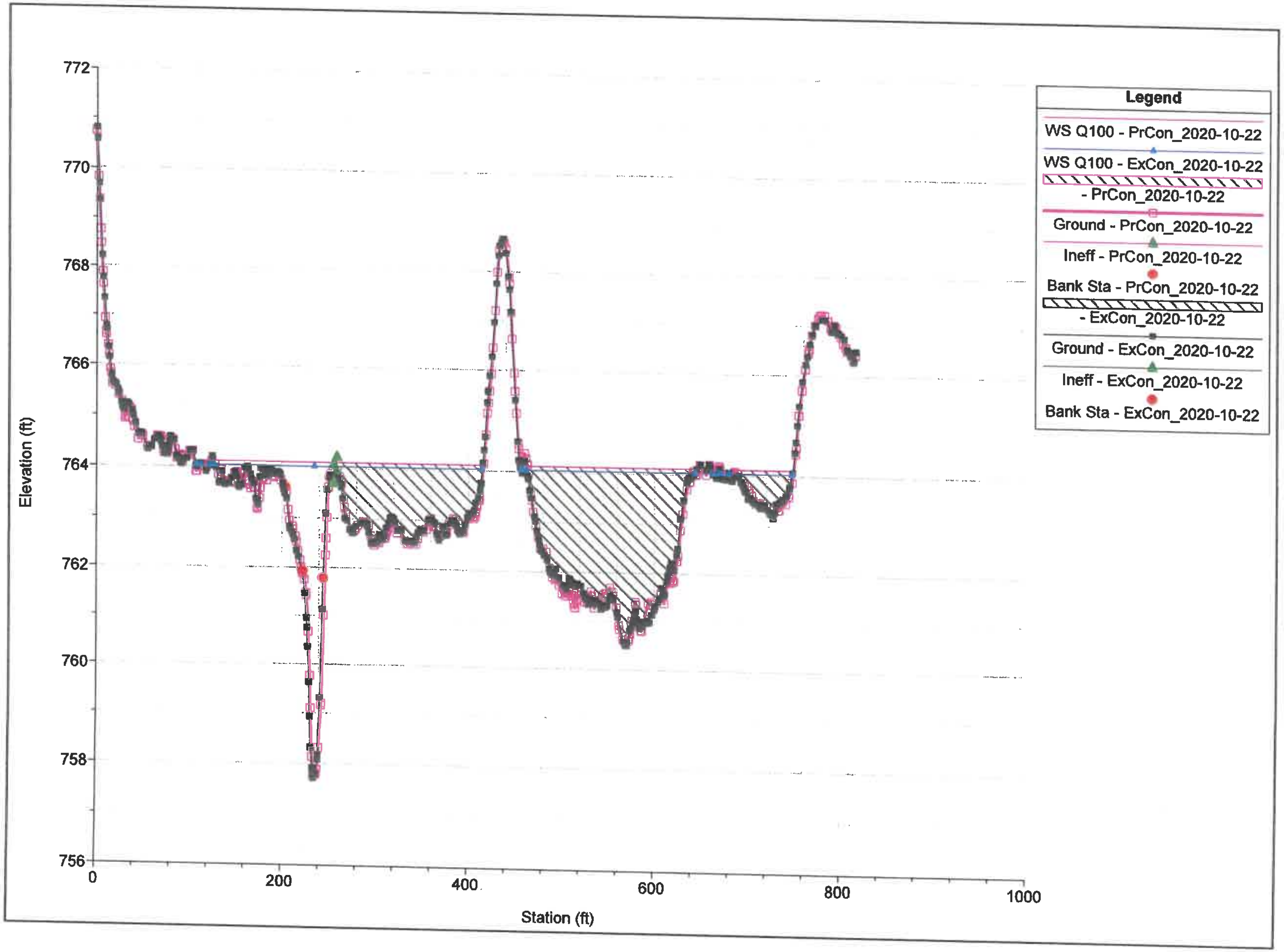


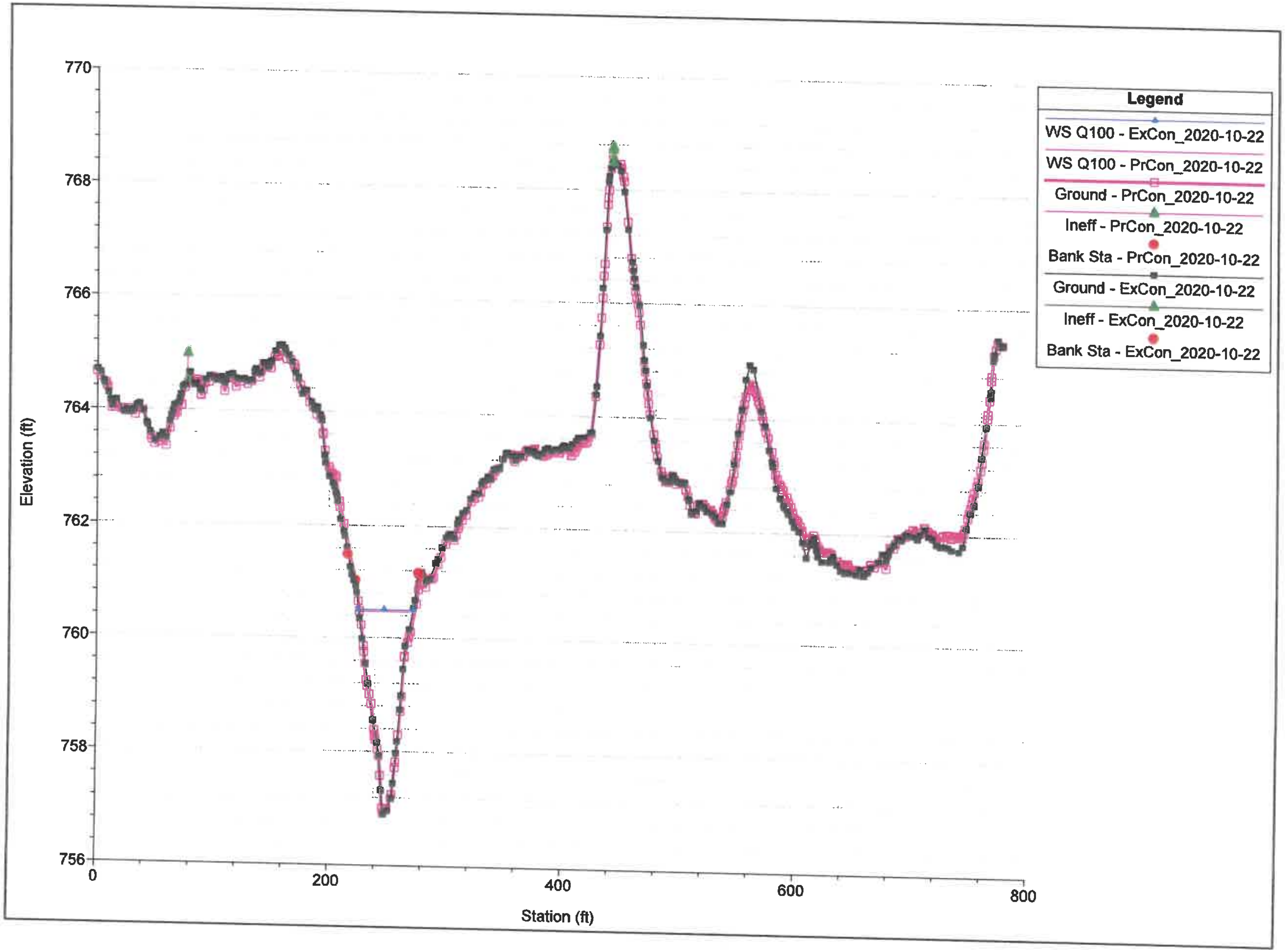
790
785
780
775
770
765
760
Elevation (ft)
0
200
400
600
800
1000
1200
1400
Station (ft)
Legend
WS Q100 - PrCon_2020-10-22
WS Q100 - ExCon_2020-10-22
- PrCon_2020-10-22
Ground - PrCon_2020-10-22
Ineff - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
- ExCon_2020-10-22
Ground - ExCon_2020-10-22
Ineff - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22



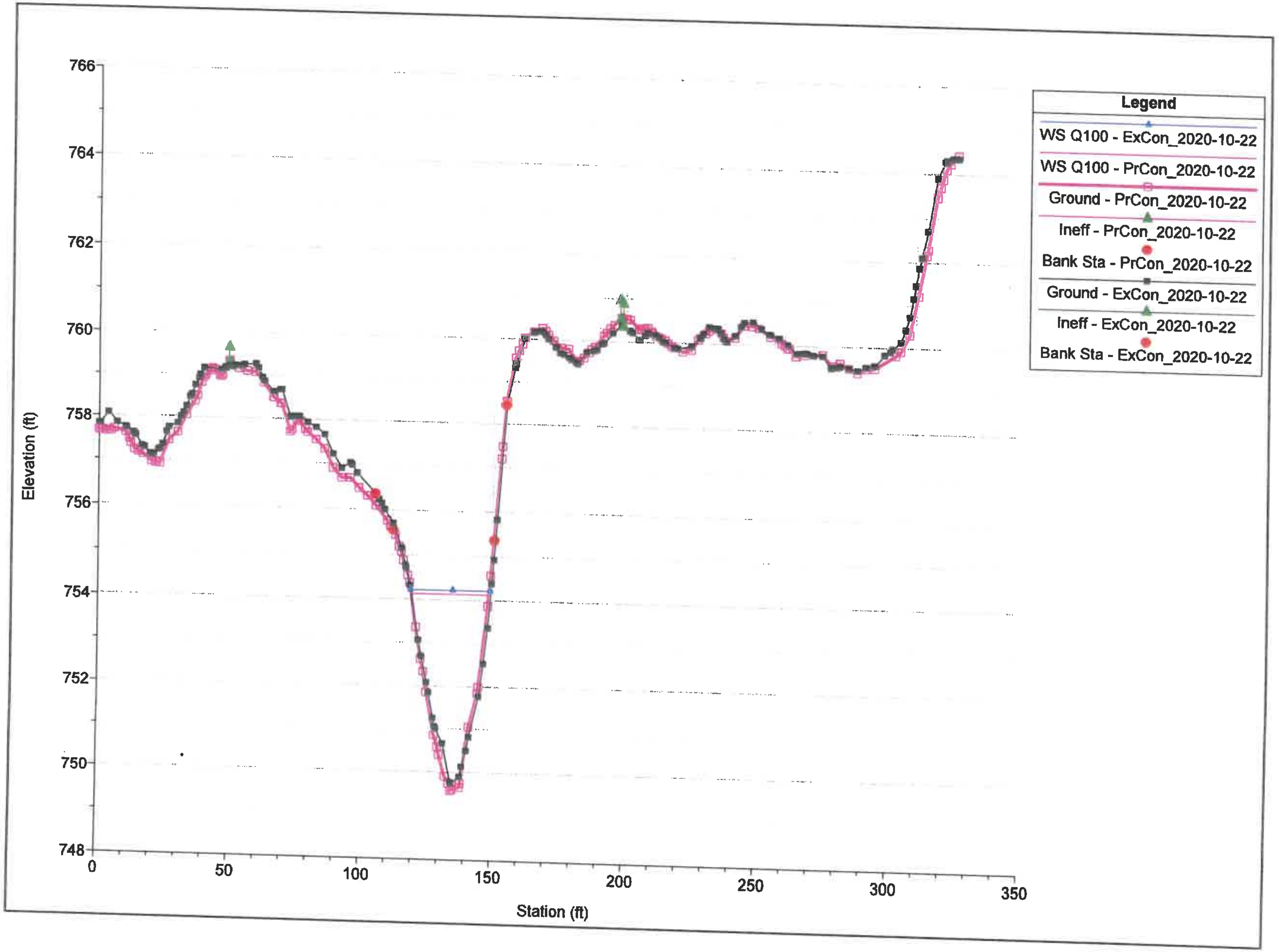
Legend
WS Q100 - ExCon_2020-10-22
WS Q100 - PrCon_2020-10-22
- PrCon_2020-10-22
Ground - PrCon_2020-10-22
Ineff - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
- ExCon_2020-10-22
Ground - ExCon_2020-10-22
Ineff - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22
Elevation (ft)
Station (ft)
795
790
785
780
775
770
765
760
0
200
400
600
800
1000


Legend
WS Q100 - ExCon_2020-10-22
WS Q100 - PrCon_2020-10-22
- PrCon_2020-10-22
Ground - PrCon_2020-10-22
Ineff - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
- ExCon_2020-10-22
Ground - ExCon_2020-10-22
Ineff - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22
Elevation (ft)
800
795
790
785
780
775
770
765
760
Station (ft)
0
200
400
600
800
1000


Legend
WS Q100 - PrCon_2020-10-22
WS Q100 - ExCon_2020-10-22
- PrCon_2020-10-22
Ground - PrCon_2020-10-22
Ineff - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
- ExCon_2020-10-22
Ground - ExCon_2020-10-22
Ineff - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22
Elevation (ft)
772
770
768
766
764
762
760
758
756
Station (ft)
0
200
400
600
800
1000



Legend
WS Q100 - ExCon_2020-10-22
WS Q100 - PrCon_2020-10-22
Ground - PrCon_2020-10-22
Ineff - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
Ground - ExCon_2020-10-22
Ineff - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22
Elevation (ft)
770
768
766
764
762
760
758
756
0
200
400
600
800
Station (ft)



Legend
WS Q100 - ExCon_2020-10-22
WS Q100 - PrCon_2020-10-22
Ground - PrCon_2020-10-22
Ineff - PrCon_2020-10-22
Bank Sta - PrCon_2020-10-22
Ground - ExCon_2020-10-22
Ineff - ExCon_2020-10-22
Bank Sta - ExCon_2020-10-22
Elevation (ft)
Station (ft)
766
764
762
760
758
756
754
752
750
748
0
50
100
150
200
250
300
350

CONTINENTAL PLACER INC.

II Winners Circle • Albany, New York 12205
(518) 458-9203 *fax* (518) 458-9206
www.continentalplacer.com

MEMORANDUM

To:	Mark Carabetta, Milone & Macbroom
From:	Continental Placer Inc.
RE:	Dolomite Products Co., Inc., Mud Creek Realignment
Date:	September 29, 2020

Subject: FEMA Request for Additional Data
Case No: 20-02-1048R
Community: Town of LeRoy, NY
Community No: 360280

INTRODUCTION

The following information is in response to a July 30, 2020 letter from the National Flood Insurance Program/FEMA, requesting additional pertinent information needed to complete a review of a proposed relocation of Mud Creek in the Town of LeRoy, New York.

The analysis was developed and certified by a professional engineer and a senior geologist. Their report and supporting data accompanies this memorandum as follows.

MUD CREEK HYDROLOGIC ANALYSIS

Dolomite Products Co., Inc has applied to the New York State Department of Environmental Conservation (DEC) for a mined land use plan/mining permit modification dated January 20, 2015. The modification would allow mining of 29± acres of reserve land on owned property contiguous to the currently permitted life-of-mine area at the Leroy, New York quarry. The 29 acre area contains an intermittent stream/drainage swale known as Mud Creek; Dolomite proposes to relocate a section of Mud Creek off the 29 acres to allow for mining.

The relocation will entail approximately 2515± linear feet of the creek bed being moved to a location between the 29 acre expansion area and Dolomite's southern property line. The appended Mud Creek Relocation Plan shows both the current and proposed locations and several channel profiles. The new channel has been designed in three sections that include an upper section 1160 feet in length, with a width of 32 feet and depth of 4 feet. This section will be graded to have a 5 foot drop in elevation over the 1160 foot length. The additional portion of the relocated channel will be basically a long "slot cut" blasted into the underlying bedrock (see channel profiles). The upper portion of the slot cut channel is 50 to 65 feet in width with a depth of 25 feet. The upper and lower sections of the slot-cut channel are separated by a broad crested weir formed by leaving a 55 by 35 foot section of bedrock in-place. This weir will act to minimize upward flow or tailwater conditions from quarry water discharge at low and moderate flow conditions in the system.

HydroCAD was utilized to aid in the design process of the Mud Creek channel realignment. HydroCAD is a computer aided design program for modeling the hydrology and hydraulics of stormwater runoff. The software is largely based on the hydrology techniques developed by the Soil Conservation Service (NRCS, TR-20 and TR-55), combined with other hydrology and hydraulic calculations. Based on a given rainfall event these techniques are used to generate data and hydrographs throughout the modeled watershed. This allows for the verification that a given drainage system, and its component structures, are adequately sized for the area under consideration, or to predict where flooding or erosion issues are likely to occur.

The software allows for the development of a complete database for the watershed and drainage system. Each drainage system is represented by a network of nodes. Three primary node types are used which include:

Subcatchment: A relatively homogenous area of land that typically drains into a reach or pond. Each subcatchment generates a runoff hydrograph. Three major subcatchment areas were modeled and encompass 140 acres of runoff area between Route 5 and Mud Creek. The subcatchments are noted as area 1 west, trailer park and area 2 east, and the airport.

Pond: A pond, swamp, dam, or other impoundment that fills with water from one or more sources and empties in a manner determined by a weir, culvert, or other outlet device. The outflow of each pond is determined by a hydrograph routing calculation which attenuates and delays the peak flow. The slot-cut channel sections have been modeled as ponds in order to account for the cumulative storage and to determine the flood elevation associated with the structures. The twin culverts, located under the adjacent railroad grade at the secondary channel, have been modeled as a discharge structure of a small pond. This was done to determine possible tailwater conditions and to model the head associated with ponding of water on the inlet side of the culverts.

Reach: A uniform stream, channel, or pipe that conveys water from one point to another and operates under open channel flow. Four reach sections were modeled and these include; the main Mud Creek portion from the Route 5 bridge to the rail bridge, the eastern Mud Creek channel through the airport, the Mud Creek channel from the railroad bridge to the relocation, and the upper relocation section.

The Mud Creek Relocation Plan Map is keyed to the accompanying HydroCAD flow diagram with reference nodes for each subcatchment, Pond, and Reach. The reference symbols correspond to printed HydroCAD node results.

The printed results from the HydroCAD software have also been included. The results include the data generated for a, 100 year, Type II 24 hour storm, which represents a 4.9 inch rainfall event. HydroCAD model time span was set for 180 hours or 7.5 days.

An existing base flow can be introduced into the modeled system by way of a reach node. In order to account for the runoff from the drainage area south of Route 5, and resultant flow in Mud Creek, a base flow was applied. Between 1974 and 1977, a stream flow gauge was operated by the USGS on Mud Creek at Route 5, just upstream of the proposed stream relocation (04230470). Peak streamflow measurements were recorded for the years of 1975 and 1976 and actual measured peak for this period was 201 cfs (see attachment). This peak measurement occurred on March 5, 1976 and corresponded with a significant rainfall and snowmelt event.

Dr. Paul Richards and his students at the SUNY College at Brockport have studied extensively the geology and complex hydrology of Mud Creek. As part of Richards study, he recorded flow rates for both the main and eastern Mud Creek channels (spring of 2008), at the Route 5 bridge locations. Richards peak flow, recorded on March 27, 2008 was 41.7 cfs in the main channel and 3.85 cfs. In the eastern channel. Richards also noted that over fifty percent of the Mud Creek channel flow is lost to the stream bed between Route 5 and Gulf Road.

Based on the measured USGS data, (Table 1, 3/5/76 measured), a base flow of 201 cfs or 90,215 gpm was applied to the main channel of Mud Creek (Reach 1) and a base flow of 19.3 cfs or 8,662 gpm was applied to the Mud Creek eastern channel (Reach 3). The base flow rates were used to represent the flow rate, from a Spring runoff event, for the Mud Creek drainage South of Route 5 and were modeled as constant rate throughout the storm event. A conservative, discarded flow rate of 5 cfs or 2,244 gpm, was utilized for the two channel slot cuts, to represent water lost to bedding plane, fractures, and karst features.

The HydroCAD results show that the maximum water depth, for the relocated Mud Creek segment (Reach 2AR 20 foot bottom width by 4 foot depth), will be 3.39 feet in depth, with a peak discharge of 634 cfs, during the 100 year storm event. Slot cut 1 (Pond 1P) will reach a peak elevation of 764.4 feet which is 0.6 feet below the current flood elevation and 0.1 foot below the invert elevation of the twin culverts under the railroad grade The maximum flow over the weir outlet will be 491 cfs. Slot cut 2 (Pond 2P) will reach a peak elevation of 764.95 feet, which is below the 768 foot flood elevation. The peak outflow from the system will be 491.4 cfs. The peak runoff for the eastern section of Mud Creek combined with the airport drainage (64 acres) was calculated at 70.6 88.43 cfs. The peak elevation at the twin culvert inlet will be 767.34, 0.34 feet over flood elevation.

Submitted by:

DA Myers

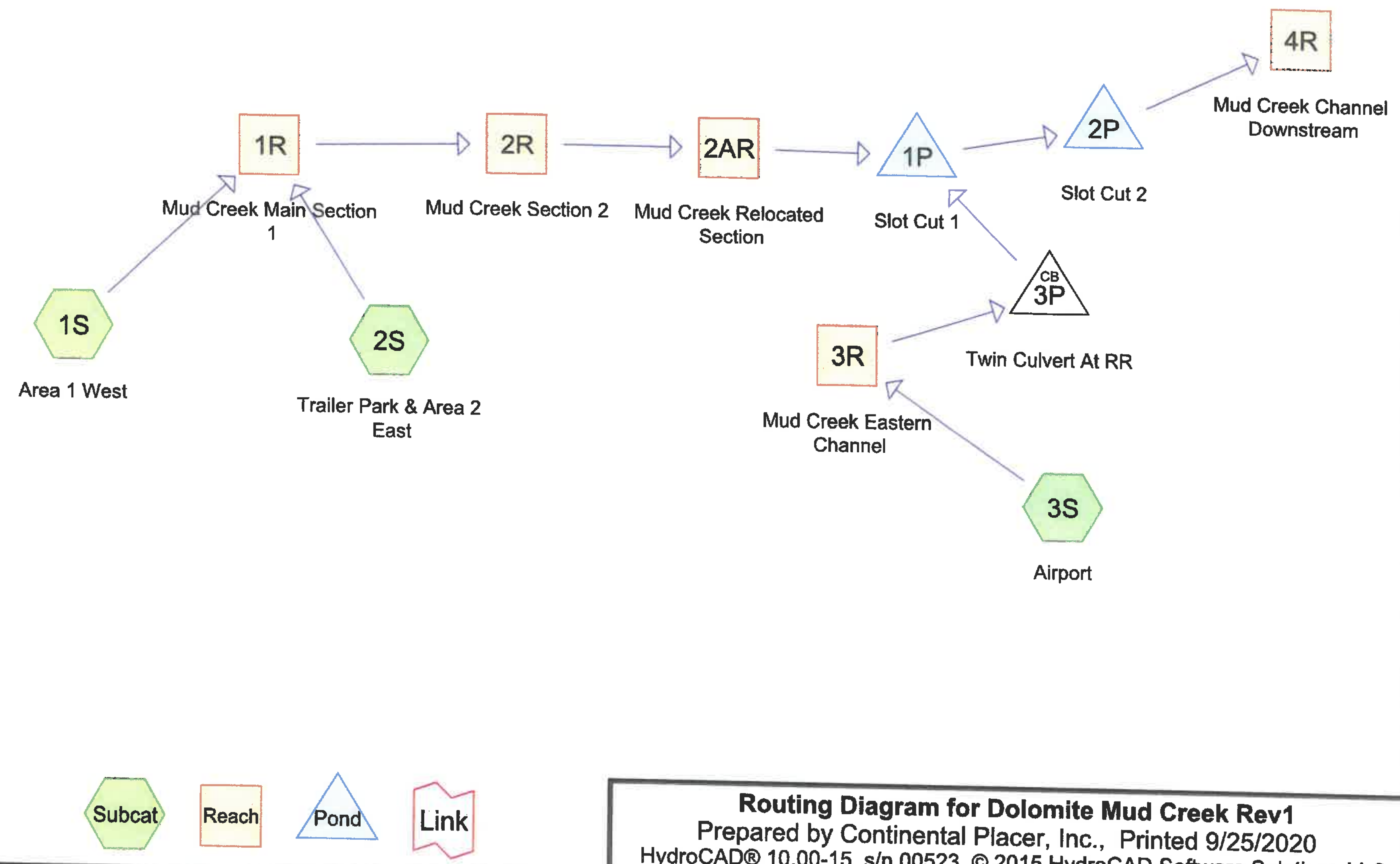
David A. Myers
Professional Engineer
October 6, 2020

Jeffrey Slade
Senior Geologist
Continental Placer Inc.
October 6, 2020

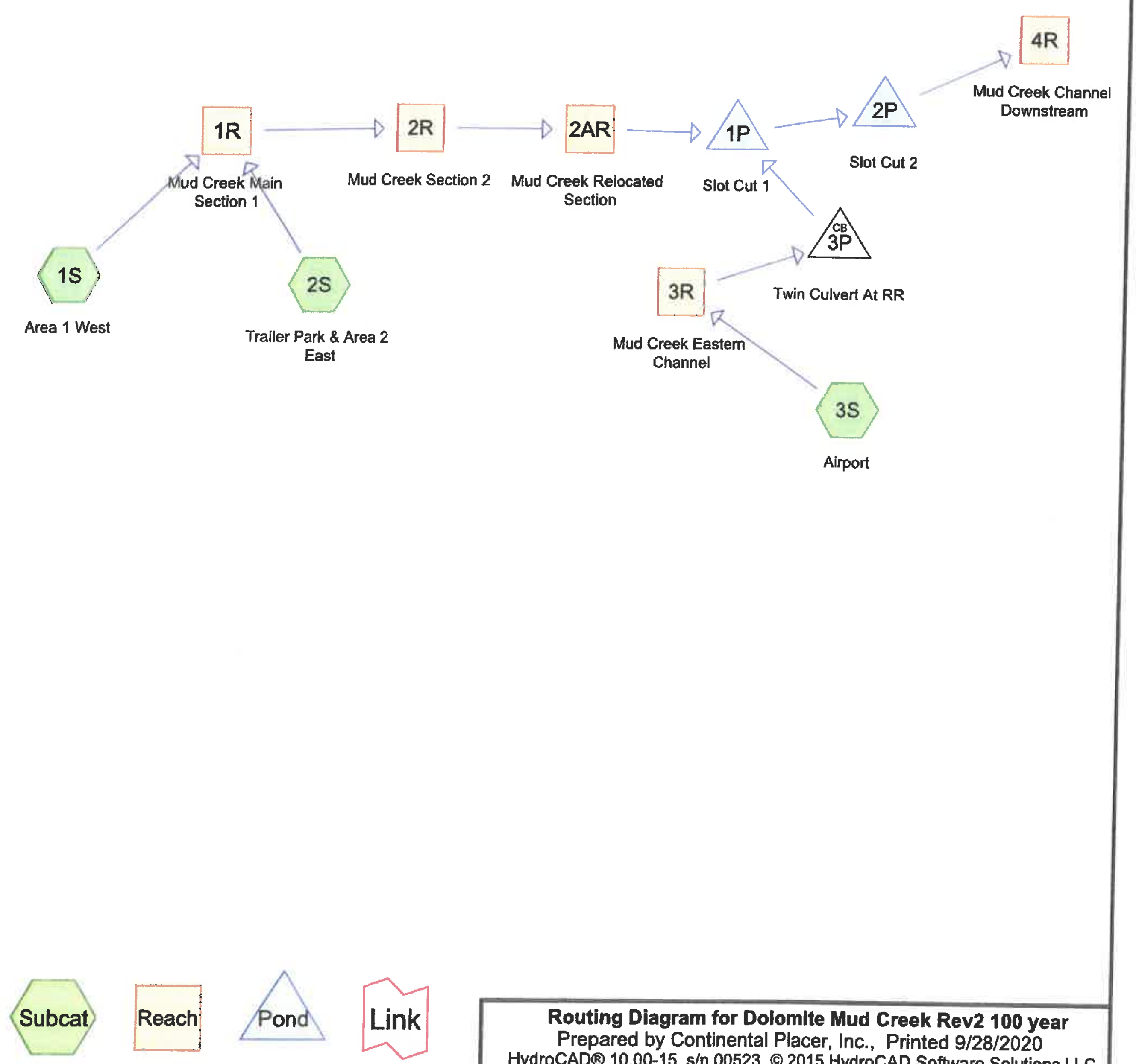
STATE OF NEW YORK
DAVID A. MYERS
061985
PROFESSIONAL ENGINEER

STATE OF NEW YORK
JEFFREY ALAN SLADE
783
LICENSED PROFESSIONAL GEOLOGIST

ATTACHMENTS



Routing Diagram for Dolomite Mud Creek Rev1
Prepared by Continental Placer, Inc., Printed 9/25/2020
HydroCAD® 10.00-15 s/n 00523



Routing Diagram for Dolomite Mud Creek Rev2 100 year
Prepared by Continental Placer, Inc., Printed 9/28/2020

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.000	68	1 acre lots, 20% imp, HSG B (1S)
7.300	75	1/4 acre lots, 38% imp, HSG B (2S)
64.100	61	>75% Grass cover, Good, HSG B (1S, 2S, 3S)
22.000	98	Paved parking, HSG B (3S)
18.200	74	Row crops, C + CR, Good, HSG B (2S)
24.500	75	Small grain, straight row, Good, HSG B (1S)
2.000	58	Woods/grass comb., Good, HSG B (1S)
140.100	**72**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
140.100	HSG B	1S, 2S, 3S
0.000	HSG C	
0.000	HSG D	
0.000	Other	
140.100		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	2.000	0.000	0.000	0.000	2.000	1 acre lots, 20% imp	1S
0.000	7.300	0.000	0.000	0.000	7.300	1/4 acre lots, 38% imp	2S
0.000	64.100	0.000	0.000	0.000	64.100	>75% Grass cover, Good	1S, 2S, 3S
0.000	22.000	0.000	0.000	0.000	22.000	Paved parking	3S
0.000	18.200	0.000	0.000	0.000	18.200	Row crops, C + CR, Good	2S
0.000	24.500	0.000	0.000	0.000	24.500	Small grain, straight row, Good	1S
0.000	2.000	0.000	0.000	0.000	2.000	Woods/grass comb., Good	1S
0.000	**140.100**	**0.000**	**0.000**	**0.000**	**140.100**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	3P	764.50	764.00	60.0	0.0083	0.025	60.0	0.0	0.0
2	3P	764.50	764.00	60.0	0.0083	0.025	60.0	0.0	0.0

Time span=2.00-180.00 hrs, dt=0.05 hrs, 3561 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Area 1 West Runoff Area=35.500 ac 1.13% Impervious Runoff Depth=2.04"
Flow Length=3,300' Tc=54.7 min CN=71 Runoff=39.98 cfs 6.039 af

Subcatchment 2S: Trailer Park & Area 2 East Runoff Area=40.600 ac 6.83% Impervious Runoff Depth=1.89"
Flow Length=2,400' Tc=45.1 min CN=69 Runoff=47.90 cfs 6.378 af

Subcatchment 3S: Airport Runoff Area=64.000 ac 34.38% Impervious Runoff Depth=2.28"
Flow Length=4,800' Slope=0.0085 '/' Tc=68.4 min CN=74 Runoff=69.45 cfs 12.185 af

Reach 1R: Mud Creek Main Section 1 Avg. Flow Depth=3.85' Max Vel=5.95 fps Inflow=636.44 cfs 8,105.598 af
n=0.040 L=1,745.0' S=0.0063 '/' Capacity=844.96 cfs Outflow=634.99 cfs 8,096.895 af

Reach 2AR: Mud Creek Relocated Section Avg. Flow Depth=3.39' Max Vel=7.45 fps Inflow=634.62 cfs 8,093.186 af
n=0.025 L=1,160.0' S=0.0043 '/' Capacity=848.20 cfs Outflow=634.19 cfs 8,089.166 af

Reach 2R: Mud Creek Section 2 Avg. Flow Depth=3.10' Max Vel=8.29 fps Inflow=634.99 cfs 8,096.895 af
n=0.025 L=1,190.0' S=0.0059 '/' Capacity=990.87 cfs Outflow=634.62 cfs 8,093.186 af

Reach 3R: Mud Creek Eastern Channel Avg. Flow Depth=1.46' Max Vel=3.77 fps Inflow=88.75 cfs 296.182 af
n=0.035 L=2,300.0' S=0.0065 '/' Capacity=1,318.21 cfs Outflow=86.43 cfs 295.429 af

Reach 4R: Mud Creek Channel Avg. Flow Depth=5.11' Max Vel=3.76 fps Inflow=486.40 cfs 5,051.274 af
n=0.040 L=1,500.0' S=0.0020 '/' Capacity=464.57 cfs Outflow=483.28 cfs 5,044.682 af

Pond 1P: Slot Cut 1 Peak Elev=764.44' Storage=75,000 cf Inflow=713.39 cfs 8,384.595 af
Discarded=5.00 cfs 73.430 af Primary=491.41 cfs 5,122.767 af Outflow=496.41 cfs 5,196.196 af

Pond 2P: Slot Cut 2 Peak Elev=764.95' Storage=18,694 cf Inflow=491.41 cfs 5,122.767 af
Discarded=5.00 cfs 73.430 af Primary=486.40 cfs 5,051.274 af Outflow=491.40 cfs 5,124.704 af

Pond 3P: Twin Culvert At RR Peak Elev=767.34' Inflow=86.43 cfs 295.429 af
Outflow=86.43 cfs 295.429 af

Total Runoff Area = 140.100 ac Runoff Volume = 24.601 af Average Runoff Depth = 2.11"
82.03% Pervious = 114.926 ac 17.97% Impervious = 25.174 ac

Summary for Subcatchment 1S: Area 1 West

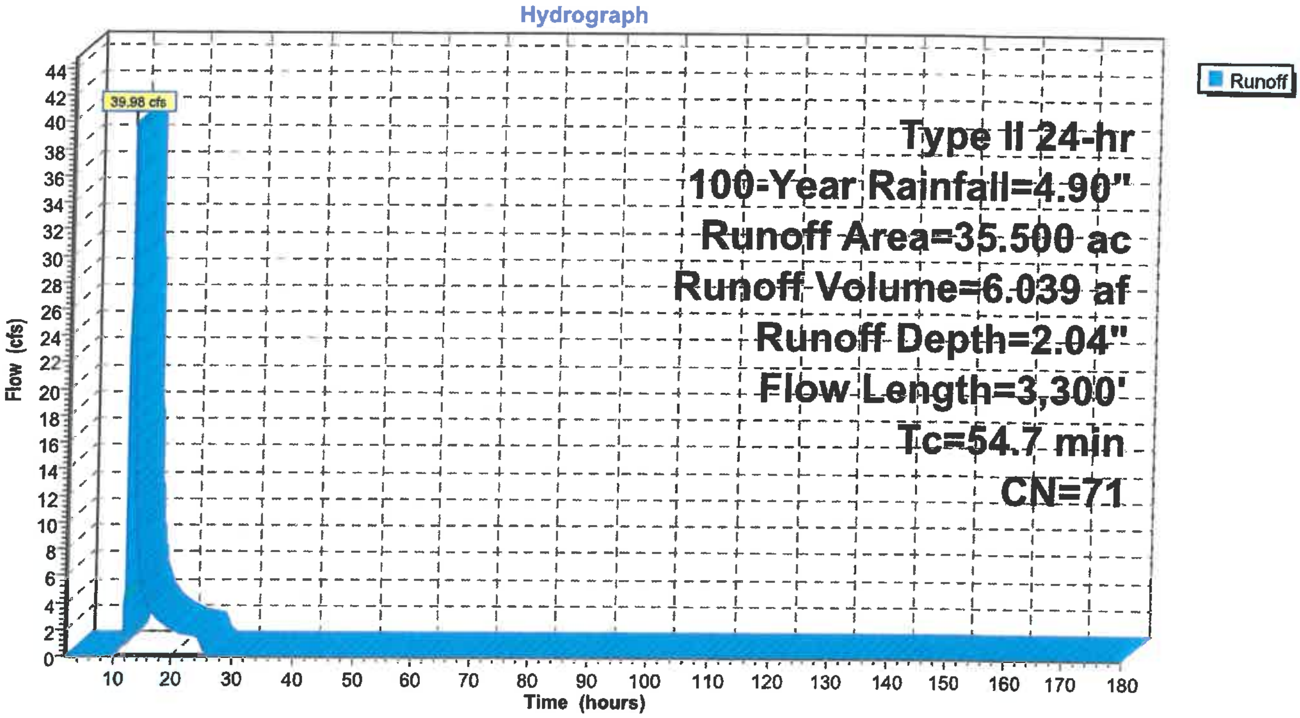
Runoff = 39.98 cfs @ 12.58 hrs, Volume= 6.039 af, Depth= 2.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-180.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=4.90"

Area (ac)	CN	Description
24.500	75	Small grain, straight row, Good, HSG B
7.000	61	>75% Grass cover, Good, HSG B
2.000	58	Woods/grass comb., Good, HSG B
2.000	68	1 acre lots, 20% imp, HSG B
35.500	71	Weighted Average
35.100		98.87% Pervious Area
0.400		1.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	200	0.0100	0.27		**Sheet Flow, Sheet Flow** Cultivated: Residue<=20% n= 0.060 P2= 2.50"
34.1	1,700	0.0085	0.83		**Shallow Concentrated Flow, Shallow Con** Cultivated Straight Rows Kv= 9.0 fps
8.4	1,400	0.0085	2.78	33.42	**Channel Flow, Shallow Channel** Area= 12.0 sf Perim= 20.0' r= 0.60' n= 0.035 Earth, dense weeds
54.7	3,300	Total			

Subcatchment 1S: Area 1 West



Summary for Subcatchment 2S: Trailer Park & Area 2 East

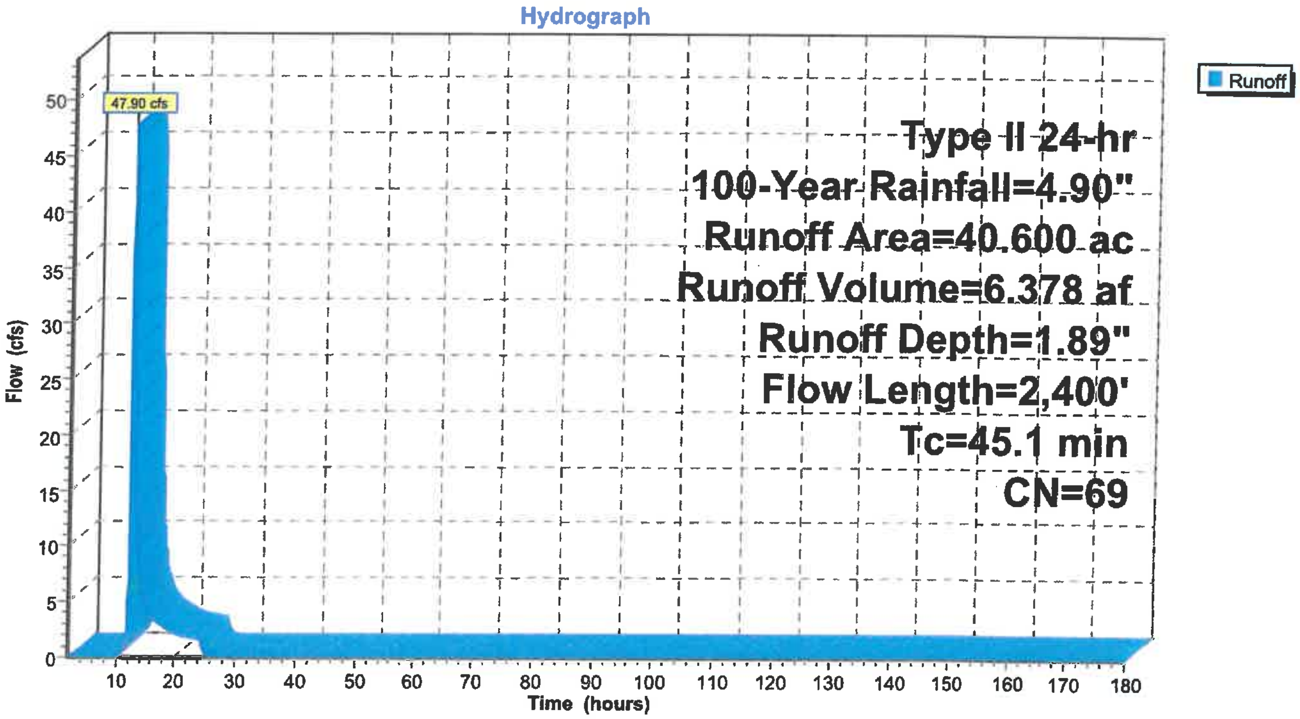
Runoff = 47.90 cfs @ 12.46 hrs, Volume= 6.378 af, Depth= 1.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-180.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=4.90"

Area (ac)	CN	Description
18.200	74	Row crops, C + CR, Good, HSG B
15.100	61	>75% Grass cover, Good, HSG B
7.300	75	1/4 acre lots, 38% imp, HSG B
40.600	69	Weighted Average
37.826		93.17% Pervious Area
2.774		6.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	200	0.0070	0.92		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 2.50"
38.1	1,600	0.0100	0.70		**Shallow Concentrated Flow, Shallow Con** Short Grass Pasture Kv= 7.0 fps
3.4	600	0.0070	2.95	44.22	**Channel Flow, Channelized Flow** Area= 15.0 sf Perim= 25.0' r= 0.60' n= 0.030 Earth, grassed & winding
45.1	2,400	Total			

Subcatchment 2S: Trailer Park & Area 2 East



Summary for Subcatchment 3S: Airport

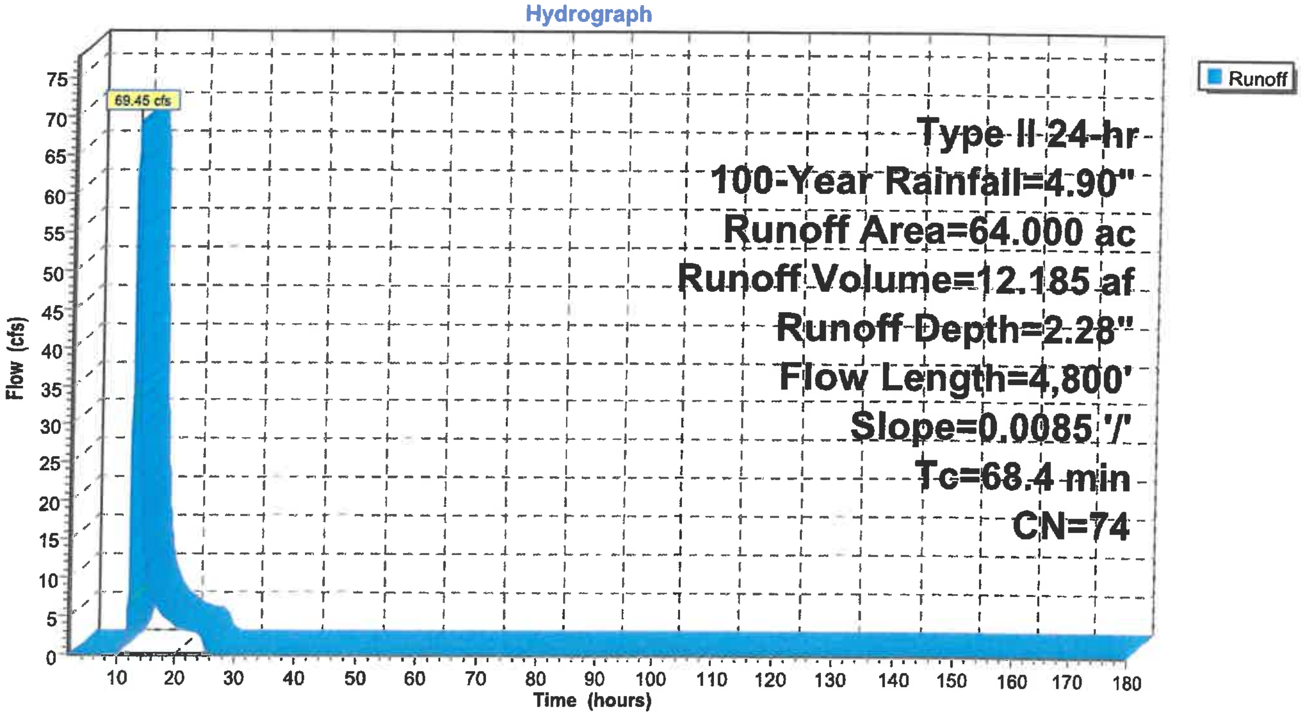
Runoff = 69.45 cfs @ 12.75 hrs, Volume= 12.185 af, Depth= 2.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-180.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Year Rainfall=4.90"

Area (ac)	CN	Description
42.000	61	>75% Grass cover, Good, HSG B
22.000	98	Paved parking, HSG B
64.000	74	Weighted Average
42.000		65.63% Pervious Area
22.000		34.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.2	200	0.0085	0.12		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 2.50"
31.3	2,600	0.0085	1.38		**Shallow Concentrated Flow, Shallow Con** Grassed Waterway Kv= 15.0 fps
9.9	2,000	0.0085	3.37	67.47	**Channel Flow, Channelized flow** Area= 20.0 sf Perim= 25.0' r= 0.80' n= 0.035 Earth, dense weeds
68.4	4,800	Total			

Subcatchment 3S: Airport



Summary for Reach 1R: Mud Creek Main Section 1

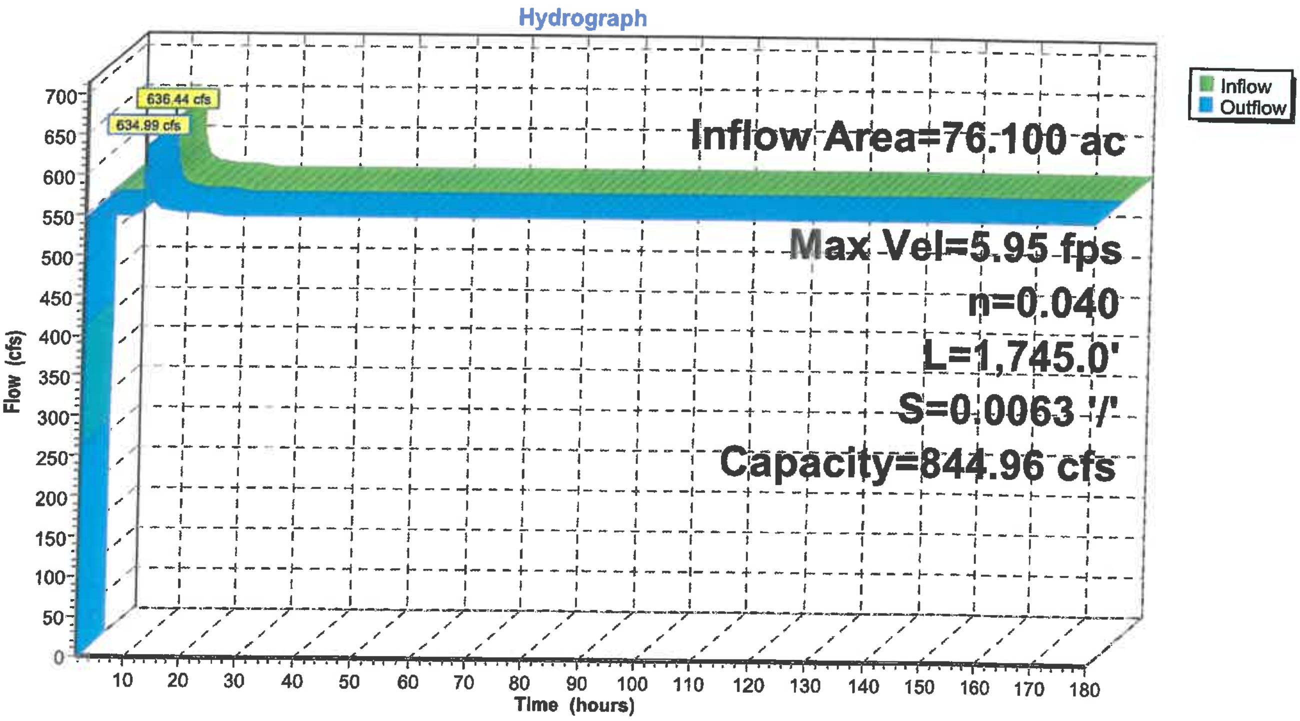
Inflow Area = 76.100 ac, 4.17% Impervious, Inflow Depth > 1,278.15" for 100-Year event
Inflow = 636.44 cfs @ 12.50 hrs, Volume= 8,105.598 af, Incl. 550.00 cfs Base Flow
Outflow = 634.99 cfs @ 12.65 hrs, Volume= 8,096.895 af, Atten= 0%, Lag= 8.7 min

Routing by Stor-Ind+Trans method, Time Span= 2.00-180.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.95 fps, Min. Travel Time= 4.9 min
Avg. Velocity = 5.70 fps, Avg. Travel Time= 5.1 min

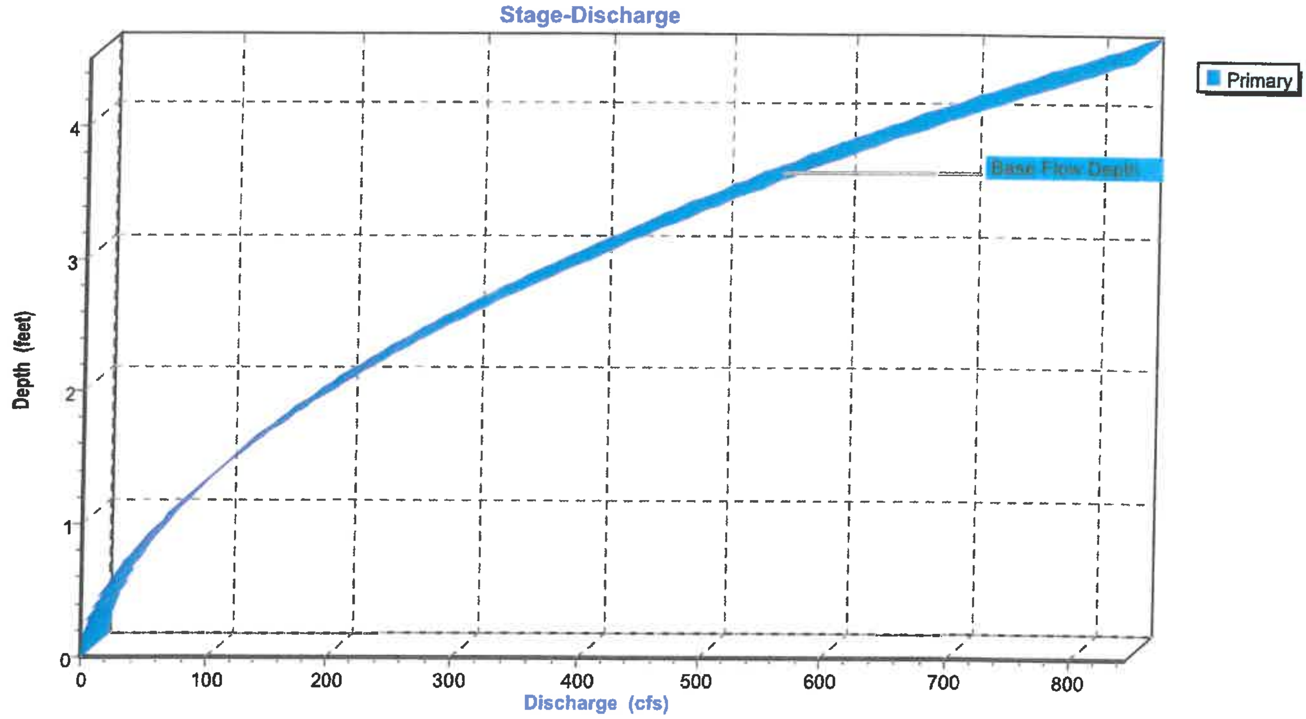
Peak Storage= 186,220 cf @ 12.57 hrs
Average Depth at Peak Storage= 3.85'
Bank-Full Depth= 4.50' Flow Area= 130.5 sf, Capacity= 844.96 cfs

20.00' x 4.50' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 2.0 '/' Top Width= 38.00'
Length= 1,745.0' Slope= 0.0063 '/'
Inlet Invert= 785.00', Outlet Invert= 774.00'

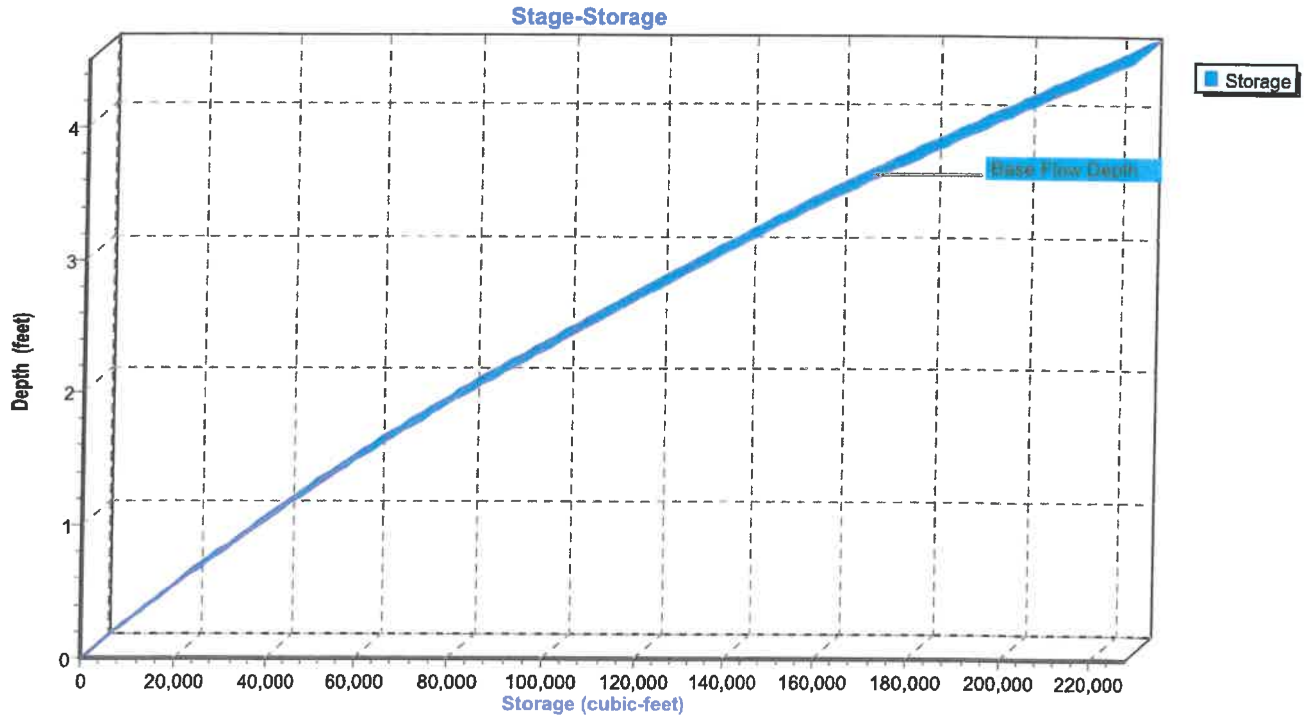
Reach 1R: Mud Creek Main Section 1



Reach 1R: Mud Creek Main Section 1



Reach 1R: Mud Creek Main Section 1



Summary for Reach 2AR: Mud Creek Relocated Section

[62] Hint: Exceeded Reach 2R OUTLET depth by 0.30' @ 12.95 hrs

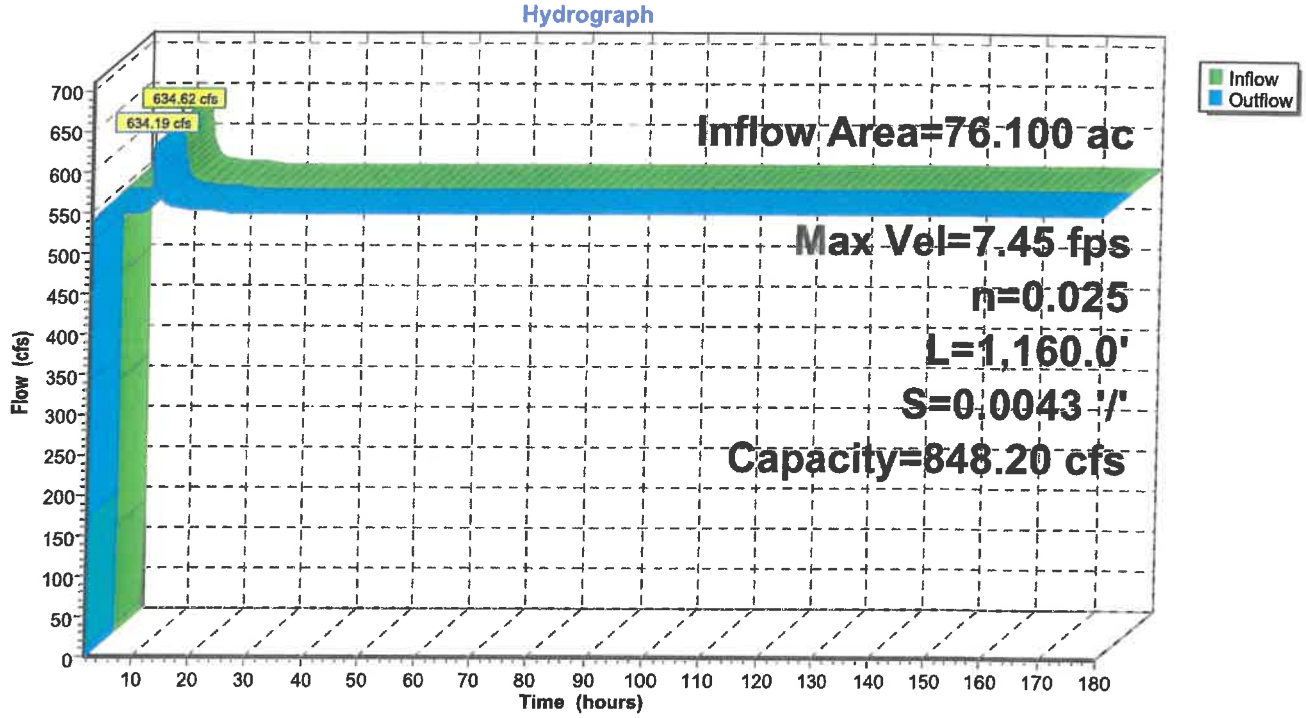
Inflow Area = 76.100 ac, 4.17% Impervious, Inflow Depth > 1,276.19" for 100-Year event
Inflow = 634.62 cfs @ 12.72 hrs, Volume= 8,093.186 af
Outflow = 634.19 cfs @ 12.79 hrs, Volume= 8,089.166 af, Atten= 0%, Lag= 4.5 min

Routing by Stor-Ind+Trans method, Time Span= 2.00-180.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.45 fps, Min. Travel Time= 2.6 min
Avg. Velocity = 7.12 fps, Avg. Travel Time= 2.7 min

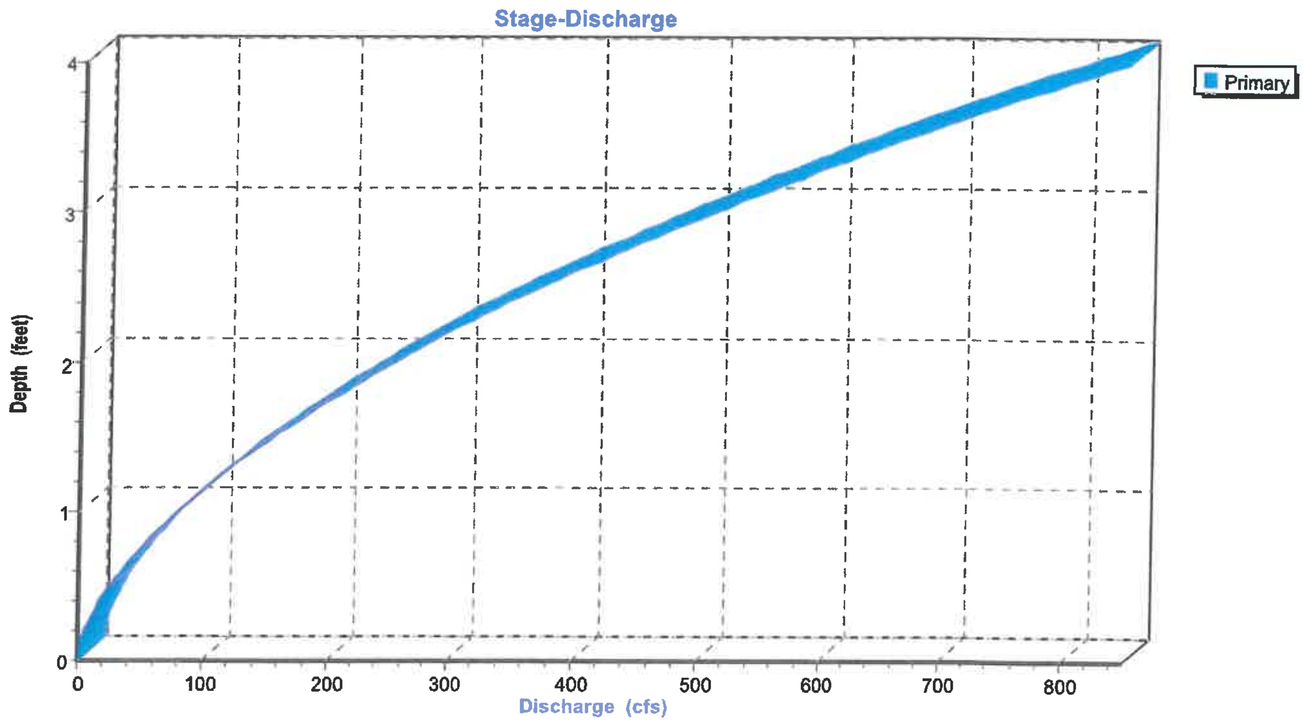
Peak Storage= 98,702 cf @ 12.75 hrs
Average Depth at Peak Storage= 3.39'
Bank-Full Depth= 4.00' Flow Area= 104.0 sf, Capacity= 848.20 cfs

20.00' x 4.00' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 1.5 '/' Top Width= 32.00'
Length= 1,160.0' Slope= 0.0043 '/'
Inlet Invert= 767.00', Outlet Invert= 762.00'

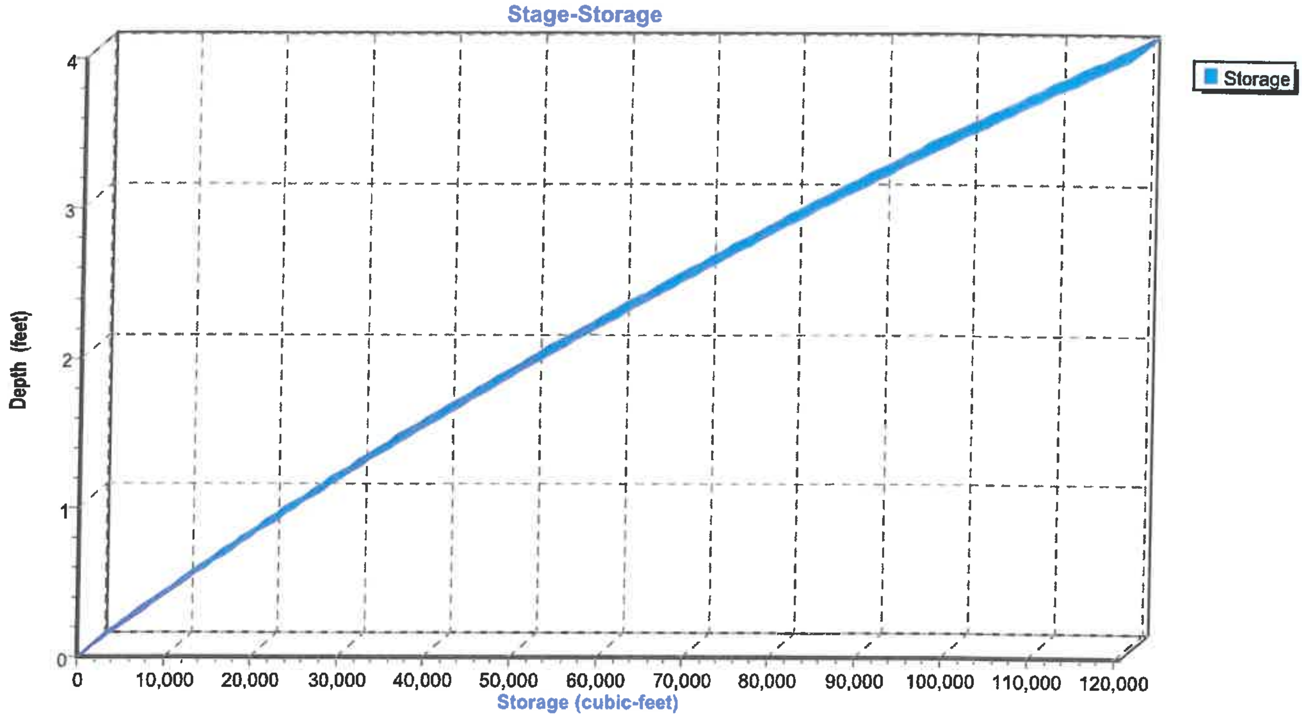
Reach 2AR: Mud Creek Relocated Section



Reach 2AR: Mud Creek Relocated Section



Reach 2AR: Mud Creek Relocated Section



Summary for Reach 2R: Mud Creek Section 2

[61] Hint: Exceeded Reach 1R outlet invert by 3.10' @ 12.70 hrs

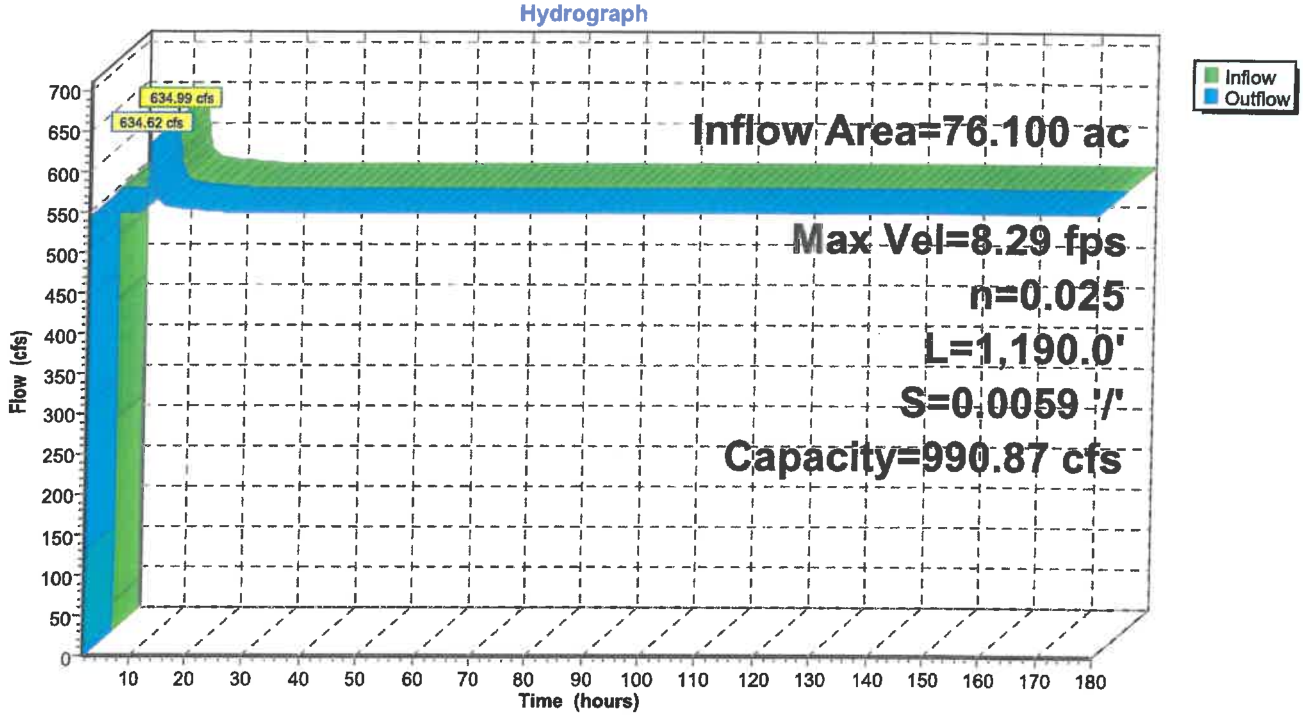
Inflow Area = 76.100 ac, 4.17% Impervious, Inflow Depth > 1,276.78" for 100-Year event
Inflow = 634.99 cfs @ 12.65 hrs, Volume= 8,096.895 af
Outflow = 634.62 cfs @ 12.72 hrs, Volume= 8,093.186 af, Atten= 0%, Lag= 4.1 min

Routing by Stor-Ind+Trans method, Time Span= 2.00-180.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.29 fps, Min. Travel Time= 2.4 min
Avg. Velocity = 7.92 fps, Avg. Travel Time= 2.5 min

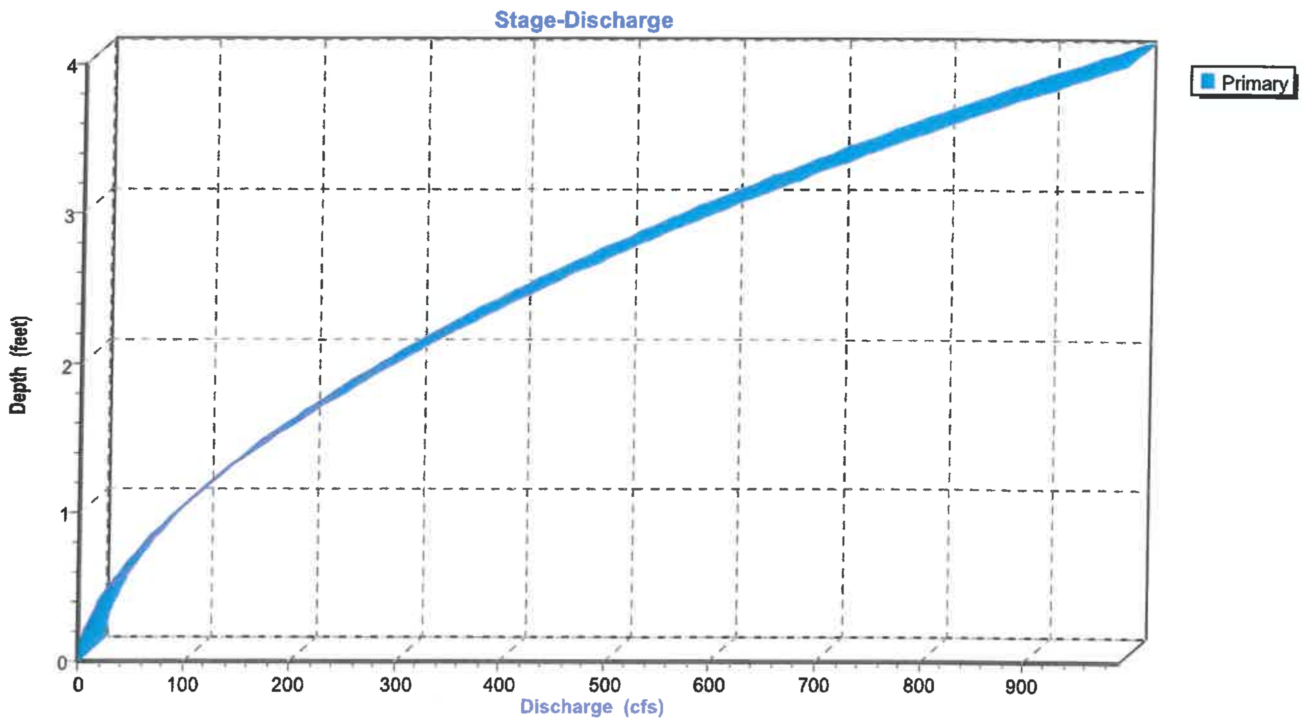
Peak Storage= 91,074 cf @ 12.68 hrs
Average Depth at Peak Storage= 3.10'
Bank-Full Depth= 4.00' Flow Area= 104.0 sf, Capacity= 990.87 cfs

20.00' x 4.00' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 1.5 '/' Top Width= 32.00'
Length= 1,190.0' Slope= 0.0059 '/'
Inlet Invert= 774.00', Outlet Invert= 767.00'

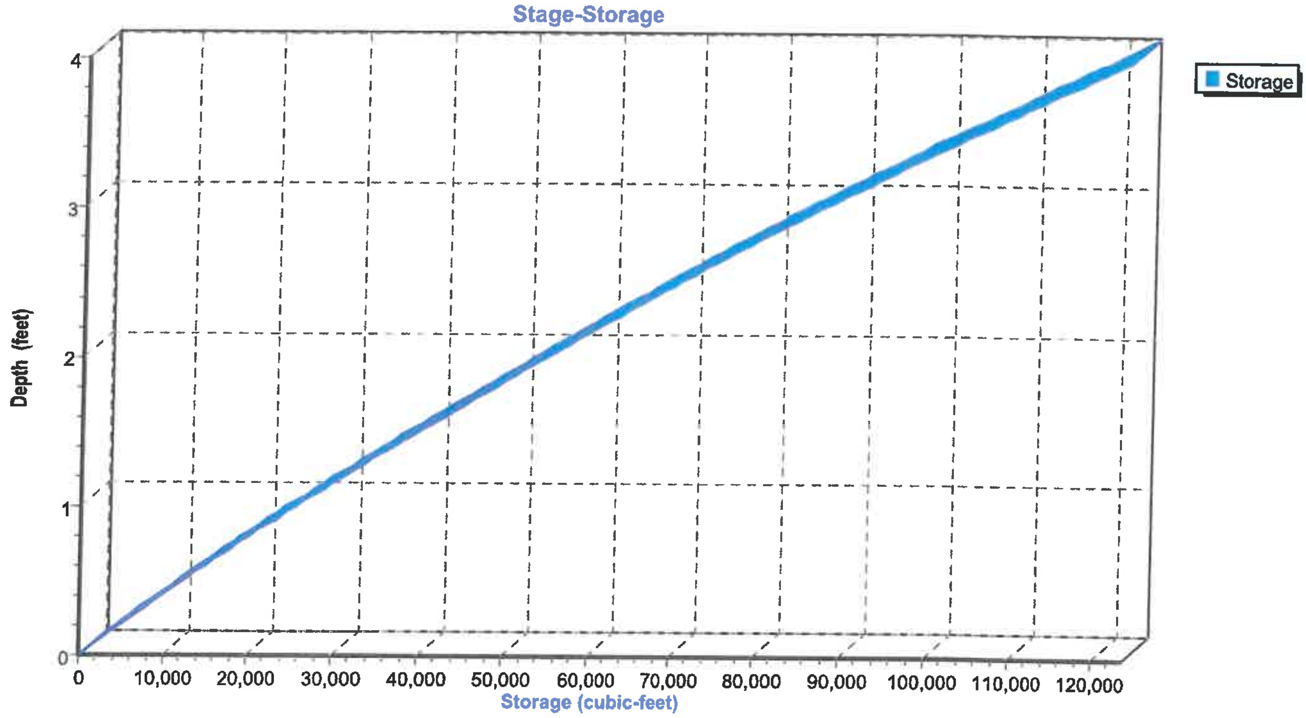
Reach 2R: Mud Creek Section 2



Reach 2R: Mud Creek Section 2



Reach 2R: Mud Creek Section 2



Summary for Reach 3R: Mud Creek Eastern Channel

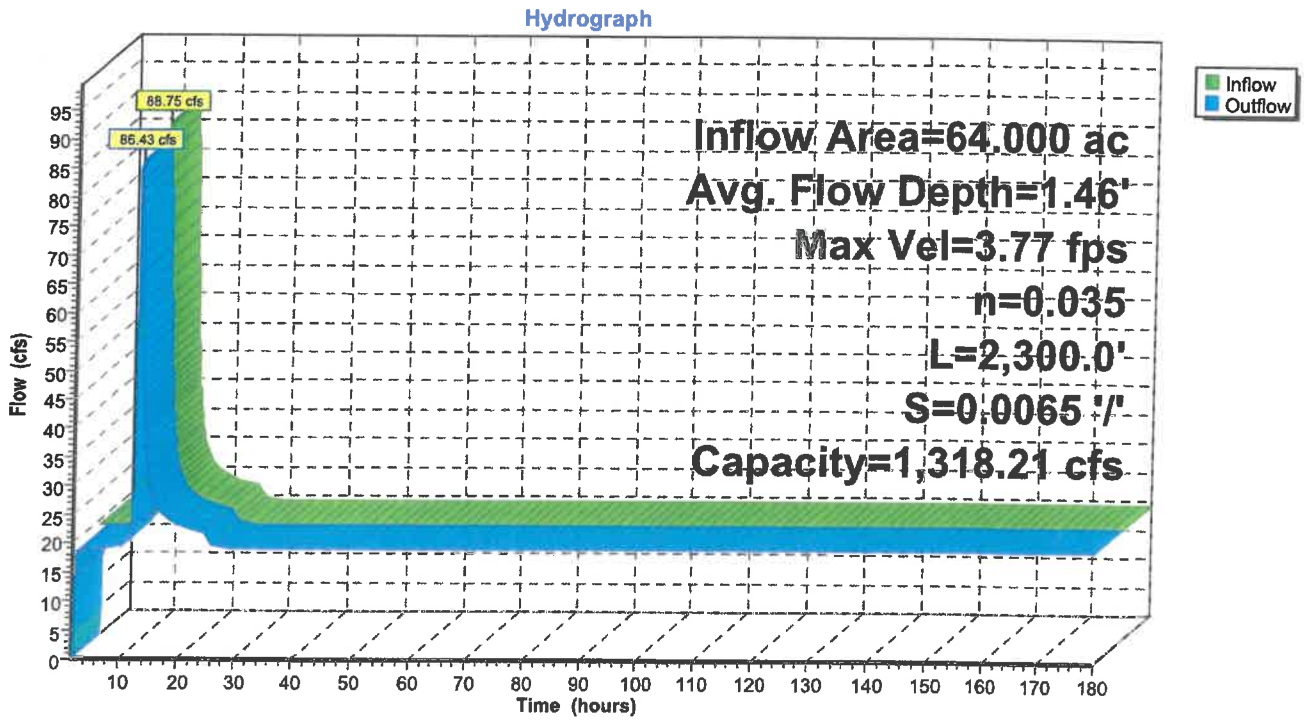
Inflow Area =	64.000 ac, 34.38% Impervious,	Inflow Depth > 55.53"	for 100-Year event	
Inflow =	88.75 cfs @ 12.75 hrs,	Volume=	296.182 af,	Incl. 19.30 cfs Base Flow
Outflow =	86.43 cfs @ 13.05 hrs,	Volume=	295.429 af,	Atten= 3%, Lag= 18.4 min

Routing by Stor-Ind+Trans method, Time Span= 2.00-180.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.77 fps, Min. Travel Time= 10.2 min
Avg. Velocity = 2.32 fps, Avg. Travel Time= 16.5 min

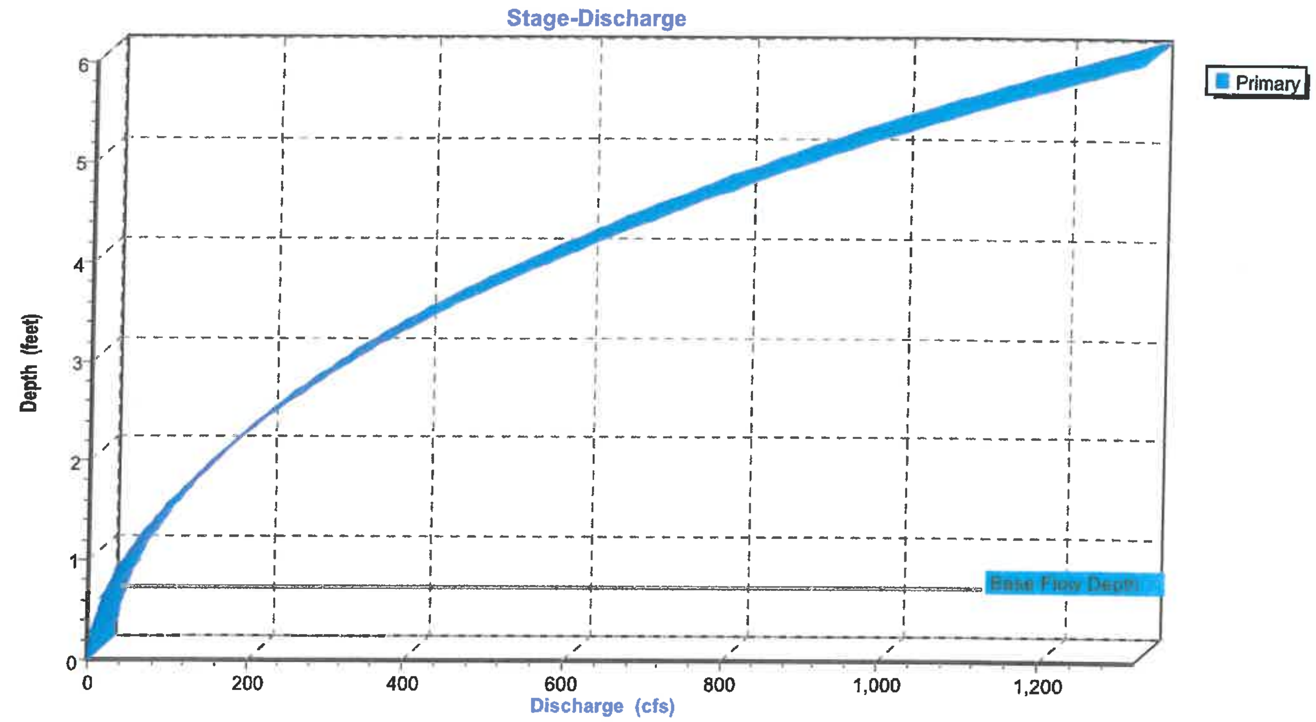
Peak Storage= 52,758 cf @ 12.88 hrs
Average Depth at Peak Storage= 1.46'
Defined Flood Depth= 7.00' Flow Area= 203.9 sf, Capacity= 1,778.14 cfs
Bank-Full Depth= 6.00' Flow Area= 162.0 sf, Capacity= 1,318.21 cfs

12.00' x 6.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 2.5 '/' Top Width= 42.00'
Length= 2,300.0' Slope= 0.0065 '/'
Inlet Invert= 781.00', Outlet Invert= 766.00'

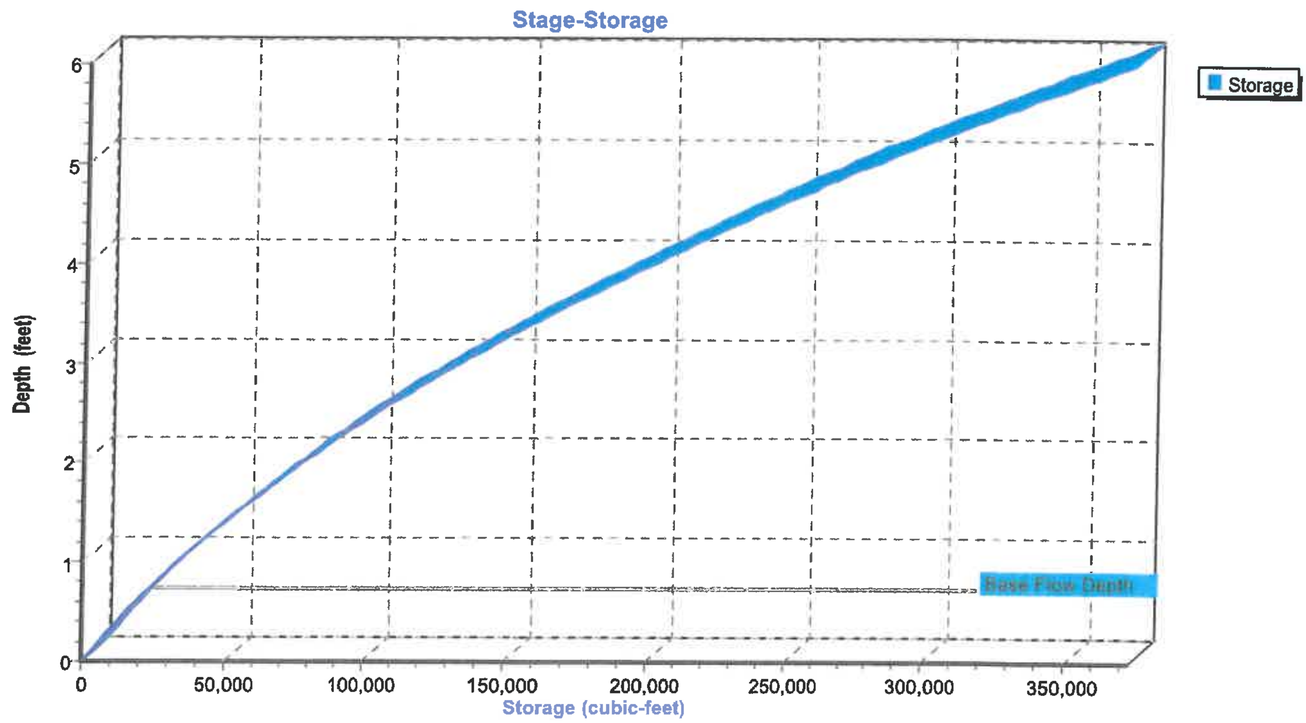
Reach 3R: Mud Creek Eastern Channel



Reach 3R: Mud Creek Eastern Channel



Reach 3R: Mud Creek Eastern Channel



Summary for Reach 4R: Mud Creek Channel Downstream

[91] Warning: Storage range exceeded by 0.11'
[55] Hint: Peak inflow is 105% of Manning's capacity
[81] Warning: Exceeded Pond 2P by 9.00' @ 2.00 hrs

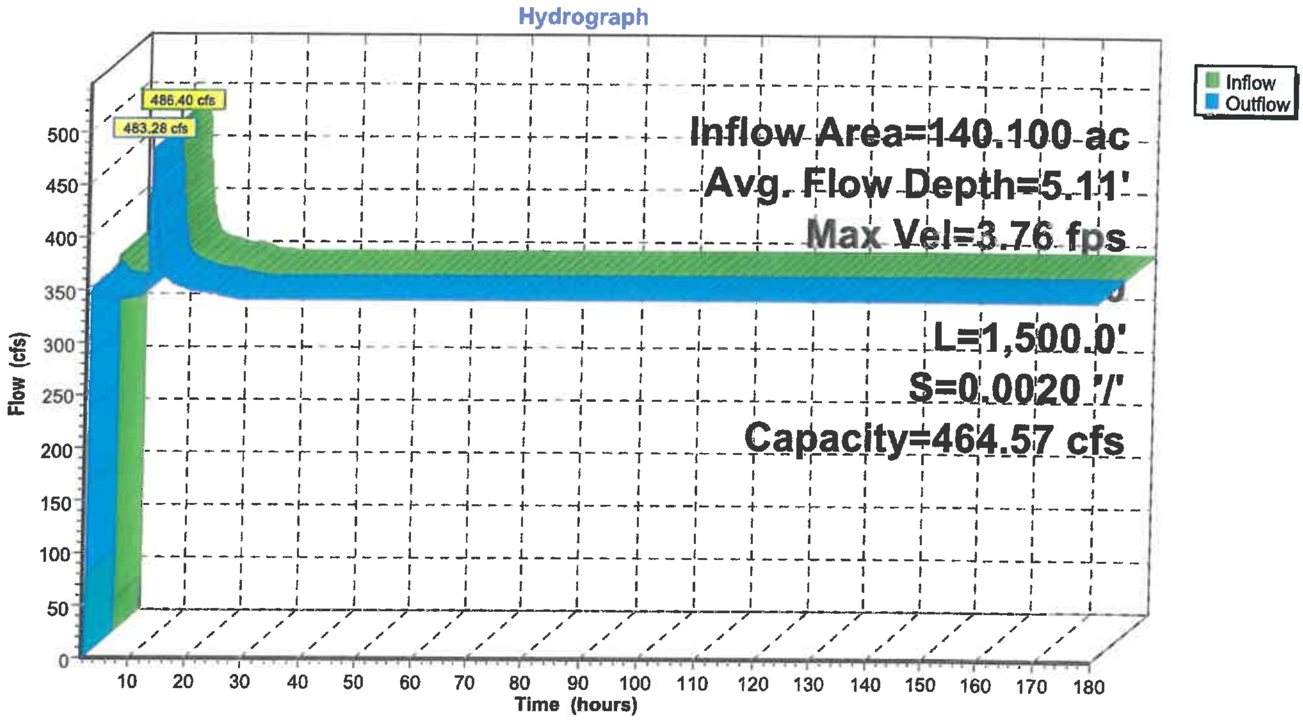
Inflow Area = 140.100 ac, 17.97% Impervious, Inflow Depth >432.66" for 100-Year event
Inflow = 486.40 cfs @ 12.89 hrs, Volume= 5,051.274 af
Outflow = 483.28 cfs @ 13.09 hrs, Volume= 5,044.682 af, Atten= 1%, Lag= 12.0 min

Routing by Stor-Ind+Trans method, Time Span= 2.00-180.00 hrs, dt= 0.05 hrs / 2
Max. Velocity= 3.76 fps, Min. Travel Time= 6.7 min
Avg. Velocity = 3.42 fps, Avg. Travel Time= 7.3 min

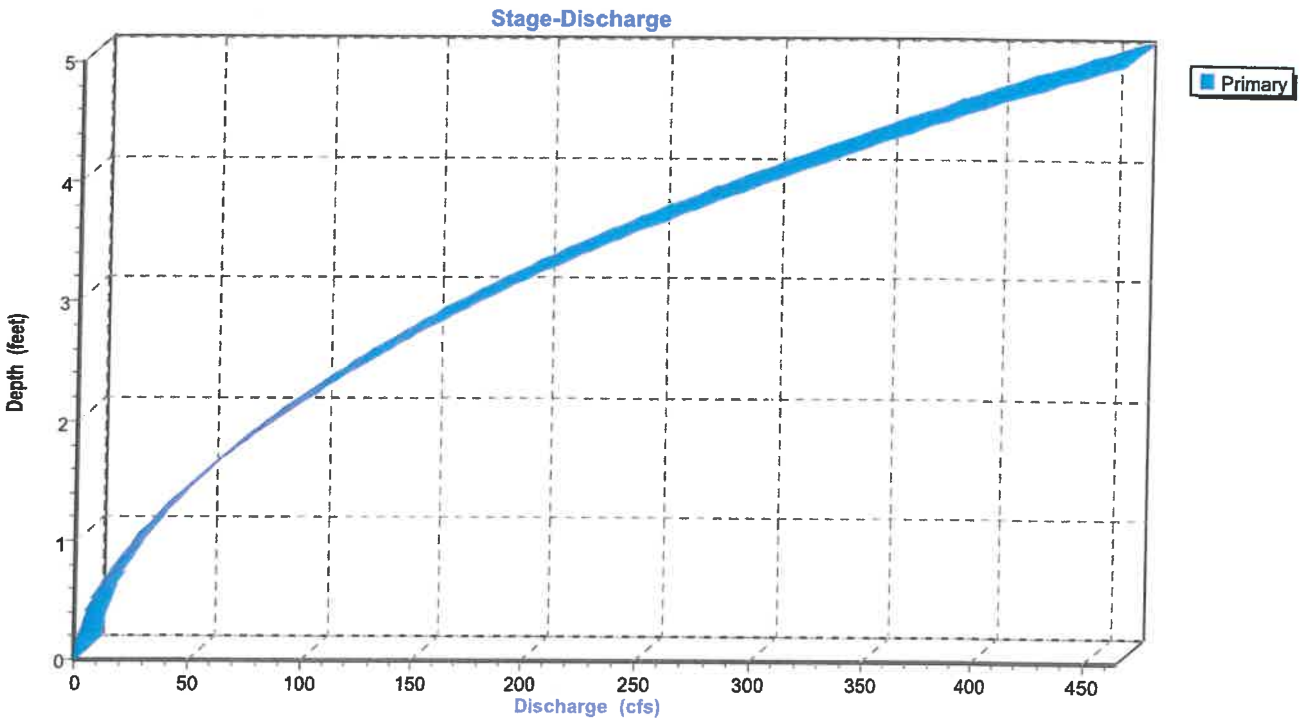
Peak Storage= 193,036 cf @ 12.97 hrs
Average Depth at Peak Storage= 5.11'
Defined Flood Depth= 768.00' Flow Area= 26,753.7 sf, Capacity= 136,869.55 cfs
Bank-Full Depth= 5.00' Flow Area= 125.0 sf, Capacity= 464.57 cfs

15.00' x 5.00' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 2.0 '/' Top Width= 35.00'
Length= 1,500.0' Slope= 0.0020 '/'
Inlet Invert= 763.00', Outlet Invert= 760.00'

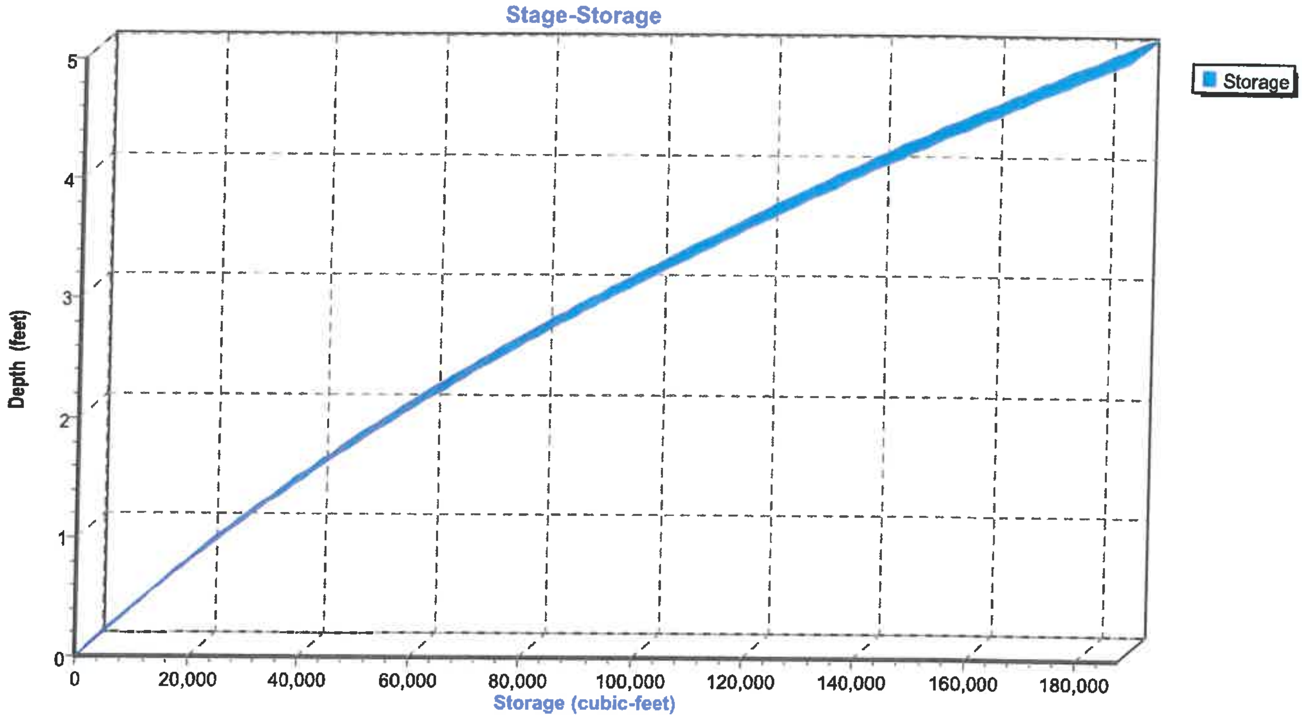
Reach 4R: Mud Creek Channel Downstream



Reach 4R: Mud Creek Channel Downstream



Reach 4R: Mud Creek Channel Downstream



Summary for Pond 1P: Slot Cut 1

[93] Warning: Storage range exceeded by 0.44'
[61] Hint: Exceeded Reach 2AR outlet invert by 2.44' @ 12.90 hrs
[79] Warning: Submerged Pond 3P Primary device # 1 OUTLET by 0.44'
[79] Warning: Submerged Pond 3P Primary device # 2 OUTLET by 0.44'

Inflow Area = 140.100 ac, 17.97% Impervious, Inflow Depth > 718.17" for 100-Year event
Inflow = 713.39 cfs @ 12.89 hrs, Volume= 8,384.595 af
Outflow = 496.41 cfs @ 12.89 hrs, Volume= 5,196.196 af, Atten= 30%, Lag= 0.0 min
Discarded = 5.00 cfs @ 2.35 hrs, Volume= 73.430 af
Primary = 491.41 cfs @ 12.89 hrs, Volume= 5,122.767 af

Routing by Stor-Ind method, Time Span= 2.00-180.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 764.44'@ 12.89 hrs Surf.Area= 0 sf Storage= 75,000 cf
Flood Elev= 765.00' Surf.Area= 0 sf Storage= 75,000 cf

Plug-Flow detention time=2,025.0 min calculated for 5,194.737 af (62% of inflow)
Center-of-Mass det. time=(not calculated: outflow precedes inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	739.00'	75,000 cf	**Custom Stage Data** Listed below

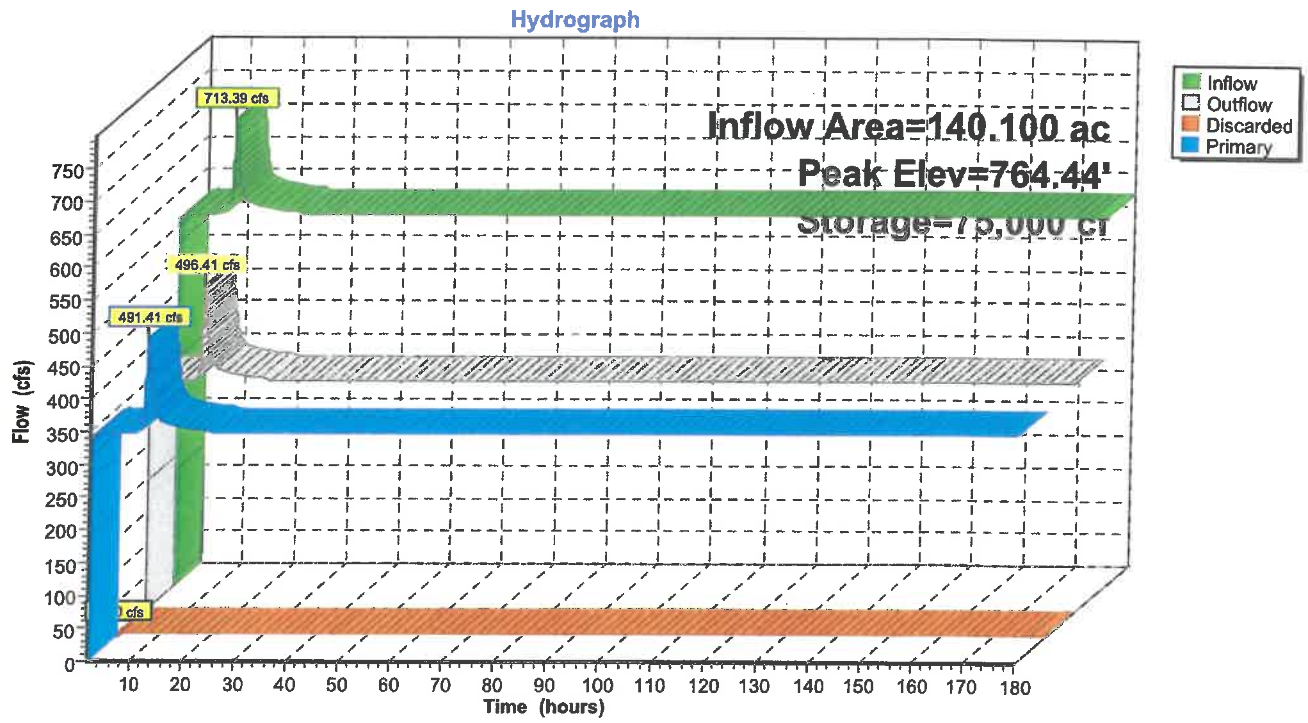
Elevation (feet)	Cum.Store (cubic-feet)
739.00	0
740.00	55,451
742.00	56,962
744.00	58,474
746.00	59,987
748.00	61,503
750.00	63,020
752.00	64,538
754.00	66,058
756.00	67,579
758.00	69,101
760.00	70,718
762.00	71,200
764.00	75,000

Device	Routing	Invert	Outlet Devices
#1	Primary	762.00'	**55.0' long x 35.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Discarded	740.00'	**5.00 cfs Exfiltration when above 740.00'**

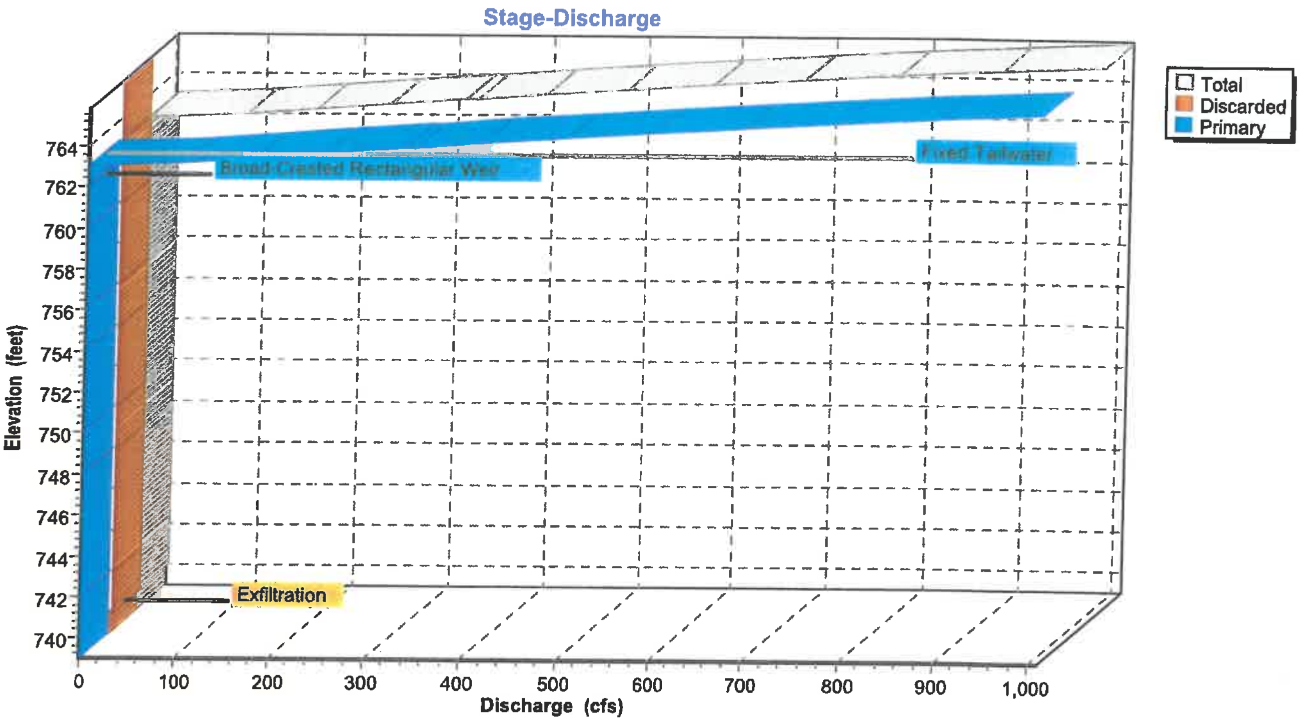
Discarded OutFlow Max=5.00 cfs @ 2.35 hrs HW=763.02' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 5.00 cfs)

Primary OutFlow Max=490.95 cfs @ 12.89 hrs HW=764.44' TW=763.00' (Fixed TW Elev= 763.00')
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 490.95 cfs @ 3.66 fps)

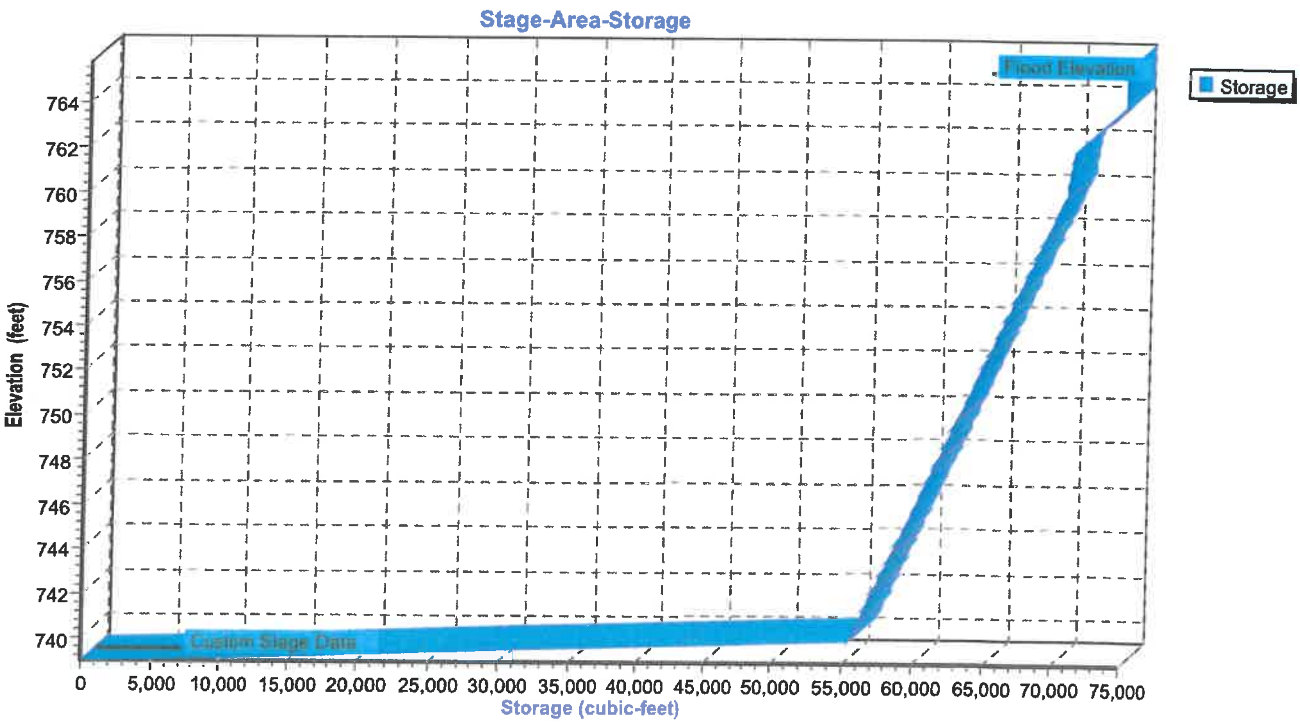
Pond 1P: Slot Cut 1



Pond 1P: Slot Cut 1



Pond 1P: Slot Cut 1



Summary for Pond 2P: Slot Cut 2

[81] Warning: Exceeded Pond 1P by 0.51'@ 12.90 hrs

Inflow Area = 140.100 ac, 17.97% Impervious, Inflow Depth >438.78" for 100-Year event
Inflow = 491.41 cfs @ 12.89 hrs, Volume= 5,122.767 af
Outflow = 491.40 cfs @ 12.89 hrs, Volume= 5,124.704 af, Atten= 0%, Lag= 0.0 min
Discarded = 5.00 cfs @ 2.35 hrs, Volume= 73.430 af
Primary = 486.40 cfs @ 12.89 hrs, Volume= 5,051.274 af

Routing by Stor-Ind method, Time Span= 2.00-180.00 hrs, dt= 0.05 hrs / 2
Starting Elev= 754.00' Surf.Area= 0 sf Storage= 13,471 cf
Peak Elev= 764.95'@ 12.89 hrs Surf.Area= 0 sf Storage= 18,694 cf (5,223 cf above start)
Flood Elev= 768.00' Surf.Area= 0 sf Storage= 18,700 cf (5,229 cf above start)

Plug-Flow detention time=(not calculated: outflow precedes inflow)
Center-of-Mass det. time=(not calculated: outflow precedes inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	749.00'	18,700 cf	**Custom Stage Data** Listed below

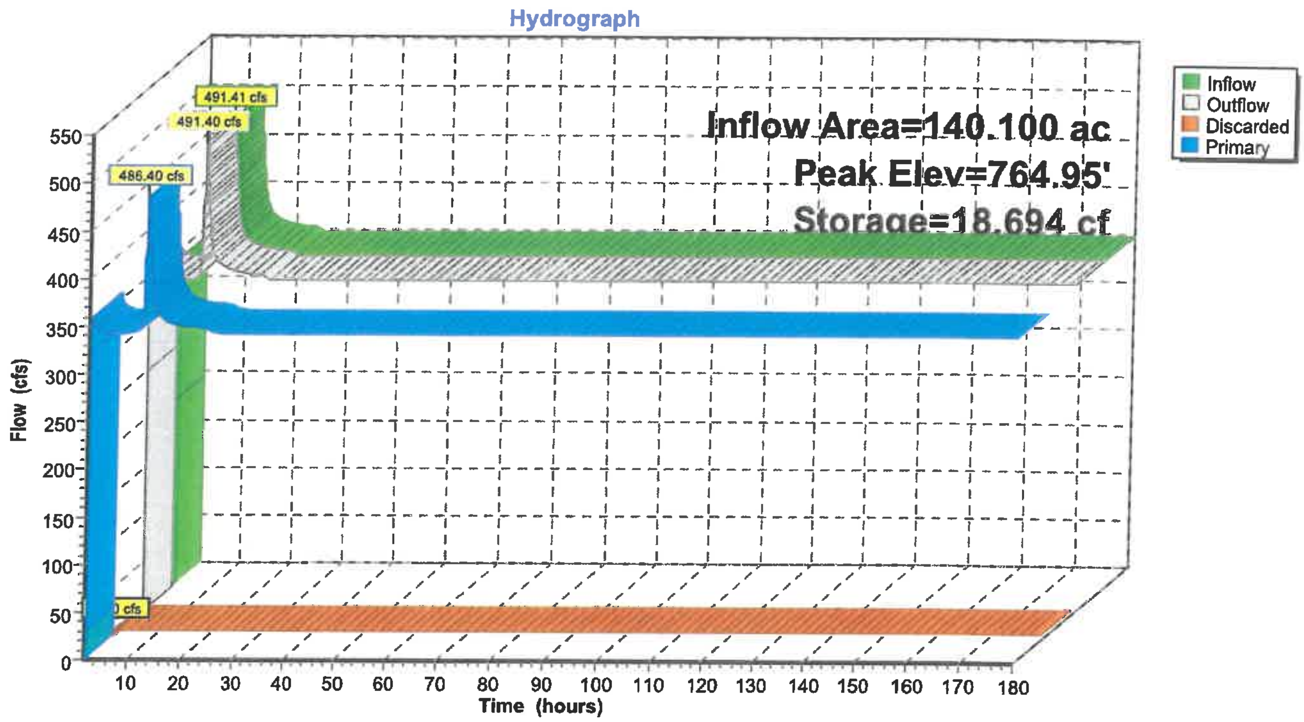
Elevation (feet)	Cum.Store (cubic-feet)
749.00	0
750.00	10,610
752.00	11,395
754.00	13,471
756.00	15,574
758.00	16,250
760.00	17,125
762.00	17,950
764.00	18,590
765.00	18,700

Device	Routing	Invert	Outlet Devices
#1	Primary	760.50'	**20.0' long x 40.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Discarded	754.00'	**5.00 cfs Exfiltration when above 754.00'**

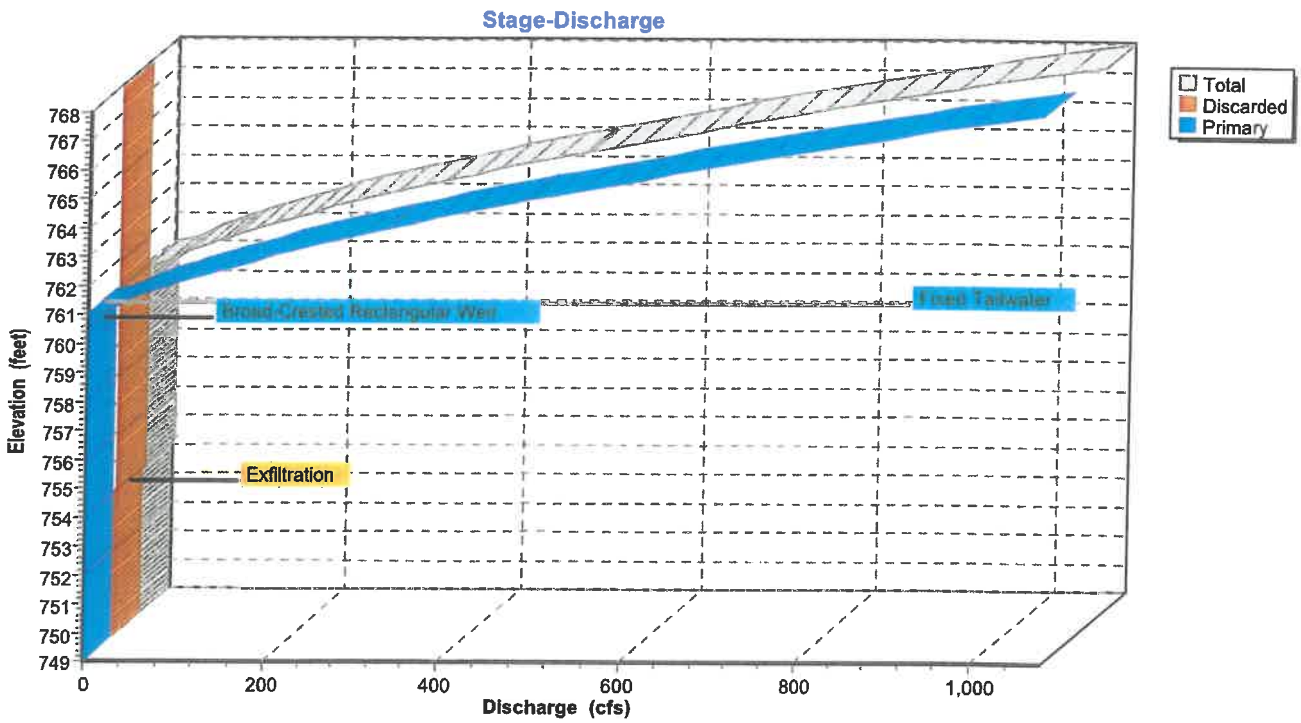
Discarded OutFlow Max=5.00 cfs @ 2.35 hrs HW=754.48' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 5.00 cfs)

Primary OutFlow Max=486.19 cfs @ 12.89 hrs HW=764.95' TW=761.00' (Fixed TW Elev= 761.00')
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 486.19 cfs @ 5.47 fps)

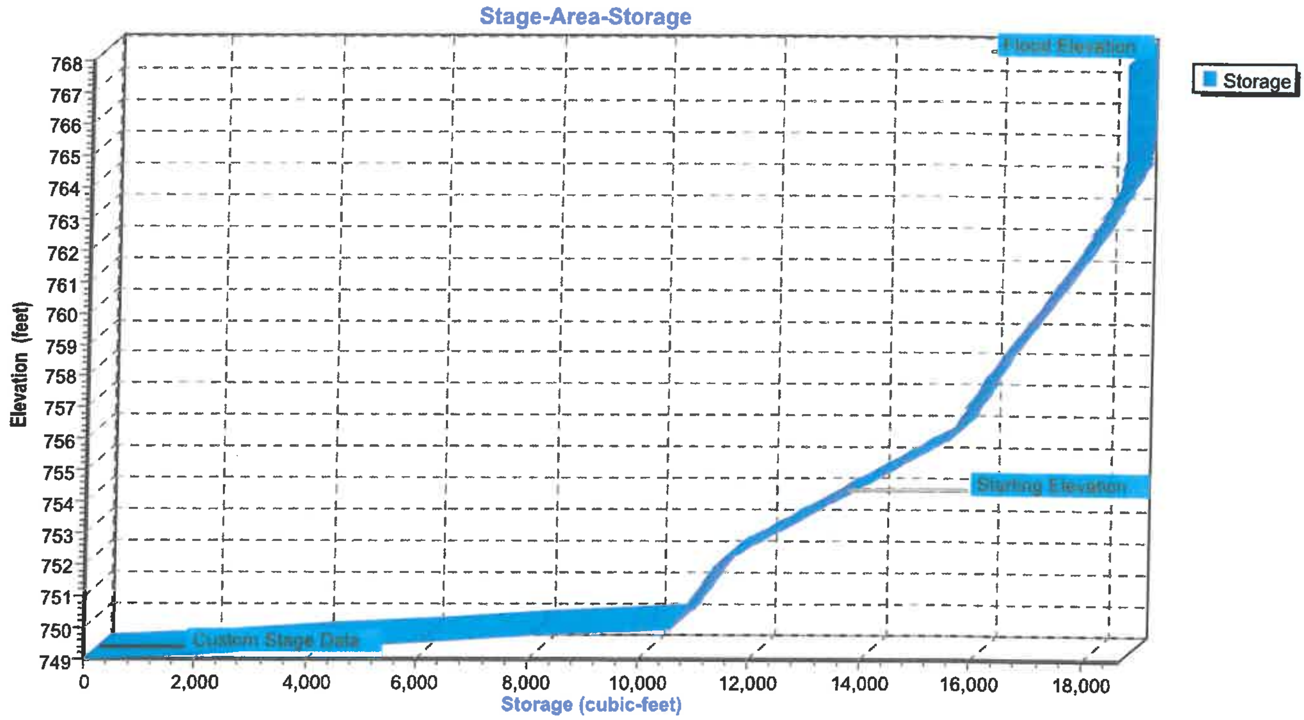
Pond 2P: Slot Cut 2



Pond 2P: Slot Cut 2



Pond 2P: Slot Cut 2



Summary for Pond 3P: Twin Culvert At RR

[58] Hint: Peaked 0.34' above defined flood level
[61] Hint: Exceeded Reach 3R outlet invert by 1.34' @ 13.05 hrs

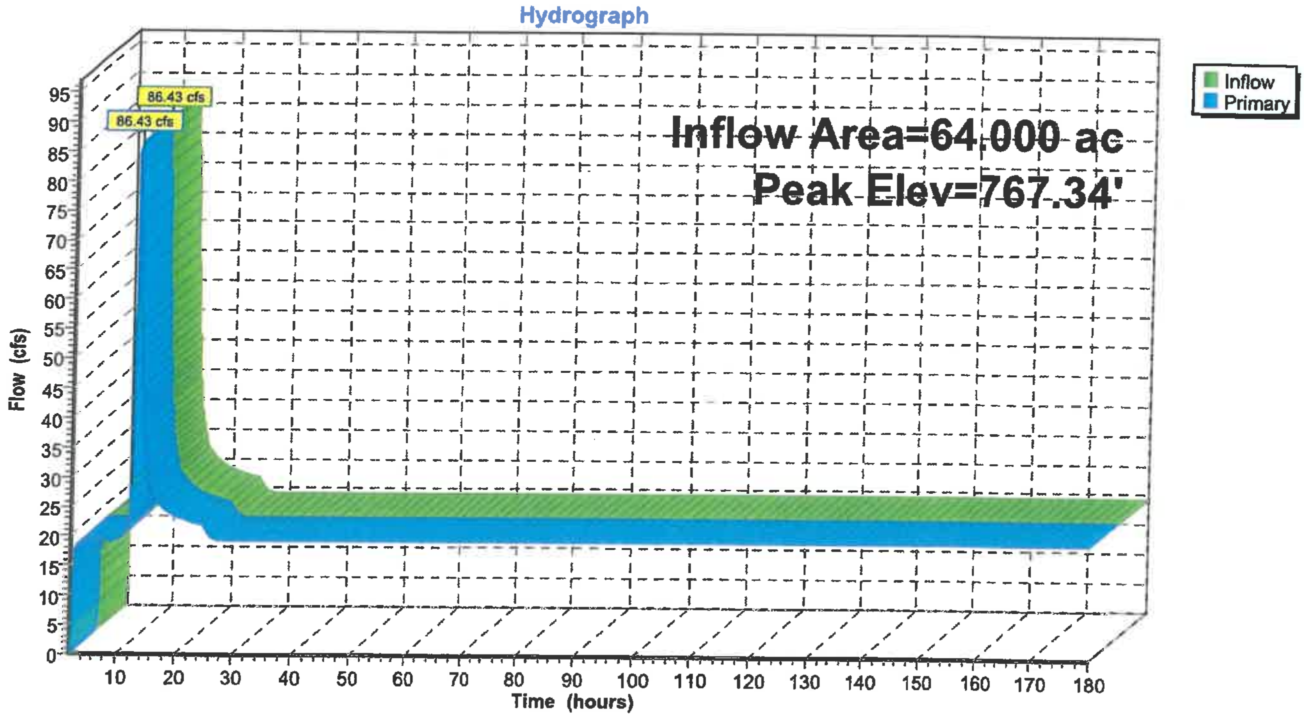
Inflow Area =	64.000 ac,	34.38% Impervious,	Inflow Depth > 55.39"	for 100-Year event
Inflow =	86.43 cfs @	13.05 hrs, Volume=	295.429 af	
Outflow =	86.43 cfs @	13.05 hrs, Volume=	295.429 af,	Atten= 0%, Lag= 0.0 min
Primary =	86.43 cfs @	13.05 hrs, Volume=	295.429 af	

Routing by Stor-Ind method, Time Span= 2.00-180.00 hrs, dt= 0.05 hrs
Peak Elev= 767.34'@ 13.05 hrs
Flood Elev= 767.00'

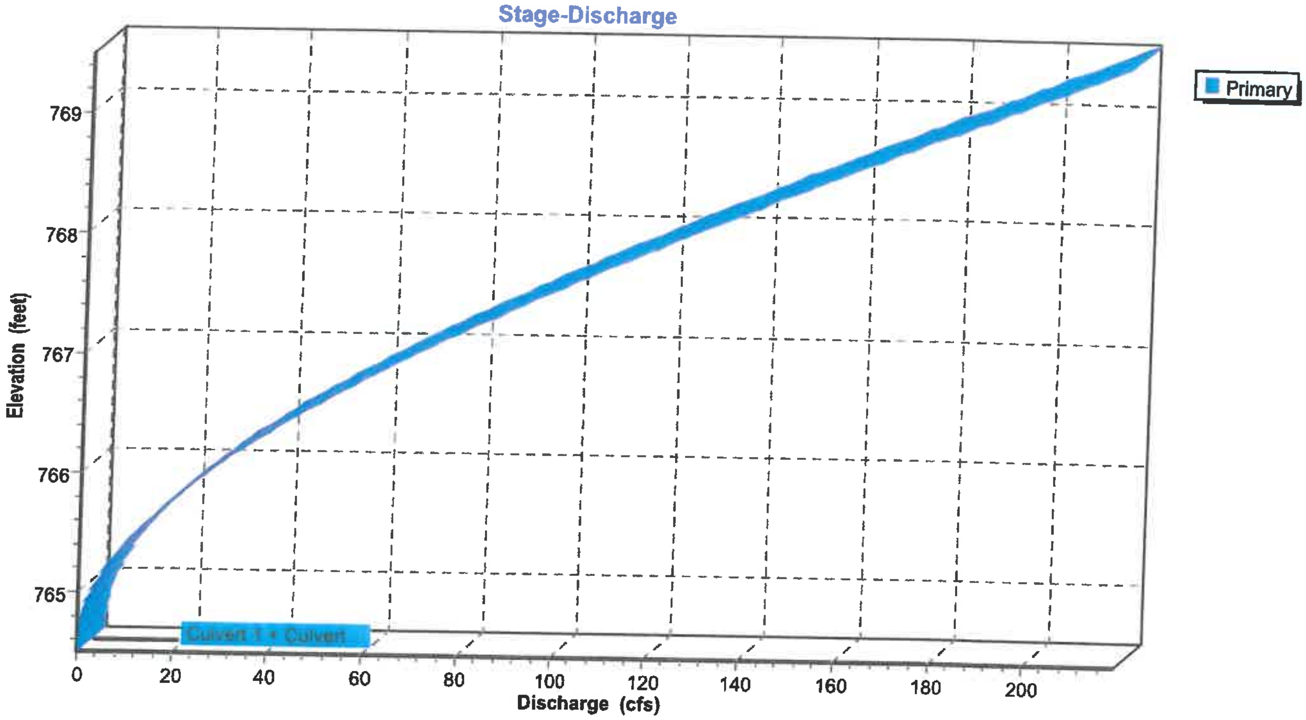
Device	Routing	Invert	Outlet Devices
#1	Primary	764.50'	**60.0" Round Culvert 1** L= 60.0' CMP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 764.50' / 764.00' S= 0.0083 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 19.63 sf
#2	Primary	764.50'	**60.0" Round Culvert** L= 60.0' CMP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 764.50' / 764.00' S= 0.0083 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 19.63 sf

Primary OutFlow Max=86.41 cfs @ 13.05 hrs HW=767.34' (Free Discharge)
1=Culvert 1 (Barrel Controls 43.20 cfs @ 5.43 fps)
2=Culvert (Barrel Controls 43.20 cfs @ 5.43 fps)

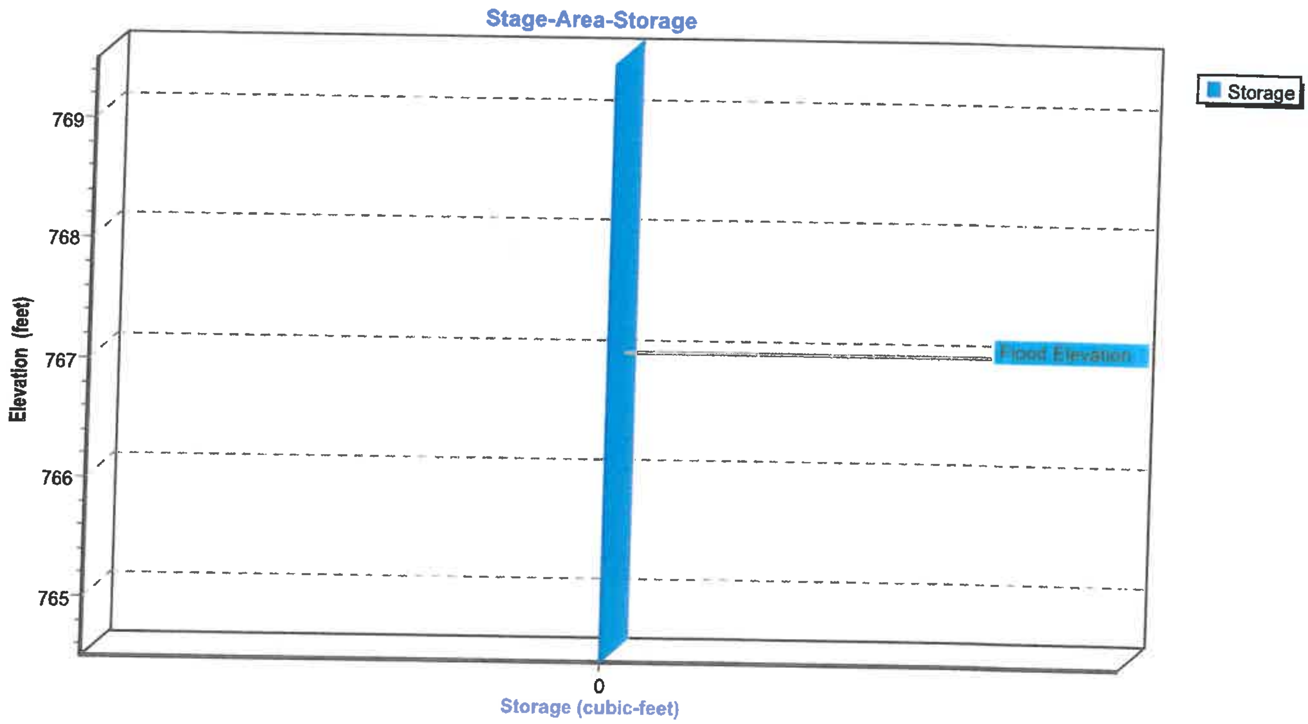
Pond 3P: Twin Culvert At RR



Pond 3P: Twin Culvert At RR



Pond 3P: Twin Culvert At RR



Streamflow Measurements for the Nation

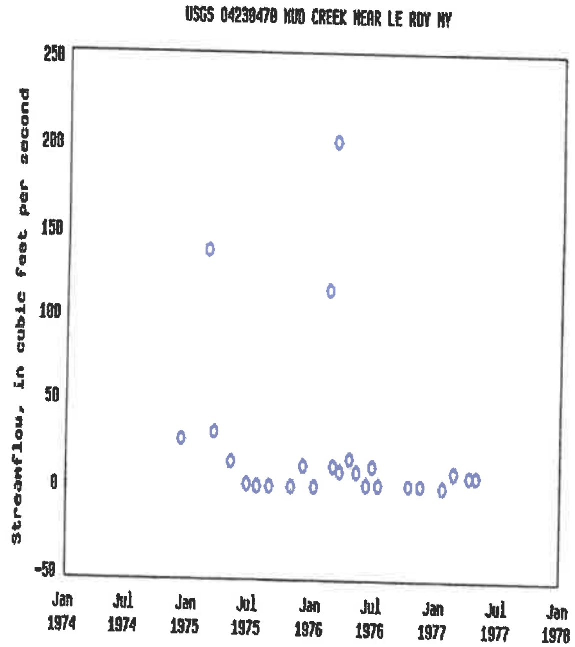
04230470 MUD CREEK NEAR LE ROY NY

Available data for this site Surface-water: Field measurements GO

Genesee County, New York
Hydrologic Unit Code 04130003
Latitude 42°58'47", Longitude 77°56'59" NAD83
Drainage area 10.2 square miles

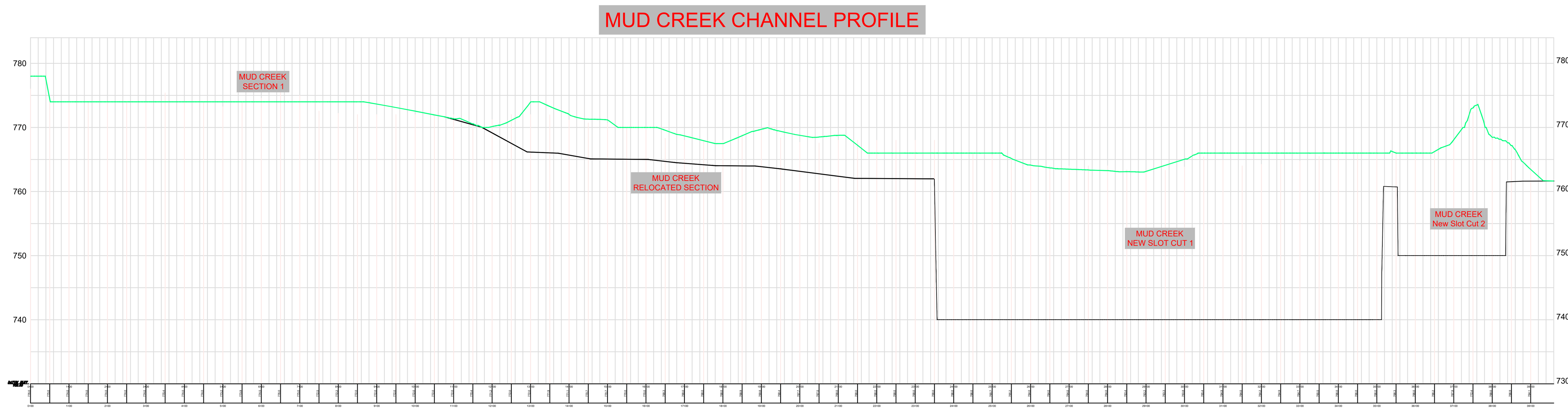
Output formats

HTML table with channel data
HTML table without channel data
Tab-separated data with channel data
Tab-separated data without channel data
Graph of data
Reselect output format

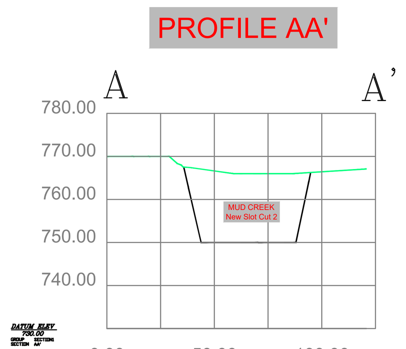


```
#
# U.S. Geological Survey, National Water Information System
# Surface water measurements
#
# Retrieved: 2020-09-28 15:59:12 EDT
#
# Further descriptions of the columns and codes used can be found at:
# https://help.waterdata.usgs.gov/output-formats#streamflow_measurement_data
#
# Data for the following 1 site(s) are contained in this file
#  USGS 04230470 MUD CREEK NEAR LE ROY NY
# -----------------------------------------------------------------------------------
#
#
agency_cd	site_no	measurement_nu	measurement_dt	tz_cd	q_meas_used_fg	party_nm	site_visit_coll_agency_cd	gage_height_va	discharge_va	measured_rating_diff	gage_va_change	gage_va_time	control_type_cd	discharge_cd
5s	15s	6s	19d	12s	1s	12s	5s	12s	12s	12s	7s	6s	21s	15s
USGS	04230470	1	1974-12-10	Yes	LRB	USGS	1.49	26.5	Fair	IceCover	NONE
USGS	04230470	2	1975-02-26	Yes	XXX/..BH	USGS	2.00	138	Good	Clear	NONE
USGS	04230470	3	1975-03-13	Yes	LRB	USGS	1.09	30.2	Good	DebrisLight	NONE
USGS	04230470	4	1975-05-07	Yes	HRB	USGS	0.55	14.8	Good	DebrisLight	NONE
USGS	04230470	5	1975-06-25	Yes	x	USGS	0.14	0.94	Poor	NONE
USGS	04230470	6	1975-07-24	Yes	LJ[illegible]	USGS		0.00	Unspecified	NONE
USGS	04230470	7	1975-08-27	Yes	x	USGS		0.00	Unspecified	NONE
USGS	04230470	8	1975-10-30	Yes	x	USGS		0.00	Unspecified	NONE
USGS	04230470	9	1975-12-05	Yes	LJ[illegible]	USGS	0.82	11.9	Unspecified	NONE
USGS	04230470	10	1976-01-07	Yes	x	USGS		0.00	Unspecified	NONE
USGS	04230470	11	1976-02-18	Yes	DAS	USGS	1.74	115	Fair	IceCover	NONE
USGS	04230470	12	1976-03-02	Yes	LJ[illegible]	USGS	0.62	11.9	Unspecified	DebrisLight	NONE
USGS	04230470	13	1976-03-05	Yes	DAS/[illegible]	USGS	2.20	201	Good	DebrisLight	NONE
USGS	04230470	14	1976-03-24	Yes	JA	USGS	0.46	8.20	Good	DebrisHeavy	NONE
USGS	04230470	15	1976-04-23	Yes	JP[illegible]	USGS	0.63	15.3	Fair	DebrisLight	NONE
USGS	04230470	16	1976-05-12	Yes	x	USGS	0.47	0.61	Unspecified	DebrisLight	NONE
USGS	04230470	17	1976-06-10	Yes	[illegible]	USGS	0.23	1.28	Poor	NONE
USGS	04230470	18	1976-06-30	Yes	[illegible]RK	USGS	0.82	11.2	Fair	DebrisHeavy	NONE
USGS	04230470	19	1976-07-13	Yes	[illegible]	USGS	0.20	1.00	Good	DebrisLight	NONE
USGS	04230470	20	1976-10-13	Yes	[illegible]	USGS	0.17	0.50	Good	DebrisHeavy	NONE
USGS	04230470	21	1976-11-18	Yes	[illegible]S	USGS	0.20	1.34	Fair	DebrisLight	NONE
USGS	04230470	22	1976-11-18	Yes	[illegible]S	USGS	0.28	1.24	Unspecified	NONE
USGS	04230470	23	1977-01-21	Yes	x	USGS	0.23	0.29	Unspecified	NONE
USGS	04230470	24	1977-02-23	Yes	x	USGS	3.34	8.17	Unspecified	IceCover	NONE
USGS	04230470	25	1977-04-06	Yes	x	USGS	0.38	6.34	Unspecified	IceCover	NONE
USGS	04230470	26	1977-04-29	Yes	[illegible]S	USGS	0.37	6.18	Good	DebrisLight	NONE
```

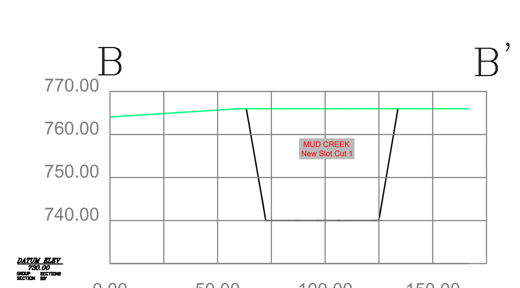
MUD CREEK CHANNEL PROFILE



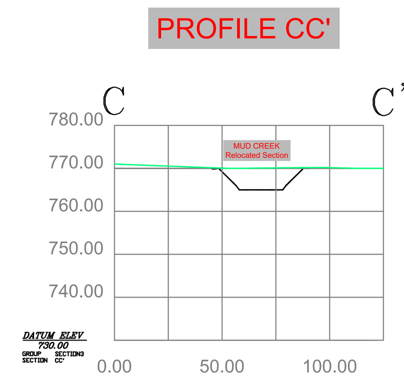
PROFILE AA'



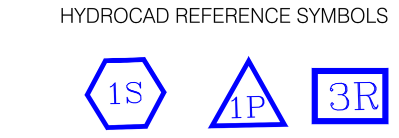
PROFILE BB'



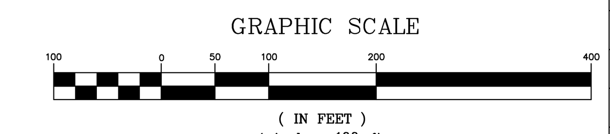
PROFILE CC'



HYDROCAD REFERENCE SYMBOLS



GRAPHIC SCALE



CONTINENTAL PLACER INC.
II Winners Circle, Albany, New York 12205
ph: 518/458-9203 fax: 518/458-9206

MUD CREEK RELOCATION PLAN
Dolomite Products Company Inc.
LeRoy Quarry
Town of LeRoy Genesee Co., NY

Project Manager:JRH
Prepared By:JAS
Drafted By:JAS
Reviewed By:JRH

Date: September 30, 2020

Project No: 73-173-11-3887

Sheet No: 1 of 1

Appendix 10

Best Management Practice Plan

CONTINENTAL PLACER INC.

II Winners Circle • Albany, New York 12205
(518) 458-9203 *fax* (518) 458-9206
www.continentalplacer.com

LEROY QUARRY
STORMWATER BEST MANAGEMENT PRACTICE PLAN
DOLOMITE PRODUCTS CO., INC.

SPDES Permit No. NY-0247189
Town of Leroy, Genesee County, New York

Prepared For:

Dolomite Products Co., Inc.
1150 Penfield Road
Rochester, New York 14625

Prepared by:

Continental Placer Inc.
2 Winners Circle
Albany, New York 12205

Original
July 18, 2014

Revised
May 5, 2017

Version 2.0

GEOLOGIC AND ENVIRONMENTAL SERVICES

TABLE OF CONTENTS

TABLES

PLATES

APPENDICES

1.0 Introduction

This Stormwater Best Management Practice (BMP) Plan has been developed for the Dolomite Products Co., Inc. Leroy Quarry (Leroy facility) in the Town of Leroy, Genesee County, New York. This BMP Plan has been prepared pursuant to a special condition requirement of a State Pollution Discharge Elimination System (SPDES) permit (Permit No. NY-0247189). This SPDES permit is provided in Appendix A. The objective of the BMP is to present methods that can be applied at the facility "to prevent releases of significant amounts of pollutants to the waters of the State through plant site runoff; spillage and leaks; sludge or waste disposal; and storm water discharges including, but not limited to, drainage from raw material storage" (from Special Conditions in SPDES Permit NY-0247189 dated 7/1/13). The original July 18, 2014 BMP Plan has been revised to incorporate personnel changes and a change in the outfall location.

The primary operations at the Leroy facility are the mining and processing of limestone bedrock (Onondaga Formation) for crushed and broken stone (quarry pit). The bedrock is drilled and blasted and transported to the aggregate processing area immediately northeast of the quarry by haul trucks where it is crushed and screened into various sizes for sale. The aggregate product is stored in stockpiles northwest of the aggregate processing area (crusher plant) and sold by loading it into customers' trucks.

Activities performed as part of the mining operations that have the potential to contribute potential pollutants to stormwater include:

- Mining and processing of crushed stone,
- Handling and storage of aggregate materials,
- Transport of materials over paved and unpaved haul roads,
- Bulk storage of petroleum fuels, lubricating oils, and hydraulic fluids,
- Fueling, maintenance, and operation of portable and mobile material handling and processing equipment,
- Usage of blasting agent (ANFO) for mining, and
- Runoff from roadways and staging areas.

BMPs intended for the protection of stormwater quality that are typically applicable to aggregate operations include the following:

- Berms, diversion ditches, and grading to direct and control stormwater flow,
- Stormwater detention and retention ponds,
- Grit (silt) traps in drainage areas,
- Capture of stormwater into closed-system units (settling ponds, sumps),
- Erosion control plans,
- Vegetative controls,
- Containment walls for storage tanks,
- Oil/water separators,
- Storage of materials under cover using silos, buildings, or pole barns,
- Stormwater inspections, sampling, and recordkeeping, and
- Employee training.

Stormwater at the Leroy facility is primarily managed through quarry dewatering, surface ditches, and berms. Berms prevent off-site stormwater runoff and direct stormwater into the quarry pit. Groundwater and stormwater accumulated in the quarry pit are pumped to an air stripper that discharges via a 24-inch pipe to a rip rap lined ditch along the eastern property line. This ditch then discharges into Mud Creek approximately 1,200 feet southeast of the quarry pit. Plate 1 shows the quarry sump and dewatering discharge station, the air stripper, the 24-inch pipe, the current outfall location, the ditch transmitting the dewatering water to Mud Creek, and the future SPDES Outfall 001.

This BMP Plan shall be implemented in conjunction and consistently with other facility plans such as the Spill Prevention Control and Countermeasure (SPCC) plan, which is incorporated as part of this BMP Plan. The facility also had a Stormwater Pollution Prevention Plan (SWPPP) for a general stormwater permit. With the issuance of the SPDES Permit No. NY-0247189, the SWPPP has been superseded by this BMP Plan. This BMP Plan must be maintained at the facility and be available for review at the quarry site by State or Federal regulatory inspectors upon request.

2.0 BMP Committee

A BMP committee or team has been formed that implements the BMP Plan, performs site inspections to ensure BMPs are in-place and effective, defines BMP incident reporting procedures, and periodically reviews and updates the BMP Plan with additional BMPs as necessary to prevent or minimize contamination of stormwater flowing from the Dolomite Products Co., Inc. Leroy facility.

The BMP Committee and contact information is comprised of the following personnel:

Ed Wood Location Superintendent	(585) 768-7295 (work) (585) 750-4500 (cell)
Dale Siel Safety Manager	(585) 381-7010 (work) (585) 301-5620 (cell)
John Swierkos, Jr. Geologist & Environmental Coordinator	(585) 381 7010 (work) (585) 749 2371 (cell)
Jack Odenbach Vice President of Aggregates	(585) 381 7010 (work) (585) 350 9508 (cell)

3.0 Reporting of BMP Incidents

A BMP incident reporting system is used to keep records of incidents such as spills, leaks, runoff and other improper discharges for the purpose of minimizing recurrence, expediting mitigation or cleanup activities, and complying with legal requirements. Reporting procedures defined by the BMP Committee include: notification of a discharge to appropriate plant personnel to initiate immediate action; formal written reports for review and evaluation by management of the BMP incident and revisions to the BMP plan; and notification as required by law to governmental and environmental agencies in the event that a spill or other reportable discharge reaches surface waters of the State. In some circumstances, voluntary reporting to authorities such as municipal sewage treatment works, drinking water treatment plants, and fish and wildlife commissions may be desirable.

For the Dolomite Products Co., Inc. Leroy facility, the BMP reporting procedures are as follows:

1) Report incident to shift supervisor.
2) Notify and mobilize spill cleanup or mitigation personnel, as necessary, to control and contain the incident.
3) Make a determination whether incident is a reportable spill, pursuant to SPCC Plan procedures.
4) If it is a reportable spill notify the appropriate regulatory authority at the notification contact numbers provided below (Section 3.1).
5) Mitigate the incident (stop the discharge, cleanup spill, appropriately contain and dispose of any impacted soil and water).
6) Replace or repair faulty equipment, machinery, or storage containers, as necessary, to prevent continuing discharges.
7) Prepare written report describing the BMP incident (reporting form provided in Appendix B).

The primary form of communication of BMP incidents will be by telephone and direct verbal communication followed up with written reports (Appendix B). Reliable communications with the person or persons directly responsible will expedite immediate action and countermeasures to prevent incidents or to contain and mitigate discharged chemicals.

Written reports on all BMP incidents will be submitted to the plant's BMP Committee and plant management for review. Written reports will include the date and time of the discharge, weather conditions, nature of the materials involved, duration, volume, cause, environmental problems, countermeasures taken, people and agencies notified, and recommended revisions, as appropriate, to the BMP plan, operating procedures and/or equipment to prevent recurrence.

3.1 Emergency Contact List & Phone Numbers

3.1.1 Leroy Quarry Personnel

Table 1 – Leroy Quarry Personnel

Site Personnel		Telephone Number
Facility/Spill Response Coordinator and Location Superintendent	Ed Wood	(585) 768-7295 (work) (585) 750-4500 (cell)
Alternative Facility/Spill Response Coordinator	Dale Siel	(585) 381-7010 (work) (585) 301-5620
Geologist/Environmental Coordinator	John Swierkos, Jr	(585) 381-7010(work) (585) 749-2371(cell)
VP of Aggregates	Jack Odenbach	(585) 381-7010 (work) (585) 350-9508 (cell)

3.1.2 Local, State & Federal Emergency Response Agencies

Table 2 – Emergency Response Agency Contact Information

Emergency Service Providers	Phone #
Rescue Squad	911
Fire Dept	(585) 768 2527 or 911
Police (NYS)	(585) 344 6200 or 911
Sheriff	(585) 343 5000 or 911

3.1.3 List of Emergency Response Contractors

No emergency response contractors should be necessary. However, in the event that a contracted responder is necessary, the following response contractors are available to provide assistance.

Table 3 – Emergency Response Contractors

Spill Response Contractors (Contacts confirmed October 2013)	(800) 807-7455 *(24 hr access)* (585) 436 5660	Nyetech
	(585) 924 1570	Arrow Contracting

4.0 Risk Identification and Assessment

The areas of the plant subject to BMP requirements have been identified by the BMP Committee in conjunction with other facility personnel. These areas, which are shown on Plate 1, are as follows:

- Maintenance shop,
- Aggregate processing and aggregate stockpile areas,
- Bulk fuel storage tanks,
- Empty drum storage area next to small shop,
- Mobile equipment and parts storage areas, and
- Quarry dewatering discharge ditch network.

Each area has been examined for potential risks for discharges to receiving waters of pollutants or hazardous substances from ancillary sources. Structural BMPs (dikes, diversion ditches, etc.) for controlling such discharges have been identified.

4.1 Potential Pollution Sources and Types of Contaminants

Materials exposed to stormwater at the Leroy facility that have the potential to impact stormwater runoff include the following:

- Quarry pit;
- Aggregate piles;
- Paved and unpaved haul/access roads;
- Miscellaneous vehicular and processing equipment fuels, lubricating oils, and hydraulic oils leaked on the ground by active equipment;
- Fuel storage tank loading and dispensing areas;
- Empty drum storage area next to small shop; and
- Mobile equipment and parts storage areas.

The corresponding potential pollutants that may results from these sources are particulate matter (aggregate materials from unpaved haul roads) that could create suspended and dissolved solids in stormwater, and volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) from petroleum products used in mobile mining equipment (such as benzene, ethyl benzene, toluene, xylene, naphthalene, anthracene, pyrene and benzo(a)anthracene). The potential for significant stormwater pollution from these sources is not anticipated.

4.2 Potential Source Areas for Stormwater Contamination

The source areas for stormwater contamination are runoff associated with the crushing and processing of stone aggregate materials, the maintenance shop area, bulk petroleum storage tank dispensers and fill ports, runoff from access roads, mobile equipment and parts storage areas, and empty drum storage area next to small shop (See Drainage Features and Area Map, Plate 1). Stormwater flowing over these areas has the potential to transport stone dust and particles from travel surfaces as well as any drops of disseminated petroleum products associated with petroleum storage and everyday operation of quarry equipment and vehicles.

4.3 Historic Spill and Leak Record

Significant spills or leaks are to be recorded on a BMP incident form in Appendix B and on Spill Reporting Forms provided in the facility SPCC Plan, and kept with the SPCC Plan at the facility office.

4.4 Non-Stormwater Discharges

Non-stormwater discharges would primarily be the result of spillage of petroleum fuels, lubricating oils, or hydraulic fluids. The potential for the release of petroleum fuels, lubricating oils, and hydraulic fluids at the facility would be caused by human error and equipment failure. Equipment failures resulting in potential release of fuel, lubricating oil, and hydraulic fluids include worn hoses, inadequate piping and tank foundational supports, leaky gaskets, malfunctioning dispensing pumps, insecure welded seams, corrosion, and container body punctures.

Human errors resulting in potential release of fuels, lubricating oil, and hydraulic fluids include vehicular collisions, failure to secure drain plugs, valves, or lids, failure to deactivate pumps, kinked hoses, inadequate hose connections, and unstable placement of storage containers. Human errors and equipment failures leading to potential releases may occur during operation of processing and material handling equipment, routine maintenance of facility equipment, activities near storage areas, filling or refueling of facility tanks, or pumping or draining facility tanks.

A combination of inspections, training, standard procedures, maintenance, and structural BMPs (such as, secondary containments and berming) will help minimize the potential for non-stormwater discharges.

4.5 Existing Monitoring Data

Monitoring data can be found in the SPDES file at the Leroy facility office.

4.6 Site Evaluation Summary

The primary operations at the Leroy facility are the mining and processing of bedrock for crushed and broken stone. The bedrock is drilled and blasted and transported to the aggregate processing area adjacent to the quarry by haul trucks where it is crushed and screened into various sizes for sale. The aggregate product is stored in stockpiles adjacent to the quarry and sold by loading it into customers' trucks.

Activities performed as part of the mining operations that have the potential to contribute potential pollutants to stormwater include:

- Mining and processing of crushed stone,
- Usage of blasting agent (ANFO) for mining,
- Handling and storage of aggregate materials,
- Transport of materials over paved and unpaved haul roads,
- Bulk storage of petroleum fuels, lubricating oils, and hydraulic fluids,
- Fueling, maintenance, and operation of portable and mobile material handling and processing equipment,
- Mobile equipment and parts storage areas,
- Empty drum storage area next to small shop, and
- Runoff from roadways and staging areas.

To follow is a discussion of each of these activities, including an assessment of storage and handling practices of significant materials, the potential to contribute potential pollutants, and the practices employed to minimize off-site transport of impacted stormwater. Refer to Section 4.1 for identity of potential pollutants.

Although minimal, the processing of crushed stone and the handling and storage of aggregate materials has the potential to contribute pollutants to stormwater through contact with the aggregate materials and the transmission of dust. Likewise, the handling and use of blasting agents has the potential to contribute pollutants to stormwater via spills and incomplete detonations.

Transport of materials over haul roads also has the potential to contribute potential pollutants to stormwater. There is also the potential for stormwater contamination through incidental leaks and spills from the mobile material handling equipment. Off-site transport of impacted stormwater will be minimized through the use of sediment and erosion controls and preventative maintenance at the facility.

Fuel, lubricating oils, and hydraulic fluid deliveries and dispensing have the potential to contribute to stormwater pollution from drips, spills, and potential leaks. These potential sources of pollution will be controlled by the use of fill and dispensing standard operating procedures, routine inspections, the use of drip pans, the use of spill kits, and training. Personnel are to be present and alert, and proper procedures are to be employed during fueling activities. Additional measures are addressed in the facility SPCC Plan.

Mobile and processing equipment has the potential to contribute potential pollutants to stormwater through contact with incidental leaks and releases from equipment, fueling operations, or maintenance activities. To minimize the potential for stormwater contact, processing equipment is to be inspected daily prior to start up ("Pre-Shift Inspection") to assure no unusual conditions exist, and is to be maintained in accordance with manufacturers and/or Dolomite Products Co., Inc.'s recommended preventive maintenance procedures. Observed leaks are to be immediately controlled with drip pans and absorbents and the failure is to be promptly corrected.

Runoff from roadways and material storage areas will be controlled by diversion ditches and berms. Vegetation and sediment control structures are also in place to prevent sediment transport off-site. The majority of the site runoff flows into to the quarry pit; the remainder flows via ditching to Outfall 001.

5.0 Employee Training

Employee training programs will instill in key personnel a complete understanding of the BMP plan, the processes and materials with which they are working, the safety hazards, the practices for preventing discharges, and the procedures for responding properly and rapidly to toxic and hazardous materials incidents. To do this, it is necessary to inform personnel at all levels of their responsibilities, and the goals and components of the BMP Plan. Key components of the employee training should include at a minimum:

- Descriptions of structural and non-structural BMPs utilized at the facility,
- Inspection and maintenance of structural BMPs,
- Spill prevention and response training,

- Housekeeping and equipment maintenance responsibilities,
- Materials management procedures,
- Maintenance of inspection and corrective action records,
- Training tools such as, handbooks, drills, meetings, suggestion boxes, awards, and other incentives.

Employee training meetings will be conducted at least annually to assure adequate understanding of the objectives of the BMP plan and the individual responsibilities of each employee. Typically, these meetings will be part of routine employee meetings for safety or fire and spill protection. Such meetings will highlight previous spill events or failures, malfunctioning equipment components, and recently developed BMP precautionary measures. Specific training requirements are also provided in the facility SPCC Plan.

Training sessions will review the BMP plan and associated procedures. Just as fire drills are used to improve an employee's reaction to a fire emergency, spill or environmental incident drills may serve to improve the employee's reactions to BMP incidents. Spill drills should be performed on a routine basis. Spill drills serve to evaluate the employees' knowledge of BMP-related procedures and are a fundamental part of employee training.

Of particular importance is the strong commitment and periodic input from top management to the employee training program to create the necessary climate of concern for a successful program. Documentation of employee training shall be recorded, as required in the facility SPCC Plan, and stored at the facility office.

6.0 Inspection Records

The purpose of the inspection and records system is to detect actual or potential BMP incidents. The inspection and records system will include the equipment and plant areas identified in Section 4.0, Risk Identification and Assessment as having the potential for significant discharges, and as identified in the facility SPCC Plan.

Inspection records include inspection dates and results. These records will be signed by the appropriate supervisor and maintained at the facility office, pursuant to SPCC Plan requirements. A tracking (follow-up) procedure will be instituted to assure that adequate response and corrective action have been taken. The recordkeeping portion of this system can be combined with the existing SPCC Plan inspections. Appendix C provides a visual inspection form.

6.1 Annual Comprehensive Site Inspection and BMP Evaluation

An annual stormwater compliance inspection will be conducted approximately one year following implementation of this BMP Plan and annually thereafter. This comprehensive site compliance evaluation shall be performed by the Facility/Spill Response Coordinator and/or Alternate Facility/Spill Response Coordinator (see Table 1). The inspection will determine if the BMPs have been implemented and will assess their effectiveness. The inspection will also determine if site operations have changed since development of this BMP Plan.

If operational changes have been made, the Facility/Spill Response Coordinator and /or Alternate Facility/Spill Response Coordinator will determine if those changes will impact stormwater quality and develop new BMPs to address the change. All operational changes and new BMPs will be recorded and maintained with this BMP Plan. Additionally, the inspection date, the inspection personnel, the scope of the inspection, major observations, and any needed revisions will be recorded. ***Revisions to the plan will occur within fourteen days after the annual inspection.*** Blank annual compliance inspections reports can be found in Appendix D.

The following steps are to provide guidance for conducting the annual comprehensive site inspection and BMP evaluation.

1. **Perform a complete facility inspection**

    - ❑ Inspect stormwater drainage areas and outfalls for evidence of pollutants (sheens and turbidity) entering the drainage system.
    - ❑ Inspect conditions of all structural controls (e.g., berms, basins, curbing, etc.)
    - ❑ Determine if practices or controls are being implemented as identified in the BMP Plan.
    - ❑ Evaluate the effectiveness of pollution prevention measures. Evaluate whether the controls described in the BMP Plan are sufficient to minimize stormwater pollution or if additional controls are necessary.
    - ❑ Verify operational guidelines and other standard operating procedures are being followed.
    - ❑ Conduct inventory and visually inspect equipment needed to implement the BMP Plan such as spill response kits, drip pans, and tarps.
    - ❑ Review site to ensure stormwater is being discharged only through the outfalls listed in SPDES Permit # NY- 0247189 (Appendix A).
    - ❑ Check for industrial materials, residue or trash on the ground that could contaminate or be washed away in stormwater;
    - ❑ Check for leaks or spills from industrial equipment, drums, barrels, tanks, or similar containers; and
    - ❑ Check for off-site tracking of industrial materials or sediment where vehicles enter or exit the site.

2. **Review BMP Plan**

    - ❑ Review and update personnel and contact information in Section 2.0 (Page 2) and Table 1 (Page 3).
    - ❑ Determine if assessment information presented in Section 4.0 (Page 4) is up-to-date and reflects current site conditions and operations.
    - ❑ Determine if changes to the selected stormwater management controls (Sections 12.0 and 13.0) and training program (Section 5.0 and SPCC Plan) are needed based on results of inspection.

3. **Evaluate Compliance**

- ❑ Determine if additional controls are needed.
- ❑ Verify compliance with employee training program (Section 5.0 and SPCC Plan).
- ❑ Verify completion of stormwater monitoring, if applicable.
- ❑ Verify compliance with recordkeeping requirements (Section 6.0 and SPCC Plan).

4. **Complete the "Annual Comprehensive Site Inspection and BMP Evaluation Report Form" (see Appendix D)**

- ❑ Report is to be certified and signed by management.
- ❑ Retain copies of reports in the site office with the BMP and SPCC Plan for three years after the date of the report.

5. **Revise BMP Plan**

- ❑ Make revisions to the BMP Plan in accordance with Section 6.3 within two weeks of the inspection.
- ❑ Document revisions to the BMP Plan and maintain revision documentation in site office.

6. **Perform Corrective Actions**

- ❑ Document on "Future Spill and Erosion Control Measures" Form (Appendix E)
- ❑ Define schedule for completion.
- ❑ Implement changes within 12 weeks of the inspection.

6.2 BMPs for Sectors J and P

The Leroy facility is a limestone quarry with an aggregate processing plant, a maintenance shop, and an office. BMPs applicable to a limestone quarry (Sector J) and mobile equipment maintenance and fueling (Sector P) are associated with fuel and lubricating oil storage, aggregate materials processing, storage, and handling, and the use of mobile equipment on unpaved haul roads, and mobile equipment maintenance and fueling.

Fuel and lubricating oil and aggregate material BMPs require monthly routine inspections of material storage and handling areas, vehicle and equipment maintenance, cleaning, and fueling areas, material handling vehicles (e.g., stone bin load truck), equipment and processing areas. The site must maintain compliance with these "Sector J and P" requirements through performance of a combination of Dolomite Products Company, Inc. policies and procedures, and bulk petroleum storage regulations. Below is a summary of the minimum policies and procedures used to ensure stormwater pollution is prevented at the facility.

Fueling areas: Daily work-place inspections; monthly PBS tank inspections.

Equipment, processing areas, material storage and handling:
Daily work-place inspections; daily operating checklist; service reports.

Vehicles: Daily pre-shift inspections.

Equipment maintenance:
Daily work-place inspections; daily operating checklist; service reports; and employee time sheet maintenance log.

Specific sampling requirements are described in the SPDES Permit, which is incorporated as Appendix A of this BMP.

6.3 BMP Plan Revisions

The BMP Plan shall be amended whenever:

1. There is a change in design, construction, operation, or maintenance, which has a significant effect on the potential for the discharge of pollutants;

2. The BMP Plan proves to be ineffective in achieving the general objectives of controlling pollutants in stormwater discharges;

3. The recognition of deficiencies or needed changes discovered as a result of a facility inspection; and/or,

4. Annual stormwater reviews indicate changes are needed.

Revisions to the BMP Plan are to be documented. A history of revisions since the initial BMP Plan development date, as stated on title page, is to be maintained in the site office with the BMP Plan.

7.0 Preventative Maintenance

Preventative maintenance involves the regular inspection and testing of facility equipment, structures, grounds, and operations. A regular inspection program ensures that equipment, structures, and grounds (roadways, berms, ditches, catch basins, oil/water separators, etc.) are maintained in good operating condition and proper working order. Such inspections can uncover conditions such as leaks, cracks, faulty equipment, and damage to stormwater control structures that can be repaired or adjusted to prevent or minimize impacts to storm water. Many crushed stone and aggregate facilities already implement preventative maintenance programs in association with SPCC Plans that perform this function and can be utilized to satisfy this BMP. Key elements of an effective preventative maintenance program include the following:

- Daily visual inspections ('Pre-Shift Inspection') of equipment, machinery, structures, grounds, and operational systems prior to start-up.
- Appropriate and timely repair or replacement of faulty equipment, machinery, structures, and grounds.
- Maintenance of complete records on inspections, and repairs on equipment, machinery, structures, and grounds pursuant to manufacturer's recommendations and facility operations.

8.0 Good Housekeeping

Housekeeping practices at crushed stone facilities are intended to maintain a clean and orderly operation. Well maintained material and petroleum storage areas reduce the possibility of stormwater mixing with pollutants. Good housekeeping practices include the following:

- Trash and wind blown debris are to be collected regularly and properly containerized, for shipment to a licensed landfill on a regular basis.
- All leaks and spills are to be addressed as soon as possible in accordance with the facility SPCC Plan.
- Mobile and (or) stationary equipment is to be kept maintained.
- Used absorbent materials and drip pans are to be stored in closed, covered leak-proof containers and are to be appropriately disposed off-site as applicable.
- Operation and maintenance of the facility stormwater retention areas (quarry sump, ditching, and swales) will be performed.

8.1 Operations and Maintenance

Diligent operation and maintenance (O & M) of machinery, equipment, structures, and grounds help minimize the potential for accidental spills and the possibility of stormwater mixing with pollutants. Typical O & M practices include the following:

- Maintaining clean ground surfaces and floors by broom cleaning, shoveling, or sweeping,
- Regularly scheduled site cleanings, including trash, debris, and waste materials, including petroleum secondary containments,
- Prompt disposal of recyclable materials, including scrap metal,
- Routine inspections for leaks on equipment and machinery, pursuant to the facility SPCC Plan, and
- Train all employees and contractors about the need for good housekeeping and O & M.

8.2 Material Storage Practices

Improper storage can result in the release of materials and chemicals that can impact stormwater runoff.

- Store containers, drums, and other storage vessels indoors or under cover, and away from high traffic areas to minimize accidental releases and prevent impacts to stormwater due to accidental releases.
- Provide adequate aisle space to facilitate material transfer and easy access for inspections.
- Ensure that all liquids are stored within contained areas; at least to include curbing or diking around the perimeter of the storage area.
- Dispose of all drums and storage containers as soon as possible after use.
- Store containers or drums on wooden pallets or similar devices to prevent corrosion that could result in leaks and accidental releases.
- Conduct regular inspections of all material storage areas and maintain accurate and up-to-date materials inventories.
- Routinely inspect and drain fuel storage area secondary containments and remove any solid waste and vegetative debris.

9.0 Materials Compatibility

Materials compatibility encompasses three aspects, which are the compatibility of the chemicals being handled with the materials comprising the container, compatibility of different chemicals upon mixing in a container, and compatibility of the container with its environment.

Though not a significant practice at the Leroy facility, specific consideration should be given to procedures and practices delineating the mixing of chemicals and the prohibition of mixing of incompatible chemicals, which might result in fire, explosion or unusual corrosion. Thorough cleaning of storage vessels and equipment before being used for another chemical should be standard practice to ensure that there is no residual of a chemical that is incompatible with the second, or later, chemical to be used. Coatings or cathodic protection should be considered for protecting a buried pipeline or storage tank from corrosion.

10.0 Security

A security system is needed to prevent accidental or intentional entry to a plant which might result in vandalism, theft, sabotage or other improper or illegal use of plant facilities that could possibly cause a BMP incident. All petroleum storage areas should be secured and all dispensers lockable. All plant entrance roads shall have lockable gates.

11.0 Spill Prevention and Response

Development of a spill prevention and response plan is an important part of the BMP implementation and is an integral part of BMP and SPCC Plans. Several areas of a spill prevention and response BMP that should be addressed include the following:

- Identification of potential spill areas,
- Material handling procedures and storage requirements, and
- Spill response procedures.

Additional detail regarding these is provided in the facility SPCC Plan and summarized in the following sub-sections.

Storage of petroleum products will comply with the requirements of 6 NYCRR Part 613 (New York State regulations on the handling and storage of petroleum) and the SPCC Plan. To ensure releases of any quantity are promptly responded to and properly managed, training and inspections and maintenance of the petroleum storage facilities and mobile equipment shall be performed pursuant to the SPCC Plan.

11.1 Identification of Potential Spill Areas

A list or inventory of source materials and storage areas is provided in the SPCC Plan and summarized below. Stormwater drainage points from these storage areas and drainage pathways across the facility are provided in Plate 1. This inventory and the understanding of facility drainage pathways illustrate those areas with the greatest potential for material spills that could impact stormwater. These areas include:

- Bulk petroleum storage areas,
- Loading and unloading areas (e.g., fueling areas, maintenance areas etc.),

- Material storage areas,
- Aggregate processing equipment,
- Dust or particulate generating processes,
- Empty drum areas next to small shop, and
- Mobile equipment and parts storage areas.

The Leroy facility has the storage capacity to store almost 17,000 gallons of petroleum fuel, lubricating oils, and hydraulic fluids. As described in the SPCC Plan, these bulk storage areas are at the maintenance shop, the aggregate processing yard, and the quarry pit. A summary of the bulk petroleum, lubricating oil, and hydraulic fluid storage tank capacities and locations is provided in Table 4 below, and shown on Plate 1. Reference to the facility SPCC Plan is recommended.

Table 4 - Petroleum Storage Tank Summary

Tank No.	Tank Contents	Tank Location
1	10,000 gallon diesel AST	400 feet east of office
2	290 gallon diesel AST	400 feet east of office
3	300 gallon gasoline AST	400 feet east of office
4	500 gallon used oil AST	West end of shop
5	1,000 gallon used oil AST	West end of shop
6	250 gallon used oil AST	West end of shop
7	275 lubricating oil AST	In shop
8	275 lubricating oil AST	In shop
9	500 gallon dielectric fluid AST	East of stone plant
10	500 gallon dielectric fluid AST	of stone plant
11	500 gallon dielectric fluid AST	
12	350 gallon dielectric fluid AST	
13	350 gallon dielectric fluid AST	
14	275 gallon crusher oil AST	Stone plant
15	110 gallon crusher oil AST	Stone plant
16	110 gallon crusher oil AST	Stone plant
17	110 gallon crusher oil AST	Stone plant
18	200 gallon crusher oil AST	Stone plant
19	200 gallon crusher oil AST	Stone plant
	Variable Number of 55-gallon drums (lubricating oils and hydraulic fluids)	In shop

11.2 Material Handling Procedures and Storage Requirements

Procedures to eliminate spills or minimize the impacts of spills need to be implemented. These procedures include the following:

- Development of a recycling and waste minimization program,
- Install leak detection, overflow controls, diversion berms, and containment structures,
- Implement housekeeping practices,
- Perform regular inspections, and adopt standard operating procedures for filling tanks and other equipment in order to minimize spills, and
- Train all employees and suppliers regarding material transfer procedures.

11.3 Spill Response Procedures and Equipment

If a spill occurs, a rapid response may prevent or minimize impacts to storm water. The facility SPCC plan provides this function. The response plan provided in the SPCC Plan describes the following:

- Identification of a designated spill response team responsible for implementing response plan,
- Procedures to notify appropriate authorities providing assistance (e.g., police, fire, NYSDEC, USEPA, etc.),
- Provide safety measures with appropriate guidance on the type and location of personal protective equipment necessary,
- Provide procedures and identify the location of equipment and supplies to contain, divert, isolate, and clean-up the spill, and
- Provide training to all employees and suppliers on proper spill prevention and response.

12.0 Erosion and Sediment Control

BMPs for erosion and sediment control are in-place at the Leroy facility and will be maintained to minimize erosion potential and transport of sediment into stormwater flow paths and off-site. In general, the natural topography is flat with a low potential for soil erosion. The primary BMP used at the Leroy facility for erosion control and off-site sediment transport is berming and maintaining a vegetative cover. Most of the surfaces at the plant site are paved, aggregate gravel, or bedrock. As such, there is limited potential for soil erosion.

Areas with the potential for soil erosion are primarily the berms and areas where overburden has been stripped off the bedrock. When berms are constructed they are vegetated to prevent erosion. If and when erosion occurs, most of the sediment is transported into the quarry where is it is accumulated in the quarry pit and sump, and settles out prior to quarry dewatering. Berms at the quarry are routinely inspected and re-graded and re-seeded, as necessary. In some cases, ditching at the base of berms is utilized to direct run-off in to the quarry pit. In areas where overburden has been stripped, erosion and sediment control features will be implemented and runoff will be directed to the quarry pit.

13.0 Management of Runoff

As indicated in Section 12.0, the majority of runoff at the Leroy facility is directed into the quarry pit. Stormwater and quarry dewatering water are then pumped from the quarry sump to the air stripper with discharges to a 24-inch pipe that directs the water to a rip rapped ditch and the SPDES

Outfall 001. All of this water ultimately flows to Mud Creek southeast of the quarry. Retention in the quarry sump, rip rap and vegetation in the ditch network, good housekeeping, and site inspections are utilized to minimize potential impacts to runoff. Plate 1 shows the quarry sump, air stripper, 24-inch discharge pipe and the ditch pathways transmitting the dewatering water, and the SPDES Outfall 001.

Notes:

- This map generated from photogrammetric data and aerial photograph by Lockwood Mapping Inc., base map by Continental Placer Inc. dated 5/7/96, base map by Erdman Anthony Associates dated 2/84, U.S.G.S. quad., Leroy, New York, and 2010 NAIP Orthophoto.
- Property lines, railroad location, tree lines, and Hanson Stone Quarry location are approximate.
- Datum: Mean Sea Level
- Contour interval is 2 ft..
- U.S.G.S. 7.5 minute quad., Leroy, New York.
- This map is intended for illustrative purposes only, and should not be used for any other purpose.

① Plant area is future excavation area except for a 170' strip along northernmost portion, 4.6± acres.

AFFECTED AREA SUMMARY
2011-2016 PERMIT TERM

PLANT AREA①	30.8± ACRES
QUARRIED AREA	9.4± ACRES
EXCAVATION AREAS	103.3± ACRES
MODIFIED AREA FOR STOCKPILES, STAGING AND EQUIPMENT STORAGE	16.0± ACRES
MODIFIED DISCHARGE DITCH	0.17± ACRES
TOTAL LIFE OF MINE AND 2011-2016 PERMIT TERM AREA	159.67± ACRES

CONTINENTAL PLACER INC.
11 Winners Circle Albany, New York 12205
ph: 518/458-9203 fax: 518/458-9206

Site Drainage & Features Map

Dolomite Products Co., Inc.
LeRoy Quarry
Town of LeRoy Genesee Co., NY.

Project Manager: WJM Prepared By: WJM Drafted By: WKC Reviewed By: WJM	Date: May 4, 2017 Project No: 73-201-13-4335	Sheet No: 1 of 1

APPENDIX A

LEROY FACILITY SPDES PERMIT
NO. NY-0247189

New York State Department of Environmental Conservation
Division of Environmental Permits
NYSDEC HEADQUARTERS
625 BROADWAY
ALBANY, NY 12233
(518) 402-9167

SPDES PERMIT RENEWAL

10/29/2018

JOHN SWIERKOS, JR
DOLOMITE PRODUCTS CO INC
1150 PENFIELD RD
ROCHESTER NY 14625

Permittee Name: DOLOMITE PRODUCTS COMPANY INC
Facility Name: LE ROY STONE QUARRY
Ind. Code: 1422 County: GENESEE
DEC ID: 8-1836-00001/02002 SPDES No.: NY0247189
Permit Effective Date: 7/1/2019
Permit Expiration Date: 6/30/2024

Dear Permittee,

The State Pollutant Elimination System (SPDES) permit renewal for the facility referenced above is approved with the new effective and expiration dates. This letter together with the previous valid permit for this facility effective on 07/01/2014 and any subsequent modifications constitute authorization to discharge wastewater in accordance with all terms, conditions and limitations specified in the previously issued permit(s).

As a reminder, SPDES permits are renewed at a central location in Albany in order to make the process more efficient. All other concerns with your permit, including applications for permit modification or transfer to a new owner, a name change, and other questions, should be directed to:

Regional Permit Administrator
NYSDEC Region 8 Headquarters
6274 E Avon-Lima Rd
Avon, NY 14414
(585) 226-2466

If you have already filed an application for modification of your permit, it will be processed separately by that office.

If you have questions concerning this permit renewal, please contact Michael R Schaefer at (518) 402-9167.

Sincerely,

Kent P. Sanders

Kent P. Sanders
Deputy Permit Administrator

cc:

RPA	RWE	BWP
BWC	File	EPA

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

State Pollutant Discharge Elimination System (SPDES)
DISCHARGE PERMIT

First3.03

Industrial Code:	1422	SPDES Number:	NY0247189
Discharge Class (CL):	01	DEC Number:	8-1836-00001/02002
Toxic Class (TX):	T	Effective Date (EDP):	July 1, 2014
Major Drainage Basin:	04	Expiration Date (ExDP):	June 30, 2019
Sub Drainage Basin:	02	Modification Dates: (EDPM)	
Water Index Number:	Ont. 11-7-257		
Compact Area:			

This SPDES permit is issued in compliance with Title 8 of Article 17 of the Environmental Conservation Law of New York State and in compliance with the Clean Water Act, as amended, (33 U.S.C. ' 1251 et.seq.)(hereinafter referred to as "the Act").

PERMITTEE NAME AND ADDRESS

Name: **Dolomite Products Co., Inc.** Attention: **John Swierkos, Jr.**

Street: **1150 Penfield Road**

City: **Rochester** State: **NY** Zip Code: **14625**

is authorized to discharge from the facility described below:

FACILITY NAME AND ADDRESS

Name: **LeRoy Quarry**

Location (C,T,V): **LeRoy(T)** County: **Genesee**

Facility Address: **Gulf Road**

City: **LeRoy** State: **NY** Zip Code: **14482**

NYTM -E: **260811** NYTM - N: **4763212**

From Outfall No.: **001** at Latitude: **42 ° 59 ' 82 "** & Longitude: **77 ° 56 ' 53 "**

into receiving waters known as: **Mud Creek** Class: **C**

and (list other Outfalls, Receiving Waters & Water Classifications)

in accordance with: effluent limitations; monitoring and reporting requirements; other provisions and conditions set forth inthis permit; and 6 NYCRR Part 750-1and 750-2.

DISCHARGE MONITORING REPORT (DMR) MAILING ADDRESS

Mailing Name: **Dolomite Products Co., Inc.**

Street: **1150 Penfield Road**

City: **Rochester** State: **NY** Zip Code: **14625**

Responsible Official or Agent: **John Swierkos, Jr.** Phone: **(585) 381-7010**

This permit and the authorization to discharge shall expire on midnight of the expiration date shown above and the permittee shall not discharge after the expiration date unless this permit has been renewed, or extended pursuant to law. To be authorized to discharge beyond the expiration date, the permittee shall apply for permit renewal not less than 180 days prior to the expiration dateshown above.

DISTRIBUTION:

CO BWP - Permit Coordinator
RWE
RPA
EPA Region II - Michelle Josilo
J. Swierkos, Jr. Dolomite Products Co., Inc.
J. Hellert, Continental Placer

Permit Administrator: Scott E. Sheeley	
Address: NYSDEC Region 8 6274 E. Avon-Lima Road, Avon, NY 14414	
Signature: Scott E. Sheeley	Date: 6 /06 2014

PERMIT LIMITS, LEVELS AND MONITORING DEFINITIONS

OUTFALL	WASTEWATER TYPE	RECEIVING WATER	EFFECTIVE	EXPIRING
	This cell describes the type of wastewater authorized for discharge. Examples include process or sanitary wastewater, storm water, non-contact cooling water.	This cell lists classified waters of the state to which the listed outfall discharges.	The date this page starts in effect. (e.g. EDP or EDPM)	The date this page is no longer in effect. (e.g. ExDP)

PARAMETER	MINIMUM	MAXIMUM	UNITS	SAMPLE FREQ.	SAMPLE TYPE
e.g. pH, TRC, Temperature, D.O.	The minimum level that must be maintained at all instants in time.	The maximum level that may not be exceeded at any instant in time.	SU, °F, mg/l, etc.	See below	See below

PARAMETER	EFFLUENT LIMIT or CALCULATED LEVEL	COMPLIANCE LEVEL/ ML	ACTION LEVEL	UNITS	SAMPLE FREQUENCY	SAMPLE TYPE
	Limit types are defined below in Note 1. The effluent limit is developed based on the more stringent of technology-based limits, required under the Clean Water Act, or New York State water quality standards. The limit has been derived based on existing assumptions and rules. These assumptions include receiving water hardness, pH and temperature; rates of this and other discharges to the receiving stream; etc. If assumptions or rules change the limit may, after due process and modification of this permit, change.	For the purposes of compliance assessment, the permittee shall use the approved EPA analytical method with the lowest possible detection limit as promulgated under 40CFR Part 136 for the determination of the concentrations of parameters present in the sample unless otherwise specified. If a sample result is below the detection limit of the most sensitive method, compliance with the permit limit for that parameter was achieved. Monitoring results that are lower than this level must be reported, but shall not be used to determine compliance with the calculated limit. This PQL can be neither lowered nor raised without a modification of this permit.	Action Levels are monitoring requirements, as defined below in Note 2, which trigger additional monitoring and permit review when exceeded.	This can include units of flow, pH, mass, temperature, or concentration. Examples include µg/l, lbs/d, etc.	Examples include Daily, 3/week, weekly, 2/month, monthly, quarterly, 2/yr and yearly. All monitoring periods (quarterly, semiannual, annual, etc) are based upon the calendar year unless otherwise specified in this Permit.	Examples include grab, 24 hour composite and 3 grab samples collected over a 6 hour period.

<u>Notes:</u>

1. EFFLUENT LIMIT TYPES:
   a. DAILY DISCHARGE: The discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for the purposes of sampling. For pollutants expressed in units of mass, the 'daily discharge' is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the 'daily discharge' is calculated as the average measurement of the pollutant over the day.
   b. DAILY MAX.: The highest allowable daily discharge. DAILY MIN.: The lowest allowable daily discharge.
   c. MONTHLY AVG: The highest allowable average of daily discharges over a calendar month, calculated as the sum of each of the daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.
   d. 7 DAY ARITHMETIC MEAN (7 day average): The highest allowable average of daily discharges over a calendar week.
   e. 30 DAY GEOMETRIC MEAN: The highest allowable geometric mean of daily discharges over a calendar month, calculated as the antilog of: the sum of the log of each of the daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.
   f. 7 DAY GEOMETRIC MEAN: The highest allowable geometric mean of daily discharges over a calendar week.
   g. RANGE: The minimum and maximum instantaneous measurements for the reporting period must remain between the two values shown.

2. ACTION LEVELS: Routine Action Level monitoring results, if not provided for on the Discharge Monitoring Report (DMR) form, shall be appended to the DMR for the period during which the sampling was conducted. If the additional monitoring requirement is triggered as noted below, the permittee shall undertake a short-term, high-intensity monitoring program for the parameter(s). Samples identical to those required for routine monitoring purposes shall be taken on each of at least three consecutive operating and discharging days and analyzed. Results shall be expressed in terms of both concentration and mass, and shall be submitted no later than the end of the third month following the month when the additional monitoring requirement was triggered. Results may be appended to the DMR or transmitted under separate cover to the same address. If levels higher than the Action Levels are confirmed, the permit may be reopened by the Department for consideration of revised Action Levels or effluent limits. The permittee is not authorized to discharge any of the listed parameters at levels which may cause or contribute to a violation of water quality standards.

PERMIT LIMITS, LEVELS AND MONITORING

OUTFALL	WASTEWATER TYPE	RECEIVING WATER	EFFECTIVE	EXPIRING
001	Mine dewatering including stormwater, clean groundwater, and contaminated groundwater	Mud Creek	EDP	ExDP

PARAMETER	MINIMUM	MAXIMUM	UNITS	SAMPLE FREQUENCY	SAMPLE TYPE	FOOTNOTES (FN)
pH	6.5	8.5	SU	1 / month	Grab	-
Temperature	Monitor	Monitor	°F	1 / month	Grab	-

PARAMETER	EFFLUENT LIMIT or CALCULATED LEVEL		COMPLIANCE LEVEL/ ML	ACTION LEVEL	UNITS	SAMPLE FREQUENCY	SAMPLE TYPE	FN
	Monthly Avg	Daily Max						
Flow	2.9		-	-	MGD	Continuous	Recorder	-
Total Suspended Solids, TSS	-	10	-	-	mg/L	1 / month	24 hr. Comp.	-
Oil & Grease	-	15	-	-	mg/L	1 / month	Grab	-
Benzene	-	5	-	-	ug/L	1 / month	Grab	-
Chemical Oxygen Demand, COD	-	Monitor	-	-	mg/L	1 / month	Grab	-
Ethylbenzene	-	5	-	-	ug/L	1 / month	Grab	-
Toluene	-	5	-	-	ug/L	1 / month	Grab	-
Trichloroethene	-	10	-	-	ug/L	2 / month	Grab	-
Xylenes, Sum of O,M,P	-	15	-	-	ug/l	1 / month	Grab	-

SPECIAL CONDITIONS - INDUSTRY BEST MANAGEMENT PRACTICES

1. **General** - The permittee shall develop, maintain, and implement a Best Management Practices (BMP) plan to prevent releases of significant amounts of pollutants to the waters of the State through plant site runoff; spillage and leaks; sludge or waste disposal; and stormwater discharges including, but not limited to, drainage from raw material storage. The BMP plan shall be documented in narrative form and shall include the 13 minimum BMPs and any necessary plot plans, drawings, or maps. Other documents already prepared for the facility such as a Safety Manual or a Spill Prevention, Control and Countermeasure (SPCC) plan may be used as part of the plan and may be incorporated by reference. A copy of the current BMP plan shall be submitted to the Department as required in item (2.) below and a copy must be maintained at the facility and shall be available to authorized Department representatives upon request.

2. **Compliance Deadlines** - The initial completed BMP plan shall be submitted **WITHIN 6 MONTHS OF EDP** to the Regional Water Engineer. The BMP plan shall be implemented within 6 months of submission, unless a different time frame is approved by the Department. The BMP plan shall be reviewed annually and shall be modified whenever (a) changes at the facility materially increase the potential for releases of pollutants; (b) actual releases indicate the plan is inadequate, or (c) a letter from the Department identifies inadequacies in the plan. The permittee shall certify in writing, as an attachment to the December Discharge Monitoring Report (DMR), that the annual review has been completed. All BMP plan revisions (with the exception of SWPPPs - see item (5.) below) must be submitted to the Regional Water Engineer within 30 days. Note that the permittee is not required to obtain Department approval of the BMP plan (or of any SWPPPs) unless notified otherwise. Subsequent modifications to or renewal of this permit does not reset or revise these deadlines unless a new deadline is set explicitly by such permit modification or renewal.

3. **Facility Review** - The permittee shall review all facility components or systems (including but not limited to material storage areas; in-plant transfer, process, and material handling areas; loading and unloading operations; storm water, erosion, and sediment control measures; process emergency control systems; and sludge and waste disposal areas) where materials or pollutants are used, manufactured, stored or handled to evaluate the potential for the release of pollutants to the waters of the State. In performing such an evaluation, the permittee shall consider such factors as the probability of equipment failure or improper operation, cross-contamination of storm water by process materials, settlement of facility air emissions, the effects of natural phenomena such as freezing temperatures and precipitation, fires, and the facility's history of spills and leaks. The relative toxicity of the pollutant shall be considered in determining the significance of potential releases. The review shall address all substances present at the facility that are identified in Tables 6-10 of SPDES application Form NY-2C (available at http://www.dec.ny.gov/docs/permits_ej_operations_pdf/form2c.pdf) or that are required to be monitored for by the SPDES permit.
4. **13 Minimum BMPs:** Whenever the potential for a release of pollutants to State waters is determined to be present, the permittee shall identify BMPs that have been established to prevent or minimize such potential releases. Where BMPs are inadequate or absent, appropriate BMPs shall be established. In selecting appropriate BMPs, the permittee shall consider good industry practices and, where appropriate, structural measures such as secondary containment and erosion/sediment control devices and practices. USEPA guidance for development of stormwater elements of the BMP is available in the September 1992 manual *Storm Water Management for Industrial Activities,* EPA 832-R-92-006 (available from NTIS, 703-487-4650, order # PB 92235969). As a minimum, the plan shall include the following BMPs:

1. BMP Pollution Prevention Team	6. Security	10. Spill Prevention & Response
2. Reporting of BMP Incidents	7. Preventive Maintenance	11. Erosion & Sediment Control
3. Risk Identification & Assessment	8. Good Housekeeping	12. Management of Runoff
4. Employee Training	9. Materials/Waste Handling, Storage, & Compatibility	13. Street Sweeping
5. Inspections and Records		

Note that for some facilities, especially those with few employees, some of the above BMPs may not be applicable. It is acceptable in these cases to indicate "Not Applicable" for the portion(s) of the BMP Plan that do not apply to your facility, along with an explanation.

SPECIAL CONDITIONS - INDUSTRY BEST MANAGEMENT PRACTICES (continued)

5. **Stormwater Pollution Prevention Plans (SWPPPs) Required for Discharges of Stormwater From Construction Activity to Surface Waters** - As part of BMP #11, a SWPPP shall be developed prior to the initiation of any site disturbance of one acre or more of uncontaminated area. Uncontaminated area means soils or groundwater which are free of contamination by any toxic or non-conventional pollutants identified in Tables 6-10 of SPDES application Form NY-2C. Disturbance of any size contaminated area(s) and the resulting discharge of contaminated stormwater is not authorized by this permit unless the discharge is under State or Federal oversight as part of a remedial program or after review by the Regional Water Engineer; nor is such discharge authorized by any SPDES general permit for stormwater discharges. SWPPPs are not required for discharges of stormwater from construction activity to groundwaters. The SWPPP shall conform to the *New York Standards and Specifications for Erosion and Sediment Control* and *New York State Stormwater Management Design Manual,* unless a variance has been obtained from the Regional Water Engineer, and to any local requirements. The permittee shall submit a copy of the SWPPP and any amendments thereto to the local governing body and any other authorized agency having jurisdiction or regulatory control over the construction activity **at least 30 days prior to soil disturbance.** The SWPPP shall also be submitted to the Regional Water Engineer if contamination, as defined above, is involved and the permittee must obtain a determination of any SPDES permit modifications and/or additional treatment which may be required prior to soil disturbance. Otherwise, the SWPPP shall be submitted to the Department only upon request. When a SWPPP is required, a properly completed *Notice of Intent* (NOI) form shall be submitted (available at www.dec.ny.gov/chemical/43133.html) prior to soil disturbance. Note that submission of a NOI is required for informational purposes; the permittee is not eligible for and will not obtain coverage under any SPDES general permit for stormwater discharges, nor are any additional permit fees incurred. SWPPPs must be developed and submitted for subsequent site disturbances in accordance with the above requirements. The permittee is responsible for ensuring that the provisions of each SWPPP are properly implemented.

6. **Facilities with Petroleum and/or Chemical Bulk Storage (PBS and CBS) Areas** - Compliance must be maintained with all applicable regulations including those involving releases, registration, handling and storage (6NYCRR 595-599 and 612-614). Stormwater discharges from handling and storage areas should be eliminated where practical.

   A. Spill Cleanup - All spilled or leaked substances must be removed from secondary containment systems as soon as practical and for CBS storage areas within 24 hours, unless written authorization is received from the Department. The containment system must be thoroughly cleaned to remove any residual contamination which could cause contamination of stormwater and the resulting discharge of pollutants to waters of the State. Following spill cleanup the affected area must be completely flushed with clean water three times and the water removed after each flushing for proper disposal in an on-site or off-site wastewater treatment plant designed to treat such water and permitted to discharge such wastewater. Alternately, the permittee may test the first batch of stormwater following the spill cleanup to determine discharge acceptability. If the water contains no pollutants it may be discharged. Otherwise it must be disposed of as noted above. See *Discharge Monitoring* below for the list of parameters to be sampled for.

   B. Discharge Operation - Stormwater must be removed before it compromises the required containment system capacity. Each discharge may only proceed with the prior approval of the permittee staff person responsible for ensuring SPDES permit compliance. Bulk storage secondary containment drainage systems must be locked in a closed position except when the operator is in the process of draining accumulated stormwater. Transfer area secondary containment drainage systems must be locked in a closed position during all transfers and must not be reopened unless the transfer area is clean of contaminants. Stormwater discharges from secondary containment systems should be avoided during periods of precipitation. A logbook shall be maintained on site noting the date, time and personnel supervising each discharge.

SPECIAL CONDITIONS - INDUSTRY BEST MANAGEMENT PRACTICES (continued)

C. Discharge Screening - Prior to each discharge from a secondary containment system the stormwater must be screened for contamination*. All stormwater must be inspected for visible evidence of contamination. Additional screening methods shall be developed by the permittee as part of the overall BMP Plan, e.g. the use of volatile gas meters to detect the presence of gross levels of gasoline or volatile organic compounds. If the screening indicates contamination, the permittee must collect and analyze a representative sample** of the stormwater. If the water contains no pollutants it may be discharged. Otherwise it must either be disposed of in an onsite or off site wastewater treatment plant designed to treat and permitted to discharge such wastewater or the Regional Water Engineer can be contacted to determine if it may be discharged without treatment.

D. Discharge Monitoring - Unless the discharge from any bulk storage containment system outlet is identified in the SPDES permit as an outfall with explicit effluent and monitoring requirements, the permittee shall monitor the outlet as follows:

(i) *Bulk Storage Secondary Containment Systems:*

(a) The volume of each discharge from each outlet must be monitored. Discharge volume may be calculated by measuring the depth of water within the containment area times the wetted area converted to gallons or by other suitable methods. A representative sample shall be collected of the first discharge* following any cleaned up spill or leak. The sample must be analyzed for pH, the substance(s) stored within the containment area and any other pollutants the permittee knows or has reason to believe are present**.

(b) Every fourth discharge* from each outlet must be sampled for pH, the substance(s) stored within the containment area and any other pollutants the permittee knows or has reason to believe are present**.

(ii) *Transfer Area Secondary Containment Systems:*

The first discharge* following any spill or leak must be sampled for flow, pH, the substance(s) transferred in that area and any other pollutants the permittee knows or has reason to believe are present**.

E. Discharge Reporting - Any results of monitoring required above, excluding screening data, must be submitted to the Department by appending them to the corresponding DMR. Failure to perform the required discharge monitoring and reporting shall constitute a violation of the terms of the SPDES permit.

F. Prohibited Discharges - **In all cases, any discharge which contains a visible sheen, foam, or odor, or may cause or contribute to a violation of water quality is prohibited.** The following discharges are prohibited unless specifically authorized elsewhere in this SPDES permit: spills or leaks, tank bottoms, maintenance wastewaters, wash waters where detergents or other chemicals have been used, tank hydrotest and ballast waters, contained fire fighting runoff, fire training water contaminated by contact with pollutants or containing foam or fire retardant additives, and unnecessary discharges of water or wastewater into secondary containment systems.

* Discharge includes stormwater discharges and snow and ice removal. If applicable, a representative sample of snow and/or ice should be collected and allowed to melt prior to assessment.

** If the stored substance is gasoline or aviation fuel then sample for oil & grease, benzene, ethylbenzene, naphthalene, toluene and total xylenes (EPA method 602). If the stored substance is kerosene, diesel fuel, fuel oil, or lubricating oil then sample for oil & grease and polynuclear aromatic hydrocarbons (EPA method 610). If the substance(s) are listed in Tables 6-8 of SPDES application form NY-2C then sampling is required. If the substance(s) are listed in NY-2C Tables 9-10 sampling for appropriate indicator parameters may be required, e.g. BOD5 or toxicity testing. Contact the facility inspector for further guidance. In all cases flow and pH monitoring is required.

DISCHARGE NOTIFICATION REQUIREMENTS

(a) Except as provided in (c) and (g) of these Discharge Notification Act requirements, the permittee shall install and maintain identification signs at all outfalls to surface waters listed in this permit. Such signs shall be installed before initiation of any discharge.

(b) Subsequent modifications to or renewal of this permit does not reset or revise the deadline set forth in (a) above, unless a new deadline is set explicitly by such permit modification or renewal.

(c) The Discharge Notification Requirements described herein do not apply to outfalls from which the discharge is composed exclusively of storm water, or discharges to ground water.

(d) The sign(s) shall be conspicuous, legible and in as close proximity to the point of discharge as is reasonably possible while ensuring the maximum visibility from the surface water and shore. The signs shall be installed in such a manner to pose minimal hazard to navigation, bathing or other water related activities. If the public has access to the water from the land in the vicinity of the outfall, an identical sign shall be posted to be visible from the direction approaching the surface water.

The signs shall have **minimum** dimensions of eighteen inches by twenty four inches (18" x 24") and shall have white letters on a green background and contain the following information:

N.Y.S. PERMITTED DISCHARGE POINT

SPDES PERMIT No.: NY_________

OUTFALL No. :____

For information about this permitted discharge contact:

Permittee Name: ______________________________

Permittee Contact: ______________________________

Permittee Phone: ( ) - ### - ####

OR:

NYSDEC Division of Water Regional Office Address :

NYSDEC Division of Water Regional Phone: ( ) - ### -####

(e) For each discharge required to have a sign in accordance with a), the permittee shall, concurrent with the installation of the sign, provide a repository of copies of the Discharge Monitoring Reports (DMRs), as required by the **RECORDING, REPORTING AND ADDITIONAL MONITORING REQUIREMENTS** page of this permit. This repository shall be open to the public, at a minimum, during normal daytime business hours. The repository may be at the business office repository of the permittee or at an off-premises location of its choice (such location shall be the village, town, city or county clerk's office, the local library or other location as approved by the Department). In accordance with the **RECORDING, REPORTING AND ADDITIONAL MONITORING REQUIREMENTS** page of your permit, each DMR shall be maintained on record for a period of five years

(f) The permittee shall periodically inspect the outfall identification sign(s) in order to ensure they are maintained, are still visible, and contain information that is current and factually correct. Signs that are damaged or incorrect shall be replaced within 3 months of inspection.

DISCHARGE NOTIFICATION REQUIREMENTS (continued)

(g) All requirements of the Discharge Notification Act, including public repository requirements, are waived for any outfall meeting any of the following circumstances, provided Department notification is made in accordance with (h) below:

(i) such sign would be inconsistent with any other state or federal statute;

(ii) the Discharge Notification Requirements contained herein would require that such sign could only be located in an area that is damaged by ice or flooding due to a one-year storm or storms of less severity;

(iii) instances in which the outfall to the receiving water is located on private or government property which is restricted to the public through fencing, patrolling, or other control mechanisms. Property which is posted only, without additional control mechanisms, does not qualify for this provision;

(iv) instances where the outfall pipe or channel discharges to another outfall pipe or channel, before discharge to a receiving water; or

(v) instances in which the discharge from the outfall is located in the receiving water, two-hundred or more feet from the shoreline of the receiving water.

(h) If the permittee believes that any outfall which discharges wastewater from the permitted facility meets any of the waiver criteria listed in (g) above, notification (form enclosed) must be made to the Department's Bureau of Water Permits, Central Office, of such fact, and, provided there is no objection by the Department, a sign and DMR repository for the involved outfall(s) are not required. This notification must include the facility's name, address, telephone number, contact, permit number, outfall number(s), and reason why such outfall(s) is waived from the requirements of discharge notification. The Department may evaluate the applicability of a waiver at any time, and take appropriate measures to assure that the ECL and associated regulations are complied with.

SCHEDULE OF SUBMITTALS

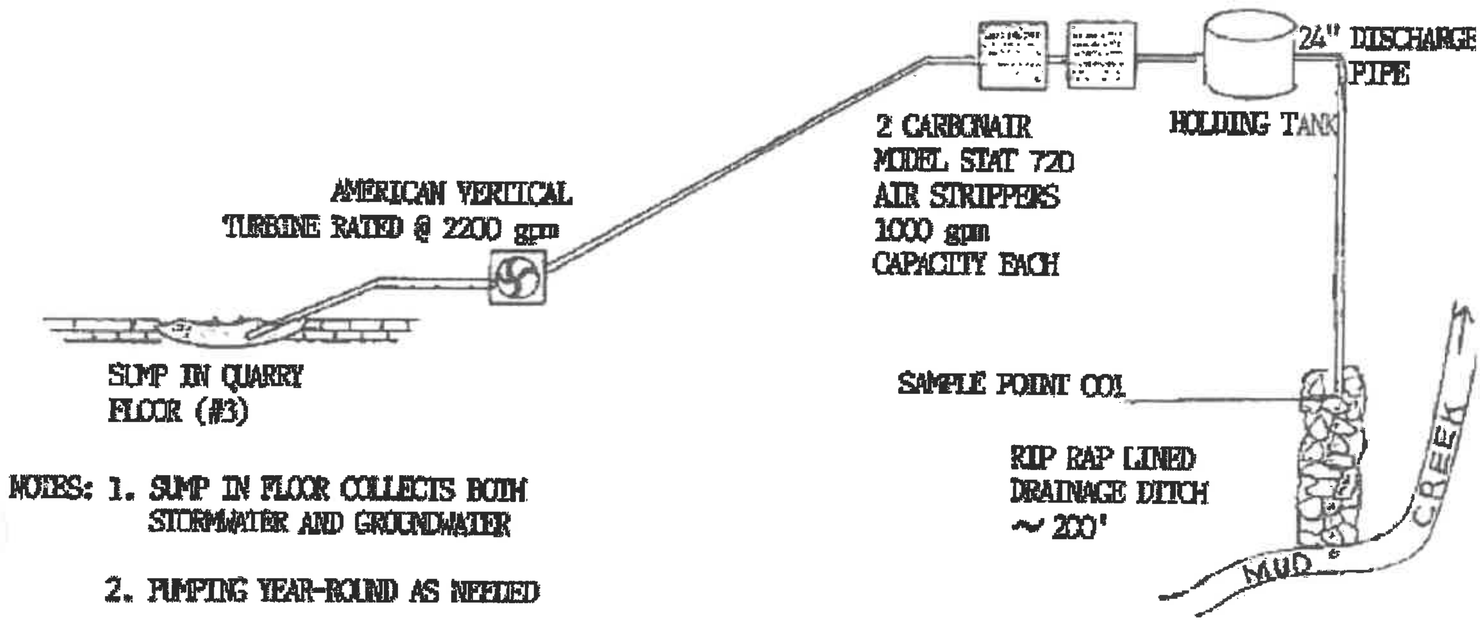
a) The permittee shall submit the following information to the Regional Water Engineer at the address listed on the Recording, Reporting and Monitoring page of this Permit, and to the Bureau of Water Permits, 625 Broadway, Albany NY 12233-3505:

Outfall	Parameters Affected	Required Action	Due Date
001	Total Phosphorus Total Nitrogen Total Dissolved Solids	The permittee shall collect 12 samples representative of normal discharge conditions and treatment plant operations over a 12 month period for the identified parameters, at a frequency of 1 per month. The permittee shall use the approved EPA analytical method with the lowest possible detection limit as promulgated under 40 CFR Part 136 for the determination of the concentrations of parameters listed. The permittee shall submit **quarterly** a summary of the results of the analyses to the addresses listed above.	Quarterly until EDP + 12 months

b) The above actions are one time requirements. The permittee shall submit the results of the above actions to the Department's satisfaction once. When this permit is administratively renewed by NYSDEC letter entitled "SPDES NOTICE/RENEWAL APPLICATION/PERMIT," the permittee is not required to repeat the submittal(s) noted above. The above due dates are independent from the effective date of the permit stated in the letter of "SPDES NOTICE/RENEWAL APPLICATION/PERMIT."

MONITORING LOCATIONS

The permittee shall take samples and measurements, to comply with the monitoring requirements specified in this permit, at the location(s) specified below:



GENERAL REQUIREMENTS

A. The regulations in 6 NYCRR Part 750 are hereby incorporated by reference and the conditions are enforceable requirements under this permit. The permittee shall comply with all requirements set forth in this permit and with all the applicable requirements of 6 NYCRR Part 750 incorporated into this permit by reference, including but not limited to the regulations in paragraphs B through H as follows:.

B. General Conditions

1.	Duty to comply	6NYCRR Part 750-2.1(e) & 2.4
2.	Duty to reapply	6NYCRR Part 750-1.16(a)
3.	Need to halt or reduce activity not a defense	6NYCRR Part 750-2.1(g)
4.	Duty to mitigate	6NYCRR Part 750-2.7(f)
5.	Permit actions	6NYCRR Part 750-1.1(c), 1.18, 1.20 & 2.1(h)
6.	Property rights	6NYCRR Part 750-2.2(b)
7.	Duty to provide information	6NYCRR Part 750-2.1(i)
8.	Inspection and entry	6NYCRR Part 750-2.1(a) & 2.3

C. Operation and Maintenance

1.	Proper Operation & Maintenance	6NYCRR Part 750-2.8
2.	Bypass	6NYCRR Part 750-1.2(a)(17), 2.8(b) & 2.7
3.	Upset	6NYCRR Part 750-1.2(a)(94) & 2.8(c)

D. Monitoring and Records

1.	Monitoring and records	6NYCRR Part 750-2.5(a)(2), 2.5(c)(1), 2.5(c)(2), 2.5(d) & 2.5(a)(6)
2.	Signatory requirements	6NYCRR Part 750-1.8 & 2.5(b)

E. Reporting Requirements

1.	Reporting requirements	6NYCRR Part 750-2.5, 2.6, 2.7 & 1.17
2.	Anticipated noncompliance	6NYCRR Part 750-2.7(a)
3.	Transfers	6NYCRR Part 750-1.17
4.	Monitoring reports	6NYCRR Part 750-2.5(e)
5.	Compliance schedules	6NYCRR Part 750-1.14(d)
6.	24-hour reporting	6NYCRR Part 750-2.7(c) & (d)
7.	Other noncompliance	6NYCRR Part 750-2.7(e)
8.	Other information	6NYCRR Part 750-2.1(f)
9.	Additional conditions applicable to a POTW	6NYCRR Part 750-2.9
10.	Special reporting requirements for discharges that are not POTWs	6NYCRR Part 750-2.6

F. Planned Changes

1. The permittee shall give notice to the Department as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

   a. The alteration or addition to the permitted facility may meet of the criteria for determining whether facility is a new source in 40 CFR §122.29(b); or
   b. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, or to notification requirements under 40 CFR §122.42(a)(1); or
   c. The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.

   In addition to the Department, the permittee shall submit a copy of this notice to the United States Environmental Protection Agency at the following address: U.S. EPA Region 2, Clean Water Regulatory Branch, 290 Broadway, 24th Floor, New York, NY 10007-1866.

GENERAL REQUIREMENTS continued

G. Notification Requirement for POTWs

1. All POTWs shall provide adequate notice to the Department and the USEPA of the following:
   a. Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to section 301 or 306 of CWA if it were directly discharging those pollutants; or
   b. Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.
   c. For the purposes of this paragraph, adequate notice shall include information on:
      i. the quality and quantity of effluent introduced into the POTW, and
      ii. any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

POTWs shall submit a copy of this notice to the United States Environmental Protection Agency, at the following address: U.S. EPA Region 2, Clean Water Regulatory Branch, 290 Broadway, 24th Floor, New York, NY 10007-1866.

H. Sludge Management
The permittee shall comply with all applicable requirements of 6 NYCRR Part 360.

RECORDING, REPORTING AND ADDITIONAL MONITORING REQUIREMENTS

A. The monitoring information required by this permit shall be summarized, signed and retained for a period of at least five years from the date of the sampling for subsequent inspection by the Department or its designated agent. **Also, monitoring information required by this permit shall be summarized and reported by submitting;**

[X] (if box is checked) completed and signed Discharge Monitoring Report (DMR) forms for each _1_ month reporting period to the locations specified below. Blank forms are available at the Department's Albany office listed below. The first reporting period begins on the effective date of this permit and the reports will be due no later than the 28th day of the month following the end of each reporting period.

[ ] (if box is checked) an annual report to the Regional Water Engineer at the address specified below. The annual report is due by February 1 each year and must summarize information for January to December of the previous year in a format acceptable to the Department.

[ ] (if box is checked) a monthly "Wastewater Facility Operation Report..." (form 92-15-7) to the:
[ ] Regional Water Engineer and/or [ ] County Health Department or Environmental Control Agency specified below

Send the **original** (top sheet) of each DMR page to:
Department of Environmental Conservation
Division of Water, Bureau of Water Compliance
625 Broadway, Albany, New York 12233-3506
Phone: (518) 402-8177

Send the **first copy** (second sheet) of each DMR page to:
Department of Environmental Conservation
Regional Water Engineer, Region 8
6274 East Avon-Lima Rd., Avon, New York, 14414-9516
Phone: (585) 226-5450

Send an **additional copy** of each DMR page to:

B. Monitoring and analysis shall be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit.

C. More frequent monitoring of the discharge(s), monitoring point(s), or waters of the State than required by the permit, where analysis is performed by a certified laboratory or where such analysis is not required to be performed by a certified laboratory, shall be included in the calculations and recording of the data on the corresponding DMRs.

D. Calculations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified in this permit.

E. Unless otherwise specified, all information recorded on the DMRs shall be based upon measurements and sampling carried out during the most recently completed reporting period.

F. Any laboratory test or sample analysis required by this permit for which the State Commissioner of Health issues certificates of approval pursuant to section 502 of the Public Health Law shall be conducted by a laboratory which has been issued a certificate of approval. Inquiries regarding laboratory certification should be directed to the New York State Department of Health, Environmental Laboratory Accreditation Program.

SPDES Permit Statement of Basis – Surface Water Discharges

I. SUMMARY OF PROPOSED PERMIT CHANGES

A new State Pollutant Discharge Elimination System (SPDES) permit has been issued. Following is a summary of the limitations in the permit; the details of these limitations are specified below and in the permit:

- Flow is limited to the design of the treatment system.
- Pollutants subject to the Intermittent stream effluent limits (ISEL):
- pH and Total Suspended Solids
- Benzene, chemical oxygen demand, ethylbenzene, toluene, trichloroethene, toluene, oil & grease, and sum of xylenes is subject to best professional judgment(BPJ)
- To better characterize the effluent a short-term monitoring program for nutrients and total dissolved solids have been included in the permit.

Please note that when the Department updates a permit this typically includes updated forms incorporating the latest general conditions.

II. BACKGROUND INFORMATION

As noted throughout this document, SPDES permits are based on both federal and state requirements - law, regulation, policy, and guidance. These can generally be found on the internet. Current locations include: Clean Water Act (CWA) *www.epa.gov/lawsregs/laws/index.html#env*; Environmental Conservation Law (ECL) *www.dec.ny.gov/regulations/40195.html*; federal regulations *www.gpo.gov/fdsys/browse/collectionCfr.action?collectionCode=CFR*; state environmental regulations *www.dec.ny.gov/regulations/regulations.html*; NYSDEC water policy *www.dec.ny.gov/regulations/2654.html.*

III. PROPOSED PERMIT REQUIREMENTS

The Department evaluates discharges with respect to the relevant sections of the CWA, ECL, federal/state regulations, policy, and guidance to determine which conditions to include in the draft permit.

The Department determines the **technology-based effluent limits (TBELs)** that must be incorporated into the permit. A TBEL requires a minimum level of treatment. For industrial point sources, TBELs are typically based on federal effluent guidelines and/or best professional judgment (BPJ). BPJ considers currently available treatment technologies and appropriate Best Management Practices (BMPs). For municipal POTWs and private sewage treatment plants, TBELs are typically based on secondary treatment requirements and, if applicable, CSO control policy.

The Department then evaluates the water quality expected to result from technology controls to determine if any exceedances of water quality criteria in the receiving water might result. If so, **water quality-based effluent limits (WQBELs)** must be included in the permit. A WQBEL is designed to ensure that the water quality standards of receiving waters are being met. In general, effluent limits for a particular pollutant are the more stringent of either the TBEL or WQBEL.

For existing permittees, the previous permit typically forms the basis for the next permit. Permit revisions are implemented where justified due to changed conditions at the facility and/or in response to updated regulatory requirements. Regulatory anti-backsliding requirements prohibit the relaxation of effluent limits in reissued permits unless one of the specified exceptions applies, as detailed in TOGS 1.2.1.

Applicable law and regulation requires that monitoring be included in permits to determine compliance with effluent limitations. Additional effluent monitoring may also be required to gather data to determine if effluent limitations may be required. The permittee is responsible for conducting the monitoring and, when required, for reporting results on DMRs. The permit contains the monitoring requirements for the facility. Monitoring frequency is based on the minimum sampling necessary to adequately monitor the facility's performance and TOGS 1.2.1 and TOGS 1.3.3.

IV. TBELs & Anti-Backsliding:

CWA sections 301(b)(1)(B) and 304(d)(1), ECL section 17-0509, and 6 NYCRR Part 750-1.11 require technology-based controls, known as secondary treatment, on Publicly Owned Treatment Works (POTW) effluents. The applicable regulations are specified in 40 CFR Part 133.102 and 6 NYCRR Part 750-1.11. These and other requirements are summarized in TOGS 1.3.3.

Anti-backsliding requirements are specified in the CWA, sections 402(o) and 303(d)(4), ECL 17-0809 and regulations at 40 CFR 122.44(l) and 6 NYCRR Part 750-1.10. These requirements are summarized in TOGS 1.2.1. Generally, the regulations prohibit the relaxation of effluent limits in reissued permits unless one of the specified exceptions applies. In practice, limits in reissued permits will generally be no less stringent than previous permit limits to ensure compliance with anti-backsliding requirements. Otherwise, the specific exceptions that allow backsliding will be cited on a case-by-case basis.

Following is the TBEL & Anti-backsliding assessment for each pollutant present in the discharge(s). A summary of this analysis is provided in the *Pollutant Summary Table* at the end of this fact sheet.

V. WQBELs & Anti-Degradation:

In addition to the TBELs previously discussed, the NYSDEC evaluated the discharge to determine compliance with CWA sections 101 and 301(b)(1)(C), 40 CFR 122.44(d)(1), and 6 NYCRR Parts 700-704 and 750-1.11. These require that permits include limits for all pollutants or parameters which are or may be discharged at a level which will cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality. The limits must be stringent enough to ensure that water quality standards are met and must be consistent with any available wasteload allocation (WLA). These and other requirements are summarized in TOGS 1.1.1, 1.3.1, 1.3.2, 1.3.5 and 1.3.6.

The procedure for developing WQBELs includes knowing the pollutants present in the discharge(s), identifying water quality criteria applicable to these pollutants, determining if WQBELs are necessary (reasonable potential), and calculating the WQBELs. Factors also considered in this analysis include available dilution of effluent in the receiving water, receiving water chemistry, and other pollutant sources. If the expected concentration of the pollutant of concern in the receiving water may exceed the ambient water quality standard or guidance value then there is reasonable potential that the discharge may cause or contribute to a violation of the water quality, and a WQBEL or WLA for the pollutant is required.

Antidegradation Policy: New York State implements the antidegradation portion of the CWA based upon two documents: (1) Organization and Delegation Memorandum #85-40, entitled "Water Quality Antidegradation Policy," signed by the Commissioner of NYSDEC, dated September 9, 1985; and, (2) TOGS 1.3.9, entitled "Implementation of the NYSDEC Antidegration Policy – Great Lakes Basin (Supplement to Antidegradation Policy dated September 9, 1985)." A SPDES permit cannot be issued that would result in the water quality criteria being violated. The permit for the facility contains effluent limits which ensure that the existing beneficial uses of the receiving waters will be maintained.

Following is the WQBEL analysis for each pollutant present in the discharge(s). Anti-degradation analysis which justifies applying water quality standards of a higher classification is noted below, if applicable. Refer to section VII below for information on discharge location, receiving water information (class, dilution, chemistry), and the existence of any TMDLs. A summary of this analysis is provided in the *Pollutant Summary Table* at the end of this fact sheet.

VI. POLLUTANT-SPECIFIC TBEL / WQBEL & ANTI-DEGRADATION ANALYSIS

Flow – A flow limit of 2.9 MGD is specified, which is equal to the design capacity of the treatment system.

pH – The dilution ratio is 1:1 so a limit equal to the water quality standard of 6.5-8.5 is appropriate.

Temperature – Monitoring is required for control and informational purposes.

Total Suspended Solids (TSS) – The narrative water quality standards provided in 6 NYCRR Part 703.2 state that the discharge of suspended solids shall not cause deposition or impair the receiving waters for their best usages. The dilution ratio is 1:1 so a limit equal to 10 mg/L daily maximum is appropriate, consistent with TOGS 1.3.1 for intermittent streams.

Oil & Grease – A limit of 15 mg/l has been established to ensure appropriate pretreatment to prevent fouling of the carbon filters.

Benzene – The maximum daily limit has been set to 5 ug/L in accordance with the model technology, air stripping. See Attachment C, TOGS 1.2.1.

Chemical Oxygen Demand – Monitoring is required for control and informational purposes.

Toluene – The maximum daily limit has been set to 5 ug/L in accordance with the model technology, air stripping. See Attachment C, TOGS 1.2.1.

Trichloroethene – The maximum daily limit has been set to 10 ug/L in accordance with the model technology, air stripping. See Attachment C, TOGS 1.2.1.

Xylenes, Sum of O, M, P – The maximum daily limit has been set to 15 ug/L in accordance with the model technology, air stripping. See Attachment C, TOGS 1.2.1.

VI. OTHER CONDITIONS SPECIFIC TO THIS PERMIT

Schedule of Submittals: The permittee is required to complete a short-term high intensity monitoring program. This program requires the permittee to collect monthly samples to determine the levels or presence of nutrients and total dissolved solids in the effluent.

Best Management Practices (BMPs): The permittee is required to implement a BMP plan that prevents, or minimizes the potential for, the release of significant amounts of toxic or hazardous pollutants to state waters. The BMP plan requires annual review by the permittee. This requirement is new.

VII. OUTFALL, RECEIVING WATER & POLLUTANT SUMMARY TABLES

Outfall Number	Latitude	Longitude	Receiving Water Name	Water Class	Water Index Number	Major/Sub Basin	Hardness	7Q10	Dilution
001	42° 59' 82"	77° 56' 53"	Mud Creek	C	Ont. 11-7-257	04 / 02	171 mg/L - D	0 cfs	1:1
Source(s) of Wastewater:			Stormwater, clean groundwater, and groundwater impacted by Lehigh derailment spill.						
Existing Wastewater Treatment Facilities:			Air Stripping						

Effluent Parameter (concentration in mg/L and mass in lbs/day unless otherwise specified)	Existing Effluent Quality*				TBELs				Water Quality Data & WQBELs					Permit Basis (T or WQ or NA)
	concentration		Mass (lbs/d)					PQL	Ambient Criteria	Ambient Background	WQBEL			
	Avg	Max	Avg/Max	95%/99%	conc.	mass	Type	conc.	conc.	conc.	conc.	mass	Type	
Flow Rate, MGD	Minimum	NA	Maximum	NA	2.9		MA	-	-	-	-	-	-	T
pH, su	Minimum	7.81	Maximum	8.44	6.0 – 9.0		Range		6.5 – 8.5	-	6.5 – 8.5		Range	WQ
Temperature, °F	Minimum	NA	Maximum	NA	Monitor		Range		Narrative	-	-		-	T
Total Suspended Solids, TSS	<10	13.5	-	-	10	-	DM		Narrative	-	-	-	-	T
Oil & Grease	-	-	-	-	15	-	DM		Narrative	-	-	-	-	T
Trichloroethene (μg/L)	5.5	8.84	-	-	10	-	DM	0.5	40	-	40	-	DM	T
Benzene (μg/L)	-	-	-	-	5	-	DM	-	210	-	210	-	DM	T
Chemical Oxygen Demand, COD	-	-	-	-	Monitor	-	DM	-	-	-	-	-	-	T
Ethylbenzene (μg/L)	-	-	-	-	5	-	DM	-	17	-	17	-	DM	T
Toluene (μg/L)	-	-	-	-	5	-	DM	-	100	-	100	-	DM	T
Xylenes, Sum of O,M,P (μg/L)	-	-	-	-	15	-	DM	-	65	-	65	-	DM	T

D: Default value based on nearby facilities.
MA: monthly average
DM: daily maximum
* 2012 quarry discharge pump out water test was used.

APPENDIX B

BMP INCIDENT REPORTING FORM

BMP Incident Reporting Form

Instructions: In the event of a BMP Incident, this form is to be completed as soon as possible and is to be used in reporting spills to the appropriate agencies. Contact the Dolomite Products Company, Inc. Leroy Quarry Environmental Manager for assistance in completing this form and for reporting of the incident.

Your Name:
Location:
Telephone Number:

Those responsible for the incident: Name:
Location Address:

Date and Time of Incident:

Location of Incident:

Source and cause of the release or spill:

Type of material(s) released or spilled:

Quantity of Material(s) released or spilled:

Danger or threat posed by the release or spill:

Number and types of injuries (if any):

Weather conditions at the incident location:

Actions Taken to Mitigate Incident:

Any other information that may help emergency personnel responding to the incident:

Spill Reporting: **Person reporting spill:**

Name(s) of person and agencies reported to:

Name	Agency	Date	Time

APPENDIX C

VISUAL MONITORING RECORDS

Quarterly Visual Monitoring Form

Facility:		Permit ID:
Outfall No.:	Examiners Name and Title:	
Quarter/Year:	Date/Time Examined:	Runoff Source: Rain Snow
Rainfall Amount:	Qualifying Storm? Yes No	
Parameter	Parameter Description	Parameter Characteristics
Color	Does the stormwater appear to be colored? Yes No	Describe:
Clarity	Is stormwater clear or transparent? Yes No	Describe the clarity: Clear Milky Opaque
Oil Sheen	Can you see a rainbow effect or sheen on the water? Yes No	Which best describes the sheen? Rainbow Sheen Floating Oil Blebs
Odor	Does the sample have an odor Yes No	Describe:
Floating Solids	Is there anything floating on the water? Yes No	Describe:
Suspended Solids	Is there anything suspended in the water column? Yes No	Describe:
Settled Solids	Is there anything settled on the bottom of the sample? Yes No	Describe:
Foam	Is there foam or froth on the top of the sample surface? Yes No	Describe:

Detail any concerns, corrective actions taken and any other indicators of pollution present in the sample:

Stormwater Examiner's Signature:

Fax this Quarterly Visual Monitoring Form to the Environmental Manager within 24 hours of completion: (585) 381-0208

APPENDIX D

ANNUAL STORMWATER AND/OR SPDES COMPLIANCE EVALUATION FORM

ANNUAL STORMWATER AND/OR SPDES COMPLIANCE EVALUATION

SITE NAME: ______________________________

SITE ADDRESS: ______________________________

INSPECTOR(S) NAMES(S): ______________________________

DATE: ____________________

SITE INSPECTION:

Conditions: ______________________________

Notes/Findings

1) **Outfalls –**
(e.g., obstructions, visible staining, damage, etc.)

2) **Structural BMPs -**
(e.g., berms, drains, retention basins, etc.)
(Confirm BMPs are maintained in good condition, operating correctly, and adequate for conditions.)

3) **Areas where additional BMPs needed?**

4) Industrial materials, residue, or trash exposed to stormwater? (Y / N)

Comments:

5) Leaks or spills from equipment or containers? (Y / N)

Comments:

6) Are there non-stormwater discharges? (Y / N)

Comments:

7) Off-site track out of sediment where vehicles enter or exit the site? (Y / N)

Comments:

8) Tracking or blowing of raw, final, or waste materials from areas of no exposure to exposed areas? (Y / N)

Comments:

9) Evidence of, or the potential for, pollutants entering the drainage system? (Y / N)
Comments:

10) Review "Quarterly Visual Monitoring" forms
Comments:

11) Review "Annual Sampling" reports. Are "bench-mark" or "effluent limitations" exceeded? (Y / N)
Comments:

12) Review the Stormwater Best Management Plan (BMP Plan). Are revisions needed? (Y / N)

Notes:

a) Revisions may include personnel names, tele. #s, description of new or modified BMPs/controls, new or modified procedures, etc.
b) Revisions to the BMP Plan must be completed within 14 calendar days following inspection, unless permission is granted in writing by NYSDEC.
c) If existing BMPs need modification or if additional BMPs are necessary implementation must be completed before the next anticipated storm event (if practical), but no more than <u>12 weeks</u> after the comprehensive site evaluation.

Comments:

13a) Were incidents of non-compliance found? (Y / N)

13b) Describe any incidents of non-compliance and associated corrective actions with deadlines.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gathered and evaluated the information contained in this document. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information contained herein is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. Based on my review the facility is in compliance with the BMP Plan and the SPDES Permit.

Management

Signature: ______________________________

Date: __________________________________

APPENDIX E

FUTURE SPILL AND EROSION CONTROL FEATURES

Future Spill and Erosion Control Features

Control Measure	Location	Proposed Date of Construction	Completion Date

APPENDIX F

CONSTRUCTION SWPPP

CONTINENTAL PLACER INC.

II Winners Circle • Albany, New York 12205
(518) 458-9203 *fax* (518) 458-9206

www.continentalplacer.com

LEROY QUARRY
STORMWATER BEST MANAGEMENT PRACTICE PLAN
DOLOMITE PRODUCTS CO., INC.

SPDES Permit No. NY-0247189
Town of Leroy, Genesee County, New York

Prepared For:

Dolomite Products Co., Inc.
1150 Penfield Road
Rochester, New York 14625

Prepared by:

Continental Placer Inc.
2 Winners Circle
Albany, New York 12205

Original
July 18, 2014

Revised
May 5, 2017

Version 2.0

TABLE OF CONTENTS

Figures

Appendices

1.0 INTRODUCTION

This Construction Activities Stormwater Pollution Prevention Plan (SWPPP) has been prepared for soil disturbance activities (overburden stripping) at the Dolomite Products Co., Inc. (Dolomite) Leroy facility. This SWPPP has been prepared pursuant to the SPDES Permit Special Condition #5 requiring a SWPPP for discharges of stormwater from soil disturbance of one or more acres of land. Implementation of this plan is not expected to be necessary because soil disturbance (overburden stripping) activities at the Dolomite Leroy facility are not expected to have the potential to discharge stormwater to waters of the State. All stormwater from the stripping areas is directed into the quarry pit and/or the on-site retention ponds. If site soil disturbance activities ever have the potential to discharge stormwater to waters of the State then this SWPPP will be implemented.

2.0 SITE DESCRIPTION

The Leroy facility is a limestone quarry. The limestone bedrock being mined is the Onondaga Formation. The Leroy facility also has aggregate processing plants, a dewatering water air stripping treatment plant, a mobile equipment maintenance shop, and office. It is located on Gulf Road in the Town of Leroy in Genesee County. A site location map is provided as Figure 1.

The closest water body to the Leroy facility is Mud Creek. Mud Creek is south and east of the quarry flowing eastward south of the quarry and northeastward east of the quarry. There is also a flooded quarry pond in an inactive quarry pit northwest of the Leroy facility. None of these surface water features are listed as impaired, nor do they discharge to an impaired surface water body.

2.1 Slopes and Soils

Land surface elevations range from approximately 775 to 795 feet from east to west across the facility. The majority of the site has been cleared of overburden soils and is exposed limestone bedrock. The soils in the area are primarily mapped as being part of the Benson Soil series with smaller areas of Niagara, Collamer, Palmyra, and Honeoye soils. The soils mapped in proximity to the Dolomite Leroy facility are as follows:

BeB	Benson cherty loam; 0 to 8% slopes
BeD	Benson cherty loam, 8 to 25% slopes
BeE	Benson cherty loam, 25 to 40% slopes
NaA	Niagara and Collamer silt loams, 0 to 2% slopes
PaA	Palmyra gravelly loam, 0 to 3% slopes
PaC	Palmyra gravelly loam, 8 to 15% slopes
HnB	Honeoye silt loam, 2 to 8% slope.

The Benson soils are thin layered over bedrock with gentle to moderate slopes; they are rocky, and generally moderately to well drained. The Niagara soils are somewhat poorly drained silty deposits. The Collamer soils are moderately well drained silty and fine sand deposits. Palmyra soils are gravelly, well drained with gentle to moderate slopes. The Honeoye soils are well drained silty loam deposits with gentle to moderate slopes.

As stated above, bedrock is exposed in the quarry pit and areas adjacent to the pit. Near vertical bedrock highwalls comprise the bounds of the quarry pit. Natural slopes typically range from 0 to 35 percent.

2.2 Site Drainage

All site drainage is into the quarry pit and into on-site retention ponds.

3.0 STRIPPING SCHEDULE

Stripping is typically performed periodically during the year with a duration of only a few weeks. Stripping is done adjacent to the active portion of the quarry. Vegetation is first removed then overburden is removed and transported to a storage area or used to make berms. Once stripping is completed, areas of exposed soil are stabilized via seeding and silt fencing and bedrock mining progresses into the stripped area.

4.0 PLANNED EROSION AND SEDIMENT CONTROL PRACTICES

Planned erosion and sediment control (ESC) practices are silt fencing; diversion with swales, ditching, and berms; check dams; retention ponds; surface stabilization (seeding/re-vegetation); dust control; grading; and the use of no greater than 3:1 slopes. The ditching is a permanent feature southeast of the quarry pit. Silt fencing, grading, and surface stabilization will be temporary erosion control features utilized during overburden stripping. The stripped overburden will be stockpiled for subsequent use during mine reclamation and used to build berms. The stockpiled overburden and any earthen berms constructed with the overburden will be graded with no greater than 3:1 slopes, silt fencing will be placed at the toe of the overburden stockpiles or berms, and the stockpile or berms will be seeded. A copy of the 'Blue Book Lite' that shows schematics of the typical erosion control BMPs that will be used at the Dolomite Leroy facility is provided in Attachment A. The key elements for erosion and sediment control are runoff control, sediment control, and stabilization.

4.1 Runoff Control

To minimize concentrated flow from the facility a few runoff control techniques may be implemented. These provisions help prevent point discharge and provide on-site runoff control by infiltration. The goal is to minimize runoff and replicate pre-soil disturbance hydrology. On-site management of stormwater runoff can be accomplished by a combination of the following approaches.

- As possible, direct run-off into quarry pit to allow accumulation and sediment settling in quarry sumps.
- Utilize perimeter controls (berming, grading, silt fencing) to prevent run-on of stormwater into the work area and direct run-off from the work area into the quarry pit (not towards property bonds).
- Control the runoff in each small drainage area before flow reaches runoff from entire stripping area.
- Convey surface flows from highly erodible soil and steep slopes to more suitable stable areas.
- Runoff from existing or proposed cut and fill slopes should be redirected to lower water velocity without causing erosion (use of check dams or vegetated swales).

- Final site drainage should be designed to prevent erosion, concentrated flows to adjacent properties, uncontrolled overflow, and ponding.

4.2 Sediment Control

Sediment control is a primary feature that must be addressed whenever disturbing soil at the Dolomite Leroy facility. The following will be considered during all site overburden stripping activities:

- At any location where surface runoff from disturbed or graded areas may flow off the stripping area, sediment control measures must be installed to prevent sediment from being transported to property bonds. Grading, filling or other disturbance within existing drainage swales should be avoided. The use of berms, swales, and ditching will be used to control and direct runoff to the quarry pit.
- Swales or other areas that transport concentrated flow will be appropriately stabilized.
- Downspout or sump pump discharges must have acceptable outfalls that are protected by splash blocks, sod, or piping as required by site conditions (i.e., no concentrated flow directed over fill slopes).

4.3 Stabilization

The Dolomite Leroy facility personnel will stabilize all buffer areas adjacent to the overburden stripping areas to minimize erosion and sediment transport towards property bonds. Stabilization of soil disturbances within and surrounding the stripped areas will be accomplished by a combination of the following approaches.

- Implement erosion control practices to keep the soil in place.
- Stabilization should be completed immediately for the surface of all perimeter controls and perimeter slopes.
- When activities temporarily cease during construction, soil stockpiles and exposed soil should be stabilized by seed, mulch or other appropriate measures as soon as possible, but in no case not more than 14 days after construction activity has ceased.
- Following initial soil disturbance or re-disturbance, permanent or temporary, stabilization should be completed within 14 days or as soon as possible.
- Apply temporary or permanent stabilization measures immediately on all disturbed areas where work is delayed or completed.

5.0 INSPECTIONS

Qualified personnel will conduct site inspections in areas with the potential to discharge stormwater to surface waters of the State as follows:

- All erosion and sediment control practices in areas with potential for stormwater discharge to surface water will be inspected to ensure integrity and effectiveness to ensure that practices are constructed as indicated in the facility BMP plan and this construction SWPPP.
- All areas of disturbance in areas with potential for stormwater discharge to surface water that have not achieved final stabilization will be inspected.

- All points of discharge to natural surface water bodies located within, or immediately adjacent to, the property boundaries of the mine will be inspected.
- All stormwater discharge points will be inspected.

For sites where soil disturbance activities are on-going, the qualified personnel shall conduct a site inspection at least once every seven (7) calendar days. Where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and temporary stabilization has been applied to all disturbed areas or if runoff is unlikely due to winter conditions (e.g., site is covered with snow, ice, or the ground is frozen), the qualified personnel shall conduct a site inspection at least once every thirty (30) calendar days.

Inspection reports will be prepared following inspections to describe the inspection findings and recommending any corrective actions. At a minimum, the inspection report shall include and/or address the following:

- Date and time of inspection;
- Name and title of person(s) performing inspection;
- A description of the weather and soil conditions (e.g. dry, wet, saturated) at the time of the inspection;
- A description of the condition of the runoff at all points of discharge from the site;
- Identify any discharges of sediment or other pollutants from the site, including discharges from conveyance systems (i.e. pipes, culverts, ditches, etc.) and overland flow;
- A description of the condition of all natural surface water bodies located within, or immediately adjacent to, the property boundaries of the construction site which receive runoff from disturbed areas. This shall include identification of any discharges of sediment to the surface water body;
- Identification of all BMPs and erosion and sediment control practices that need repair or maintenance;
- Identification of all BMPs and erosion and sediment control practices that were not installed properly or are not functioning as designed and need to be reinstalled or replaced;
- Description of areas that are disturbed at the time of the inspection and areas that have been stabilized (temporary and/or final) since the last inspection, which will follow current monthly inspection pratices; and
- Corrective action(s) that must be taken to install, repair, replace or maintain erosion and sediment control practices; and to correct deficiencies identified with the construction of the post-construction stormwater management practice(s).

Within one (1) business day of the completion of an inspection, the qualified personnel will notify the SWPPP Coordinator of any corrective actions that need to be taken. The SWPPP Coordinator will ensure that the corrective actions will be implemented within one (1) business day of this notification and will complete the corrective actions within seven (7) calendar days unless otherwise notified by the Department.

6.0 MAINTENANCE

All erosion and sediment control structures require inspections, as discussed above, and maintenance to ensure those structural BMPs are functioning properly. The design, installation, inspection, maintenance and repair of erosion and sediment controls will conform to the New

York Standards and Specifications for Erosion and Sediment Control, 2005 and New York State Revegetation Procedures Manual: Surface Mining Reclamation, or their equivalents. An abbreviated version New York's 2005 document, the 'Blue Book Lite' is provided as Attachment A.

Figure 1 – Site Location Map

Attachment A

Blue Book Lite

BLUE-BOOK "LITE"

New York State
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Water

New York State
Standards and Specifications
for Erosion and Sediment Control

August 2005

New York State
Department of Environmental Conservation

George E. Pataki, Governor

Common Erosion and Sediment Control Standards
For
Code Municipal Enforcement Officers and Inspectors

For a complete copy of the Blue Book, please visit the NYS DEC website at:
http://www.dec.ny.gov/chemical/29066.html

New York State Department of Environmental Conservation

For use at *Construction Site Stormwater Inspections for Code Enforcement Officers - Part 2*

NYS Department of Environmental Conservation Endorsed Stormwater Training

NYS Department of State Code Enforcement Educational Program #49-5653

June 2007

Blue-Book "Lite"

Table of Contents

The *Blue Book "Lite"* is a compilation of the more commonly used erosion and sediment control practices from the unabridged *New York State Standards and Specifications for Erosion and Sediment Control*, the so-called "Blue Book." These were compiled for training purposes because construction stormwater site inspectors need to be familiar with the standards and specifications from the "Blue Book," and these would be more frequently encountered during inspections. The numbers in the Table (left column) represent the pages where the content (right column) would be found in the "Blue Book." Go to http://www.dec.ny.gov/chemical/29066.html to view or download the full document on the New York State Department of Environmental Conservation website.

The following sections from the August 2005 "Blue Book" prepared by:

Introduction and Sections 1, 2 and 5 -
Donald W. Lake, Jr., P.E., CPESC, CPSWQ
Engineering Specialist
New York State Soil & Water Conservation Committee

Section3 -
Frederick B. Gaffney
Former Conservation Agronomist
USDA - Natural Resources Conservation Service
Syracuse, New York

and

John A. Dickerson
Plant Materials Specialist
USDA - Natural Resources Conservation Service
Syracuse, New York

INTRODUCTION

Purpose

The purpose of this manual is to provide minimum standards and specifications for meeting criteria set forth by the New York State Department of Environmental Conservation (NYS DEC) for stormwater discharges associated with construction activity. The standards and specifications provide criteria on minimizing erosion and sediment impacts from construction activity involving soil disturbance. They show how to use soil, water, plants, and products to protect the quality of our environment. These standards and specifications were developed in cooperation with the USDA Natural Resources Conservation Service, New York State Soil and Water Conservation Committee (NYSSWCC), NYS DEC and other state and local agencies for use by planners, design engineers, developers, contractors, landscape architects, property owners, and resource managers. Proper use of these standards will protect the waters of the state from sediment loads during runoff events.

Scope and Authority

The standards and specifications apply to lands within New York State where housing, industrial, institutional, recreational, or highway construction, and other land disturbances are occurring or imminent. They are statewide in scope and, in some cases, are somewhat generalized due to variations in climate, topography, geology, soils, and plant requirements. Feasible ways to minimize erosion and sedimentation are varied and complex. Following these standards and specifications is presumed to be in compliance with the SPDES general permit for construction activities. Alternative methods may be explored on a case specific basis and shall be discussed with NYS DEC regional staff.

The Environmental Protection Agency delegated stormwater responsibility for the National Pollutant Discharge Elimination System (NPDES) Permit to New York on October 1, 1992. New York State issued its first General Permit for stormwater discharges from construction activities on August 1, 1993. This was issued pursuant to Article 17, Titles 7, 8 and Article 70 of Environmental Conservation Law. At a minimum, an erosion and sediment control plan must be prepared for any construction activity that disturbs one or more acres.

Erosion and Sediment Hazards Associated with Development

Many people may be adversely affected by development on relatively small areas of land. Uncontrolled erosion and sediment from these areas may cause considerable economic damage to individuals and society in general. Stream pollution and damages to public facilities and private homes are examples. Hazards associated with land disturbance include:

1. A large increase of soil exposed to erosion from wind and water;
2. Increased water runoff, soil movement, sediment accumulation and peak flows caused by:
   a. Removal of plant cover;
   b. A decrease in the area of soil which can absorb water because of construction of streets, buildings, sidewalks, and parking lots;
   c. Changes in drainage areas caused by grading operations, diversions, and streets;
   d. Changes in volume and duration of water concentrations caused by altering steepness, distance, and surface roughness;
   e. Soil compaction by heavy equipment, which can reduce the water intake of soils as much as 90 percent of the original rate; and,
   f. Prolonged exposure of unprotected sites and disturbed areas to poor weather conditions.
3. Altering the groundwater regime that may adversely affect drainage systems, slope stability, survival of existing vegetation and establishment of new plants;
4. Exposing subsurface materials that are too rocky, too acid, or otherwise unfavorable for establishing plants;
5. Obstructing stream flow with new buildings, dikes, and land fills;
6. Improper timing and sequencing of construction and development activities; and,
7. Abandonment of sites before completion of construction.

How to Use This Manual

The standards and specifications listed in this manual have been developed over time to reduce the impact of soil loss from construction sites to receiving water bodies and adjacent properties. This manual provides designers with details on how to plan a site for erosion and sediment control and how to select, size, and design specific practices to meet these resource protection objectives. The appendices at the end of this manual contain additional information as guidance for site plan design and review, construction implementation, and site inspection. Review and inspection checklists are provided to aid planners and designers in meeting the standards requirements.

BASIC PRINCIPLES OF EROSION AND SEDIMENT CONTROL

The Erosion and Sedimentation Processes

The standards, specifications, and planning guidelines presented in this document are intended to be utilized when development activities change the natural topography and vegetative cover of an area. Erosion and sediment control plans must be designed and constructed to minimize erosion and sediment problems associated with soil disturbance. To understand how erosion and sediment rates are increased requires an understanding of the processes themselves.

Soil erosion is the removal of soil by water, wind, ice, or gravity. This document deals primarily with the types of soil erosion caused by rainfall and surface runoff. Raindrops strike the soil surface at a velocity of approximately 25-30 feet per second and can cause splash erosion. Raindrop erosion causes particles of soil to be detached from the soil mass and splash into the air. After the soil particles are dislodged, they can be transported by surface runoff, which results when the soil becomes too saturated to absorb falling rain or when the rain falls at an intensity greater than the rate at which the water can enter the soil. Scouring of the exposed soil surface by runoff can cause further erosion. Runoff can become concentrated into rivulets or well-defined channels up to several inches deep. This advanced stage is called rill erosion. If rills and grooves remain unrepaired, they may develop into gullies when more concentrated runoff flows downslope.

Sediment deposition occurs when the rate of surface flow is insufficient for the transport of soil particles. The heavier particles, such as sand and gravel, transport less readily than the lighter silt and clay particles. Previously deposited sediment may be suspended by runoff from another storm and transported farther downslope. In this way, sediment is carried intermittently downstream from its upland point of origin.

Factors That Influence Erosion

The erosion potential of a site is determined by five factors; soil erodibility, vegetative cover, topography, climate, and season. Although the factors are interrelated as determinants of erosion potential, they are discussed separately for easy understanding.

1. **Soil Erodibility** – The vulnerability of a soil to erosion is known as erodibility. The soil structure, texture, and percentage of organic matter influence its erodibility. The most erodible soils generally contain high proportions of silt and very fine sand. The presence of clay or organic matter tends to decrease soil erodibility. Clays are sticky and tend to bind soil particles together. Organic matter helps to maintain stable soil structure (aggregates).

2. **Vegetative Cover** – Vegetation protects soil from the erosive forces of raindrop impact and runoff scour in several ways. Vegetation (top growth) shields the soil surface from raindrop impact while the root mass holds soil particles in place. Grass buffer strips can be used to filter sediment from the surface runoff. Grasses also slow the velocity of runoff, and help maintain the infiltration capacity of a soil. The establishment and maintenance of vegetation are the most important factors in minimizing erosion during development.

3. **Topography** – Slope length and steepness greatly influence both the volume and velocity of surface runoff. Long slopes deliver more runoff to the base of slopes and steep slopes increase runoff velocity. Both conditions enhance the potential for erosion to occur.

4. **Climate** – Climate also affects erosion potential in an area. Rainfall characteristics such as frequency, intensity, and duration directly influence the amount of runoff that is generated. As the frequency of rainfall increases, water has less chance to drain through the soil between storms. The soil will remain saturated for longer periods of time and stormwater runoff volume may be potentially greater. Therefore, erosion risks are high where rainfall is frequent, intense, or lengthy.

5. **Season** – Seasonal variation in temperature and rainfall defines periods of high erosion potential during the year. High erosion potential may exist in the spring when the surface soil first thaws and the ground underneath remains frozen. A low intensity rainfall may cause substantial erosion because the frozen subsoil prevents water infiltration. In addition, the erosion potential increases during the summer months due to more frequent, high intensity rainfall.

STEPS IN THE SELECTION AND DESIGN OF CONTROL MEASURES

The following text relates to the planning flow charts on pages 2.6, 2.7 and 2.8.

In the erosion and sediment control process, site designs must be prepared to address erosion control and then sediment control. Erosion control is accomplished by controlling runoff and then stabilizing soil. After erosion control has been planned, sediment control can then be developed.

Step 1: Identify Control Methods—Three basic methods are used to control soil movement on construction sites: runoff control, soil stabilization, and sediment control. **CONTROLLING EROSION SHALL BE THE FIRST LINE OF DEFENSE.** Runoff control and soil stabilization can be used to control erosion. Controlling erosion is very effective for small-disturbed areas such as single lots or small areas of a disturbance.

Sediment control may be necessary on large developments where mass grading is planned, where it is harder or impractical to control erosion, and where sediment particles are relatively large. A minimum of cost for erosion and sediment control is usually accomplished by using a combination of vegetative and structural erosion control and sedimentation control measures.

Step 2: Identify Resources and Potential Problem Areas—Resources need to be identified prior to initiating an ESC plan. These resources include, but are not limited to, receiving waters, tributaries to public water supplies, beaches and other concentrated recreational areas, wetlands, trees, vegetative buffers, steep slopes and cultural resources. Areas where erosion is to be controlled will usually fall into categories of slopes, graded areas or drainage ways. Slopes include graded rights-of-way, stockpile areas, and all cut or fill slopes. Graded areas include all stripped areas other than slopes. Drainage ways are areas where concentrations of water flow naturally or artificially, and the potential for gully erosion is high. Problem areas where sediment is to be controlled fall into categories of large or small drainage areas. Small areas are usually 1 acre or less while large areas are greater than 1 acre.

Step 3: Identify Required Strategy—The third step in erosion and sediment control planning is to follow the planning matrix from the problem area to the strategy that can be taken to solve the problem. Strategies can be used individually or in combination. For example, if there is a cut slope to be protected from erosion, the strategies may be to protect the ground surface, divert water from the slope, or shorten it. Any combination of these strategies can be used. If no rainfall except that which falls on the slope has the potential to cause erosion, and if the slope is relatively short, protecting the soil surface is often all that is required to solve the problem.

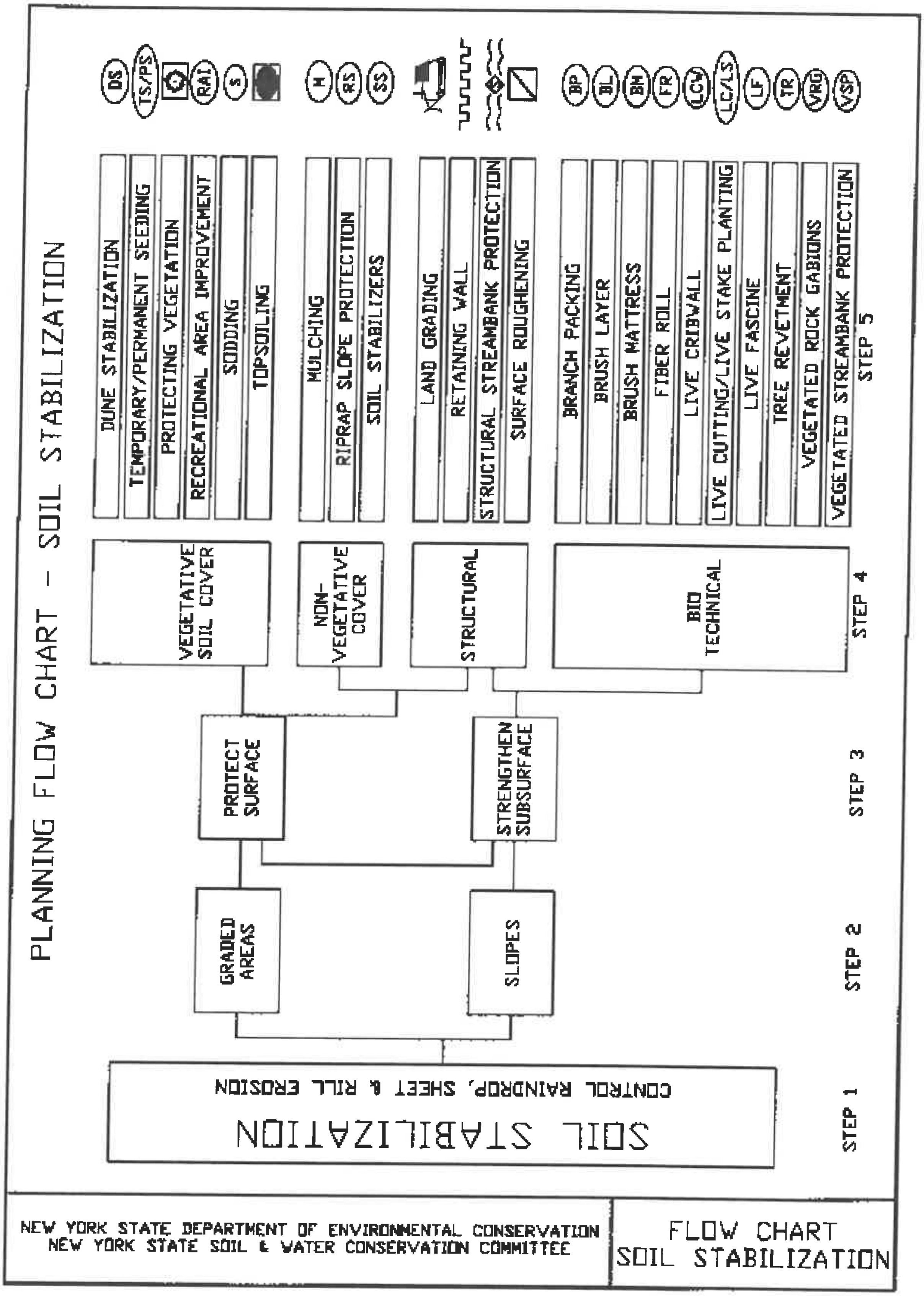
Step 4: Identify Control Measure Group—Once required strategies are identified, the planning flow chart leads to the group or groups of control measures that will accomplish one strategy. Control measures within each group have similar purpose, scope, application, design, criteria, standard plans, and construction specifications. Therefore, any measure within a group may solve the problem in question.

Step 5: Design Specific Control Measures—The final step in erosion and sediment control planning is accomplished by completing final design. This involves applying any control measure within a group to solve the specific erosion and sediment control problem. From descriptions given to the right of each control measure in the ESC planning matrix (Table 2.1), the one measure which is most economical, practical, efficient, and adaptable to the site should be chosen.

Step 6: Winter Operations—If construction activities continue during winter , access points should be enlarged and stabilized to provide for snow stockpiling. In addition, a snow management plan should be prepared with adequate storage and control of meltwater. A minimum 25 foot buffer shall be maintained from perimeter controls such as silt fence. In high resource protection areas, silt fence shall be replaced with perimeter dikes, swales, or other practices resistant to the forces of snow loads. Keep drainage structures open and free of snow and ice dams. Inspection and maintenance are necessary to ensure the function of these practices during runoff events.

Once the specific control measure has been selected, the plan key symbol given in the flow chart must be placed on the erosion and sediment control site plan to show where the control measure will be used. Standardized design, plan, and construction specification sheets must then be completed for each control measure. This completes the planning for erosion control and soil stabilization as part of the total natural resource plan.

Figure 2.2
Planning Flow Chart—Soil Stabilization



STANDARD AND SPECIFICATIONS FOR PERMANENT CRITICAL AREA PLANTINGS

Definition

Establishing grasses with other forbs and/or shrubs to provide perennial vegetative cover on disturbed, denuded, slopes subject to erosion.

Purpose

To reduce erosion and sediment transport.

Conditions Where Practice Applies

This practice applies to all disturbed areas void of, or having insufficient, cover to prevent erosion and sediment transport. See additional standards for special situations such as sand dunes and sand and gravel pits.

Criteria

All water control measures will be installed as needed prior to final grading and seedbed preparation. Any severely compacted sections will require chiseling or disking to provide an adequate rooting zone, to a minimum depth of 12". The seedbed must be prepared to allow good soil to seed contact, with the soil not too soft and not too compact. Adequate soil moisture must be present to accomplish this. If surface is powder dry or sticky wet, postpone operations until moisture changes to a favorable condition. If seeding is accomplished within 24 hours of final grading, additional scarification is generally not needed, especially on ditch or stream banks. Remove all stones and other debris from the surface that are greater than 4 inches, or that will interfere with future mowing or maintenance.

Soil amendments should be incorporated into the upper 2 inches of soil when feasible. **The soil should be tested to determine the amounts of amendments needed.** Apply ground agricultural limestone to attain a pH of 6.0 in the upper 2 inches of soil. If soil must be fertilized before results of a soil test can be obtained to determine fertilizer needs, apply commercial fertilizer at 600 lbs. per acre of 5-10-10 or equivalent. If manure is used, apply a quantity to meet the nutrients of the above fertilizer. This requires an appropriate manure analysis prior to applying to the site. Do not use manure on sites to be planted with birdsfoot trefoil or in the path of concentrated water flow.

Seed mixtures may vary depending on location within the state and time of seeding. Generally, warm season grasses should only be seeded during early spring, April to May. These grasses are primarily used for vegetating excessively drained sands and gravels. See Standard and Specification for Sand and Gravel Mine Reclamation. Other grasses may be seeded any time of the year when the soil is not frozen and is workable. When legumes such as birdsfoot trefoil are included, spring seedings are preferred. See Table 3.1 "Permanent Critical Area Planting Mixture Recommendations" for additional seed mixtures.

General Seed Mix:
[1] add inoculant immediately prior to seeding

	Variety	lbs./acre	lbs/1000 sq. ft.
Birdsfoot trefoil[1] OR	Empire/Pardee	8[2]	0.20
Common white clover[1]	Common	8	0.20
PLUS			
Tall fescue	KY-31/Rebel	20	0.45
PLUS			
Redtop OR	Common	2	0.05
Ryegrass (perennial)	Pennfine/Linn	5	0.10

[2] Mix 4 lbs each of Empire and Pardee OR 4 lbs of Birdsfoot and 4 lbs white clover per acre.

Time of Seeding: The optimum timing for the general seed mixture is early spring. Permanent seedings may be made any time of year if properly mulched and adequate moisture is provided. Late June through early August is not a good time to seed, but may facilitate covering the land without additional disturbance if construction is completed. Portions of the seeding may fail due to drought and heat. These areas may need reseeding in late summer/fall or the following spring.

Method of seeding: Broadcasting, drilling, cultipack type seeding, or hydroseeding are acceptable methods. Proper soil to seed contact is key to successful seedings.

Mulching: Mulching is essential to obtain a uniform stand of seeded plants. Optimum benefits of mulching new seedings are obtained with the use of small grain straw applied at a rate of 2 tons per acre, and anchored with a netting or tackifier. See the mulch standard and specification for choices and requirements.

Irrigation: Watering may be essential to establish a new seeding when a drought condition occurs shortly after a new seeding emerges. Irrigation is a specialized practice and care must be taken not to exceed the application rate for the soil or subsoil. When disconnecting irrigation pipe, be sure pipes are drained in a safe manor, not creating an erosion concern.

STANDARD AND SPECIFICATIONS FOR MULCHING

Definition

Applying coarse plant residue or chips, or other suitable materials, to cover the soil surface.

Purpose

The primary purpose is to provide initial erosion control while a seeding or shrub planting is establishing. Mulch will conserve moisture and modify the surface soil temperature and reduce fluctuation of both. Mulch will prevent soil surface crusting and aid in weed control. Mulch is also used alone for temporary stabilization in non-growing months.

Conditions Where Practice Applies

On soils subject to erosion and on new seedings and shrub plantings. Mulch is useful on soils with low infiltration rates by retarding runoff.

Criteria

Site preparation prior to mulching requires the installation of necessary erosion control or water management practices and drainage systems.

Slope, grade and smooth the site to fit needs of selected mulch products.

Remove all undesirable stones and other debris to meet the needs of the anticipated land use and maintenance required.

Apply mulch after soil amendments and planting is accomplished or simultaneously if hydroseeding is used.

Select appropriate mulch material and application rate or material needs. Determine local availability.

Select appropriate mulch anchoring material.

NOTE: The best combination for grass/legume establishment is straw (cereal grain) mulch applied at 2 ton/ acre (90 lbs./1000sq.ft.) and anchored with wood fiber mulch (hydromulch) at 500 – 750 lbs./acre (11 – 17 lbs./1000 sq. ft.). The wood fiber mulch must be applied through a hydroseeder immediately after mulching.

Table 3.7
Guide to Mulch Materials, Rates, and Uses

Mulch Material	Quality Standards	per 1000 Sq. Ft.	per Acre	Depth of Application	Remarks
Wood chips or shavings	Air-dried. Free of objectionable coarse material	500-900 lbs.	10-20 tons	2-7"	Used primarily around shrub and tree plantings and recreation trails to inhibit weed competition. Resistant to wind blowing. Decomposes slowly.
Wood fiber cellulose (partly digested wood fibers)	Made from natural wood usually with green dye and dispersing agent	50 lbs.	2,000 lbs.	—	Apply with hydromulcher. No tie down required. Less erosion control provided than 2 tons of hay or straw.
Gravel, Crushed Stone or Slag	Washed; Size 2B or 3A—1 1/2"	9 cu. yds.	405 cu. yds.	3"	Excellent mulch for short slopes and around plants and ornamentals. Use 2B where subject to traffic. (Approximately 2,000 lbs./cu. yd.). Frequently used over filter fabric for better weed control.
Hay or Straw	Air-dried; free of undesirable seeds & coarse materials	90-100 lbs. 2-3 bales	2 tons (100-120 bales)	cover about 90% surface	Use small grain straw where mulch is maintained for more than three months. Subject to wind blowing unless anchored. Most commonly used mulching material. Provides the best micro-environment for germinating seeds.
Jute twisted yarn	Undyed, unbleached plain weave. Warp 78 ends/yd., Weft 41 ends/yd. 60-90 lbs./roll	48" x 50 yds. or 48" x 75 yds.	—	—	Use without additional mulch. Tie down as per manufacturers specifications. Good for center line of concentrated water flow.
Excelsior wood fiber mats	Interlocking web of excelsior fibers with photodegradable plastic netting	8" x 100" 2-sided plastic, 48" x 180" 1-sided plastic	—	—	Use without additional mulch. Excellent for seeding establishment. Tie down as per manufacturers specifications. Approximately 72 lbs./roll for excelsior with plastic on both sides. Use two sided plastic for centerline of waterways.
Compost	Up to 3" pieces, moderately to highly stable	3-9 cu. yds.	134-402 cu. yds.	1-3"	Coarser textured mulches may be more effective in reducing weed growth and wind erosion.
Straw or coconut fiber, or combination	Photodegradable plastic net on one or two sides	Most are 6.5 ft. x 3.5 ft.	81 rolls	—	Designed to tolerate higher velocity water flow, centerlines of waterways, 60 sq. yds. per roll.

STANDARD AND SPECIFICATIONS FOR STABILIZATION WITH SOD

Definition

Stabilizing silt producing areas by establishing long term stands of grass with sod.

Purpose

To stabilize the soil; reduce damage from sediment and runoff to downstream areas; enhance natural beauty.

Conditions Where Practice Applies

On exposed soils that have a potential for causing off site environmental damage where a quick vegetative cover is desired. Moisture, either applied or natural, is essential to success.

Design Criteria

1. Sod shall be bluegrass or a bluegrass/red fescue mixture or a perennial ryegrass for average sites. (CAUTION: Perennial ryegrass has limited cold tolerance and may winter kill.) Use turf type cultivars of tall fescue for shady, droughty, or otherwise more critical areas. For variety selection, contact Cornell Cooperative Extension Turf Specialist.

2. Sod shall be machine cut at a uniform soil thickness of 3/4 inch, plus or minus 1/4 inch. Measurement for thickness shall exclude top growth and thatch.

3. Standard size sections of sod shall be strong enough to support their own weight and retain their size and shape when suspended vertically from a firm grasp on the upper 10 percent of the section.

4. Sod shall be free of weeds and undesirable coarse weedy grasses. Wild native or pasture grass sod shall not be used unless specified.

5. Sod shall not be harvested or transplanted when moisture content (excessively dry or wet) may adversely affect its survival.

6. Sod shall be harvested, delivered, and installed within a period of 36 hours. Sod not transplanted within this period shall be inspected and approved by the contracting officer or his designated representative prior to its installation.

Site Preparation

Fertilizer and lime application rates shall be determined by soil tests. Under unusual circumstances where there is insufficient time for a complete soil test and the contracting officer agrees, fertilizer and lime materials may be applied in amounts shown in subsection 2 below. Slope land such as to provide good surface water drainage. Avoid depressions or pockets.

1. Prior to sodding, the surface shall be smoothed and cleared of all trash, debris, and of all roots, brush, wire, grade stakes and other objects that would interfere with planting, fertilizing or maintenance operations.

2. **The soil should be tested to determine the amounts of amendments needed.** Where the soil is acid or composed of heavy clays, ground limestone shall be spread to raise the pH to 6.5. If the soil must be fertilized before results of a soil test can be obtained to determine fertilizer needs, apply commercial fertilizer at 20 lbs. of 5-10-10 (or equivalent) and mix into the top 3 inches of soil with the required lime for every 1,000 square feet. Soil should be moist prior to sodding. Arrange for temporary storage of sod to keep it shaded and cool.

Sod Installation

1. For the operation of laying, tamping, and irrigating for any areas, sod shall be completed within eight hours. During periods of excessively high temperature, the soil shall be lightly moistened immediately prior to laying the sod.

2. The first row of sod shall be laid in a straight line with subsequent rows placed parallel to, and tightly wedged against, each other. Lateral joints shall be staggered to promote more uniform growth and strength. Ensure that sod is not stretched or overlapped and that all joints are butted tight in order to prevent voids which would cause air drying of the roots. On sloping areas where erosion may be a problem, sod shall be laid with the long edges parallel to the contour and with staggered joints.

3. Secure the sod by tamping and pegging, or other approved methods. As sodding is completed in any one section, the entire area shall be rolled or tamped to ensure solid contact of roots with the soil surface.

4. Sod shall be watered immediately after rolling or tamping until the underside of the new sod pad and soil surface below the sod are thoroughly wet. Keep sod moist for at least two weeks.

Sod Maintenance

1. In the absence of adequate rainfall, watering shall be performed daily, or as often as deemed necessary by the inspector, during the first week and in sufficient quantities to maintain moist soil to a depth of 4 inches. Watering should be done in the morning. Avoid excessive watering during applications.

2. After the first week, sod shall be watered as necessary to maintain adequate moisture and ensure establishment.

3. The first mowing should not be attempted until sod is firmly rooted. No more than 1/3 of the grass leaf shall be removed by the initial cutting or subsequent cuttings. Grass height shall be maintained between 2 and 3 inches unless otherwise specified. Avoid heavy mowing equipment for several weeks to prevent rutting.

4. If the soil must be fertilized before results of a soil test can be obtained to determine fertilizer needs, apply fertilizer three to four weeks after sodding, at a rate of 1 pound nitrogen/1,000 sq.ft. Use a complete fertilizer with a 2-1-1 ratio.

5. Weed Control: Target herbicides for weeds present. Consult current Cornell Pest Control Recommendations for Commercial Turfgrass Management or consult the local office of Cornell Cooperative Extension.

6. Disease Control: Consult the local office of the Cornell Cooperative Extension.

Additional References

1. Home Lawns, Establishment and Maintenance, CCE Information Bulletin 185, Revised November 1994. Cornell University, Ithaca, NY.

2. Installing a Sod Lawn. CCE Suffolk County, NY. Thomas Kowalsick February 1994, Revised January 1999. www.cce.cornell.edu/counties/suffolk/grownet

STANDARD AND SPECIFICATIONS FOR STRAW BALE DIKE

Definition

A temporary barrier of straw, or similar material, used to intercept sediment laden runoff from small drainage areas of disturbed soil.

Purpose

The purpose of a bale dike is to reduce runoff velocity and effect deposition of the transported sediment load. Straw bale dikes have an estimated design life of three (3) months.

Conditions Where Practice Applies

The straw bale dike is used where:

1. No other practice is feasible.
2. There is no concentration of water in a channel or other drainage way above the barrier.
3. Erosion would occur in the form of sheet erosion.
4. Length of slope above the straw bale dike does not exceed these limits.

Constructed Slope	Percent Slope	Slope Length (ft.)
2:1	50	25
3:1	33	50
4:1	25	75

Where slope gradient changes through the drainage area, steepness refers to the steepest slope section contributing to the straw bale dike.

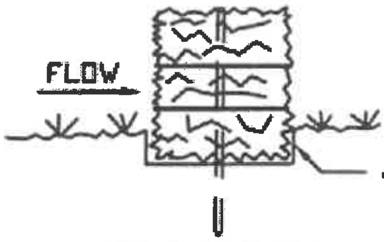
The practice may also be used for a single family lot if the slope is less than 15 percent. The contributing drainage areas in this instance shall be less than one quarter of an acre per 100 feet of fence and the length of slope above the dike shall be less than 200 feet.

Design Criteria

The above table is adequate, in general, for a one-inch rainfall event. Larger storms could cause failure of this practice. Use of this practice in sensitive areas for longer than one month should be specifically designed to store expected runoff. All bales shall be placed on the contour with cut edge of bale adhering to the ground. See Figure 5A.7 on page 5A.18 or details.

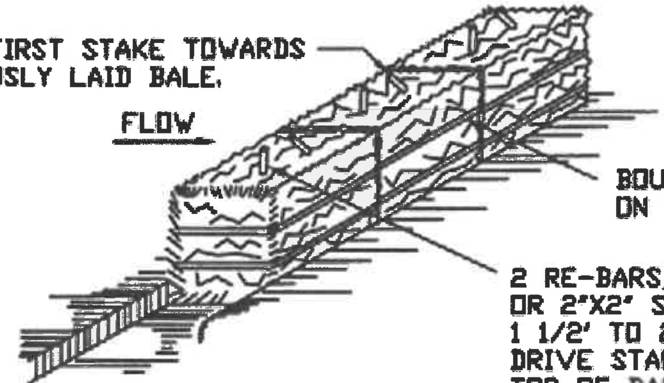
Figure 5A.7
Straw Bale Dike

SYMBOL



BEDDING DETAIL
NOT TO SCALE

DRAINAGE AREA NO MORE THAN 1/4 ACRE PER 100 FEET OF STRAW BALE DIKE FOR SLOPES LESS THAN 25%.



ANCHORING DETAIL
NOT TO SCALE

CONSTRUCTION SPECIFICATIONS

1. BALES SHALL BE PLACED AT THE TOE OF A SLOPE OR ON THE CONTOUR AND IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES.
2. EACH BALE SHALL BE EMBEDDED IN THE SOIL A MINIMUM OF (4) INCHES, AND PLACED SO THE BINDINGS ARE HORIZONTAL.
3. BALES SHALL BE SECURELY ANCHORED IN PLACE BY EITHER TWO STAKES OR RE-BARS DRIVEN THROUGH THE BALE. THE FIRST STAKE IN EACH BALE SHALL BE DRIVEN TOWARD THE PREVIOUSLY LAID BALE AT AN ANGLE TO FORCE THE BALES TOGETHER. STAKES SHALL BE DRIVEN FLUSH WITH THE BALE.
4. INSPECTION SHALL BE FREQUENT AND REPAIR REPLACEMENT SHALL BE MADE PROMTLY AS NEEDED.
5. BALES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULLNESS SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS, NEW YORK STATE DEPARTMENT OF TRANSPORTATION, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE	STRAW BALE DIKE

STANDARD AND SPECIFICATIONS FOR SILT FENCE

Definition

A temporary barrier of geotextile fabric installed on the contours across a slope used to intercept sediment laden runoff from small drainage areas of disturbed soil.

Purpose

The purpose of a silt fence is to reduce runoff velocity and effect deposition of transported sediment load. Limits imposed by ultraviolet stability of the fabric will dictate the maximum period the silt fence may be used (approximately one year).

Conditions Where Practice Applies

A silt fence may be used subject to the following conditions:

1. Maximum allowable slope lengths contributing runoff to a silt fence placed on a slope are:

Slope Steepness	Maximum Length (ft.)
2:1	25
3:1	50
4:1	75
5:1 or flatter	100

2. Maximum drainage area for overland flow to a silt fence shall not exceed ¼ acre per 100 feet of fence, with maximum ponding depth of 1.5 feet behind the fence; and

3. Erosion would occur in the form of sheet erosion; and

4. There is no concentration of water flowing to the barrier.

Design Criteria

Design computations are not required for installations of 1 month or less. Longer installation periods should be designed for expected runoff. All silt fences shall be placed as close to the areas as possible, but at least 10 feet from the toe of a slope to allow for maintenance and roll down. The area beyond the fence must be undisturbed or stabilized.

Sensitive areas to be protected by silt fence may need to be reinforced by using heavy wire fencing for added support to prevent collapse.

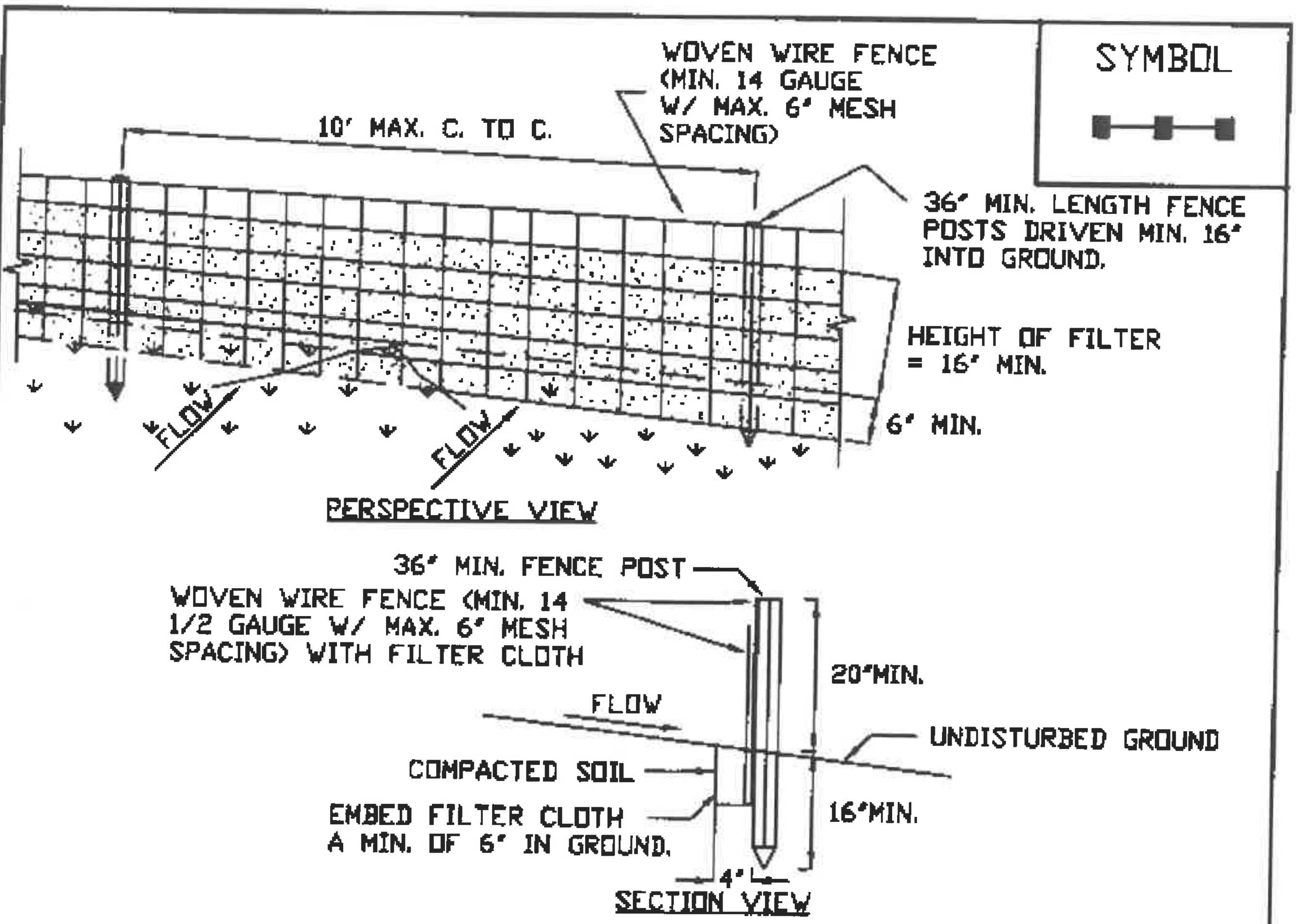
Where ends of filter cloth come together, they shall be overlapped, folded and stapled to prevent sediment bypass. A detail of the silt fence shall be shown on the plan. See Figure 5A.8 on page 5A.21 for details.

Criteria for Silt Fence Materials

1. Silt Fence Fabric: The fabric shall meet the following specifications unless otherwise approved by the appropriate erosion and sediment control plan approval authority. Such approval shall not constitute statewide acceptance.

Fabric Properties	Minimum Acceptable Value	Test Method
Grab Tensile Strength (lbs)	90	ASTM D1682
Elongation at Failure (%)	50	ASTM D1682

Figure 5A.8
Silt Fence



CONSTRUCTION SPECIFICATIONS

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. POSTS SHALL BE STEEL EITHER "T" OR "U" TYPE OR HARDWOOD.
2. FILTER CLOTH TO BE TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION. FENCE SHALL BE WOVEN WIRE, 6" MAXIMUM MESH OPENING.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVER-LAPPED BY SIX INCHES AND FOLDED. FILTER CLOTH SHALL BE EITHER FILTER X, MIRAFI 100X, STABILINKA T140N, OR APPROVED EQUIVALENT.
4. PREFABRICATED UNITS SHALL BE GEOFAB, ENVIROFENCE, OR APPROVED EQUIVALENT.
5. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS, NEW YORK STATE DEPARTMENT OF TRANSPORTATION, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE	SILT FENCE

STANDARD AND SPECIFICATIONS FOR CHECK DAM

Definition

Small barriers or dams constructed of stone, bagged sand or gravel, or other durable material across a drainage way.

Purpose

To reduce erosion in a drainage channel by restricting the velocity of flow in the channel.

Condition Where Practice Applies

This practice is used as a temporary or emergency measure to limit erosion by reducing velocities in small open channels that are degrading or subject to erosion and where permanent stabilization is impractical due to short period of usefulness and time constraints of construction.

Design Criteria

Drainage Area: Maximum drainage area above the check dam shall not exceed two (2) acres.

Height: Not greater than 2 feet. Center shall be maintained 9 inches lower than abutments at natural ground elevation.

Side Slopes: Shall be 2:1 or flatter.

Spacing: The check dams shall be spaced as necessary in the channel so that the crest of the downstream dam is at the elevation of the toe of the upstream dam. This spacing is equal to the height of the check dam divided by the channel slope.

Therefore:

$$S = h/s$$

Where:

S = spacing interval (ft.)
h = height of check dam (ft.)
s = channel slope (ft./ft.)

Example:

For a channel with a 4% slope and 2 ft. high stone check dams, they are spaced as follows:

$$S = \frac{2 \text{ ft.}}{.04 \text{ ft/ft.}} = 50 \text{ ft.}$$

Stone size: Use a well graded stone matrix 2 to 9 inches in size (NYS – DOT Light Stone Fill meets these requirements).

The overflow of the check dams will be stabilized to resist erosion that might be caused by the check dam. See Figure 5A.9 on page 5A.24 for details.

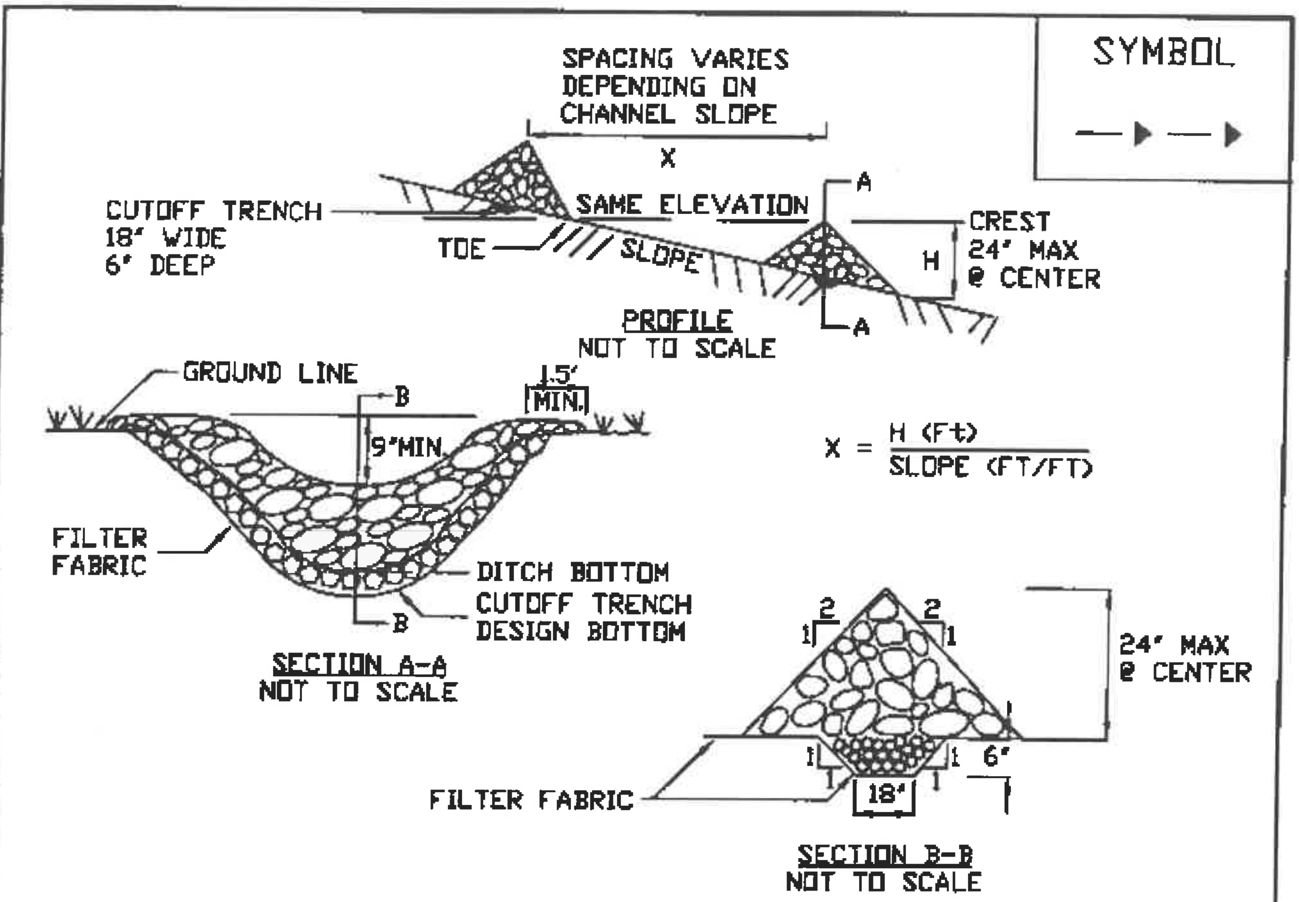
Check dams should be anchored in the channel by a cutoff trench 1.5 ft. wide and 0.5 ft. deep and lined with filter fabric to prevent soil migration.

Maintenance

The check dams should be inspected after each runoff event. Correct all damage immediately. If significant erosion has occurred between structures, a liner of stone or other suitable material should be installed in that portion of the channel.

Remove sediment accumulated behind the dam as needed to allow channel to drain through the stone check dam and prevent large flows from carrying sediment over the dam. Replace stones as needed to maintain the design cross section of the structures.

Figure 5A.9
Check Dam



CONSTRUCTION SPECIFICATIONS

1. STONE WILL BE PLACED ON A FILTER FABRIC FOUNDATION TO THE LINES, GRADES AND LOCATIONS SHOWN IN THE PLAN.
2. SET SPACING OF CHECK DAMS TO ASSUME THAT THE ELEVATIONS OF THE CREST OF THE DOWNSTREAM DAM IS AT THE SAME ELEVATION OF THE TOE OF THE UPSTREAM DAM.
3. EXTEND THE STONE A MINIMUM OF 1.5 FEET BEYOND THE DITCH BANKS TO PREVENT CUTTING AROUND THE DAM.
4. PROTECT THE CHANNEL DOWNSTREAM OF THE LOWEST CHECK DAM FROM SCOUR AND EROSION WITH STONE OR LINER AS APPROPRIATE.
5. ENSURE THAT CHANNEL APPURTENANCES SUCH AS CULVERT ENTRANCES BELOW CHECK DAMS ARE NOT SUBJECT TO DAMAGE OR BLOCKAGE FROM DISPLACED STONE.

MAXIMUM DRAINAGE AREA 2 ACRES.

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS, NEW YORK STATE DEPARTMENT OF TRANSPORTATION, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE	CHECK DAM

STANDARD AND SPECIFICATIONS FOR STORM DRAIN INLET PROTECTION

Definition

A temporary, somewhat permeable barrier, installed around inlets in the form of a fence, berm or excavation around an opening, trapping water and thereby reducing the sediment content of sediment laden water by settling.

Purpose

To prevent heavily sediment laden water from entering a storm drain system through inlets.

Conditions Where Practice Applies

This practice shall be used where the drainage area to an inlet is disturbed, it is not possible to temporarily divert the storm drain outfall into a trapping device, and watertight blocking of inlets is not advisable. **It is not to be used in place of sediment trapping devices.** This may be used in conjunction with storm drain diversion to help prevent siltation of pipes installed with low slope angle.

Types of Storm Drain Inlet Practices

There are four (4) specific types of storm drain inlet protection practices that vary according to their function, location, drainage area, and availability of materials:

I. Excavated Drop Inlet Protection
II. Fabric Drop Inlet Protection
III. Stone & Block Drop Inlet Protection
IV. Curb Drop Inlet Protection

Design Criteria

Drainage Area – The drainage area for storm drain inlets shall not exceed one acre. The crest elevations of these practices shall provide storage and minimize bypass flow.

Type I – Excavated Drop Inlet Protection

See details for Excavated Drop Inlet Protection in Figure 5A.11 on page 5A.29.

Limit the drainage area to the inlet device to 1 acre. Excavated side slopes shall be no steeper than 2:1. The minimum depth shall be 1 foot and the maximum depth 2 feet as measured from the crest of the inlet structure. Shape the excavated basin to fit conditions with the longest dimension oriented toward the longest inflow area to provide maximum trap efficiency. The capacity of the excavated basin should be established to contain 900 cubic feet per acre of disturbed area. Weep holes, protected by fabric and stone, should be provided for draining the temporary pool.

Inspect and clean the excavated basin after every storm. Sediment should be removed when 50 percent of the storage volume is achieved This material should be incorporated into the site in a stabilized manner.

Type II – Fabric Drop Inlet Protection

See Figure 5A.12 for details on Filter Fabric Drop Inlet Protection on page 5A.30.

Limit the drainage area to 1 acre per inlet device. Land area slope immediately surrounding this device should not exceed 1 percent. The maximum height of the fabric above the inlet crest shall not exceed 1.5 feet unless reinforced.

The top of the barrier should be maintained to allow overflow to drop into the drop inlet and not bypass the inlet to unprotected lower areas. Support stakes for fabric shall be a minimum of 3 feet long, spaced a maximum 3 feet apart. They should be driven close to the inlet so any overflow drops into the inlet and not on the unprotected soil. Improved performance and sediment storage volume can be obtained by excavating the area.

Inspect the fabric barrier after each rain event and make repairs as needed. Remove sediment from the pool area as necessary with care not to undercut or damage the filter fabric. Upon stabilization of the drainage area, remove all materials and unstable sediment and dispose of properly. Bring the adjacent area of the drop inlet to grade, smooth and compact and stabilize in the appropriate manner to the site.

If straw bales are used in lieu of filter fabric, they should be placed tight with the cut edge adhering to the ground at least 3 inches below the elevation of the drop inlet. Two anchor stakes per bale shall be driven flush to bale surface. Straw bales will be replaced every 4 months until the area is stabilized.

Type III – Stone and Block Drop Inlet Protection

See Figure 5A.13 for details on Stone and Block Drop Inlet Protection on page 5A.31.

Limit the drainage area to 1 acre at the drop inlet. The stone barrier should have a minimum height of 1 foot and a maximum height of 2 feet. Do not use mortar. The height should be limited to prevent excess ponding and bypass flow.

Recess the first course of blocks at least 2 inches below the crest opening of the storm drain for lateral support. Subsequent courses can be supported laterally if needed by placing a 2x4 inch wood stud through the block openings perpendicular to the course. The bottom row should have a few blocks oriented so flow can drain through the block to dewater the basin area.

The stone should be placed just below the top of the blocks on slopes of 2:1 or flatter. Place hardware cloth of wire mesh with ½ inch openings over all block openings to hold stone in place.

As an optional design, the concrete blocks may be omitted and the entire structure constructed of stone, ringing the outlet ("doughnut"). The stone should be kept at a 3:1 slope toward the inlet to keep it from being washed into the inlet.

A level area 1 foot wide and four inches below the crest will further prevent wash. Stone on the slope toward the inlet should be at least 3 inches in size for stability and 1 inch or smaller away from the inlet to control flow rate. The elevation of the top of the stone crest must be maintained 6 inches lower than the ground elevation down slope from the inlet to ensure that all storm flows pass over the stone into the storm drain and not past the structure. Temporary diking should be used as necessary to prevent bypass flow.

The barrier should be inspected after each rain event and repairs made where needed. Remove sediment as necessary to provide for accurate storage volume for subsequent rains. Upon stabilization of contributing drainage area, remove all materials and any unstable soil and dispose of properly.

Bring the disturbed area to proper grade, smooth, compact and stabilized in a manner appropriate to the site.

Type IV – Curb Drop Inlet Protection

See Figure 5A. 14 for details on Curb Drop Inlet Protection on page 5A.32.

The drainage area should be limited to 1 acre at the drop inlet. The wire mesh must be of sufficient strength to support the filter fabric and stone with the water fully impounded against it. Stone is to be 2 inches in size and clean. The filter fabric must be of a type approved for this purpose with an equivalent opening size (EOS) of 40-85. The protective structure will be constructed to extend beyond the inlet 2 feet in both directions. Assure that storm flow does not bypass the inlet by installing temporary dikes (such as sand bags) directing flow into the inlet. Make sure that the overflow weir is stable. Traffic safety shall be integrated with the use of this practice.

The structure should be inspected after every storm event. Any sediment should be removed and disposed of on the site. Any stone missing should be replaced. Check materials for proper anchorage and secure as necessary.

STANDARD AND SPECIFICATIONS FOR SEDIMENT TRAP

Definition

A temporary sediment control device formed by excavation and/or embankment to intercept sediment laden runoff and retain the sediment.

Purpose

The purpose of the structure is to intercept sediment-laden runoff and trap the sediment in order to protect drainage ways, properties, and rights-of-way below the sediment trap from sedimentation.

Conditions Where Practice Applies

A sediment trap is usually installed in a drainage way, at a storm drain inlet, or other points of collection from a disturbed area.

Sediment traps should be used to artificially break up the natural drainage area into smaller sections where a larger device (sediment basin) would be less effective.

Design Criteria

If any of the design criteria presented here cannot be met, see Standard and Specification for Sediment Basin on page 5A.49.

Drainage Area

The drainage area for sediment traps shall be in accordance with the specific type of sediment trap used (Type I through V).

Location

Sediment traps shall be located so that they can be installed prior to grading or filling in the drainage area they are to protect. Traps must not be located any closer than 20 feet from a proposed building foundation if the trap is to function during building construction. Locate traps to obtain maximum storage benefit from the terrain and for ease of cleanout and disposal of the trapped sediment.

Trap Size

The volume of a sediment trap as measured at the elevation of the crest of the outlet shall be at least 3,600 cubic feet per acre of drainage area. The volume of a constructed trap shall be calculated using standard mathematical procedures. The volume of a natural sediment trap may be approximated by the equation: Volume (cu.ft.) = 0.4 x surface area (sq.ft.) x maximum depth (ft.).

Trap Cleanout

Sediment shall be removed and the trap restored to the original dimensions when the sediment has accumulated to ½ of the design depth of the trap. Sediment removed from the trap shall be deposited in a protected area and in such a manner that it will not erode.

Embankment

All embankments for sediment traps shall not exceed five (5) feet in height as measured at the low point of the original ground along the centerline of the embankment. Embankments shall have a minimum four (4) foot wide top and side slopes of 2:1 or flatter. The embankment shall be compacted by traversing with equipment while it is being constructed. The embankment shall be stabilized with seed and mulch as soon as it is completed

The elevation of the top of any dike directing water to any sediment trap will equal or exceed the maximum height of the outlet structure along the entire length of the trap.

Excavation

All excavation operations shall be carried out in such a manner that erosion and water pollution shall be minimal. Excavated portions of sediment traps shall have 1:1 or flatter slopes.

Outlet

The outlet shall be designed, constructed, and maintained in such a manner that sediment does not leave the trap and that erosion at or below the outlet does not occur.

Sediment traps must outlet onto stabilized (preferable undisturbed) ground, into a watercourse, stabilized channel, or into a storm drain system. Distance between inlet and outlet should be maximized to the longest length :acticable.

Trap Details Needed on Erosion and Sediment Control Plans

Each trap shall be delineated on the plans in such a manner that it will not be confused with any other features. Each trap on a plan shall indicate all the information necessary to properly construct and maintain the structure. If the drawings are such that this information cannot be delineated on the drawings, then a table shall be developed. If a table is developed, then each trap on a plan shall have a number and the numbers shall be consecutive.

The following information shall be shown for each trap in a summary table format on the plans.

1. Trap number
2. Type of trap
3. Drainage area
4. Storage required
5. Storage provided (if applicable)
6. Outlet length or pipe sizes
7. Storage depth below outlet or cleanout elevation
8. Embankment height and elevation (if applicable)

Type of Sediment Traps

There are five (5) specific types of sediment traps which vary according to their function, location, or drainage area.

I. Pipe Outlet Sediment Trap
II. Grass Outlet Sediment Trap
III. Catch Basin Sediment Trap
IV. Stone Outlet Sediment Trap
V. Riprap Outlet Sediment Trap

I. Pipe Outlet Sediment Trap

A Pipe Outlet Sediment Trap consists of a trap formed by embankment or excavation. The outlet for the trap is through a perforated riser and a pipe through the embankment. The outlet pipe and riser shall be made of steel, corrugated metal or other suitable material. The top of the embankment shall be at least 1 ½ feet above the crest of the riser. The top 2/3 of the riser shall be perforated with one (1) inch nominal diameter holes or slits spaced six (6) inches vertically and horizontally placed in the concave portion of the corrugated pipe.

No holes or slits will be allowed within six (6) inches of the top of the horizontal barrel. All pipe connections shall be watertight. The riser shall be wrapped with ½ to ¼ inch hardware cloth wire then wrapped with filter cloth with a sieve size between #40-80 and secured with strapping or connecting band at the top and bottom of the cloth. The cloth shall cover an area at least six (6) inches above the highest hole and six (6) inches below the lowest hole. The top of the riser pipe shall not be covered with filter cloth. The riser shall have a base with sufficient weight to prevent flotation of the riser. Two approved bases are:

1. A concrete base 12 in. thick with the riser embedded 9 in. into the concrete base, or

2. One quarter inch, minimum, thick steel plate attached to the riser by a continuous weld around the circumference of the riser to form a watertight connection. The plate shall have 2.5 feet of stone, gravel, or earth placed on it to prevent flotation. In either case, each side of the square base measurement shall be the riser diameter plus 24 inches.

Pipe outlet sediment traps shall be limited to a five (5) acre maximum drainage area. Pipe outlet sediment traps may be interchangeable in the field with stone outlet or riprap sediment traps provided that these sediment traps are constructed in accordance with the detail and specifications for that trap.

Select pipe diameter from the following table:

Minimum Sizes

Barrel Diameter[1] (in.)	Riser Diameter[1] (in.)	Maximum Drainage Area (ac.)
12	15	1
15	18	2
18	21	3
21	24	4
21	27	5

[1] Barrel diameter may be same size as riser diameter.

See details for Pipe Outlet Sediment Trap ST-I in Figure 5A.16 (1) and 5A.16 (2) on pages 5A.38 and 5A.39.

II. Grass Outlet Sediment Trap

A Grass Outlet Sediment Trap consists of a trap formed by excavating the earth to create a holding area. The trap has a discharge point over natural existing grass. The outlet crest width (feet) shall be equal to four (4) times the drainage area (acres) with a minimum width of four (4) feet. The outlet shall be free of any restrictions to flow. The outlet lip must remain undisturbed and level. The volume of this trap shall be computed at the elevation of the crest of the outlet. Grass outlet sediment traps shall be limited to a five (5) acre maximum drainage area.

STANDARD AND SPECIFICATIONS FOR SEDIMENT BASIN

Definition

A temporary barrier or dam constructed across a drainage way or at other suitable locations to intercept sediment laden runoff and to trap and retain the sediment.

Scope

This standard applies to the installation of temporary sediment basins on sites where: (a) failure of the structure would not result in loss of life, damage to homes or buildings, or interruption of use or service of public roads or utilities; (b) the drainage area does not exceed 100 acres; and (c) the basin is to be removed within 36 months after the beginning of construction of the basin.

Permanent (to function more than 36 months) sediment basins, or temporary basins exceeding the classification requirements for class 1 and 2, or structures that temporarily function as a sediment basin but are intended for use as a permanent pool shall be classified as permanent structures and shall conform to criteria appropriate for permanent structures. These structures shall be designed and constructed to conform to NRCS Standard And Specification No. 378 for Ponds in the National Handbook of Conservation Practices and the New York State Department of Environmental Conservation, "Guidelines for the Design of Dams." The total volume of permanent sediment basins shall equal to or exceed the capacity requirements for temporary basins contained herein.

Classification of Temporary Sediment Basins

For the purpose of this standard, temporary sediment basins are classified as follows:

Class	1	2
Max. Drainage Area (acres)	100	100
Max. Height[1] of Dam (ft.)	10	15
Min. Embankment Top Width	8	10
Embankment Side Slopes	2:1 or Flatter	2 ½:1 or Flatter
Anti-Seep Control Required	Yes	Yes

[1] Height is measured from the low point of original ground at the downstream toe of the dam to the top of the dam.

Purpose

The purpose of a sediment basin is to intercept sediment-laden runoff and reduce the amount of sediment leaving the disturbed area in order to protect drainage ways, properties, and rights-of-way below the sediment basin.

Conditions Where Practice Applies

A sediment basin is appropriate where physical site conditions or land ownership restrictions preclude the installation of other erosion control measures to adequately control runoff, erosion, and sedimentation. However, it is strongly encouraged to use a basin in addition to other ESC measures if practicable. It may be used below construction operations which expose critical areas to soil erosion. The basin shall be maintained until the disturbed area is protected against erosion by permanent stabilization.

Design Criteria

Compliance with Laws and Regulations

Design and construction shall comply with state and local laws, ordinances, rules and regulations, including permits.

Location

The sediment basin should be located to obtain the maximum storage benefit from the terrain and for ease of cleanout of the trapped sediment. It should be located to minimize interference with construction activities and

STANDARD AND SPECIFICATIONS FOR DUST CONTROL

Definition

The control of dust resulting from land-disturbing activities.

Purpose

To prevent surface and air movement of dust from disturbed soil surfaces that may cause off-site damage, health hazards, and traffic safety problems.

Conditions Where Practice Applies

On construction roads, access points, and other disturbed areas subject to surface dust movement and dust blowing where off-site damage may occur if dust is not controlled.

Design Criteria

Construction operations should be scheduled to minimize the amount of area disturbed at one time. Buffer areas of vegetation should be left where practical. Temporary or permanent stabilization measures shall be installed. No specific design criteria is given; see construction specifications below for common methods of dust control.

Water quality must be considered when materials are selected for dust control. Where there is a potential for the material to wash off to a stream, ingredient information must be provided to the local permitting authority.

Construction Specifications

A. Non-driving Areas – These areas use products and materials applied or placed on soil surfaces to prevent airborne migration of soil particles.

Vegetative Cover – For disturbed areas not subject to traffic, vegetation provides the most practical method of dust control (see Section 3).

Mulch (including gravel mulch) – Mulch offers a fast effective means of controlling dust. This can also include rolled erosion control blankets.

Spray adhesives – These are products generally composed of polymers in a liquid or solid form that are mixed with water to form an emulsion that is sprayed on the soil surface with typical hydroseeding equipment. The mixing ratios and application rates will be in accordance with the manufacturer's recommendations for the specific soils on the site. In no case should the application of these adhesives be made on wet soils or if there is a probability of precipitation within 48 hours of its proposed use. Material Safety Data Sheets will be provided to all applicators and others working with the material.

B. Driving Areas – These areas utilize water, polymer emulsions, and barriers to prevent dust movement from the traffic surface into the air.

Sprinkling – The site may be sprayed with water until the surface is wet. This is especially effective on haul roads and access routes.

Polymer Additives – These polymers are mixed with water and applied to the driving surface by a water truck with a gravity feed drip bar, spray bar or automated distributor truck. The mixing ratios and application rates will be in accordance with the manufacturer's recommendations. Incorporation of the emulsion into the soil will be done to the appropriate depth based on expected traffic. Compaction after incorporation will be by vibratory roller to a minimum of 95%. The prepared surface shall be moist and no application of the polymer will be made if there is a probability of precipitation within 48 hours of its proposed use. Material Safety Data Sheets will be provided to all applicators working with the material.

Barriers – Woven geotextiles can be placed on the driving surface to effectively reduce dust throw and particle migration on haul roads. Stone can also be used for construction roads for effective dust control.

Windbreak – A silt fence or similar barrier can control air currents at intervals equal to ten times the barrier height. Preserve existing wind barrier vegetation as much as practical.

STANDARD AND SPECIFICATIONS FOR STABILIZED CONSTRUCTION ENTRANCE

Definition

A stabilized pad of aggregate underlain with geotextile located at any point where traffic will be entering or leaving a construction site to or from a public right-of-way, street, alley, sidewalk, or parking area.

Purpose

The purpose of stabilized construction entrance is to reduce or eliminate the tracking of sediment onto public rights-of-way or streets.

Conditions Where Practice Applies

A stabilized construction entrance shall be used at all points of construction ingress and egress.

Design Criteria

See Figure 5A.35 on page 5A.76 for details.

Aggregate Size: Use a matrix of 1-4 inch stone, or reclaimed or recycled concrete equivalent.

Thickness: Not less than six (6) inches.

Width: 12-foot minimum but not less than the full width of points where ingress or egress occurs. 24-foot minimum if there is only one access to the site.

Length: As required, but not less than 50 feet (except on a single residence lot where a 30 foot minimum would apply).

Geotextile: To be placed over the entire area to be covered with aggregate. Filter cloth will not be required on a single-family residence lot. Piping of surface water under entrance shall be provided as required. If piping is impossible, a mountable berm with 5:1 slopes will be permitted.

Criteria for Geotextile

The geotextile shall be woven or nonwoven fabric consisting only of continuous chain polymeric filaments or yarns of polyester. The fabric shall be inert to commonly encountered chemicals, hydro-carbons, mildew, rot resistant, and conform to the fabric properties as shown:

Fabric Properties[3]	Light Duty[1] Roads Grade Subgrade	Heavy Duty[2] Haul Roads Rough Graded	Test Method
Grab Tensile Strength (lbs)	200	220	ASTM D1682
Elongation at Failure (%)	50	60	ASTM D1682
Mullen Brust Strength (lbs)	190	430	ASTM D3786
Puncture Strength (lbs)	40	125	ASTM D751 modified
Equivalent Opening Size	40-80	40-80	US Std Sieve CW-02215
Aggregate Depth	6	10	--

[1]Light Duty Road: Area sites that have been graded to subgrade and where most travel would be single axle vehicles and an occasional multi-axle truck. Acceptable materials are Trevira Spunbond 1115, Mirafi 100X, Typar 3401, or equivalent.

[2]Heavy Duty Road: Area sites with only rough grading, and where most travel would be multi-axle vehicles. Acceptable materials are Trevira Spunbond 1135, Mirafi 600X, or equivalent.

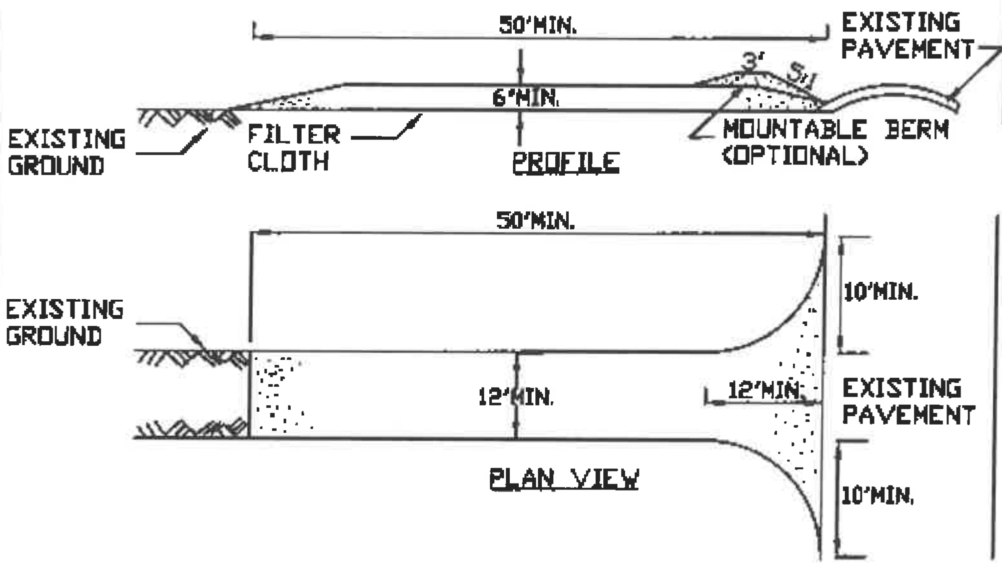
[3]Fabrics not meeting these specifications may be used only when design procedure and supporting documentation are supplied to determine aggregate depth and fabric strength.

Maintenance

The entrance shall be maintained in a condition which will prevent tracking of sediment onto public rights-of-way or streets. This may require periodic top dressing with additional aggregate. All sediment spilled, dropped, or washed onto public rights-of-way must be removed immediately.

When necessary, wheels must be cleaned to remove sediment prior to entrance onto public rights-of-way. When washing is required, it shall be done on an area stabilized with aggregate, which drains into an approved sediment-trapping device. All sediment shall be prevented from entering storm drains, ditches, or watercourses.

Figure 5A.35
Stabilized Construction Entrance



SYMBOL

CONSTRUCTION SPECIFICATIONS

1. STONE SIZE - USE 1-4 INCH STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH - NOT LESS THAN 50 FEET (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY).
3. THICKNESS - NOT LESS THAN SIX (6) INCHES.
4. WIDTH - TWELVE (12) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. TWENTY-FOUR (24) FOOT IF SINGLE ENTRANCE TO SITE.
5. GEOTEXTILE - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACTED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON A AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS, NEW YORK STATE DEPARTMENT OF TRANSPORTATION, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE	STABILIZED CONSTRUCTION ENTRANCE

STANDARD AND SPECIFICATIONS FOR GRASSED WATERWAY

Definition

A natural or man-made channel of parabolic or trapezoidal cross-section that is below adjacent ground level and is stabilized by suitable vegetation. The flow channel is normally wide and shallow and conveys the runoff down the slope.

Purpose

The purpose of a grassed waterway is to convey runoff without causing damage by erosion.

Conditions Where Practice Applies

Grass waterways are used where added vegetative protection is needed to control erosion resulting from concentrated runoff.

Design Criteria

Capacity

The minimum capacity shall be that required to confine the peak rate of runoff expected from a 10-year frequency rainfall event or a higher frequency corresponding to the hazard involved. This requirement for confinement may be waived on slopes of less than one (1) percent where out-of-bank flow will not cause erosion or property damage.

Peak rates of runoff values used in determining the capacity requirements shall be computed by TR-55, Urban Hydrology for Small Watersheds, or other appropriate methods.
Where there is base flow, it shall be handled by a stone center, subsurface drain, or other suitable means since sustained wetness usually prevents adequate vegetative cover. The cross-sectional area of the stone center or subsurface drain size to be provided shall be determined by using a flow rate of 0.1 cfs/acre or by actual measurement of the maximum base flow.

Velocity

Please see Table 5B.1, Diversion Maximum Permissible Design Velocities, for seed, soil, and velocity variables.

Cross Section

The design water surface elevation of a grassed waterway receiving water from diversions or other tributary channels shall be equal to or less than the design water surface elevation in the diversion or other tributary channels.

The top width of parabolic waterways shall not exceed 30 feet and the bottom width of trapezoidal waterways shall not exceed 15 feet unless multiple or divided waterways, stone center, or other means are provided to control meandering of low flows.

Structural Measures

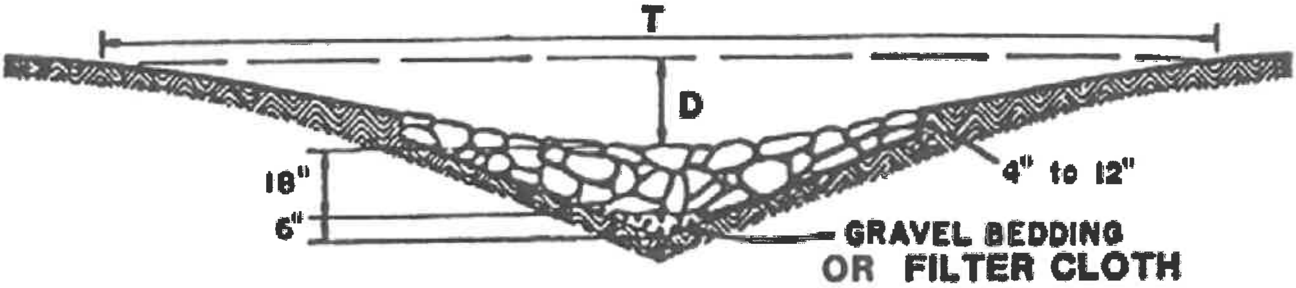
In cases where grade or erosion problems exist, special control measures may be needed such as lined waterways (5B.17), or grade stabilization measures (5B.31). Where needed, these measures will be supported by adequate design computations. For typical cross sections of waterways with riprap sections or stone centers, refer to Figure 5B.8 on page 5B.13.

The design procedures for parabolic and trapezoidal channels are available in the NRCS Engineering Field Handbook; Figure 5B.9 on page 5B.14 also provides a design chart for parabolic waterway.

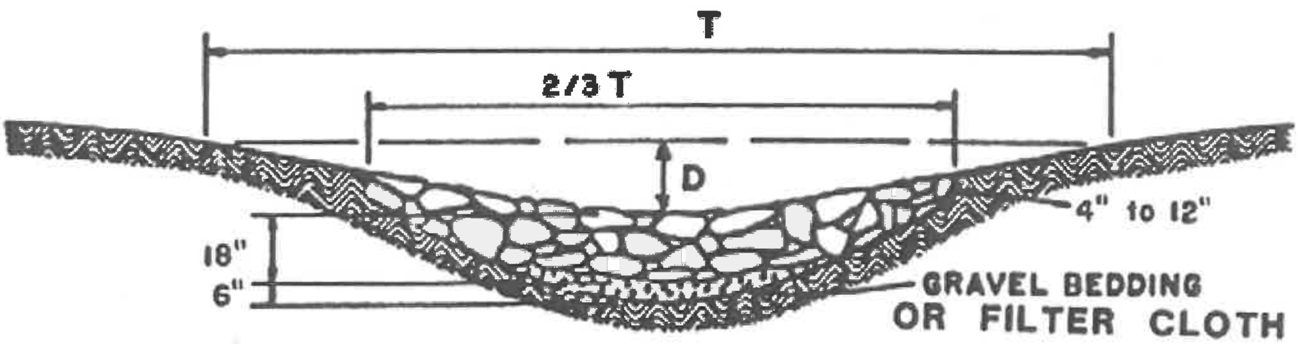
Outlets

Each waterway shall have a stable outlet. The outlet may be another waterway, a stabilized open channel, grade stabilization structure, etc. In all cases, the outlet must discharge in such a manner as not to cause erosion. Outlets shall be constructed and stabilized prior to the operation of the waterway.

Figure 5B.8
Typical Waterway Cross Sections



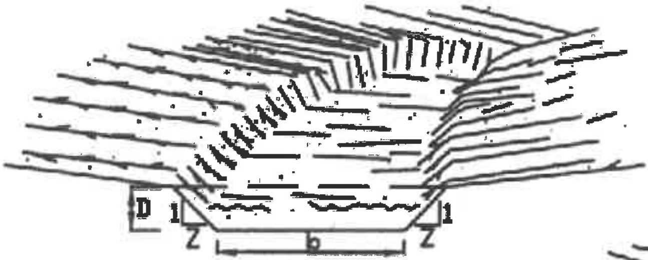
Waterway with stone center drain. "V" section shaped by motor grader.



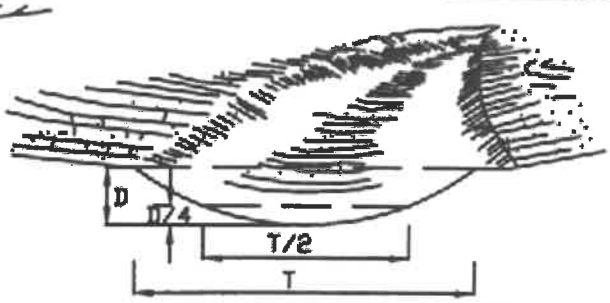
Waterway with stone center drain. Rounded section shaped by bulldozer.

Figure 5B.10
Grassed Waterway

SYMBOL



TRAPEZIODAL CROSS SECTION



PARABOLIC CROSS SECTION

CONSTRUCTION SPECIFICATIONS

1. ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS, AND OTHER OBJECTIONABLE MATERIAL SHALL BE REMOVED AND DISPOSED OF SO AS NOT TO INTERFERE WITH THE PROPER FUNCTIONING OF THE WATERWAY.
2. THE WATERWAY SHALL BE EXCAVATED OR SHAPED TO LINE, GRADE, AND CROSS SECTION AS REQUIRED TO MEET THE CRITERIA SPECIFIED HEREIN, AND BE FREE OF BANK PROJECTIONS OR OTHER IRREGULARITIES WHICH WILL IMPEDE NORMAL FLOW.
3. FILLS SHALL BE COMPACTED AS NEEDED TO PREVENT UNEQUAL SETTLEMENT THAT WOULD CAUSE DAMAGE IN THE COMPLETE WATERWAY.
4. ALL EARTH REMOVED AND NOT NEEDED IN CONSTRUCTION SHALL BE SPREAD OR DISPOSED OF SO THAT IT WILL NOT INTERFERE WITH THE FUNCTIONING OF THE WATERWAY.
5. STABILIZATION SHALL BE DONE ACCORDING TO THE APPROPRIATE STANDARD AND SPECIFICATIONS FOR VEGETATIVE PRACTICES.
   - A. FOR DESIGN VELOCITIES OF LESS THAN 3.5 FT. PER. SEC., SEEDING AND MULCHING MAY BE USED FOR THE ESTABLISHMENT OF THE VEGETATION. IT IS RECOMMENDED THAT, WHEN CONDITIONS PERMIT, TEMPORARY WATERWAYS OR OTHER MEANS SHOULD BE USED TO PREVENT WATER FROM ENTERING THE WATERWAY DURING THE ESTABLISHMENT OF THE VEGETATION.
   - B. FOR DESIGN VELOCITIES OF MORE THAN 3.5 FT. PER. SEC., THE WATERWAY SHALL BE STABILIZED WITH SOD, WITH SEEDING PROTECTED BY JUTE OR EXCELSIOR MATTING OR WITH SEEDING AND MULCHING INCLUDING TEMPORARY DIVERSION OF THE WATER UNTIL THE VEGETATION IS ESTABLISHED.
   - C. STRUCTURAL - VEGETATIVE PROTECTION
     SUBSURFACE DRAIN FOR BASE FLOW SHALL BE CONSTRUCTED AS SHOWN ON THE STANDARD DRAWING AND AS SPECIFIED IN THE STANDARD AND SPECIFICATIONS FOR SUBSURFACE DRAIN.

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS, NEW YORK STATE DEPARTMENT OF TRANSPORTATION, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE	GRASSED WATERWAY

STANDARD AND SPECIFICATIONS FOR LINED WATERWAY OR OUTLET

Definition

A waterway or outlet with a lining of concrete, stone, or other permanent material. The lined section extends up the side slopes to the designed depth. The earth above the permanent lining may be vegetated or otherwise protected.

Purpose

To provide for the disposal of concentrated runoff without damage from erosion or flooding, where grassed waterways would be inadequate due to high velocities.

Scope

This standard applies to waterways or outlets with linings of cast-in-place concrete, flagstone mortared in place, rock riprap, gabions, or similar permanent linings. It does not apply to irrigation ditch or canal linings, grassed waterways with stone centers or small lined sections that carry prolonged low flows, or to reinforced concrete channels. The maximum capacity of the waterway flowing at design depth shall not exceed 100 cubic feet per second.

Conditions Where Practice Applies

This practice applies where the following or similar conditions exist:

1. Concentrated runoff is such that a lining is required to control erosion.
2. Steep grades, wetness, prolonged base flow, seepage, or piping that would cause erosion.
3. The location is such that damage from use by people or animals precludes use of vegetated waterways or outlets.
4. Soils are highly erosive or other soil and climate conditions preclude using vegetation.
5. High value property or adjacent facilities warrant the extra cost to contain design runoff in a limited space.

Design Criteria

Capacity

1. The minimum capacity shall be adequate to carry the peak rate of runoff from a 10-year, 24-hour storm. Velocity shall be computed using Manning's equation with a coefficient of roughness "n" as follows:

Lined Material	"n"
Concrete (Type):	
Trowel Finish	0.015
Float Finish	0.019
Gunite	0.019
Flagstone	0.022
Riprap	Determine from Figure 5B.11 on page 5B.19
Gabion	0.030

2. Riprap gradation and filter (bedding) are generally designed in accordance with criteria set forth in the National Cooperative Highway Research Program Report 108, available from the University Microfilm International, 300 N. Ree Road, Ann Arbor, Michigan 48016, Publication No. PB-00839; or the Hydraulic Engineering Circular No. 11, prepared by the U.S. Bureau of Public Roads, available from Federal Highway Administration, 400 7th Street, S.W., Washington, D.C. 20590, HNG-31, or the procedure in the USDA-NRCS's Engineering Field Manual, Chapter 16.

Velocity

1. Maximum design velocity shall be as shown below. Except for short transition sections, flow with a channel gradient within the range of 0.7 to 1.3 of this

CONTINENTAL PLACER INC.

II Winners Circle • Albany, New York 12205
(518) 458-9203 *fax* (518) 458-9206

www.continentalplacer.com

LEROY QUARRY
STORMWATER BEST MANAGEMENT PRACTICE PLAN
DOLOMITE PRODUCTS CO., INC.

SPDES Permit No. NY-0247189
Town of Leroy, Genesee County, New York

Prepared For:

Dolomite Products Co., Inc.
1150 Penfield Road
Rochester, New York 14625

Prepared by:

Continental Placer Inc.
2 Winners Circle
Albany, New York 12205

July 18, 2014

Original
Version 1.0

TABLE OF CONTENTS

TABLES

PLATES

APPENDICES

1.0 Introduction

This Stormwater Best Management Practice (BMP) Plan has been developed for the Dolomite Products Co., Inc. Leroy Quarry (Leroy facility) in the Town of Leroy, Genesee County, New York. This BMP Plan has been prepared pursuant to a special condition requirement of a State Pollution Discharge Elimination System (SPDES) permit (Permit No. NY-0247189). This SPDES permit is provided in Appendix A. The objective of the BMP is to present methods that can be applied at the facility "to prevent releases of significant amounts of pollutants to the waters of the State through plant site runoff; spillage and leaks; sludge or waste disposal; and storm water discharges including, but not limited to, drainage from raw material storage" (from Special Conditions in SPDES Permit NY-0247189 dated 7/1/13).

The primary operations at the Leroy facility are the mining and processing of limestone bedrock (Onondaga Formation) for crushed and broken stone (quarry pit). The bedrock is drilled and blasted and transported to the aggregate processing area immediately northeast of the quarry by haul trucks where it is crushed and screened into various sizes for sale. The aggregate product is stored in stockpiles northwest of the aggregate processing area (crusher plant) and sold by loading it into customers' trucks.

Activities performed as part of the mining operations that have the potential to contribute potential pollutants to stormwater include:

- Mining and processing of crushed stone,
- Handling and storage of aggregate materials,
- Transport of materials over paved and unpaved haul roads,
- Bulk storage of petroleum fuels, lubricating oils, and hydraulic fluids,
- Fueling, maintenance, and operation of portable and mobile material handling and processing equipment,
- Usage of blasting agent (ANFO) for mining, and
- Runoff from roadways and staging areas.

BMPs intended for the protection of stormwater quality that are typically applicable to aggregate operations include the following:

- Berms, diversion ditches, and grading to direct and control stormwater flow,
- Stormwater detention and retention ponds,
- Grit (silt) traps in drainage areas,
- Capture of stormwater into closed-system units (settling ponds, sumps),
- Erosion control plans,
- Vegetative controls,
- Containment walls for storage tanks,
- Oil/water separators,
- Storage of materials under cover using silos, buildings, or pole barns,
- Stormwater inspections, sampling, and recordkeeping, and
- Employee training.

Stormwater at the Leroy facility is primarily managed through quarry dewatering, surface ditches, and berms. Berms prevent off-site stormwater runoff and direct stormwater into the quarry pit. Groundwater and stormwater accumulated in the quarry pit are pumped to an air stripper that discharges into a 24-inch pipe that directs the discharge to a bermed-in field east of the quarry pit where it infiltrates into the ground. In the near future, this discharge will be piped to a rip rap lined ditch along the eastern property line that will discharge into Mud Creek approximately 1,200 feet southeast of the quarry pit. Plate 1 shows the quarry sump and dewatering discharge station, the air stripper, the 24-inch pipe, the current outfall location, the proposed ditch transmitting the dewatering water to Mud Creek, and the future SPDES Outfall 001.

This BMP Plan shall be implemented in conjunction and consistently with other facility plans such as the Spill Prevention Control and Countermeasure (SPCC) plan, which is incorporated as part of this BMP Plan. The facility also has a Stormwater Pollution Prevention Plan (SWPPP) for a general stormwater permit. With the issuance of the SPDES Permit No. NY-0247189, the SWPPP is superseded by this BMP Plan. This BMP Plan must be maintained at the facility and be available for review at the quarry site by State or Federal regulatory inspectors upon request.

2.0 BMP Committee

A BMP committee or team has been formed that implements the BMP Plan, performs site inspections to ensure BMPs are in-place and effective, defines BMP incident reporting procedures, and periodically reviews and updates the BMP Plan with additional BMPs as necessary to prevent or minimize contamination of stormwater flowing from the Dolomite Products Co., Inc. Leroy facility.

The BMP Committee and contact information is comprised of the following personnel:

Barry Johnson Location Manager	(585) 768-7295 (work) (585) 507-5028 (cell)
Ed Wood Location Superintendent	(585) 768-7295 (work) (585) 750-4500 (cell)
Ed Johannes Safety Manager	(585) 943-2012 (cell)
John Swierkos, Jr. Geologist & Environmental Coordinator	(585) 381 7010 (work) (585) 749 2371 (cell)
Jack Odenbach Vice President of Aggregates	(585) 381 7010 (work) (585) 350 9508 (cell)

3.0 Reporting of BMP Incidents

A BMP incident reporting system is used to keep records of incidents such as spills, leaks, runoff and other improper discharges for the purpose of minimizing recurrence, expediting mitigation or cleanup activities, and complying with legal requirements. Reporting procedures defined by the BMP Committee include: notification of a discharge to appropriate plant personnel to initiate immediate action; formal written reports for review and evaluation by management of the BMP incident and revisions to the BMP plan; and notification as required by law to governmental and environmental agencies in the event that a spill or other reportable discharge reaches surface waters of the State. In some circumstances, voluntary reporting to authorities such as municipal sewage treatment works, drinking water treatment plants, and fish and wildlife commissions may be desirable.

For the Dolomite Products Co., Inc. Leroy facility, the BMP reporting procedures are as follows:

1) Report incident to shift supervisor.
2) Notify and mobilize spill cleanup or mitigation personnel, as necessary, to control and contain the incident.
3) Make a determination whether incident is a reportable spill, pursuant to SPCC Plan procedures.
4) If it is a reportable spill notify the appropriate regulatory authority at the notification contact numbers provided below (Section 3.1).
5) Mitigate the incident (stop the discharge, cleanup spill, appropriately contain and dispose of any impacted soil and water).
6) Replace or repair faulty equipment, machinery, or storage containers, as necessary, to prevent continuing discharges.
7) Prepare written report describing the BMP incident (reporting form provided in Appendix B).

The primary form of communication of BMP incidents will be by telephone and direct verbal communication followed up with written reports (Appendix B). Reliable communications with the person or persons directly responsible will expedite immediate action and countermeasures to prevent incidents or to contain and mitigate discharged chemicals.

Written reports on all BMP incidents will be submitted to the plant's BMP Committee and plant management for review. Written reports will include the date and time of the discharge, weather conditions, nature of the materials involved, duration, volume, cause, environmental problems, countermeasures taken, people and agencies notified, and recommended revisions, as appropriate, to the BMP plan, operating procedures and/or equipment to prevent recurrence.

3.1 Emergency Contact List & Phone Numbers

3.1.1 Leroy Quarry Personnel

Table 1 – Leroy Quarry Personnel

Site Personnel		Telephone Number
Facility/Spill Response Coordinator and Location Manager	Barry Johnson	(585) 768-7295 (work) (585) 507-5028 (cell)
Alternative Facility/Spill Response Coordinator	Ed Johannes	(585) 924-1570 (cell)
Location Superintendent	Ed Wood	(585) 768-7295 (work) (585) 750-4500 (cell)
Geologist/Environmental Coordinator	John Swierkos, Jr	(585) 381-7010(work) (585) 749-2371(cell)
VP of Aggregates	Jack Odenbach	(585) 381-7010 (work) (585) 350-9508 (cell)

3.1.2 Local, State & Federal Emergency Response Agencies

Table 2 – Emergency Response Agency Contact Information

Emergency Service Providers	Phone #
Rescue Squad	911
Fire Dept	(585) 768 2527 or 911
Police (NYS)	(585) 344 6200 or 911
Sheriff	(585) 343 5000 or 911

3.1.3 List of Emergency Response Contractors

No emergency response contractors should be necessary. However, in the event that a contracted responder is necessary, the following response contractors are available to provide assistance.

Table 3 – Emergency Response Contractors

Spill Response Contractors (Contacts confirmed October 2013)	(800) 807-7455 *(24 hr access)* (585) 436 5660	Nyetech
	(585) 924 1570	Arrow Contracting

4.0 Risk Identification and Assessment

The areas of the plant subject to BMP requirements have been identified by the BMP Committee in conjunction with other facility personnel. These areas, which are shown on Plate 1, are as follows:

- Maintenance shop,
- Aggregate processing and aggregate stockpile areas,
- Bulk fuel storage tanks,
- Empty drum storage area next to small shop,
- Mobile equipment and parts storage areas, and
- Quarry dewatering discharge ditch network.

Each area has been examined for potential risks for discharges to receiving waters of pollutants or hazardous substances from ancillary sources. Structural BMPs (dikes, diversion ditches, etc.) for controlling such discharges have been identified.

4.1 Potential Pollution Sources and Types of Contaminants

Materials exposed to stormwater at the Leroy facility that have the potential to impact stormwater runoff include the following:

- Quarry pit;
- Aggregate piles;
- Paved and unpaved haul/access roads;
- Miscellaneous vehicular and processing equipment fuels, lubricating oils, and hydraulic oils leaked on the ground by active equipment;
- Fuel storage tank loading and dispensing areas;
- Empty drum storage area next to small shop; and
- Mobile equipment and parts storage areas.

The corresponding potential pollutants that may results from these sources are particulate matter (aggregate materials from unpaved haul roads) that could create suspended and dissolved solids in stormwater, and volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) from petroleum products used in mobile mining equipment (such as benzene, ethyl benzene, toluene, xylene, naphthalene, anthracene, pyrene and benzo(a)anthracene). The potential for significant stormwater pollution from these sources is not anticipated.

4.2 Potential Source Areas for Stormwater Contamination

The source areas for stormwater contamination are runoff associated with the crushing and processing of stone aggregate materials, the maintenance shop area, bulk petroleum storage tank dispensers and fill ports, runoff from access roads, mobile equipment and parts storage areas, and empty drum storage area next to small shop (See Drainage Features and Area Map, Plate 1). Stormwater flowing over these areas has the potential to transport stone dust and particles from travel surfaces as well as any drops of disseminated petroleum products associated with petroleum storage and everyday operation of quarry equipment and vehicles.

4.3 Historic Spill and Leak Record

Significant spills or leaks are to be recorded on a BMP incident form in Appendix B and on Spill Reporting Forms provided in the facility SPCC Plan, and kept with the SPCC Plan at the facility office.

4.4 Non-Stormwater Discharges

Non-stormwater discharges would primarily be the result of spillage of petroleum fuels, lubricating oils, or hydraulic fluids. The potential for the release of petroleum fuels, lubricating oils, and hydraulic fluids at the facility would be caused by human error and equipment failure. Equipment failures resulting in potential release of fuel, lubricating oil, and hydraulic fluids include worn hoses, inadequate piping and tank foundational supports, leaky gaskets, malfunctioning dispensing pumps, insecure welded seams, corrosion, and container body punctures.

Human errors resulting in potential release of fuels, lubricating oil, and hydraulic fluids include vehicular collisions, failure to secure drain plugs, valves, or lids, failure to deactivate pumps, kinked hoses, inadequate hose connections, and unstable placement of storage containers. Human errors and equipment failures leading to potential releases may occur during operation of processing and material handling equipment, routine maintenance of facility equipment, activities near storage areas, filling or refueling of facility tanks, or pumping or draining facility tanks.

A combination of inspections, training, standard procedures, maintenance, and structural BMPs (such as, secondary containments and berming) will help minimize the potential for non-stormwater discharges.

4.5 Existing Monitoring Data

Monitoring data can be found in the SPDES file at the Leroy facility office.

4.6 Site Evaluation Summary

The primary operations at the Leroy facility are the mining and processing of bedrock for crushed and broken stone. The bedrock is drilled and blasted and transported to the aggregate processing area adjacent to the quarry by haul trucks where it is crushed and screened into various sizes for sale. The aggregate product is stored in stockpiles adjacent to the quarry and sold by loading it into customers' trucks.

Activities performed as part of the mining operations that have the potential to contribute potential pollutants to stormwater include:

- Mining and processing of crushed stone,
- Usage of blasting agent (ANFO) for mining,
- Handling and storage of aggregate materials,
- Transport of materials over paved and unpaved haul roads,
- Bulk storage of petroleum fuels, lubricating oils, and hydraulic fluids,
- Fueling, maintenance, and operation of portable and mobile material handling and processing equipment,

- Mobile equipment and parts storage areas,
- Empty drum storage area next to small shop, and
- Runoff from roadways and staging areas.

To follow is a discussion of each of these activities, including an assessment of storage and handling practices of significant materials, the potential to contribute potential pollutants, and the practices employed to minimize off-site transport of impacted stormwater. Refer to Section 4.1 for identity of potential pollutants.

Although minimal, the processing of crushed stone and the handling and storage of aggregate materials has the potential to contribute pollutants to stormwater through contact with the aggregate materials and the transmission of dust. Likewise, the handling and use of blasting agents has the potential to contribute pollutants to stormwater via spills and incomplete detonations.

Transport of materials over haul roads also has the potential to contribute potential pollutants to stormwater. There is also the potential for stormwater contamination through incidental leaks and spills from the mobile material handling equipment. Off-site transport of impacted stormwater will be minimized through the use of sediment and erosion controls and preventative maintenance at the facility.

Fuel, lubricating oils, and hydraulic fluid deliveries and dispensing have the potential to contribute to stormwater pollution from drips, spills, and potential leaks. These potential sources of pollution will be controlled by the use of fill and dispensing standard operating procedures, routine inspections, the use of drip pans, the use of spill kits, and training. Personnel are to be present and alert, and proper procedures are to be employed during fueling activities. Additional measures are addressed in the facility SPCC Plan.

Mobile and processing equipment has the potential to contribute potential pollutants to stormwater through contact with incidental leaks and releases from equipment, fueling operations, or maintenance activities. To minimize the potential for stormwater contact, processing equipment is to be inspected daily prior to start up ("Pre-Shift Inspection") to assure no unusual conditions exist, and is to be maintained in accordance with manufacturers and/or Dolomite Products Co., Inc.'s recommended preventive maintenance procedures. Observed leaks are to be immediately controlled with drip pans and absorbents and the failure is to be promptly corrected.

Runoff from roadways and material storage areas will be controlled by diversion ditches and berms. Vegetation and sediment control structures are also in place to prevent sediment transport off-site. The majority of the site runoff flows into to the quarry pit; the remainder flows via ditching to Outfall 001.

5.0 Employee Training

Employee training programs will instill in key personnel a complete understanding of the BMP plan, the processes and materials with which they are working, the safety hazards, the practices for preventing discharges, and the procedures for responding properly and rapidly to toxic and hazardous materials incidents. To do this, it is necessary to inform personnel at all levels of their responsibilities, and the goals and components of the BMP Plan. Key components of the employee training should include at a minimum:

- Descriptions of structural and non-structural BMPs utilized at the facility,
- Inspection and maintenance of structural BMPs,
- Spill prevention and response training,
- Housekeeping and equipment maintenance responsibilities,
- Materials management procedures,
- Maintenance of inspection and corrective action records,
- Training tools such as, handbooks, drills, meetings, suggestion boxes, awards, and other incentives.

Employee training meetings will be conducted at least annually to assure adequate understanding of the objectives of the BMP plan and the individual responsibilities of each employee. Typically, these meetings will be part of routine employee meetings for safety or fire and spill protection. Such meetings will highlight previous spill events or failures, malfunctioning equipment components, and recently developed BMP precautionary measures. Specific training requirements are also provided in the facility SPCC Plan.

Training sessions will review the BMP plan and associated procedures. Just as fire drills are used to improve an employee's reaction to a fire emergency, spill or environmental incident drills may serve to improve the employee's reactions to BMP incidents. Spill drills should be performed on a routine basis. Spill drills serve to evaluate the employees' knowledge of BMP-related procedures and are a fundamental part of employee training.

Of particular importance is the strong commitment and periodic input from top management to the employee training program to create the necessary climate of concern for a successful program. Documentation of employee training shall be recorded, as required in the facility SPCC Plan, and stored at the facility office.

6.0 Inspection Records

The purpose of the inspection and records system is to detect actual or potential BMP incidents. The inspection and records system will include the equipment and plant areas identified in Section 4.0, Risk Identification and Assessment as having the potential for significant discharges, and as identified in the facility SPCC Plan.

Inspection records include inspection dates and results. These records will be signed by the appropriate supervisor and maintained at the facility office, pursuant to SPCC Plan requirements. A tracking (follow-up) procedure will be instituted to assure that adequate response and corrective action have been taken. The recordkeeping portion of this system can be combined with the existing SPCC Plan inspections. Appendix C provides a visual inspection form.

6.1 Annual Comprehensive Site Inspection and BMP Evaluation

An annual stormwater compliance inspection will be conducted approximately one year following implementation of this BMP Plan and annually thereafter. This comprehensive site compliance evaluation shall be performed by the Facility/Spill Response Coordinator and/or

Alternate Facility/Spill Response Coordinator (see Table 1). The inspection will determine if the BMPs have been implemented and will assess their effectiveness. The inspection will also determine if site operations have changed since development of this BMP Plan.

If operational changes have been made, the Facility/Spill Response Coordinator and /or Alternate Facility/Spill Response Coordinator will determine if those changes will impact stormwater quality and develop new BMPs to address the change. All operational changes and new BMPs will be recorded and maintained with this BMP Plan. Additionally, the inspection date, the inspection personnel, the scope of the inspection, major observations, and any needed revisions will be recorded. ***Revisions to the plan will occur within fourteen days after the annual inspection***. Blank annual compliance inspections reports can be found in Appendix D.

The following steps are to provide guidance for conducting the annual comprehensive site inspection and BMP evaluation.

1. **Perform a complete facility inspection**

   - ☐ Inspect stormwater drainage areas and outfalls for evidence of pollutants (sheens and turbidity) entering the drainage system.
   - ☐ Inspect conditions of all structural controls (e.g., berms, basins, curbing, etc.)
   - ☐ Determine if practices or controls are being implemented as identified in the BMP Plan.
   - ☐ Evaluate the effectiveness of pollution prevention measures. Evaluate whether the controls described in the BMP Plan are sufficient to minimize stormwater pollution or if additional controls are necessary.
   - ☐ Verify operational guidelines and other standard operating procedures are being followed.
   - ☐ Conduct inventory and visually inspect equipment needed to implement the BMP Plan such as spill response kits, drip pans, and tarps.
   - ☐ Review site to ensure stormwater is being discharged only through the outfalls listed in SPDES Permit # NY- 0247189 (Appendix A).
   - ☐ Check for industrial materials, residue or trash on the ground that could contaminate or be washed away in stormwater;
   - ☐ Check for leaks or spills from industrial equipment, drums, barrels, tanks, or similar containers; and
   - ☐ Check for off-site tracking of industrial materials or sediment where vehicles enter or exit the site.

2. **Review BMP Plan**

   - ☐ Review and update personnel and contact information in Section 2.0 (Page 2) and Table 1 (Page 3).

- ☐ Determine if assessment information presented in Section 4.0 (Page 4) is up-to-date and reflects current site conditions and operations.
- ☐ Determine if changes to the selected stormwater management controls (Sections 12.0 and 13.0) and training program (Section 5.0 and SPCC Plan) are needed based on results of inspection.

3. **Evaluate Compliance**
   - ☐ Determine if additional controls are needed.
   - ☐ Verify compliance with employee training program (Section 5.0 and SPCC Plan).
   - ☐ Verify completion of stormwater monitoring, if applicable.
   - ☐ Verify compliance with recordkeeping requirements (Section 6.0 and SPCC Plan).

4. **Complete the "Annual Comprehensive Site Inspection and BMP Evaluation Report Form" (see Appendix D)**
   - ☐ Report is to be certified and signed by management.
   - ☐ Retain copies of reports in the site office with the BMP and SPCC Plan for three years after the date of the report.

5. **Revise BMP Plan**
   - ☐ Make revisions to the BMP Plan in accordance with Section 6.3 within two weeks of the inspection.
   - ☐ Document revisions to the BMP Plan and maintain revision documentation in site office.

6. **Perform Corrective Actions**
   - ☐ Document on "Future Spill and Erosion Control Measures" Form (Appendix E)
   - ☐ Define schedule for completion.
   - ☐ Implement changes within 12 weeks of the inspection.

6.2 BMPs for Sectors J and P

The Leroy facility is a limestone quarry with an aggregate processing plant, a maintenance shop, and an office. BMPs applicable to a limestone quarry (Sector J) and mobile equipment maintenance and fueling (Sector P) are associated with fuel and lubricating oil storage, aggregate materials processing, storage, and handling, and the use of mobile equipment on unpaved haul roads, and mobile equipment maintenance and fueling.

Fuel and lubricating oil and aggregate material BMPs require monthly routine inspections of material storage and handling areas, vehicle and equipment maintenance, cleaning, and fueling areas, material handling vehicles (e.g., stone bin load truck), equipment and processing areas. The site must maintain compliance with these "Sector J and P" requirements through performance of a combination of Dolomite Products Company, Inc. policies and procedures, and bulk petroleum storage regulations. Below is a summary of the minimum policies and procedures used to ensure stormwater pollution is prevented at the facility.

Fueling areas: Daily work-place inspections; monthly PBS tank inspections.

Equipment, processing areas, material storage and handling:
Daily work-place inspections; daily operating checklist; service reports.

Vehicles: Daily pre-shift inspections.

Equipment maintenance:
Daily work-place inspections; daily operating checklist; service reports; and employee time sheet maintenance log.

Specific sampling requirements are described in the SPDES Permit, which is incorporated as Appendix A of this BMP.

6.3 BMP Plan Revisions

The BMP Plan shall be amended whenever:

1. There is a change in design, construction, operation, or maintenance, which has a significant effect on the potential for the discharge of pollutants;

2. The BMP Plan proves to be ineffective in achieving the general objectives of controlling pollutants in stormwater discharges;

3. The recognition of deficiencies or needed changes discovered as a result of a facility inspection; and/or,

4. Annual stormwater reviews indicate changes are needed.

Revisions to the BMP Plan are to be documented. A history of revisions since the initial BMP Plan development date, as stated on title page, is to be maintained in the site office with the BMP Plan.

7.0 Preventative Maintenance

Preventative maintenance involves the regular inspection and testing of facility equipment, structures, grounds, and operations. A regular inspection program ensures that equipment, structures, and grounds (roadways, berms, ditches, catch basins, oil/water separators, etc.) are maintained in good operating condition and proper working order. Such inspections can uncover conditions such as leaks, cracks, faulty equipment, and damage to stormwater control structures that can be repaired or adjusted to prevent or minimize impacts to storm water. Many crushed stone and aggregate facilities already implement preventative maintenance programs in association with SPCC Plans that perform this function and can be utilized to satisfy this BMP. Key elements of an effective preventative maintenance program include the following:

- Daily visual inspections ('Pre-Shift Inspection') of equipment, machinery, structures, grounds, and operational systems prior to start-up.
- Appropriate and timely repair or replacement of faulty equipment, machinery, structures, and grounds.
- Maintenance of complete records on inspections, and repairs on equipment, machinery, structures, and grounds pursuant to manufacturer's recommendations and facility operations.

8.0 Good Housekeeping

Housekeeping practices at crushed stone facilities are intended to maintain a clean and orderly operation. Well maintained material and petroleum storage areas reduce the possibility of stormwater mixing with pollutants. Good housekeeping practices include the following:

- Trash and wind blown debris are to be collected regularly and properly containerized, for shipment to a licensed landfill on a regular basis.
- All leaks and spills are to be addressed as soon as possible in accordance with the facility SPCC Plan.
- Mobile and (or) stationary equipment is to be kept maintained.
- Used absorbent materials and drip pans are to be stored in closed, covered leak-proof containers and are to be appropriately disposed off-site as applicable.
- Operation and maintenance of the facility stormwater retention areas (quarry sump, ditching, and swales) will be performed.

8.1 Operations and Maintenance

Diligent operation and maintenance (O & M) of machinery, equipment, structures, and grounds help minimize the potential for accidental spills and the possibility of stormwater mixing with pollutants. Typical O & M practices include the following:

- Maintaining clean ground surfaces and floors by broom cleaning, shoveling, or sweeping,
- Regularly scheduled site cleanings, including trash, debris, and waste materials, including petroleum secondary containments,
- Prompt disposal of recyclable materials, including scrap metal,
- Routine inspections for leaks on equipment and machinery, pursuant to the facility SPCC Plan, and
- Train all employees and contractors about the need for good housekeeping and O & M.

8.2 Material Storage Practices

Improper storage can result in the release of materials and chemicals that can impact stormwater runoff.

- Store containers, drums, and other storage vessels indoors or under cover, and away from high traffic areas to minimize accidental releases and prevent impacts to stormwater due to accidental releases.
- Provide adequate aisle space to facilitate material transfer and easy access for inspections.
- Ensure that all liquids are stored within contained areas; at least to include curbing or diking around the perimeter of the storage area.
- Dispose of all drums and storage containers as soon as possible after use.
- Store containers or drums on wooden pallets or similar devices to prevent corrosion that could result in leaks and accidental releases.
- Conduct regular inspections of all material storage areas and maintain accurate and up-to-date materials inventories.
- Routinely inspect and drain fuel storage area secondary containments and remove any solid waste and vegetative debris.

9.0 Materials Compatibility

Materials compatibility encompasses three aspects, which are the compatibility of the chemicals being handled with the materials comprising the container, compatibility of different chemicals upon mixing in a container, and compatibility of the container with its environment.

Though not a significant practice at the Leroy facility, specific consideration should be given to procedures and practices delineating the mixing of chemicals and the prohibition of mixing of incompatible chemicals, which might result in fire, explosion or unusual corrosion. Thorough cleaning of storage vessels and equipment before being used for another chemical should be standard practice to ensure that there is no residual of a chemical that is incompatible with the second, or later, chemical to be used. Coatings or cathodic protection should be considered for protecting a buried pipeline or storage tank from corrosion.

10.0 Security

A security system is needed to prevent accidental or intentional entry to a plant which might result in vandalism, theft, sabotage or other improper or illegal use of plant facilities that could possibly cause a BMP incident. All petroleum storage areas should be secured and all dispensers lockable. All plant entrance roads shall have lockable gates.

11.0 Spill Prevention and Response

Development of a spill prevention and response plan is an important part of the BMP implementation and is an integral part of BMP and SPCC Plans. Several areas of a spill prevention and response BMP that should be addressed include the following:

- Identification of potential spill areas,
- Material handling procedures and storage requirements, and
- Spill response procedures.

Additional detail regarding these is provided in the facility SPCC Plan and summarized in the following sub-sections.

Storage of petroleum products will comply with the requirements of 6 NYCRR Part 613 (New York State regulations on the handling and storage of petroleum) and the SPCC Plan. To ensure releases of any quantity are promptly responded to and properly managed, training and inspections and maintenance of the petroleum storage facilities and mobile equipment shall be performed pursuant to the SPCC Plan.

11.1 Identification of Potential Spill Areas

A list or inventory of source materials and storage areas is provided in the SPCC Plan and summarized below. Stormwater drainage points from these storage areas and drainage pathways across the facility are provided in Plate 1. This inventory and the understanding of facility drainage pathways illustrate those areas with the greatest potential for material spills that could impact stormwater. These areas include:

- Bulk petroleum storage areas,
- Loading and unloading areas (e.g., fueling areas, maintenance areas etc.),
- Material storage areas,
- Aggregate processing equipment,
- Dust or particulate generating processes,
- Empty drum areas next to small shop, and
- Mobile equipment and parts storage areas.

The Leroy facility has the storage capacity to store almost 17,000 gallons of petroleum fuel, lubricating oils, and hydraulic fluids. As described in the SPCC Plan, these bulk storage areas are at the maintenance shop, the aggregate processing yard, and the quarry pit. A summary of the bulk petroleum, lubricating oil, and hydraulic fluid storage tank capacities and locations is provided in Table 4 below, and shown on Plate 1. Reference to the facility SPCC Plan is recommended.

11.2 Material Handling Procedures and Storage Requirements

Procedures to eliminate spills or minimize the impacts of spills need to be implemented. These procedures include the following:

- Development of a recycling and waste minimization program,
- Install leak detection, overflow controls, diversion berms, and containment structures,
- Implement housekeeping practices,
- Perform regular inspections, and adopt standard operating procedures for filling tanks and other equipment in order to minimize spills, and
- Train all employees and suppliers regarding material transfer procedures.

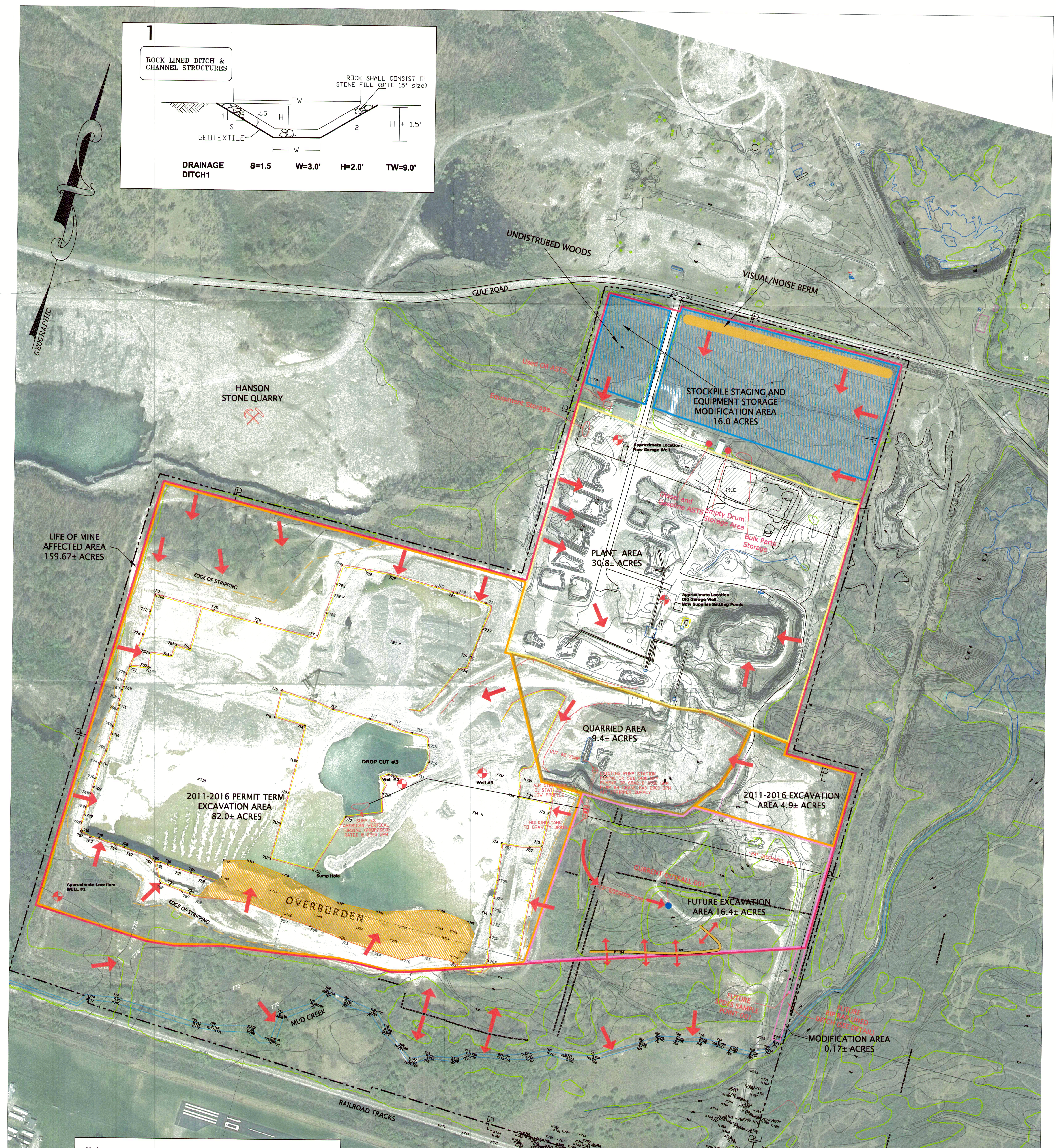
Table 4 - Petroleum Storage Tank Summary

Tank No.	Tank Contents	Tank Location
1	10,000 gallon diesel AST	400 feet east of office
2	290 gallon diesel AST	400 feet east of office
3	300 gallon gasoline AST	400 feet east of office
4	500 gallon used oil AST	West end of shop
5	1,000 gallon used oil AST	West end of shop
6	250 gallon used oil AST	West end of shop
7	275 lubricating oil AST	In shop
8	275 lubricating oil AST	In shop
9	500 gallon dielectric fluid AST	East of stone plant
10	500 gallon dielectric fluid AST	of stone plant
11	500 gallon dielectric fluid AST	
12	350 gallon dielectric fluid AST	
13	350 gallon dielectric fluid AST	
14	275 gallon crusher oil AST	Stone plant
15	110 gallon crusher oil AST	Stone plant
16	110 gallon crusher oil AST	Stone plant
17	110 gallon crusher oil AST	Stone plant
18	200 gallon crusher oil AST	Stone plant
19	200 gallon crusher oil AST	Stone plant
	Variable Number of 55-gallon drums (lubricating oils and hydraulic fluids)	In shop

11.3 Spill Response Procedures and Equipment

If a spill occurs, a rapid response may prevent or minimize impacts to storm water. The facility SPCC plan provides this function. The response plan provided in the SPCC Plan describes the following:

- Identification of a designated spill response team responsible for implementing response plan,
- Procedures to notify appropriate authorities providing assistance (e.g., police, fire, NYSDEC, USEPA, etc.),
- Provide safety measures with appropriate guidance on the type and location of personal protective equipment necessary,
- Provide procedures and identify the location of equipment and supplies to contain, divert, isolate, and clean-up the spill, and
- Provide training to all employees and suppliers on proper spill prevention and response.



Notes:

- This map generated from photogrammetric data and aerial photograph by Lockwood Mapping Inc., base map by Continental Placer Inc. dated 5/7/96, base map by Erdman Anthony Associates dated 2/84, U.S.G.S. quad., Leroy, New York, and 2010 NAIP Orthophoto.
- Property lines, railroad location, tree lines, and Hanson Stone Quarry location are approximate.
- Datum: Mean Sea Level
- Contour interval is 2 ft..
- U.S.G.S. 7.5 minute quad., Leroy, New York.
- This map is intended for illustrative purposes only, and should not be used for any other purpose.

(1) Plant area is future excavation area except for a 170' strip along northernmost portion, 4.6± acres.

AFFECTED AREA SUMMARY

2011–2016 PERMIT TERM

PLANT AREA (1)	30.8± ACRES
QUARRIED AREA	9.4± ACRES
EXCAVATION AREAS	103.3± ACRES
MODIFIED AREA FOR STOCKPILES, STAGING AND EQUIPMENT STORAGE	16.0± ACRES
MODIFIED DISCHARGE DITCH	0.17± ACRES
TOTAL LIFE OF MINE AND 2011–2016 PERMIT TERM AREA	159.67± ACRES

GRAPHIC SCALE

(IN FEET)
1 inch = 200 ft.

CONTINENTAL PLACER INC.
II Winners Circle Albany, New York 12205
ph: 518/458-9203 fax: 518/458-9206

Site Drainage & Features Map

Dolomite Products Co., Inc.
LeRoy Quarry
Town of LeRoy Genesee Co., NY.

Project Manager: WJM Prepared By: WJM Drafted By: WKC Reviewed By: WJM	Date: July 18, 2014 Project No: 73-201-13-4335	Sheet No: 1 of 1

12.0 Erosion and Sediment Control

BMPs for erosion and sediment control are in-place at the Leroy facility and will be maintained to minimize erosion potential and transport of sediment into stormwater flow paths and off-site. In general, the natural topography is flat with a low potential for soil erosion. The primary BMP used at the Leroy facility for erosion control and off-site sediment transport is berming and maintaining a vegetative cover. Most of the surfaces at the plant site are paved, aggregate gravel, or bedrock. As such, there is limited potential for soil erosion.

Areas with the potential for soil erosion are primarily the berms and areas where overburden has been stripped off the bedrock. When berms are constructed they are vegetated to prevent erosion. If and when erosion occurs, most of the sediment is transported into the quarry where is it is accumulated in the quarry pit and sump, and settles out prior to quarry dewatering. Berms at the quarry are routinely inspected and re-graded and re-seeded, as necessary. In some cases, ditching at the base of berms is utilized to direct run-off in to the quarry pit. In areas where overburden has been stripped, erosion and sediment control features will be implemented and runoff will be directed to the quarry pit.

13.0 Management of Runoff

As indicated in Section 12.0, the majority of runoff at the Leroy facility is directed into the quarry pit. Stormwater and quarry dewatering water are then pumped from the quarry sump to the air stripper with discharges to a 24-inch pipe that directs the water to a rip rapped ditch and the SPDES Outfall 001. All of this water ultimately flows to Mud Creek southeast of the quarry. Retention in the quarry sump, rip rap and vegetation in the ditch network, good housekeeping, and site inspections are utilized to minimize potential impacts to runoff. Plate 1 shows the quarry sump, air stripper, 24-inch discharge pipe and the ditch pathways transmitting the dewatering water, and the SPDES Outfall 001.

APPENDIX A

LEROY FACILITY SPDES PERMIT NO. NY-0247189

APPENDIX B

BMP INCIDENT REPORTING FORM

BMP Incident Reporting Form

Instructions: In the event of a BMP Incident, this form is to be completed as soon as possible and is to be used in reporting spills to the appropriate agencies. Contact the Dolomite Products Company, Inc. Leroy Quarry Environmental Manager for assistance in completing this form and for reporting of the incident.

Your Name:
Location:
Telephone Number:

Those responsible for the incident: Name:
Location Address:

Date and Time of Incident:

Location of Incident:

Source and cause of the release or spill:

Type of material(s) released or spilled:

Quantity of Material(s) released or spilled:

Danger or threat posed by the release or spill:

Number and types of injuries (if any):

Weather conditions at the incident location:

Actions Taken to Mitigate Incident:

Any other information that may help emergency personnel responding to the incident:

Spill Reporting: **Person reporting spill:**

Name(s) of person and agencies reported to:

Name	Agency	Date	Time

APPENDIX C

VISUAL MONITORING RECORDS

Quarterly Visual Monitoring Form

Facility:		Permit ID:
Outfall No.:	Examiners Name and Title:	
Quarter/Year:	Date/Time Examined:	Runoff Source: Rain Snow
Rainfall Amount:	Qualifying Storm? Yes No	
Parameter	Parameter Description	Parameter Characteristics
Color	Does the stormwater appear to be colored? Yes No	Describe:
Clarity	Is stormwater clear or transparent? Yes No	Describe the clarity: Clear Milky Opaque
Oil Sheen	Can you see a rainbow effect or sheen on the water? Yes No	Which best describes the sheen? Rainbow Sheen Floating Oil Blebs
Odor	Does the sample have an odor Yes No	Describe:
Floating Solids	Is there anything floating on the water? Yes No	Describe:
Suspended Solids	Is there anything suspended in the water column? Yes No	Describe:
Settled Solids	Is there anything settled on the bottom of the sample? Yes No	Describe:
Foam	Is there foam or froth on the top of the sample surface? Yes No	Describe:

Detail any concerns, corrective actions taken and any other indicators of pollution present in the sample:

Stormwater Examiner's Signature:

Fax this Quarterly Visual Monitoring Form to the Environmental Manager within 24 hours of completion: (716)

APPENDIX D

ANNUAL STORMWATER AND/OR SPDES COMPLIANCE EVALUATION FORM

ANNUAL STORMWATER AND/OR SPDES COMPLIANCE EVALUATION

SITE NAME: ______________________________________

SITE ADDRESS: ______________________________________

INSPECTOR(S) NAMES(S): ______________________________________

DATE: ____________________

SITE INSPECTION:

Conditions: ______________________________________

Notes/Findings

1) **Outfalls –**
   (e.g., obstructions, visible staining, damage, etc.)

2) **Structural BMPs -**
   (e.g., berms, drains, retention basins, etc.)
   (Confirm BMPs are maintained in good condition, operating correctly, and adequate for conditions.)

3) **Areas where additional BMPs needed?**

4) Industrial materials, residue, or trash exposed to stormwater? (Y / N)

Comments:

5) Leaks or spills from equipment or containers? (Y / N)

Comments:

6) Are there non-stormwater discharges? (Y / N)

Comments:

7) Off-site track out of sediment where vehicles enter or exit the site? (Y / N)

Comments:

8) Tracking or blowing of raw, final, or waste materials from areas of no exposure to exposed areas? (Y / N)

Comments:

9) Evidence of, or the potential for, pollutants entering the drainage system? (Y / N)

Comments:

10) Review "Quarterly Visual Monitoring" forms

Comments:

11) Review "Annual Sampling" reports. Are "bench-mark" or "effluent limitations" exceeded? (Y / N)

Comments:

12) Review the Stormwater Best Management Plan (BMP Plan). Are revisions needed? (Y / N)

Notes:

a) Revisions may include personnel names, tele. #s, description of new or modified BMPs/controls, new or modified procedures, etc.

b) Revisions to the BMP Plan must be completed within 14 calendar days following inspection, unless permission is granted in writing by NYSDEC.

c) If existing BMPs need modification or if additional BMPs are necessary implementation must be completed before the next anticipated storm event (if practical), but no more than 12 weeks after the comprehensive site evaluation.

Comments:

13a) Were incidents of non-compliance found? (Y / N)

13b) Describe any incidents of non-compliance and associated corrective actions with deadlines.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gathered and evaluated the information contained in this document. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information contained herein is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. Based on my review the facility is in compliance with the BMP Plan and the SPDES Permit.

Management

Signature: ________________________________

Date: ____________________________________

APPENDIX E

FUTURE SPILL AND EROSION CONTROL FEATURES

Future Spill and Erosion Control Features			
Control Measure	**Location**	**Proposed Date of Construction**	**Completion Date**

APPENDIX F

CONSTRUCTION SWPPP

CONTINENTAL PLACER INC.
II Winners Circle • Albany, New York 12205
(518) 458-9203 *fax* (518) 458-9206
www.continentalplacer.com

CONSTRUCTION ACTIVITIES
STORM WATER POLLUTION PREVENTION PLAN

FOR

DOLOMITE PRODUCTS CO., INC
LEROY QUARRY

SPDES PERMIT # NYR0247189
PERMIT EFFECTIVE DATE:
JULY 1, 2014

Prepared For:

Dolomite Products Co., Inc.
1150 Penfield Road
Rochester, New York 14625

Prepared By:

Continental Placer Inc.
II Winners Circle
Albany, NY 12205

July 18, 2014

TABLE OF CONTENTS

Figures

Appendices

1.0 INTRODUCTION

This Construction Activities Stormwater Pollution Prevention Plan (SWPPP) has been prepared for soil disturbance activities (overburden stripping) at the Dolomite Products Co., Inc. (Dolomite) Leroy facility. This SWPPP has been prepared pursuant to the SPDES Permit Special Condition #5 requiring a SWPPP for discharges of stormwater from soil disturbance of one or more acres of land. Implementation of this plan is not expected to be necessary because soil disturbance (overburden stripping) activities at the Dolomite Leroy facility are not expected to have the potential to discharge stormwater to waters of the State. All stormwater from the stripping areas is directed into the quarry pit and/or the on-site retention ponds. If site soil disturbance activities ever have the potential to discharge stormwater to waters of the State then this SWPPP will be implemented.

2.0 SITE DESCRIPTION

The Leroy facility is a limestone quarry. The limestone bedrock being mined is the Onondaga Formation. The Leroy facility also has aggregate processing plants, a dewatering water air stripping treatment plant, a mobile equipment maintenance shop, and office. It is located on Gulf Road in the Town of Leroy in Genesee County. A site location map is provided as Figure 1.

The closest water body to the Leroy facility is Mud Creek. Mud Creek is south and east of the quarry flowing eastward south of the quarry and northeastward east of the quarry. There is also a flooded quarry pond in an inactive quarry pit northwest of the Leroy facility. None of these surface water features are listed as impaired, nor do they discharge to an impaired surface water body.

2.1 Slopes and Soils

Land surface elevations range from approximately 775 to 795 feet from east to west across the facility. The majority of the site has been cleared of overburden soils and is exposed limestone bedrock. The soils in the area are primarily mapped as being part of the Benson Soil series with smaller areas of Niagara, Collamer, Palmyra, and Honeoye soils. The soils mapped in proximity to the Dolomite Leroy facility are as follows:

BeB	Benson cherty loam; 0 to 8% slopes
BeD	Benson cherty loam, 8 to 25% slopes
BeE	Benson cherty loam, 25 to 40% slopes
NaA	Niagara and Collamer silt loams, 0 to 2% slopes
PaA	Palmyra gravelly loam, 0 to 3% slopes
PaC	Palmyra gravelly loam, 8 to 15% slopes
HnB	Honeoye silt loam, 2 to 8% slope.

The Benson soils are thin layered over bedrock with gentle to moderate slopes; they are rocky, and generally moderately to well drained. The Niagara soils are somewhat poorly drained silty deposits. The Collamer soils are moderately well drained silty and fine sand deposits. Palmyra soils are gravelly, well drained with gentle to moderate slopes. The Honeoye soils are well drained silty loam deposits with gentle to moderate slopes.

As stated above, bedrock is exposed in the quarry pit and areas adjacent to the pit. Near vertical bedrock highwalls comprise the bounds of the quarry pit. Natural slopes typically range from 0 to 35 percent.

2.2 Site Drainage

All site drainage is into the quarry pit and into on-site retention ponds.

3.0 STRIPPING SCHEDULE

Stripping is typically performed periodically during the year with a duration of only a few weeks. Stripping is done adjacent to the active portion of the quarry. Vegetation is first removed then overburden is removed and transported to a storage area or used to make berms. Once stripping is completed, areas of exposed soil are stabilized via seeding and silt fencing and bedrock mining progresses into the stripped area.

4.0 PLANNED EROSION AND SEDIMENT CONTROL PRACTICES

Planned erosion and sediment control (ESC) practices are silt fencing; diversion with swales, ditching, and berms; check dams; retention ponds; surface stabilization (seeding/re-vegetation); dust control; grading; and the use of no greater than 3:1 slopes. The ditching is a permanent feature southeast of the quarry pit. Silt fencing, grading, and surface stabilization will be temporary erosion control features utilized during overburden stripping. The stripped overburden will be stockpiled for subsequent use during mine reclamation and used to build berms. The stockpiled overburden and any earthen berms constructed with the overburden will be graded with no greater than 3:1 slopes, silt fencing will be placed at the toe of the overburden stockpiles or berms, and the stockpile or berms will be seeded. A copy of the 'Blue Book Lite' that shows schematics of the typical erosion control BMPs that will be used at the Dolomite Leroy facility is provided in Attachment A. The key elements for erosion and sediment control are runoff control, sediment control, and stabilization.

4.1 Runoff Control

To minimize concentrated flow from the facility a few runoff control techniques may be implemented. These provisions help prevent point discharge and provide on-site runoff control by infiltration. The goal is to minimize runoff and replicate pre-soil disturbance hydrology. On-site management of stormwater runoff can be accomplished by a combination of the following approaches.

- As possible, direct run-off into quarry pit to allow accumulation and sediment settling in quarry sumps.
- Utilize perimeter controls (berming, grading, silt fencing) to prevent run-on of stormwater into the work area and direct run-off from the work area into the quarry pit (not towards property bonds).
- Control the runoff in each small drainage area before flow reaches runoff from entire stripping area.
- Convey surface flows from highly erodible soil and steep slopes to more suitable stable areas.
- Runoff from existing or proposed cut and fill slopes should be redirected to lower water velocity without causing erosion (use of check dams or vegetated swales).

- Final site drainage should be designed to prevent erosion, concentrated flows to adjacent properties, uncontrolled overflow, and ponding.

4.2 Sediment Control

Sediment control is a primary feature that must be addressed whenever disturbing soil at the Dolomite Leroy facility. The following will be considered during all site overburden stripping activities:

- At any location where surface runoff from disturbed or graded areas may flow off the stripping area, sediment control measures must be installed to prevent sediment from being transported to property bonds. Grading, filling or other disturbance within existing drainage swales should be avoided. The use of berms, swales, and ditching will be used to control and direct runoff to the quarry pit.
- Swales or other areas that transport concentrated flow will be appropriately stabilized.
- Downspout or sump pump discharges must have acceptable outfalls that are protected by splash blocks, sod, or piping as required by site conditions (i.e., no concentrated flow directed over fill slopes).

4.3 Stabilization

The Dolomite Leroy facility personnel will stabilize all buffer areas adjacent to the overburden stripping areas to minimize erosion and sediment transport towards property bonds. Stabilization of soil disturbances within and surrounding the stripped areas will be accomplished by a combination of the following approaches.

- Implement erosion control practices to keep the soil in place.
- Stabilization should be completed immediately for the surface of all perimeter controls and perimeter slopes.
- When activities temporarily cease during construction, soil stockpiles and exposed soil should be stabilized by seed, mulch or other appropriate measures as soon as possible, but in no case not more than 14 days after construction activity has ceased.
- Following initial soil disturbance or re-disturbance, permanent or temporary, stabilization should be completed within 14 days or as soon as possible.
- Apply temporary or permanent stabilization measures immediately on all disturbed areas where work is delayed or completed.

5.0 INSPECTIONS

Qualified personnel will conduct site inspections in areas with the potential to discharge stormwater to surface waters of the State as follows:

- All erosion and sediment control practices in areas with potential for stormwater discharge to surface water will be inspected to ensure integrity and effectiveness to ensure that practices are constructed as indicated in the facility BMP plan and this construction SWPPP.
- All areas of disturbance in areas with potential for stormwater discharge to surface water that have not achieved final stabilization will be inspected.

- All points of discharge to natural surface water bodies located within, or immediately adjacent to, the property boundaries of the mine will be inspected.
- All stormwater discharge points will be inspected.

For sites where soil disturbance activities are on-going, the qualified personnel shall conduct a site inspection at least once every seven (7) calendar days. Where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and temporary stabilization has been applied to all disturbed areas or if runoff is unlikely due to winter conditions (e.g., site is covered with snow, ice, or the ground is frozen), the qualified personnel shall conduct a site inspection at least once every thirty (30) calendar days.

Inspection reports will be prepared following inspections to describe the inspection findings and recommending any corrective actions. At a minimum, the inspection report shall include and/or address the following:

- Date and time of inspection;
- Name and title of person(s) performing inspection;
- A description of the weather and soil conditions (e.g. dry, wet, saturated) at the time of the inspection;
- A description of the condition of the runoff at all points of discharge from the site;
- Identify any discharges of sediment or other pollutants from the site, including discharges from conveyance systems (i.e. pipes, culverts, ditches, etc.) and overland flow;
- A description of the condition of all natural surface water bodies located within, or immediately adjacent to, the property boundaries of the construction site which receive runoff from disturbed areas. This shall include identification of any discharges of sediment to the surface water body;
- Identification of all BMPs and erosion and sediment control practices that need repair or maintenance;
- Identification of all BMPs and erosion and sediment control practices that were not installed properly or are not functioning as designed and need to be reinstalled or replaced;
- Description of areas that are disturbed at the time of the inspection and areas that have been stabilized (temporary and/or final) since the last inspection, which will follow current monthly inspection pratices; and
- Corrective action(s) that must be taken to install, repair, replace or maintain erosion and sediment control practices; and to correct deficiencies identified with the construction of the post-construction stormwater management practice(s).

Within one (1) business day of the completion of an inspection, the qualified personnel will notify the SWPPP Coordinator of any corrective actions that need to be taken. The SWPPP Coordinator will ensure that the corrective actions will be implemented within one (1) business day of this notification and will complete the corrective actions within seven (7) calendar days unless otherwise notified by the Department.

6.0 MAINTENANCE

All erosion and sediment control structures require inspections, as discussed above, and maintenance to ensure those structural BMPs are functioning properly. The design, installation, inspection, maintenance and repair of erosion and sediment controls will conform to the New

York Standards and Specifications for Erosion and Sediment Control, 2005 and New York State Revegetation Procedures Manual: Surface Mining Reclamation, or their equivalents. An abbreviated version New York's 2005 document, the 'Blue Book Lite' is provided as Attachment A.

Figure 1 – Site Location Map

Attachment A

Blue Book Lite

BLUE-BOOK "LITE"

New York State
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Water

New York State
Standards and Specifications
for Erosion and Sediment Control

August 2005

New York State
Department of Environmental Conservation

George E. Pataki, Governor

Common Erosion and Sediment Control Standards
For
Code Municipal Enforcement Officers and Inspectors

For a complete copy of the Blue Book, please visit the NYS DEC website at:
http://www.dec.ny.gov/chemical/29066.html

New York State Department of Environmental Conservation

For use at *Construction Site Stormwater Inspections for Code Enforcement Officers - Part 2*

NYS Department of Environmental Conservation Endorsed Stormwater Training

NYS Department of State Code Enforcement Educational Program #49-5653

June 2007

Blue-Book "Lite"

Table of Contents

The *Blue Book "Lite"* is a compilation of the more commonly used erosion and sediment control practices from the unabridged *New York State Standards and Specifications for Erosion and Sediment Control*, the so-called "Blue Book." These were compiled for training purposes because construction stormwater site inspectors need to be familiar with the standards and specifications from the "Blue Book," and these would be more frequently encountered during inspections. The numbers in the Table (left column) represent the pages where the content (right column) would be found in the "Blue Book." Go to http://www.dec.ny.gov/chemical/29066.html to view or download the full document on the New York State Department of Environmental Conservation website.

The following sections from the August 2005 "Blue Book" prepared by:

Introduction and Sections 1, 2 and 5 -
Donald W. Lake, Jr., P.E., CPESC, CPSWQ
Engineering Specialist
New York State Soil & Water Conservation Committee

Section3 -
Frederick B. Gaffney
Former Conservation Agronomist
USDA - Natural Resources Conservation Service
Syracuse, New York

and

John A. Dickerson
Plant Materials Specialist
USDA - Natural Resources Conservation Service
Syracuse, New York

INTRODUCTION

Purpose

The purpose of this manual is to provide minimum standards and specifications for meeting criteria set forth by the New York State Department of Environmental Conservation (NYS DEC) for stormwater discharges associated with construction activity. The standards and specifications provide criteria on minimizing erosion and sediment impacts from construction activity involving soil disturbance. They show how to use soil, water, plants, and products to protect the quality of our environment. These standards and specifications were developed in cooperation with the USDA Natural Resources Conservation Service, New York State Soil and Water Conservation Committee (NYSSWCC), NYS DEC and other state and local agencies for use by planners, design engineers, developers, contractors, landscape architects, property owners, and resource managers. Proper use of these standards will protect the waters of the state from sediment loads during runoff events.

Scope and Authority

The standards and specifications apply to lands within New York State where housing, industrial, institutional, recreational, or highway construction, and other land disturbances are occurring or imminent. They are statewide in scope and, in some cases, are somewhat generalized due to variations in climate, topography, geology, soils, and plant requirements. Feasible ways to minimize erosion and sedimentation are varied and complex. Following these standards and specifications is presumed to be in compliance with the SPDES general permit for construction activities. Alternative methods may be explored on a case specific basis and shall be discussed with NYS DEC regional staff.

The Environmental Protection Agency delegated stormwater responsibility for the National Pollutant Discharge Elimination System (NPDES) Permit to New York on October 1, 1992. New York State issued its first General Permit for stormwater discharges from construction activities on August 1, 1993. This was issued pursuant to Article 17, Titles 7, 8 and Article 70 of Environmental Conservation Law. At a minimum, an erosion and sediment control plan must be prepared for any construction activity that disturbs one or more acres.

Erosion and Sediment Hazards Associated with Development

Many people may be adversely affected by development on relatively small areas of land. Uncontrolled erosion and sediment from these areas may cause considerable economic damage to individuals and society in general. Stream pollution and damages to public facilities and private homes are examples. Hazards associated with land disturbance include:

1. A large increase of soil exposed to erosion from wind and water;
2. Increased water runoff, soil movement, sediment accumulation and peak flows caused by:
    a. Removal of plant cover;
    b. A decrease in the area of soil which can absorb water because of construction of streets, buildings, sidewalks, and parking lots;
    c. Changes in drainage areas caused by grading operations, diversions, and streets;
    d. Changes in volume and duration of water concentrations caused by altering steepness, distance, and surface roughness;
    e. Soil compaction by heavy equipment, which can reduce the water intake of soils as much as 90 percent of the original rate; and,
    f. Prolonged exposure of unprotected sites and disturbed areas to poor weather conditions.
3. Altering the groundwater regime that may adversely affect drainage systems, slope stability, survival of existing vegetation and establishment of new plants;
4. Exposing subsurface materials that are too rocky, too acid, or otherwise unfavorable for establishing plants;
5. Obstructing stream flow with new buildings, dikes, and land fills;
6. Improper timing and sequencing of construction and development activities; and,
7. Abandonment of sites before completion of construction.

How to Use This Manual

The standards and specifications listed in this manual have been developed over time to reduce the impact of soil loss from construction sites to receiving water bodies and adjacent properties. This manual provides designers with details on how to plan a site for erosion and sediment control and how to select, size, and design specific practices to meet these resource protection objectives. The appendices at the end of this manual contain additional information as guidance for site plan design and review, construction implementation, and site inspection. Review and inspection checklists are provided to aid planners and designers in meeting the standards requirements.

BASIC PRINCIPLES OF EROSION AND SEDIMENT CONTROL

The Erosion and Sedimentation Processes

The standards, specifications, and planning guidelines presented in this document are intended to be utilized when development activities change the natural topography and vegetative cover of an area. Erosion and sediment control plans must be designed and constructed to minimize erosion and sediment problems associated with soil disturbance. To understand how erosion and sediment rates are increased requires an understanding of the processes themselves.

Soil erosion is the removal of soil by water, wind, ice, or gravity. This document deals primarily with the types of soil erosion caused by rainfall and surface runoff. Raindrops strike the soil surface at a velocity of approximately 25-30 feet per second and can cause splash erosion. Raindrop erosion causes particles of soil to be detached from the soil mass and splash into the air. After the soil particles are dislodged, they can be transported by surface runoff, which results when the soil becomes too saturated to absorb falling rain or when the rain falls at an intensity greater than the rate at which the water can enter the soil. Scouring of the exposed soil surface by runoff can cause further erosion. Runoff can become concentrated into rivulets or well-defined channels up to several inches deep. This advanced stage is called rill erosion. If rills and grooves remain unrepaired, they may develop into gullies when more concentrated runoff flows downslope.

Sediment deposition occurs when the rate of surface flow is insufficient for the transport of soil particles. The heavier particles, such as sand and gravel, transport less readily than the lighter silt and clay particles. Previously deposited sediment may be suspended by runoff from another storm and transported farther downslope. In this way, sediment is carried intermittently downstream from its upland point of origin.

Factors That Influence Erosion

The erosion potential of a site is determined by five factors; soil erodibility, vegetative cover, topography, climate, and season. Although the factors are interrelated as determinants of erosion potential, they are discussed separately for easy understanding.

1. **Soil Erodibility** – The vulnerability of a soil to erosion is known as erodibility. The soil structure, texture, and percentage of organic matter influence its erodibility. The most erodible soils generally contain high proportions of silt and very fine sand. The presence of clay or organic matter tends to decrease soil erodibility. Clays are sticky and tend to bind soil particles together. Organic matter helps to maintain stable soil structure (aggregates).

2. **Vegetative Cover** – Vegetation protects soil from the erosive forces of raindrop impact and runoff scour in several ways. Vegetation (top growth) shields the soil surface from raindrop impact while the root mass holds soil particles in place. Grass buffer strips can be used to filter sediment from the surface runoff. Grasses also slow the velocity of runoff, and help maintain the infiltration capacity of a soil. The establishment and maintenance of vegetation are the most important factors in minimizing erosion during development.

3. **Topography** – Slope length and steepness greatly influence both the volume and velocity of surface runoff. Long slopes deliver more runoff to the base of slopes and steep slopes increase runoff velocity. Both conditions enhance the potential for erosion to occur.

4. **Climate** – Climate also affects erosion potential in an area. Rainfall characteristics such as frequency, intensity, and duration directly influence the amount of runoff that is generated. As the frequency of rainfall increases, water has less chance to drain through the soil between storms. The soil will remain saturated for longer periods of time and stormwater runoff volume may be potentially greater. Therefore, erosion risks are high where rainfall is frequent, intense, or lengthy.

5. **Season** – Seasonal variation in temperature and rainfall defines periods of high erosion potential during the year. High erosion potential may exist in the spring when the surface soil first thaws and the ground underneath remains frozen. A low intensity rainfall may cause substantial erosion because the frozen subsoil prevents water infiltration. In addition, the erosion potential increases during the summer months due to more frequent, high intensity rainfall.

STEPS IN THE SELECTION AND DESIGN OF CONTROL MEASURES

The following text relates to the planning flow charts on pages 2.6, 2.7 and 2.8.

In the erosion and sediment control process, site designs must be prepared to address erosion control and then sediment control. Erosion control is accomplished by controlling runoff and then stabilizing soil. After erosion control has been planned, sediment control can then be developed.

Step 1: Identify Control Methods—Three basic methods are used to control soil movement on construction sites: runoff control, soil stabilization, and sediment control. **CONTROLLING EROSION SHALL BE THE FIRST LINE OF DEFENSE.** Runoff control and soil stabilization can be used to control erosion. Controlling erosion is very effective for small-disturbed areas such as single lots or small areas of a disturbance.

Sediment control may be necessary on large developments where mass grading is planned, where it is harder or impractical to control erosion, and where sediment particles are relatively large. A minimum of cost for erosion and sediment control is usually accomplished by using a combination of vegetative and structural erosion control and sedimentation control measures.

Step 2: Identify Resources and Potential Problem Areas—Resources need to be identified prior to initiating an ESC plan. These resources include, but are not limited to, receiving waters, tributaries to public water supplies, beaches and other concentrated recreational areas, wetlands, trees, vegetative buffers, steep slopes and cultural resources. Areas where erosion is to be controlled will usually fall into categories of slopes, graded areas or drainage ways. Slopes include graded rights-of-way, stockpile areas, and all cut or fill slopes. Graded areas include all stripped areas other than slopes. Drainage ways are areas where concentrations of water flow naturally or artificially, and the potential for gully erosion is high. Problem areas where sediment is to be controlled fall into categories of large or small drainage areas. Small areas are usually 1 acre or less while large areas are greater than 1 acre.

Step 3: Identify Required Strategy—The third step in erosion and sediment control planning is to follow the planning matrix from the problem area to the strategy that can be taken to solve the problem. Strategies can be used individually or in combination. For example, if there is a cut slope to be protected from erosion, the strategies may be to protect the ground surface, divert water from the slope, or shorten it. Any combination of these strategies can be used. If no rainfall except that which falls on the slope has the potential to cause erosion, and if the slope is relatively short, protecting the soil surface is often all that is required to solve the problem.

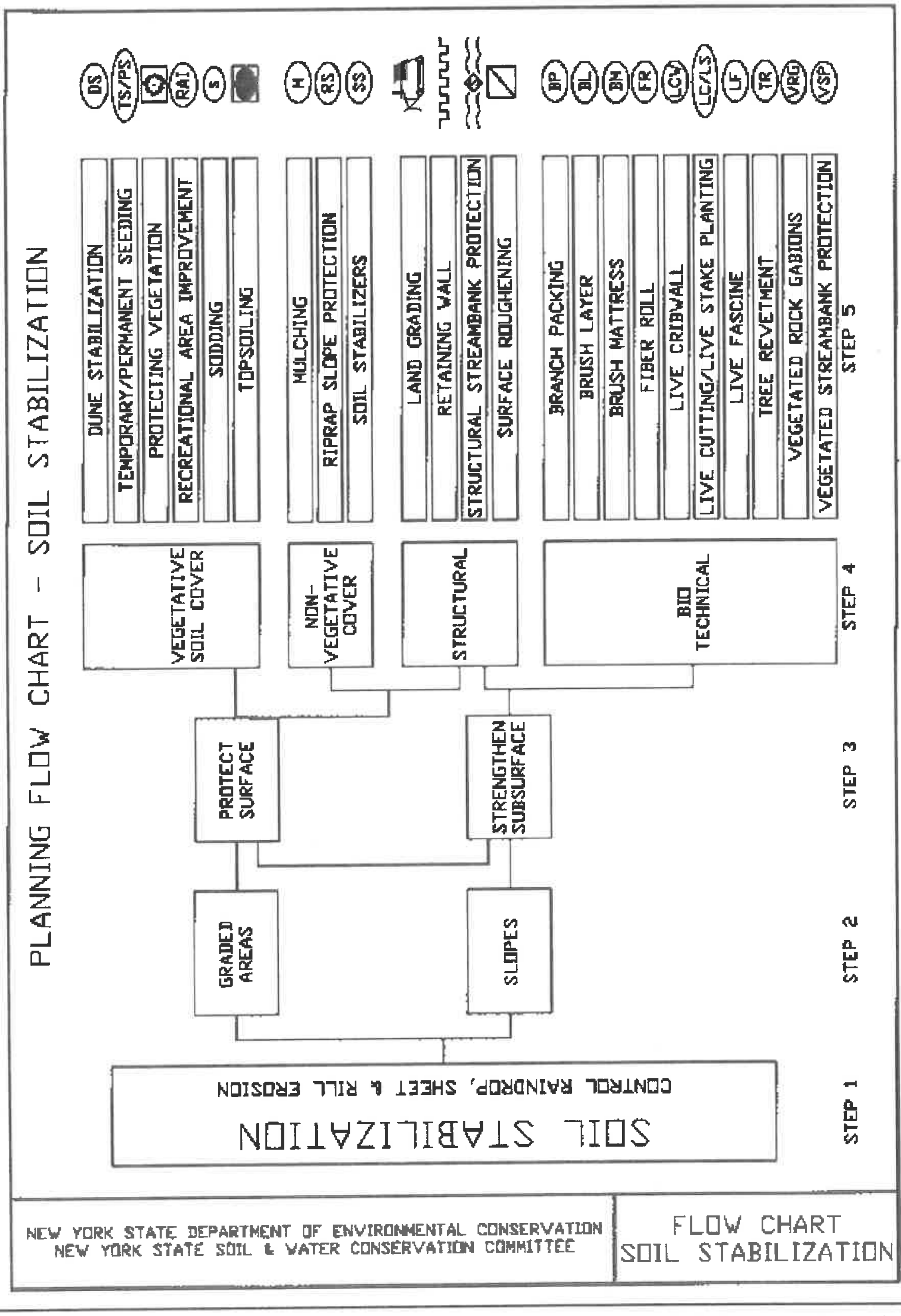
Step 4: Identify Control Measure Group—Once required strategies are identified, the planning flow chart leads to the group or groups of control measures that will accomplish one strategy. Control measures within each group have similar purpose, scope, application, design, criteria, standard plans, and construction specifications. Therefore, any measure within a group may solve the problem in question.

Step 5: Design Specific Control Measures—The final step in erosion and sediment control planning is accomplished by completing final design. This involves applying any control measure within a group to solve the specific erosion and sediment control problem. From descriptions given to the right of each control measure in the ESC planning matrix (Table 2.1), the one measure which is most economical, practical, efficient, and adaptable to the site should be chosen.

Step 6: Winter Operations—If construction activities continue during winter, access points should be enlarged and stabilized to provide for snow stockpiling. In addition, a snow management plan should be prepared with adequate storage and control of meltwater. A minimum 25 foot buffer shall be maintained from perimeter controls such as silt fence. In high resource protection areas, silt fence shall be replaced with perimeter dikes, swales, or other practices resistant to the forces of snow loads. Keep drainage structures open and free of snow and ice dams. Inspection and maintenance are necessary to ensure the function of these practices during runoff events.

Once the specific control measure has been selected, the plan key symbol given in the flow chart must be placed on the erosion and sediment control site plan to show where the control measure will be used. Standardized design, plan, and construction specification sheets must then be completed for each control measure. This completes the planning for erosion control and soil stabilization as part of the total natural resource plan.

Figure 2.2
Planning Flow Chart—Soil Stabilization



STANDARD AND SPECIFICATIONS FOR PERMANENT CRITICAL AREA PLANTINGS

Definition

Establishing grasses with other forbs and/or shrubs to provide perennial vegetative cover on disturbed, denuded, slopes subject to erosion.

Purpose

To reduce erosion and sediment transport.

Conditions Where Practice Applies

This practice applies to all disturbed areas void of, or having insufficient, cover to prevent erosion and sediment transport. See additional standards for special situations such as sand dunes and sand and gravel pits.

Criteria

All water control measures will be installed as needed prior to final grading and seedbed preparation. Any severely compacted sections will require chiseling or disking to provide an adequate rooting zone, to a minimum depth of 12". The seedbed must be prepared to allow good soil to seed contact, with the soil not too soft and not too compact. Adequate soil moisture must be present to accomplish this. If surface is powder dry or sticky wet, postpone operations until moisture changes to a favorable condition. If seeding is accomplished within 24 hours of final grading, additional scarification is generally not needed, especially on ditch or stream banks. Remove all stones and other debris from the surface that are greater than 4 inches, or that will interfere with future mowing or maintenance.

Soil amendments should be incorporated into the upper 2 inches of soil when feasible. **The soil should be tested to determine the amounts of amendments needed.** Apply ground agricultural limestone to attain a pH of 6.0 in the upper 2 inches of soil. If soil must be fertilized before results of a soil test can be obtained to determine fertilizer needs, apply commercial fertilizer at 600 lbs. per acre of 5-10-10 or equivalent. If manure is used, apply a quantity to meet the nutrients of the above fertilizer. This requires an appropriate manure analysis prior to applying to the site. Do not use manure on sites to be planted with birdsfoot trefoil or in the path of concentrated water flow.

Seed mixtures may vary depending on location within the state and time of seeding. Generally, warm season grasses should only be seeded during early spring, April to May. These grasses are primarily used for vegetating excessively drained sands and gravels. See Standard and Specification for Sand and Gravel Mine Reclamation. Other grasses may be seeded any time of the year when the soil is not frozen and is workable. When legumes such as birdsfoot trefoil are included, spring seedings are preferred. See Table 3.1 "Permanent Critical Area Planting Mixture Recommendations" for additional seed mixtures.

General Seed Mix:
[1] add inoculant immediately prior to seeding

	Variety	lbs./acre	lbs/1000 sq. ft.
Birdsfoot trefoil[1] OR	Empire/Pardee	8[2]	0.20
Common white clover[1]	Common	8	0.20
PLUS			
Tall fescue	KY-31/Rebel	20	0.45
PLUS			
Redtop OR	Common	2	0.05
Ryegrass (perennial)	Pennfine/Linn	5	0.10

[2] Mix 4 lbs each of Empire and Pardee OR 4 lbs of Birdsfoot and 4 lbs white clover per acre.

Time of Seeding: The optimum timing for the general seed mixture is early spring. Permanent seedings may be made any time of year if properly mulched and adequate moisture is provided. Late June through early August is not a good time to seed, but may facilitate covering the land without additional disturbance if construction is completed. Portions of the seeding may fail due to drought and heat. These areas may need reseeding in late summer/fall or the following spring.

Method of seeding: Broadcasting, drilling, cultipack type seeding, or hydroseeding are acceptable methods. Proper soil to seed contact is key to successful seedings.

Mulching: Mulching is essential to obtain a uniform stand of seeded plants. Optimum benefits of mulching new seedings are obtained with the use of small grain straw applied at a rate of 2 tons per acre, and anchored with a netting or tackifier. See the mulch standard and specification for choices and requirements.

Irrigation: Watering may be essential to establish a new seeding when a drought condition occurs shortly after a new seeding emerges. Irrigation is a specialized practice and care must be taken not to exceed the application rate for the soil or subsoil. When disconnecting irrigation pipe, be sure pipes are drained in a safe manor, not creating an erosion concern.

STANDARD AND SPECIFICATIONS FOR MULCHING

Definition

Applying coarse plant residue or chips, or other suitable materials, to cover the soil surface.

Purpose

The primary purpose is to provide initial erosion control while a seeding or shrub planting is establishing. Mulch will conserve moisture and modify the surface soil temperature and reduce fluctuation of both. Mulch will prevent soil surface crusting and aid in weed control. Mulch is also used alone for temporary stabilization in non-growing months.

Conditions Where Practice Applies

On soils subject to erosion and on new seedings and shrub plantings. Mulch is useful on soils with low infiltration rates by retarding runoff.

Criteria

Site preparation prior to mulching requires the installation of necessary erosion control or water management practices and drainage systems.

Slope, grade and smooth the site to fit needs of selected mulch products.

Remove all undesirable stones and other debris to meet the needs of the anticipated land use and maintenance required.

Apply mulch after soil amendments and planting is accomplished or simultaneously if hydroseeding is used.

Select appropriate mulch material and application rate or material needs. Determine local availability.

Select appropriate mulch anchoring material.

NOTE: The best combination for grass/legume establishment is straw (cereal grain) mulch applied at 2 ton/ acre (90 lbs./1000sq.ft.) and anchored with wood fiber mulch (hydromulch) at 500 – 750 lbs./acre (11 – 17 lbs./1000 sq. ft.). The wood fiber mulch must be applied through a hydroseeder immediately after mulching.

Table 3.7
Guide to Mulch Materials, Rates, and Uses

Mulch Material	Quality Standards	per 1000 Sq. Ft.	per Acre	Depth of Application	Remarks
Wood chips or shavings	Air-dried. Free of objectionable coarse material	500-900 lbs.	10-20 tons	2-7"	Used primarily around shrub and tree plantings and recreation trails to inhibit weed competition. Resistant to wind blowing. Decomposes slowly.
Wood fiber cellulose (partly digested wood fibers)	Made from natural wood usually with green dye and dispersing agent	50 lbs.	2,000 lbs.	—	Apply with hydromulcher. No tie down required. Less erosion control provided than 2 tons of hay or straw.
Gravel, Crushed Stone or Slag	Washed; Size 2B or 3A—1 1/2"	9 cu. yds.	405 cu. yds.	3"	Excellent mulch for short slopes and around plants and ornamentals. Use 2B where subject to traffic. (Approximately 2,000 lbs./cu. yd.). Frequently used over filter fabric for better weed control.
Hay or Straw	Air-dried; free of undesirable seeds & coarse materials	90-100 lbs. 2-3 bales	2 tons (100-120 bales)	cover about 90% surface	Use small grain straw where mulch is maintained for more than three months. Subject to wind blowing unless anchored. Most commonly used mulching material. Provides the best micro-environment for germinating seeds.
Jute twisted yarn	Undyed, unbleached plain weave. Warp 78 ends/yd., Weft 41 ends/ yd. 60-90 lbs./roll	48" x 50 yds. or 48" x 75 yds.	—	—	Use without additional mulch. Tie down as per manufacturers specifications. Good for center line of concentrated water flow.
Excelsior wood fiber mats	Interlocking web of excelsior fibers with photodegradable plastic netting	8" x 100" 2-sided plastic, 48" x 180" 1-sided plastic	—	—	Use without additional mulch. Excellent for seeding establishment. Tie down as per manufacturers specifications. Approximately 72 lbs./roll for excelsior with plastic on both sides. Use two sided plastic for centerline of waterways.
Compost	Up to 3" pieces, moderately to highly stable	3-9 cu. yds.	134-402 cu. yds.	1-3"	Coarser textured mulches may be more effective in reducing weed growth and wind erosion.
Straw or coconut fiber, or combination	Photodegradable plastic net on one or two sides	Most are 6.5 ft. x 3.5 ft.	81 rolls	—	Designed to tolerate higher velocity water flow, centerlines of waterways, 60 sq. yds. per roll.

STANDARD AND SPECIFICATIONS FOR STABILIZATION WITH SOD

Definition

Stabilizing silt producing areas by establishing long term stands of grass with sod.

Purpose

To stabilize the soil; reduce damage from sediment and runoff to downstream areas; enhance natural beauty.

Conditions Where Practice Applies

On exposed soils that have a potential for causing off site environmental damage where a quick vegetative cover is desired. Moisture, either applied or natural, is essential to success.

Design Criteria

1. Sod shall be bluegrass or a bluegrass/red fescue mixture or a perennial ryegrass for average sites. (CAUTION: Perennial ryegrass has limited cold tolerance and may winter kill.) Use turf type cultivars of tall fescue for shady, droughty, or otherwise more critical areas. For variety selection, contact Cornell Cooperative Extension Turf Specialist.

2. Sod shall be machine cut at a uniform soil thickness of 3/4 inch, plus or minus 1/4 inch. Measurement for thickness shall exclude top growth and thatch.

3. Standard size sections of sod shall be strong enough to support their own weight and retain their size and shape when suspended vertically from a firm grasp on the upper 10 percent of the section.

4. Sod shall be free of weeds and undesirable coarse weedy grasses. Wild native or pasture grass sod shall not be used unless specified.

5. Sod shall not be harvested or transplanted when moisture content (excessively dry or wet) may adversely affect its survival.

6. Sod shall be harvested, delivered, and installed within a period of 36 hours. Sod not transplanted within this period shall be inspected and approved by the contracting officer or his designated representative prior to its installation.

Site Preparation

Fertilizer and lime application rates shall be determined by soil tests. Under unusual circumstances where there is insufficient time for a complete soil test and the contracting officer agrees, fertilizer and lime materials may be applied in amounts shown in subsection 2 below. Slope land such as to provide good surface water drainage. Avoid depressions or pockets.

1. Prior to sodding, the surface shall be smoothed and cleared of all trash, debris, and of all roots, brush, wire, grade stakes and other objects that would interfere with planting, fertilizing or maintenance operations.

2. **The soil should be tested to determine the amounts of amendments needed.** Where the soil is acid or composed of heavy clays, ground limestone shall be spread to raise the pH to 6.5. If the soil must be fertilized before results of a soil test can be obtained to determine fertilizer needs, apply commercial fertilizer at 20 lbs. of 5-10-10 (or equivalent) and mix into the top 3 inches of soil with the required lime for every 1,000 square feet. Soil should be moist prior to sodding. Arrange for temporary storage of sod to keep it shaded and cool.

Sod Installation

1. For the operation of laying, tamping, and irrigating for any areas, sod shall be completed within eight hours. During periods of excessively high temperature, the soil shall be lightly moistened immediately prior to laying the sod.

2. The first row of sod shall be laid in a straight line with subsequent rows placed parallel to, and tightly wedged against, each other. Lateral joints shall be staggered to promote more uniform growth and strength. Ensure that sod is not stretched or overlapped and that all joints are butted tight in order to prevent voids which would cause air drying of the roots. On sloping areas where erosion may be a problem, sod shall be laid with the long edges parallel to the contour and with staggered joints.

3. Secure the sod by tamping and pegging, or other approved methods. As sodding is completed in any one section, the entire area shall be rolled or tamped to ensure solid contact of roots with the soil surface.

4. Sod shall be watered immediately after rolling or tamping until the underside of the new sod pad and soil surface below the sod are thoroughly wet. Keep sod moist for at least two weeks.

Sod Maintenance

1. In the absence of adequate rainfall, watering shall be performed daily, or as often as deemed necessary by the inspector, during the first week and in sufficient quantities to maintain moist soil to a depth of 4 inches. Watering should be done in the morning. Avoid excessive watering during applications.

2. After the first week, sod shall be watered as necessary to maintain adequate moisture and ensure establishment.

3. The first mowing should not be attempted until sod is firmly rooted. No more than 1/3 of the grass leaf shall be removed by the initial cutting or subsequent cuttings. Grass height shall be maintained between 2 and 3 inches unless otherwise specified. Avoid heavy mowing equipment for several weeks to prevent rutting.

4. If the soil must be fertilized before results of a soil test can be obtained to determine fertilizer needs, apply fertilizer three to four weeks after sodding, at a rate of 1 pound nitrogen/1,000 sq.ft. Use a complete fertilizer with a 2-1-1 ratio.

5. Weed Control: Target herbicides for weeds present. Consult current Cornell Pest Control Recommendations for Commercial Turfgrass Management or consult the local office of Cornell Cooperative Extension.

6. Disease Control: Consult the local office of the Cornell Cooperative Extension.

Additional References

1. Home Lawns, Establishment and Maintenance, CCE Information Bulletin 185, Revised November 1994. Cornell University, Ithaca, NY.

2. Installing a Sod Lawn. CCE Suffolk County, NY. Thomas Kowalsick February 1994, Revised January 1999. www.cce.cornell.edu/counties/suffolk/grownet

STANDARD AND SPECIFICATIONS FOR STRAW BALE DIKE

Definition

A temporary barrier of straw, or similar material, used to intercept sediment laden runoff from small drainage areas of disturbed soil.

Purpose

The purpose of a bale dike is to reduce runoff velocity and effect deposition of the transported sediment load. Straw bale dikes have an estimated design life of three (3) months.

Conditions Where Practice Applies

The straw bale dike is used where:

1. No other practice is feasible.
2. There is no concentration of water in a channel or other drainage way above the barrier.
3. Erosion would occur in the form of sheet erosion.
4. Length of slope above the straw bale dike does not exceed these limits.

Constructed Slope	Percent Slope	Slope Length (ft.)
2:1	50	25
3:1	33	50
4:1	25	75

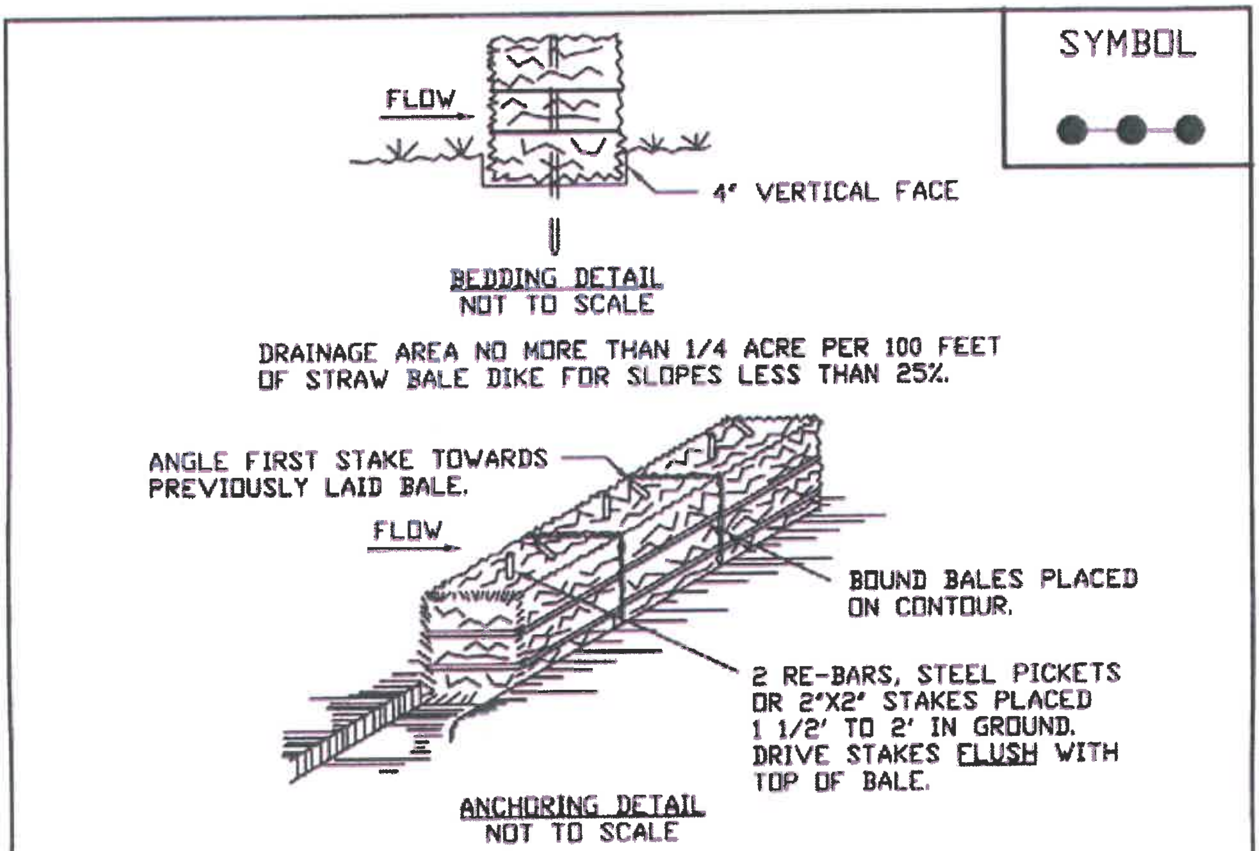
Where slope gradient changes through the drainage area, steepness refers to the steepest slope section contributing to the straw bale dike.

The practice may also be used for a single family lot if the slope is less than 15 percent. The contributing drainage areas in this instance shall be less than one quarter of an acre per 100 feet of fence and the length of slope above the dike shall be less than 200 feet.

Design Criteria

The above table is adequate, in general, for a one-inch rainfall event. Larger storms could cause failure of this practice. Use of this practice in sensitive areas for longer than one month should be specifically designed to store expected runoff. All bales shall be placed on the contour with cut edge of bale adhering to the ground. See Figure 5A.7 on page 5A.18 or details.

Figure 5A.7
Straw Bale Dike



CONSTRUCTION SPECIFICATIONS

1. BALES SHALL BE PLACED AT THE TOE OF A SLOPE OR ON THE CONTOUR AND IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES.
2. EACH BALE SHALL BE EMBEDDED IN THE SOIL A MINIMUM OF (4) INCHES, AND PLACED SO THE BINDINGS ARE HORIZONTAL.
3. BALES SHALL BE SECURELY ANCHORED IN PLACE BY EITHER TWO STAKES OR RE-BARS DRIVEN THROUGH THE BALE. THE FIRST STAKE IN EACH BALE SHALL BE DRIVEN TOWARD THE PREVIOUSLY LAID BALE AT AN ANGLE TO FORCE THE BALES TOGETHER. STAKES SHALL BE DRIVEN FLUSH WITH THE BALE.
4. INSPECTION SHALL BE FREQUENT AND REPAIR REPLACEMENT SHALL BE MADE PROMTLY AS NEEDED.
5. BALES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULLNESS SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS, NEW YORK STATE DEPARTMENT OF TRANSPORTATION, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE	STRAW BALE DIKE

STANDARD AND SPECIFICATIONS FOR SILT FENCE

Definition

A temporary barrier of geotextile fabric installed on the contours across a slope used to intercept sediment laden runoff from small drainage areas of disturbed soil.

Purpose

The purpose of a silt fence is to reduce runoff velocity and effect deposition of transported sediment load. Limits imposed by ultraviolet stability of the fabric will dictate the maximum period the silt fence may be used (approximately one year).

Conditions Where Practice Applies

A silt fence may be used subject to the following conditions:

1. Maximum allowable slope lengths contributing runoff to a silt fence placed on a slope are:

Slope Steepness	Maximum Length (ft.)
2:1	25
3:1	50
4:1	75
5:1 or flatter	100

2. Maximum drainage area for overland flow to a silt fence shall not exceed ¼ acre per 100 feet of fence, with maximum ponding depth of 1.5 feet behind the fence; and

3. Erosion would occur in the form of sheet erosion; and

4. There is no concentration of water flowing to the barrier.

Design Criteria

Design computations are not required for installations of 1 month or less. Longer installation periods should be designed for expected runoff. All silt fences shall be placed as close to the areas as possible, but at least 10 feet from the toe of a slope to allow for maintenance and roll down. The area beyond the fence must be undisturbed or stabilized.

Sensitive areas to be protected by silt fence may need to be reinforced by using heavy wire fencing for added support to prevent collapse.

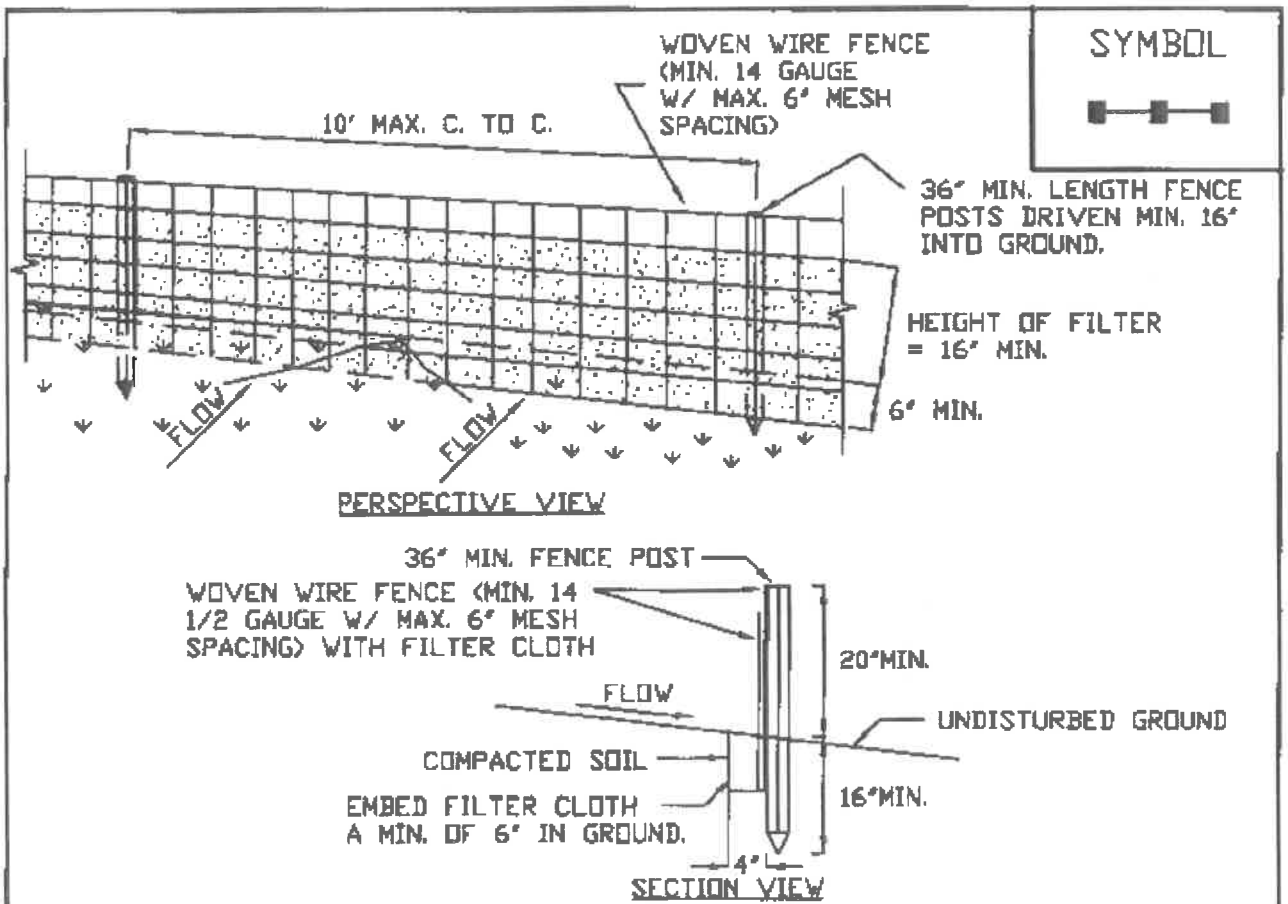
Where ends of filter cloth come together, they shall be overlapped, folded and stapled to prevent sediment bypass. A detail of the silt fence shall be shown on the plan. See Figure 5A.8 on page 5A.21 for details.

Criteria for Silt Fence Materials

1. Silt Fence Fabric: The fabric shall meet the following specifications unless otherwise approved by the appropriate erosion and sediment control plan approval authority. Such approval shall not constitute statewide acceptance.

Fabric Properties	Minimum Acceptable Value	Test Method
Grab Tensile Strength (lbs)	90	ASTM D1682
Elongation at Failure (%)	50	ASTM D1682

Figure 5A.8
Silt Fence



CONSTRUCTION SPECIFICATIONS

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. POSTS SHALL BE STEEL EITHER "T" OR "U" TYPE OR HARDWOOD.
2. FILTER CLOTH TO BE TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION. FENCE SHALL BE WOVEN WIRE, 6" MAXIMUM MESH OPENING.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVER-LAPPED BY SIX INCHES AND FOLDED. FILTER CLOTH SHALL BE EITHER FILTER X, MIRAFI 100X, STABILINKA T140N, OR APPROVED EQUIVALENT.
4. PREFABRICATED UNITS SHALL BE GEOFAB, ENVIROFENCE, OR APPROVED EQUIVALENT.
5. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS, NEW YORK STATE DEPARTMENT OF TRANSPORTATION, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE	SILT FENCE

STANDARD AND SPECIFICATIONS FOR CHECK DAM

Definition

Small barriers or dams constructed of stone, bagged sand or gravel, or other durable material across a drainage way.

Purpose

To reduce erosion in a drainage channel by restricting the velocity of flow in the channel.

Condition Where Practice Applies

This practice is used as a temporary or emergency measure to limit erosion by reducing velocities in small open channels that are degrading or subject to erosion and where permanent stabilization is impractical due to short period of usefulness and time constraints of construction.

Design Criteria

Drainage Area: Maximum drainage area above the check dam shall not exceed two (2) acres.

Height: Not greater than 2 feet. Center shall be maintained 9 inches lower than abutments at natural ground elevation.

Side Slopes: Shall be 2:1 or flatter.

Spacing: The check dams shall be spaced as necessary in the channel so that the crest of the downstream dam is at the elevation of the toe of the upstream dam. This spacing is equal to the height of the check dam divided by the channel slope.

Therefore:

$$S = h/s$$

Where:

S = spacing interval (ft.)
h = height of check dam (ft.)
s = channel slope (ft./ft.)

Example:

For a channel with a 4% slope and 2 ft. high stone check dams, they are spaced as follows:

$$S = \frac{2\text{ ft.}}{.04\text{ ft/ft.}} = 50\text{ ft.}$$

Stone size: Use a well graded stone matrix 2 to 9 inches in size (NYS – DOT Light Stone Fill meets these requirements).

The overflow of the check dams will be stabilized to resist erosion that might be caused by the check dam. See Figure 5A.9 on page 5A.24 for details.

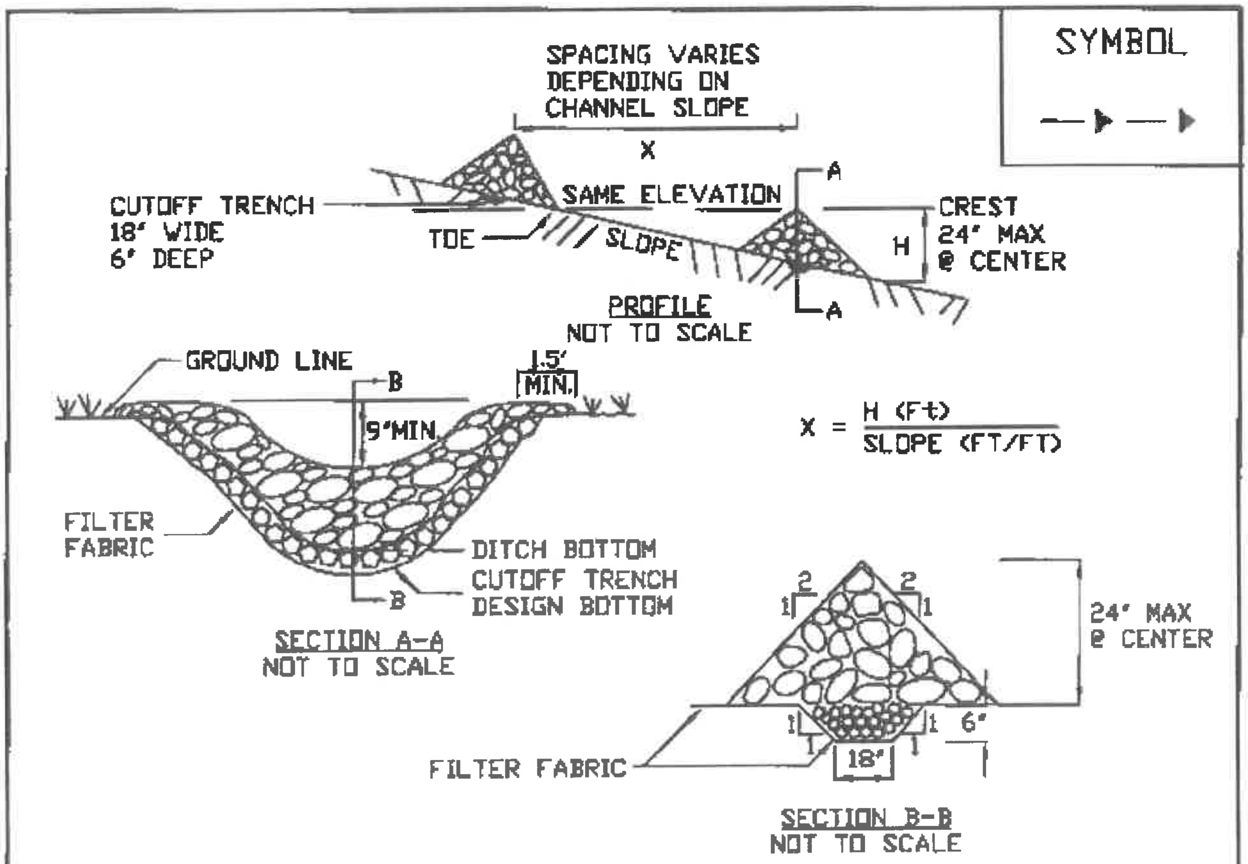
Check dams should be anchored in the channel by a cutoff trench 1.5 ft. wide and 0.5 ft. deep and lined with filter fabric to prevent soil migration.

Maintenance

The check dams should be inspected after each runoff event. Correct all damage immediately. If significant erosion has occurred between structures, a liner of stone or other suitable material should be installed in that portion of the channel.

Remove sediment accumulated behind the dam as needed to allow channel to drain through the stone check dam and prevent large flows from carrying sediment over the dam. Replace stones as needed to maintain the design cross section of the structures.

Figure 5A.9
Check Dam



CONSTRUCTION SPECIFICATIONS

1. STONE WILL BE PLACED ON A FILTER FABRIC FOUNDATION TO THE LINES, GRADES AND LOCATIONS SHOWN IN THE PLAN.
2. SET SPACING OF CHECK DAMS TO ASSUME THAT THE ELEVATIONS OF THE CREST OF THE DOWNSTREAM DAM IS AT THE SAME ELEVATION OF THE TOE OF THE UPSTREAM DAM.
3. EXTEND THE STONE A MINIMUM OF 1.5 FEET BEYOND THE DITCH BANKS TO PREVENT CUTTING AROUND THE DAM.
4. PROTECT THE CHANNEL DOWNSTREAM OF THE LOWEST CHECK DAM FROM SCOUR AND EROSION WITH STONE OR LINER AS APPROPRIATE.
5. ENSURE THAT CHANNEL APPURTENANCES SUCH AS CULVERT ENTRANCES BELOW CHECK DAMS ARE NOT SUBJECT TO DAMAGE OR BLOCKAGE FROM DISPLACED STONE.

MAXIMUM DRAINAGE AREA 2 ACRES.

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS, NEW YORK STATE DEPARTMENT OF TRANSPORTATION, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE	CHECK DAM

STANDARD AND SPECIFICATIONS FOR STORM DRAIN INLET PROTECTION

Definition

A temporary, somewhat permeable barrier, installed around inlets in the form of a fence, berm or excavation around an opening, trapping water and thereby reducing the sediment content of sediment laden water by settling.

Purpose

To prevent heavily sediment laden water from entering a storm drain system through inlets.

Conditions Where Practice Applies

This practice shall be used where the drainage area to an inlet is disturbed, it is not possible to temporarily divert the storm drain outfall into a trapping device, and watertight blocking of inlets is not advisable. **It is not to be used in place of sediment trapping devices.** This may be used in conjunction with storm drain diversion to help prevent siltation of pipes installed with low slope angle.

Types of Storm Drain Inlet Practices

There are four (4) specific types of storm drain inlet protection practices that vary according to their function, location, drainage area, and availability of materials:

I. Excavated Drop Inlet Protection
II. Fabric Drop Inlet Protection
III. Stone & Block Drop Inlet Protection
IV. Curb Drop Inlet Protection

Design Criteria

Drainage Area – The drainage area for storm drain inlets shall not exceed one acre. The crest elevations of these practices shall provide storage and minimize bypass flow.

Type I – Excavated Drop Inlet Protection

See details for Excavated Drop Inlet Protection in Figure 5A.11 on page 5A.29

Limit the drainage area to the inlet device to 1 acre. Excavated side slopes shall be no steeper than 2:1. The minimum depth shall be 1 foot and the maximum depth 2 feet as measured from the crest of the inlet structure. Shape the excavated basin to fit conditions with the longest dimension oriented toward the longest inflow area to provide maximum trap efficiency. The capacity of the excavated basin should be established to contain 900 cubic feet per acre of disturbed area. Weep holes, protected by fabric and stone, should be provided for draining the temporary pool.

Inspect and clean the excavated basin after every storm. Sediment should be removed when 50 percent of the storage volume is achieved This material should be incorporated into the site in a stabilized manner.

Type II – Fabric Drop Inlet Protection

See Figure 5A.12 for details on Filter Fabric Drop Inlet Protection on page 5A.30.

Limit the drainage area to 1 acre per inlet device. Land area slope immediately surrounding this device should not exceed 1 percent. The maximum height of the fabric above the inlet crest shall not exceed 1.5 feet unless reinforced.

The top of the barrier should be maintained to allow overflow to drop into the drop inlet and not bypass the inlet to unprotected lower areas. Support stakes for fabric shall be a minimum of 3 feet long, spaced a maximum 3 feet apart. They should be driven close to the inlet so any overflow drops into the inlet and not on the unprotected soil. Improved performance and sediment storage volume can be obtained by excavating the area.

Inspect the fabric barrier after each rain event and make repairs as needed. Remove sediment from the pool area as necessary with care not to undercut or damage the filter fabric. Upon stabilization of the drainage area, remove all materials and unstable sediment and dispose of properly. Bring the adjacent area of the drop inlet to grade, smooth and compact and stabilize in the appropriate manner to the site.

If straw bales are used in lieu of filter fabric, they should be placed tight with the cut edge adhering to the ground at least 3 inches below the elevation of the drop inlet. Two anchor stakes per bale shall be driven flush to bale surface. Straw bales will be replaced every 4 months until the area is stabilized.

Type III – Stone and Block Drop Inlet Protection

See Figure 5A.13 for details on Stone and Block Drop Inlet Protection on page 5A.31.

Limit the drainage area to 1 acre at the drop inlet. The stone barrier should have a minimum height of 1 foot and a maximum height of 2 feet. Do not use mortar. The height should be limited to prevent excess ponding and bypass flow.

Recess the first course of blocks at least 2 inches below the crest opening of the storm drain for lateral support. Subsequent courses can be supported laterally if needed by placing a 2x4 inch wood stud through the block openings perpendicular to the course. The bottom row should have a few blocks oriented so flow can drain through the block to dewater the basin area.

The stone should be placed just below the top of the blocks on slopes of 2:1 or flatter. Place hardware cloth of wire mesh with ½ inch openings over all block openings to hold stone in place.

As an optional design, the concrete blocks may be omitted and the entire structure constructed of stone, ringing the outlet ("doughnut"). The stone should be kept at a 3:1 slope toward the inlet to keep it from being washed into the inlet. A level area 1 foot wide and four inches below the crest will further prevent wash. Stone on the slope toward the inlet should be at least 3 inches in size for stability and 1 inch or smaller away from the inlet to control flow rate. The elevation of the top of the stone crest must be maintained 6 inches lower than the ground elevation down slope from the inlet to ensure that all storm flows pass over the stone into the storm drain and not past the structure. Temporary diking should be used as necessary to prevent bypass flow.

The barrier should be inspected after each rain event and repairs made where needed. Remove sediment as necessary to provide for accurate storage volume for subsequent rains. Upon stabilization of contributing drainage area, remove all materials and any unstable soil and dispose of properly.

Bring the disturbed area to proper grade, smooth, compact and stabilized in a manner appropriate to the site.

Type IV – Curb Drop Inlet Protection

See Figure 5A. 14 for details on Curb Drop Inlet Protection on page 5A.32.

The drainage area should be limited to 1 acre at the drop inlet. The wire mesh must be of sufficient strength to support the filter fabric and stone with the water fully impounded against it. Stone is to be 2 inches in size and clean. The filter fabric must be of a type approved for this purpose with an equivalent opening size (EOS) of 40-85. The protective structure will be constructed to extend beyond the inlet 2 feet in both directions. Assure that storm flow does not bypass the inlet by installing temporary dikes (such as sand bags) directing flow into the inlet. Make sure that the overflow weir is stable. Traffic safety shall be integrated with the use of this practice.

The structure should be inspected after every storm event. Any sediment should be removed and disposed of on the site. Any stone missing should be replaced. Check materials for proper anchorage and secure as necessary.

STANDARD AND SPECIFICATIONS FOR SEDIMENT TRAP

Definition

A temporary sediment control device formed by excavation and/or embankment to intercept sediment laden runoff and retain the sediment.

Purpose

The purpose of the structure is to intercept sediment-laden runoff and trap the sediment in order to protect drainage ways, properties, and rights-of-way below the sediment trap from sedimentation.

Conditions Where Practice Applies

A sediment trap is usually installed in a drainage way, at a storm drain inlet, or other points of collection from a disturbed area.

Sediment traps should be used to artificially break up the natural drainage area into smaller sections where a larger device (sediment basin) would be less effective.

Design Criteria

If any of the design criteria presented here cannot be met, see Standard and Specification for Sediment Basin on page 5A.49.

Drainage Area

The drainage area for sediment traps shall be in accordance with the specific type of sediment trap used (Type I through V).

Location

Sediment traps shall be located so that they can be installed prior to grading or filling in the drainage area they are to protect. Traps must not be located any closer than 20 feet from a proposed building foundation if the trap is to function during building construction. Locate traps to obtain maximum storage benefit from the terrain and for ease of cleanout and disposal of the trapped sediment.

Trap Size

The volume of a sediment trap as measured at the elevation of the crest of the outlet shall be at least 3,600 cubic feet per acre of drainage area. The volume of a constructed trap shall be calculated using standard mathematical procedures. The volume of a natural sediment trap may be approximated by the equation: Volume (cu.ft.) = 0.4 x surface area (sq.ft.) x maximum depth (ft.).

Trap Cleanout

Sediment shall be removed and the trap restored to the original dimensions when the sediment has accumulated to ½ of the design depth of the trap. Sediment removed from the trap shall be deposited in a protected area and in such a manner that it will not erode.

Embankment

All embankments for sediment traps shall not exceed five (5) feet in height as measured at the low point of the original ground along the centerline of the embankment. Embankments shall have a minimum four (4) foot wide top and side slopes of 2:1 or flatter. The embankment shall be compacted by traversing with equipment while it is being constructed. The embankment shall be stabilized with seed and mulch as soon as it is completed

The elevation of the top of any dike directing water to any sediment trap will equal or exceed the maximum height of the outlet structure along the entire length of the trap.

Excavation

All excavation operations shall be carried out in such a manner that erosion and water pollution shall be minimal. Excavated portions of sediment traps shall have 1:1 or flatter slopes.

Outlet

The outlet shall be designed, constructed, and maintained in such a manner that sediment does not leave the trap and that erosion at or below the outlet does not occur.

Sediment traps must outlet onto stabilized (preferable undisturbed) ground, into a watercourse, stabilized channel, or into a storm drain system. Distance between inlet and outlet should be maximized to the longest length practicable.

Trap Details Needed on Erosion and Sediment Control Plans

Each trap shall be delineated on the plans in such a manner that it will not be confused with any other features. Each trap on a plan shall indicate all the information necessary to properly construct and maintain the structure. If the drawings are such that this information cannot be delineated on the drawings, then a table shall be developed. If a table is developed, then each trap on a plan shall have a number and the numbers shall be consecutive.

The following information shall be shown for each trap in a summary table format on the plans.

1. Trap number
2. Type of trap
3. Drainage area
4. Storage required
5. Storage provided (if applicable)
6. Outlet length or pipe sizes
7. Storage depth below outlet or cleanout elevation
8. Embankment height and elevation (if applicable)

Type of Sediment Traps

There are five (5) specific types of sediment traps which vary according to their function, location, or drainage area.

I. Pipe Outlet Sediment Trap
II. Grass Outlet Sediment Trap
III. Catch Basin Sediment Trap
IV. Stone Outlet Sediment Trap
V. Riprap Outlet Sediment Trap

I. Pipe Outlet Sediment Trap

A Pipe Outlet Sediment Trap consists of a trap formed by embankment or excavation. The outlet for the trap is through a perforated riser and a pipe through the embankment. The outlet pipe and riser shall be made of steel, corrugated metal or other suitable material. The top of the embankment shall be at least 1 ½ feet above the crest of the riser. The top 2/3 of the riser shall be perforated with one (1) inch nominal diameter holes or slits spaced six (6) inches vertically and horizontally placed in the concave portion of the corrugated pipe.

No holes or slits will be allowed within six (6) inches of the top of the horizontal barrel. All pipe connections shall be watertight. The riser shall be wrapped with ½ to ¼ inch hardware cloth wire then wrapped with filter cloth with a sieve size between #40-80 and secured with strapping or connecting band at the top and bottom of the cloth. The cloth shall cover an area at least six (6) inches above the highest hole and six (6) inches below the lowest hole. The top of the riser pipe shall not be covered with filter cloth. The riser shall have a base with sufficient weight to prevent flotation of the riser. Two approved bases are:

1. A concrete base 12 in. thick with the riser embedded 9 in. into the concrete base, or

2. One quarter inch, minimum, thick steel plate attached to the riser by a continuous weld around the circumference of the riser to form a watertight connection. The plate shall have 2.5 feet of stone, gravel, or earth placed on it to prevent flotation. In either case, each side of the square base measurement shall be the riser diameter plus 24 inches.

Pipe outlet sediment traps shall be limited to a five (5) acre maximum drainage area. Pipe outlet sediment traps may be interchangeable in the field with stone outlet or riprap sediment traps provided that these sediment traps are constructed in accordance with the detail and specifications for that trap.

Select pipe diameter from the following table:

Minimum Sizes

Barrel Diameter[1] (in.)	Riser Diameter[1] (in.)	Maximum Drainage Area (ac.)
12	15	1
15	18	2
18	21	3
21	24	4
21	27	5

[1] Barrel diameter may be same size as riser diameter.

See details for Pipe Outlet Sediment Trap ST-I in Figure 5A.16 (1) and 5A.16 (2) on pages 5A.38 and 5A.39.

II. Grass Outlet Sediment Trap

A Grass Outlet Sediment Trap consists of a trap formed by excavating the earth to create a holding area. The trap has a discharge point over natural existing grass. The outlet crest width (feet) shall be equal to four (4) times the drainage area (acres) with a minimum width of four (4) feet. The outlet shall be free of any restrictions to flow. The outlet lip must remain undisturbed and level. The volume of this trap shall be computed at the elevation of the crest of the outlet. Grass outlet sediment traps shall be limited to a five (5) acre maximum drainage area.

STANDARD AND SPECIFICATIONS FOR SEDIMENT BASIN

Definition

A temporary barrier or dam constructed across a drainage way or at other suitable locations to intercept sediment laden runoff and to trap and retain the sediment.

Scope

This standard applies to the installation of temporary sediment basins on sites where: (a) failure of the structure would not result in loss of life, damage to homes or buildings, or interruption of use or service of public roads or utilities; (b) the drainage area does not exceed 100 acres; and (c) the basin is to be removed within 36 months after the beginning of construction of the basin.

Permanent (to function more than 36 months) sediment basins, or temporary basins exceeding the classification requirements for class 1 and 2, or structures that temporarily function as a sediment basin but are intended for use as a permanent pool shall be classified as permanent structures and shall conform to criteria appropriate for permanent structures. These structures shall be designed and constructed to conform to NRCS Standard And Specification No. 378 for Ponds in the National Handbook of Conservation Practices and the New York State Department of Environmental Conservation, "Guidelines for the Design of Dams." The total volume of permanent sediment basins shall equal to or exceed the capacity requirements for temporary basins contained herein.

Classification of Temporary Sediment Basins

For the purpose of this standard, temporary sediment basins are classified as follows:

Class	1	2
Max. Drainage Area (acres)	100	100
Max. Height[1] of Dam (ft.)	10	15
Min. Embankment Top Width	8	10
Embankment Side Slopes	2:1 or Flatter	2 ½:1 or Flatter
Anti-Seep Control Required	Yes	Yes

[1] Height is measured from the low point of original ground at the downstream toe of the dam to the top of the dam.

Purpose

The purpose of a sediment basin is to intercept sediment-laden runoff and reduce the amount of sediment leaving the disturbed area in order to protect drainage ways, properties, and rights-of-way below the sediment basin.

Conditions Where Practice Applies

A sediment basin is appropriate where physical site conditions or land ownership restrictions preclude the installation of other erosion control measures to adequately control runoff, erosion, and sedimentation. However, it is strongly encouraged to use a basin in addition to other ESC measures if practicable. It may be used below construction operations which expose critical areas to soil erosion. The basin shall be maintained until the disturbed area is protected against erosion by permanent stabilization.

Design Criteria

Compliance with Laws and Regulations

Design and construction shall comply with state and local laws, ordinances, rules and regulations, including permits.

Location

The sediment basin should be located to obtain the maximum storage benefit from the terrain and for ease of cleanout of the trapped sediment. It should be located to minimize interference with construction activities and

STANDARD AND SPECIFICATIONS FOR DUST CONTROL

Definition

The control of dust resulting from land-disturbing activities.

Purpose

To prevent surface and air movement of dust from disturbed soil surfaces that may cause off-site damage, health hazards, and traffic safety problems.

Conditions Where Practice Applies

On construction roads, access points, and other disturbed areas subject to surface dust movement and dust blowing where off-site damage may occur if dust is not controlled.

Design Criteria

Construction operations should be scheduled to minimize the amount of area disturbed at one time. Buffer areas of vegetation should be left where practical. Temporary or permanent stabilization measures shall be installed. No specific design criteria is given; see construction specifications below for common methods of dust control.

Water quality must be considered when materials are selected for dust control. Where there is a potential for the material to wash off to a stream, ingredient information must be provided to the local permitting authority.

Construction Specifications

A. **Non-driving Areas** – These areas use products and materials applied or placed on soil surfaces to prevent airborne migration of soil particles.

Vegetative Cover – For disturbed areas not subject to traffic, vegetation provides the most practical method of dust control (see Section 3).

Mulch (including gravel mulch) – Mulch offers a fast effective means of controlling dust. This can also include rolled erosion control blankets.

Spray adhesives – These are products generally composed of polymers in a liquid or solid form that are mixed with water to form an emulsion that is sprayed on the soil surface with typical hydroseeding equipment. The mixing ratios and application rates will be in accordance with the manufacturer's recommendations for the specific soils on the site. In no case should the application of these adhesives be made on wet soils or if there is a probability of precipitation within 48 hours of its proposed use. Material Safety Data Sheets will be provided to all applicators and others working with the material.

B. **Driving Areas** – These areas utilize water, polymer emulsions, and barriers to prevent dust movement from the traffic surface into the air.

Sprinkling – The site may be sprayed with water until the surface is wet. This is especially effective on haul roads and access routes.

Polymer Additives – These polymers are mixed with water and applied to the driving surface by a water truck with a gravity feed drip bar, spray bar or automated distributor truck. The mixing ratios and application rates will be in accordance with the manufacturer's recommendations. Incorporation of the emulsion into the soil will be done to the appropriate depth based on expected traffic. Compaction after incorporation will be by vibratory roller to a minimum of 95%. The prepared surface shall be moist and no application of the polymer will be made if there is a probability of precipitation within 48 hours of its proposed use. Material Safety Data Sheets will be provided to all applicators working with the material.

Barriers – Woven geotextiles can be placed on the driving surface to effectively reduce dust throw and particle migration on haul roads. Stone can also be used for construction roads for effective dust control.

Windbreak – A silt fence or similar barrier can control air currents at intervals equal to ten times the barrier height. Preserve existing wind barrier vegetation as much as practical.

STANDARD AND SPECIFICATIONS FOR STABILIZED CONSTRUCTION ENTRANCE

Definition

A stabilized pad of aggregate underlain with geotextile located at any point where traffic will be entering or leaving a construction site to or from a public right-of-way, street, alley, sidewalk, or parking area.

Purpose

The purpose of stabilized construction entrance is to reduce or eliminate the tracking of sediment onto public rights-of-way or streets.

Conditions Where Practice Applies

A stabilized construction entrance shall be used at all points of construction ingress and egress.

Design Criteria

See Figure 5A.35 on page 5A.76 for details.

Aggregate Size: Use a matrix of 1-4 inch stone, or reclaimed or recycled concrete equivalent.

Thickness: Not less than six (6) inches.

Width: 12-foot minimum but not less than the full width of points where ingress or egress occurs. 24-foot minimum if there is only one access to the site.

Length: As required, but not less than 50 feet (except on a single residence lot where a 30 foot minimum would apply).

Geotextile: To be placed over the entire area to be covered with aggregate. Filter cloth will not be required on a single-family residence lot. Piping of surface water under entrance shall be provided as required. If piping is impossible, a mountable berm with 5:1 slopes will be permitted.

Criteria for Geotextile

The geotextile shall be woven or nonwoven fabric consisting only of continuous chain polymeric filaments or yarns of polyester. The fabric shall be inert to commonly encountered chemicals, hydro-carbons, mildew, rot resistant, and conform to the fabric properties as shown:

Fabric Properties[3]	Light Duty[1] Roads Grade Subgrade	Heavy Duty[2] Haul Roads Rough Graded	Test Method
Grab Tensile Strength (lbs)	200	220	ASTM D1682
Elongation at Failure (%)	50	60	ASTM D1682
Mullen Brust Strength (lbs)	190	430	ASTM D3786
Puncture Strength (lbs)	40	125	ASTM D751 modified
Equivalent Opening Size	40-80	40-80	US Std Sieve CW-02215
Aggregate Depth	6	10	--

[1]Light Duty Road: Area sites that have been graded to subgrade and where most travel would be single axle vehicles and an occasional multi-axle truck. Acceptable materials are Trevira Spunbond 1115, Mirafi 100X, Typar 3401, or equivalent.

[2]Heavy Duty Road: Area sites with only rough grading, and where most travel would be multi-axle vehicles. Acceptable materials are Trevira Spunbond 1135, Mirafi 600X, or equivalent.

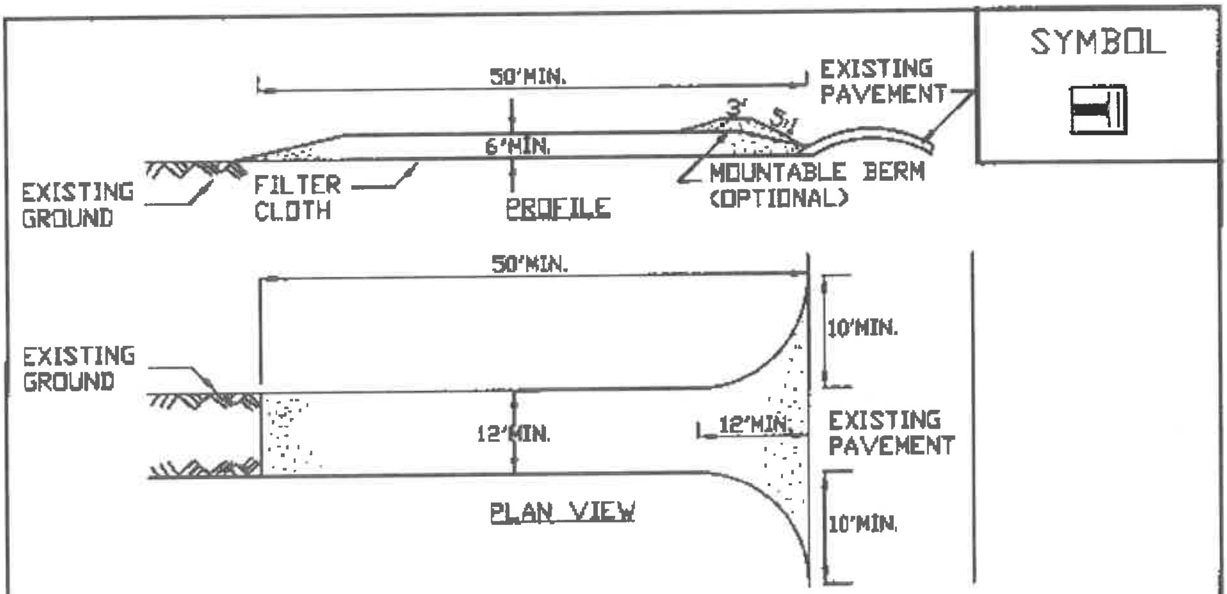
[3]Fabrics not meeting these specifications may be used only when design procedure and supporting documentation are supplied to determine aggregate depth and fabric strength.

Maintenance

The entrance shall be maintained in a condition which will prevent tracking of sediment onto public rights-of-way or streets. This may require periodic top dressing with additional aggregate. All sediment spilled, dropped, or washed onto public rights-of-way must be removed immediately.

When necessary, wheels must be cleaned to remove sediment prior to entrance onto public rights-of-way. When washing is required, it shall be done on an area stabilized with aggregate, which drains into an approved sediment-trapping device. All sediment shall be prevented from entering storm drains, ditches, or watercourses.

Figure 5A.35
Stabilized Construction Entrance



CONSTRUCTION SPECIFICATIONS

1. STONE SIZE - USE 1-4 INCH STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH - NOT LESS THAN 50 FEET (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY).
3. THICKNESS - NOT LESS THAN SIX (6) INCHES.
4. WIDTH - TWELVE (12) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. TWENTY-FOUR (24) FOOT IF SINGLE ENTRANCE TO SITE.
5. GEOTEXTILE - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY, ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACTED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON A AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS, NEW YORK STATE DEPARTMENT OF TRANSPORTATION, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE	STABILIZED CONSTRUCTION ENTRANCE

STANDARD AND SPECIFICATIONS FOR GRASSED WATERWAY

Definition

A natural or man-made channel of parabolic or trapezoidal cross-section that is below adjacent ground level and is stabilized by suitable vegetation. The flow channel is normally wide and shallow and conveys the runoff down the slope.

Purpose

The purpose of a grassed waterway is to convey runoff without causing damage by erosion.

Conditions Where Practice Applies

Grass waterways are used where added vegetative protection is needed to control erosion resulting from concentrated runoff.

Design Criteria

Capacity

The minimum capacity shall be that required to confine the peak rate of runoff expected from a 10-year frequency rainfall event or a higher frequency corresponding to the hazard involved. This requirement for confinement may be waived on slopes of less than one (1) percent where out-of-bank flow will not cause erosion or property damage.

Peak rates of runoff values used in determining the capacity requirements shall be computed by TR-55, Urban Hydrology for Small Watersheds, or other appropriate methods.
Where there is base flow, it shall be handled by a stone center, subsurface drain, or other suitable means since sustained wetness usually prevents adequate vegetative cover. The cross-sectional area of the stone center or subsurface drain size to be provided shall be determined by using a flow rate of 0.1 cfs/acre or by actual measurement of the maximum base flow.

Velocity

Please see Table 5B.1, Diversion Maximum Permissible Design Velocities, for seed, soil, and velocity variables.

Cross Section

The design water surface elevation of a grassed waterway receiving water from diversions or other tributary channels shall be equal to or less than the design water surface elevation in the diversion or other tributary channels.

The top width of parabolic waterways shall not exceed 30 feet and the bottom width of trapezoidal waterways shall not exceed 15 feet unless multiple or divided waterways, stone center, or other means are provided to control meandering of low flows.

Structural Measures

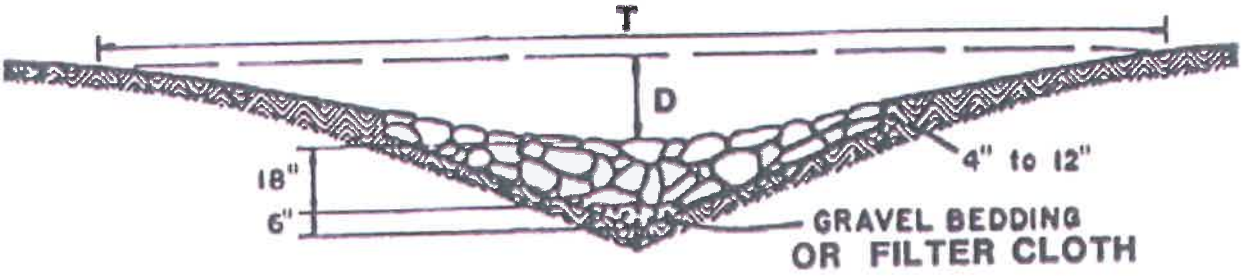
In cases where grade or erosion problems exist, special control measures may be needed such as lined waterways (5B.17), or grade stabilization measures (5B.31). Where needed, these measures will be supported by adequate design computations. For typical cross sections of waterways with riprap sections or stone centers, refer to Figure 5B.8 on page 5B.13.

The design procedures for parabolic and trapezoidal channels are available in the NRCS Engineering Field Handbook; Figure 5B.9 on page 5B.14 also provides a design chart for parabolic waterway.

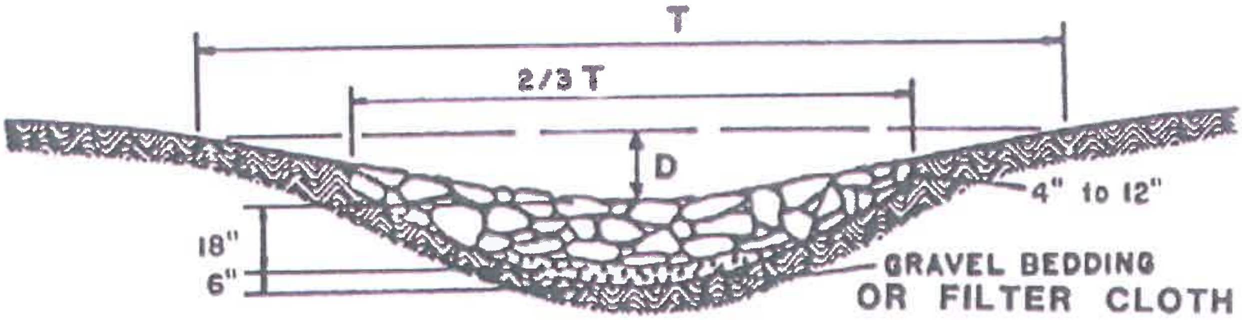
Outlets

Each waterway shall have a stable outlet. The outlet may be another waterway, a stabilized open channel, grade stabilization structure, etc. In all cases, the outlet must discharge in such a manner as not to cause erosion. Outlets shall be constructed and stabilized prior to the operation of the waterway.

Figure 5B.8
Typical Waterway Cross Sections



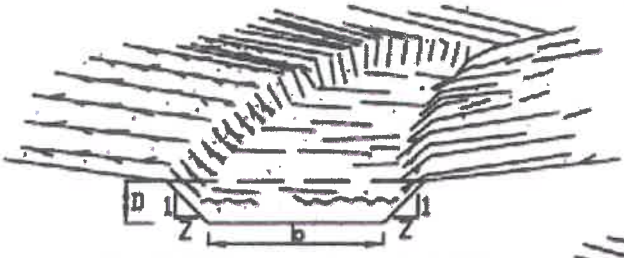
Waterway with stone center drain. "V"
section shaped by motor grader.



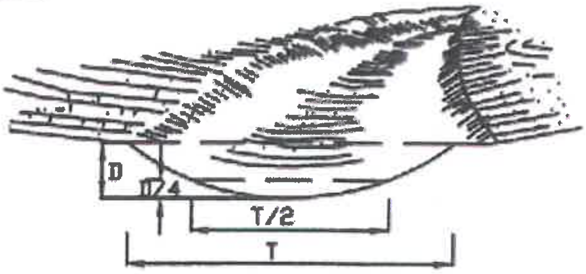
Waterway with stone center drain.
Rounded section shaped by bulldozer.

Figure 5B.10
Grassed Waterway

SYMBOL



TRAPEZIODAL CROSS SECTION



PARABOLIC CROSS SECTION

CONSTRUCTION SPECIFICATIONS

1. ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS, AND OTHER OBJECTIONABLE MATERIAL SHALL BE REMOVED AND DISPOSED OF SO AS NOT TO INTERFERE WITH THE PROPER FUNCTIONING OF THE WATERWAY.
2. THE WATERWAY SHALL BE EXCAVATED OR SHAPED TO LINE, GRADE, AND CROSS SECTION AS REQUIRED TO MEET THE CRITERIA SPECIFIED HEREIN, AND BE FREE OF BANK PROJECTIONS OR OTHER IRREGULARITIES WHICH WILL IMPEDE NORMAL FLOW.
3. FILLS SHALL BE COMPACTED AS NEEDED TO PREVENT UNEQUAL SETTLEMENT THAT WOULD CAUSE DAMAGE IN THE COMPLETE WATERWAY.
4. ALL EARTH REMOVED AND NOT NEEDED IN CONSTRUCTION SHALL BE SPREAD OR DISPOSED OF SO THAT IT WILL NOT INTERFERE WITH THE FUNCTIONING OF THE WATERWAY.
5. STABILIZATION SHALL BE DONE ACCORDING TO THE APPROPRIATE STANDARD AND SPECIFICATIONS FOR VEGETATIVE PRACTICES.
   A. FOR DESIGN VELOCITIES OF LESS THAN 3.5 FT. PER. SEC., SEEDING AND MULCHING MAY BE USED FOR THE ESTABLISHMENT OF THE VEGETATION. IT IS RECOMMENDED THAT, WHEN CONDITIONS PERMIT, TEMPORARY WATERWAYS OR OTHER MEANS SHOULD BE USED TO PREVENT WATER FROM ENTERING THE WATERWAY DURING THE ESTABLISHMENT OF THE VEGETATION.
   B. FOR DESIGN VELOCITIES OF MORE THAN 3.5 FT. PER. SEC., THE WATERWAY SHALL BE STABILIZED WITH SOD, WITH SEEDING PROTECTED BY JUTE OR EXCELSIOR MATTING OR WITH SEEDING AND MULCHING INCLUDING TEMPORARY DIVERSION OF THE WATER UNTIL THE VEGETATION IS ESTABLISHED.
   C. STRUCTURAL - VEGETATIVE PROTECTION
   SUBSURFACE DRAIN FOR BASE FLOW SHALL BE CONSTRUCTED AS SHOWN ON THE STANDARD DRAWING AND AS SPECIFIED IN THE STANDARD AND SPECIFICATIONS FOR SUBSURFACE DRAIN.

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS, NEW YORK STATE DEPARTMENT OF TRANSPORTATION, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE	GRASSED WATERWAY

STANDARD AND SPECIFICATIONS FOR LINED WATERWAY OR OUTLET

Definition

A waterway or outlet with a lining of concrete, stone, or other permanent material. The lined section extends up the side slopes to the designed depth. The earth above the permanent lining may be vegetated or otherwise protected.

Purpose

To provide for the disposal of concentrated runoff without damage from erosion or flooding, where grassed waterways would be inadequate due to high velocities.

Scope

This standard applies to waterways or outlets with linings of cast-in-place concrete, flagstone mortared in place, rock riprap, gabions, or similar permanent linings. It does not apply to irrigation ditch or canal linings, grassed waterways with stone centers or small lined sections that carry prolonged low flows, or to reinforced concrete channels. The maximum capacity of the waterway flowing at design depth shall not exceed 100 cubic feet per second.

Conditions Where Practice Applies

This practice applies where the following or similar conditions exist:

1. Concentrated runoff is such that a lining is required to control erosion.
2. Steep grades, wetness, prolonged base flow, seepage, or piping that would cause erosion.
3. The location is such that damage from use by people or animals precludes use of vegetated waterways or outlets.
4. Soils are highly erosive or other soil and climate conditions preclude using vegetation.
5. High value property or adjacent facilities warrant the extra cost to contain design runoff in a limited space.

Design Criteria

Capacity

1. The minimum capacity shall be adequate to carry the peak rate of runoff from a 10-year, 24-hour storm. Velocity shall be computed using Manning's equation with a coefficient of roughness "n" as follows:

Lined Material	"n"
Concrete (Type):	
Trowel Finish	0.015
Float Finish	0.019
Gunite	0.019
Flagstone	0.022
Riprap	Determine from Figure 5B.11 on page 5B.19
Gabion	0.030

2. Riprap gradation and filter (bedding) are generally designed in accordance with criteria set forth in the National Cooperative Highway Research Program Report 108, available from the University Microfilm International, 300 N. Ree Road, Ann Arbor, Michigan 48016, Publication No. PB-00839; or the Hydraulic Engineering Circular No. 11, prepared by the U.S. Bureau of Public Roads, available from Federal Highway Administration, 400 7th Street, S.W., Washington, D.C. 20590, HNG-31, or the procedure in the USDA-NRCS's Engineering Field Manual, Chapter 16.

Velocity

1. Maximum design velocity shall be as shown below. Except for short transition sections, flow with a channel gradient within the range of 0.7 to 1.3 of this