

APPENDIX A

**SEDIMENT CONTROL TREATMENTS
BLACK GORE CREEK I-70 CORRIDOR**

**SEDIMENT CONTROL TREATMENTS
BLACK GORE CREEK
Milepost 180 to 190
(Aerial photo base 2000 used for mileposts)**

WESTBOUND LANE (TRIBUTARY TO BLACK LAKES)

MP190.4 to 190.6 (West Tenmile)

- Pave shoulder to toe cut slope and install knee wall barrier
- Install series Bgrade sediment traps above culvert inlets

MP189.75 to 189.85

- Pave to crest of hillslope and install snow storage zone Type 7 barriers (WB189.8)
- Install 2 large sediment basins at 189.75 (WB189.75)

MP189.4 to 189.75

- Pave to toe cut slope and install knee wall barrier
- Provide snow storage zone (WB189.4)
- Prevent sediment transport to clean ephemeral tributaries bypassing culvert inlets at MP 189.4, 189.55, and 189.7
- Route all highway runoff from 189.55 to sediment basin at 189.75
- Install in series 4 Bgrade traps at 189.4

EASTBOUND LANE (TRIBUTARY TO BLACK LAKES)

MP189.6 to 189.9

- Pave to crest of hillslope and install snow storage zone Type 7 barriers and valley pan drain (EB189.7)
- Install 4 Bgrade traps at 189.65 (EB189.65)
- Install culvert rundown from Bgrade traps at 189.65 to 1 large sediment basin at US-6 ditch
- Install culvert rundown to US-6 1 large sediment basin at US-6 ditch (BGL2A)

MP189.3 to 189.6

- Install Type 4 barrier along crest of hillslope at truck rest area to reduce migration of sediment over the slope

VAIL PASS MAINTENANCE FACILITY AREA (TRIBUTARY TO BLACK LAKES)

- Lower height of the existing spoil pile, remove boulders, regrade and revegetate berm, pave and install sediment basin for sand shed area runoff (completed 2001)



- Remove sand dump deposits along wetlands, install topsoil berm, and revegetate (VPSSSANDBERM2)
- Design and install clean ephemeral tributary bypass channel - the ephemeral tributary behind the sand storage shed needs to be routed through a designed channel behind the restrooms and into the natural drainage channel at 189.1 to prevent contamination (VPSS2, VPSS3, VPSSCHANNEL1, WB189.25)
- Install 2 large sediment basin in series at 189.15 to 189.2 (WB189.15, WB189.2)
- The lowermost basin must include runoff from the entrance ramp median, so existing culvert outlet must be cut back to accommodate the basin
- Provide energy dissipation at the basin inlets (and side culvert inflow)

MP189.05 to 189.15

- Remove excess sand and pave shoulder to crest of hillslope above clean perennial tributary (WB189.1)
- Install snow storage zone/valley pan drain/Type 7 barrier extending beyond sign to 189.05 (WB189.05B, WB189.1C) to direct sheet flow from highway
- Install culvert rundown to 2 large sediment basins in series at 189.05 (WB189.05, WB189.05B)

MP 188.65 TO 189.0 (TRIBUTARY TO BLACK LAKES)

Westbound Lane

- Pave shoulder to toe slope and install knee wall barrier/valley pan drain (WB189.0, WB189.95B, WB188.8, WB188.8B, WB188.7)
- Install 2 large sediment basins in series at 188.65 (WB188.65, WB188.65B)
- Route median runoff at 188.75 to sediment basins at 188.65
- Route flows from 188.6 to basin at 188.65
- Bypass clean ephemeral tributaries at 188.75 and 188.95 (WB188.75, WB188.95)

Eastbound Lane

- Pave to crest of hillslope or toeslope and install snow storage zone Type 7 barriers 189.05 to 189.3 (EB188.9)
- Install valley pan drain to 2 large sediment basins at 189.05 with outlet control and culvert rundown (EB189.05)
- Pave to crest of hillslope or toeslope and install snow storage zone Type 7 barriers (EB188.9)
- Install valley pan drain to 6 Bgrade traps at 188.65
- Install culvert rundown to sediment basin at bike path 188.65 (EB188.7)

MP 188.55 TO 188.65 (TRIBUTARY TO BLACK LAKES)

Westbound Lane

- Pave shoulder to toe slope and install knee wall barrier/valley pan drain
- Route highway runoff to sediment basin at 188.65 (WB188.6), bypassing clean ephemeral tributary culvert at 188.6



Eastbound Lane

- Pave to crest of hillslope or toeslope and install snow storage zone Type 7 barriers (EB188.55)
- Install valley pan drain to inlet and route highway runoff to culvert rundown at 188.65 (EB188.6)

MP 188.35 TO 188.55 (TRIBUTARY TO BLACK LAKE WETLANDS)**Westbound Lane**

- Pave shoulder to toe slope and install knee wall barrier/valley pan drain (WB188.5)
- Install 3 large sediment basins in series at 188.35 (WB188.35, WB188.3D, WB 188.3)
- Bypass all existing cuvert inlets from 188.55 to 188.35 basins
- Pave shoulder and install vegetated berm from 188.25 to 188.4 (WB188.3C)
- No action on natural red sandstone depression/pond (WB188.3B)

Eastbound Lane

- Pave to crest of hillslope or toeslope and install snow storage zone Type 7 barriers/valley pan drain (EB188.55)
- Install 2 large sediment basins at 188.45 with rundown (EB188.45)

MP 188.0 TO 188.35**Westbound Lane**

- Pave shoulder to toe slope and install knee wall barrier/valley pan drain (WB188.2)
- Install 2 large sediment basins at 188.15 (WB188.15)
- Bypass clean ephemeral tributary at 188.2 and route highway runoff to basins/culvert at 188.15
- Regrade and bypass clean ephemeral tributary culvert at 188.05 (WB188.05, WB188.1) and route highway runoff to basins at 188.15 (from MP188)

Eastbound Lane

- Pave to crest of hillslope or toeslope and install snow storage zone Type 7 barriers (EB188.4)
- Install valley pan drain bypassing ephemeral tributaries at 188.2 and 188.3 to culvert rundown at 188.15 (EB188.15B)
- Install 3 large series sediment basins along bike path at 188.15 (EB188.2, EB188.15)

MP 187.8 TO 188.0**Westbound Lane**

- Pave shoulder to toe slope and install knee wall barrier/valley pan drain (WB188.0)
- Install 5 Bgrade traps at 187.8 (WB187.85)
- Connect trap overflow to EB sediment basin at 187.8



Eastbound Lane

- Pave to crest of hillslope or toeslope and install snow storage zone Type 7 barriers (EB187.9, EB188.0)
- Install valley pan drain to 5 Bgrade traps and culvert rundown at 187.8
- Install 1 large sediment basin at bike path 187.8 (EB187.85)

MP 187.45 TO 187.8**Westbound Lane**

- Pave shoulder to toe slope and install knee wall barrier/valley pan drain (WB187.5)
- Install 6 Bgrade traps followed by 1 large sediment basin in series at 187.45 (WB187.7B)

Eastbound Lane

- Pave to crest of hillslope or toeslope and install snow storage zone Type 7 barriers (EB187.6B, EB187.8)
- Install valley pan drain to 3 Bgrade traps and culvert rundown at 187.6 (EB187.6)
- Install 1 large sediment basin at bike path 187.6

MP 187.3 TO 187.45**Westbound Lane**

- Pave shoulder to toe slope and install knee wall barrier/valley pan drain
- Install 1 large sediment basin in at 187.35 (WB187.35)
- Connect basin outlet to EB culvert rundown at 187.25

Eastbound Lane

- Pave to crest of hillslope or toeslope and install snow storage zone Type 7 barriers (EB187.4)
- Install 3 large sediment basins in series at 187.3 to 187.35 (EB187.3)
- Install valley pan drain to new culvert rundown at 187.25 (EB187.25)

MP 187.0 TO 187.3**Westbound Lane**

- Pave shoulder to toe slope and install knee wall barrier/valley pan drain (WB187.2)
- Install 3 large sediment basins in series at 187.0 (WB187.05)
- Bypass existing cuvert inlets to 187.0 basins
- Connect basin outlet to new culvert rundown at 187.0

Eastbound Lane

- Pave to crest of hillslope or toeslope and install snow storage zone Type 7 barriers (EB187.2)
- Install 5 Bgrade traps and 1 large sediment basin at 187.0 (EB187)
- Install valley pan drain to new culvert rundown at 187.0 (EB187.05)



MP 186.7 TO 187.0**Westbound Lane**

- Pave shoulder to toe slope and install knee wall barrier/valley pan drain
- Install 8 Bgrade traps in series at 186.7
- Bypass existing culvert inlets to 186.7 basins
- Connect basin outlet to new culvert rundown at 186.7

Eastbound Lane

- Pave to crest of hillslope or toeslope and install snow storage zone Type 7 barriers
- Install 8 Bgrade traps with valley pan drain to culvert rundown at 186.7
- Install new culvert rundown at 186.85

MP 186.4 TO 186.7**Westbound Lane**

- Pave shoulder to toe slope and install knee wall barrier/valley pan drain (WB186.9)
- Install 8 Bgrade traps in series with drainage to existing culvert at 186.4 (WB186.6, WB186.6B)

Eastbound Lane

- Pave to crest of hillslope or toeslope and install snow storage zone Type 7 barriers (EB186.95/186.9B)
- Install barrier between bike path and I-70 for safety (EB186.9/186.5/186.55)
- Install 8 Bgrade traps and valley pan drain to new culvert rundown at 186.4 (EB186.85)

MP 186.1 TO 186.4**Westbound Lane**

- This area has major drainage problems – it appears that both EB and WB lanes are super-elevated towards the WB shoulder and runoff is directed hence. The drainage system should be analyzed and new culvert/rundowns installed where needed
- Pave shoulder to toe slope and install knee wall barrier/valley pan drain (WB186.2)
- Install 8 Bgrade traps in series at 186.1 (WB186.2B)
- Bypass existing culvert inlets from 186.1 to 186.4

Eastbound Lane

- Pave to crest of hillslope or toeslope and install snow storage zone Type 7 barriers (EB186.3)
- Install barrier between bike path and I-70 for safety (EB186.5)
- Install valley pan drain to 2 large sediment basins with culvert rundown at 186.1 (EB186.2,186.1/B)

MP 185.9 TO 186.1

Westbound Lane

- Pave shoulder to toe slope and install knee wall barrier/valley pan drain (WB185.8)
- Install 2 large series sediment basins at 185.9 (WB185.9)
- Route highway runoff from basin 185.9 to EB culvert rundown

Eastbound Lane

- Pave to toe of cutslope and install knee wall barrier/valley pan drain (EB185.7/65)
- Pave to crest of hillslope and install Type 7 barrier
- Install barrier between bike path and I-70 for safety (EB186.0/B)
- Install valley pan drain to new culvert rundowns at 185.9 and 185.6
- Install 1 large sediment basin at 185.95 with inlet/outlet protection (EB185.95/B)
- Install 1 large sediment basin at 185.85 with new culvert rundown (EB185.85B/85)
- Install 1 small sediment basin 185.8 (EB185.8)

MP 185.6 TO 185.9**Westbound Lane**

- Install 3 large sediment basins in series at 185.6 and 185.65 (WB185.65/6)
- Route runoff from basin 185.6 outlet to EB culvert rundown

Eastbound Lane

- Install 4 Bgrade traps and 1 small sediment basin at 185.6 with new culvert rundown (EB185.6)

MP 185.3 TO 185.6**Westbound Lane**

- Route springs from 185.5 through existing culvert (WB185.5B)
- Pave shoulder to toe of cutslope and install knee wall (WB185.4B)
- Route spring flows behind knee wall to wetlands (WB185.45B/D)
- Install emergency spill containment at runaway truck ramp No.1
- Protect wetlands in depression at 185.45 and allow clean water flow through existing culvert
- Pave shoulder to crest fillslope and install Type 7 barrier/valley pan drain to protect perennial tributary at 185.45 (WB185.4)
- Pave shoulder to toeslope and install knee wall barrier/valley pan drain (WB185.45)
- Install 3 large sediment basins in series at 185.3 above Polk Creek bridge abutment (WB185.3/35)

Eastbound Lane

- Pave to toeslope/install valley pan drain and utilize bike path as snow storage zone with Type 7 barriers (EB185.4)
- Install snow storage zone/valley pan drain 185.3 to 185.45
- Install 5 Bgrade traps at 185.4 (EB185.35)



MP 185.25 (POLK CREEK BRIDGE)**Eastbound and Westbound Lanes**

- Remove all sand beneath bridge
- Install retaining walls/sand traps 20-feet wide across slopes on both sides of Polk Creek bridge (WB185.25/B)

MP 184.9 TO 185.2**Westbound Lane**

- Pave shoulder to toeslope and install knee wall barrier/valley pan drain
- Route runoff to 2 large sediment basins in series at 184.95 (WB184.95)
- Reduce size of turnout area and pave shoulder to barrier (WB184.95B)
- Remove sediment, regrade, and revegetate, and close-off Miller Creek bridge abutment (WB184.9B)
- Same treatment for Miller Creek bridge as with Polk Creek bridge (WB184.9)

Eastbound Lane

- Pave to crest hillslope and install snow storage zone Type 7 barriers (EB185.05)
- Install valley pan drain along barrier to new sediment basin and culvert rundown at 184.9 (EB185.05B)
- Pave shoulder and install valley pan drain to 4 small sediment basins or Bgrade traps with culvert rundown (EB184.95/184.9C/184.95B)
- Same treatment for Miller Creek bridge as with Polk Creek bridge (EB184.85, 184.9B, 184.8C)
- Install Bgrade sediment traps in series above median culvert inlet at 184.95 (EB184.95M)

MP 184.45 TO 184.8**Westbound Lane**

- Pave shoulder to toeslope and install knee wall barrier/valley pan drain (WB184.65)
- Route runoff to 1 small sediment basin or Bgrade trap at 184.75 (WB184.75/184.7)
- Bypass any existing culverts
- Route highway runoff 3 small series sediment basins or Bgrade traps at 184.55 (WB184.55/184.6)
- Outlet from last basin to existing culvert with new rundown
- Pave shoulder and install Type 7 barrier/valley pan drain, and revegetate at 184.5 (WB184.5)
- Remove sediment, regrade, revegetate, and install 2 small sediment basins or Bgrade traps and close-off Black Gore Creek bridge abutment (WB184.45)
- Same treatment for Black Gore Creek bridge as with other bridges (WB184.3/184.4)

Eastbound Lane

- Pave to crest hillslope and install snow storage zone Type 7 barriers (EB184.75)



- Install valley pan drain along barrier to 3 small sediment basins or Bgrade traps and culvert rundown at 184.6 (EB184.65)
- Install valley pan drain along barrier to 2 sediment basins or Bgrade traps and culvert rundown at 184.45 (EB184.6/184.5)
- Install Bgrade sediment traps in series above median culvert inlet at 184.5 (EB184.5M)
- Remove sediment, place barrier on crest of hillslope, and install snow storage zone, and close-off Black Gore Creek bridge abutment (EB184.45)
- No treatment for Black Gore Creek EB bridge – good riparian area (EB184.4)

MP 183.9 TO 184.3

Westbound Lane

- Pave shoulder to crest of hillslope and install snow storage zone Type 7 barriers (WB184.2/184.3B)
- Install valley pan drain to 2 small sediment basins or Bgrade traps at 184.2

Eastbound Lane (chain-up Area)

- Complete shoulder paving and install Type 7 barrier on edge to reduce sediment migration
- Install 3 small sediment basins or Bgrade traps at 184.3 behind existing Type 4 at Black Gore Creek bridge abutment to prevent sediment from falling into creek

MP 183.5 TO 183.9

Westbound Lane

- Pave shoulder to crest of hillslope and install snow storage zone Type 7 barriers (WB183.7/183.75)
- Install valley pan drain to 4 small sediment basins or Bgrade traps at 183.6 (WB183.6)

Eastbound Lane

- Pave shoulder to cutslope or crest fillslope and install knee wall or Type 7 barrier and valley pan drain
- Install 2 small sediment basins or Bgrade traps at 183.8 and 183.65
- Install 2 small sediment basins or Bgrade traps at 183.5 to protect wetland/spring area (EB183.5/183.5WET)

MP 183.0 TO 183.5

Westbound Lane

- Pave shoulder to crest of hillslope and install snow storage zone Type 7 barriers
- Install valley pan drain to 3 small sediment basins or Bgrade traps and culvert rundown at 183.35



Eastbound Lane

- Pave shoulder to cutslope or crest fillslope and install knee wall or Type 7 barrier (EB183.3)
- Install valley pan drain to 3 small sediment basins or Bgrade traps at 183.25 (EB183.25)
- Bypass culvert at 183.35
- Protect perennial tributary at 183.25 (EB183.2)
- Install valley pan drain to 2 small sediment basins or Bgrade traps at 183.05
- Install snow storage zone Type 7 barriers to prevent dumping of sand into forest (EB183.1/183.15)

MP 182.45 TO 183.0**Westbound Lane**

- Pave shoulder to crest of hillslope and install snow storage zone Type 7 barriers (WB182.5)
- Install valley pan drain to 2 large sediment basins at 182.95 (WB182.45B)

Eastbound Lane

- Pave shoulder to cutslope or crest fillslope and install knee wall or Type 7 barrier (EB182.65)
- Install valley pan drain to 3 small series sediment basins or Bgrade traps at 182.8 (EB182.8)
- Install snow storage zone Type 7 barriers to prevent dumping of sand into forest (EB182.6)
- Install valley pan drain to 4 small series sediment basins of Bgrade traps at 182.45 (EB182.5/182.45B/182.45C)
- Install Bgrade sediment traps in series above median inlet at 182.5

MP 182.0 TO 182.4**Westbound Lane**

- Pave to cutslope and install toe barrier
- Install valley pan drain to 3 small sediment basins or Bgrade traps at 182.15
- Install 2 small sediment basins or Bgrade traps in series behind existing Type 4 barrier at 182.0 (WB182)

Eastbound Lane

- Pave shoulder to cutslope or crest fillslope and install knee wall or Type 7 barrier/valley pan drain (EB182.2/182.25)
- Install 2 small sediment basins or Bgrade traps at end of Type 4 barrier at 182.3 (EB182.3/182.35)
- Install valley pan drain to 4 small series sediment basins or Bgrade traps with culvert rundown at 182.0 (EB182B)
- Install Bgrade sediment traps in series above median inlet at 182.0 (EB182C)



MP 180.0 TO 182.0

Westbound Lane

- Pave shoulder and install 3 small series sediment basins or Bgrade traps at 180.2, 181.0, and 181.25
- Install valley pan drain to culvert inlets

Eastbound Lane

- Pave shoulder to cutslope or crest fillslope and install Type 7 barrier/snow storage zone
- Install sediment basins at culvert outfalls as needed to protect private property
- Install valley pan drain to culvert inlets

