BMP Table

NRCS Practice Standards, where not directly linked in the table, can be found in Section 4 of the **Field Office Technical Guide for Minnesota.** Practice standards are frequently updated, so links may not remain valid.

Symptom/Issue To be Addressed	Cause	On-System: Ditch System	On-System: Tile System	Off-System
Erosion	Construction	Stormwater Runoff Control (NRCS CP 570) • **MN Stormwater Manual** • **Practice Standard**	Stormwater Runoff Control (NRCS CP 570) • **MN Stormwater Manual** • **Practice Standard**	Stormwater Runoff Control (NRCS CP 570) • **MN Stormwater Manual** • **Practice Standard**
Excessive Sediment (Aggradation)	Excessive sediment transport from field and upstream ditch bottom and side slopes.	Open Channel (NRCS CP 582) - Natural Channel/Two-stage Channel Design • **Factsheet** (see page 163 of **The Agricultural BMP Handbook for Minnesota)** • **Practice Standard** • **Two-Stage Channel Design Guidance** or **Part 654: Stream Restoration Design National Engineering Handbook**	Tile Replacement (NRCS CP 606) • **Practice Standard** • **Design Guidance**	Cover Crops (NRCS CP 340) • **Factsheet** (see page 47 of **The Agricultural BMP Handbook for Minnesota**) • **Practice Standard** • **Practice Information**
Excessive Sediment (Aggradation)		Grade Stabilization Structure - Side Inlet (Various Types) (NRCS CP 410) • **Factsheet** (see page 195 of **The Agricultural BMP Handbook for Minnesota)** • **Practice Standard**	Alternative Tile Intakes (Perforated Risers, Gravel/rock inlets, dense pattern Tile) (NRCS CP 606) • **Factsheet** (see page 97 of **The Agricultural BMP Handbook for Minnesota)** • **Practice Standard – see FOTG**	Grassed Waterways (NRCS CP 412) • **Factsheet** (see page 119 of **The Agricultural BMP Handbook for Minnesota)** • **Practice Standard** • **Design Guidance**
Excessive Sediment (Aggradation)		Grade Stabilization Structure (Upstream in Ditch) (NRCS CP 410)		Water and Sediment Control Basin (NRCS CP 638)

Symptom/Issue To be Addressed	Cause	On-System: Ditch System	On-System: Tile System	Off-System
		• **Factsheet** (see page 55 of The Agricultural BMP Handbook for Minnesota) • Practice Standard		• **Factsheet** (see page 203 of The Agricultural BMP Handbook for Minnesota) • **Practice Standard – see FOTG** • Design Guidance
Excessive Sediment (Aggradation)		Energy Dissipation at Piped outlets • Design Guidance • CSP or MnDOT Standard Plates • RCP or MnDOT Standard Plates		Contour Buffer Strips (NRCS CP 332) • **Factsheet:** (see page 37 of The Agricultural BMP Handbook for Minnesota) • Practice Standard • Practice Information
Excessive Sediment (Aggradation)		Sediment Basin (NRCS CP 350) • **Factsheet:** (see page 191 of The Agricultural BMP Handbook for Minnesota) • **Practice Standard – see FOTG**		Contour Farming (NRCS CP 330) • **Factsheet:** (see page 43 of The Agricultural BMP Handbook for Minnesota) • Practice Standard • Practice Information
Excessive Sediment (Aggradation)		Constructed (Treatment) Wetland (NRCS CP 656) • **Factsheet** (see page 207 of The Agricultural BMP Handbook for Minnesota) • **Practice Standard – see FOTG** • Design Guidance		Conservation Cover (NRCS CP 327) • **Factsheet** (see page 22 of The Agricultural BMP Handbook for Minnesota) • Practice Standard
Excessive Sediment (Aggradation)		Vegetated Buffer Strips [Filter strips (393)] • **Factsheet** (see page 181 of The Agricultural BMP Handbook for Minnesota) • Practice Standard		Terrace (600) • **Factsheet** (see page 159 of The Agricultural BMP Handbook for Minnesota) • Practice Standard • Design Guidance
Excessive Sediment (Aggradation)				Conservation Tillage (NRCS CPs 329, 345, 346)

Symptom/Issue To be Addressed	Cause	On-System: Ditch System	On-System: Tile System	Off-System
				• **Factsheet** (see page 135 of **The Agricultural BMP Handbook for Minnesota**) • **CP 329 Practice Standard** • **CP 329 Practice Information** • **CP 345 Practice Standard** • **CP 345 Practice Information** • **CP 346 Practice Standard** • **Residue Management Information**
Excessive Sediment (Aggradation)				Vegetated Buffer Strips [Filter strips (NRCS CP 393)] • **Factsheet** (see page 181 of **The Agricultural BMP Handbook for Minnesota**) • **Practice Standard**
Excessive Nutrients	Excessive nutrient use, drain tile leaching, carried in surface runoff	Constructed Wetland for Storage and Treatment (In-line or Off-channel) (NRCS CP 656) • **Factsheet** (see page 207 of **The Agricultural BMP Handbook for Minnesota**) • **Practice Standard** • **Design Guidance**	Denitrifying Bioreactor (NRCS CP 605) • **Factsheet** (see page 223 of **The Agricultural BMP Handbook for Minnesota**) • **Practice Standard**	Nutrient Management (NRCS CP 590) • **Factsheet** (see page 69 of **The Agricultural BMP Handbook for Minnesota**) • **Practice Standard**
Excessive Nutrients		Open Channel (NRCS CP 582) - Natural Channel/Two-stage Channel Design • **Factsheet** (see page 207 of **The Agricultural BMP Handbook for Minnesota**) • **Practice Standard** • **Two-Stage Channel Design Guidance**	Saturated Buffer (NRCS CP 604) • **Practice Standard**	Denitrifying Bioreactor (NRCS CP 605) • **Factsheet** (see page 223 of **The Agricultural BMP Handbook for Minnesota**) • **Practice Standard**

Symptom/Issue To be Addressed	Cause	On-System: Ditch System	On-System: Tile System	Off-System
		• Natural Channel Design Guidance		
Excessive Nutrients			Wetland Creation (In-line or Off-channel) (NRCS CP 656) • **Factsheet** (see page 207 of The Agricultural BMP Handbook for Minnesota) • **Practice Standard – see FOTG** • Design Guidance	Saturated Buffer (NRCS CP 604) • Practice Standard
Excessive Nutrients				Drainage Water Management (NRCS CAP 130, CP 587, CP 554) • **Factsheet** (see page 107 of The Agricultural BMP Handbook for Minnesota) • **Practice Standard – see FOTG**
Excessive Nutrients				Cover Crops (NRCS CP 340) • **Factsheet** (see page 47 of The Agricultural BMP Handbook for Minnesota) • Practice Standard
Excessive Nutrients				Conservation Tillage (NRCS CPs 329, 345, 346) • **Factsheet** (see page 135 of The Agricultural BMP Handbook for Minnesota) • CP 329 Practice Standard • CP 329 Practice Information • CP 345 Practice Standard • CP 345 Practice Information • CP 346 Practice Standard

Symptom/Issue To be Addressed	Cause	On-System: Ditch System	On-System: Tile System	Off-System
				• **Residue Management Information**
Excessive Nutrients				Conservation Cover (NRCS CP 327) • **Factsheet** (see page 27 of The Agricultural BMP Handbook for Minnesota) • **Practice Standard**
Excessive Nutrients				Conservation Crop Rotations (NRCS CP 328) • **Practice Standard**
In-Ditch Erosion (Headcutting/Degradation)	Excessive Slope in Drainage Conveyance	Rock Riffle/Rock Grade Control Structure Grade Stabilization Structure (NRCS CP 410) • **Factsheet** (see page 55 of The Agricultural BMP Handbook for Minnesota) • **Practice Standard** • **Design Guidance** or **Part 654 NEH TS14H**		
In-Ditch Erosion (Headcutting/Degradation)		Grade Stabilization Structure (NRCS CP 410) Reinforced Concrete Weir Spillway • **Factsheet** (see page 55 of The Agricultural BMP Handbook for Minnesota) • **Practice Standard** • **Design Guidance**		
In-Ditch Erosion (Headcutting/Degradation)		Grade Stabilization Structure (NRCS CP 410) Reticulated Concrete Block Drop Structure • **Factsheet** (see page 55 of The Agricultural BMP Handbook for Minnesota)		

Symptom/Issue To be Addressed	Cause	On-System: Ditch System	On-System: Tile System	Off-System
		• Practice Standard		
In-Ditch Erosion (Headcutting/Degradation)		Grade Stabilization Structure (NRCS CP 410) Rock Grade Control Structure • **Factsheet** (see page 55 of The Agricultural BMP Handbook for Minnesota) • Practice Standard		
In-Ditch Erosion (Headcutting/Degradation)		Lined Waterway or Outlet (NRCS CP 468) • **Practice Standard – see FOTG** • Design Guidance		
In-Ditch Erosion (Headcutting/Degradation)		Open Channel (NRCS CP 582) - Natural Channel/Two-stage Channel Design • **Factsheet** (see page 163 of The Agricultural BMP Handbook for Minnesota) • Practice Standard: See *Open Channel (582)* • Two-Stage Channel Design Guidance • Natural Channel Design Guidance		
Ditch Slope or Bank Erosion	Channel migration, Excessive discharge	Rock Riprap • Design Guidance		
Ditch Slope or Bank Erosion		Lined Waterway or Outlet (NRCS CP 468) • **Practice Standard – see FOTG** • Design Guidance		
Ditch Slope or Bank Erosion		Streambank and Shoreline Protection (NRCS CP 580)		

Symptom/Issue To be Addressed	Cause	On-System: Ditch System	On-System: Tile System	Off-System
		• **Factsheet** (see page 155 of **The Agricultural BMP Handbook for Minnesota**) • **Practice Standard – see FOTG**		
Ditch Slope or Bank Erosion		Stream Barbs/J-hook Vanes • **J-Hook Design Guidance** • **Stream Barb Design Guidance**		
Ditch Slope or Bank Erosion		Stream Restoration - Toe Wood-Sod Mat • **Factsheet**		
Ditch Slope or Bank Erosion		Open Channel (NRCS CP 582) - Natural Channel/Two-stage Channel Design • **Factsheet** (see page 163 of **The Agricultural BMP Handbook for Minnesota**) • **Practice Standard** • **Two-Stage Channel Design Guidance** • **Natural Channel Design Guidance**		
Tributary Erosion	Excessive slope and Discharge Entering Ditch	Grade Stabilization Structure Side Inlet (Various Types) (NRCS CP 410) • **Factsheet** (see page 195 of **The Agricultural BMP Handbook for Minnesota**)		
Tributary Erosion		Water & Sediment Control Basin (638) • **Factsheet** (see page 203 of **The Agricultural BMP Handbook for Minnesota** • **Practice Standard – see FOTG** • **Design Guidance**		

Symptom/Issue To be Addressed	Cause	On-System: Ditch System	On-System: Tile System	Off-System
Excessive Peak Discharge/Inadequate Capacity	Land Use Change, Climate Change, Flooding	Open Channel (NRCS CP 582) - Natural Channel/Two-stage Channel Design • **Factsheet** (see page 163 of The Agricultural BMP Handbook for Minnesota) • Practice Standard • Two-Stage Channel Design Guidance • Natural Channel Design Guidance	Surge Pond/Off-channel Storage site	Water and Sediment Control Basin (NRCS CP 638) • **Factsheet** (see page 203 of The Agricultural BMP Handbook for Minnesota) • **Practice Standard – see FOTG** • Design Guidance
Excessive Peak Discharge/Inadequate Capacity		Surge Pond/Off-channel Storage (See Sediment Pond and Dam Guidance)	Dam (NRCS CP 402) • **Practice Standard – see FOTG**	Terrace (NRCS CP 600) • **Factsheet** (see page 159 of The Agricultural BMP Handbook for Minnesota • **Practice Standard – see FOTG** • Design Guidance
Excessive Peak Discharge/Inadequate Capacity		Dam (NRCS CP 402) • **Practice Standard – see FOTG** Design Guidance		Drainage Water Management (NRCS CAP 130, CP 587, CP 554) • **Factsheet** (see page 107 of The Agricultural BMP Handbook for Minnesota) • **Practice Standards – see FOTG**
Excessive Peak Discharge/Inadequate Capacity		Culvert Sizing • **Factsheet** (see page 113 of The Agricultural BMP Handbook for Minnesota • **Guidelines** (see Red River Basin Flood Damage Reduction Work Group, TSAC Technical Paper No. 15)		Cover Crops (NRCS CP 340) • **Factsheet** (see page 47 of The Agricultural BMP Handbook for Minnesota) • Practice Standard • Design Guidance

Symptom/Issue To be Addressed	Cause	On-System: Ditch System	On-System: Tile System	Off-System
Excessive Peak Discharge/Inadequate Capacity				Conservation Cover (NRCS CP 327) • **Factsheet** (see page 27 of **The Agricultural BMP Handbook for Minnesota**) • **Practice Standard**
Excessive Peak Discharge/Inadequate Capacity				Wetland Creation (In-line or Off-Channel) (NRCS CP 656) • **Factsheet** (see page 207 of **The Agricultural BMP Handbook for Minnesota**) • **Practice Standard – see FOTG** • **Design Guidance**
Statute Mandate in Drainage Law	Statute Mandate in Drainage Law	Vegetated Buffer Strips [Filter strips (NRCS CP 393)] • **Factsheet** (see page 181 of **The Agricultural BMP Handbook for Minnesota**) • **Practice Standard**		