APPENDIX F: SILT TMDL TECHNICAL ADVISORY COMMITTEE'S RECOMMENDATIONS FOR ON-FIELD BEST MANAGEMENT PRACTICES

Silt TMDL Subcommittee for BMP's

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Proposed Subcommittee Statement

Best Management Practices ("BMP"s) as defined for water quality practices, can be any practices or methods that suitably address the goal of maintaining or enhancing the beneficial uses of water. The term "BMP" is misleading, however. It cannot be said that any so-called BMP will be the most effective option in any particular circumstance. Experience, professional judgment, and experimentation are always required for the successful implementation of appropriate pollution controls on a site-specific basis. For this reason, the term "management practice" is used in these recommendations rather than BMP.

A wide variety of generally effective management practices have been developed to reduce the impacts of runoff, erosion, and sedimentation or siltation from agricultural lands. Many of these management practices are now so widely incorporated into the technological baseline of modern American agriculture that they are taken for granted as part of the agricultural landscape. Soil and water conservation practices developed to reduce offsite transport of sediment from agricultural fields include such applications as berms, water bars, sediment basins, drainage ditches, field drains and sumps, contour plowing, sprinkler and drip irrigation, cover cropping, planting grass in waterways and field roads, vegetative buffers, windbreaks, retaining residual dry matter and minimum stubble heights, encouragement of fencing and off-stream stock water on grazing lands. Each of these practices can reduce silt under a particular set of circumstances. The practices vary widely from very simple and relatively inexpensive, to the extreme of retiring the farmland. Some of these practices are not feasible or -applicable to the crops and physical environment of the Imperial Valley.

The goal of this subcommittee is to select and describe management practices which experience in the field have demonstrated are most likely to be effective in achieving the goal of reducing the load of silt in agricultural drains of the Imperial Valley and the Alamo River. The object of these management practices is to prevent the drain water velocity from reaching that point where soil particles will be stirred up and carried with the flow. In the event soil particles are already suspended in the drain water, these practices will allow some of the soil particles to settle out before leaving the fields.

The subcommittee has compiled lists of practices from those agencies which have made them I available, with their accompanying documentation. We encourage managers to consider all potential practices and implement those which are best for them.

The subcommittee desires to focus attention on those practices which it expects will have the greatest impact on silt load for the crops and circumstances of the Imperial Valley. The subcommittee also desires to designate those practices which likely will be applicable to the broadest range of crops and circumstances, which are also expected to provide the greatest siltation reduction for the smallest financial investment, and are therefore the most likely to be chosen for implementation by prudent farm managers. With this in mind, we offer the following list of recommended management practices for reducing the load of silt leaving farm fields and entering the agricultural drains and the Alamo River when used individually or in combination with each other.

Since specific management practices do not apply to all operations, and are not practicable in all instances, the practices recommended below are not intended to serve as a prescriptive list. Effective management practices for specific sites and crops are best determined by the individual landowner relying on available expertise, and will continue to evolve as additional research and technology become available.

RECOMMENDED MANAGEMENT PRACTICES FOR SILTATION REDUCTION

Practices to Reduce Siltation by Managing Tailwater Ditches

Tailwater Drop Box Grade Elevation

Care should be taken to maintain the grade board elevation high enough to minimize erosion. Imperial Irrigation District's Regulation 39 states in part: *An acceptable structure shall have vertical walls and a permanent, level grade board set a maximum of 12 inches below the natural surface. If the situation warrants, and at the discretion of the district, 18" maximum may be allowed.* In many situations the elevation can be significantly higher, especially when anticipated tailwater flows will not reach elevations that will cause crop damage.

Enlarged Tailwater Drop Box

Widening the drop box overpour weir enables the weir elevation to be set higher without raising the surface elevation of the water above the acceptable level. Higher weir elevations allow for an increased tailwater ditch cross section, and reduced erosion when water leaving the field enters the tailwater ditch.

Tailwater Ditch Checks

These are temporary or permanent dams which hold the water level well above the ground. They can be placed at intervals in tailwater ditches, especially those with steeper slopes. They increase the cross section of the stream of water. They will decrease the water velocity and reduce erosion, and may even cause sediment already in the water to settle out. Check dams might be constructed of plastic, concrete, fiber, metal or other suitable material. If plastic sheets are used, care must be taken not to allow pieces of the plastic to be carried downstream with the water.

Enlarged Tailwater Ditch Cross Section

Deepening and widening the ditch will cause tail water velocity to decrease. The water must be checked up downstream of the oversized area to make the cross section of the water as large as practical. The slower the velocity the more sediment will settle out of the water and stay in the field, and the less will be picked up by the moving water.

Spillways to Drain Water Into Tailwater Ditches

Use of spillways or pipes where water moves from fields into tailwater ditches allows the tailwater to fall down into the tailwater ditch from the field without washing across and eroding the soil. Spillways might be constructed of plastic, concrete, metal or other suitable material. If plastic sheets are used, care must be taken not to allow deterioration to cause pieces of the plastic to be carried downstream with the water. This procedure may be useful on fields irrigated in bordered-strips and furrows.

Raising or Keeping Lower End of Field at Grade

Do not allow low spots to develop on the tail end of a field. In some cases it might be advantageous to maintain a reduced main or cross slope. This facilitates more uniform distribution of irrigation water to this area, which can result in reduced salt build-up in the soil, increased production, reduced tailwater, and decreased erosion.

Using Flat Area Between Furrow Ends and Field Tailditch

Allow water to flow slowly away from furrows without falling directly into the tailditch. Water then enters the tailditch only through spillways. This reduces erosion at furrow ends, especially when soil is freshly tilled and when water initially begins to flow from the furrows.

Practices to Reduce Siltation by Eliminating Tailwater Ditches

Draining Water Across End of Field

Eliminate borders on last 20-200 feet of the field. Maintain planted crop to the end of the field. Allow tailwater from upper lands to irrigate the crop at the ends of the adjacent lower lands. It is important that the main slope on the lower end of the field is no greater than on the balance of the field. A reduced slope might be better. With no tailwater ditch there should be very little erosion as the water slowly moves across a wide area of the field to the tailwater box. Some sediment might settle out as the water is slowed by the crop while it moves across the field. This could be used with water tolerant crops or special soil conditions.