California Regional Water Quality Control Board

Los Angeles Region

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October 7, 2004

Jai Paul Thakur, Chief
Department of Transportation
District 7, Office of Engineering Services
120 South Spring Street, MS13
Los Angeles, CA 90012

SUBJECT: CERTIFICATION OF THE GROSS SOLIDS REMOVAL DEVICES AS FULL CAPTURE SYSTEMS

Dear Mr. Thakur:

We have reviewed your request for certification on two trash capture devices, Linear Radial – Configuration 1 (LR1 I-10) and Inclined Screen – Configuration 1 (IS1 SR-170) as full capture systems in your January 13, 2004 letter and at your presentation to the Los Angeles Regional Water Quality Control Board staff on September 1, 2004. The Linear Radial Gross Solids Removal Device (GSRD) – Configuration 1 and Inclined Screen GSRD – Configuration 1 were installed by Interstate I-10 at Rosemead and along State Route 170 at North Hollywood, respectively in an effort to comply with the Ballona Creek and Los Angeles River Trash TMDLs.

Based on your *Phase I Gross Solids Removal Devices Pilot Study: 2000-2002 Final Report, October 2003* (Phase I Report), the above GSRDs met the performance criteria for certification as listed below:

1. Particle Capture – The device or system must capture all particles retained by a 5 mm mesh screen from all runoff generated from a one-year, one-hour storm.

2. Clogging – The device or system must be designed to prevent plugging or blockage of the screening module.

3. Hydraulic Capacity – The device or system must pass the 25-year peak flow.

4. Drainage – The device or system must drain within 72 hours to avoid vector breeding.

5. Gross Solids Storage Capacity – The device or system will hold the estimated annual load of gross solids, so that it requires only one cleaning per year.

6. Maintenance Requirements – The device or system will not require any maintenance other than inspections throughout the storm season.

As you are probably aware, the definition of “full capture system” for the Ballona Creek Trash TMDL was amended per Resolution No. 04-023 adopted on March 4, 2004 by the Los Angeles Regional Water Quality Control Board. It is likely that this definition will be applicable in future revisions of the Los Angeles River Trash TMDL. As a result, the Regional Board staff has also analyzed the GSRD installations for compliance with the Ballona Creek Trash TMDL’s full capture system definition. This analysis will eliminate any uncertainty in the event the Los Angeles River Trash TMDL’s definition is subsequently modified.

The definition of a "full capture system" as defined in the Resolution No. 04-023 is as follows:

> " A full capture system is any single device or series of devices that traps all particles retained by a 5 mm mesh screen and has a design treatment capacity of not less than the peak flow rate (Q) resulting from a one-year, one-hour, storm in the subdrainage area. Rational equation is used to compute the peak flow rate: Q = C x I x A, where Q = design flow rate (cubic feet per second, cfs); C = runoff coefficient (dimensionless); I = design rainfall intensity (inches per hour, as determined per the rainfall isohyetal map in Figure A), and A = subdrainage area (acres)."

Based on your Phase I Report, both LR1 I-10 and IS1 SR-170 have a 5 mm mesh screen and meet the particle capture criteria for a full capture system. Since these GSRDs are designed for 24-year peak flow, it also satisfies 1-year, 1-hour design criteria. Based on information from your handouts at the September 1, 2004 presentation, the flow capacity for LR1 I-10 and IS1 SR-170 are 11.9 and 9.1 ft^3/sec, respectively. The peak flow rates resulting from a one-year, one-hour storm for these GSRDs are as follows:

For LR1 I-10,

C = 0.9 (assuming impermeable surface)
I = 0.38 in/hr (from attached Figure A, showing 1-year, 1-hour rainfall intensity)
A = 3.7 acres (from Phase I Report)

Q = 0.9 x 0.38 in/hr x 3.7 acres x [(1.008 ft^3/sec) /(in/hr acres)] = 1.28 ft^3/sec

Since design flow capacity is much greater than estimate flow rate, LR1 I-10 meets the design criteria for a full capture system.

Similarly, design flow capacity is much greater than estimated peak flow rate for ISI SR-170 as shown below:

For ISI SR-170,

C = 0.9 (assuming impermeable surface)
I = 0.36 in/hr (from attached Figure A, showing 1-year, 1-hour rainfall intensity)
A = 2.5 acres (from Phase I Report)

Q = 0.9 x 0.36 in/hr x 2.5 acres x [(1.008 ft^3/sec) /(in/hr acres)] = 0.82 ft^3/sec

The drainage criterion is not part of the definition for a full capture system. However, it is important for the system to drain within 72 hours to avoid vector issues. These GSRDs met this requirement.

The Gross Solids Storage Capacity ranged from 0.13 to 0.93 m^3/ha/yr during 2000 to 2002 Pilot Study. The estimated annual gross solids loading rate used for the design was 0.7 m^3/ha/yr. Some GSRDs required cleaning more than once a year.

Based on the above information, the Linear Radial Gross Solids Removal Device (GSRD) – Configuration 1 and Inclined Screen GSRD – Configuration 1 meet the definition of full capture system and can be certified as a full capture system under the following conditions:

- Adequate Pipe Sizing: The pipes carrying the flows from the subdrainage area should be able to handle peak flows.

- Adequate Drainage: The GSRDs must drain within 72 hours to avoid vector issues.

- Regular Inspections: The GSRDs should be checked at minimum, three times during the rainy season.

- Regular Maintenance: Adequate number of employees will be used to clean out the GSRDs. The GSRDs will be cleaned when ¾ full.

The determination that the Linear Radial Gross Solids Removal Device (GSRD) – Configuration 1 and Inclined Screen GSRD – Configuration 1 satisfy the full capture definition of the trash TMDL will allow the systems to be used elsewhere in the region. Dischargers will have an on-going obligation to demonstrate that the installation of a particular system is appropriately sized. Likewise, dischargers will be responsible for on-going maintenance to ensure the systems perform to design specifications. The Regional Board will review and consider performance data on a continuing basis. In the event data demonstrate that the systems are not performing to the full capture design standard established by the trash TMDL, then the Regional Board reserves the ability to rescind the certification for subsequent installations.

Please contact Dr. Xavier Swamikannu at 213/620-2094, if you have any further questions.

Sincerely,

ORIGINAL SIGNED BY
Jonathan Bishop, P.E.
Executive Officer

Attachment

cc: Michael Lauffer, Office of Chief Counsel, State Water Resources Control Board
Terry Fleming, Water Division, U.S. Environmental Protection Agency, Region 9
Bill Depoto, Los Angeles County Department of Public Works
Robert Wu, Department of Transportation, District 7