

STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

STAFF SUMMARY REPORT (Dale Bowyer)
MEETING DATE: November 28, 2011

ITEM: 7

SUBJECT: **Amendment Revising the Municipal Regional Stormwater NPDES Permit – Municipalities and Flood Management Agencies in Alameda County, Contra Costa County, San Mateo County, Santa Clara County, and the Cities of Fairfield, Suisun City, and Vallejo in Solano County – Amendment of Order No. R2-2009-0074**

CHRONOLOGY: October 14, 2009 – Municipal Regional Stormwater Permit adopted

DISCUSSION: The Revised Tentative Order would amend the Municipal Regional Stormwater Permit (Permit) to allow reduction of low impact development (LID) treatment requirements for special development projects, approve biotreatment soil and green roof specifications, and make minor changes to the Santa Clara County Hydromodification Management Plan implementation map. Appendix A contains the Revised Tentative Order and its attachments, including the supporting Fact Sheet. Appendix B contains a Staff Report that describes the proposed special development project categories and the reductions in LID treatment requirements that would be allowed, and provides regulatory background and discussion of key issues. Appendix C contains our responses to all written comments received during the public comment period, which are contained in Appendix D.

The Permit requires implementation of LID stormwater treatment for all new development and significant redevelopment beginning December 1, 2011, and required permittees to propose criteria for identifying special development projects and allowing reductions in LID treatment. LID treatment includes retaining stormwater runoff onsite for infiltration, evapotranspiration, or harvest for uses such as irrigation or toilet flushing. It also includes treatment with green roofs and biotreatment with underdrains when retention alternatives are not feasible. However, there are “smart growth” projects, which are dense, infill developments, close to transit that will have difficulty meeting the LID treatment requirements due to lack of space for biotreatment or retention and the cost of implementing stormwater harvest, infiltration, or green roofs. These special development projects reduce urban sprawl and overall stormwater runoff pollution by concentrating development in urban centers, near jobs, services, and mass transit, and by reducing reliance on the automobile, thus reducing urban stormwater runoff pollution. Projects that would be allowed LID treatment reduction would still be required to implement “non-LID treatment” of stormwater to reduce discharge of pollutants.

The Revised Tentative Order includes a framework that allows reductions in

LID treatment for three special development project categories: lot-line to lot-line infill up to a half-acre; lot-line to lot-line infill up to two acres; and transit-oriented development. The framework is based on the proposal submitted by the permittees in December 2010 and our review and modification, with input from U.S. EPA and other interested parties, of the proposed special development project categories and allowed LID treatment reduction. Qualifying projects would be allowed to use non-LID treatment, high flowrate filter vaults or high rate tree filter vaults, for up to a specified percentage of runoff in each category.

The Permit also required the permittees to submit for Board approval proposed soil media specifications for biotreatment systems and biotreatment specifications for green roofs. We reviewed and made minor revisions to the specifications as proposed with input from interested parties. The Revised Tentative Order approves and incorporates these specifications into the Permit.

The key issues raised in the written comments include assertion by the Natural Resources Defense Council (NRDC) and San Francisco BayKeeper that LID treatment is mandatory and up to 100% reduction in LID treatment should not be allowed. U.S. EPA had also previously asked that LID treatment reduction be capped at 50%. We affirm that the proposed framework allowing up to 100% non-LID treatment in limited and restricted settings is appropriate and reasonable as we discuss in the Staff Report. NRDC and BayKeeper also point out that, as proposed, special development projects would be allowed to use non-LID treatment without showing infeasibility of LID treatment. That was unintended, and, in response, we revised the original tentative order to clarify that LID treatment must be implemented for special development projects to the extent it is feasible, and to require reporting of the type of non-LID treatment system installed along with pollutant reduction certifications it carries.

Another issue raised by NRDC and BayKeeper is that too many projects would qualify for LID treatment reduction, resulting in large areas around transit centers with no LID treatment. However, the permittees assert that, due to the qualifying restrictions and the current economy, there will be very few special development projects in the near future. We agree, and we will track reporting of special development projects to verify. We will also thoroughly review implementation of the special development project requirements and recommend modifications if necessary for approval by the Board when it considers reissuance of the Permit in three years.

RECOMMEN- Adoption of the Revised Tentative Order
DATION:

APPENDICES: A. Revised Tentative Order and Attachments, including Fact Sheet
B. Staff Report
C. Responses to Comments
D. Written Comments Submitted

Appendix A

**Revised Tentative Order
Attachments
&
Fact Sheet**

**California Regional Water Quality Control Board
San Francisco Bay Region
Municipal Regional Stormwater NPDES Permit**

**REVISED TENTATIVE ORDER NO. R2-2011-XXXX
NPDES PERMIT NO. CAS612008**

AMENDMENT REVISING ORDER NO. R2-2009-0074 for the following jurisdictions and entities:

The cities of Alameda, Albany, Berkeley, Dublin, Emeryville, Fremont, Hayward, Livermore, Newark, Oakland, Piedmont, Pleasanton, San Leandro, and Union City, Alameda County, the Alameda County Flood Control and Water Conservation District, and Zone 7 of the Alameda County Flood Control and Water Conservation District, which have joined together to form the Alameda Countywide Clean Water Program (Alameda Permittees)

The cities of Clayton, Concord, El Cerrito, Hercules, Lafayette, Martinez, Orinda, Pinole, Pittsburg, Pleasant Hill, Richmond, San Pablo, San Ramon, and Walnut Creek, the towns of Danville and Moraga, Contra Costa County, the Contra Costa County Flood Control and Water Conservation District, which have joined together to form the Contra Costa Clean Water Program (Contra Costa Permittees)

The cities of Campbell, Cupertino, Los Altos, Milpitas, Monte Sereno, Mountain View, Palo Alto, San Jose, Santa Clara, Saratoga, and Sunnyvale, the towns of Los Altos Hills and Los Gatos, the Santa Clara Valley Water District, and Santa Clara County, which have joined together to form the Santa Clara Valley Urban Runoff Pollution Prevention Program (Santa Clara Permittees)

The cities of Belmont, Brisbane, Burlingame, Daly City, East Palo Alto, Foster City, Half Moon Bay, Menlo Park, Millbrae, Pacifica, Redwood City, San Bruno, San Carlos, San Mateo, and South San Francisco, the towns of Atherton, Colma, Hillsborough, Portola Valley, and Woodside, the San Mateo County Flood Control District, and San Mateo County, which have joined together to form the San Mateo Countywide Water Pollution Prevention Program (San Mateo Permittees)

The cities of Fairfield and Suisun City, which have joined together to form the Fairfield-Suisun Urban Runoff Management Program (Fairfield-Suisun Permittees)

The City of Vallejo and the Vallejo Sanitation and Flood Control District (Vallejo Permittees)

The California Regional Water Quality Control Board, San Francisco Bay Region, (hereinafter referred to as the Water Board) finds that:

Findings:

1. On October 14, 2009, the Water Board adopted Order No. R2-2009-0074, NPDES No. CAS612008, prescribing Waste Discharge Requirements under the San Francisco Bay Municipal Regional Stormwater Permit for the discharge of stormwater runoff from the municipal separate storm sewer systems (MS4s) of the named Permittees.
2. Provision C.3.b. of Order No. R2-2009-0074 establishes the scope of development projects that must implement post-construction stormwater treatment and defines them as Regulated Projects.
3. Provision C.3.c. of Order No. R2-2009-0074 requires Permittees to implement Low Impact Development (LID) requirements by December 1, 2011. Under Provision C.3.c., Permittees must require all Regulated Projects to implement source control and site design measures and to treat 100% of the amount of runoff identified in Provision C.3.d. for the Regulated Project's drainage area with LID treatment measures onsite or at a joint stormwater treatment facility.
4. Provision C.3.e.ii.(1) of Order No. R2-2009-0074 acknowledges that certain types of smart growth, high density, and transit-oriented development can either reduce existing impervious surfaces, or create less "accessory" impervious areas and auto-related pollutant impacts. This Provision further states that incentive LID Treatment Reduction Credits approved by the Water Board may be applied to these types of Regulated Projects that are considered "Special Projects."
5. Provision C.3.e.ii.(2) of Order No. R2-2009-0074 requires the Permittees to submit a proposal by December 1, 2010, to the Water Board identifying the types of projects proposed as Special Projects and therefore eligible for LID Treatment Reduction Credit. The proposal was required to include specific criteria for each type of Special Project proposed, including size, location, minimum densities, minimum floor area ratios, other appropriate limitations, and the proposed LID Treatment Reduction Credit.
6. On December 1, 2010, the Bay Area Stormwater Management Agencies Association (BASMAA) submitted a Special Projects proposal on behalf of the Permittees, which defined the types of Special Project Categories and their corresponding LID Treatment Reduction Credits.
7. BASMAA's stormwater proposal was posted on the Water Board's website and circulated for public comment on December 10, 2010. Comments on the proposal were received from USEPA, NRDC, San Francisco Baykeeper, the Building Industry Association, other building industry groups, and developers.
8. Water Board staff has met on a regular basis with representatives of BASMAA and within these negotiations, revisions of the December 10, 2010, proposal have been made and considered. Representatives of USEPA, the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG) have participated in some of these meetings. Water Board staff has also met separately with representatives of NRDC and San Francisco Baykeeper.

9. This Order amends Order No. R2-2009-0074 to add criteria for determining which types of Regulated Projects may be considered Special Projects. This Order establishes different categories of Special Projects based on size, land use type, and density.
10. For each category of Special Projects, this Order establishes corresponding LID Treatment Reduction Credits that may be used to reduce the amount of stormwater runoff that must be treated with LID stormwater treatment systems.
11. This Order requires that when LID Treatment Reduction Credits are applied, the percentage of stormwater runoff not treated by LID treatment systems to be treated with specific non-LID treatment systems.
12. Provisions C.3.c.i.(2)(vi) and C.3.c.iii.(3) of Order No. R2-2009-0074 require Permittees to submit to the Water Board by May 1, 2011, a proposed set of model biotreatment soil media specifications and soil infiltration testing methods to verify a long-term infiltration rate of 5 to 10 inches/hour.
13. The Permittees submitted a proposal for the soil media specifications and soil infiltration testing methods on December 1, 2010, which was distributed for public comment on December 15, 2010. Comments were received on January 28, 2011, from Roger James of Resources Management and from the Natural Resources Defense Council.
14. Provisions C.3.c.i.(2)(vii) C.3.c.iii.(4) of Order No. R2-2009-0074 require Permittees to submit to the Water Board by December 1, 2011, proposed minimum specifications for green roofs to be considered biotreatment systems.
15. The Permittees submitted a proposal for the minimum green roof specifications on April 29, 2011, which was distributed for public comment on May 4, 2011. No comments were received.
16. This Order approves the model biotreatment soil media specifications, soil infiltration testing methods, and minimum green roof specifications submitted by the Permittees.
17. Provision C.3.g.ii.(5) of Order No. R2-2009-0074 requires the Santa Clara Permittees to comply with all the requirements in Attachment F of the same Order. Requirement 4. of Attachment F (pages F-3 and F-4 of Order No. R2-2009-0074) defines geographical areas where applicable Regulated Projects are required to meet the HM Standard and associated requirements. These areas of HM applicability described in Requirement 4. are shown in the Santa Clara Permittees' HM Map [available at http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/stormwater/muni/mrp/Final%20TO%20HM%20Maps.pdf](http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/stormwater/muni/mrp/Final%20TO%20HM%20Maps.pdf).
18. Requirement 4.c. of Attachment F states that Pink areas on the HM Map are under review by the Permittees for accuracy of the imperviousness data. The HM Standard and associated requirements apply to projects in areas designated as pink on the map until such time as a Permittee presents new data that indicates that the actual level of imperviousness of a particular area is greater than or equal to 65% impervious. Any new data is to be submitted to the Water Board in one coordinated submittal within one year of permit adoption.
19. The Santa Clara Permittees submitted new impervious data and a revised HM Map that reflects the new data to the Water Board on October 14, 2010. On March 11, 2011, the Santa Clara Permittees submitted a revised HM Map to correct a small error in the October 2010 HM Map, and to provide additional information per Water Board staff request. The revised HM Map shows that in the majority of the Pink area of the original, approved, Santa Clara Permittees' HM

Map, the HM Standard and associated requirements do apply. In the revised HM Map, these areas are now shown in green to represent the applicability of the HM Standard and associated requirements. The remaining small portion of the Pink area in the original HM Map is now shown in red to represent areas where the HM Standard and associated requirements do not apply.

20. This Order approves the revised Santa Clara Permittees' HM Map and replaces the HM Map originally adopted by Order No. R2-2009-0074.
21. The Fact Sheet attached to this Order as Appendix III contains background information and rationale for this Order's requirements. It is hereby incorporated into this Order and therefore constitutes part of the findings for this Order
22. This Order is exempt from the provisions of the California Environmental Quality Act pursuant to California Water Code Section 13389
23. The Water Board notified the Permittees named in this Order and interested agencies and persons of its intent to consider adoption of this Order, and provided an opportunity to submit written comments.
24. In a public meeting, the Water Board heard and considered all comments pertaining to this Order.

IT IS HEREBY ORDERED, pursuant to the provisions of California Water Code Division 7 and regulations adopted thereunder, and the provisions of the federal Clean Water Act and regulations and guidelines adopted thereunder, that the Permittees shall comply with the following:

1. Provision C.3. and Attachment F of Order No. R2-2009-0074, are hereby modified and amended as shown in Appendix I. Additions to Provision C.3. and Attachment F are displayed as underlined type and deletions of text are displayed as ~~strikeout~~ format.
2. Attachments L and M as shown in Appendix II are hereby added to Order No. R2-2009-0074.
3. This Order shall become effective on December 1, 2011.

I, Bruce H. Wolfe, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on _____, 2011.

Bruce H. Wolfe
Executive Officer

- Appendix I: Revisions to Provision C.3. and Attachment F of Order No. R2-2009-0074
Appendix II: Attachments L and M to be added to Order No. R2-2009-0074
Appendix III: Fact Sheet

APPENDIX I

Revisions to Provision C.3. and Attachment F of Water Board Order No. R2-2009-0074

Revisions to Provision C.3. and Attachment F as proposed in the September 6, 2011, Tentative Order are displayed as underlined type for additions of text and in ~~strikeout~~ format for deletions of text.

Further revisions to Provision C.3. and Attachment F as proposed in the November 18, 2011, Revised Tentative Order are displayed as double-underlined type for additions of text and in ~~double-strikeout~~ format for deletions of text.

C.3. New Development and Redevelopment

C.3.c. Low Impact Development (LID)

The goal of LID is to reduce runoff and mimic a site's predevelopment hydrology by minimizing disturbed areas and impervious cover and then infiltrating, storing, detaining, evapotranspiring, and/or biotreating stormwater runoff close to its source. LID employs principles such as preserving and recreating natural landscape features and minimizing imperviousness to create functional and appealing site drainage that treats stormwater as a resource, rather than a waste product. Practices used to adhere to these LID principles include measures such as rain barrels and cisterns, green roofs, permeable pavement, preserving undeveloped open space, and biotreatment through rain gardens, bioretention units, bioswales, and planter/tree boxes.

Task Description

i. The Permittees shall, at a minimum, implement the following LID requirements:

(1) Source Control Requirements

Require all Regulated Projects to implement source control measures onsite that at a minimum, shall include the following:

- (a) Minimization of stormwater pollutants of concern in urban runoff through measures that may include plumbing of the following discharges to the sanitary sewer, subject to the local sanitary sewer agency's authority and standards:
 - Discharges from indoor floor mat/equipment/hood filter wash racks or covered outdoor wash racks for restaurants;
 - Dumpster drips from covered trash, food waste and compactor enclosures;
 - Discharges from covered outdoor wash areas for vehicles, equipment, and accessories;
 - Swimming pool water, if discharge to onsite vegetated areas is not a feasible option; and
 - Fire sprinkler test water, if discharge to onsite vegetated areas is not a feasible option;
- (b) Properly designed covers, drains, and storage precautions for outdoor material storage areas, loading docks, repair/maintenance bays, and fueling areas;
- (c) Properly designed trash storage areas;
- (d) Landscaping that minimizes irrigation and runoff, promotes surface infiltration, minimizes the use of pesticides and fertilizers, and incorporates other appropriate sustainable landscaping practices and programs such as Bay-Friendly Landscaping;
- (e) Efficient irrigation systems; and
- (f) Storm drain system stenciling or signage.

(2) **Site Design and Stormwater Treatment Requirements**

- (a) Require each Regulated Project to implement at least the following design strategies onsite:
- (i) Limit disturbance of natural water bodies and drainage systems; minimize compaction of highly permeable soils; protect slopes and channels; and minimize impacts from stormwater and urban runoff on the biological integrity of natural drainage systems and water bodies;
 - (ii) Conserve natural areas, including existing trees, other vegetation, and soils;
 - (iii) Minimize impervious surfaces;
 - (iv) Minimize disturbances to natural drainages; and
 - (v) Minimize stormwater runoff by implementing one or more of the following site design measures:
 - Direct roof runoff into cisterns or rain barrels for reuse.
 - Direct roof runoff onto vegetated areas.
 - Direct runoff from sidewalks, walkways, and/or patios onto vegetated areas.
 - Direct runoff from driveways and/or uncovered parking lots onto vegetated areas.
 - Construct sidewalks, walkways, and/or patios with permeable surfaces.³
 - Construct driveways, bike lanes, and/or uncovered parking lots with permeable surfaces.³
- (b) Require each Regulated Project to treat 100% of the amount of runoff identified in Provision C.3.d for the Regulated Project's drainage area with LID treatment measures onsite or with LID treatment measures at a joint stormwater treatment facility.
- (i) LID treatment measures are harvesting and re-use, infiltration, evapotranspiration, or biotreatment.
 - (ii) A properly engineered and maintained biotreatment system may be considered only if it is infeasible to implement harvesting and re-use, infiltration, or evapotranspiration at a project site.
 - (iii) Infeasibility to implement harvesting and re-use, infiltration, or evapotranspiration at a project site may result from conditions including the following:
 - Locations where seasonal high groundwater would be within 10 feet of the base of the LID treatment measure.
 - Locations within 100 feet of a groundwater well used for drinking water.

- Development sites where pollutant mobilization in the soil or groundwater is a documented concern.
 - Locations with potential geotechnical hazards.
 - Smart growth and infill or redevelopment sites where the density and/or nature of the project would create significant difficulty for compliance with the onsite volume retention requirement.
 - Locations with tight clay soils that significantly limit the infiltration of stormwater.
- (iv) By May 1, 2011, the Permittees, collaboratively or individually, shall submit a report on the criteria and procedures the Permittees shall employ to determine when harvesting and re-use, infiltration, or evapotranspiration is feasible and infeasible at a Regulated Project site. This report shall, at a minimum, contain the information required in Provision C.3.c.iii.(1).
- (v) By December 1, 2013, the Permittees, collaboratively or individually, shall submit a report on their experience with determining infeasibility of harvesting and re-use, infiltration, or evapotranspiration at Regulated Project sites. This report shall, at a minimum, contain the information required in Provision C.3.iii.(2).
- (vi) Biotreatment (or bioretention) systems shall be designed to have a surface area no smaller than what is required to accommodate a 5 inches/hour stormwater runoff surface loading rate, and infiltrate runoff at a minimum of 5 inches per hour during the life of the facility. The ~~planting and~~ soil media for biotreatment (or bioretention) systems shall be designed to sustain healthy, vigorous plant growth and maximize stormwater runoff retention and pollutant removal. Permittees shall ensure that Regulated Projects use biotreatment soil media that meet the minimum specifications set forth in Attachment L.
- ~~By December 1, 2010, the Permittees, working collaboratively or individually, shall submit for Water Board approval, a proposed set of model biotreatment soil media specifications and soil infiltration testing methods to verify a long-term infiltration rate of 5 to 10 inches/hour. This submittal to the Water Board shall, at a minimum, contain the information required in Provision C.3.c.iii.(3). Once the Water Board approves biotreatment soil media specifications and soil infiltration testing methods, the Permittees shall ensure that biotreatment systems installed to meet the requirements of Provision C.3.c and d comply with the Water Board approved minimum specifications and soil infiltration testing methods.~~
- (vii) Green roofs may be considered biotreatment systems that treat roof runoff only if they meet certain minimum specifications. ~~By May 1, 2011, the Permittees shall submit for Water Board~~

~~approval, proposed minimum specifications for green roofs. This submittal to the Water Board shall, at a minimum, contain the information required in Provision C.3.c.iii.(4). Once the Water Board approves green roof minimum specifications, the~~
Permittees shall ensure that green roofs installed at Regulated Projects ~~to~~ meet the following requirements of Provision C.3.e and d ~~and d~~ comply with the Water Board approved minimum specifications.:

- The green roof system planting media shall be sufficiently deep to provide capacity within the pore space of the media for the required runoff volume specified by Provision C.3.d.i.(1).
- The green roof system planting media shall be sufficiently deep to support the long term health of the vegetation selected for the green roof, as specified by a landscape architect or other knowledgeable professional.

- (c) Require any Regulated Project that does not comply with Provision C.3.c.i.(2)(b) above to meet the requirements established in Provision C.3.e for alternative compliance.

- ii. **Implementation Level** – All elements of the tasks described in Provision C.3.c.i shall be fully implemented.

Due Date for Full Implementation – December 1, 2011

- (1) For any private development project for which a planning application has been deemed complete by a Permittee on or before the Permit effective date, Provision C.3.c.i shall not apply so long as the project applicant is diligently pursuing the project. Diligent pursuance may be demonstrated by the project applicant's submittal of supplemental information to the original application, plans, or other documents required for any necessary approvals of the project by the Permittee. If during the time period between the Permit effective date and the required implementation date of December 1, 2011, the project applicant has not taken any action to obtain the necessary approvals from the Permittee, the project will then be subject to the requirements of Provision C.3.c.i.
- (2) For any private development project with an application deemed complete after the Permit effective date, the requirements of Provision C.3.c.i shall not apply if the project applicant has received final discretionary approval for the project before the required implementation date of December 1, 2011.
- (3) For public projects for which funding has been committed and construction is scheduled to begin by December 1, 2012, the requirements of Provision C.3.c.i shall not apply.

iii. **Reporting**

- (1) Feasibility/Infeasibility Criteria Report - By May 1, 2011, the Permittees, collaboratively or individually, shall submit a report to the Water Board containing the following information:
 - Literature review and discussion of documented cases/sites, particularly in the Bay Area and California, where infiltration, harvesting and reuse, or evapotranspiration have been demonstrated to be feasible and/or infeasible.
 - Discussion of proposed feasibility and infeasibility criteria and procedures the Permittees shall employ to make a determination of when biotreatment will be allowed at a Regulated Project site.
- (2) Status Report on Application of Feasibility/Infeasibility Criteria – By December 1, 2013, the Permittees shall submit a report to the Water Board containing the following information:
 - Discussion of the most common feasibility and infeasibility criteria employed since implementation of Provision C.3.c requirements, including site-specific examples;
 - Discussion of barriers, including institutional and technical site specific constraints, to implementation of harvesting and reuse, infiltration, or evapotranspiration, and proposed strategies for removing these identified barriers;
 - If applicable, discussion of proposed changes to feasibility and infeasibility criteria and rationale for the changes; and
 - Guidance for the Permittees to make a consistent and appropriate determination of the feasibility of harvesting and reuse, infiltration, or evapotranspiration for each Regulated Project.
- ~~(3) Model Biotreatment Soil Media Specifications—By December 1, 2010, the Permittees, collaboratively or individually, shall submit a report to the Water Board containing the following information:~~
 - ~~• Proposed soil media specifications for biotreatment systems;~~
 - ~~• Proposed soil testing methods to verify a long term infiltration rate of 5-10 inches/hour;~~
 - ~~• Relevant literature and field data showing the feasibility of the minimum design specifications;~~
 - ~~• Relevant literature, field, and analytical data showing adequate pollutant removal and compliance with the Provision C.3.d hydraulic sizing criteria; and~~
 - ~~• Guidance for the Permittees to apply the minimum specifications in a consistent and appropriate manner.~~
- ~~(4) Green Roof Minimum Specifications—By May 1, 2011, the Permittees, collaboratively or individually, shall submit a report to the Water Board containing the following information:~~
 - ~~• Proposed minimum design specifications for green roofs;~~

- ~~• Relevant literature and field data showing the feasibility of the minimum design specifications;~~
 - ~~• Relevant literature, field, and analytical data showing adequate pollutant removal and compliance with the Provision C.3.d hydraulic sizing criteria;~~
 - ~~• Discussion of data and lessons learned from already installed green roofs;~~
 - ~~• Discussion of barriers, including institutional and technical site specific constraints, to installation of green roofs and proposed strategies for removing these identified barriers; and~~
 - ~~• Guidance for the Permittees to apply the minimum specifications in a consistent and appropriate manner.~~
- (3) Report the method(s) of implementation of Provisions C.3.c.i above in the 2012 Annual Report. For specific tasks listed above that are reported using the reporting tables required for Provision C.3.b.v, a reference to those tables will suffice.

C.3.d. Numeric Sizing Criteria for Stormwater Treatment Systems

- i. Task Description** – The Permittees shall require that stormwater treatment systems constructed for Regulated Projects meet at least one of the following hydraulic sizing design criteria:
- (1) **Volume Hydraulic Design Basis** – Treatment systems whose primary mode of action depends on volume capacity shall be designed to treat stormwater runoff equal to:
- (a) The maximized stormwater capture volume for the area, on the basis of historical rainfall records, determined using the formula and volume capture coefficients set forth in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87, (1998), pages 175–178 (e.g., approximately the 85th percentile 24-hour storm runoff event); or
 - (b) The volume of annual runoff required to achieve 80 percent or more capture, determined in accordance with the methodology set forth in Section 5 of the California Stormwater Quality Association’s Stormwater Best Management Practice Handbook, New Development and Redevelopment (2003), using local rainfall data.
- (2) **Flow Hydraulic Design Basis** – Treatment systems whose primary mode of action depends on flow capacity shall be sized to treat:
- (a) 10 percent of the 50-year peak flowrate;
 - (b) The flow of runoff produced by a rain event equal to at least two times the 85th percentile hourly rainfall intensity for the applicable area, based on historical records of hourly rainfall depths; or
 - (c) The flow of runoff resulting from a rain event equal to at least 0.2 inches per hour intensity.

- (3) **Combination Flow and Volume Design Basis** – Treatment systems that use a combination of flow and volume capacity shall be sized to treat at least 80 percent of the total runoff over the life of the project, using local rainfall data.
- ii. **Implementation Level** – The Permittees shall immediately require the controls in this task.
- Due Date for Full Implementation** – Immediate, except December 1, 2010, for Vallejo Permittees.
- iii. **Reporting** – Permittees shall use the reporting tables required in Provision C.3.b.v.
- iv. **Limitations on Use of Infiltration Devices in Stormwater Treatment Systems**
- (1) For Regulated Projects, each Permittee shall review planned land use and proposed treatment design to verify that installed stormwater treatment systems with no under-drain, and that function primarily as infiltration devices, should not cause or contribute to the degradation of groundwater quality at project sites. An infiltration device is any structure that is deeper than wide and designed to infiltrate stormwater into the subsurface and, as designed, bypass the natural groundwater protection afforded by surface soil. Infiltration devices include dry wells, injection wells, and infiltration trenches (includes french drains).
- (2) For any Regulated Project that includes plans to install stormwater treatment systems which function primarily as infiltration devices, the Permittee shall require that:
- (a) Appropriate pollution prevention and source control measures are implemented to protect groundwater at the project site, including the inclusion of a minimum of two feet of suitable soil to achieve a maximum 5 inches/hour infiltration rate for the infiltration system;
 - (b) Adequate maintenance is provided to maximize pollutant removal capabilities;
 - (c) The vertical distance from the base of any infiltration device to the seasonal high groundwater mark is at least 10 feet. (Note that some locations within the Permittees' jurisdictions are characterized by highly porous soils and/or high groundwater tables. In these areas, a greater vertical distance from the base of the infiltration device to the seasonal high groundwater mark may be appropriate, and treatment system approvals should be subject to a higher level of analysis that considers the potential for pollutants (such as from onsite chemical use), the level of pretreatment to be achieved, and other similar factors in the overall analysis of groundwater safety);
 - (d) Unless stormwater is first treated by a method other than infiltration, infiltration devices are not approved as treatment measures for runoff from areas of industrial or light industrial activity; areas subject to high vehicular traffic (i.e., 25,000 or greater average daily traffic on a

main roadway or 15,000 or more average daily traffic on any intersecting roadway); automotive repair shops; car washes; fleet storage areas (e.g., bus, truck); nurseries; and other land uses that pose a high threat to water quality;

- (e) Infiltration devices are not placed in the vicinity of known contamination sites unless it has been demonstrated that increased infiltration will not increase leaching of contaminants from soil, alter groundwater flow conditions affecting contaminant migration in groundwater, or adversely affect remedial activities; and
- (f) Infiltration devices are located a minimum of 100 feet horizontally away from any known water supply wells, septic systems, and underground storage tanks with hazardous materials. (Note that some locations within the Permittees' jurisdictions are characterized by highly porous soils and/or high groundwater tables. In these areas, a greater horizontal distance from the infiltration device to known water supply wells, septic systems, or underground storage tanks with hazardous materials may be appropriate, and treatment system approvals should be subject to a higher level of analysis that considers the potential for pollutants (such as from onsite chemical use), the level of pretreatment to be achieved, and other similar factors in the overall analysis of groundwater safety).

C.3.e. Alternative or In-Lieu Compliance with Provision C.3.c.

- i. The Permittees may allow a Regulated Project to provide alternative compliance with Provision C.3.c in accordance with one of the two options listed below:

(1) **Option 1: LID Treatment at an Offsite Location**

Treat a portion of the amount of runoff identified in Provision C.3.d for the Regulated Project's drainage area with LID treatment measures onsite or with LID treatment measures at a joint stormwater treatment facility **and** treat the remaining portion of the Provision C.3.d runoff with LID treatment measures at an offsite project in the same watershed. The offsite LID treatment measures must provide hydraulically-sized treatment (in accordance with Provision C.3.d) of an equivalent quantity of both stormwater runoff and pollutant loading and achieve a net environmental benefit.

(2) **Option 2: Payment of In-Lieu Fees**

Treat a portion of the amount of runoff identified in Provision C.3.d for the Regulated Project's drainage area with LID treatment measures onsite or with LID treatment measures at a joint stormwater treatment facility **and** pay equivalent in-lieu fees² to treat the remaining portion of the Provision

² **In-lieu fees** – Monetary amount necessary to provide both hydraulically-sized treatment (in accordance with Provision C.3.d) with LID treatment measures of an equivalent quantity of stormwater runoff and pollutant loading, and a proportional share of the operation and maintenance costs of the Regional Project.

C.3.d runoff with LID treatment measures at a Regional Project.³ The Regional Project must achieve a net environmental benefit.

- (3) For the alternative compliance options described in Provision C.3.e.i.(1) and (2) above, offsite projects must be constructed by the end of construction of the Regulated Project. If more time is needed to construct the offsite project, for each additional year, up to three years, after the construction of the Regulated Project, the offsite project must provide an additional 10% of the calculated equivalent quantity of both stormwater runoff and pollutant loading. Regional Projects must be completed within three years after the end of construction of the Regulated Project. However, the timeline for completion of the Regional Project may be extended, up to five years after the completion of the Regulated Project, with prior Executive Officer approval. Executive Officer approval will be granted contingent upon a demonstration of good faith efforts to implement the Regional Project, such as having funds encumbered and applying for the appropriate regulatory permits.

ii. Special Projects

- (1) When considered at the watershed scale, certain land development projects characterized as ~~types of~~ smart growth, high density, ~~and or~~ transit-oriented development can either reduce existing impervious surfaces, or create less “accessory” impervious areas and automobile-related pollutant impacts. Incentive LID Treatment Reduction Credits approved by the Water Board may be applied to these ~~types of~~ Special Projects, which are Regulated Projects that meet the specific criteria listed below in Provisions C.3.e.ii.(2),(3)&(4). For any Special Project, the allowable incentive LID Treatment Reduction Credit is the maximum percentage of the amount of runoff identified in Provision C.3.d. for the Special Project’s drainage area, that may be treated with one or a combination of the following two types of non-LID treatment systems:

- Tree-box-type high flowrate biofilters
- Vault-based high flowrate media filters

The allowed LID Treatment Reduction Credit recognizes that density and space limitations for the Special Projects identified herein may make 100% LID treatment infeasible. Under Provision C.3.e.vi, each Permittee is required to report on the infeasibility of LID treatment for each of the Special Projects for which LID Treatment Reduction Credit was applied.

- (2) Category A Special Project Criteria
 - (a) To be considered a Category A Special Project, a Regulated Project must meet all of the following criteria:

³ **Regional Project** – A regional or municipal stormwater treatment facility that discharges into the same watershed that the Regulated Project does.

- (i) Be built as part of a Permittee's stated objective to preserve or enhance a pedestrian-oriented type of urban design.
 - (ii) Be located in a Permittee's designated central business district, downtown core area or downtown core zoning district, neighborhood business district or comparable pedestrian-oriented commercial district, or historic preservation site and/or district.
 - (iii) Create and/or replace one half acre or less of impervious surface area.
 - (iv) Include no surface parking, except for incidental surface parking. Incidental surface parking is allowed only for emergency vehicle access, Americans with Disabilities Act (ADA) accessibility, and passenger and freight loading zones.
 - (v) Have at least 85% coverage for the entire project site by permanent structures. The remaining 15% portion of the site is to be used for safety access, parking structure entrances, trash and recycling service, utility access, pedestrian connections, public uses, landscaping, and stormwater treatment.
- (b) Any Category A Special Project may qualify for 100% LID Treatment Reduction Credit, which would allow the Category A Special Project to treat up to 100% of the amount of runoff identified in Provision C.3.d. for the Project's drainage area with either one or a combination of the two types of non-LID treatment systems listed in Provision C.3.e.ii.(1) above.

(3) Category B Special Project Criteria

- (a) To be considered a Category B Special Project, a Regulated Project must meet all of the following criteria:
 - (i) Be built as part of a Permittee's stated objective to preserve or enhance a pedestrian-oriented type of urban design.
 - (ii) Be located in a Permittee's designated central business district, downtown core area or downtown core zoning district, neighborhood business district or comparable pedestrian-oriented commercial district, or historic preservation site and/or district.
 - (iii) Create and/or replace greater than one-half acre but no more than 2 acres of impervious surface area.
 - (iv) Include no surface parking, except for incidental surface parking. Incidental surface parking is allowed only for emergency vehicle access, ADA accessibility, and passenger and freight loading zones.
 - (v) Have at least 85% coverage for the entire project site by permanent structures. The remaining 15% portion of the site is to be used for safety access, parking structure entrances, trash

- and recycling service, utility access, pedestrian connections, public uses, landscaping, and stormwater treatment.
- (b) For any Category B Special Project, the maximum LID Treatment Reduction Credit allowed is determined based on the density achieved by the Project in accordance with the criteria listed below. Density is expressed in Floor Area Ratios (FARs) for commercial and mixed-use development projects and in Dwelling Units per Acre (DU/Ac) for residential development projects.
- (i) 50% Maximum LID Treatment Reduction Credit
- For any commercial or mixed use Category B Special Project with a FAR of at least 2:1, up to 50% of the amount of runoff identified in Provision C.3.d. for the Project's drainage area may be treated with either one or a combination of the two types of non-LID treatment systems listed in Provision C.3.e.ii.(1) above.
 - For any residential Category B Special Project with a density of at least 50 DU/Ac, up to 50% of the amount of runoff identified in Provision C.3.d. for the Project's drainage area may be treated with either one or a combination of the two types of non-LID treatment systems listed in Provision C.3.e.ii.(1) above.
- (ii) 75% Maximum LID Treatment Reduction Credit
- For any commercial or mixed use Category B Special Project with a FAR of at least 3:1, up to 75% of the amount of runoff identified in Provision C.3.d. for the Project's drainage area may be treated with either one or a combination of the two types of non-LID treatment systems listed in Provision C.3.e.ii.(1) above.
 - For any residential Category B Special Project with a density of at least 75 DU/Ac, up to 75% of the amount of runoff identified in Provision C.3.d. for the Project's drainage area may be treated with either one or a combination of the two types of non-LID treatment systems listed in Provision C.3.e.ii.(1) above.
- (iii) 100% Maximum LID Treatment Reduction Credit
- For any commercial or mixed use Category B Special Project with a FAR of at least 4:1, up to 100% of the amount of runoff identified in Provision C.3.d. for the Project's drainage area may be treated with either one or a combination of the two types of non-LID treatment systems listed in Provision C.3.e.ii.(1) above.
 - For any residential Category B Special Project with a density of at least 100 DU/Ac, up to 100% of the amount of runoff identified in Provision C.3.d. for the Project's drainage area may be treated with either one or a combination of the two types of non-LID treatment systems listed in Provision C.3.e.ii.(1) above.
- (4) Category C Special Project Criteria (Transit-Oriented Development)
- (a) Transit-Oriented Development refers to the clustering of homes, jobs, shops and services in close proximity to rail stations, ferry terminals

or bus stops offering access to frequent, high-quality transit services. This pattern typically involves compact development and a mixing of different land uses, along with amenities like pedestrian-friendly streets. To be considered a Category C Special Project, a Regulated Project must meet all of the following criteria:

- (i) Be characterized as a non auto-related land use project. That is, Category C specifically excludes any Regulated Project that is a stand-alone surface parking lot; car dealership; auto and truck rental facility with onsite surface storage; fast-food restaurant, bank or pharmacy with drive-through lanes; gas station, car wash, auto repair and service facility; or other auto-related project unrelated to the concept of Transit-Oriented Development.
 - (ii) If a commercial or mixed-use development project, achieve at least an FAR of 2:1.
 - (iii) If a residential development project, achieve at least a density of 25 DU/Ac.
- (b) For any Category C Special Project, the total maximum LID Treatment Reduction Credit allowed is the sum of three different types of credits that the Category C Special Project may qualify for, namely: Location, Density and Minimized Surface Parking Credits.
- (c) Location Credits
- (i) A Category C Special Project may qualify for the following Location Credits:
 - 50% Location Credit: Located within a ¼ mile radius of an existing or planned transit hub.
 - 25% Location Credit: Located within a ½ mile radius of an existing or planned transit hub.
 - 25% Location Credit: Located within a planned Priority Development Area (PDA), which is an infill development area formally designated by the Association of Bay Area Government's / Metropolitan Transportation Commission's FOCUS regional planning program. FOCUS is a regional incentive-based development and conservation strategy for the San Francisco Bay Area.
 - (ii) Only one Location Credit may be used by an individual Category C Special Project, even if the project qualifies for multiple Location Credits.
 - (iii) At least 50% or more of a Category C Special Project's site must be located within the ¼ or ½ mile radius of an existing or planned transit hub to qualify for the corresponding Location Credits listed above. One hundred percent of a Category C Special Project's site must be located within a PDA to qualify for the corresponding Location Credit listed above.

- (iv) Transit hub is defined as a rail, light rail, or commuter rail station, ferry terminal, or bus transfer station served by three or more bus routes (i.e., a bus stop with no supporting services does not qualify). A planned transit hub is a station on the MTC's Regional Transit Expansion Program list, per MTC's Resolution 3434 (revised April 2006), which is a regional priority funding plan for future transit stations in the San Francisco Bay Area.
- (d) Density Credits: To qualify for any Density Credits, a Category C Special Project must first qualify for one of the Location Credits listed in Provision C.3.e.ii.(4)(c) above.
- (i) A Category C Special Project that is a commercial or mixed-use development project may qualify for the following Density Credits:
- 10% Density Credit: Achieve an FAR of at least 2:1.
 - 20% Density Credit: Achieve an FAR of at least 4:1.
 - 30% Density Credit: Achieve an FAR of at least 6:1.
- (ii) A Category C Special Project that is a residential development project may qualify for the following Density Credits:
- 10% Density Credit: Achieve a density of at least 30 DU/Ac.
 - 20% Density Credit: Achieve a density of at least 60 DU/Ac.
 - 30% Density Credit: Achieve a density of at least 100 DU/Ac.
- (iii) Commercial and mixed-use Category C Projects do not qualify for Density Credits based on DU/Ac and residential Category C Projects do not qualify for Density Credits based on FAR.
- (iv) Only one Density Credit may be used by an individual Category C Special Project, even if the project qualifies for multiple Density Credits.
- (e) Minimized Surface Parking Credits: To qualify for any Minimized Surface Parking Credits, a Category C Special Project must first qualify for one of the Location Credits listed in Provision C.3.e.ii.(4)(c) above.
- (i) A Category C Special Project may qualify for the following Minimized Surface Parking Credits:
- 10% Minimized Surface Parking Credit: Have 10% or less of the total post-project impervious surface area dedicated to at-grade surface parking. The at-grade surface parking must be treated with LID treatment measures.
 - 20% Minimized Surface Parking Credit: Have no surface parking except for incidental surface parking. Incidental surface parking is allowed only for emergency vehicle access, ADA accessibility, and passenger and freight loading zones.

- (ii) Only one Minimized Surface Parking Credit may be used by an individual Category C Special Project, even if the project qualifies for multiple Minimized Surface Parking Credits.
- (5) Any Regulated Project that meets all the criteria for multiple Special Projects Categories (i.e., a Regulated Project that may be characterized as a Category B or C Special Project) may only use the LID Treatment Reduction Credit allowed under one of the Special Projects Categories (i.e., a Regulated Project that may be characterized as a Category B or C Special Project may use the LID Treatment Reduction Credit allowed under Category B or Category C, but not the sum of both.)
- ~~(2) By December 1, 2010, the Permittees shall submit a proposal to the Water Board containing the following information:~~
 - ~~• Identification of the types of projects proposed for consideration of LID treatment reduction credits and an estimate of the number and cumulative area of potential projects during the remaining term of this Permit for each type of project;~~
 - ~~• Identification of institutional barriers and/or technical site specific constraints to providing 100% LID treatment onsite that justify the allowance for non-LID treatment measures onsite;~~
 - ~~• Specific criteria for each type of Special Project proposed, including size, location, minimum densities, minimum floor area ratios, or other appropriate limitations;~~
 - ~~• Identification of specific water quality and environmental benefits provided by these types of projects that justify the allowance for non-LID treatment measures onsite;~~
 - ~~• Proposed LID treatment reduction credit for each type of Special Project and justification for the proposed credits. The justification shall include identification and an estimate of the specific water quality benefit provided by each type of Special Project proposed for LID treatment reduction credit; and~~
 - ~~• Proposed total treatment reduction credit for Special Projects that may be characterized by more than one category and justification for the proposed total credit.~~

iii. Effective Date – December 1, 2011.

iv. Implementation Level

- (1) For any private development project for which a planning application has been deemed complete by a Permittee on or before the Permit effective date, Provisions C.3.e.i-ii shall not apply so long as the project applicant is diligently pursuing the project. Diligent pursuance may be demonstrated by the project applicant's submittal of supplemental information to the original application, plans, or other documents required for any necessary approvals of the project by the Permittee. If during the time period between the Permit effective date and the required implementation date of December 1, 2011, the project applicant has not taken any action to obtain

the necessary approvals from the Permittee, the project will then be subject to the requirements of Provision C.3.e.i-ii.

- (2) For public projects for which funding has been committed and construction is scheduled to begin by December 1, 2012, the requirements of Provisions C.3.e.i-ii shall not apply.
 - (3) Provisions C.3.e.i-ii supersede any Alternative Compliance Policies previously approved by the Executive Officer
 - (4) For all offsite projects and Regional Projects installed in accordance with Provision C.3.e.i-ii, the Permittees shall meet the Operation & Maintenance (O&M) requirements of Provision C.3.h.
- v. **Reporting** –The Permittees shall submit the ordinance/legal authority and procedural changes made, if any, to implement Provision C.3.e with their 2012 Annual Report. Annual reporting thereafter shall be done in conjunction with reporting requirements under Provision C.3.b.v.

Any Permittee choosing to require 100% LID treatment onsite for all Regulated Projects and not allow alternative compliance under Provision C.3.e, shall include a statement to that effect in the 2012 Annual Report and all subsequent Annual Reports.

vi. Reporting on Special Projects

- (1) Beginning December 1, 2011, Permittees shall track any identified potential Special Projects that have submitted planning applications but that have not received final discretionary approval.
- (2) By March 15 and September 15 of each year, Permittees shall report to the Water Board on these tracked potential Special Projects using Table 3.1 found at the end of Provision C.3. All the required column entry information listed in Table 3.1 shall be reported for each potential Special Project. Any Permittee with no potential Special Projects shall so state.

For each Special Project listed in Table 3.1, Permittees shall include a narrative discussion of the feasibility or infeasibility of 100% LID treatment, onsite and offsite. Both technical and economic feasibility or infeasibility shall be discussed, as applicable. The discussion shall also contain enough technical and/or economic detail to document the basis of infeasibility used.

- ~~(2)~~(3) Once a Special Project has final discretionary approval, it shall be reported in the Provision C.3.b. Reporting Table in the same reporting year that the project was approved. In addition to the column entries contained in the Provision C.3.b. Reporting Table, the Permittees shall provide the following supplemental information for each approved Special Project:
 - (a) Submittal Date: Date that a planning application for the Special Project was submitted.
 - (b) Description: Type of project, number of floors, number of units (commercial, mixed-use, residential), type of parking, and other relevant information.

- (c) Site Acreage: Total site area in acres.
- (d) Density in DU/Ac: Number of dwelling units per acre.
- (e) Density in FAR: Floor Area Ratio
- (f) Special Project Category: For each applicable Special Project Category, ~~indicate applicability to the subject Special Project. If a Category is applicable, list the specific criteria applied to determine applicability.~~ For each non-applicable Special Project Category, indicate n/a.
- (g) LID Treatment Reduction Credit Available: For each applicable Special Project Category, state the maximum total LID Treatment Reduction Credit applied. For Category C Special Projects also list the individual Location, Density, and Minimized Surface Parking Credits applied.
- (h) List of Stormwater Treatment Systems: List all LID stormwater treatment systems approved ~~proposed, stormwater treatment systems and the corresponding~~. For each type of LID treatment system, indicate the percentage of the total amount of runoff identified in Provision C.3.d. for the Special Project's drainage area that will be treated by each treatment system.
- ~~(h)~~(i) List of Non-LID Stormwater Treatment Systems: List all non-LID stormwater treatment systems approved. For each type of non-LID treatment system, indicate: (1) the percentage of the total amount of runoff identified in Provision C.3.d. for the Special Project's drainage area, and (2) whether the treatment system either meets minimum design criteria published by a government agency or received certification issued by a government agency, and reference the applicable criteria or certification.

Table 3.1 Standard Tracking and Reporting Form for Potential Special Projects

<u>Project Name and No.</u>	<u>Permittee</u>	<u>Address</u>	<u>Application Submittal Date</u>	<u>Description</u>	<u>Site Total Acreage</u>	<u>Density DU/Ac</u>	<u>Density FAR</u>	<u>Special Project Category</u>	<u>LID Treatment Reduction Credit Available</u>	<u>List of LID Stormwater Treatment Systems</u>	<u>List of Non-LID Stormwater Treatment Systems</u>
								<u>Category A:</u> <u>Category B:</u> <u>Category C:</u> <u>Location:</u> <u>Density:</u> <u>Parking:</u>	<u>Category A:</u> <u>Category B:</u> <u>Category C:</u> <u>Location:</u> <u>Density:</u> <u>Parking:</u>	<u>Indicate each type of LID treatment system and the percentage of total runoff treated.</u>	<u>Indicate each type of non-LID treatment system and the percentage of total runoff treated. Indicate whether minimum design criteria met or certification received (see footnotes).</u>

Project Name and No: Name of the Special Project and Project No. (if applicable)

Permittee: Name of the Permittee in whose jurisdiction the Special Project will be built.

Address: Address of the Special Project; if no street address, state the cross streets.

Submittal Date: Date that a planning application for the Special Project was submitted; if a planning application has not been submitted, include a projected application submittal date.

Description: Type of project (commercial, mixed-use, residential), number of floors, number of units, type of parking, and other relevant information.

Site Acreage: Total site area in acres.

Density in DU/Ac: Number of dwelling units per acre.

Density in FAR: Floor Area Ratio

Special Project Category: For each applicable Special Project Category, indicate applicability. If a Category is applicable, list the specific criteria applied to determine applicability. For each non-applicable Special Project Category, indicate n/a.

LID Treatment Reduction Credit Available: For each applicable Special Project Category, state the maximum total LID Treatment Reduction Credit available. For Category C Special Projects also list the individual Location, Density, and Minimized Surface Parking Credits available.

List of LID Stormwater Treatment Systems: List all LID stormwater treatment systems proposed ~~stormwater treatment systems and the corresponding~~. For each type, indicate the percentage of the total amount of runoff ~~runoff~~ identified in Provision C.3.d. for the Special Project's drainage area ~~that will be treated by each treatment system~~.

List of Non-LID Stormwater Treatment Systems: List all non-LID stormwater treatment systems proposed. For each type, indicate the percentage of the total amount of runoff identified in Provision C.3.d. for the Special Project's drainage area. For each type of non-LID treatment system, indicate: (1) the percentage of the total amount of runoff identified in Provision C.3.d. for the Special Project's drainage area, and (2) whether the treatment system either meets minimum design criteria published by a government agency or received certification issued by a government agency, and reference the applicable criteria or certification.

ATTACHMENT F

Provision C.3.g. Santa Clara Permittees Hydromodification Management Requirements

Santa Clara Permittees Hydromodification Management Requirements

1. On-site and Regional Hydromodification Management (HM) Control Design Criteria

- a. *Range of flows to control:* Flow duration controls shall be designed such that post-project stormwater discharge rates and durations match pre-project discharge rates and durations from 10 percent of the pre-project 2-year peak flow⁴ up to the pre-project 10-year peak flow, except where the lower endpoint of this range is modified as described in Section 5 of this Attachment.
- b. *Goodness of fit criteria:* The post-project flow duration curve shall not deviate above the pre-project flow duration curve by more than 10 percent over more than 10 percent of the length of the curve corresponding to the range of flows to control.
- c. *Allowable low flow rate:* Flow control structures may be designed to discharge stormwater at a very low rate that does not threaten to erode the receiving waterbody. This flow rate (also called Q_{cp} ⁵) shall be no greater than 10 percent of the pre-project 2-year peak flow unless a modified value is substantiated by analysis of actual channel resistance in accordance with an approved User Guide as described in Section 5 of this Attachment.
- d. *Standard HM modeling:* On-site and regional HM controls designed using the Bay Area Hydrology Model (BAHM⁶) and site-specific input data shall be considered to meet the HM Standard. Such use must be consistent with directions and options set forth in the most current BAHM User Manual.⁷ Permittees shall demonstrate to the satisfaction of the Executive Officer that any modifications of the BAHM made are consistent with this attachment and Provision C.3.g.

⁴ Where referred to in this Order, the 2-year peak flow is determined using a flood flow frequency analysis procedure based on USGS Bulletin 17B to obtain the peak flow statistically expected to occur at a 2-year recurrence interval. In this analysis, the appropriate record of hourly rainfall data (e.g., 35–50 years of data) is run through a continuous simulation hydrologic model, the annual peak flows are identified, rank ordered, and the 2-year peak flow is estimated. Such models include USEPA's Hydrologic Simulation Program—Fortran (HSPF), U.S. Army Corps of Engineers' Hydrologic Engineering Center-Hydrologic Modeling System (HEC-HMS), and USEPA's Storm Water Management Model (SWMM).

⁵ Q_{cp} is the allowable low flow discharge from a flow control structure on a project site. It is a means of apportioning the critical flow in a stream to individual projects that discharge to that stream, such that cumulative discharges do not exceed the critical flow in the stream.

⁶ See www.bayareahydrologymodel.org, Resources.

⁷ The Bay Area Hydrology Model User Manual is available at <http://www.bayareahydrologymodel.org/downloads.html>.

- e. *Alternate HM modeling and design:* The project proponent may use a continuous simulation hydrologic computer model⁸ to simulate pre-project and post-project runoff and to design HM controls. To use this method, the project proponent shall compare the pre-project and post-project model output for a rainfall record of at least 30 years, and shall show that all applicable performance criteria in 1.a. – c. above are met.

2. Impracticability Provision

Where conditions (e.g., extreme space limitations) prevent a project from meeting the HM Standard for a reasonable cost, *and* where the project's runoff cannot be directed to a Regional HM control⁹ within a reasonable time frame, *and* where an in-stream measure is not practicable, the project shall use (1) site design for hydrologic source control, *and* (2) stormwater treatment measures that collectively minimize, slow, and detain¹⁰ runoff to the maximum extent practicable. In addition, if the cost of providing site design for hydrologic source control and treatment measures to the maximum extent practicable does not exceed 2% of the project cost (as defined in "2.a." below), the project shall contribute financially to an alternative HM project as set forth below:

- a. *Reasonable cost:* To show that the HM Standard cannot be met at a reasonable cost, the project proponent must demonstrate that the total cost to comply with both the HM Standard and the Provision C.3.d treatment requirement exceeds 2 percent of the project construction cost, excluding land costs. Costs of HM and treatment control measures shall not include land costs, soil disposal fees, hauling, contaminated soil testing, mitigation, disposal, or other normal site enhancement costs such as landscaping or grading that are required for other development purposes.
- b. *Regional HM control:* A regional HM control shall be considered available if there is a planned location for the regional HM control and if an appropriate funding mechanism for a regional control is in place by the time of project construction.
- c. *In-stream measures practicability:* In-stream measures shall be considered practicable when an in-stream measure for the project's watershed is planned and an appropriate funding mechanism for an in-stream measure is in place by the time of project construction.
- d. *Financial contribution to an alternative HM project:* The difference between 2 percent of the project construction costs and the cost of the treatment measures at the site (both costs as described in Section 2.a of this Attachment) shall be contributed to an alternative HM project, such as a stormwater treatment retrofit, HM retrofit, regional HM control, or in-stream measure. Preference shall be given to projects discharging, in this order, to the same tributary, mainstem, watershed, then in the same municipality or county.

3. Record Keeping

⁸ Such models include USEPA's Hydrologic Simulation Program—Fortran (HSPF), U.S. Army Corps of Engineers Hydrologic Engineering Center-Hydrologic Modeling System (HEC-HMS), and USEPA's Storm Water Management Model (SWMM).

⁹ *Regional HM controls* are flow duration control structures that collect stormwater runoff discharge from multiple projects (each of which should incorporate hydrologic source control measures as well) and are designed such that the HM Standard is met for all the projects at the point where the regional control measure discharges.

¹⁰ Stormwater treatment measures that detain runoff are generally those that filter runoff through soil or other media, and include bioretention units, bioswales, basins, planter boxes, sand filters, and green roofs.

Permittees shall collect and retain the following information for all projects subject to HM requirements:

- a. Site plans identifying impervious areas, surface flow directions for the entire site, and location(s) of HM measures;
- b. For projects using standard sizing charts, a summary of sizing calculations used;
- c. For projects using the BAHM, a listing of model inputs;
- d. For projects using custom modeling, a summary of the modeling calculations with corresponding graph showing curve matching (existing, post-project, and post-project with HM controls curves);
- e. For projects using the Impracticability Provision, a listing of all applicable costs and a brief description of the alternative HM project (name, location, date of start up, entity responsible for maintenance); and
- f. A listing, summary, and date of modifications made to the BAHM, including technical rationale. Permittees shall submit this list and explanation annually with the Annual Report. This may be prepared at the Countywide Program level and submitted on behalf of participating Permittees.

4. HM Control Areas

Applicable projects shall be required to meet the HM Standard when such projects are located in areas of HM applicability as described below and shown in the [revised Santa Clara Permittees' HM Map \(see Attachment M\)](http://www.waterboards.ca.gov/sanfranciseobay/water_issues/programs/stormwater/muni/mrp/Final%20TO%20HM%20Maps.pdf). ~~the Santa Clara Permittees' HM Map (available at http://www.waterboards.ca.gov/sanfranciseobay/water_issues/programs/stormwater/muni/mrp/Final%20TO%20HM%20Maps.pdf).~~

- a. **Purple areas:** These areas represent catchments that drain to hardened channels that extend continuously to the Bay or to tidally influenced sections of creeks. The HM Standard and associated requirements do not apply to projects in the areas designated in purple on the map.

Plans to restore a creek reach may reintroduce the applicability of HM requirements, unless the creek restoration project is designed to accommodate the potential hydromodification impacts of future development; if this is not the case, in these instances, Permittees may add, but shall not delete, areas of applicability accordingly.

- b. **Red areas:** These areas represent catchments and subwatersheds that are greater than or equal to 65% impervious, based on existing imperviousness data sources. The HM Standard and associated requirements do not apply to projects in the areas designated in red on the map.

~~c. **Pink areas:** These are areas that are under review by the Permittees for accuracy of the imperviousness data. The HM Standard and associated requirements apply to projects in areas designated as pink on the map until such time as a Permittee presents new data that indicate that the actual level of imperviousness of a particular area is greater than or equal to 65% impervious. Any new data will be submitted to the Water Board in one coordinated submittal within one year of permit adoption.~~

- c. **Green area:** These areas represent catchments and subwatersheds that are less than 65% impervious ~~and are not under review by the Permittees~~. The HM Standard and associated requirements apply to projects in areas designated as green on the map.

5. Potential Exceptions to Map Designations

The Program may choose to prepare a User Guide¹¹ to be used for evaluating individual receiving waterbodies using detailed methods to assess channel stability and watercourse critical flow. This User Guide would reiterate and collate established stream stability assessment methods that have been presented in the Program's HMP.¹² After the Program has collated its methods into User Guide format, received approval of the User Guide from the Executive Officer,¹³ and informed the public through such process as an electronic mailing list, the Permittees may use the User Guide to guide preparation of technical reports for the following: implementing the HM Standard using in-stream or regional controls; determining whether certain projects are discharging to a watercourse that is less susceptible (from point of discharge to the Bay) to hydromodification (e.g., would have a lower potential for erosion than set forth in these requirements); and/or determining if a watercourse has a higher critical flow and project(s) discharging to it are eligible for an alternative Qcp for the purpose of designing on-site or regional measures to control flows draining to these channels (i.e., the actual threshold of erosion-causing critical flow is higher than 10 percent of the 2-year pre-project flow). In no case shall the design value of Qcp exceed 50 percent of the 2-year pre-project flow.

¹¹ The User Guide may be offered under a different title.

¹² The Program's HMP has undergone Water Board staff review and been subject to public notice and comment.

¹³ The User Guide will not introduce a new concept, but rather reformat existing methods; therefore, Executive Officer approval is appropriate.

APPENDIX II

**Attachments L and M
to be added to
Water Board Order No. R2-2009-0074**

ATTACHMENT L

Provision C.3.c.i.(1)(b)(vi)

Specification of soils for Biotreatment or Bioretention Facilities

Soils for biotreatment or bioretention areas shall meet two objectives:

- Be sufficiently permeable to infiltrate runoff at a minimum rate of 5" per hour during the life of the facility, and
- Have sufficient moisture retention to support healthy vegetation.

Achieving both objectives with an engineered soil mix requires careful specification of soil gradations and a substantial component of organic material (typically compost).

Local soil products suppliers have expressed interest in developing 'brand-name' mixes that meet these specifications. At their sole discretion, municipal construction inspectors may choose to accept test results and certification for a 'brand-name' mix from a soil supplier.

Tests must be conducted within 120 days prior to the delivery date of the bioretention soil to the project site.

Batch-specific test results and certification shall be required for projects installing more than 100 cubic yards of bioretention soil.

SOIL SPECIFICATIONS

Bioretention soils shall meet the following criteria. "Applicant" refers to the entity proposing the soil mixture for approval by a Permittee.

1. General Requirements – Bioretention soil shall:
 - a. Achieve a long-term, in-place infiltration rate of at least 5 inches per hour.
 - b. Support vigorous plant growth.
 - c. Consist of the following mixture of fine sand and compost, measured on a volume basis:
 - 60%-70% Sand
 - 30%-40% Compost
2. Submittal Requirements – The applicant shall submit to the Permittee for approval:
 - a. A sample of mixed bioretention soil.
 - b. Certification from the soil supplier or an accredited laboratory that the Bioretention Soil meets the requirements of this guideline specification.
 - c. Grain size analysis results of the fine sand component performed in accordance with ASTM D 422, Standard Test Method for Particle Size Analysis of Soils.
 - d. Quality analysis results for compost performed in accordance with Seal of Testing Assurance (STA) standards, as specified in 4.

- e. Organic content test results of mixed Bioretention Soil. Organic content test shall be performed in accordance with by Testing Methods for the Examination of Compost and Composting (TMECC) 05.07A, "Loss-On-Ignition Organic Matter Method".
- f. Grain size analysis results of compost component performed in accordance with ASTM D 422, Standard Test Method for Particle Size Analysis of Soils.
- g. A description of the equipment and methods used to mix the sand and compost to produce Bioretention Soil.
- h. Provide the name of the testing laboratory(s) and the following information:
 - (1) Contact person(s)
 - (2) Address(s)
 - (3) Phone contact(s)
 - (4) E-mail address(s)
 - (5) Qualifications of laboratory(s), and personnel including date of current certification by STA, ASTM, or approved equal

3. Sand for Bioretention Soil

- a. Sand shall be free of wood, waste, coating such as clay, stone dust, carbonate, etc., or any other deleterious material. All aggregate passing the No. 200 sieve size shall be non-plastic.
- b. Sand for Bioretention Soils shall be analyzed by an accredited lab using #200, #100, #40, #30, #16, #8, #4, and 3/8 inch sieves (ASTM D 422 or as approved by municipality), and meet the following gradation:

Sieve Size	Percent Passing (by weight)	
	<i>Min</i>	<i>Max</i>
3/8 inch	100	100
No. 4	90	100
No. 8	70	100
No. 16	40	95
No. 30	15	70
No. 40	5	55
No. 100	0	15
No. 200	0	5

Note: all sands complying with ASTM C33 for fine aggregate comply with the above gradation requirements.

4. Composted Material

Compost shall be a well decomposed, stable, weed free organic matter source derived from waste materials including yard debris, wood wastes or other organic materials not including manure or biosolids meeting the standards developed by the US Composting Council (USCC). The product shall be certified through the USCC Seal of Testing Assurance (STA) Program (a compost testing and information disclosure program).

a. Compost Quality Analysis – Before delivery of the soil, the supplier shall submit a copy of lab analysis performed by a laboratory that is enrolled in the US Composting Council's Compost Analysis Proficiency (CAP) program and using approved Test Methods for the Evaluation of Composting and Compost (TMECC). The lab report shall verify:

- (1) Feedstock Materials shall be specified and include one or more of the following: landscape/yard trimmings, grass clippings, food scraps, and agricultural crop residues.
- (2) Organic Matter Content: 35% - 75% by dry wt.
- (3) Carbon and Nitrogen Ratio: C:N < 25:1 and C:N >15:1
- (4) Maturity/Stability: shall have a dark brown color and a soil-like odor. Compost exhibiting a sour or putrid smell, containing recognizable grass or leaves, or is hot (120F) upon delivery or rewetting is not acceptable. In addition any one of the following is required to indicate stability:
 - (i) Oxygen Test < 1.3 O₂ /unit TS /hr
 - (ii) Specific oxy. Test < 1.5 O₂ / unit BVS /
 - (iii) Respiration test < 8 C / unit VS / day
 - (iv) Dewar test < 20 Temp. rise (°C) e.
 - (v) Solvita® > 5 Index value
- (5) Toxicity: any one of the following measures is sufficient to indicate non-toxicity.
 - (i) NH₄⁻ : NO₃-N < 3
 - (ii) Ammonium < 500 ppm, dry basis
 - (iii) Seed Germination > 80 % of control
 - (iv) Plant Trials > 80% of control
 - (v) Solvita® > 5 Index value
- (6) Nutrient Content: provide analysis detailing nutrient content including N-P-K, Ca, Na, Mg, S, and B.
 - (i) Total Nitrogen content 0.9% or above preferred.
 - (ii) Boron: Total shall be <80 ppm; Soluble shall be <2.5 ppm
- (7) Salinity: Must be reported; < 6.0 mmhos/cm
- (8) pH shall be between 6.5 and 8. May vary with plant species.

- b. Compost for Bioretention Soil Texture – Compost for bioretention soils shall be analyzed by an accredited lab using #200, 1/4 inch, 1/2 inch, and 1 inch sieves (ASTM D 422 or as approved by municipality), and meet the following gradation:

Sieve Size	Percent Passing (by weight)	
	<i>Min</i>	<i>Max</i>
1 inch	99	100
1/2 inch	90	100
1/4 inch	40	90
No. 200	2	10

- c. Bulk density shall be between 500 and 1100 dry lbs/cubic yard
- d. Moisture content shall be between 30% - 55% of dry solids.
- e. Inerts – compost shall be relatively free of inert ingredients, including glass, plastic and paper, < 1 % by weight or volume.
- f. Weed seed/pathogen destruction – provide proof of process to further reduce pathogens (PFRP). For example, turned windrows must reach min. 55C for 15 days with at least 5 turnings during that period.
- g. Select Pathogens – Salmonella <3 MPN/4grams of TS, or Coliform Bacteria <10000 MPN/gram.
- h. Trace Contaminants Metals (Lead, Mercury, Etc.) – Product must meet US EPA, 40 CFR 503 regulations.
- i. Compost Testing – The compost supplier will test all compost products within 120 calendar days prior to application. Samples will be taken using the STA sample collection protocol. (The sample collection protocol can be obtained from the U.S. Composting Council, 4250 Veterans Memorial Highway, Suite 275, Holbrook, NY 11741 Phone: 631-737-4931, www.compostingcouncil.org). The sample shall be sent to an independent STA Program approved lab. The compost supplier will pay for the test.

VERIFICATION OF ALTERNATIVE BIORETENTION SOIL MIXES

Bioretention soils not meeting the above criteria shall be evaluated on a case by case basis. Alternative bioretention soil shall meet the following specification: “Soils for bioretention facilities shall be sufficiently permeable to infiltrate runoff at a minimum rate of 5 inches per hour during the life of the facility, and provide sufficient retention of moisture and nutrients to support healthy vegetation.”

The following steps shall be followed by municipalities to verify that alternative soil mixes meet the specification:

1. General Requirements – Bioretention soil shall achieve a long-term, in-place infiltration rate of at least 5 inches per hour. Bioretention soil shall also support vigorous plant growth. The applicant refers to the entity proposing the soil mixture for approval.
 - a. Submittals – The applicant must submit to the municipality for approval:
 - (1) A sample of mixed bioretention soil.
 - (2) Certification from the soil supplier or an accredited laboratory that the Bioretention Soil meets the requirements of this guideline specification.
 - (3) Certification from an accredited geotechnical testing laboratory that the Bioretention Soil has an infiltration rate between 5 and 12 inches per hour as tested according to Section 1.b.(2)(ii).
 - (4) Organic content test results of mixed Bioretention Soil. Organic content test shall be performed in accordance with by Testing Methods for the Examination of Compost and Composting (TMECC) 05.07A, “Loss-On-Ignition Organic Matter Method”.
 - (5) Grain size analysis results of mixed bioretention soil performed in accordance with ASTM D 422, Standard Test Method for Particle Size Analysis of Soils.
 - (6) A description of the equipment and methods used to mix the sand and compost to produce Bioretention Soil.
 - (7) The name of the testing laboratory(s) and the following information:
 - (i) contact person(s)
 - (ii) address(s)
 - (iii) phone contact(s)
 - (iv) e-mail address(s)
 - (v) qualifications of laboratory(s), and personnel including date of current certification by STA, ASTM, or approved equal

b. Bioretention Soil

(1) Bioretention Soil Texture

Bioretention Soils shall be analyzed by an accredited lab using #200, and 1/2” inch sieves (ASTM D 422 or as approved by municipality), and meet the following gradation:

Sieve Size	Percent Passing (by weight)	
	Min	Max
1/2 inch	97	100
No. 200	2	5

(2) Bioretention Soil Permeability testing

Bioretention Soils shall be analyzed by an accredited geotechnical lab for the following tests:

- (i) Moisture – density relationships (compaction tests) shall be conducted on bioretention soil. Bioretention soil for the permeability test shall be compacted to 85 to 90 percent of the maximum dry density (ASTM D1557).
- (ii) Constant head permeability testing in accordance with ASTM D2434 shall be conducted on a minimum of two samples with a 6-inch mold and vacuum saturation.

MULCH FOR BIORETENTION FACILITIES

Mulch is recommended for the purpose of retaining moisture, preventing erosion and minimizing weed growth. Projects subject to the State's Model Water Efficiency Landscaping Ordinance (or comparable local ordinance) will be required to provide at least two inches of mulch. Aged mulch, also called compost mulch, reduces the ability of weeds to establish, keeps soil moist, and replenishes soil nutrients. Aged mulch can be obtained through soil suppliers or directly from commercial recycling yards. It is recommended to apply 1" to 2" of composted mulch, once a year, preferably in June following weeding.

APPENDIX III

Fact Sheet

Revisions to the September 6, 2011, Fact Sheet are displayed as double-underlined type for additions of text and in ~~double-strikeout~~ format for deletions of text

This Fact Sheet describes the legal requirements and technical rationale that serve as the basis for this Order's requirements. This Fact Sheet constitutes a portion of the findings for the Order.

Purpose

The purpose of the Order is to amend Water Board Order No. R2-2009-0074, the San Francisco Bay Municipal Regional Stormwater Permit, to add criteria for determining which types of Regulated Projects may be considered Special Projects and to allow these Special Projects to reduce the amount of stormwater runoff that must be treated with [Low Impact Development \(LID\)](#) stormwater treatment systems.

Background and Summary of Existing Requirements

On October 14, 2009, the Water Board adopted Order No. R2-2009-0074, NPDES No. CAS612008, prescribing Waste Discharge Requirements under the San Francisco Bay Municipal Regional Stormwater Permit for the discharge of stormwater runoff from the municipal separate storm sewer systems (MS4s) of the named Permittees.

Provision C.3. of Order No. R2-2009-0074 requires the Permittees to use their planning authorities to include appropriate source control, site design, and stormwater treatment measures in new development and redevelopment projects to address both soluble and insoluble stormwater runoff pollutant discharges and prevent increases in runoff flows from new development and redevelopment projects. Provision C.3. requires that the source control, site design, and stormwater treatment measures be ~~low impact development~~ (LID) measures.

Provision C.3.b. of Order No. R2-2009-0074 defines Regulated Projects as the different categories of new development and redevelopment projects that Permittees must regulate under Provision C.3. These categories are defined on the basis of the land use and the amount of impervious surface created and/or replaced by the project because all impervious surfaces contribute pollutants to stormwater runoff and certain land uses contribute more pollutants. Impervious surfaces can neither absorb water nor remove pollutants as the natural, vegetated soil they replaced can. Also, urban development creates new pollution by bringing higher levels of car emissions that are aerially deposited, car maintenance wastes, pesticides, household hazardous wastes, pet wastes, and trash, which can all be washed into the storm sewer.

Provision C.3.c. of Order No. R2-2009-0074 recognizes LID as a cost-effective, beneficial, holistic, integrated stormwater management strategy¹. The goal of LID is to reduce runoff and mimic a site's predevelopment hydrology by minimizing disturbed areas and impervious cover and then infiltrating, storing, detaining, evapotranspiring, and/or biotreating stormwater runoff close to its source. LID employs principles such as preserving and recreating natural landscape features and minimizing imperviousness to create functional and appealing site drainage that treat stormwater as a resource, rather than a waste product. Practices used to adhere to these LID principles include measures such as preserving undeveloped open space, rain barrels and cisterns, green roofs, permeable pavement, and biotreatment through rain gardens, bioretention units, bioswales, and planter/tree boxes.

¹ USEPA, *Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices* (Publication Number EPA 841-F-07-006, December 2007) <http://www.epa.gov/owow/nps/lid/costs07>

This Provision sets forth a three-pronged approach to LID with source control, site design, and stormwater treatment requirements. The concepts and techniques for incorporating LID into development projects, particularly for site design, have been extensively discussed in BASMAA's Start at the Source manual (1999) and its companion document, Using Site Design Techniques to Meet Development Standards for Stormwater Quality (May 2003), as well as in various other LID reference documents.

Provision C.3.c.i.(2)(b) requires each Regulated Project to treat 100% of the Provision C.3.d. runoff with LID treatment measures onsite or with LID treatment measures at a joint stormwater treatment facility. LID treatment measures are harvesting and re-use, infiltration, evapotranspiration, or biotreatment. A properly engineered and maintained biotreatment system may be considered only if it is infeasible to implement harvesting and re-use, infiltration, or evapotranspiration at a project site.

Provision C.3.c.i.(2)(b)(vi) requires the Permittees to propose specifications for soil installed in all biotreatment or bioretention facilities built under the provisions of this permit. These minimum specifications are contained in Attachment L. These specifications were proposed by the Permittees pursuant to Provision C.3.c.iii.(3) after research performed under their direction.^{2, 3, 4}

Provision C.3.c.i.(2)(b)(vii) requires minimum specifications for green roofs which are installed as treatment measures under this permit. The Permittees proposed green roof minimum specifications pursuant to Provision C.3.c.iii.(4) and submitted a brief report in support of their proposal.⁵

Special Projects

Provision C.3.e.ii.(1) of Order No. R2-2009-0074 ~~was included based on the Permittees' and building industry stakeholders' comments and testimony during order adoption, acknowledges~~ that certain types of smart growth, high density, and transit-oriented development ~~can either reduce existing impervious surfaces, or create less "accessory" impervious areas and auto-related pollutant impacts, projects cannot practicably implement LID treatment including biotreatment, LID treatment measures, including infiltration, harvest for use, evapotranspiration and green roofs can be infeasible to implement in a dense urban context in some cases, from a physical or cost basis. The urban centers in this region are often underlain by tight clay soils that make infiltration difficult, requiring storage at possibly prohibitive cost. Stormwater harvest for internal, non-potable use still meets regulatory obstacles from implementation of the plumbing code and lack of winter water demand. Green roofs continue to be very expensive, and evapotranspiration is lowest in the cold winter when rains fall. Many dense, central business district developments lack room for planted areas for biotreatment.~~

² Technical Memorandum – Regional Bioretention Soil Guidance & Model Specification, Bay Area Stormwater Management Agencies Association – WRA Environmental Consultants, November 12, 2010

³ Technical Memorandum – Regional Bioretention Installation Guidance, Bay Area Stormwater Management Agencies Association – WRA Environmental Consultants, November 12, 2010

⁴ Annotated Bibliography – Regional Biotreatment Soil Guidance, Bay Area Stormwater Management Agencies Association – WRA Environmental Consultants, November 12, 2010

⁵ Green Roof Minimum Specifications, Bay Area Stormwater Management Agencies [Association](#), April 29, 2011.

Moreover, these projects have various environmental benefits, including either reducing existing impervious surfaces associated with commercial or residential development due to increased density, or creating less “accessory” impervious areas and less auto-related pollutant impacts. Auto use in general and its associated pollution is reduced because residential areas are closer to commercial areas for jobs and services, and closer to transit hubs. In addition, concentrating development in urban centers should reduce pressure to develop green fields on the urban perimeter.

Incentive LID treatment reduction credits approved by the Water Board may be applied to these types of Regulated Projects that are considered “Special Projects.”

Provision C.3.e.ii.(2) of Order No. R2-2009-0074 ~~requires~~required the Permittees to submit by December 1, 2010, a proposal to the Water Board identifying the types of projects proposed as Special Projects and therefore eligible for LID Treatment Reduction Credit. The proposal was required to include specific criteria for each type of Special Project proposed, including size, location, minimum densities, minimum floor area ratios, other appropriate limitations, and the proposed LID Treatment Reduction Credit. Specifically, the Provision required the proposal to contain the following:

- Identification of the types of projects proposed for consideration of LID treatment reduction credits and an estimate of the number and cumulative area of potential projects during the remaining term of this permit for each type of project.
- Identification of institutional barriers and/or technical site specific constraints to providing 100% LID treatment onsite that justify the allowance for non-LID treatment measures onsite.
- Specific criteria for each type of Special Project proposed, including size, location, minimum densities, minimum floor area ratios, or other appropriate limitations.
- Identification of specific water quality and environmental benefits provided by these types of projects that justify the allowance for non-LID treatment measures onsite.
- Proposed LID Treatment Reduction Credit for each type of Special Project and justification for the proposed Credits. The justification shall include identification and an estimate of the specific water quality benefit provided by each type of Special Project proposed for LID treatment reduction credit.
- Proposed total treatment reduction credit for Special Projects that may be characterized by more than one category and justification for the proposed total Credit.

On December 1, 2010, the Bay Area Stormwater Management Agencies Association (BASMAA) submitted a Special Projects proposal on behalf of the Permittees, which defined the types of Special Project Categories and their corresponding LID Treatment Reduction Credits.

BASMAA’s stormwater proposal was posted on the Water Board’s website and circulated for public comment on December 10, 2010. Comments on the proposal were received from U.S. EPA, [the Natural Resources Defense Council \(NRDC\)](#), San Francisco Baykeeper, the Building Industry Association, other building industry groups, and developers.

Water Board staff has met on a regular basis with representatives of BASMAA and, within these ~~negotiations meetings~~, revisions of the December 10, 2010, proposal have been made and ~~publicly circulated-considered~~. Representatives of U.S. EPA, the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG), among other stakeholders, have participated in some of these meetings. Water Board staff has also met separately with representatives of NRDC and San Francisco Baykeeper.

In the Permittees' original submittal and at ~~the negotiation~~subsequent meetings, the Permittees' have provided Water Board staff with estimates of the number and type of projects that may potentially qualify as Special Projects and the percentage of LID Treatment Reduction Credit that may be applied for the various projects.

The proposed revision to Provision C.3.e.ii. of ~~Board~~ Order No. R2-2009-0074 establishes specific criteria for determining which types of Regulated Projects may be considered Special Projects, which are more stringent than originally proposed by the Permittees. The proposed revision ~~establishes~~ establishes different three categories of Special Projects, with different amounts of maximum allowable non-LID treatment, based on size, land use type, and density. Projects that are the most dense and would have the greatest infeasibility problems with LID implementation are allowed to use the most non-LID treatment. ~~Except for~~ Category A projects (Provision C.3.e.ii), which represents the smallest Special Projects, ~~the proposed revisions also use location,~~ must be under a half acre, built in a pedestrian-oriented business district and have 85% lot coverage. Category B projects (Provision C.3.e.iii) must also have 85% lot coverage, a minimum density, and be between a half acre and 2 acres. Category C, transit-oriented development projects (Provision C.3.e.iv), have no size limitation, but must have a minimum density, and are allowed an additional non-LID treatment percentage based on proximity to transit, density, and parking criteria to establish a tiered approach for determining the total LID Treatment Reduction available ~~for any given Special Project. The total available LID Treatment Reduction Credit may be used to reduce the amount of stormwater runoff that must be treated with LID stormwater treatment systems.~~ The ~~remaining~~ amount of Provision C.3.d. design stormwater runoff not treated with LID measures, must be treated with one or a combination of the following two specific non-LID treatment systems:

- Tree-box-type high flowrate biofilters
- Vault-based high flowrate media filters

If LID treatment measures are not feasible, these are the best controls for qualifying Special Projects to reduce pollutants in stormwater discharges to the maximum extent practicable.

Provision C.3.e.ii.(2) of Board Order No. R2-2009-0074 is now superseded by a new Provision C.3.e.ii.(2) and Provisions C.3.e.ii.(3) and C.3.e.ii.(4), which specify criteria in three categories for determining which types of Regulated Projects may be considered Special Projects and which are more stringent than originally proposed by the Permittees.

Qualifying Special Projects are dense urban development projects that will reduce development pressure on the greenfield suburban fringe by concentrating residences and commercial development in urban centers. These projects have many more commercial square feet and dwelling units per square foot of impervious surface. Dense urban "smart growth" tends to be more pedestrian-friendly, allowing reduced auto use and reduction of associated pollution.

Transit-oriented developments are designed to reduce automobile use and will reduce associated urban runoff pollution. Typically, high density residential developments are designed to be within ½ mile of a major transit hub, with commercial development also included in the developments so that shops and jobs are all clustered in a central location, with easy transit access. These elements add up to fewer automobile trips and more use of transit.

Page 6 of *New Places, New Choices: Transit-Oriented Development in the San Francisco Bay Area*, November 2006, by the MTC, states:

In 2002, the Bay Area’s “Smart Growth Strategy” —a landmark, long-range regional visioning effort —found that promoting transit-oriented development and focusing housing, jobs and retail along transit corridors would preserve as much as 66,000 acres of open space by 2020, compared with current development trends. Such a strategy also would reduce average weekday driving by as much as 3.6 million vehicle miles in 2020, conserving 150,000 gallons of gasoline a day and reducing daily carbon dioxide emissions (the principal greenhouse gas) by 2.9 million pounds per day. Already, Bay Area households located close to transit stations make fewer driving trips than do others in the region. Households within a half-mile of train stations and ferry stops log only 20 vehicle miles of travel per day, just 56 percent of the regional average. The fewer trips people make, the fewer the pollution-producing “cold starts” of their cars. These factors combine to result in lower fuel use and lower tailpipe emissions by those households living close to transit — and they also add up to powerfully persuasive evidence of the environmental benefits of TOD in the Bay Area.

Page 8 of the same MTC report also states:

...Proximity Matters - Bay Area residents who live within a half-mile of rail or ferry stops are four times as likely to use transit, three times as likely to bike, and twice as likely to walk as are those who live at greater distances.

The proposed reporting requirements (Provision C.3.e.vi) provides Water Board sStaff with early notice of the Special Projects that are being considered by the Permittees prior to the Permittees granting final planning approval. This allows Water Board staff to validate the Permittees’ analysis of the number and size of potential Special Projects that may be approved during the remainder of the MRP’s permit term. The reporting requirements also require the Permittees to describe in detail the basis for infeasibility of implementing LID treatment when non-LID treatment is used. Also, the Permittees must describe the types of filter vaults or tree filters used, and the certification these systems have achieved. Water Board sStaff intends to use the data collected in the proposed reporting requirements to revise the Special Projects criteria as appropriate for the next MRP permit term.

Biotreatment Soil Media and Green Roof Minimum Specifications

Provisions C.3.c.i.(2)(vi) and C.3.c.iii.(3) of Order No. R2-2009-0074 required the Permittees to submit to the Water Board by May 1, 2011, a proposed set of model biotreatment soil media specifications and soil infiltration testing methods to verify a long-term infiltration rate of 5 to 10 inches/hour.

The Permittees submitted a proposal for the soil media specifications and soil infiltration testing methods on December 1, 2010, which was distributed for public comment on December 15, 2010. Comments were received on January 28, 2011, from Roger James of Resources Management and from ~~the Natural Resources Defense Council~~ NRDC.

Provisions C.3.c.i.(2)(vii) and C.3.c.iii.(4) of Order No. R2-2009-0074 require the Permittees to submit to the Water Board by December 1, 2011, proposed minimum specifications for green roofs to be considered biotreatment systems.

The Permittees submitted a proposal for the minimum green roof specifications on April 29, ~~2010~~2011, which was distributed for public comment on May 4, 2011. No comments were received.

This Order approves the model biotreatment soil media specifications, soil infiltration testing methods, and minimum green roof specifications submitted by the Permittees.

Hydromodification Management (HM) – Santa Clara Permittees

Provision C.3.g. of ~~Board~~ Order No. R2-2009-0074 requires that certain new development projects manage increases in stormwater runoff flow and volume so that post-project runoff shall not exceed estimated pre-project runoff rates and durations, where such increased flow and/or volume is likely to cause increased potential for erosion of creek beds and banks, silt pollutant generation, or other adverse impacts on beneficial uses due to increased erosive force.

Based on Hydrograph Modification Management Plans that were developed for the Permittees on a countywide basis, the Water Board adopted HM requirements specific to the Permittees in each county, prior to the 2009 adoption of the MRP. Provision C.3.g. of ~~Board~~ Order No. R2-2009-0074 restates the major common elements of the specific HM requirements for all Permittees. Within Provision C.3.g., Attachment F contains the specific HM requirements for the Santa Clara Permittees.

Provision C.3.g.ii.(5) of Order No. R2-2009-0074 requires the Santa Clara Permittees to comply with all the requirements in Attachment F of the same Order. Requirement 4. of Attachment F (pages F-3 and F-4 of Order No. R2-2009-0074) defines geographical areas where applicable Regulated Projects are required to meet the HM Standard and associated requirements. These areas of HM applicability described in Requirement 4. are shown in the Santa Clara Permittees' HM Map available at http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/stormwater/muni/mrp/Final%20TO%20HM%20Maps.pdf.

Requirement 4.c. of Attachment F states that pink areas on the HM Map are under review by the Permittees for accuracy of the imperviousness data. The HM Standard and associated requirements apply to projects in areas designated as pink on the map until such time as a Permittee presents new data that indicates that the actual level of imperviousness of a particular area is greater than or equal to 65% impervious. Any new data is to be submitted to the Water Board in one coordinated submittal within one year of permit adoption.

The Santa Clara Permittees submitted new impervious data and a revised HM Map that reflects the new data to the Water Board on October 14, 2010. On March 11, 2011, the Santa Clara Permittees submitted a revised HM Map to correct a small error in the October 2010 HM Map, and to provide additional information per Water Board staff request. The revised HM Map shows that in the majority of the pink area of the originally approved Santa Clara Permittees' HM Map, the HM Standard and associated requirements do apply. In the revised HM Map, these areas are now shown in green to represent the applicability of the HM Standard and associated requirements. The remaining small portion of the pink area in the original HM Map is now shown in red to represent areas where the HM Standard and associated requirements do not apply.

This Order approves the revised Santa Clara Permittees' HM Map and replaces the HM Map originally adopted by Order No. R2-2009-0074.

Appendix B

Staff Report



Matthew Rodriguez
Secretary for
Environmental Protection

California Regional Water Quality Control Board San Francisco Bay Region

1515 Clay Street, Suite 1400, Oakland, California 94612
(510) 622-2300 • FAX (510) 622-2460
<http://www.waterboards.ca.gov/sanfranciscobay>



Edmund G. Brown Jr.
Governor

Staff Report

Special Projects Amendment of the Municipal Regional Stormwater Permit

In this report, we provide an overview of the current Municipal Regional Stormwater Permit (MRP) requirements for low impact development (LID) treatment of stormwater from new and redevelopment projects and the need and justification for allowing onsite non-LID treatment measures at special development projects (Special Projects) that are dense urban and transit oriented “Smart Growth” development projects. We discuss the maximum extent practicable standard to reduce pollutants in stormwater discharges, its applicability to LID and non-LID treatment measures, the infeasibility of 100% LID treatment at Special Projects, and the scope and numbers of Special Projects. At the end of the report, we provide a summary of the proposed Special Project categories, their qualifying criteria, and the maximum non-LID treatment allowed at qualifying projects.

MRP LID Treatment Requirements

The MRP requires implementation of LID treatment for all regulated projects beginning December 1, 2011. Regulated projects are all projects creating and/or replacing 10,000 square feet of impervious surface or 5,000 square feet for retail gasoline outlets, auto service facilities, restaurants and uncovered parking lots. These development projects must treat the water quality design storm¹ using LID measures, which include infiltration, evapotranspiration, or rainfall harvest for uses such as irrigation or toilet flushing. Where these methods are not alone sufficient or are otherwise infeasible, the LID measure of biotreatment or biofiltration with an underdrain to the storm drain may be used for the remaining runoff required to be treated.

During the process leading to adoption of the MRP, many of the MRP’s 76 permittees (Permittees) and building industry stakeholders provided comments and testimony that certain types of smart growth, high density, and transit-oriented development cannot practicably implement LID treatment including biotreatment. LID treatment measures, including infiltration, harvest for use, evapotranspiration, and green roofs can be infeasible to implement in a dense urban context in some cases, from a physical or cost basis. These stakeholders maintained that a small percentage of these redevelopment projects would not be built if the projects had to meet 100% LID requirements, due to the high cost of storing stormwater for internal use or infiltration in tight clay soils, or of constructing a green roof. These projects would proceed if they were allowed to have the flexibility to treat some or, in rare cases, all of the required amount of stormwater with high flowrate filter vaults or tree vaults. The stakeholders also indicated that these projects were “smart growth” with inherent environmental benefits such as concentrating development density in the inner city, and concentrating businesses and residences close to public transit services, such that automobile use and its associated pollution is reduced.

¹ The water quality design storm is specified in MRP Provision C.3.d as the optimal amount of stormwater to treat, representing about 80% of the annual runoff from a site.

In response, the MRP required the Permittees to submit a report to the Board by December 1, 2010, that proposed types of Special Projects that should be allowed to use non-LID treatment to the extent that LID treatment was infeasible. The proposed Special Projects amendment of the MRP prepared for Board consideration at the November 2011 meeting is based on the Permittees' 2010 submittal and Board staff's review and modification, with input from U.S. EPA and other interested parties, of the proposed special development project categories and allowed LID treatment reduction. It provides a framework that would allow reductions in LID treatment for three special development project categories: lot-line to lot-line infill up to a half-acre; lot-line to lot-line infill up to two acres; and transit-oriented development. (A summary of each of these categories is at the end of this report.) Qualifying projects would be allowed to use non-LID treatment, high flowrate filter vaults or high rate tree filter vaults, for up to a specified percentage of runoff in each category.

Maximum Extent Practicable Standard

The most significant issue raised in public comments on the tentative order for the proposed amendment is whether allowing use of non-LID treatment measures for up to 100% of the stormwater runoff from the water quality design storm complies with the regulatory mandate to require controls to reduce pollutants in stormwater discharges to the maximum extent practicable (MEP). There is no binding law, regulation, or policy that mandates that specific treatment measures or categories of treatment measures must be required in municipal stormwater discharge permits. However, there is a general mandate that applies to municipal stormwater permits in the federal Clean Water Act (CWA) that is referred to as the MEP standard. There is also a California Court of Appeal ruling on the definition of MEP and a precedential State Water Resources Control Board (State Water Board) order that addresses the MEP standard.

Section 402(p)(3)(B) of the CWA mandates that permits for discharges from municipal separate storm sewers:

“shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as ... the State determines appropriate for the control of such pollutants.”

The Court of Appeal ruled in 2004 in the Building Industry Association of San Diego County v. State Water Board case, that since the Clean Water Act does not define MEP, it was proper for the San Diego Regional Water Board to define MEP in the permit it issued to municipalities in San Diego County:

... As broadly defined in the Permit, the maximum extent practicable standard is a highly flexible concept that depends on balancing numerous factors, including the particular control's technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. This definition conveys that the Permit's maximum extent practicable standard is a term of art, and is not a phrase that can be interpreted solely by reference to its everyday or dictionary meaning. Further, the Permit's definitional section states that the maximum extent practicable standard “considers economics and is generally, but not necessarily, less stringent than BAT.” BAT is an acronym for “best available technology economically achievable,” which is a technology-based standard for industrial storm water dischargers that focuses on reducing pollutants by treatment or by a combination of

treatment and best management practices. [Citation omitted.] If the maximum extent practicable standard is generally “less stringent” than another Clean Water Act standard that relies on available technologies, it would be unreasonable to conclude that anything more stringent than the maximum extent practicable standard is necessarily impossible. In other contexts, courts have similarly recognized that the word “practicable” does not necessarily mean the most that can possibly be done. [Citations omitted.]

The State Water Board, in its precedential Order WQ 2000-11 (*Cities of Bellflower et al.*) discussed MEP at length:

MEP is the technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) that municipal dischargers of stormwater must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve. MEP is generally a result of emphasizing pollution prevention and source control BMPs as the first lines of defense in combination with structural and treatment methods where appropriate serving as additional lines of defense. The MEP approach is an ever evolving, flexible, and advancing concept, which considers technical and economic feasibility. As knowledge about controlling urban runoff continues to evolve, so does that which constitutes MEP. The individual and collective activities elucidated in the MS4’s SWMP become its proposal for reducing or eliminating pollutants in storm water to the MEP. The way in which MEP is met may vary between communities.

In choosing BMPs, the major focus is on technical feasibility, but cost, effectiveness, and public acceptance are also relevant. If a Permittee chooses only the most inexpensive BMPs, it is likely that MEP has not been met. If a Permittee employs all applicable BMPs except those that are not technically feasible in the locality, or whose cost exceeds any benefit to be derived, it would meet the MEP standard. MEP requires Permittees to choose effective BMPs, and to reject applicable BMPs only where other effective BMPs will serve the same purpose, the BMPs are not technically feasible, or the cost is prohibitive.

We considered and applied these concepts when developing the MRP New and Redevelopment requirements, including the LID treatment requirements as adopted in 2009 and the now-proposed Special Project requirements. Onsite retention LID measures (infiltration, evapotranspiration, or rain harvest) are the ideal, best controls to minimize discharges of pollutants. However, these onsite retention measures are not always feasible, and in such cases the next best controls are biotreatment or biofiltration with an underdrain to the storm drain. The proposed Special Project requirements add another layer to this hierarchy of controls and would allow, up to a specified maximum percent of the required stormwater amount in each Special Project category, non-LID treatment controls, specifically, high flowrate filter vaults or high rate tree filter vaults. These are the best controls for qualifying Special Projects to reduce pollutants in stormwater discharges to MEP if LID measures are not feasible or their cost is prohibitive.

Infeasibility of 100% LID Treatment in Special Projects

There are a number of factors that may apply to each of the Special Project categories that affect the feasibility and costs of LID treatment measures. The urban centers in our region are often underlain by tight clay soils that make infiltration difficult, requiring storage at possibly prohibitive cost. Stormwater harvest for internal, non-potable use still meets regulatory obstacles from implementation of the plumbing code and lack of winter water demand. Green roofs continue to be very expensive, and regionwide evapotranspiration is lowest in the cooler winter when rains fall. Many dense, central business district developments lack room for planted areas for biotreatment. Further consideration of infeasibility of LID treatment measures for each Special Project Category is presented below.

Category A (Lot-Line to Lot-Line \leq Half Acre) Special Projects are usually in storefront-type, walkable business districts, and are often constructed completely filling the lot, leaving only a small space for solid waste and deliveries in a rear alley if there is one. If such a building must be replaced due to fire, etc., given the qualifying lot coverage criteria, there is no room for LID measures other than an expensive green roof, which may be cost prohibitive. There is insufficient demand or space for stormwater harvest, and infiltration could only occur beneath the building with expensive storage to accommodate the low infiltration rate of clay soils.

Category B (Lot-Line to Lot-Line \leq Two Acres) Special Projects are usually in urban centers, and to meet the qualifying surface parking restrictions, lot coverage, and density requirements (floor to area ratios or dwelling units per acre), there is little or no room for LID treatment other than an expensive green roof, which may be cost prohibitive. In the future, there may be more demand for stormwater harvest, but these systems are new and expensive, and face regulatory barriers in the current plumbing code, which varies by locality. Infiltration could only occur beneath the building with expensive storage to accommodate the low infiltration rate of clay soils. Infeasibility of LID treatment measures for Category C (Transit-Oriented Development) Special Projects is comparable to that for Category B projects.

In addition to the general or categorical infeasibility considerations described above, it should be noted that non-LID treatment use is only allowed up to the level of demonstrated infeasibility of LID treatment. Further, the Special Project provisions as proposed require the Permittees to report the basis of infeasibility of LID treatment measures that merits the use of non-LID treatment measures at qualifying projects. This will provide accountability in how any reduction in LID treatment measures is implemented. We will review this reporting to ensure appropriate determination of reduced use of LID treatment. We will also use this information during the reissuance of the MRP in three years to refine the Special Projects categories, the qualifying criteria, and the allowed reductions in LID treatment. The Permittees will also be required to report which types of high rate filter vault systems they use and the certification (of pollutant reduction) status of those systems. Several systems certified by the state of Washington have demonstrated good pollutant removal in actual installations, and are both the filter vault and tree vault systems most commonly used.

Scope and Numbers of Special Projects

We received comments on the scope and potential numbers of qualifying projects. Natural Resources Defense Council (NRDC) and San Francisco BayKeeper expressed concern that the Special Project categories and qualifying criteria are too broad, and a large number of projects could potentially qualify, resulting in large areas, particularly around transit centers, that would be exempted from LID treatment. Conversely, the Permittees would like lower density criteria to qualify and higher percentages of allowed non-LID treatment. The Permittees also would like two additional Special Projects, one for the “50% rule” and another regarding road projects. We discuss the comments below and see no need to further modify the proposed Special Projects amendment based on them.

The NRDC and BayKeeper concern with the scope and number of projects is primarily driven by the Transit-Oriented Development Special Projects category that may allow non-LID treatment in projects up to ½ mile from a transit center. Although it appears that this allowance could result in large areas exempted from LID treatment, the actual number of projects will be limited by the other qualifying criteria (density and limited parking). In its comment letter, the City of San Jose noted it conducted an analysis of projects approved during the last five years and estimated that, if the Special Projects requirements had been in place during that time, approximately 91% of the total impervious surface created or replaced would have been required to use LID treatment measures and less than 9% of the total would have had the option to use non-LID treatment measures. San Jose also noted that countywide (Santa Clara County), the overall percentage of impervious surface with the option to use non-LID treatment measures would be much lower, since other municipalities in Santa Clara County would have had fewer types of development that would qualify as Special Projects. We assume San Jose’s analysis was based on the Special Projects qualifying criteria without project-specific consideration of LID treatment infeasibility, which would likely reduce the estimate. Regardless, given the current economic climate, we expect very few such projects during the remaining three-year term of the MRP, and, as noted previously, we will review all Special Project reports and will have the opportunity to refine the Special Project requirements when the MRP is reissued.

The Permittees included two additional categories in their Special Projects proposal, one regarding the “50% rule” and another regarding road projects. The MRP “50% rule” requires redevelopment projects that rebuild more than 50% of a site to include LID treatment for the entire site. The Permittees proposed that non-LID treatment be allowed for the old portion of the site if major plumbing changes are required for LID treatment. However, these types of projects are beyond the scope of Special Projects contemplated in the existing MRP and do not have water quality and environmental benefits that justify the allowance for non-LID treatment measures onsite, and, although major plumbing changes might be required for LID treatment, there is no evidence that the cost would be prohibitive. The Permittees also proposed that non-LID treatment be allowed for stormwater from additional impervious surface added to road projects as traffic lanes, such as turn lanes, from which the stormwater could not be separately directed to landscape areas as LID treatment. Although potential infeasibility of LID treatment is an issue, However, these road projects are also beyond the scope of Special Projects contemplated in the existing MRP and do not have water quality and environmental benefits that justify an allowance for non-LID treatment measures onsite. U.S. EPA also indicated in its

review of the Permittees' Special Projects proposal that neither of these categories meets the intent or eligibility criteria of the MRP Special Project requirements.

Special Project Categories

The following describes the specifics of the Special Projects LID-treatment reduction framework as proposed in the Revised Tentative Order for amendment of the MRP. A project is only eligible for LID treatment reduction based on one of the three categories even if it meets criteria for other categories.

Category A (Lot-Line to Lot-Line \leq Half Acre) Special Project Criteria: A project must be part of a Permittee's stated objective to preserve or enhance a pedestrian-oriented type of urban design, and be located in a designated central business district, downtown core area or downtown core zoning district, neighborhood business district or comparable pedestrian-oriented commercial district, or historic preservation site or district. The project must create or replace one half acre or less of impervious surface area and include no surface parking other than incidental. Permanent structures must cover at least 85% of the entire project site. The remaining 15% portion of the site is to be used for safety access, parking structure entrances, trash and recycling service, utility access, pedestrian connections, public uses, landscaping, and stormwater treatment. A "Category A Special Project" may qualify for 100% LID exemption and must treat the required Provision C.3.d. stormwater volume or flow with either high rate filter vaults or high rate tree filters.

Category B (Lot-Line to Lot-Line \leq Two Acres) Special Project Criteria: Same as Category A except projects must create or replace greater than one-half acre but no more than two acres of impervious surface area and include no surface parking other than incidental.

The maximum LID treatment reduction allowed is determined based on the density achieved by the project. Density is expressed in Floor Area Ratios (FARs) for commercial and mixed-use development projects and in Dwelling Units per Acre (DU/Ac) for residential development projects. The higher the density, the higher the LID treatment reduction allowed.

50% Maximum LID Treatment Reduction

- For an FAR of at least 2:1 or a density of at least 50 DU/Ac, up to 50% of the required Provision C.3.d stormwater volume or flow may be treated with filter vaults or tree vaults.

75% Maximum LID Treatment Reduction

- For an FAR of at least 3:1 or a density of at least 75 DU/Ac, up to 75% of the required Provision C.3.d stormwater volume or flow may be treated with filter vaults or tree vaults.

100% Maximum LID Treatment Reduction

- For an FAR of at least 4:1 or a density of at least 100 DU/Ac, up to 100% of the required Provision C.3.d stormwater volume or flow may be treated with filter vaults or tree vaults.

Category C (Transit-Oriented Development) Special Project Criteria: A project must be characterized as a non-auto-related land use project. This excludes any surface parking lot; car dealership; auto and rental facility with onsite surface storage; fastfood restaurant, bank or

pharmacy with drive-through lanes; gas station, car wash, auto repair and service facility; or other auto-related project unrelated to the concept of Transit-Oriented Development. If it is a commercial or mixed-use development project, it must have an FAR of at least 2:1. If it is a residential development project, it must have a density of at least 25 DU/Ac. Up to the total LID treatment reduction allowed may be treated with filter vaults or tree vaults. The total LID treatment reduction allowed is the sum of three different credits that the project may qualify for: Location, Density and Minimized Surface Parking Credits.

Location Credits:

50% LID Treatment Reduction: Project must be located within a ¼ mile radius of an existing or planned transit hub.

25% LID Treatment Reduction: Project must be located within a ½ mile radius of an existing or planned transit hub.

25% LID Treatment Reduction: Project must be located within a planned Priority Development Area (PDA), which is an infill development area formally designated by the Association of Bay Area Government and Metropolitan Transportation Commission FOCUS planning program.

Only one location credit may be used by an individual “Category C Special Project”, even if the project qualifies for multiple location credits. At least 50% or more of a project must be located within the ¼ or ½ mile radius of an existing or planned transit hub to qualify for the corresponding location credit. The entire project site must be located within a PDA to qualify for the corresponding location credit. Transit hub is defined as a rail, light rail, or commuter rail station, ferry terminal, or bus transfer station served by three or more bus routes.

Density Credits:

- 10% LID Treatment Reduction: Project must achieve an FAR of at least 2:1 for a commercial and mixed-use development project or 30 DU/Ac for a residential project.
- 20% LID Treatment Reduction: Project must achieve an FAR of at least 4:1 for a commercial and mixed-use development project or 60 DU/Ac for a residential project.
- 30% LID Treatment Reduction: Project must achieve an FAR of at least 6:1 for a commercial and mixed-use development project or 100 DU/Ac for a residential project.

Minimized Surface Parking Credits:

- 10% LID Treatment Reduction: Project surface parking must be 10% or less of the impervious surface. At-grade surface parking must be treated with LID treatment measures.
- 20% LID Treatment Reduction: Project must have no surface parking except for incidental surface parking for emergency vehicle access, Americans with Disability Act (ADA) accessibility, and passenger and freight loading zones.

Appendix C

Responses to Comments

Response to Comments

on September 6, 2011 Tentative Order Amendment Revising Order No. R2-2009-0074 (Municipal Regional Stormwater Permit)

Comments on the September 6, 2011 Tentative Order were received by October 6, 2011 from the following entities:

Permittees

- Bay Area Stormwater Management Agencies Association (BASMAA)
- Alameda Countywide Clean Water Program (ACCWP)
- Contra County Clean Water Program (CCCWP)
- City of Dublin
- City of Fremont
- San Mateo Countywide Water Pollution Prevention Program (SMCWPPP)
- Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP)
- City of San Jose

Other agencies

- Metropolitan Transportation Commission (MTC) and Association of Bay Area Governments (ABAG)

Non-Government Environmental Organizations

- Natural Resources Defense Council (NRDC) and San Francisco BayKeeper

Consulting firms

- HMH
- Ruth and Going, Inc.
- Water Resources Management, Roger James

We also received a comment letter after the October 6, 2011, written comment submittal deadline from the US Environmental Protection Agency (US EPA). Although our procedure is not to consider late written comments, we are accepting considering the US EPA comments because our agreement with US EPA for implementing the National Pollutant Discharge Elimination System (NPDES) requires us to consider its input on NPDES permits.

The following table contains responses for each written comment submitted. Comments are numbered sequentially for each commenter.

**Response to Comments on September 6, 2011 Tentative Order
Amendment Revising Order No. R2-2009-0074 (Municipal Regional Stormwater Permit)**

Commenter	Comment No.	Key Word(s)	Comment	Response
ACCWP	1	General Comment	The proposed Municipal Regional Stormwater Permit (MRP) amendment provides an approach that balances ACCWP's and the Water Board's preference for vegetated treatment systems while providing flexibility where needed to provide overall environmental benefit.	Comment noted.
ACCWP	2	Category D 50% Rule Category E Roads	ACCWP supports comments submitted by BASMAA that request additional amendments to the MRP to address certain road projects and projects that fall under the "50% rule" in Provision C.3. of the MRP. We ask that the Water Board adopt the proposed MRP amendment as well as the additional amendments set forth in the BASMAA comment letter.	Provision C.3.e.ii. of the MRP describes Special Projects as certain smart growth, high density, and transit-oriented development projects that can either reduce existing impervious surfaces or create less "accessory" impervious areas and automobile-related pollutant impacts. The Category D projects (i.e., projects where stormwater treatment is required for the entire project site because more than 50% of the total existing impervious surface area will be added and/or replaced – referred to as the "50% rule") described in BASMAA's 12/1/10 Proposal are incorrectly referred to by BASMAA as retrofit projects. Category D projects are not retrofits of existing development; rather they constitute redevelopment activity that should not be eligible for LID Treatment Reduction Credits because they are not smart growth, high density, or transit-oriented development. Provision C.3.e.i. already contains alternative compliance options (i.e., LID treatment offsite or payment in-lieu) that can be used to address the potential infeasibility scenarios described by BASMAA.
BASMAA CCCWP	1 1	Category D 50% Rule	<p>We generally support the proposed MRP amendment; however, we are concerned that it does not address the situation (described in BASMAA's 12/1/10 Special Projects Proposal) where portions of development sites that are not being developed or redeveloped must be retrofitted to meet LID treatment requirements in accordance with the "50% rule."</p> <p>To address this concern, we ask that the following underscored sentence be added to Provision C.3.b.ii.(1)(c) and C.3.b.ii.(3)(a) of the MRP: "Where a project results in an alteration of more than 50 percent of the impervious surface of a previously existing development that was not subject to Provision C.3, the entire project, consisting of all existing, new and/or replaced impervious surfaces, must be included in the treatment system design (i.e., stormwater treatment systems must be designed and sized to treat stormwater runoff from the entire development project). <u>100% of the amount of runoff identified in Provision C.3.d. for the new and replaced impervious surfaces must be treated with LID treatment measures. 100% of the amount of runoff identified in Provision C.3.d. for existing impervious surfaces must be treated with LID treatment measures, except where the use of LID</u></p>	

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			<p><u>treatment measures would require significant alterations to existing structures, paving, or walkways that would not otherwise occur. In such cases, other treatment methods may be used.</u></p> <p>Although the change affects a fraction of 1% of the aggregate impervious area subject to Provision C.3., it provides needed flexibility for certain projects subject to the “50% rule” and avoids the scenario where a “smart growth” development project is killed because of inability to comply.</p>	
<p>BASMAA CCCWP HMH</p>	<p>2 3 4</p>	<p>Category E Roads</p>	<p>We are also concerned that the proposed MRP amendment does not address the situation (described in BASMAA’s 12/1/10 Proposal) where a traffic lane is added to an existing roadway within a limited right-of-way from which runoff cannot be directed to a landscaped area.</p> <p>To address this concern, we ask that the following underscored sentence be added to Provision C.3.b.ii.(4)(b) of the MRP: <u>“Widening of existing streets and roads with additional traffic lanes. 100% of the amount of runoff identified in Provision C.3.d. for the existing impervious surfaces must be treated with LID treatment measures except where the use of LID treatment measures is infeasible because the drainage from the additional traffic lanes cannot be routed to vegetated areas. In such cases, other treatment methods may be used.”</u></p> <p>Although the change affects a fraction of 1% of the aggregate impervious area subject to Provision C.3., it provides flexibility that may be needed for certain roadway projects.</p>	<p>Provision C.3.e.ii. of the MRP describes Special Projects as certain smart growth, high density, and transit-oriented development projects that can either reduce existing impervious surfaces or create less “accessory” impervious areas and automobile-related pollutant impacts. The Category E road-widening projects described in BASMAA’s 12/1/10 Proposal constitute redevelopment activity that should not be eligible for LID Treatment Reduction Credits because they do not constitute smart growth, high density, or transit-oriented development. Provision C.3.e.i. already contains alternative compliance options (i.e., LID treatment offsite or payment in-lieu) that can be used to address the potential infeasibility scenarios described by BASMAA.</p>
<p>BASMAA CCCWP SCVURPPP City of San Jose</p>	<p>3 4 6 8</p>	<p>Biotreatment Soil Specs</p>	<p>The biotreatment soil specifications identified as Attachment L to the proposed MRP amendment should not be included in the amendment. BASMAA’s 12/1/10 soil specifications submittal recommended that only the biotreatment soil objectives (i.e., a minimum infiltration rate</p>	<p>The specifications included in Attachment L were recommended by the Permittees, after significant discussion, research and experience with installation contractors. Simply stating the goals for infiltration rate, plant growth, runoff retention</p>

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			<p>of 5 inches per hour and the ability to sustain vigorous, healthy plant growth and maximize stormwater runoff retention and pollutant removal) should be included in the MRP. The detailed soil specifications should only be referenced as guidance in order to allow room for experimentation and innovation with bioretention soils.</p> <p>We request that the Board remove Attachment L and delete the last sentence of Provision C.3.c.i.(2)(b)(vi): "Permittees shall ensure that Regulated Projects use biotreatment soil media that meet the minimum specifications set forth in Attachment L."</p>	<p>and pollutant removal lacks consistency and specificity. In order to allow flexibility to test other soil mixtures, there is a second specification included in Attachment L that sets basic performance requirements for the soil mixture, but is not as prescriptive as the first recipe.</p>
BASMAA	4	Typo Clarification	<p>An important clarification needs to be made in the proposed MRP amendment language for Provision C.3.e.ii.(1). With the current proposed language, the LID Treatment Reduction Credits would only extend to the Category A Special Projects. We do not believe this is Board staff's intent and that the reference error is a carryover from the MRP section numbers adopted in 2009. Thus, Provision C.3.e.ii.(1) should be modified as follows: In the 8th line, it should refer to "Provisions C.3.e.ii.(2)(3)&(4)" not just "Provision C.3.e.ii.(2)."</p>	<p>We concur, and have made the requested change to Provision C.3.e.ii(1) of the proposed MRP amendment.</p>
BASMAA	5	General Comment	<p>The main effect of the proposed MRP amendment with the requested additional language stated in Comments 1-3 above will be to allow a narrowly defined and careful selected set of development projects to select, as an option, non-LID methods of treatment. The overall effect will be, by our estimate, that LID treatment will be provided for roughly 90% or more of the aggregate impervious area created or replaced as part of development projects approved during the remaining MRP term. The remaining 10% or less of impervious area created or replaced will receive treatment by either vault-based media filtration or by higher-rate biofiltration in a tree-box-type unit. The Permittees will carefully track the use of LID and non-LID treatment in development projects approved during the</p>	<p>Comment noted.</p>

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			remaining MRP term. We encourage the Board to adopt the proposed MRP amendment to include our requested 90% + approach and to recognize that for the remaining 10% or less of impervious area created or replaced that cannot accommodate LID treatment, other effective treatment methods will be employed (i.e., 100% of the runoff from such areas will receive treatment).	
CCCWP HMH	2 2	Category A <i>Small Projects</i>	Projects less than 1 acre should have 100% LID Reduction Credit. BASMAA's analysis shows that projects meeting Contra Costa's current criteria, including the one acre size limit, account for 0.29% of the aggregate impervious area created or replaced in the region over the four preceding years. Reduction of the size limit to half an acre is arbitrary, as there has been no analysis relating the change in size limit to any water quality benefit. In any case, such a benefit would be minimal in the context of total aggregate impervious area that will be constructed during the remaining term.	Category A in the proposed MRP amendment is given 100% LID Treatment Reduction Credit in recognition that the total impervious surface area for these projects is small and there may be corresponding space limitations for LID treatment measures. However, bigger projects that are greater than ½ acre have more impervious surface area and more space for LID treatment measures. Therefore, it is appropriate that the amount of LID Treatment Reduction Credit available for these types of projects (Category B projects) are dependent on the density of the projects.
CCCWP	5	General Comment	CCCWP supports the proposed MRP amendment, which will allow a narrowly defined set of development projects to select, as an option, non-LID methods of treatment resulting in LID treatment for 90% or more of the aggregate impervious area created or replaced as part of development projects approved during the remaining MRP term. The remaining 10% or less of impervious area created or replaced will receive treatment with either vault-based media filtration or by higher-rate biofiltration in a tree-box-type unit. We encourage the Board to endorse this 90% + approach.	Comment noted.
CCCWP	6	Categories of Special Projects	CCCWP's current LID policy identifies narrow categories of development projects where LID may be found to be infeasible. In BASMAA's 12/1/10 Proposal, Category A	BASMAA's 12/1/10 Proposal, to which CCCWP was a signatory to, identified five categories of Special Projects that were proposed for 100%

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			<p>projects are sites smaller than one acre approved for lot-line to lot-line development or redevelopment as part of a municipality's stated objective to preserve or enhance a pedestrian-oriented "smart growth" type of urban design, and Category D projects are existing portions of redevelopment sites that require stormwater treatment in accordance with the "50% rule." These two categories correspond closely to the project categories described in Contra Costa's current LID policy. The BASMAA analysis estimates that development projects fitting its proposed Category A would constitute about 0.29% of the total amount of the aggregate impervious area subject to Provision C.3 and only two potential development projects fitting its proposed Category D. The inclusion of Category B and C projects in the proposed MRP amendment would expand the total number of development projects allowed non-LID treatment beyond what Contra Costa's current LID policy allows.</p>	<p>LID Treatment Reduction Credit. That Proposal expanded the number and percentage of projects eligible for 100% LID Reduction Credit beyond what is described in CCCWP's current LID policy. In that BASMAA's 12/1/10 Proposal was submitted on behalf of all 76 MRP Permittees, including the Permittees in Contra Costa County, CCCWP's concerns about relaxation of its current LID policy highlighted in its comments should have been raised with BASMAA prior to submittal of the BASMAA 12/1/10 Proposal. The proposed MRP amendment reflects a narrowing of BASMAA's 12/1/10 Proposal in terms of the universe of potential Special Projects and the total maximum LID Treatment Reduction Credit allowed for each category of Special Projects. CCCWP is free to implement its current LID policy if it is more restrictive than that prescribed by the MRP.</p>
CCCWP	7	Clarification	<p>BASMAA has previously recommended that Board staff include a requirement to strongly encourage LID treatment even for projects eligible to use non-LID treatment. This language should be included in the proposed MRP amendment.</p>	<p>Comment noted.</p>
CCCWP SCVURPPP SMCWPPP	8 5 5	Category D <i>50% Rule</i>	<p>Category D as proposed in BASMAA's 12/1/10 Special Projects Proposal should be included in the proposed MRP amendment. Category D consists of redevelopment projects that redevelop more than 50% of the existing impervious surface area and are required to retrofit portions of the sites that are not being redeveloped, in accordance with the "50% rule" outlined in the MRP. It is often difficult to make space for LID treatment measures in the part of the site not being redeveloped or to get runoff from that part to LID treatment measures in the</p>	<p>See response to BASMAA's Comment No. 1 above.</p>

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			redeveloped part of the site. We do not want to disincentivize these types of urban infill projects and cause developers to choose instead an undeveloped site in a greenfield area that may be easier and cheaper to develop.	
CCCWP	9	General Comment	We ask the Board to review the process by which the current proposed MRP amendment was crafted. Board staff failed to make use of the available data and facts, but chose to focus on subjective preferences for various types and characteristics of different types of development. The proposed MRP amendment reads like a zoning code, complete with references to dwelling units per acre, floor area ratios, clustering, and street amenities.	BASMAA's 12/1/10 Proposal, to which CCCWP is a signatory, uses the same parameters to define the various Special Project Categories that CCCWP's comment is criticizing. That is, BASMAA's 12/1/10 Proposal defines the criteria for each Special Project Category using dwelling units per acre, floor area ratios, and parking. The proposed MRP amendment uses these same parameters except that it sets higher thresholds for these parameters and tiers the amount of LID Treatment Reduction Credit available for any given project. The density criteria in the proposed MRP amendment falls approximately midway within the accepted range of density values for various types of smart growth, high density, and transit-oriented development. On the other hand, the thresholds contained in BASMAA's 12/1/10 Proposal represent the lower end of the range of density values for these types of development. Adopting BASMAA's very loose criteria for the granting of LID Treatment Reduction Credits would result in most development projects qualifying for 100% LID Treatment Reduction Credit, which is inappropriate.
SCVURPPP SMCWPPP	1 1	Category D <i>50% Rule</i> Category E <i>Roads</i>	We support and incorporate by reference the comments submitted by BASMAA.	See response to BASMAA's comments above.
SCVURPPP	2	General Comment	The Program expects the LID Treatment Reduction Credits to be applied to a small percentage of the total number of	Comment noted.

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			<p>development projects in our region and the use of non-LID treatment to be limited. The City of San Jose conducted an analysis of projects approved during the last 5 years and estimated that, if the Special Projects criteria had been in place during that time, approximately 91% of the total impervious surface created or replaced would have been required to use LID treatment measures and less than 9% of the total would have had the option to use non-LID treatment measures. Countywide, the overall percentage of impervious surface with the option to use non-LID treatment measures would be much lower because many of the Santa Clara Permittees do not expect to have the types of development that would qualify as Special Projects.</p>	
SCVURPPP SMCWPPP	3 3	Category B Category C <i>Transit-Oriented Development</i>	<p>Our Permittees have concerns that smart growth projects in Categories B and C that get partial LID Treatment Reduction Credits will still have difficulty meeting LID requirements for the remaining impervious area. We prefer the credit system proposed in BASMAA's 12/1/10 Special Projects Proposal that granted 100% LID Treatment Reduction Credit to all Category B Special Projects.</p>	<p>Provision C.3.e.ii.(1) of the MRP acknowledges that certain types of smart growth, high density, and transit-oriented development can reduce impervious areas and their auto-related impacts. Given the potential water quality benefits from such developments, the MRP allows for incentive LID Treatment Reduction Credits to be applied to such projects. However, appropriate criteria must be established to limit: 1) the scope of projects that qualify for such credits, and 2) the total credits that are allowed for any given project. The proposed MRP amendment accomplishes this by establishing tiered LID Treatment Reduction Credits that take into account the size, land use type, location, density, and surface parking of the projects. BASMAA's 12/1/10 Proposal established criteria that were overly broad in terms of size, location, and density and allowed outright exemptions from LID treatment for all qualifying projects, often citing space limitations as reasons for</p>

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				<p>infeasibility of LID treatment. Provision C.3.e.i. already contains alternative compliance options (i.e., LID treatment offsite or payment in-lieu) that can be used to address these potential infeasibility scenarios described by BASMAA.</p>
<p>SCVURPPP SMCWPPP</p>	<p>4 4</p>	<p>Category C <i>Transit-Oriented Development Priority Development Areas</i></p>	<p>Special Projects located in Priority Development Areas (PDAs) should get 50% LID Treatment Reduction Credit instead of 25%. The PDAs are designated by MTC as part of the Bay Area's FOCUS program, a regional development strategy that promotes a more compact land use pattern, linking land use and transportation by encouraging the development of complete, livable communities in PDAs, and promoting conservation of the region's most significant resource lands. PDAs comprise about 3% of the land area in the Bay Area, but are expected to accommodate 40% of the future growth; therefore, PDAs should receive greater incentives in the form of increased LID Treatment Reduction Credits.</p>	<p>Category C Special Projects in the proposed MRP amendment establishes tiered LID Treatment Reduction Credits based on the location of transit-oriented development with the greatest credit (50%) given to development within a ¼-mile radius of a transit hub and smaller credits (25%) given to transit-oriented development within a ½-mile radius of a transit hub or within a PDA. This tiering directly reflects the concept that people are more likely to walk and take public transit if they are within a ¼-mile radius versus within a ½-mile radius or PDA. PDAs do not have any requirements for proximity to transit hubs; however, if they are within a ¼-mile radius, they will qualify for the higher 50% credit. Category C appropriately acknowledges the value of PDAs but assigns less LID Reduction Credit to reflect the greater likelihood of developments located within close proximity to transit hubs to decrease the use of automobiles. MTC and ABAG, the two regional planning and transportation agencies in the Bay Area, have endorsed this tiered approach in their comments below.</p>
<p>SCVURPPP SMCWPPP</p>	<p>5 5</p>	<p>Category D <i>50% Rule</i></p>	<p>Category D as proposed in BASMAA's 12/1/10 Special Projects Proposal should be included in the proposed MRP amendment. Category D consists of redevelopment projects that redevelop more than 50% of the existing impervious surface area and are required to retrofit portions of the sites that are not being redeveloped, in</p>	<p>See response to BASMAA's Comment No. 2 above.</p>

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			accordance with the "50% rule" outlined in the MRP. It is often difficult to make space for LID treatment measures in the part of the site not being redeveloped or to get runoff from that part to LID treatment measures in the redeveloped part of the site. We do not want to disincentivize these types of urban infill projects and cause developers to choose instead an undeveloped site in a greenfield area that may be easier and cheaper to develop.	
SMCWPPP	2	General Comment	In 2010, the 21 municipalities in San Mateo County identified development projects that had been approved during the preceding four years that would have met the Special Projects criteria included in BASMAA's 12/1/10 Special Projects Proposal. We have updated the 2010 findings with new data and now estimate that Special Projects would comprise less than 5% of the impervious area created and/or replaced by C.3. Regulated Projects within San Mateo County.	Comment noted.
City of Dublin	1	General Comment	The proposed MRP amendment is critical for Dublin to achieve its goal of replacing its current auto-oriented downtown to a mixed-use community with shopping and transit within walking distance.	Comment noted.
City of Dublin	2	General Comment	Analysis by Dublin in November 2010 shows that only 0.93% of the land surface area for projects approved by the City over the last four years would qualify for the proposed exemptions.	Comment noted.
City of Dublin	3	General Comment	City of Dublin fully supports the proposed MRP amendment.	Comment noted.
City of Fremont	1	General Comment	City of Fremont supports the concept of Special Projects due to the noted environmental advantages of infill development and need to incentivize infill projects in the competitive residential and economic development markets of the Bay Area.	Comment noted.
City of	2	Category C	The majority of cities in the Bay Area do not have urban	Transit-oriented development refers to the

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Fremont		<i>Transit-Oriented Development</i>	environments with high intensity buildings exceeding a 200% (2:1) FAR. A more moderate minimum FAR for Category C (transit-oriented development) Special Projects is important during the horizon of the MRP to help establish new viable transit-oriented development neighborhoods. The minimum FAR standard should be changed to 100% (1:1) instead.	clustering of homes, jobs, shops and services in close proximity to high quality transit services, and typically includes compact, relatively dense development and a mixing of different land uses. In many cases, an FAR of 2:1 (200%) equates to a two-story building; mixed use development in the Bay Area, including in suburban environments, generally are at least two-stories high. Therefore, achieving an FAR of 2:1 is a relatively easy threshold for qualifying for some LID Treatment Reduction Credit under Category C of the proposed MRP amendment.
City of Fremont	3	Category C <i>Transit-Oriented Development</i>	Category C mixed-use residential development should be allowed to qualify for LID Reduction Credit based upon either compliance with the minimum FAR <u>or</u> the minimum density.	At meetings with BASMAA, MTC and ABAG, held prior to circulation of the proposed MRP amendment, Board staff verified that the appropriate density measurements for mixed use and residential developments were FAR and dwelling units per acre, respectively.
City of Fremont	4	Category C <i>Transit-Oriented Development</i>	The two changes requested in Comment #2 and #3 will allow important initial projects to move ahead and create momentum for TOD neighborhoods without extensive undercutting of the MRP's goals. The City estimates that through 2014 there are only three known development projects in Fremont that may benefit from the Special Projects LID Reduction Credits. All three projects are redevelopment projects on existing sites that do not currently have stormwater treatment.	In accordance with the MRP, LID Treatment Reduction Credits may be granted to certain types of smart growth, high density, and transit-oriented development that reduce impervious areas and their auto-related impacts to achieve potential water quality benefits. Setting very loose criteria for the granting of these LID Treatment Reduction Credits such that most redevelopment projects qualify is inappropriate, no matter how small the total number of projects.
City of Fremont	5	Biotreatment Soil Specs	Eliminate the requirement for batch-specific test results and certification for projects installing more than 100 cubic yards of bioretention soil because it is onerous and will unnecessarily delay construction of desirable treatment measures.	This is a specification proposed by the Permittees. There will be few projects with this large soil requirement, and it is reasonable to test for adherence to the specifications for such large projects.

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City of San Jose	1	General Comment	<p>City of San Jose supports the following aspects of the proposed Special Projects approach:</p> <ul style="list-style-type: none"> • The use of location and density criteria for defining Smart Growth • Smart Growth should avoid conventional surface parking lots and limit surface parking to the minimum necessary. • The use of tree-well biofilters and/or structural media filters to treat portions of the C.3. runoff volume as allowed by the LID credits that a project qualifies for, resulting in treatment of the entire C.3. runoff volume for any Special Project. • Semi-annual reporting of Special Projects to the Water Board. 	Comment noted.
City of San Jose	2	Categories of Special Projects <i>LID Treatment Reduction Credit</i>	<p>The City remains concerned that the proposed MRP amendment does not align with the Smart Growth development strategies of the Bay Area. San Jose supports an LID credit system that would provide full treatment flexibility to certain types of Smart Growth development. The proposed MRP amendment does not align with the MRP's vision of incentivizing Smart Growth to leverage its water quality benefits at the watershed scale.</p>	<p>The density criteria in the proposed MRP amendment fall within the accepted range of density values for various types of smart growth, high density, and transit-oriented development. On the other hand, the criteria contained in BASMAA's 12/1/10 Proposal, while offering the full flexibility that the City wants, represent the lower end of the range of density values for these types of development. Adopting BASMAA's very loose criteria for the granting of LID Treatment Reduction Credits would result in most development projects qualifying for 100% LID Treatment Reduction Credit, which is inappropriate.</p>
City of San Jose	3	Category C <i>Transit-Oriented Development Priority Development Areas</i>	<p>The City has the most concerns about the limited location credit for projects in Priority Development Areas (PDAs). PDAs are the centerpiece of ABAG's FOCUS program, a regional development and conservation strategy that promotes compact development in transit-rich areas. PDAs represent <5% of the total Bay Area, yet are projected to accommodate over half its growth. To better align the MRP with regional sustainable growth strategies,</p>	See Response to SCVURPPP Comment No. 4.

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			the proposed MRP amendment should provide at least a 50% location credit for TOD projects that meet the minimum density/intensity criteria and are located in PDAs.	
City of San Jose	4	Category A <i>Small Projects</i> Category B	The density requirements of the proposed LID credit system only provide full (100%) treatment flexibility to small infill projects (Category A) and to very high density or high-rise projects (Categories B & C). These are rare forms of re-development and represent the exception rather than the norm of development in the Bay Area region. San Jose recommends that, at a minimum, the Category B criteria for 100% credit be revised to an FAR of 3:1 or a density of 75 dwelling units per acre.	The proposed MRP amendment's tiering of LID Treatment Reduction Credits with greater credit given to higher density developments is recognition that these types of development result in the greatest reduction of impervious area per capita. Another consideration is that the densest developments mostly occur in urban environments where there may be limited space for LID treatment measures. Likewise, the smallest projects (Category A) also may have space limitations and are therefore given 100% LID Treatment Reduction Credit. On the other hand, Category B projects are bigger in size, so it is appropriate that the less dense projects do not get the maximum LID Treatment Reduction Credit of 100%.
City of San Jose	5	Category C <i>Transit-Oriented Development Priority Development Areas</i>	The FAR identified for the transit-oriented development density criteria for mixed-use and commercial development describe a much more intense form of development than for the residential densities to which they should be aligned. The FAR for the 20% density credit should be reduced to 3:1 and the FAR for 30% credit should be lowered to 4:1.	In accordance with the MRP, LID Treatment Reduction Credits may be granted to certain types of smart growth, high density, and transit-oriented development that reduce impervious areas and their auto-related impacts to achieve potential water quality benefits. The density criteria in the proposed MRP amendment fall within the accepted range of density values for the various types of transit-oriented development. On the other hand, the criteria contained in BASMAA's 12/1/10 Proposal represent the lower end of the range of density values for these types of development. By comparison, the density values in the proposed MRP amendment represent mid-range values when compared directly to the City's <i>Envision</i>

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				<i>2040 Draft General Plan.</i>
City of San Jose	6	Special Projects <i>LID Treatment Reduction Credits</i>	The entire LID credit system in the proposed MRP amendment appears structured to ensure that nearly every qualifying Smart Growth project is required to treat at least a portion of its runoff with LID treatment methods, rather than allowing those projects to successfully treat the full C.3. volume with compact structural BMPs. The Water Board has not presented sufficient evidence that the structural BMPs in use today are not effective and should not be used in Smart Growth development. San Jose is concerned that the application of partial LID credits to Smart Growth projects will add complexity and cost due to the additional architectural and engineering design necessary to route portions of a projects' stormwater runoff to different treatment facilities, as well as increased construction costs.	By establishing LID treatment requirements in the MRP for all Regulated Projects, the Board recognized LID as a superior, cost-effective, beneficial, holistic, integrated stormwater management strategy. The benefits of LID have been well documented and represent a preferable approach to treating and reducing stormwater runoff because it is cost-effective, sustainable, and environmentally sound. LID treatment measures are effective because they can remove a broader range of pollutants in a more robust and redundant fashion, and can achieve multiple environmental and economic benefits in addition to reducing downstream water quality impacts, such as enhanced water supplies, cleaner air, reduced urban temperature, increased energy efficiency and other community benefits. The proposed MRP amendment's tiering of LID Treatment Reduction Credits has been proposed to purposefully maximize LID treatment for any given Special Project and minimize the amount of runoff needing to be treated with non-LID measures. LID treatment measures have not been shown to increase cost or complexity of development projects where they are feasible to use and not cost prohibitive (see response to NRDC/BayKeeper comment No. 5 below).
City of San Jose	7	SCVURPPP HM Map	The City appreciates that the proposed MRP amendment incorporates the revised HM Applicability Map for Santa Clara Valley into the MRP. The City notes that field verification of catchment areas may indicate the need to adjust the HM Map boundaries. The City will notify the Water Board and submit documentation supporting any	The MRP contains specific language in Requirement 4.c. of Attachment F (page F-3) acknowledging that the "Pink Areas" of SCVURPPP's HM Map were under review for accuracy by the Santa Clara Permittees. The MRP specifies that any new data must be

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			need for adjustments.	submitted within one year of MRP adoption on 10/14/09. SCVURPPP submitted new impervious data and a revised HM Map to the Board on 10/14/10. The proposed MRP amendment includes the revised HM Map. Once these changes are adopted by the Board, the HM Map boundaries will be set for the rest of the Permit term; the MRP does not contain any language allowing for further revisions to the HM Map. Any additional data collected by the Permittees supporting further revisions should be submitted with the Permit application for consideration in the next Permit term.
MTC and ABAG	1	General Comment	<p>We support the proposed MRP amendment that allows certain types of smart growth, urban infill and transit-oriented development projects with inherent environmental benefits to receive LID Treatment Reduction Credits for treating stormwater runoff. We specifically support the allowance of LID Treatment Reduction Credits for the Category B and C Special Projects.</p> <p>MTC is the transportation planning, coordinating and financing agency for the nine-county Bay Area. ABAG is the Bay Area's regional planning agency and council of governments. MTC and ABAG are leading the Bay Area's FOCUS program with support from our partner agencies, the Bay Area Air Quality Management District and the Bay Conservation and Development Commission. FOCUS is a regional development and conservation strategy that promotes a more compact land use pattern, linking land use and transportation by encouraging the development of complete, livable communities in areas served by transit (Priority Development Areas (PDA)), and promoting conservation of the region's most significant resource</p>	Comment noted.

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			lands. This program and the current effort to develop the Sustainable Communities Strategy will direct growth and development to the PDAs along existing and proposed local and regional transportation routes.	
NRDC and San Francisco Baykeeper	1	General Comment	We appreciate that the Water Board has made efforts to clearly specify the categories of development that would qualify for LID Treatment Reduction Credits.	Comment noted.
NRDC and San Francisco Baykeeper	2	overbroad, unsupported, illegal	We are strongly concerned that the proposed MRP Amendment is overbroad, unsupported, and fails to meet the requirements of federal law.	The proposed MRP amendment is specific, supported by adequate rationale and meets requirements of the federal Clean Water Act regulations.
NRDC and San Francisco Baykeeper	3	Commented on earlier draft	NRDC and Baykeeper submitted comments to the Water Board previously on the Board's release of the BASMAA 12/1/10 Special Projects Proposal/LID Treatment Reduction Credits MRP Provision C.3.e.ii.(ii) ("Dec. 1 Proposal").	Comment noted.
NRDC and San Francisco Baykeeper	4	No new analysis or justification of LID implementation flexibility put forth by Board staff	As the Water Board has not circulated any additional analysis or justification for the credit system in the proposed MRP amendment, we assume that, while some of the specific criteria have been altered from the 12/1/10 Proposal, the discussion and proffered reasoning for allowing LID Treatment Reduction Credits given in the 12/1/10 Proposal (by BASMAA) still form the basis for the proposed MRP amendment.	Additional justification is found in the Staff Report, Fact Sheet, and record.
NRDC and San Francisco Baykeeper	5	Proposed MRP amendment inconsistent with state and federal law, specifically	In our January 28, 2011, comments, which we incorporate by reference and attach here as "Exhibit A," we noted that this recommended system of credits was ill-conceived and that its terms were inconsistent with state and federal law, most notably with the requirements of the Clean Water Act's "maximum extent practicable" ("MEP") standard.	The proposed credit system does meet the MEP stormwater treatment standard. Treatment of stormwater is still required with only the added flexibility of allowing use of vault-based high rate filtration or high rate tree well filtration systems where either LID measures are too costly or infeasible due to lack of space or other physical factors. MEP includes the concept of technical and cost feasibility. The flexibility allowed in the

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		MEP.		<p>proposed MRP amendment is granted to account for feasibility issues associated with implementation of LID treatment on certain specific projects:</p> <ul style="list-style-type: none"> • Green roofs may be technically feasible, unless interfering with other roof uses, but may be too costly for some projects. • Infiltration in areas of low infiltration rate clay soils would require large storage volumes and large infiltration devices that may not be technically feasible or otherwise are otherwise too costly for some projects. • Stormwater harvest may be technically feasible, but the additional plumbing, treatment and storage needed to hold sufficient stormwater volume until it is used renders it too costly for certain projects. • Biotreatment with underdrains requires sufficient surface area for planting and underground clearance for drainage, which may not be available in some dense projects. <p>Therefore, in these circumstances, due to physical limitations or cost, LID treatment measures are not practicable. The proposed credit system allowing use of vault based high rate filtration or high rate tree well filtration systems does meet the MEP stormwater treatment standard.</p> <p>Additionally, tree-box-type high rate biofilters and vault-based high rate media filters do provide good removal of fine particulates and particle-bound pollutants, and can adsorb some soluble pollutants. When properly designed and operated they are nearly as effective as LID biotreatment.</p>

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NRDC and San Francisco Baykeeper	6	Doesn't meet MEP	The proposed credit system fails to meet the MEP requirement because it “would not obligate any Special Project to demonstrate that it is technically infeasible to implement the MRP’s LID stormwater mitigation measures—merely falling into one of the specified categories would accord the project a complete waiver from the retention requirements, or even the requirement to use biotreatment where onsite retention is technically infeasible.”	That was not staff’s intent. The tentative order has been revised to require Permittees to report on infeasibility for Special Projects not employing 100% LID treatment. Also, as discussed in our response to NRDC/BayKeeper comment no.5 above, the proposed credit system does meet the MEP standard. Treatment of stormwater is still required with only the added flexibility of allowing use of vault-based filtration systems where either LID treatment measures are too costly or infeasible due to lack of space.
NRDC and San Francisco Baykeeper	7	Evidence of water quality benefits of Smart Growth lacking	Neither BASMAA’s 12/1/10 Proposal nor the proposed MRP amendment provide credible evidence to support the claim that Smart Growth yields water quality benefits. The 12/1/10 Proposal cited reports that point to benefits that can, under certain circumstances, accrue from smart growth development, without any finding to demonstrate that any benefits will actually accrue from any specific Special Project.	When considered at a watershed scale, smart growth, high density and transit-oriented development can either reduce existing impervious surfaces or create less “accessory” impervious areas and automobile-related pollutant impacts. Facilitating smart growth is consistent with regional, State and federal plans and policies, including the Bay Area’s Smart Growth Strategy, the California Local Government Commission’s Ahwahnee Water Principles, and principles espoused in U.S. EPA’s publication “Protecting Water Resources with Smart Growth.” Smart growth, infill, and transit-oriented development increase population density and improve access to transit, both of which reduce annual auto mileage per capita and consequently reduce automobile-related pollution runoff. These types of development also preserve open space and make efficient use of previously developed land and existing infrastructure.

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NRDC and San Francisco Baykeeper	8	High rate media filters and high rate tree box biofilters performance overstated, no performance standard for these systems	<p>Retaining the design storm volume onsite would prevent 100 percent of the pollutants in that runoff from ever reaching receiving waters. In contrast vault-based systems with conventional treatment BMPs (such as sand filters) only attenuate just slightly over half of the total suspended solids, 40% of the total zinc, and one-third of the total copper and total phosphorous.</p> <p>BASMAA's 12/1/10 Proposal is unable to provide any data that tree-box-type high-rate biofilters are as good or better than effluent quality from a bioretention facility. Further, we provided evidence that "full biotreatment systems utilizing an underdrain are likely to attenuate only 57 percent of TSS, 80 percent of TCu, 62 percent of TZn, and 78 percent of TP even under optimum conditions, let alone when engineered to allow infiltration rates of up to 100 inches per hour," and that "[b]iotreatment systems with underdrains have additionally proven relatively ineffective for removal of total nitrogen or nitrate."</p> <p>The proposed MRP amendment provides no specific design, performance, or sizing standards for these proposed alternative methods, meaning there is absolutely no assurance that they will serve to reduce pollution in an effective manner.</p>	<p>With regard to the performance of a "vault" cited in the 2009 Horner paper, NRDC/SFBaykeeper is comparing apples to oranges. The 2009 Horner paper addresses a calculated example that is half "conventional treatment" and half "vault", with the vault data from a simple gravity separation vault that is pretreatment for a sand filter, not from a filter media vault. A filter media vault would have far superior performance. The vault discussion from the 2009 Horner paper, "Shapiro and Associates, Inc. (1999)," measured the water quality of discharge from a wet vault serving as pretreatment for a sand filter in Bellevue, WA. This study found reductions of 36 percent for TSS, 13 percent for TCu, 26 percent for TZn, and 7 percent for TP. Performance from a true filter media vault, properly maintained, will have much better performance than that described in the comment.</p> <p>As for biotreatment performance for a high rate tree-box-filter, one vendor of these systems, Filterra, has received the Washington State certification for its systems, which involves rigorous testing of actual installations. In short, the performance is far better than the numbers in the 2009 Horner paper.</p> <p>Most of the proprietary vault-based methods that we expect Permittees to specify for treatment have been subjected to testing by the state of Washington, which has a rigorous testing and certification system that sets a performance threshold. While we do not require Washington State certification for filter or tree vaults used, we will require reporting of the</p>

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				<p>types of systems installed and closely scrutinize what the Permittees specify, to determine if such a requirement will be necessary when the MRP is reissued in 2014.</p> <p>We have revised the proposed MRP amendment to add requirements in Provision C.3.e.vi and Table 3.1 to report the specific type of tree-box-type or vault-based high flowrate biofilter system(s) proposed and any government agency certifications for those systems.</p>
NRDC and San Francisco Baykeeper	9	Category C TOD exemption too broad	<p>The Proposed Transit-Oriented Development Exemption (Category C) is ill-conceived and overbroad. There are 19 Bart stations in Alameda County alone, which would create approximately 13.5 square miles of waiver eligible land, including considerable portions of downtown Oakland and Berkeley, without even considering other rail stops, bus transfer stations, or ferry terminals, or transportation hubs outside of Alameda County.</p>	<p>The location credit for Category C (Transit Oriented Development) allows only a 25% or 50% credit, and the 50% credit only for projects within 1/4-mile of transit stations. There are additional density and parking requirements necessary for projects to attain additional credits, and, simply because a project qualifies for the credits, does not necessarily mean the credits will be used. Moreover, the credits are not automatic; Permittees have to consider feasibility of LID treatment measures and report on them.</p> <p>Vault-based type systems are more expensive to install and to maintain compared with some LID and biotreatment systems. Also, the LID Treatment Reduction Credits proposed will be evaluated in advance of the end of the MRP's current term in three years. Prior to reissuance of the MRP, we will take stock of how the LID Treatment Reduction Credits were implemented to determine if the proposed flexibility needs more limitation.</p>

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NRDC and San Francisco Baykeeper	10	No evidence that T.O. would avoid green field development on suburban fringe	The Water Board has not provided evidence or basis for waiver of the MRP's LID retention requirements. BASMAA's 12/10/10 Proposal claimed that a waiver from the MRP's LID requirements was necessary for all development in the selected categories because the development "would otherwise likely be directed to the suburban fringe." However, neither BASMAA's 12/1/10 Proposal nor the proposed MRP amendment provide any basis for such a statement, and the claim is in fact contradicted by recent research by ECO Northwest which is further discussed in a comment below.	<p>The basis for the waiver of LID treatment requirements is the recognition that for those Special Projects identified in the tentative order, it may not be feasible to implement LID treatment. This is consistent with the MEP standard, which takes into account technical and cost feasibility.</p> <p>Regarding development patterns, the Permittees, as land use entities with expertise in the development patterns of their respective cities, have stated to us that, if dense urban development lacks the flexibility to build stormwater treatment that is cost feasible (see response to NRDC/SFBaykeeper Comment No. 3), some projects will not be built. These same developers may not necessarily build in green fields, but over time development pressure on the suburban fringe will increase if urban centers are not adequately utilized.</p>
NRDC and San Francisco Baykeeper	11	Up to 100% credit with no reason stated by applicant	Where a Special Project may practicably implement LID treatment measures that retain runoff onsite, under the MEP standard it is required to do so, regardless of whether the project may promote some other environmentally beneficial goal. The proposed MRP Amendment must therefore require that credits are given for LID treatment reduction, if at all, only where it is demonstrated to be technically infeasible to retain the runoff onsite.	We agree that Permittees must evaluate and state the basis of infeasibility of implementing LID treatment measures. We have revised the proposed MRP amendment to include requirements in Provision C.3.e.vi and Table 3.1 to report on the infeasibility of LID treatment for each of the Special Projects for which LID Treatment Reduction Credit was applied.
NRDC and San Francisco Baykeeper	12	Development won't be directed to the urban fringe. Special Projects can	The primary basis for implementing the credit system, that development or redevelopment "would otherwise likely be directed to the suburban fringe", is patently false. NRDC-SF Baykeeper submitted technical studies to establish that Special Projects could in many circumstances meet standards even more stringent than the LID requirements adopted in the MRP. Moreover, BASMAA's 12/1/10	<p>See response to NRDC/SFBaykeeper comment No. 10.</p> <p>We have revised the proposed MRP amendment to clarify that non-LID treatment is only allowed to the extent LID treatment is not feasible.</p>

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		implement LID in many instances.	Proposal states that “[i]nfiltration is feasible on some of these project sites,” that evapotranspiration “may be implementable for some projects,” and that even though it may not be “universally applicable,” rainwater capture and reuse “may be implementable.” Even in the event none of these practices can be feasibly implemented, the Draft Proposal states “[b]iotreatment will be implementable on many projects.” Thus, the claim that a full 100 percent credit is necessary, or warranted at all, is unsupported.	
NRDC and San Francisco Baykeeper	13	ECO Northwest study shows that LID not a disincentive for redevelopment	Research by ECO Northwest demonstrated that in recent case stud(ies) interviewing staff in multiple jurisdictions, “none had actually observed that developers were choosing to invest in greenfield projects over redevelopment projects because of . . . new [stormwater] standards.” The research found that, while pursuing projects to meet strong stormwater standards “was not without challenge . . . [developers] will continue developing in places that require strong stormwater controls and LID.” The study found that “many developers describe the cost of implementing stormwater controls as minor compared to the other economic factors they considered in deciding whether or not to pursue a project. . especially in the context of highly-complex redevelopment projects and green-building infill projects . . some developers pointed out . . that using LID controls has helped offset some of the increased cost, compared to using conventional controls.”	The study leans heavily on anecdotal interviews with a few staff from various jurisdictions with strong LID requirements and is far from conclusive. While we do not dispute the results of the studies’ narrow inquiries, the experience of the 76 Permittees under the MRP is valid also, especially since they are the experts on the development that occurs within their respective jurisdictions. The Permittees have stated that where redevelopment cannot take place, the development pressure at green fields is increased. As such, they have strongly advocated for allowing the flexibility in a narrow range of circumstances afforded by the proposed MRP amendment.
NRDC and San Francisco Baykeeper	14	Smart Growth is supported	NRDC and Baykeeper agree with the environmental preferability of smart growth projects in comparison to their greenfield counterparts (indeed, NRDC is a national advocate of smart growth).	Comment noted.
NRDC and San Francisco Baykeeper	15	No blanket waiver	In the MS4 permitting context there is no reason to establish a blanket waiver from proven stormwater mitigation requirements simply because a project constitutes “smart growth” or infill.	The proposed MRP amendment does not confer a blanket waiver, but allows flexibility to a narrow range of very specific projects, which meet very clear, specific and narrow criteria.

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NRDC and San Francisco Baykeeper	16	Implement LID where feasible	If a project can feasibly implement stormwater treatment measures, it must be required to do so, particularly for regions such as the Bay Area that contain numerous impaired waters. The Tentative Order and BASMAA's 12/1/10 Proposal provide no basis to conclude otherwise.	We agree that the Permittees must evaluate and state the basis of infeasibility of implementing LID treatment measures. We have revised the proposed MRP amendment to include requirements in Provision C.3.e.vi and Table 3.1 to report on the infeasibility of LID treatment for each of the Special Projects for which LID Treatment Reduction Credit was applied.
NRDC and San Francisco Baykeeper	17	No evidence Smart Growth has environment benefits to offset lack of LID	No evidence has been given to demonstrate that all projects in these categories are incapable of complying with the MRP, no evidence has been given to demonstrate that perceived benefits of smart growth or development in proximity to a transit hub will outweigh the water quality detriments created by additional urban runoff, and no evidence has been given to show that smart growth, infill, or redevelopment projects will be forced to migrate to greenfield spaces.	While stormwater infiltration and harvest for onsite use will lead to no discharge of the design storm flow, green roofs and bio-treatment will involve some offsite discharge of treated stormwater. Capacity for infiltration in an urban context in the Bay Area is fairly rare, and harvest requires large onsite demand for non-potable water. The difference in treatment efficiency between tree wells and filter vaults is not insignificant, but would be balanced by the environmental benefits of reduced car use and concentration of dense development in urban cores where transportation and infrastructure already exist. It is not necessary to demonstrate that smart growth-pollutant reduction benefits will fully outweigh the impact of non-LID treatment, as it is possible to find that LID cannot be implemented fully in all projects, since it is not always practicable. In those cases, the best non-LID treatment can be implemented and demonstrated to meet the MEP standard for those few projects.
NRDC and San Francisco Baykeeper	18	100% exemption from LID does not meet MEP	Allowing for any such development to obtain a 100 percent credit such as proposed here fails to properly implement the requirement that development reduce the impacts of stormwater "to the maximum extent practicable,"	See responses to NRDC/SFBayKeeper comments 5 and 6.

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NRDC and San Francisco Baykeeper	20	January 28, 2011 comments on December 1, 2010 Draft Special Projects Proposal by BASMAA	We are strongly disappointed with the Draft Proposal. While we appreciate that the number and type of categories of projects that would qualify for treatment reduction credits has been reduced from that originally, and unjustifiably, proposed in early drafts of the MRP, the Draft Proposal nevertheless presents ill-conceived and unduly broad exemptions from the MRP low impact development (“LID”)-based retention and alternative compliance requirements. Inexplicably, the Draft Proposal would provide “Special Projects” with a categorical exemption from meeting any of the LID requirements under section C.3.c.i.(2)(b) of the MRP. The Draft Proposal fails to provide passable technical support or compliance-based reason for such a blanket waiver. Further, its proposed terms are inconsistent with state and federal law, most notably with the Clean Water Act’s “maximum extent practicable” (“MEP”) standard. For the reasons presented below, we strongly urge the Board to reject the Draft Proposal.	See responses to NRDC/SF Baykeeper comments 5, 6, and 7.
NRDC and San Francisco Baykeeper	21	January 28, 2011 comments on December 1, 2010 Draft Special Projects Proposal by BASMAA Any LID Treatment Credit System Must Meet the Federal Clean Water Act’s	Section 402(p) of the Clean Water Act establishes the MEP standard as a requirement for pollution reduction in stormwater permits. “[T]he phrase „to the maximum extent practicable“ does not permit unbridled discretion. It imposes a clear duty on the agency to fulfill the statutory command to the extent that it is feasible or possible.” (<i>Defenders of Wildlife v. Babbitt</i> (D.D.C. 2001) 130 F.Supp.2d 121, 131 (internal citations omitted); <i>Friends of Boundary Waters Wilderness v. Thomas</i> (8th Cir. 1995) 53 F.3d 881, 885 (“feasible” means “physically possible”).) As one state hearing board held: [MEP] means to the fullest degree technologically feasible for the protection of water quality, except where costs are wholly disproportionate to the potential benefits.... This standard requires more of permittees than mere compliance with water quality standards or	See responses to NRDC/SF Baykeeper comments 5, 6, and 7.

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		MEP Standard	<p>numeric effluent limitations designed to meet such standards.... The term "maximum extent practicable" in the stormwater context implies that the mitigation measures in a stormwater permit must be more than simply adopting standard practices. This definition applies particularly in areas where standard practices are already failing to protect water quality...</p> <p><i>(North Carolina Wildlife Fed. Central Piedmont Group of the NC Sierra Club v. N.C. Division of Water Quality (N.C.O.A.H. October 13, 2006) 2006 WL 3890348, Conclusions of Law 21-22 (internal citations omitted).)</i> The North Carolina board further found that the permits in question violated the MEP standard both because commenters" highlighted measures that would reduce pollution more effectively than the permits" requirements and because other controls, such as infiltration measures, "would [also] reduce discharges more than the measures contained in the permits." (<i>Id.</i> at Conclusions of Law 19.) Low Impact Development has been established as "a practicable and superior approach . . . to minimize and mitigate increases in runoff and runoff pollutants and the resulting impacts on downstream uses, coastal resources and communities." Of note, the U.S. Environmental Protection Agency originally threatened to "consider objecting to the [MRP] permit" if it did not include "additional, prescriptive requirements" for LID. Further, NRDC and Baykeeper submitted several technical studies to the Regional Board to establish that the exempted Special Projects, including "smart growth" or urban infill and redevelopment projects, could in many circumstances meet standards even more stringent than the LID requirements adopted in the MRP.</p> <p>Yet, here the Permittees propose to allow a broadly defined swath of Special Projects to be granted a complete waiver from meeting the MRP's LID requirements. Of particular</p>	

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			<p>concern, the Draft proposal would exempt any development or redevelopment project from the MRP's LID requirements if it occurs within ½ mile of an existing or planned "transit hub." (Draft Proposal, at 10.) The Draft Proposal would not obligate any Special Project to demonstrate that it is technically infeasible to implement the MRP's LID stormwater mitigation measures— merely falling into one of the specified categories would accord the project a complete waiver from the retention requirements, or even the requirement to use biotreatment where onsite retention is technically infeasible. The only justification presented for this waiver is a set of generalized and largely unquantified environmental benefits that may, in theory, accrue from the exempted projects, and vague assertions made regarding the complexity involved in procuring approval for smart growth projects.</p> <p>While we do agree with the environmental preferability of smart growth projects in comparison to their greenfield counterparts (indeed, NRDC is a national advocate of smart growth), in the MS4 permitting context there is no reason to establish a blanket waiver from proven stormwater mitigation requirements simply because a project constitutes "smart growth." If a project can feasibly implement stormwater treatment measures, it must be required to do so (particularly for regions such as the Bay Area that contain numerous impaired waters). As discussed in the sections below, the Draft Proposal does not present any evidence to demonstrate that all projects in these categories are incapable of complying with the MRP, nor does it present any evidence to demonstrate that any perceived benefits of smart growth or development in proximity to a transit hub will outweigh the water quality detriments created by additional urban runoff. As a result, simply authorizing a blanket waiver such as the one proposed here would fail to properly implement the requirement that development reduce the impacts of</p>	

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Commenter	Comment No.	Key Word(s)	Comment	Response
			stormwater "to the maximum extent practicable."	
NRDC and San Francisco Baykeeper	22	<p>January 28, 2011 comments on December 1, 2010 Draft Special Projects Proposal by BASMAA</p> <p>The Draft Proposal Fails to Provide Support for Water Quality Benefits Claimed to Arise from Development of Special Projects.</p>	<p>Rather than proposing specific LID treatment reduction credits for different types of "Special Projects," as specified in the MRP under section C.3.e.ii.(2), the Permittees propose instead to exempt all designated Special Projects from the MRP's LID requirements entirely. The Draft Proposal states that the benefits of "Smart Growth strategies . . . are expected to offset any potential for increases in pollutant loading that may result from allowing" Special Projects to use alternative compliance measures. However, the Draft Proposal provides no credible basis to support such a claim.</p> <p>The Draft Proposal claims that "[s]mart growth strategies . . . will achieve significant water quality benefits." (<i>Id.</i>) The Proposal then cites to several reports, each of which point to benefits that can, generally speaking, be derived from smart growth development. For example, the Draft Proposal points to a U.S. EPA report that states that "high density" development of 8 houses per acre would produce approximately 20 percent less runoff annually than would medium density development of only 4 houses per acre. (See Draft Proposal, at 21.) While we would dispute the characterization of typical suburban development on 1/8 acre lots as "high density," there is nothing to this finding that demonstrates that a 20 percent reduction in runoff will occur for any specific Special Project in particular, let alone that a benefit would accrue to justify a complete and total waiver from requirements to retain runoff onsite or to comply with the MRPs alternative compliance provisions. Neither the Draft Proposal nor the studies it cites (either the EPA report or others cited on pages 21-24) point to specific, quantifiable pollutant load reductions that would occur as a result of smart growth or other</p>	<p>The proposed MRP amendment does not allow 100% LID Treatment Reduction for all projects.</p> <p>See responses to NRDC/SFBaykeeper comments 7 and 16.</p>

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			<p>development designated as Special Projects; the proposal in no way provides validation for its claim that “increases in pollutant loading” resulting from the proposed blanket waiver would be offset. Effectively, the Draft Proposal provides no evidence of the true water quality benefits of smart growth.</p> <p>While we do not doubt that such benefits may exist for a particular project, the Draft Proposal’s blanket waiver is simply not calibrated to ensure such benefits are achieved. Nor does the Draft Proposal address the issue that, discussed in section A.3, below, many, if not a majority of designated Special Projects will be able to feasibly implement LID-based retention practices to address some or all of the required volume of runoff, obviating any claimed need for such a credit in the first place.</p>	
NRDC and San Francisco Baykeeper	23	<p>January 28, 2011 comments on December 1, 2010 Draft Special Projects Proposal by BASMAA</p> <p>The Draft Proposal Overstates the Effectiveness of Proposed Alternative Methods of Compliance in</p>	<p>Far from having been “proven capable of providing good stormwater treatment,” the proposed alternative practices the Draft Proposal advocates for represent a demonstrably inferior means of addressing stormwater pollution compared with LID practices that infiltrate, evapotranspire, or harvest and re-use runoff. For instance, retaining the design storm volume onsite would prevent 100 percent of the runoff, and therefore, 100 percent of the pollutants in that runoff, from ever reaching receiving waters. In contrast, under the Draft Proposal a Special Project could implement a vault-based system with conventional treatment BMPs (such as sand filters) that would only attenuate just slightly over half of the total suspended solids (TSS), 40% of the total zinc (TZn), and one-third of the total copper (TCu) and total phosphorous (TP) in that volume of runoff. For tree-box-type high-rate biofilters, the Draft Proposal acknowledges that it is unable to provide any conclusive data as to “whether effluent quality . . . is as good or better than effluent quality from a bioretention facility.” (Draft Proposal, at 6.) However, unless the tree</p>	See responses to NRDC/SFBaykeeper comments 8 and 16.

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		Reducing Stormwater Pollution	<p>box filter is designed with the same capacity to store and infiltrate or evapotranspire water as the bioretention system, it is unlikely to provide comparable performance. As we have demonstrated in technical papers previously, full biotreatment systems utilizing an underdrain are likely to attenuate only 57 percent of TSS, 80 percent of TCu, 62 percent of TZn, and 78 percent of TP even under optimum conditions, let alone when engineered to allow infiltration rates of up to 100 inches per hour. Biotreatment systems with underdrains have additionally proven relatively ineffective for removal of total nitrogen or nitrate.⁹ Given the poor performance of these systems, even allowing partial treatment through such features all but guarantees high pollutant loads and concentrations in the resulting stormwater runoff, and refutes any claim that a blanket waiver will “achieve significant water quality benefits.”</p> <p>That Special Projects would be “[s]trongly encourage[d]” to implement retention practices is entirely insufficient (see Draft Proposal, at 6); this Language represents, at best, a toothless, hortatory suggestion that will not ensure Special Projects are developed in a manner that reduces stormwater pollution to the MEP. The Regional Board should reject the Draft Proposal’s claims regarding use of alternative practices and the proposal they purportedly support.</p>	
NRDC and San Francisco Baykeeper	24	January 28, 2011 comments on December 1, 2010 Draft Special Projects Proposal by	<p>The MRP requires Regulated Projects to retain a specified volume of runoff onsite using LID practices that infiltrate, evapotranspire, or harvest and reuse rainfall, or, where these practices are technically infeasible to implement, to treat the runoff using biotreatment BMPs or by performing alternative compliance. (MRP, section C.3.c.i.(2)(b).) The Draft Proposal claims, without citation to data or other evidence, that “[d]evelopments where none of the methods prescribed by the Water Board are possible will include smart growth, high density, and transit oriented</p>	<p>The proposed MRP amendment does not allow 100% LID Treatment Reduction for all projects.</p> <p>See responses to NRDC/SFBaykeeper comments 6, 7, 8, and 16.</p>

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		<p>BASMAA</p> <p>The Draft Proposal Fails to Articulate any Demonstrated Basis for a Blanket Waiver of the MRP's LID Requirements</p>	<p>development.” (Draft Proposal, at 1.) The Draft Proposal then claims, again without support, that a blanket waiver from the MRP’s LID requirements is necessary for all development in the above categories because the development “would otherwise likely be directed to the suburban fringe.” (Draft Proposal, at 3.) However, even disregarding their anecdotal nature, the Draft Proposal itself disqualifies these claims as the basis for any waiver. In numerous places, the Draft Proposal points out not that a complete (or even partial) exemption is required for these types of development, but that implementing the MRP’s LID requirements will be entirely feasible. The Draft Permit openly points out that “[i]nfiltration is feasible on some of these project sites,” that evapotranspiration “may be implementable for some projects, “ and that even though it may not be “universally applicable,” rainwater capture and reuse “may be implementable.” (Draft Proposal, at 7.) Even in the event none of these practices can be feasibly implemented, the Draft Proposal fully admits that “[b]iotreatment will be implementable on many projects.” Yet, the Draft Proposal insists that a complete waiver is necessary in order to allow for Special Projects to be built. As the Draft Permit states “none of the four permit prescribed LID-options . . . can be counted on to be feasible in every case.” Draft Proposal, at 7 (emphasis added). “[I]t is possible,” the Draft Proposal states, “one or more projects proposed somewhere within the 76 regulated municipalities during the permit term would require a choice of additional options for stormwater treatment.” (Draft Proposal, at 9.) The implication being that, because meeting the MRP’s LID requirements may be infeasible for some, or even one Special Project within the 76 municipalities subject to the MRP, no Special Project should be required to meet them. This suggestion is poorly taken, and inconsistent with the requirements of the Clean Water Act’s MEP standard.</p>	

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			<p>Aside from the total lack of support for the Draft Proposal's assertion that such an exemption is needed, the proposed waiver is, compared to other provisions nationally, a poorly crafted and crude instrument. Even in other jurisdictions where "credits" are granted to smart growth projects, and with which we disagree over need for, these credits are a small fraction of the project's overall obligation (e.g., reduction of a project's onsite retention requirement by 20%). In California, multiple permits have declined to incorporate a credit system, finding instead that allowing the use of alternative compliance to meet the permit's LID requirements suffices to encourage or allow smart growth and urban infill projects to proceed. For example, the Ventura County MS4 Permit introduces its alternative compliance provisions by stating explicitly that they are in place in specifically "[t]o encourage smart growth and infill development of existing urban centers" where onsite compliance with LID requirements may be technically infeasible.</p> <p>Moreover, the criteria for commercial and mixed-use projects proposed for Special Project status under Category B are not especially strict when compared with other urban settings, and would not appear to warrant a credit; under the Draft Proposal, a project's FAR must be at least 2—i.e., it must be at least two stories tall without any tapering—not a difficult standard to meet in urban areas. (See Draft Proposal, at 9.) In total, the Draft Proposal would ensure that a significant number of projects that are capable of meeting the MRP's LID requirements will provide stormwater management that is comparably lacking instead. These deficiencies, apart from being inconsistent with federal and state law, will serve to hamstring the MRP's ability to move the Bay Area's many impaired watersheds toward compliance with water quality standards.</p>	

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NRDC and San Francisco Baykeeper	25	<p>January 28, 2011 comments on December 1, 2010 Draft Special Projects Proposal by BASMAA</p> <p>The Draft Proposal's Transit-Oriented Development Exemption Is Particularly Ill-Conceived and Would Potentially Exempt Numerous Regulated Projects from the MRP's LID Requirements</p>	<p>Just as it was when originally proposed in the February 11, 2009 Draft MRP, the definition of "transit-oriented development" ("TOD") presented by the Draft Proposal in the context of the MRP's area of coverage is overly broad and would allow the installation of stormwater management BMPs across the Bay Area that are far less protective of water quality than required under the MRP's LID standards. The definition suffers from two central problems. First, and related to comments we submitted to the Regional Board during the MRP adoption process the requirement that a project be located within a half-mile of an "existing or planned transit hub and/or located within an area designated as a transit village . . ." would carve out large areas of the metropolitan Bay Area for waivers from LID requirements under the MRP. The percentage of land and, as a corollary, of development that would qualify for waivers is substantial. The Draft Proposal identifies the amount of new or replaced surface under this category to be between "168 and 503 acres, or 5% to 15% of the total new or replaced impervious surface" for Regulated Projects under the MRP; up to 15 percent of all Regulated Projects would be 100 percent excused from meeting the MRP's key requirement for reducing stormwater pollution. This analysis, while showing the extensive impact that such a blanket waiver would provide, is perhaps even conservative given the abundance of rail and bus lines in the region.</p> <p>There are, for instance, 19 BART stations within Alameda County alone. Accounting for the close proximity of some stations to each other, the BART system in Alameda County would create approximately 13.5 square miles of waiver-eligible land, which includes considerable portions of downtown Oakland and Berkeley. This is 30% more than <i>the entire land area of the City of Berkeley</i> and doesn't even account for other rail stops, bus transfer stations, or ferry terminals in Alameda County, let alone transit hubs</p>	See response to NRDC/SFBaykeeper comment No. 9.

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			<p>outside Alameda County but within the MRP's jurisdiction. Moreover, the TOD Special Projects designation would not set any restrictions on the type or attributes of development that would qualify for a complete waiver from the MRP's LID requirements. Comparatively low density projects, that will contribute substantial volumes of stormwater runoff and associated pollutant loading, and for which it would be entirely feasible to implement LID-based retention practices, will be authorized to address stormwater by using demonstrably less effective practices, resulting in increased stormwater pollution. This does not constitute reducing stormwater pollutant discharges to the maximum extent practicable.</p> <p>While the Draft Proposal identifies a group of environmental goals that may be furthered by TOD generally, such as reduced vehicle miles travelled or reduced "automobile-related pollutant impacts," the document provides no credible reason, either technical or compliance-based, to exempt such a huge area from the MRP's LID requirements. Unquantified assumptions about the overall environmental benefits of transit-oriented development are a severely lacking basis for any exemption.</p>	
HMH	1	Clarification	<p>The proposed MRP amendment contains contradictory language. In the first paragraph of Provision C.3.c., tree boxes are included with other biotreatment methods described as practices used to adhere to LID principles, including rain gardens, bioretention units, bioswales, and planter boxes. However, in the first paragraph of Provision C.3.e.ii.(1) and repeatedly in subsequent subsections, tree boxes are listed and referred to as one of two types of non-LID treatment systems. The proposed language should be clearer and less contradictory so that Permittees and prospective project applicants will understand the circumstances under which the use of this type of</p>	<p>The first paragraph of Provision C.3.c. lists LID landscaped-based treatment measures that function as biotreatment systems, which include rain gardens, bioretention units, bioswales, and planter/tree boxes. As such, all these measures make use of ponding and slow infiltration rates through soil media to remove pollutants in stormwater. Provision C.3.e.ii.(1) specifies the two types of non-LID treatment systems that may be installed for Special Projects, one of which is the tree-box-type high flowrate biofilter. The distinguishing difference between the non-</p>

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			treatment control can be used.	LID type of tree/planter boxes (usually proprietary) and the generic non-proprietary tree boxes considered as LID treatment is the flowrate through the planting media, which is already included in the name and description given in Provision C.3.e.ii.(1).
HMH	3	Category B	The proposed Category B specifies a minimum residential density of 50 dwelling units per acre, which is considerably higher than the 30 dwelling units per acre threshold proposed by BASMAA. The proposed density threshold would exclude a significant number of development projects in pedestrian-oriented urban, downtown and business districts throughout the Bay Area that should otherwise qualify for some amount of LID credit. We support the BASMAA recommendation of a 30 dwelling units per acre threshold for Category B.	The density criteria in the proposed MRP amendment fall within the accepted range of density values for various types of smart growth, high density, and transit-oriented development. On the other hand, the criteria contained in BASMAA's 12/1/10 Proposal, while offering the full flexibility that the Permittees want, represent the lower end of the range of density values for these types of development. Adopting BASMAA's very loose criteria for the granting of LID Treatment Reduction Credits would result in most development projects qualifying for 100% LID Treatment Reduction Credit, which is inappropriate.
HMH	5	SCVURPPP HM Map	We request that the Board not adopt the applicability map & consider revising the Potential Exceptions to Map Designations, to include a more realistic approach to justifying exceptions to the map. There are subwatershed & catchment area boundaries, at least for some developed urban areas, that were not based on sound hydrologic studies or locations of existing storm drains.	The map showing areas in the Santa Clara Valley where C.3.g. hydrograph management requirements apply and do not apply (Map) was adopted as part of the MRP in 2009. At that time, several municipalities commented in support of adopting the Map. The proposed MRP amendment would merely adopt corrections to the Map, which the MRP provided for and which are based on impervious surface data as analyzed by Santa Clara Permittees. These corrections result in a small reduction in area subject to HM requirements. The Commenter does not specify which boundaries are based on unsound information.

**Response to Comments on September 6, 2011 Tentative Order
Amendment Revising Order No. R2-2009-0074 (Municipal Regional Stormwater Permit)**

Commenter	Comment No.	Key Word(s)	Comment	Response
				We disagree with the comment, and maintain that the analysis and resulting proposed corrections to the Map are sound.
HMH	6	SCVURPPP HM Map	Although recent studies eliminated “pink” areas on the map, the scope of studies should have included additional areas.	The MRP specified the areas to be studied based on Santa Clara Permittees’ input regarding which areas needed further study to verify their percent imperviousness; these areas were shaded pink on the Map. It is outside the scope of the MRP and this amendment to enlarge the study area.
HMH	7	SCVURPPP HM Requirements	Costs of onsite HM controls cannot be justified by potential erosion impacts to receiving waters.	The proposed MRP amendment does not change HM control requirements; it merely reduces slightly the area in which HM requirements apply. Thus, this comment was addressed at the time the MRP was issued. Please note the MRP allows offsite, as well as onsite, HM controls.
HMH	8	SCVURPPP HM Map	The poor design quality & readability of the map are further reasons not to adopt it. The only reference elements are the major freeways and creeks, which do not allow a user to locate a specific project. It is far less detailed & less useful than other county HM maps adopted with the MRP.	The Map is not intended to provide parcel-specific information. The Santa Clara Permittees post individual city maps at http://www.scvurppp-w2k.com/hmp_maps.htm . These maps have streets & local landmarks, and are being updated currently.
HMH	9	SCVURPPP HM Requirements <i>Attachment F</i>	Section 5 of Attachment F to the MRP discusses preparation of a “User Guide” the Program could prepare. Although such a Guide was never developed, there is a need for some process that would allow a project applicant an opportunity to demonstrate a project’s erosion potential. We feel the opportunity for applicants to take advantage of Section 5 would be limited without some revision to the (permit) language to allow independent, project-specific studies to be submitted for review by the Permittees.	It is beyond the scope of this amendment to modify the HM requirements, other than the HM Map. In addition, Section 5 of the Santa Clara Permittees’ HM Requirements clearly allows project-specific studies to be submitted; indeed, that is the entire purpose of Section 5.
Ruth & Going, Inc.	1	SCVURPPP HM Map	We strongly urge the Board not to adopt the revised Attachment F for Santa Clara Permittees. There is no	See response to HMH Comment No.5 above.

**Response to Comments on September 6, 2011 Tentative Order
Amendment Revising Order No. R2-2009-0074 (Municipal Regional Stormwater Permit)**

Commenter	Comment No.	Key Word(s)	Comment	Response
			ability to discuss whether a property should be subject to HM controls, which is not reasonable.	
Ruth & Going, Inc.	2	SCVURPPP HM Map	We understand the HM Map was prepared at “large scale” level & do not believe it accurately depicts all catchments and subwatershed areas that are ≥ 65% impervious. We believe there are areas that have been changed to “green” that should be “red.”	The Commenter does not specify which boundaries are based on unsound information. We disagree with the comment, and maintain that the analysis and resulting proposed corrections to the Map are sound.
Ruth & Going, Inc.	3	SCVURPPP HM Requirements Attachment F	Section 5 of Attachment F of the MRP should be revised to provide a means to allow the Program (or project applicants) to provide studies and analysis to determine the imperviousness of an individual catchment or subwatershed area.	It is beyond the scope of this amendment to modify the HM requirements, other than the HM Map. In addition, Section 5 of the Santa Clara Permittees’ HM Requirements clearly allows project-specific studies to be submitted; indeed, that is the entire purpose of Section 5.
Water Resources Management	1		Various studies and monitoring of biotreatment systems have found that the longevity and effectiveness of engineered soil is decreased by clogging, reduced cation exchange capacity (CEC) with failure as early as the initial year of operation with very high failure rates within 5-7 years. This will require the rehabilitation and/or replacement of the facility’s biotreatment media or construction of new or additional treatment facilities during the life of the Regulated Project. Although Provision C.3.h.ii.(5) outlines operation and maintenance inspection requirements for Permittees, it does not specify any criteria, procedures and testing methods and protocols for determining when the infiltration surface has lost its percolation capacity and when the CEC has been reduced and the facility is no longer effectively removing pollutants to the MEP. These criteria, procedures and testing methods, and protocols must be developed and included in the proposed MRP amendment because without them, inspection programs are meaningless.	We agree that adequate inspection criteria, including testing where necessary to judge effective function, need to be available for all treatment measures, including biotreatment. We will work with Permittees to develop such a program prior to the reissuance of the MRP in 2014.

**Response to Comments on September 6, 2011 Tentative Order
Amendment Revising Order No. R2-2009-0074 (Municipal Regional Stormwater Permit)**

Commenter	Comment No.	Key Word(s)	Comment	Response
Water Resources Management	2		Multiple studies have documented the release of nutrients from biotreatment systems that must be of concern in the Bay Area because of building evidence that the historic resilience of the Bay to the harmful effects of nutrient enrichment is weakening. We strongly encourage the Board to implement the recommendations in our 1/27/11 letter regarding design standards for biotreatment systems and require Permittees to investigate and report on the use of alternative filtration media that would not increase the discharge of nutrients in stormwater runoff.	The current soil specifications in Attachment L include measures to reduce the nitrogen available for leaching from the compost component. There may be further measures necessary to address this issue once we have more information from the ongoing nutrient studies of the Bay and its tributaries.
Water Resources Management	3	Biotreatment Soil Specs	Provision C.3.c.i.(2)(b)(vi) requires that the soil media specifications and soil testing methods verify a long-term infiltration rate of 5-10 inches per hour. However, it is not clear whether the 10-inches per hour infiltration rate is intended to establish an upper limit for infiltration. The MRP needs to clarify and specify an upper limit for the infiltration rate that addresses excessively high infiltration rates that result in insufficient removal of pollutants in the stormwater runoff. The general requirements for soil specifications in Attachment L should specify that the maximum in-place infiltration rate for biotreatment or bioretention facilities constructed with under-drains shall be no greater than 10-inches per hour.	The issue of initial installed infiltration rates versus long term infiltration rates is a complicated one. Current knowledge indicates that initial installation rates need to be higher, as the system will infiltrate more slowly as the soil mixture settles in place and as plants and roots become established. Unfortunately, the state of the art is not yet such that we can set an initial upper limit more specifically than we have currently in Attachment L of the proposed MRP amendment. There is no upper limit specified for the "standard" soil mixture, and 5-12 inches per hour for alternative mixtures tested using ASTM D2434 constant head permeability testing.
US Environmental Protection Agency	1	Agree with changes to Permittees proposal	The revised proposal addresses many of the issues EPA raised in our initial comments. We support the elimination of Project Categories D (retrofitting) and E (road widening) from the special projects provisions. We also support the revised definitions of the remaining Project Categories, which EPA believes will limit reduction credits to projects implementing smart growth principles of high density development, transit oriented development, and infill development.	Comment noted.

**Response to Comments on September 6, 2011 Tentative Order
Amendment Revising Order No. R2-2009-0074 (Municipal Regional Stormwater Permit)**

Commenter	Comment No.	Key Word(s)	Comment	Response
US Environmental Protection Agency	2	Limit non-LID treatment to 50% of C.3.d.	<p>Under the new proposal, there are still projects that would be exempted from implementing LID by receiving 100% reduction credits. We believe these credits should not exceed 50%. While EPA supports the proposed Project Categories, we encourage the Regional Board to consider limiting the total reduction credit which may be applied to a site. As written, a site may qualify for a 100% reduction credit if certain conditions are met: All projects in Category A are provided 100% reduction credit, but are limited in size to ½ an acre. Projects in Category B may receive 100% reduction credit if densities achieve > 3:1 FAR or > 75 DU/acre, and are limited in size to 2 acres. Projects in Category C may receive 100% credit if a combination of factors are met, including proximity to transit hub, high density, and minimized surface parking. Projects in Category C do not have a size limitation. EPA believes all projects should be required to implement some LID measures and should not receive 100% exemption from LID requirements. As noted in our comments during the adoption of the MRP, EPA believes LID requirements provide many water quality and non-water quality benefits to address the increased pollutant loads generated from stormwater at newly developed sites. While we support the tiered incentive approach to encourage smart growth policies as consistent with the intent and language of the MURP, we also encourage you to establish an upper boundary of reduction credits that may be applied to a site. EPA would suggest the Reduction Credit be limited to 50% for any site.</p>	<p>We agree that LID treatment provides many water quality and non-water quality benefits. However, there is no technical or legal justification for limiting the allowable LID treatment reduction credit at 50% or any other value, and it does not recognize that there will be projects for which little or no LID treatment is feasible. The allowed amount should reflect the degree LID treatment is feasible or infeasible at a given site. Permittees will be required to report the basis of infeasibility before allowing a project to use non-LID treatment for any percentage required treatment, so sound justification will be provided for the allowed amount of non-LID treatment. For these projects, stormwater will still be treated to the maximum extent practicable. Also, see responses to NRDC/SFBayKeeper comments #5 and #6 above.</p>

Appendix D

Written Comments Submitted



Protecting Alameda County Creeks, Wetlands & the Bay

October 6, 2011

Bruce Wolfe
Executive Officer
San Francisco Bay Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612

399 Elmhurst St.
Hayward, CA
94544
p. 510-670-5543

Dear Mr. Wolfe:

SUBJECT: AMENDMENT OF THE MUNICIPAL REGIONAL PERMIT

Thank you for the opportunity to comment on the proposed Tentative Order that would amend the Municipal Regional Stormwater Permit (MRP) for Special Development Projects, Biotreatment Soil, and Green Roof Specifications. First of all, we would like to thank your staff for the time and effort they have devoted to working with us to develop a proposal for Special Projects that both they and our member agencies support.

Our member agencies are committed to protecting our creeks, wetlands and the San Francisco Bay. We agree that vegetated soil media treatment systems are usually the best option for treating stormwater runoff. However, there are times when the land area required for vegetated treatment systems conflicts with the development of dense infill and transit oriented development. These types of projects have tremendous environmental benefits including reducing green-field developments, reducing automobile use and saving energy. Options for equivalent stormwater treatments systems should be provided for these types of projects. The proposed MRP amendment provides an approach that balances our and the Water Board's preference for vegetated treatment systems while providing flexibility where needed to provide overall environmental benefit.

The Clean Water Program also supports the comments submitted by BASMAA. As additional amendments to the MRP are necessary to address certain road projects and projects that fall under the "50% rule" in Provision C.3, we request that you adopt the proposed amendments as well as the additional amendments as set forth in the BASMAA letter.

Sincerely,

Kathy Cote, Management Committee Chair

C: Dale Boyer
Clean Water Program Management Committee Representatives

MEMBER AGENCIES:

Alameda
Albany
Berkeley
Dublin
Emeryville
Fremont
Hayward
Livermore
Newark
Oakland
Piedmont
Pleasanton
San Leandro
Union City
County of Alameda
Alameda County Flood
Control and Water
Conservation District
Zone 7 Water Agency



B A S M A A

Alameda Countywide
Clean Water Program

Contra Costa
Clean Water Program

Fairfield-Suisun
Urban Runoff
Management Program

Marin County
Stormwater Pollution
Prevention Program

Napa County
Stormwater Pollution
Prevention Program

San Mateo Countywide
Water Pollution
Prevention Program

Santa Clara Valley
Urban Runoff Pollution
Prevention Program

Sonoma County
Water Agency

Vallejo Sanitation
and Flood
Control District

October 6, 2011

Bruce Wolfe
Executive Officer
San Francisco Bay Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612

Subject: Amendment of the Municipal Regional Stormwater Permit for Special Development Projects, Biotreatment Soil, and Green Roof Specifications

Dear Mr. Wolfe:

On behalf of the NPDES stormwater permittee members of the Bay Area Stormwater Management Agencies Association (BASMAA)¹, thank you for the opportunity to comment on the proposed amendment of the Municipal Regional Stormwater Permit (MRP) for Special Development Projects, Biotreatment Soil, and Green Roof Specifications (Notice of September 6, 2011). In addition to these comments approved for submittal on behalf of BASMAA, our member agencies may also be submitting their own comment letters reflecting their individual perspectives on the proposed amendment.

As you know, on December 1, 2010, BASMAA submitted a Special Projects Proposal in accordance with the original language of MRP Provision C.3.e.ii(2). Since that time, we have had discussions with your staff and other stakeholders regarding the content of this Proposal and worked together to further refine the LID treatment reduction credit concepts. We appreciate the efforts and time committed by your staff to work with us on approaches to meeting the C.3 requirements that protect water quality while recognizing the value and inherent environmental benefits of smart growth in the Bay Area.

BASMAA generally supports the proposed amendment that would allow Special Project LID treatment reduction credits, and provide Biotreatment Soil and Green Roof Specifications. However, we are concerned that the Tentative Order does not address the following situations described in our Special Projects Proposal where low impact development (LID) treatment is not always feasible:

1. Portions of development sites that are not being developed or redeveloped, but which must be retrofitted to meet treatment requirements in accordance with the "50% rule."
2. Addition of a traffic lane to an existing roadway within a limited right-of-way from which runoff cannot be directed to a landscaped area.

Bay Area

Stormwater Management

Agencies Association

P.O. Box 2385

Menlo Park, CA 94026

510.622.2326

info@basmaa.org

¹ BASMAA is a 501(c)(3) non-profit organization comprised of the municipal stormwater programs in the San Francisco Bay Area representing 96 agencies, including 84 cities and 7 counties. BASMAA is focused on regional challenges and opportunities to improving the quality of stormwater that flows to our local creeks, San Francisco Bay and Delta, and the Ocean.

BASMAA comments on Amendment of the Municipal Regional Stormwater Permit for Special Development Projects, Biotreatment Soil, and Green Roof Specifications

Accordingly, we request that the changes outlined in Attachment A to this letter be made to Tentative Order Provisions C.3.b.ii.(1)(c), C.3.b.ii.(3)(a), and C.3.b.ii.(4)(b) to address these special situations.

Another concern is related to the incorporation of the biotreatment soil specifications identified as Attachment I to the proposed MRP amendment. We recommended in the transmittal letter for the soil specifications dated December 1, 2010 that the biotreatment soil objectives (i.e., a minimum infiltration rate of 5 inches per hour and the ability to sustain vigorous, healthy plant growth and maximize stormwater runoff retention and pollutant removal) be included in the permit, but that the detailed specifications be referenced as guidance in order to allow room for experimentation and innovation with bioretention soils, as long as it is within the bounds of the minimum requirements needed to achieve effective stormwater treatment. We request that Attachment I be removed from the proposed MRP amendment (see Attachment A requested deletion in Provision C.3.c.i.(2)(b)(iv)) so that the specifications can be refined over time based on experience with bioretention installations and performance.

Finally, we believe there is an important clarification that needs to be made in the proposed amendment language for Provision C.3.e.ii.(1) for Special Projects. With the proposed language, the credits would only extend to the Category A Special Projects. We do not believe this is staff's intent and that the section reference error is a carry over from the 2009 MRP section numbers. Thus, C.3.e.ii.(1) should be modified as follows: in the 8th line, it should refer to "Provisions C.3.e.ii.(2),(3)&(4)" not just "Provision C.3.e.ii.(2)."

The main effect of the amendment, with these additions of LID treatment reduction credits that we request in Attachment A, will be to allow a narrowly defined and carefully selected set of development projects to select, as an option, non-LID methods of treatment. The overall effect will be, by our estimate, that LID treatment will be provided for roughly 90% or more of the aggregate impervious area created or replaced as part of development projects approved during the remaining MRP term. The remaining 10% or less of impervious area created or replaced will receive treatment by either vault-based media filtration or by higher-rate biofiltration in a tree-box-type unit. The permittees will carefully track the use of LID and non-LID treatment in development projects approved during the remaining MRP term.

At a regional scale, this proposed amendment to the MRP is an overwhelmingly positive outcome for advocates of LID. Up to now, regionally, the selection of LID as the BMP of choice has been inconsistently implemented. To achieve LID treatment for runoff from 90% or more of impervious area to be created or replaced beginning only two years after the MRP's 2009 adoption is extraordinarily ambitious. We encourage the Board to adopt the Tentative Order to include our requested 90% + approach and to recognize that for the remaining 10% or less of impervious area created or replaced that cannot accommodate LID treatment, other effective treatment methods will be employed (i.e., 100% of the runoff from such areas will receive treatment).

BASMAA comments on Amendment of the Municipal Regional Stormwater Permit for Special Development Projects, Biotreatment Soil, and Green Roof Specifications

Please contact me at (510) 670-6548 if you have any questions or would like to discuss our comments further.

Sincerely,

A handwritten signature in cursive script that reads "James Scanlin".

James Scanlin
Chair, Bay Area Stormwater Management Agencies Association

Attachment A – Requested Changes

cc: Thomas Mumley, Assistant Executive Officer, San Francisco Bay Regional Water Board
BASMAA Board of Directors

Attachment A

Provision (following proposed amendment)	Requested Change	Reason for Request
C.3.b.ii.(1)(c) and C.3.b.ii.(3)(a).	<p>Add the following underscored sentence: "Where a project results in an alteration of more than 50 percent of the impervious surface of a previously existing development that was not subject to Provision C.3, the entire project, consisting of all existing, new and/or replaced impervious surfaces, must be included in the treatment system design (i.e., stormwater treatment systems must be designed and sized to treat stormwater runoff from the entire development project). <u>100% of the amount of runoff identified in Provision C.3.d. for the new and replaced impervious surfaces must be treated with LID treatment measures. 100% of the amount of runoff identified in Provision C.3.d. for existing impervious surfaces must be treated with LID treatment measures, except where the use of LID treatment measures would require significant alterations to existing structures, paving, or walkways that would not otherwise occur. In such cases, other treatment methods may be used.</u>"</p>	<p>Although the change affects a fraction of 1% of the aggregate impervious area subject to Provision C.3., it provides needed flexibility for certain projects subject to the "50% rule" and avoids the scenario where a "smart growth" development project is killed because of inability to comply.</p>

Provision (following proposed amendment)	Requested Change	Reason for Request
C.3.b.ii.(4)(b)	Add the following underscored sentence: " <u>Widening of existing streets and roads with additional traffic lanes. 100% of the amount of runoff identified in Provision C.3.d. for the existing impervious surfaces must be treated with LID treatment measures except where the use of LID treatment measures is infeasible because the drainage from the additional traffic lanes cannot be routed to vegetated areas. In such cases, other treatment methods may be used.</u>	Although the change affects a fraction of 1% of the aggregate impervious area subject to Provision C.3., it provides flexibility that may be needed for certain roadway projects.
C.3.c.i.(2)(b)(vi)	Delete the last sentence, which states "Permittees shall ensure that Regulated Projects use biotreatment soil media that meet the minimum specifications set forth in Attachment I."	Attachment I, which should also be deleted, goes too far in specifying the means and methods by which compliance shall be achieved. Such specificity is redundant to the requirement that soil media "sustain healthy, vigorous plant growth and maximize stormwater runoff retention and pollutant removal," which is also included in Provision C.3.c.i.(2)(b)(vi). Inclusion of the restrictive specification in Attachment I will stifle innovation and experimentation which could lead to soil mixes that treat stormwater more effectively.



October 4, 2011

Mr. Bruce Wolfe, Executive Officer
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

SUBJECT: Amendment of the Municipal Regional Stormwater Permit for Special Development Projects, Biotreatment Soil and Green Roof Specifications

Dear Mr. Wolfe:

The Contra Costa Clean Water Program (CCCWP) comprises Contra Costa County, the 19 cities and towns within the County, and the Contra Costa County Flood Control and Water Conservation District.¹

The CCCWP supports the proposed amendment to the MRP. However, the amendment has the perverse consequence of *weakening* the effectiveness, with regard to water quality, of Low Impact Development (LID) policies Contra Costa municipalities have been implementing since 2005.

In addition, the proposed amendment fails to address specific, significant needs Contra Costa municipalities have experienced during six years of implementing LID as part of our land development policies. These are the following special situations² where LID treatment is not always feasible:

1. Portions of sites that are not being developed or redeveloped, but which must be retrofit to meet treatment requirements in accordance with the "50% rule."³
2. Sites smaller than one acre approved for lot-line to lot-line development or redevelopment as part of a municipality's stated objective to preserve or enhance a pedestrian-oriented "smart growth" type of urban design.

¹ Of the 19 cities within the County, 16 are within the San Francisco Bay Region, and the other three are within the Central Valley Region. The Program includes 18 of the 76 agencies subject to the Municipal Regional Permit.

² These same special situations are identified in our April 3, 2009 letter commenting on the Board's February 11, 2009 Revised Tentative Order.

³ The "50% rule" refers to the requirement in MRP Provision C.3.b.ii.(3)(a) and elsewhere, which states that when a redevelopment project results in an alteration of more than 50% of the impervious surface of a previously existing project that was not subject to Provision C.3, the entire project must be included in the treatment system design.

3. Addition or replacement of roadway or other impervious surface within an existing right-of-way.

Lastly, the amendment would restrict the selection of soils used in bioretention facilities to a mix meeting one design specification. That soil mix specification was originally developed by staff of Contra Costa municipalities (with assistance from consultants retained by CCCWP). However, by including the specification in the proposed permit requirements, Water Board staff has gone too far in specifying the means and methods by which compliance shall be achieved. This bulky addition to the permit will tend to stifle developers and municipalities' experimentation with soil mixes that could treat stormwater more effectively than the specified mix.

We ask for changes to the amendment to address these specific, significant needs (see Attachment A to this letter).

We further ask your Board to review the process by which the current amendment was crafted. We believe a flawed decision-making process led to an amendment that is not as protective of water quality as it could be and that also has more impact on economic development than is necessary to achieve the Board's water-quality-related objectives.

The CCCWP supports the proposed amendment to the MRP.

The main effect of the amendment will be to allow a narrowly defined set of development projects to select, as an option, non-LID methods of treatment. The overall effect will be, by our estimate that LID treatment will be provided for 90% or more of the aggregate impervious area created or replaced as part of development projects approved during the remaining MRP term. The remaining 10% or less of impervious area created or replaced will receive treatment by either vault-based media filtration or by higher-rate biofiltration in a tree-box-type unit. The permittees will carefully track the use of LID and non-LID treatment in development projects approved during the remaining MRP term.

At a regional scale, this amendment is an overwhelmingly positive outcome for advocates of LID. The MRP's LID requirements, most of which go into effect December 1, 2011, are new and very far-reaching. Up to now, regionally, LID implementation has been patchy outside of Contra Costa. To achieve LID treatment for runoff from 90% or more of impervious area to be created or replaced beginning only two years after the MRP's 2009 adoption is extraordinarily ambitious. We encourage the Board to endorse this 90% + approach, although we recognize there will continue to be concerns about the remaining 10% or less of impervious area created or replaced for which other, also effective, treatment methods will be allowed.

The amendment weakens the effectiveness of Contra Costa's LID policies.

In 2005, Contra Costa municipalities adopted an LID approach to meeting stormwater treatment requirements for new developments subject to their discretionary review. The Program pioneered a design methodology, including formats for submitting calculations and other design information, to ensure thorough and effective LID implementation on these projects. Through the CCCWP, Contra Costa municipalities conducted extensive outreach to

land developers and have provided in-depth training, approximately annually, for local land development engineers and other professionals. Late in 2005, to further encourage the use of LID, the municipalities adopted a policy prohibiting the use of hydrodynamic separators, when used alone, as a method of meeting stormwater treatment requirements.

In 2007, after two years of LID implementation, municipal staff involved in land development review recognized that, although they were generally successful in getting LID implemented on development projects where LID was feasible, they had difficulty mustering the technical expertise and other resources they needed to respond to project proponents' frequent appeals to be allowed to use non-LID methods of treatment. They requested the Program develop a policy restricting non-LID treatment. They reasoned correctly that—although municipal staff would still need to review a small number of projects case-by-case for LID feasibility—in most cases LID would be mandated without a need for such a review.

The CCCWP established such a policy in a March 21, 2007 memorandum. This policy, which was adopted voluntarily and without encouragement from Water Board staff, was carefully crafted to identify narrow categories of projects where the most experienced LID practitioners and reviewers had found LID might not be feasible. Specific examples were considered. The policy was reviewed by the CCCWP's C.3 Implementation Work Group and was adopted by the CCCWP's Management Committee.

The policy went into effect immediately and, as updated, has been included in CCCWP guidance published since, including the 4th and 5th (current) editions of the *Contra Costa Clean Water Program Stormwater C.3 Guidebook*. The 5th Edition, published in October 2010, identifies the following categories of projects where LID may not always be feasible:

- Portions of sites which are not being developed or redeveloped, but which must be retrofit to meet treatment requirements in accordance with the "50% rule."
- Sites smaller than one acre approved for lot-line to lot-line development or redevelopment as part of a municipality's stated objective to preserve or enhance a pedestrian-oriented "smart growth" type of urban design.

After more than four years implementing this policy, Contra Costa municipalities have found it feasible to implement LID on projects not meeting these criteria, although achieving 100% LID treatment is challenging for some high-density projects that exceed an acre of impervious area created or replaced.

In 2010, as part of the submittal required by the MRP,⁴ BASMAA conducted an analysis to project the amount of impervious area for which non-LID treatment would be allowed, during the remaining permit term, if similar policies were adopted regionwide. For the analysis, 631 past development projects were reviewed; comprising approximately 60% of the developments approved Bay-area wide during the four preceding years. (The results were normalized for the purposes of the projection.)

In the BASMAA analysis, Categories "A" and "D" correspond closely to Contra Costa's current policy. The BASMAA analysis estimates that projects in Category "A," "Projects creating no more than one acre of impervious surface area with permanent structures

⁴ Special Projects Proposal, Provision C.3.e.ii., submitted by BASMAA to the Water Board on December 1, 2010.

extending effectively lot-line-to-lot-line..." would constitute about 0.29% (that is, less than one-third of one percent) of the total amount of the aggregate impervious area subject to Provision C.3. The BASMAA analysis estimates only two projects in Category "D", "portions of sites which are not being developed or redeveloped but must be retrofitted to meet treatment requirements per [the 50% rule]," would be approved regionally during the remaining permit term. The aggregate amount of impervious surface area for so few projects cannot be reliably estimated. However, very conservatively, the affected portions of those projects would be sure to constitute less than one-half of one percent of the aggregate impervious area subject to C.3.

Thus, if Contra Costa's current policy were adopted regionwide, then LID treatment would be provided for more than 99% of aggregate impervious area created or replaced and non-LID treatment would be provided for less than 1% of aggregate impervious area created or replaced.

If this proposed amendment is adopted, Contra Costa municipalities will *expand* the current allowance of non-LID treatment to cover the additional categories defined in the amendment. This will include partial or total allowances for Transit-Oriented Development (TOD) projects. By our best estimates, this will increase the aggregate amount of impervious area for which non-LID treatment may be provided by between 400% and 1000%, compared to the current Contra Costa policy. Although municipal staff with the most experience reviewing proposed development projects had previously determined that LID treatment is feasible for TOD projects greater than an acre, Contra Costa municipalities will, as a result of this amendment, allow non-LID treatment for some or all impervious areas within TOD projects.

Generally, our municipalities could not, as a practical matter, require LID treatment always be used for these types of projects after the Regional Water Board has specifically identified these same types of projects as eligible for non-LID treatment. In accordance with the BASMAA proposal, Contra Costa municipalities will strongly encourage proponents of these projects to include LID treatment rather than non-LID treatment. BASMAA recommended Board staff include this requirement (to strongly encourage LID treatment even for projects eligible to use non-LID treatment) in the proposed permit amendment but Water Board staff chose not to do so.

The amendment also fails to address specific, significant problems Contra Costa municipalities have experienced when applying LID requirements.

The most significant problem is the lack of any provision to allow non-LID treatment on portions of sites which are not being developed or redeveloped, but which must be retrofit to meet treatment requirements in accordance with the "50% rule."

The permit's 50% rule affects only redevelopment projects, and places redevelopment of already urbanized sites at a distinct economic disadvantage compared with "greenfield" development on agricultural or open space lands. An example of a typical project affected by the "50% rule" would be placement of a new building on an existing parking lot. For such a project, the applicant would be required to provide treatment for runoff from the roof of the new building (even though the building's footprint was already impervious) and, under the 50% rule, would also be required to retrofit *previously existing buildings on the*

same site to route their drainage to treatment, even if those buildings were intended to remain untouched by the development project currently proposed.

The “50% rule” has been carried forward, with minor modifications in language, from stormwater NPDES permits dating back to 2000. At that time, permit treatment technical criteria foresaw that extended detention basins and in-line treatment units such as hydrodynamic separators—all non-LID methods—would be used to achieve compliance. Typically, when extended detention basins are used, a single extended detention basin is used for an entire development site, and it made some sense to require that the extended detention basin be upsized to provide enough capacity to treat runoff from the already built portions of the site, as well as from the portions of the site to be developed with new impervious surfaces. Similarly, an existing site drainage system can be retrofit with in-line treatment units, sometimes at relatively reasonable cost and with acceptable impacts, to treat runoff from the portions of a site which are to be otherwise unaltered by a currently proposed project.

LID design poses an entirely different engineering problem, because bioretention and other LID facilities are distributed throughout the project and are located on the surface rather than underground. For some projects, drainage from the existing portions of the site can be rerouted into LID facilities, such as bioretention, that use, infiltrate, evapotranspire, or biotreat runoff. For other projects—such as where roof leaders on existing buildings are tied into underground pipes that discharge directly to municipal storm drains—rerouting drainage to LID facilities would require substantial alterations that would otherwise not be required as part of the development project.

Although such projects are rare, it is likely that there will be one, two, or more development projects in the region, during the remaining permit term, where the requirement, as it appears in the proposed amendment, could kill a development project by making it too costly or technically difficult to comply. This would be very unfortunate, as this type of development project—effectively, redevelopment of a previously built site to increase its density and economic use—is much more desirable, from a water-quality standpoint, than a project on previously undeveloped land (where the “50% rule” never applies).

By omitting this needed change from the proposed amendment language, Water Board staff has effectively tied their own hands in this matter. No matter how desirable a specific proposed “smart growth” redevelopment project might be, and no matter how strong the case that non-LID treatment should be allowed because of technical constraints at the project site, there would still be no legal way to allow the project to go forward, because of the way Water Board staff has drafted the amendment language. Any informal exceptions or promises of “non-enforcement” of this permit requirement by Water Board staff would circumvent the Water Board’s authority, would amount to selective enforcement by staff of the Board’s Order, and in any case would likely be insufficient to satisfy a development project’s lenders and insurers.

We ask that the Water Board incorporate in the amendment language (see Attachment A) that identifies, as narrowly as possible, the specific condition where retrofitting drainage from existing buildings and pavement that would otherwise be unaltered may be done using non-LID treatment methods.

We further request that the maximum size for projects to meet “Category A Special Project Criteria” be changed to one acre to be consistent with Contra Costa’s current policy. As noted above, BASMAA’s analysis shows that projects meeting Contra Costa’s current criteria, including the one acre size limit, account for 0.29% of the aggregate impervious area created or replaced in the region over the four preceding years. Reduction of the size limit to half an acre is arbitrary, as there has been no analysis relating the change in size limit to any water quality benefit. In any case, such a benefit would be minimal in the context of total aggregate impervious area that will be constructed during the remaining permit term.

Lastly, we ask that the allowance for non-LID treatment be extended to roadways and new impervious area constructed within existing public right-of-way, where LID treatment measures are infeasible because the drainage from the additional traffic lanes cannot be routed to vegetated areas. BASMAA’s study found that the municipal permittees anticipate very few, if any, such projects. However, as with the “50% rule,” Water Board staff has tied their own hands in drafting the amendment; as it is currently written, an exception, no matter how badly needed or how well justified technically, could not be granted. We ask that the Water Board provide some limited flexibility by adopting the modification shown in Attachment A.

We ask your Board to review the process by which the current amendment was crafted.

In closing, we ask that the Water Board review the decision-making process leading up to the publication of the proposed amendment, particularly with regard to the “Special Projects” provision.

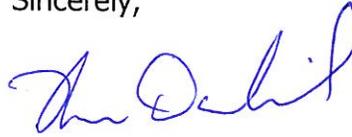
In developing Contra Costa municipalities’ present policy on non-LID treatment, in our comments on drafts of the MRP prior to adoption, and in our contributions to BASMAA’s December 1, 2010 proposal, we focused on maximizing the water quality benefits to be obtained from LID while providing minimal exceptions—minimal, that is, in terms of the aggregate amount of impervious area, and therefore the aggregate amount of runoff, that would potentially receive non-LID treatment rather than LID treatment. We believe this is the only metric that makes sense from a water-quality standpoint. The metric references a clear cause-and-effect relationship relevant to water quality. The metric can be easily planned, projected, and measured, the results can be analyzed, and the policy can therefore be periodically updated and continuously improved. The collective design and project review experience of Contra Costa municipalities’ staff, dating back more than four years, helped identify narrow categories of needed exceptions which would result, by our estimates, in at least 95% and quite possibly greater than 99% of aggregate impervious area receiving LID treatment, with the remaining *de minimis* exceptional projects receiving non-LID treatment.

However, rather than make use of the available data and facts, Water Board staff chose instead to focus on subjective preferences for various types and characteristics of different types of development—acting, in effect, as a land use planning agency (or perhaps a Design Review Board). The resulting proposed amendment reads like a zoning code, complete with references to dwelling units per acre, floor area ratios, clustering, and street amenities. There has been no data or analysis relating this exceedingly complex scheme to quantities of impervious area, or of runoff, that would receive LID vs. non-LID treatment.

In the end, as we document above, this reliance on Water Board staff's subjective preferences rather than data and facts led to an amendment that (at least in Contra Costa) will actually *increase* the aggregate amount of impervious area and of runoff that will receive non-LID treatment, as compared to present policy. At the same time, the amendment fails to protect against the scenario where a needed development project is killed because of a lack of flexibility in the new permit requirements.

Although we support Water Board staff's proposed amendment, we are disappointed, and believe it could have been done better.

Sincerely,



Thomas Dalziel, Program Manager
Contra Costa Clean Water Program

TD:vw

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Enclosures:

Cc: Elizabeth Lee, Central Valley Regional Water Quality Control Board
Tom Mumley, Francisco Bay Regional Water Quality Control Board
Dale Boywer, Francisco Bay Regional Water Quality Control Board
Selina Louie, San Francisco Bay Regional Water Quality Control Board
Steven Spedowski, Management Committee Chair, Contra Costa Clean Water Program

Attachment A

Provision (following proposed amendment)	Requested Change	Reason for Request
<p>C.3.b.ii.(1)(c) and C.3.b.ii.(3)(a).</p>	<p>Add the following underscored sentence: "Where a project results in an alteration of more than 50 percent of the impervious surface of a previously existing development that was not subject to Provision C.3, the entire project, consisting of all existing, new and/or replaced impervious surfaces, must be included in the treatment system design (i.e., stormwater treatment systems must be designed and sized to treat stormwater runoff from the entire development project). <u>100% of the amount of runoff identified in Provision C.3.d. for the new and replaced impervious surfaces must be treated with LID treatment measures. 100% of the amount of runoff identified in Provision C.3.d. for existing impervious surfaces must be treated with LID treatment measures, except where the use of LID treatment measures would require significant alterations to existing structures, paving, or walkways that would not otherwise occur. In such cases, other treatment methods may be used.</u>"</p>	<p>The change would make the provision consistent with Contra Costa municipalities' current policy. Although the change affects a fraction of 1% of the aggregate impervious area subject to Provision C.3, it provides needed flexibility for certain projects subject to the "50% rule" and avoids the scenario where a "smart growth" development project is killed because of inability to comply.</p>

Provision (following proposed amendment)	Requested Change	Reason for Request
C.3.b.ii.(4)(b)	<p>Add the following underscored sentence: <u>“Widening of existing streets and roads with additional traffic lanes. 100% of the amount of runoff identified in Provision C.3.d. for the existing impervious surfaces must be treated with LID treatment measures except where the use of LID treatment measures is infeasible because the drainage from the additional traffic lanes cannot be routed to vegetated areas. In such cases, other treatment methods may be used.”</u></p>	<p>Although the change affects a fraction of 1% of the aggregate impervious area subject to Provision C.3., it provides flexibility that may be needed for certain roadway projects.</p>
C.3.c.i.(2)(b)(vi)	<p>Delete the last sentence, which states “Permittees shall ensure that Regulated Projects use biotreatment soil media that meet the minimum specifications set forth in Attachment I.”</p>	<p>Attachment I, which should also be deleted, goes too far in specifying the means and methods by which compliance shall be achieved. Such specificity is redundant to the requirement that soil media “sustain healthy, vigorous plant growth and maximize stormwater runoff retention and pollutant removal,” which is also included in Provision C.3.c.i.(2)(b)(vi). Inclusion of the restrictive specification in Attachment I will stifle innovation and experimentation which could lead to soil mixes that treat stormwater more effectively.</p>

Provision (following proposed amendment)	Requested Change	Reason for Request
C.3.e.ii.(2)(a)(iii)	Change the provision as follows: "Create and/or replace one half acre or less of impervious surface area."	The change would bring the category in line with Contra Costa municipalities' current policy, which is estimated to account for only 0.3% of the aggregate impervious area of projects subject to C.3. No estimate or water-quality-related justification has been provided for the different threshold.

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**Santa Clara Valley
Urban Runoff
Pollution Prevention Program**

Campbell • Cupertino • Los Altos • Los Altos Hills • Los Gatos • Milpitas • Monte Sereno • Mountain View • Palo Alto
San Jose • Santa Clara • Saratoga • Sunnyvale • Santa Clara County • Santa Clara Valley Water District

October 6, 2011

Mr. Bruce Wolfe
Executive Officer
San Francisco Bay Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, California 94612

Subject: Comments on the Amendment to the San Francisco Bay Municipal Regional
Stormwater NPDES Permit, Tentative Order No. R2-2011-XXXX

Dear Mr. Wolfe,

Thank you for the opportunity to submit comments on the Regional Water Board's Tentative Order to amend the Municipal Regional Permit (MRP) dated September 6, 2011. These comments were prepared by the Santa Clara Valley Urban Runoff Pollution Prevention Program (Santa Clara Program) on behalf of its 15 Co-permittee agencies. You may also receive separate letters from individual Co-permittees with comments that are specific to their jurisdictions. In addition, the Santa Clara Program supports and incorporates by reference the comments submitted by the Bay Area Stormwater Management Agencies Association (BASMAA).

The Tentative Order contains revisions to Provision C.3 and Attachment F of the MRP (Water Board Order No. R2-2009-0074). The Santa Clara Program appreciates the efforts by Water Board staff to review and comment on the MRP-required submittals over the last year, and to work with BASMAA on implementable approaches to meeting the C.3 requirements that protect water quality and encourage smart growth in the Bay Area. We also appreciate Water Board staff's acceptance of the revisions to our Hydromodification Management Applicability Map and inclusion of the revised map in the MRP amendment.

We have the following specific comments about the proposed amendments:

Special Projects Criteria

We appreciate that the proposed amendments to Provision C.3.e.ii. incorporate the general approach contained in BASMAA's Special Projects Proposal submitted on December 1, 2010, which recognizes the inherent environmental benefits of smart growth, urban infill and transit-oriented projects, provides LID treatment reduction credits for these types of projects, and allows the use of tree well filters and media filters on these projects as needed. We expect the LID treatment reduction credits to be applied to a small percentage of the total number of

development projects in our region and that the use of non-LID treatment will be limited. For example, the City of San Jose conducted an analysis of projects approved during the last five years and estimated that, if the Special Projects requirements had been in place during that time, approximately 91% of the total impervious surface created or replaced would have been required to use LID treatment measures and less than 9% of the total would have had the option to use non-LID treatment measures. Countywide, the overall percentage of impervious surface with the option to use non-LID treatment measures would be much lower, as many of our co-permittees do not expect to have the types of development that would qualify as Special Projects.

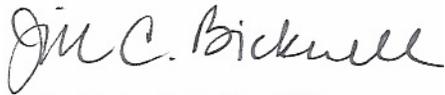
1. Special Project Categories “B” and “C” – Our Co-permittee agencies have concerns that smart growth projects in these categories that are only allowed partial LID treatment reduction credits will still have difficulty meeting LID requirements for the remaining impervious area. We would have preferred the credit system in BASMAA’s Special Projects Proposal that granted 100% LID treatment reduction credit to Category B projects.
2. Special Projects Located in a Priority Development Area (PDA) – We are concerned that projects located in PDAs are only able to get 25% in LID treatment reduction credits for location and not the 50% that was proposed in discussions with Water Board staff and regional transportation agency staff. The PDAs are designated by the Metropolitan Transportation Commission (MTC) as part of the San Francisco Bay Area’s FOCUS program, a regional development strategy that promotes a more compact land use pattern, linking land use and transportation by encouraging the development of complete, livable communities in PDAs, and promoting conservation of the region’s most significant resource lands. We understand that PDAs comprise only about 3% of the land area in the Bay region, but are expected to accommodate almost half of the projected housing growth. We believe that projects constructed within PDAs should receive greater incentives in the form of increased LID treatment reduction credits.
3. Former Special Project Category “D” – We are also concerned that Category D, which was part of BASMAA’s Special Project’s Proposal, was not included in the MRP amendment. Category D consists of redevelopment projects that redevelop more than 50% of the existing impervious surface, and therefore are required to retrofit portions of their sites that are not being developed or redeveloped, in order to meet treatment requirements in accordance with the “50% rule.” It is often difficult to make space for LID treatment measures in the part of the site not being redeveloped, or to get runoff from this part of the site to flow by gravity to LID treatment measures in the redeveloped part of the site. We do not want to disincentivize these types of urban infill projects and cause developers to choose instead an undeveloped site in a greenfield area that may be easier and cheaper to develop.
4. Biotreatment Soil Specifications – We object to the incorporation of the biotreatment soil specifications as Attachment I to the MRP amendment. BASMAA recommended in the transmittal letter for the soil specifications dated December 1, 2010 that only the biotreatment soil objectives (i.e., a minimum infiltration rate of 5 inches per hour and the ability to sustain vigorous, healthy plant growth and maximize stormwater runoff retention and pollutant removal) be included in the permit, and that the detailed specifications be referenced as guidance in order to allow room for further field experience and innovation with bioretention soils, as long as it is within the bounds of the

Mr. Bruce Wolfe
October 6, 2011
Page 3 of 3

minimum requirements needed to achieve effective stormwater treatment. We request that Attachment I be removed from the amendment so that the specifications are able to be refined over time based on experience with bioretention installations and performance.

We appreciate your consideration of these comments on the Tentative Order to amend the MRP, and we look forward to your specific responses.

Very truly yours,



Jill C. Bicknell, P.E., EOA, Inc.
Assistant Program Manager

cc: SCVURPPP Management Committee
Tom Mumley, Regional Water Quality Control Board
Shin-Roei Lee, Regional Water Quality Control Board
Dale Bowyer, Regional Water Quality Control Board
Sue Ma, Regional Water Quality Control Board
BASMAA Executive Board
Robert Falk, Morrison Foerster
Gary Grimm

October 5, 2011

Mr. Bruce Wolfe
Executive Officer
San Francisco Bay Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, California 94612

Subject: Comments on the Amendment to the San Francisco Bay Municipal Regional Stormwater NPDES Permit, Tentative Order No. R2-2011-XXXX

Dear Mr. Wolfe:

Thank you for the opportunity to submit comments on the Regional Water Board's Tentative Order to amend the Municipal Regional Permit (MRP) dated September 6, 2011. The San Mateo Countywide Water Pollution Prevention Program (Countywide Program) submits these comments on behalf of its 21 member agencies. You may also receive separate letters from individual member agencies with comments that are specific to their jurisdictions. Please note also that the Countywide Program supports and incorporates by reference the comments submitted by the Bay Area Stormwater Management Agencies Association (BASMAA).

The Tentative Order contains revisions to Provision C.3 and Attachment F of the MRP (Water Board Order No. R2-2009-0074). The Countywide Program appreciates the efforts by Water Board staff to review and comment on our MRP-required submittals over the last two years, and to work with the Permittees through BASMAA on approaches to meeting the C.3 requirements.

We have the following specific comments about the proposed amendments:

Special Projects Criteria

We appreciate that the proposed amendments to Provision C.3.e.ii. incorporate the general approach contained in BASMAA's Special Projects Proposal submitted on December 1, 2010, which recognizes the inherent environmental benefits of smart growth, urban infill and transit-oriented projects, provides LID treatment reduction credits to these types of projects, and allows the use of tree well filters and media filters on these projects as needed. Although very few projects within San Mateo County are anticipated to be eligible for Special Project treatment reduction credits, relief from the requirement to provide LID treatment is expected to be very important in helping some of our member agencies realize a small number of infill, high density, and transit-oriented development projects.

In 2010, the 21 municipalities in San Mateo County identified C.3 Regulated Projects that had been approved in their jurisdictions during the preceding four years that would have met the Special Projects criteria included in BASMAA's December 1, 2010, Special Projects report. We have updated the 2010 findings with new data provided by our member municipalities, and now estimate that Special Projects would comprise less than 5 percent of the impervious area created and/or replaced by C.3 Regulated projects within San Mateo County.

Although we are pleased that the criteria proposed in the Tentative Order will benefit that handful of Special Projects that will meet these criteria, we do have the following concerns about the amendment:

1. Special Project Categories "B" and "C" – Our Co-permittee agencies have concerns that smart growth projects in these categories that get partial LID treatment reduction credits will still have difficulty meeting LID requirements for the remaining impervious area. We would have preferred the credit system in BASMAA's Special Projects Proposal that granted 100% LID treatment reduction credit to Category B projects.
2. Special Projects Located in a Priority Development Area (PDA) – We are disappointed that projects located in PDAs are only able to get 25% in LID treatment reduction credits for location and not the 50% that was proposed in discussions with Water Board staff and regional transportation agency staff. The PDAs are designated by the Metropolitan Transportation Commission (MTC) as part of the San Francisco Bay Area's FOCUS program, a regional development strategy that promotes a more compact land use pattern, linking land use and transportation by encouraging the development of complete, livable communities in PDAs, and promoting conservation of the region's most significant resource lands. We understand that PDAs comprise about 3% of the land area in the Bay region, but are expected to accommodate 40% of the future growth. We believe that projects constructed within PDAs should receive greater incentives in the form of increased LID treatment reduction credits.
3. Former Special Project Category "D" – We are also disappointed that Category D, which was part of BASMAA's Special Project's Proposal, was not included in the MRP amendment. Category D consists of redevelopment projects that redevelop more than 50% of the existing impervious surface, and therefore are required to retrofit portions of their sites that are not being developed or redeveloped, in order to meet treatment requirements in accordance with the "50% rule." It is often difficult to make space for LID treatment measures in the part of the site not being redeveloped, or to get runoff from this part of the site to flow by gravity to LID treatment measures in the redeveloped part of the site. We do not want to disincentivize these types of urban infill projects and cause developers to choose instead an undeveloped site in a greenfield area that may be easier and cheaper to develop.

We appreciate your consideration of these comments on the Tentative Order to amend the MRP, and we look forward to your specific responses.

Sincerely,

A handwritten signature in cursive script that reads "Matthew Fabry".

Matthew Fabry, P.E.
Program Coordinator

cc: Countywide Program Technical Advisory Committee
Countywide Program New Development Subcommittee
Tom Mumley, Regional Water Quality Control Board
Shin-Roei Lee, Regional Water Quality Control Board
Dale Bowyer, Regional Water Quality Control Board
Sue Ma, Regional Water Quality Control Board
BASMAA Executive Board



CITY OF DUBLIN

100 Civic Plaza, Dublin, California 94568

Website: <http://www.ci.dublin.ca.us>

October 6, 2011

Mr. Bruce Wolfe
Executive Director
San Francisco Bay Regional Water Quality Control Board
1515 Clay Street, Ste. 1400
Oakland, CA 94612

Subject: Special Projects Comments - Tentative Order No. R2-2011-XXXX Amending
the Municipal Regional Permit for Stormwater with Regards to Section C.3,
New Development

Dear Mr. Wolfe:

The City of Dublin appreciates the opportunity to comment on Tentative Order R2-2011-XXXX, proposing amendments to the Municipal Regional Permit (Order No. R2-2009-0074). The proposed amendments would allow exemptions from the requirements in the MRP for limited types of new development to treat all storm runoff using Low Impact Development (LID) methods.

The City of Dublin believes that the proposed exemptions are critical in allowing us to achieve the goals of our recently adopted Downtown Specific Plan. One of the primary goals of the Plan is to transform portions of the Downtown from a 1960's auto-oriented shopping center to a mixed-use community that places residents within walking distance of both shopping and the newly opened West Dublin-Pleasanton BART station.

The LID measures specified under the current MRP require that runoff be treated through infiltration, evapotranspiration, or captured and reused for irrigation or other uses. This results in the need to set aside portions of the site for surface treatment features and/or the need for parallel storage and plumbing systems. The first is not always compatible with tight, dense infill or redevelopment type projects; the latter adds an additional cost to projects that are often already on the cusp of not being economically viable.

The proposed revision would not exempt these projects from storm runoff treatment, but simply allow the use of a broader band of treatment measures. Furthermore, the infill and redevelopment type projects being exempted under the proposed revisions would actually reduce the generation of pollutants associated with development, particularly those adjacent to transit stations. Infill development reduces auto use and the associated water (and air) quality impacts by placing residents close to jobs, schools, and shopping. Transit-oriented developments allow ready access to transit systems, eliminating auto use completely for many commuters. The dense design of infill projects results in covered or underground parking, eliminating storm runoff from these areas. Lastly, infill or redevelopment type projects often result in the removal of existing

Mr. Bruce Wolfe
San Francisco Bay Regional Water Control Board
Tentative Order R2-2011-XXXX
Page 2 of 3

development for which there are currently NO storm runoff measures in place; these areas would remain untreated in perpetuity unless the site were to be upgraded with a new use.

Without the exemptions allowed under the proposed language revisions, we believe that many good infill, redevelopment, or transit-oriented projects will be rendered technically or economically unviable, and will not be completed. This would have the ironic effect of encouraging further greenfield development, along with associated impacts from greater auto use.

Contrary to other comments you may have received, the exemptions will not exclude large swaths of new development from the LID requirements. Analysis by the City of Dublin completed in November 2010, in conjunction with the Bay Area Storm Management Agencies Association (BASMAA), showed that only 0.93% of the land surface area for projects approved by the City of Dublin over the last four years would qualify for the exemptions.

The proposed language was developed following numerous meetings with the Board staff and extended analysis by both the BASMAA and local agency staff. This effort resulted in the proposed exemptions contained in the Tentative Order that your staff supported and took forward to the Board for adoption.

The City is respectfully requesting that the Board adopt the Tentative Order as it is proposed.

We appreciate your attention to these comments, and look forward to ongoing dialogue with the Board as we continue with permit implementation. Please contact Gary Huisingsh, Public Works Director, at (925)-833-6630 if you would like further clarification or wish to discuss.

Sincerely,



Joni Pattillo
City Manager

JL/ml
Attach.

cc: Thomas Mumley, Assistant Executive Director, Regional Board
Jim Scanlin, Alameda County Clean Water Program
Chris Foss, Assistant City Manager
John Bakker, City Attorney
Gary Huisingsh, Public Works Director
Mark Lander, City Engineer



Community Services Department
P.O. Box 5006, Fremont, CA 94537-5006
www.fremont.gov

October 6, 2011

Via electronic mail

Dale Boyer
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

Re: Tentative Order Comments

Dear Mr. Boyer:

The City of Fremont participated in the formulation of the Special Projects proposal before the Board as a member of the Alameda County Clean Water Program. Fremont supports the concept of Special Projects due to the noted environmental advantages of infill development and need to incentive infill projects in the competitive residential and economic development markets of the Bay Area.

Fremont finds itself in a situation that is common within the Bay Area. We are an urban environment primarily built out in a suburban pattern where encouraging infill development of high density housing and employment uses is critical to supporting strategically urban initiatives. Changing the pattern of a built community has many challenges to its success. Development in cities that do not have high intensity urban downtowns such as San Jose, San Francisco, and Oakland require encouragement and assistance to foster desirable change. Often this requires support of catalytic projects that demonstrate the viability of an urban development and densities in new markets.

We encourage the Board to consider changes to the specific language of Municipal Permit C.3.ii (4) iii for Category C TOD Special Projects. The current language for commercial and mixed use development establishes a high bar of a minimum 200% floor area ratio (FAR) for eligibility of LID treatment credits. The majority of cities in the Bay Area do not have urban environments with high intensity buildings exceeding a 200% FAR and are instead trying to establish new development patterns for high density development. Fremont believes a more moderate minimum FAR is important during the horizon of this permit to help establish new viable TOD neighborhoods.

Fremont recommends two changes in this area. The first is to allow mixed use residential development to qualify based upon either compliance with minimum FAR or minimum density. The second recommendation is for a moderate 100% minimum FAR standard. In our estimation this will allow important initial projects to move ahead and create momentum for TOD neighborhoods, it will not allow extensive undercutting of the Permit's goals. Fremont estimates through 2014 there are only three known projects in



Fremont that may benefit from the Special Projects TOD standards. All three of the projects would be redevelopment projects of existing sites that do not have treatment measures on site and would result in improvements to stormwater treatment while meeting other land use and transportation goals.

Furthermore, regarding the specification of soils for biotreatment and bioretention facilities, we request the Board eliminate the requirement for batch-specific test results and certification for projects installing more than 100 cubic yard of bioretention soil. We believe this requirement is onerous and will unnecessarily delay construction of desirable treatment measurements.

We support the adoption of the Tentative Order with these changes and request the additional allowances for mixed use and commercial projects. We appreciate your attention to these comments, and look forward to ongoing dialogue with the Board as we continue with permit implementation. Please contact Shannan Young at (510)-494-4584 if you would like to further discuss these comments.

Sincerely,



Kathy Cote
Environmental Services Manager

cc: Jeff Schwob, City of Fremont
Nellie Ancel, City of Fremont
Jim Scanlin, Clean Water Program of Alameda County
Shannan Young, City of Fremont

October 6, 2011

Mr. Bruce Wolfe
Executive Officer
San Francisco Bay Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612

Attn: Dale Bowyer

Subject: City of San José Comments on the Tentative Order Amending the Municipal Regional Stormwater National Pollutant Discharge Elimination System Permit

Dear Mr. Wolfe,

Thank you for the opportunity to comment on the Tentative Order for the Municipal Regional Stormwater Permit (MRP) dated September 6, 2011.

The City of San José has had proactive stormwater pollution prevention and control programs since the first countywide municipal stormwater permit for Santa Clara County was adopted in 1990. San José has been actively engaged in the development and implementation of the MRP, with staff having participated in the original work groups and continuing to work on implementation with regional partners through Bay Area Stormwater Management Agencies Association (BASMAA) and the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP).

The MRP's effect on new and redevelopment is of particular importance to San José as it strives to accommodate a projected population increase of 400,000 by 2035 in an environmentally sustainable manner. San José's draft General Plan, *Envision 2040*, includes policies that direct growth into higher-density, mixed-use, urban districts or "Villages" which will co-locate jobs and housing and reduce the environmental impacts of that growth by promoting transit use, walking and biking to reduce per capita vehicle miles travelled.

San José's key concerns related to the Tentative Order involve the (Smart Growth) Special Projects criteria. The City acknowledges the efforts of Water Board staff to work with BASMAA to develop Low Impact Development Treatment Reduction Credits (LID credits) that acknowledge the watershed-scale benefits of Smart Growth by affording certain development projects greater flexibility in meeting its stormwater treatment requirements, as intended by the MRP. San José also commends the Water Board staff's effort to involve and consider diverse

Mr. Bruce Wolfe

September 6, 2011 MRP Tentative Order

October 6, 2011

Page 2

perspectives during development of an approach to LID flexibility for Smart Growth Special Projects.

San José supports many aspects of the proposed Special Projects approach:

- The use of location (e.g., Central Business Districts, Priority Development Areas) and density (Dwelling Units per Acre, Floor-Area Ratio), as originally proposed in the BASMAA Special Projects Proposal, are appropriate criteria for defining Smart Growth. Further, the City agrees that Smart Growth should avoid conventional surface parking lots and should limit surface parking to the minimum necessary.
- That new and redevelopment projects meeting the location, density, and site coverage criteria to use tree-well biofilters and/or structural media filters to treat the portion of the C.3 volume specified by the LID credits.
- Special Projects will provide treatment for the entire C.3 runoff volume.
- San José supports semi-annual reporting of Special Projects to the Water Board as proposed by the Tentative Order and welcomes the opportunity this provides for permittees to demonstrate successful application of the Special Projects provision.

San José remains concerned that this Tentative Order does not align with the Smart Growth development strategies of the Bay Area region. Throughout the development of the Special Projects criteria, San José has advocated for an LID credit system that would provide full treatment flexibility to certain types of Smart Growth development. As drafted, the Tentative Order does not align with the MRP's vision for incentivizing Smart Growth to leverage its water quality benefits at the watershed scale. San José's specific comments and recommendations are as follows:

- San José is most concerned about the limited location credit for projects in Priority Development Areas (PDAs). As noted in the BASMAA Special Projects Proposal, PDAs are the centerpiece of the Association of Bay Area Government's FOCUS program, a regional development and conservation strategy that promotes compact development in transit-rich areas. Priority Development Areas represent less than 5% of the total Bay Area, yet are projected to accommodate over half its growth. To better align the MRP with regional sustainable growth strategies, the Tentative Order should provide at least a 50% location credit for Transit Oriented Development projects that meet the minimum density/intensity criteria and are located in PDAs.
- The density requirements of the LID credit system only provide full (100%) treatment flexibility to small infill projects (Category A) and to very high density or high-rise

Mr. Bruce Wolfe

September 6, 2011 MRP Tentative Order

October 6, 2011

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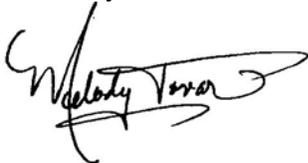
projects (Categories B & C). These are rare forms of (re)development and represent the exception rather than the norm of development in the Bay Area region. San José recommends that, at a minimum, the Category B criteria for 100% credit be revised to a Floor/Area Ratio (FAR) of 3:1 or a density of 75 dwelling units per acre.

- The FAR identified for the Transit Oriented Development density criteria for mixed-use and commercial development describe a much more intense form of development than for the residential densities to which they should be aligned. The FAR for the 20% density credit should be reduced to 3:1 and the FAR for 30% credit should be lowered to 4:1.
- The entire LID credit system appears structured to ensure that nearly every qualifying Smart Growth project is required to treat at least a portion of its runoff with LID treatment methods, rather than allowing those projects to successfully treat the full C.3 volume with compact structural BMPs. The Water Board has not presented sufficient evidence that the structural BMPs in use today are not effective and should not be used in Smart Growth development. San José is concerned that the application of partial LID credits to Smart Growth projects will add complexity and cost due to the additional architectural and engineering design necessary to route portions of a project's stormwater runoff to different treatment facilities, as well as increased construction costs.

The City appreciates that the Tentative Order incorporates the revised Hydromodification Management (HM) Applicability Map for Santa Clara Valley into the MRP. The City notes that field verification of catchment areas may indicate the need to adjust the map boundaries. The City will notify the Water Board and submit documentation supporting any need for adjustments. The City also notes and supports SCVURPPP's comments regarding the incorporation of the biotreatment soil specifications as Attachment I to the MRP amendment.

San José acknowledges the time and effort of the Water Board staff that went into the development of the Tentative Order. We appreciate your consideration of our comments and look forward to implementing stormwater treatment approaches that recognize and balance project-scale and watershed-scale relationships to our waterways.

Sincerely,

A handwritten signature in black ink, appearing to read "Kerrie Romanow". The signature is fluid and cursive, with a large initial "K" and a long, sweeping underline.

for

Kerrie Romanow

Acting Director, Environmental Services



October 6, 2011

Bruce Wolfe, Executive Officer
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

Re: Letter of Support for the 'Special Projects' Amendment to Provision C.3.e.ii of the Municipal Regional Stormwater NPDES Permit

Dear Mr. Wolfe,

We would like to support the proposed 'Special Projects' amendment to Provision C.3.e.ii of the Municipal Regional Stormwater NPDES Permit (MRP) that allows certain types of smart growth, urban infill and transit-oriented development projects with inherent environmental benefits to receive low impact development (LID) treatment reduction credits for treating storm water runoff from their sites. We specifically support the allowance of LID treatment reduction credits for the following project categories:

- Category B Special Project - Maximum Two Acres, Higher Density
- Category C Special Project - Transit Oriented Development

The Metropolitan Transportation Commission (MTC) is the transportation planning, coordinating and financing agency for the nine-county San Francisco Bay Area. The Association of Bay Area Governments (ABAG) is the Bay Area's regional planning agency and council of governments. As you may be aware, MTC and ABAG are leading the Bay Area's FOCUS program with support from our partner agencies the Bay Area Air Quality Management District (BAAQMD), and the Bay Conservation and Development Commission (BCDC). FOCUS is a regional development and conservation strategy that promotes a more compact land use pattern, linking land use and transportation by encouraging the development of complete, livable communities in areas served by transit (Priority Development Areas (PDA), and promoting conservation of the region's most significant resource lands (Priority Conservation Areas (PCA). This program, and the current effort to develop the Sustainable Communities Strategy (SCS), will direct growth and development to the PDAs along existing and proposed local and regional transportation routes. To this end we would like to make sure projects supportive of these regional goals are not impeded by overarching regulatory statutes, and that projects constructed within PDAs receive incentives in the form of significant LID treatment reduction credits. MTC and ABAG supports special projects Category B and C because these project types support regional goals of housing, livability and transit supportive land use in our region.

We are very concerned that a blanket requirement that all regulated projects utilize 100% LID treatment on-site will deter or stop the development of infill projects that will be critical to the region's successful implementation of SB375. Failure to consider the site specific constraints and the multiple

Bruce Wolfe Ltr.
October 6, 2011
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environmental, economic and equity benefits of special projects as outlined in Category B and C could cause hardship many infill development projects resulting in significant delays and added costs that could prevent the projects from being built.

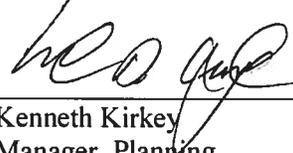
We would also like to support the allowance of additional options for treatment facilities, such as tree-box-type high rate bio filters or below-ground vault based high-rate media filters to treat runoff.

Understanding the needs for the new stormwater regulations, we should make sure that good intentions do not deter good land use practice in Bay Area.



Ann Flemer
Deputy Executive Director, Policy
Metropolitan Transportation Commission

Sincerely,



Kenneth Kirkey
Manager, Planning
Association of Bay Area Governments



September 30, 2011

Via electronic mail

Executive Officer and Members of the Board
California Regional Water Quality Control Board
San Francisco Region
1515 Clay Street, Suite 1400
Oakland, CA 94612
dbowyer@waterboards.ca.gov

Re: *Comments on September 6, 2011 Tentative Order to amend the San Francisco Bay Municipal Regional Stormwater Permit (MRP), Order No. R2-2009-0074, NPDES No. CAS612008, to address criteria for Low Impact Development (LID) Treatment Reduction Credits*

Dear Mr. Wolfe and Members of the Board:

We write on behalf of the Natural Resources Defense Council (“NRDC”) and San Francisco Baykeeper. We have reviewed the September 6, 2011 Tentative Order No. R2-2011-XXXX (“Tentative Order”) to amend the San Francisco Bay Municipal Regional Stormwater NPDES Permit (Order No. R2-2009-0074) (“MRP”) to incorporate criteria for Special Projects to qualify for Low Impact Development (“LID”) treatment reduction credits. We appreciate the opportunity to submit the following comments to the Regional Board.

We appreciate that the Regional Board has made efforts to clearly specify the categories of development that would qualify for LID treatment reduction credits. However, we are strongly concerned that the proposed Tentative Order is overbroad, unsupported, and fails to meet the requirements of federal law. NRDC and Baykeeper submitted comments to the Regional Board previously on the Board’s release of the BASMAA December 1, 2010 Draft Special Projects Proposal/LID Treatment Reduction Credits MRP Provision C.3.e.ii.(ii) (“Dec. 1 Proposal”).¹ As the Board has not circulated any additional analysis or justification for the credit system proposed in the Tentative Order, we assume that, while some of the specific criteria have

¹ NRDC and San Francisco Baykeeper letter to San Francisco Regional Water Quality Control Board (January 28, 2011) re: *Comments on December 1, 2010 Draft Special Projects Proposal/LID Treatment Reduction Credits MRP Provision C.3.e.ii.(ii)* (“January 28 Letter”).

been altered from the Dec. 1 proposal, the discussion and proffered reasoning for allowing LID treatment reduction credits given in the Dec. 1 Proposal still form the basis for the Tentative Order. In our January 28 comments, which we incorporate by reference and attach here as “Exhibit A,” we noted that this recommended system of credits was ill-conceived and that its terms were inconsistent with state and federal law, most notably with the requirements of the Clean Water Act’s “maximum extent practicable” (“MEP”) standard. Relevant to the Tentative Order’s proposed changes, we stated specifically in our January 28 Letter that:

- **The proposed credit system fails to meet the requirement that MS4 permits reduce the discharge of pollutants to the MEP.** The proposed credit system fails to meet the MEP requirement because it “would not obligate any Special Project to demonstrate that it is technically infeasible to implement the MRP’s LID stormwater mitigation measures—merely falling into one of the specified categories would accord the project a complete waiver from the retention requirements, or even the requirement to use biotreatment where onsite retention is technically infeasible.”²
- **The water quality benefits claimed to exist as the basis for the proposed credit system are not supported by evidence in the record.** The Dec. 1 Proposal made several claims, including broadly that benefits of “Smart Growth strategies . . . are expected to offset any potential for increases in pollutant loading that may result from allowing” Special Projects to use alternative compliance measures. (Dec. 1 Proposal, at 20.) However, neither the Dec. 1 Proposal nor the Tentative Order provide credible evidence to support such a claim. Notably, the Dec. 1 Proposal cited to reports that point to benefits that can, under certain circumstances, accrue from smart growth development, without any finding to demonstrate that any benefits will actually accrue from any specific Special Project.³
- **The effectiveness of proposed alternative stormwater pollution reduction practices, including tree-box-type high flowrate biofilters and vault-based high flowrate media filters, has been overstated.** We noted in our January 28 Letter that while retaining the design storm volume onsite “would prevent 100 percent of the runoff, and therefore, 100 percent of the pollutants in that runoff, from ever reaching receiving waters,” that in contrast vault-based systems with conventional treatment BMPs (such as sand filters) “only attenuate just slightly over half of the total suspended solids (TSS), 40% of the total zinc (TZn), and one-third of the total copper (TCu) and total phosphorous (TP) in that volume of

² See January 28 Letter, at 3.

³ *Id.*, at 4.

runoff,”⁴ and that the Dec. 1 Proposal acknowledged that it is unable to provide any conclusive data as to “whether effluent quality [for tree-box-type high-rate biofilters], . . . is as good or better than effluent quality from a bioretention facility.” (Dec. 1 Proposal, at 6.) Further, we provided evidence that “full biotreatment systems utilizing an underdrain are likely to attenuate only 57 percent of TSS, 80 percent of TCu, 62 percent of TZn, and 78 percent of TP even under optimum conditions, let alone when engineered to allow infiltration rates of up to 100 inches per hour,” and that “[b]iotreatment systems with underdrains have additionally proven relatively ineffective for removal of total nitrogen or nitrate.”⁵

- **The Proposed Transit-Oriented Development Exemption is ill-conceived and overbroad.** We noted in our January 28 Letter (at 8) that there are 19 Bart stations in Alameda alone, which would create approximately 13.5 square miles of waiver eligible land, including considerable portions of downtown Oakland and Berkeley, without even considering other rail stops, bus transfer stations, or ferry terminals, or transportation hubs outside of Alameda County.
- **The Regional Board has not provided evidence or basis for waiver of the MRP’s LID retention requirements.** We noted that the Dec. 1 Proposal claimed that a waiver from the MRP’s LID requirements was necessary for all development in the selected categories because the development “would otherwise likely be directed to the suburban fringe.” (Dec. 1 Proposal, at 3.) However, neither the Dec. 1 Proposal nor the Tentative Order provide any basis for such statement, and the claim is in fact contradicted by recent research, discussed below.

While we recognize that the Regional Board has made some effort to narrow the potential application of the credit system from the Dec. 1 Proposal, the above concerns have not been addressed, and serve to emphasize that the LID treatment reduction credit system proposed in the Tentative Order fails to meet the requirements of state or federal law. Particularly problematic,

⁴ *Id.*, at 5 (citing R. Horner (2009) *Assessment of Hydrologic and Water Quality Implications of Stormwater Management under Provisions of the San Francisco Bay Region Municipal Regional Stormwater NPDES Permit*, at 4-5.)

⁵ *Id.*, at 5, (citing R. Horner (2009) *Assessment of Hydrologic and Water Quality Implications of Stormwater Management under Provisions of the San Francisco Bay Region Municipal Regional Stormwater NPDES Permit*, at 2; BASMAA (December 1, 2010) *Draft Model Bioretention Soil Media Specifications-MRP Provision C.3.c.iii*, at Annotated Bibliography section 3.0 (noting reduction of only 55 to 65 percent of total Kjeldahl nitrogen and only 20 percent of nitrate). We note as well that the Draft Proposal provides no specific design, performance, or sizing standards for these proposed alternative methods, meaning there is absolutely no assurance that they will serve to reduce pollution in an effective manner.)

the Tentative Order would allow for up to a 100 percent credit from meeting any of the LID requirements under section C.3.c.i.(2)(b) of the MRP, without providing any passable technical support or compliance-based reason for such a sizeable waiver.⁶ Low Impact Development has been established as “a practicable and superior approach . . . to minimize and mitigate increases in runoff and runoff pollutants and the resulting impacts on downstream uses, coastal resources and communities.”⁷ Where a Special Project may practicably implement LID treatment measures that retain runoff onsite, under the MEP standard it is required to do so, regardless of whether the project may promote some other environmentally beneficial goal. The Tentative Order must therefore require that credits are given for LID treatment reduction, if at all, only where it is demonstrated to be technically infeasible to retain the runoff onsite.

This is especially the case given that the primary basis offered for implementing the credit system, that development or redevelopment “would otherwise likely be directed to the suburban fringe” (see Dec. 1 Proposal, at 3), is patently false. NRDC and Baykeeper have submitted several technical studies to the Regional Board to establish that the exempted Special Projects, including “smart growth” or urban infill and redevelopment projects, could in many circumstances meet standards even more stringent than the LID requirements adopted in the MRP.⁸ Moreover, The Dec 1. Proposal openly pointed out that “[i]nfiltration is feasible on some of these project sites,” that evapotranspiration “may be implementable for some projects,” and that even though it may not be “universally applicable,” rainwater capture and reuse “may be implementable.” (Dec. 1 Proposal, at 7.) Even in the event none of these practices can be feasibly implemented, the Draft Proposal fully admits that “[b]iotreatment will be implementable on many projects.” Thus, the claim that a full 100 percent credit is necessary, or warranted at all, is unsupported.

⁶ An administrative decision must be accompanied by findings that allow a court reviewing the order or decision to “bridge the analytic gap between the raw evidence and ultimate decision or order.” (*Topanga Ass’n for a Scenic Cmty. v. County of Los Angeles* (1974) 11 Cal.3d 506, 515. Abuse of discretion is established if “the order or decision is not supported by the findings, or the findings are not supported by the evidence.” Cal. Civ. Proc. Code § 1094.5(b); *see also Zuniga v. Los Angeles County Civil Serv. Comm’n*, 137 Cal. App. 4th 1255, 1258 (2006)

⁷ California Ocean Protection Council (May 15, 2008) *Resolution of the California Ocean Protection Council Regarding Low Impact Development*, at 2.

⁸ R. Horner (2007) *Initial Investigation of the Feasibility and Benefits of Low-Impact Site Design Practices (“LID”) for the San Francisco Bay Area*, at 16-19 (hereinafter, “Horner Initial Investigation”); R. Horner (2007) *Supplementary Investigation of the Feasibility and Benefits of Low-Impact Site Design Practices (“LID”) for the San Francisco Bay Area*, at 3-5 (hereinafter, “Horner Supplementary Investigation”); *See also*, NRDC letter to San Francisco Regional Board re: Comments on February 11, 2009 Draft San Francisco Bay Municipal Regional Stormwater NPDES Permit, April 3, 2009.

Further, research conducted by ECONorthwest has demonstrated that in recent case study interviewing staff in multiple jurisdictions, “none had actually observed that developers were choosing to invest in greenfield projects over redevelopment projects because of . . . new [stormwater] standards.”⁹ The research found that, while pursuing projects to meet strong stormwater standards “was not without challenge . . . [developers] will continue developing in places that require strong stormwater controls and LID.”¹⁰ The study found that “many developers describe the cost of implementing stormwater controls as minor compared to the other economic factors they considered in deciding whether or not to pursue a project . . . especially [] in the context of highly-complex redevelopment projects and green-building infill projects . . . some developers pointed out . . . that using LID controls has helped offset some of the increased cost, compared to using conventional controls.”¹¹ Infill, smart growth, and redevelopment projects are capable of meeting strong the strong LID standards in the MRP, in part or, in many cases, in whole. There is no justification for allowing for a 100 percent credit from the LID standards, and certainly no justification for allowing such a credit without first determining that it is infeasible for any specific development to meet the Permit’s otherwise applicable LID requirements.

NRDC and Baykeeper agree with the environmental preferability of smart growth projects in comparison to their greenfield counterparts (indeed, NRDC is a national advocate of smart growth), but in the MS4 permitting context there is no reason to establish a blanket waiver from proven stormwater mitigation requirements simply because a project constitutes “smart growth” or infill. If a project can feasibly implement stormwater treatment measures, it must be required to do so, particularly for regions such as the Bay Area that contain numerous impaired waters. The Tentative Order and Dec. 1 Proposal provide no basis to conclude otherwise; no evidence has been given to demonstrate that all projects in these categories are incapable of complying with the MRP, no evidence has been given to demonstrate that perceived benefits of smart growth or development in proximity to a transit hub will outweigh the water quality detriments created by additional urban runoff, and no evidence has been given to show that smart growth, infill, or redevelopment projects will be forced to migrate to greenfield spaces. Allowing for any such development to obtain a 100 percent credit such as proposed here fails to properly implement the requirement that development reduce the impacts of stormwater “to the maximum extent practicable,” and the Regional Board must revise the Tentative Order accordingly.

⁹ ECONorthwest (June 2011) *Managing Stormwater in Redevelopment and Greenfield Development Projects Using Green Infrastructure: Economic Factors that Influence Developers’ Decisions*, at 2.

¹⁰ *Id.*

¹¹ *Id.*, at 3.

Executive Officer, RWQCB San Francisco Region

September 30, 2011

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For the many aforementioned reasons, the Tentative Order is ill-conceived, inadequately supported, and unlawful under federal and state law. It requires broad and significant revisions, as well as more thorough documentation, to pass legal muster. We urge the Regional Board to reject the Tentative Order.

Sincerely,



Noah Garrison
Project Attorney
Natural Resources Defense Council



Jason Flanders
Staff Attorney
San Francisco Baykeeper

Managing Stormwater in Redevelopment and Greenfield Development Projects Using Green Infrastructure

Economic Factors that Influence Developers' Decisions

June 2011

ECONorthwest
ECONOMICS • FINANCE • PLANNING

99 W. 10th Avenue, Suite 400
Eugene, OR 97401
Phone: 541-687-0051
www.econw.com

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CONTACT INFORMATION

This report was prepared by Sarah Reich, Ed MacMullan, Lorelei Juntunen, and Ann Hollingshead of ECONorthwest, which is solely responsible for its content.

ECONorthwest specializes in economics, planning, and finance. Founded in 1974, we're one of the oldest independent economic consulting firms in the Pacific Northwest. We have extensive experience applying rigorous analytical methods to examine the benefits, costs, and other economic effects of environmental and natural resource topics for a diverse array of public and private clients throughout the United States and across the globe.

For more information about us, visit our website at www.econw.com.

For more information about this report, please contact:

Sarah Reich
ECONorthwest
99 W. 10th Ave., Suite 400
Eugene, OR 97401-3040
541-687-0051
reich@eugene.econw.com

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We gratefully acknowledge the assistance of the many individuals who provided us with information and insight in this project. We emphasize, however, that we, alone, are responsible for the report's contents – they do not necessarily represent the opinions of the other individuals involved in this research. We have prepared this report based on our synthesis of the interviews and literature search conducted in the scope of this project, and from our general knowledge of economic principles.

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I. INTRODUCTION AND SUMMARY

Low-impact development and green-infrastructure (LID) are viable strategies for managing stormwater, as reflected by the increasing number of jurisdictions that are either encouraging or requiring their use. As the U.S. EPA develops regulations for controlling non-point-source pollution from stormwater runoff, it is considering requiring local jurisdictions to implement stronger stormwater standards.¹ Among the options it is considering is a volume-based standard that will drive the use of LID more broadly nationwide.

There is currently disagreement as to whether strong stormwater standards uniformly applied across development types would have an impact on where and how development occurs. Some regulators and interest groups have raised concerns that widespread, uniform mandates for stronger stormwater controls, including LID, would undercut efforts to reduce sprawl and to direct future development into already-urbanized areas. These concerns arise from a premise that stronger stormwater controls, and LID in particular, are more expensive to integrate into redevelopment than greenfield development because of site constraints, land costs and other regulatory factors. Facing these increased costs, it is argued, developers may focus their resources on greenfield development and reduce their investment in redevelopment projects. This shift could have unintended, adverse consequences for water quality in the long run by increasing the overall amount of impervious areas in a given watershed.

Other interest groups share concerns about the adverse environmental effects of sprawl, but suggest that the data do not support claims of prohibitive cost and diversion of development to greenfields allegedly caused by strong stormwater requirements. These advocates note that the development process is complex and motivated by a range of factors, many which are highly site-specific, and that no one factor drives decisions on the location and type of development. Further, they argue that, the economic benefits of a stormwater standard – particularly if it requires the use of green infrastructure – will provide economic and livability benefits that will actually encourage the redevelopment of existing communities rather than push development to greenfields.

Smart Growth America (SGA), in collaboration with American Rivers, the Center for Neighborhood Technology, River Network, and the Natural Resources Defense Council, asked us to investigate what impact, if any, strong stormwater regulations that require or encourage LID techniques, uniformly applied to greenfield development and redevelopment, would have on developers' decisions about where and how to build. We approached this project by reviewing relevant literature and interviewing jurisdiction staff and individuals in the development community on these topics:

¹ Throughout this report, we refer to “stronger stormwater standards” to mean water-quality and/or volume standards that require developers to manage the majority of stormwater runoff from impervious surface conversion on-site, ideally using infiltration or retention techniques. The three jurisdictions we focus on in this report recently adopted stronger stormwater standards, relative to what they required previously, and relative to the stormwater controls many jurisdictions in the nation currently require. Each set of requirements is slightly different (see Section II, B for a summary), but in general, they are among the strongest in the nation, and are an indication of the level of stormwater control EPA may consider requiring more broadly as it revises the national stormwater regulations.

- the factors that affect development decisions in greenfield and redevelopment contexts, and the significance of stormwater management in these decision-making processes
- the challenges and benefits of implementing stronger stormwater standards in greenfield and redevelopment contexts
- the range of incentives jurisdictions have implemented or considered to facilitate the adoption of LID in greenfield and redevelopment projects

We focused our inquiry on the developers' decision-making process in three jurisdictions that have recently implemented stronger stormwater standards for retention and/or water-quality treatment, and allow or require consideration of LID or Environmentally Sensitive Design (referred to here as LID): Montgomery County, Maryland; Philadelphia, Pennsylvania; and Olympia, Washington. We first reviewed the literature on the topics above and each jurisdiction's efforts to implement stronger stormwater controls. We then interviewed members of the development community and permitting and planning staff in each jurisdiction to focus on specific issues the existing literature does not sufficiently address.

This report presents the information we have collected on these topics. We organize our findings into seven broad conclusions that inform the primary research question. We summarize them below. We elaborate on each with evidence from the literature and interviews in the following sections. Appendix A presents a bibliography, and Appendix B lists the individuals we interviewed and consulted during this project.

1. Developers are successfully incorporating stronger stormwater controls to meet strict volume-reduction and water-quality standards in both redevelopment and greenfield projects.

Our study found that some developers can and do meet stronger stormwater standards in both redevelopment and greenfield projects. Interviewees who had completed developments that met stronger stormwater standards using LID indicated that doing so required creativity and willingness to experiment with new approaches to projects. They emphasized that pursuing these projects was not without challenge, but they will continue developing in places that require strong stormwater controls and LID. Developers pointed to a variety of reasons for this choice: the markets they participate in respond favorably to the new stormwater designs; meeting regulations with green-infrastructure techniques could be more cost effective than conventional controls; and for some, they simply believed it was the right thing to do for the environment. Some developers we interviewed had not yet implemented projects under the stronger stormwater standards. Some were skeptical, based on their own initial experiences or other developers they'd talked to, that they could make a project pencil out using LID controls. A minority of interviewees held this perspective. Although staff at each jurisdiction had encountered this opinion, none had actually observed that developers were choosing to invest in greenfield projects over redevelopment projects because of the new standards. This is consistent with other findings in the literature (Leistra, Weiss, and Helman 2010).

2. Complying with stormwater regulations is one factor among many that influences a project's costs. It is rarely the driving factor.

Stronger stormwater standards can affect the costs of both greenfield and redevelopment projects. These costs are folded into a *pro forma* analysis that developers and lenders use to assess the viability of a project. Developers we interviewed revealed that their decision-making process incorporates a wide range of economic factors, including various construction costs, current and future market conditions, regulatory incentives and disincentives, and uncertainty and risk. While some developers we interviewed indicated that the costs associated with meeting stronger stormwater standards may change the types of projects they will pursue in the future, many developers described the cost of implementing stormwater controls as minor compared to the other economic factors they considered in deciding whether or not to pursue a project. This is especially true in the context of highly-complex redevelopment projects and green-building infill projects. In general, stronger stormwater standards increase the costs of implementing stormwater controls, a trend that many of the developers we interviewed have experienced since at least the 1980s. Some developers pointed out, however, that using LID controls has helped offset some of the increased cost, compared to using conventional controls.

3. The costs of stormwater controls in general, and LID controls in particular, tend to be more variable and site-specific for redevelopment versus greenfield development.

The developers we interviewed were reluctant to make specific predictions about the extent to which stronger stormwater controls influence the cost of projects. They emphasized that stormwater designs are highly site-specific, and one solution may be feasible and cost-effective at one site, but infeasible or cost-prohibitive at another site. The conceptual framework in Section II outlines the different factors we identified in the literature and through the interviews that influence the cost of implementing stronger stormwater standards. They underscore the site-specific nature of stormwater-control costs, and explain why implementing stronger stormwater controls in redevelopment projects tends to be more expensive than in greenfield projects.

4. Developers respond to benefits that influence their bottom line. In some cases, these may help offset increased costs of complying with stronger stormwater regulations.

While stronger stormwater regulations and LID controls can provide a range of environmental and amenity benefits, developers generally only respond to those benefits that affect their bottom line. Developers we interviewed suggested that LID controls that helped them comply with stronger stormwater regulations at lower cost, increased the sale price or rent of a project, reduced the time to sale, or all three, would affect their decisions to use LID. Specific examples of LID controls providing economic benefits to developers include bioswales and other vegetative stormwater controls that improve the appearance and market appeal of a development while also reducing overall landscaping costs, and greenroofs that reduce energy costs and the long-term cost of roof maintenance. Developers noted, however, that market demand for projects that include LID stormwater controls have not yet expanded beyond niche markets. Factors such as unfamiliarity with the technology and uncertainty about how to address

operations and maintenance of LID controls limit broader use of LID by developers and demand from consumers.

5. Cost-effective responses to stronger stormwater standards require a more collaborative approach to addressing stormwater management.

Interviewees who successfully implement stronger stormwater controls using infiltration and volume-reduction practices in redevelopment projects emphasize the importance of considering stormwater management at the earliest stages of development, and of integrating professionals' expertise throughout the project. These principles are consistent with the conclusions of the broader literature on green building, which emphasize the importance of collaboration among professionals throughout the design process to achieve reductions in overall costs. These principles are especially important in the success of redevelopment projects, because these projects tend to require more complex, site-specific, and creative solutions to effectively manage stormwater.

6. Market adjustments are already reducing costs of implementing stronger stormwater standards, for both redevelopment and greenfield development, a trend that is likely to continue.

Market adjustments include changes on the supply side that result in lower costs to implement stronger stormwater standards and changes in demand that result in increased consumer willingness to pay for projects that incorporate stronger stormwater controls. Market adjustments that have the potential to lower costs include more widespread availability of materials (such as porous pavers), better technologies that reduce the time and/or expense of installation (such as modular greenroof systems), and improved design and engineering expertise. Increased regulatory certainty as more developers become familiar with the permitting process and more permitting officials become comfortable with the new regulatory system also will reduce developers' costs of implementing stronger stormwater controls. Market adjustments also have the potential to increase consumers' willingness to pay for projects that integrate some types of stormwater controls – especially those that add amenities, such as rain gardens, and those that reduce building operating costs, such as greenroofs. Willingness to pay may increase as more consumers recognize and demand the environmental benefits LID provides, as LID techniques become more familiar and main-stream, and as time and increased use demonstrate LID's long-term effectiveness across wider geographic regions and climate conditions.

7. Developers are supportive of incentives that offset costs and ease the transition to stronger stormwater standards. Jurisdictions can use them to increase the level of social benefits derived from LID practices.

All three jurisdictions have or have considered implementing incentives to encourage developers to adopt LID controls as a way of complying with stronger stormwater standards. Jurisdictions themselves have an incentive to offer developers incentives, in part, because many of the benefits LID provides accrue to the jurisdiction or the public at large, but don't register in the developers' private accounting of costs and benefits. Enhancing the private benefits developers can receive from LID by passing through some of the public benefits can create a more economically efficient outcome for society.

Incentives come in a variety of different forms, from direct financial payments and subsidies, to efforts to reduce the costs and risks associated with the permitting and review process. Each jurisdiction we focused on has processes in place to help developers navigate the permitting process more efficiently if they propose to implement LID beyond what current regulations require. Developers generally responded favorably to these efforts and said that they took advantage of them. Among the jurisdictions we looked at, Philadelphia has the most developed financial incentive programs, including a fee offset for managing stormwater onsite and a greenroof tax credit. Developers we interviewed who work in Philadelphia indicated they were aware of these incentives and, in some cases, they had taken advantage of them. Many interviewees expressed their support of stormwater credit and off-site mitigation programs to address the reality that on-site stormwater retention may not be physically possible in every project, and may not be economically feasible in some projects.

II. CONCEPTUAL FRAMEWORK AND METHODOLOGY

We approached this project in two phases: a literature review followed by key-informant interviews. Through the literature review, we developed a conceptual framework to understand the issues developers face with regard to the factors that influence the costs and benefits of implementing increasingly stringent stormwater regulations in redevelopment and greenfield projects. The interviews provided an opportunity to test the framework against developers' practical experiences and collect information not available in the literature.

A. Literature Review

There are many stand-alone studies and reviews of the literature that describe the benefits and costs associated with LID and green infrastructure and compare the costs of LID to conventional development (*see, e.g.,* Center for Neighborhood Technology 2010, U.S. EPA 2007, MacMullan and Reich 2007, Gunderson et al. 2011). We drew heavily from our knowledge of these studies to develop our conceptual framework, and cite to them throughout the following section. We did not, however, set out to add another broad literature review of LID economics to the existing body of literature. Instead, we narrowly focused our review of the literature on two specific topics:

- 1) Studies that describe the differential impact of stronger stormwater regulations on greenfield and redevelopment activities, either quantitatively or qualitatively.
- 2) Studies that describe the impact of stronger stormwater regulations on developers' decisions to build.

1. Differential Impacts of Stormwater Regulations on Development

Our review found no broad-scale studies that systematically investigated the impacts that stronger stormwater regulations may have on different types of development, specifically greenfield projects and redevelopment projects. The literature contains an ever-growing list of case studies that illustrate developer's experiences integrating LID into different types of projects. Many of these illustrations contain cost information. It is very difficult, however, to draw meaningful conclusions about the relative costs of implementing stormwater controls in greenfield and redevelopment projects from these largely anecdotal illustrations. It is more difficult still to determine potential differential impacts under specific regulatory standards.

We found only one study that directly addressed the differential cost impact between greenfield development and redevelopment (Chesapeake Stormwater Network 2010). This study, which was specific to developments and regulations in the mid-Atlantic region and may have limited applicability in other regions of the country, found that installing LID controls at redevelopment sites with less than 65 percent impervious coverage could be successfully accomplished at little to no extra cost than new development sites. Integrating LID into sites with greater than 65 percent impervious coverage – those in highly urban settings – can be up to 4 times more expensive than new development, however. This conclusion may or may not be relevant beyond the limited cases described in this study. More quantitative research is warranted on this

topic to understand how the cost impacts of stronger stormwater standards may vary across different development types and different markets.

2. Impacts of Stronger Stormwater Regulations on Developers' Decisions

Economists and other researchers have attempted to describe the locational behavior of firms in response to environmental regulation of all types at a regional level for decades. The studies that have emerged illustrate the challenge of finding a definitive answer to this question, given the complexity of the world within which such decisions are made. One analysis summarizes the literature by concluding that the studies have found positive, negative, and no impact, and often produce conflicting, contradictory results (Jeppesen and Folmer 2001). Perhaps because of the methodological and practical challenges inherent in answering such a question, we found no studies that used statistical or quantitative methods to determine how developers have responded to changes in stormwater regulations.

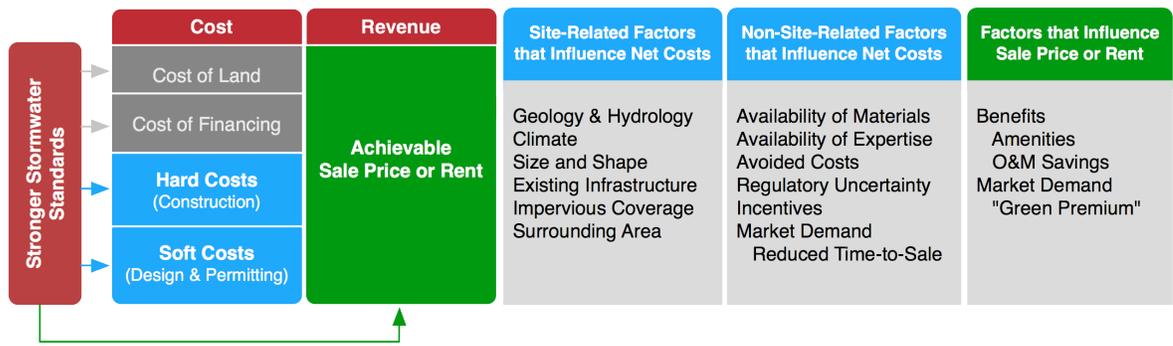
We did, however, find one recent study that used interviews of local permitting officials to inform how stronger stormwater regulations in the District of Columbia might affect developers' decisions about where to build (Leistra, Weiss, and Helman 2010). As part of the study, the researchers attempted to describe how developers responded to similar stormwater regulations in four other jurisdictions: Philadelphia, Chicago, Portland, and Seattle. Through interviews with municipal officials, the study's authors found that the new stormwater requirements have not had, or are not expected to have, discernible effects on development. In Philadelphia, which we also focus on in this study, the study's authors found that, while some developers threatened to pull projects when the regulations went into effect, municipal officials did not actually observe that this occurred. Officials attributed this to other factors influencing developers' decisions more than stormwater costs, and the City's expedited approval process, incentives, and customer service.

B. Conceptual Framework

The results of our focused literature review suggest that few researchers have set out to answer the question we were asked to investigate. There are many ways one might attempt to answer this question. Limited resources, time, and data required us to take a qualitative approach. We focus broadly on describing the economic drivers of developers' decisions, and how stronger stormwater standards may interact with these decisions. Our study does not attempt to quantify the costs developers incur from complying with particular stormwater regulations, to estimate the benefits of stronger stormwater regulations, or to predict the specific effects stronger stormwater regulations will have on particular developments or regional development patterns.

Many factors influence developers' decisions on where and how to build. We developed a conceptual framework to guide our inquiry into developers' decision-making processes and provide insight into this question: *How will stronger stormwater regulations influence how and where developers decide to build, and what impact, if any, are they likely to have on overall development patterns and trends?* Figure 1 illustrates our conceptual framework.

Figure 1. Conceptual Framework



Source: ECONorthwest

When developers embark on a project, they usually develop a financial model, called a *pro forma*, that estimates the project’s anticipated financial return. The *pro forma* typically includes four major categories of costs: land, financing, hard costs (e.g., construction), soft costs (e.g., design and permitting) (Nachem 2007). A *pro forma* assumes that all these costs are financed upfront into a stream of debt service that, when compared to achievable sale price or rent, generates a reasonable return on investment. What a developer considers “reasonable” varies depending on their personal preferences and a project’s risk and complexity.

The cost categories are shown in the left side of the diagram in Figure 1, the revenue on the right. Stronger stormwater regulations primarily affect two categories of cost most directly: hard costs and soft costs, shown in blue. To a lesser extent, stormwater regulations may also influence the cost of land and financing costs, identified in gray in Figure 1. Depending on how a developer implements stormwater controls, stronger stormwater standards also may affect the achievable sale price or rent, shown in the diagram in green.

The first two subsections, below, describe how stronger stormwater standards might affect the cost and revenue sides of a development *pro forma*. The third and fourth subsections unpack these relationships, and describe how variations in site and non-site related factors might affect the extent to which stronger stormwater standards influence cost and revenue, and ultimately, the developers’ decision-making process.

1. Cost-Related Factors in the Developers’ Decision-Making Process

Stronger stormwater standards have the potential to influence the costs in the *pro forma* analysis and affect how a project pencils out. The most direct effects are on hard and soft costs, identified in blue in Figure 1. The extent to which stronger stormwater standards affect these costs will depend, in part, on the existing level of stormwater management controls developers are accustomed to factoring into their projects. The effect on cost could be very different if regulations impose a new requirement where none existed before, versus incrementally strengthening retention or water-quality standards or requiring the use of certain best management practices (BMPs), such as LID, over more conventional controls. In the first instance, the direction of the effect likely will be more predictable (positive) and uniform in magnitude across development projects. In the

second instance, depending on the degree of regulatory change and how different developers are already approaching stormwater management, the direction and magnitude of the effect will likely vary considerably, and the overall effect from project to project may be less clear.

Hard Costs. Both conventional and LID stormwater controls have hard costs – in the short-run to install, and in the long-run to maintain. Stormwater controls represent a portion of the total construction costs, and the ratio of stormwater-control costs to other hard costs can vary considerably from project to project. An extensive and growing body of literature exists on the construction cost of conventional stormwater controls (*see, e.g.,* Brown and Schueler 1997, Heaney, Sample, and Wright 2002, Narayan and Pitt 2006). There is also a growing body of information on the construction costs of various LID controls (Schueler et al. 2007, WERF 2009), although the costs of LID controls are still less-well understood and documented (Stephenson and Beamer 2008). In general, the costs of LID controls are more dependent on site characteristics than conventional controls, and the variation in costs across LID BMPs for different development types, geographic regions, and climates is not well documented through systematic research (although the body of anecdotal case studies is growing).

Stronger stormwater management regulations (those that require LID and those that do not) may affect hard costs by requiring more extensive stormwater infrastructure to treat higher volumes or greater levels of contamination. The effect of stronger regulations, however, may not always be straightforward: by using LID techniques that provide higher levels of treatment, many developers have been able to minimize conventional infrastructure and actually reduce the overall hard costs associated with stormwater management (U.S. EPA 2007, MacMullan and Reich 2007). In general, the infrastructure to address stormwater (LID or conventional controls) on more constrained sites with higher levels of impervious coverage – typical of redevelopment and retrofit projects – will cost more than unconstrained sites with large amounts of land (Schueler et al. 2007, Chesapeake Stormwater Network 2011). Schueler et al. (2007), for example, found that the cost of implementing stormwater controls in redevelopment projects with high ratios of impervious surface can be 1.5 to 4 times the cost of constructing stormwater controls at new development sites. This research was conducted in the mid-Atlantic region and may not be applicable to other regions, with different climate, hydrology, and geology. Ultimately, it is critical to acknowledge that the effect of stronger stormwater regulations on hard costs depends on a variety of site-specific factors described in more detail in subsection three, below.

Soft Costs. Stormwater systems require engineering expertise to design, and jurisdictions typically require developers to demonstrate a stormwater control plan before they issue a building permit. The literature suggests the design and permitting costs, for LID and conventional controls, range depending on the BMP, but are typically around 25 to 40 percent of a BMP's construction costs (Schueler et al. 2007, Brown and Schueler 1997).

Stronger stormwater management regulations can increase the design and permitting costs by requiring more studies and documentation to obtain permits and more specialized engineering expertise to design new types of controls. Increased uncertainty about how to meet new regulations or how jurisdictions implement new regulations can

increase the time and costs of navigating the regulatory process, which also increases project costs (Braconi 1996, Randolph et al. 2007). More complicated or constrained sites may require more intensive and expensive stormwater design and permitting efforts, which would suggest that soft costs associated with LID or conventional stormwater controls could be higher for redevelopment projects than greenfield projects.

Cost of Land. The value of land is a function of the allowable uses on the property (entitlements), achievable pricing (rents), costs (hard costs like building materials and plumbers, and soft costs like planning and financing), and expected returns (profit). Developers see the market price of the finished project and hard and soft costs as being largely outside of their control. Thus, the developer focuses on the cost he or she can influence most strongly: the cost of property acquisition. In other words, a developer will solve backwards to determine what he or she is willing to pay for property based on the other costs to complete the project. Shifts in variables, such as hard costs, will directly affect the ability to pay for land. Stronger stormwater controls that increase the hard or soft costs of stormwater management may limit or lower what the developer can pay for land. In some cases, developers already own the land. In that situation, the cost of land factors into a developers' decision as an opportunity cost (what the developer could sell the land for if he or she did not want to redevelop it), and the effect of stronger stormwater standards in this calculation is more complicated.

Financing Costs. Lenders provide developers with working capital. They are risk limiters, not profit maximizers. Lending is a low-margin, high-volume business that generally receives fixed returns in the form of upfront fees and interest. These fees and interest factor into the developers' *pro forma*. Financial institutions make credit decisions based on a project's cash flow that will be available to pay debt service. Some lenders are important partners in community development efforts, and will accept a higher risk project without a corresponding increase in interest rates, but in general, riskier projects will cost a developer more as lenders seek to cover the risk in their portfolio. Stronger stormwater management regulations that increase a project's overall cost have the potential to reduce the margin of certainty that a project will pencil out, which would increase the risk from the lender's perspective and lead to higher financing rates.

2. Revenue-Related Factors in the Developers' Decision-Making Process

Developers' decisions are affected not only by factors that influence costs, but also by factors that influence the achievable sale price or rent (the revenue, identified in green in Figure 1) – the benefits to developers. LID stormwater controls can have **market and non-market benefits** that conventional stormwater controls do not (Center for Neighborhood Technology and American Rivers 2010). When considering developers' decision-making processes, however, it is very important to identify when these benefits materialize and to whom. While stormwater controls may produce water-quality benefits in the local watershed, for example, these benefits are unlikely to translate directly into an economic benefit a developer can capitalize into the sale price or rent of the development.²

² Some studies show that water-quality improvements can positively affect the values of adjacent property (Kirshner and Moore 1989, Leggett and Bockstael 2000).

Other benefits more directly accrue to the building owner or resident and may affect property value. Some consider the amenities that LID controls provide to be visually appealing, and would be willing to pay more to live or work in the environment they create. This demand may positively influence property values (Ward, MacMullan, and Reich 2008). Recent research is demonstrating that neighborhoods built around green streets provide more opportunities for neighbors to interact with each other, providing a positive community environment that many people may be willing to pay more to enjoy this benefit (Dill et al. 2010). Other features associated with LID BMPs, particularly green roofs, can generate benefits for building owners and occupants by reducing heating and cooling costs, and reducing maintenance costs by increasing the lifespan of the roof (David Evans and Associates and ECONorthwest 2008).

In the end, **market demand** and consumer willingness to pay determine the rent or sales price that developers earn on a project. If people aren't willing to pay for the features that LID stormwater controls provide, or don't recognize a difference between LID and conventional stormwater practices, the benefits of stronger stormwater standards that require LID may have little influence over developers' decisions. In some cases, if regulations produce features that consumers perceive as negative, they may actually lower the achievable sales price or rent. In general, however, the demand for green buildings and sustainable stormwater practices has been increasing in response to the rapid growth in the global green building industry, which is the fastest growing sector of the building industry (Jackson et al., 2010). This trend likely means that these factors will play an increasingly important role in developers' decisions.

3. Site-Related Factors that Influence Costs and Benefits

The costs and benefits associated with implementing stormwater management controls are highly site-specific. This is especially true when stronger stormwater management controls require on-site retention and treatment using LID controls. Site characteristics largely determine which types of LID controls may be used, and the wide range of costs across different LID controls may lead to widely-divergent control costs from project to project. Different LID controls also result in different levels of benefits and interactions with market demand. Local differences in public and private experience adapting LID to local conditions can also affect costs and the way benefits are perceived at the site level.

A site's **geology and hydrology** determine how effectively different infiltration techniques will address stormwater management (Langdon 2007). Level sites that infiltrate well may support infiltration techniques with little additional soil amendment or earth movement. Sites that do not infiltrate well or are sloped may require extensive modification to implement infiltration practices effectively, increasing costs, in some cases substantially. Some sites may not support any infiltration, and techniques that don't rely on infiltration, such as collection systems (rain barrels and cisterns) or vegetative systems (greenroofs and tree planters) must be used instead, often (though not always) at increased cost (Schueler et al. 2007 and U.S. Army Corps of Engineers 2009).

A site's **regional and micro-climate** can influence the way both infiltration and retention techniques are designed, with various implications on cost and achievable benefits (*see, e.g.,* U.S. EPA 2010). Places with prolonged drought or freeze periods will have the

greatest influence on design considerations. In some cases, cold-weather climates may limit the range of BMPs, or their effectiveness (Roseen et al. 2009). Total precipitation and variation in precipitation throughout the year may influence the design and utility of other BMPs, such as rainwater capture systems and greenroofs (Schroll et al. 2011, Sands 2003).

The overall **size and shape of the site** is important, as sites with large amounts of land – again, more typical of new development projects than redevelopment projects – may benefit from economies of scale (Langdon 2007). The literature suggests that construction costs decrease on a per-unit basis as the overall size of the stormwater control increases (Lampe et al. 2005).

Existing infrastructure and impervious surface coverage also affect the costs of implementing stormwater controls (Chesapeake Stormwater Network 2011 and Lukes and Kloss 2008). Existing built infrastructure reduces the land available for stormwater control, and reduces the flexibility to implement a wide range of stormwater-control designs.

4. Non-Site-Related Factors that Influence Costs and Benefits

The site-related factors described above have the potential to directly influence the costs and benefits associated with implementing stronger stormwater standards. There are several other factors unrelated to a given development site that may influence developers' decisions about whether to pursue a project that requires LID stormwater controls. Some of these factors affect the cost side of a developers' equation, while others influence the revenue side and lower a development's net costs.

The **availability of materials and expertise** to implement new or unfamiliar stormwater controls or **regulatory uncertainty** regarding these controls can affect a developers' costs. Developers operating where few engineers with experience implementing LID-type controls are working, for example, may pay more to obtain that expertise. Similarly, some LID techniques require specialized materials that may need to be shipped from other parts of the country, increasing costs beyond what they would be if they were available locally. Regulatory uncertainty is often cited as a big factor affecting the overall cost of implementing stronger stormwater standards. Sites that require more complex stormwater-control strategies may take more time to navigate regulatory reviews. Some LID controls may not be clearly defined or allowed, reducing the range of options engineers have to manage stormwater and potentially increasing costs.

Using LID controls can help **avoid other development costs**, and some jurisdictions offer **regulatory or monetary incentives**, all of which can financially benefit developers. Some LID stormwater controls may cost more than traditional controls, but can help developers avoid other costs that the traditional approaches cannot. The literature provides many examples of avoided costs when LID controls are integrated into a project, including less conveyance infrastructure and fewer curbs and gutters (U.S. EPA 2007). Sometimes jurisdictions offer financial and other **incentives**, such as fee reductions or fast-track permitting that help offset overall project costs and provide a reason for developers to pursue certain stormwater-management techniques even if they add hard costs up front.

C. Interview Site Selection and Methodology

We conducted key-informant interviews with public officials and individuals involved in development. We designed these interviews to better-understand the gaps in the literature about the range of economic factors that influence developers' decisions when faced with complying with stronger stormwater standards.

In conjunction with SGA and its partner organizations, we selected three jurisdictions that have implemented stronger stormwater controls. We used these screening criteria to guide our selection process:

1. The jurisdiction has adopted a strong stormwater regulation (e.g., volume-based, water-quality-based, or explicit LID requirement).
2. Jurisdiction boundaries should include a mix of potential redevelopment and new development opportunities.
3. Regulation should apply similarly to redevelopment and new development.
4. Set of jurisdictions should reflect a diversity of geography.
5. Preference for jurisdictions that haven't received a lot of research attention already.

Our selection process was challenged by the fact that few jurisdictions in the country have actually implemented mandatory LID requirements or stormwater regulations that require significant retention or water-quality treatment on-site. Those that have, have done so only recently. We selected these communities:

Montgomery County, Maryland. Montgomery County enacted its first stormwater management standards nearly forty years ago, and has strengthened them several times to address declining water-quality in the region. In 2010, the County passed a revised stormwater ordinance that maintained the existing volume standards, which require both new development and redevelopment projects to protect water quality for the first inch of stormwater and control volume for the first 2.6 inches of stormwater. The new regulations require greenfield developments to use environmental site design (ESD, which is equivalent to LID) to meet these standards for the first inch of stormwater, and require ESD to the "maximum extent practicable" for redevelopment. County staff is in the process of clarifying what "maximum extent practicable," means for redevelopment projects, and are adjusting local ordinances to remove barriers to implementing LID (Montgomery County Department of Environmental Protection 2011, Biohabitats 2010). After considerable concern from the development community that the proposed regulations would have a significant impact on the cost of projects and discourage redevelopment, the regulations incorporated a provision to allow the County to grant administrative waivers for projects that received approval before the regulations were passed (Montgomery County Department of Permitting Services 2011).

Olympia, Washington. Olympia's stormwater program is one of the oldest in western Washington, and continues to be one of the most stringent. It adopted its most recent regulations in 2009, which apply to both new development and redevelopment (City of Olympia, Washington 2009). The regulations are modeled on the Western Washington Stormwater Manual (Washington Department of Ecology

2005), but go beyond the state-level standards, especially for water-quality treatment. Developments meeting certain minimum size and disturbance criteria must match stormwater discharges to pre-development rates from 50-percent of the 2-year peak flow to the full 50-year peak flow. Water-quality standards also apply, and must be managed using approved on-site treatment BMPs, including LID controls. Although the regulations apply to both new development and redevelopment, in its 2009 revision to the regulations, Olympia added a financial cap for mitigating existing impervious surfaces at redevelopment projects, at 30-percent of the total project costs. The state of Washington is currently considering more broadly requiring LID controls in its next regions of the Western Washington Stormwater Manual, due out in 2012 (Washington Department of Ecology 2010).

Philadelphia, Pennsylvania. Philadelphia adopted revised stormwater regulations in 2006 that apply to both new development and redevelopment. All development projects (new and redevelopment) must control stormwater quality for the first one-inch of runoff from connected impervious surfaces. This provision was adopted to 1) recharge groundwater and increase stream base flows, 2) restore more natural site hydrology, 3) improve water quality, and 4) reduce combined sewer overflows (CSOs) from the city's CSO system. This requirement must be met using infiltration techniques. If infiltration is demonstrated to be infeasible, a waiver may be considered. Philadelphia also has adopted channel protection and flood control standards, which require slow release of the 1-year, 24-hour storm event and require developers to prevent the occurrence of flooding in downstream areas. Redevelopment projects may apply for exemptions from the channel protection and flood control requirements by reducing land disturbance by 20 percent from predevelopment and post-development conditions (Philadelphia Water Department 2011).

Within each jurisdiction, we identified and interviewed the key municipal officials with experience designing and implementing the new stormwater regulations. These interviews helped us clarify the regulatory context within which developers were making decisions. They also helped us understand how the development community, as a whole, is responding to the new regulations.

To capture the range of perspectives from the development community, we interviewed builders, engineers, landscape designers, and architects in each jurisdiction. We identified potential interviewees by contacting trade organizations (e.g., the U.S. Green Building Council, Master Builders Associations), reviewing public documents, searching web-based directories, and soliciting recommendations from the public officials and other interviewees in each jurisdiction.

Appendix B contains a complete list of the individuals we interviewed for this project.

III. FINDINGS AND CONCLUSIONS

Our review of the literature, described in the previous section, and the interviews we conducted revealed many insights into how developers in different parts of the country respond to stronger stormwater standards. In this section we present the results of our interviews in each jurisdiction together, rather than as three separate case studies, because the themes that emerged were strikingly similar across the jurisdictions. Where interesting differences across jurisdictions stand out, we highlight them. We organize the results of the interviews, with insights from the literature, into seven broad findings.

As we attempted to understand how developers responded to the most recent regulatory changes, we were faced with the reality that economic conditions since 2007 have had an unprecedented effect on all types of development. The three jurisdictions we focused on all adopted stronger stormwater standards between 2006 and 2010 – although each had stronger-than-average regulations prior to this. In many places, very little development activity has occurred at all since stronger stormwater regulations were implemented. Many of the projects that have gone forward were grandfathered under previous stormwater regulations. Because of this, the responses we collected in our interviews were often – but not always – based on conjecture or theoretical understanding, rather than actual experience or observation. In all jurisdictions we studied, the market has yet to fully respond to the new regulatory environment. Repeating this study in 2 to 3 years likely would yield an interesting comparison to our results.

1. Developers are successfully incorporating stronger stormwater controls to meet strict volume-reduction and water-quality standards in both greenfield and redevelopment projects.

Our study found that some developers can and do meet stronger stormwater standards in both redevelopment and greenfield projects. Interviewees who had completed developments that met stronger stormwater standards using LID indicated that doing so required creativity and willingness to experiment with new approaches to projects. They emphasized that pursuing these projects was not without challenge, but they will continue developing in places that require strong stormwater controls and LID for a variety of reasons: the markets they participate in respond favorably to the new stormwater designs; meeting regulations with green-infrastructure techniques could be more cost effective than conventional controls; and for some, they simply believed it was the right thing to do for the environment. Some developers we interviewed had not yet implemented projects under the stronger stormwater standards. Some were skeptical, based on their own initial experiences or other developers they'd talked to, that they could make a project pencil out using LID controls. A minority of interviewees held this perspective. Although staff at each jurisdiction had encountered this opinion, none had actually observed that developers were choosing to invest in greenfield projects over redevelopment projects because of the new standards. This is consistent with other findings in the literature (Leistra, Weiss, and Helman 2010).

Several important distinctions about the way developers approached compliance with stronger stormwater standards in redevelopment projects stand out:

- Redevelopment applications of stormwater controls, including LID techniques, are usually more site-specific and custom than greenfield applications, although this depends on the nature of the redevelopment. Redevelopment sites that are taken down to bare soil can often be treated more like greenfield sites. Redevelopment sites with considerable existing impervious cover, or sites that are surrounded by or incorporate existing infrastructure are generally more challenging to accommodate stormwater management than greenfield or less-dense redevelopment sites.
- The three jurisdictions in our study have strong stormwater regulations that govern greenfield and redevelopment projects. Each jurisdiction also has “off-ramps” that permit developers to avoid full compliance with the new regulations if they can demonstrate engineering, site-condition, or financial reasons why they cannot implement the new controls. Off-ramps can include payment in lieu, off-site mitigation, on-site trading, alternative treatment practices, and reduced performance criteria. Staff in Montgomery County are currently developing clear and consistent guidelines for applying off-ramp provisions, such as using LID to the “maximum extent practicable,” that may relax standards for some redevelopment projects. In Olympia, permitting officials described taking a pragmatic approach to permitting stormwater controls for some redevelopment projects that contend with complex existing infrastructure (both on-site and off-site) and connections to existing systems. In Philadelphia, permitting officials allow on-site trading for difficult sites, where one part of a site may not meet the standards, but another part exceeds the standards. There are currently no explicit requirements in any of the jurisdictions that mandate the use of specific BMPs, such as green roofs, on redevelopment sites to fully meet infiltration or water-quality targets.

2. Complying with stormwater regulations is one factor among many that influences a project’s costs. It is rarely the driving factor.

Stronger stormwater standards can affect the costs of both greenfield and redevelopment projects. These costs are folded into a *pro forma* analysis that developers and lenders use to assess the viability of a project. Our interviews revealed that developers’ decision-making process incorporates a wide range of economic factors, including various construction costs, current and future market conditions, regulatory incentives and disincentives, and uncertainty and risk. While some developers we interviewed indicated that the costs associated with meeting stronger stormwater standards may change the types of projects they will pursue in the future, many developers described the cost of implementing stormwater controls as minor compared to the other economic factors they considered in deciding whether or not to pursue a project, especially in the context of highly-complex redevelopment projects and green-building infill projects.

- In general, stronger stormwater standards have increased the costs to implement stormwater controls, a trend that many of the developers we interviewed have experienced since at least the 1980s. Some developers pointed out, however, that using LID controls has helped offset some of the increased cost, compared to using conventional controls.

- Among the interviewees we spoke to, the majority agreed that complying with stormwater regulations has become a larger component of both greenfield and redevelopment projects, in terms of complexity and cost.
- Complying with stormwater regulations is considered a cost of doing business, and most members of the development community we spoke with did not view the cost of managing stormwater as a major deciding factor in whether or not they pursued a particular project.
- Interviewees cited zoning regulations (and related provisions, such as density limitations and height restrictions) and non-stormwater environmental regulations, such as wetlands and critical habitat areas, as the primary regulatory factors guiding a site's development potential and a project's viability. These are usually larger factors in greenfield development than redevelopment.
- Several interviewees in Philadelphia said that labor costs, which they claimed were driven higher by union wages, made many redevelopment projects in the city unviable. Interviewees in Olympia or Montgomery County did not identify labor costs as a major factor.
- Consumer demand and market conditions matter to developers above all other factors. Developers emphasized that they build where the market demands development. If the market is strong for redevelopment projects in urban areas, interviewees said they would continue to meet that demand. Likewise, if people continue to demand the type of housing that new greenfield sites accommodate, developers maintained that they would continue to pursue these projects.
- In deciding between sites that would accommodate similar types of development, developers indicated that the potential stormwater management costs associated with a site could be among the deciding factors. In general, however, developers noted that market demand trumps the costs of stormwater controls. All things being equal, however, where there are substitute sites, higher stormwater costs could dictate project location.
- Redevelopment projects generally fall into one of two categories: those that are more financially risky because they are being built in a market with soft demand and many potential substitutes with fewer site constraints, and those that are less financially risky because they are being driven by high demand and are higher-end, and sometimes green-branded, projects. For the former group, any factor that influences costs – including stricter stormwater regulations – may affect the project's viability. For the latter group, stricter stormwater controls have not been an issue, and may actually be integrated as an amenity or help the project achieve green ratings.

3. The costs of stormwater controls in general, and LID controls in particular, tend to be more variable and site-specific for redevelopment versus greenfield development.

The developers we interviewed were reluctant to make broad generalizations about the extent to which stronger stormwater controls influence the cost of projects. They emphasized that stormwater designs are highly site-specific, and one solution may be feasible and cost-effective at one site, but infeasible or cost-prohibitive at another site.

The diagram presented in Section II outlines the different factors we identified in the literature and through the interviews that influence the cost of implementing stronger stormwater standards. They underscore the site-specific nature of stormwater-control costs, and explain why implementing stronger stormwater controls in redevelopment projects tends to be more expensive than in greenfield projects. This discussion of costs, however, cannot be separated from the discussion of other factors that influence developers' decisions: avoided costs and market and non-market benefits may help offset increases in direct costs, and market demand and other regulatory and non-regulatory factors may support increases in net project costs.

- Developers incorporate stormwater-management costs into *pro forma* analyses of all development projects. The proportion of total development costs attributable to stormwater controls is highly variable, especially in redevelopment projects. Developers we interviewed were unable or unwilling to provide specific “rules of thumb” for either the proportional costs of stormwater relative to overall development costs or the difference in costs to implement stormwater controls between redevelopment and greenfield projects.
- Many developers we interviewed noted that it is not difficult to incorporate LID for equal or less cost than conventional stormwater controls in a greenfield development. When asked the same question about redevelopment or infill development, developers were very reluctant to make broad generalizations. They were quick to note that the additional costs could be insignificant or major, depending on site conditions.
- Implementing stronger stormwater standards are often, though not always, more expensive in redevelopment projects than greenfield projects. Developers identified several reasons for this:

Soil characteristics: poor, compacted soils require more amendment to support infiltration. Infiltration may not be allowed at all on sites with contaminated soils. Redevelopment sites are more likely to display these challenging soil conditions.

Impervious coverage: infiltration techniques are cheaper to construct on large sites with extensive pervious area. Redevelopment sites tend to have higher densities than new development, with less land available for infiltration BMPs. In general, the higher the impervious coverage, the more expensive managing stormwater is likely to be.

Existing infrastructure: redevelopment sites tend to have existing infrastructure that must be considered in designing stormwater controls. In some cases, this may reduce the flexibility engineers have to design cost-effective solutions for managing stormwater, increasing costs.

- Driving the cost differential, in large part, is the more limited range of BMPs available to manage stormwater on constrained, largely impervious sites. Developers indicated that for many urban redevelopment projects, BMPs on the lower end of the cost curve (e.g., rain gardens and managed wetlands) are not possible. Instead, they must rely on BMPs that are perceived as being on the higher end of the cost curve in many cases, such as greenroofs, micro-swales,

water capture and reuse, stormwater planters, and permeable pavement materials (either pavers or pavement).

- Regulatory uncertainty can increase a developers' costs in the planning and design stages of a project. While regulatory uncertainty is not unique to stronger stormwater regulations, the site-specific nature of using green infrastructure to comply with regulations is inherently more varied than conventional approaches to managing stormwater. It is more difficult for regulators to provide black-and-white guidance for complying with the regulations across all potential circumstances. Moreover, the application of regulatory guidance for stormwater management in redevelopment projects may be more uncertain than in greenfield sites because of the greater variability across and unique characteristics of each redevelopment site. This may, in part, contribute to the perception that it costs more to integrate stronger stormwater controls into redevelopment projects. The developers we interviewed identified these ways in which regulatory uncertainty increased their costs, especially for redevelopment projects:

Multiple plan reviews: All three jurisdictions require stormwater designs to be incorporated into early plan review, before other permits are issued. If changes to the stormwater design are required later – a common situation, especially in redevelopment projects – plans often must be re-reviewed, adding time and cost to the review process. It is important to note that some developers indicated that early plan review requirements actually helped reduce uncertainty and costs in many cases, because they were forced to address and resolve potential stormwater-related issues while there was still flexibility in the design process.

Inconsistent application of standards and guidance: Inconsistency in how both developers and permitting officials interpret stormwater standards can cause considerable uncertainty that may lead to increased costs. Developers identified two issues that have increased their uncertainty under the stronger stormwater regulations: 1) receiving different signals from officials within the same jurisdiction about how applications of stormwater controls on a given site may be approved and 2) stormwater design applications that are approved for one site may not be approved for a site with similar characteristics at a different location or future time. Without clear, predictable, and consistent guidance, developers spend more time, and thus cost, navigating the permit-review process.

Overbuilding: Engineers and developers may hedge against a plan rejection by overdesigning or building multiple levels of stormwater controls, which adds unnecessary costs to the project (but, in theory, reduces the costs associated with regulatory review.)

4. Developers respond to benefits that influence their bottom line. In some cases, these may help offset increased costs of complying with stronger stormwater regulations.

While stronger stormwater regulations and LID controls can provide a range of environmental and amenity benefits, developers generally only respond to those

benefits that affect their bottom line. Developers we interviewed suggested that LID controls that helped them comply with stronger stormwater regulations at lower cost, increased the sale price or rent of a project, reduced the time to sale, or all three, would affect their decisions to use LID. Specific examples of LID controls providing economic benefits to developers include bioswales and other vegetative stormwater controls that improved the appearance and market appeal of a development while also reducing overall landscaping costs, and greenroofs that reduced energy costs and long-term cost of roof maintenance for their customers. Developers noted, however, that market demand for projects that include LID stormwater controls have not yet expanded beyond niche markets. Factors such as unfamiliarity with the technology and uncertainty how to address operations and maintenance of LID controls limit broader use of LID by developers and demand from consumers.

- Developers in each jurisdiction recognized that many of their customers respond positively to the landscape amenities LID BMPs provide. Few developers said that the landscape amenities translated directly into increased property values or higher rents, however.
- Developers who observed that LID could increase property values focused narrowly on the green sector of the market, and incorporated many green-building techniques into their residential infill properties. LID is one of the multiple green attributes of these developments, and the relative importance of LID compared to the other green attributes (e.g., high-efficiency windows, low-VOC building materials, etc.) is difficult for developers to identify.
- Several developers, particularly in Montgomery County, MD and Olympia, Washington, said that some of their customers still expect to see the traditional curb-and-gutter, sidewalk design that characterizes conventional stormwater management techniques. They do not respond as favorably to the LID designs characterized by rain gardens, bioswales, narrow streets, and fewer sidewalks.
- Several developers commented that some customers are wary of LID designs that require maintenance, and that bioswales and rain gardens may actually deter some potential customers from buying a property.

5. Cost-effective responses to stronger stormwater standards require a more collaborative approach to addressing stormwater management.

Engineers and developers who successfully implement stronger stormwater controls using infiltration and retention practices emphasize the importance of considering stormwater management at the earliest stages of development, and of integrating professionals' expertise throughout the project. These principles are consistent with the conclusions of the broader literature on green building, which emphasize the importance of integrating professionals throughout the design process to achieve reductions in capital costs (*see, e.g., Kibert 2008*).

- Some professionals and jurisdictions recognize that thinking about stormwater management early in a project's design is critical to successfully and cost-effectively implementing stronger stormwater controls. Jurisdictions encourage this approach by requiring stormwater management plans, or encouraging consultation with permitting officials early in a project's evolution. Considering

stormwater first allows engineers and developers the flexibility to extract cost savings, maximize site efficiencies, and work around more complex features of a site that could lead to increased costs later.

- Interviewees who successfully and cost-effectively implement LID emphasize the value of collaboration among professionals involved in site design, including the engineer, architect, and builder. This approach treats stormwater management as an integral part of project and site design, rather than as an isolated engineering exercise.
- Engineers often lead the design process that includes implementing stormwater controls. Yet, many engineers have not yet acquired the necessary skills and experience to implement LID controls efficiently and cost-effectively. This lack of experience increases the cost of responding to stronger stormwater standards. Developers raised these issues about the lack of skilled engineering expertise:

Scarcity of expertise. Those engineers that have LID expertise often charge a premium for it, which increases the overall cost of implementing LID, compared to conventional controls.

Lack of appropriate tools. Many engineers rely on engineering software or other tools that do not easily accommodate LID designs or collaboration with other professionals, e.g., architects, designers, builders, etc.

Need for education. Some engineering higher-education programs now include LID training as part of their curriculum. As more engineering students learn LID techniques and apply them in their professional careers, the costs associated with these issues will decrease.

6. Market adjustments are already reducing costs of implementing stronger stormwater standards, for both redevelopment and greenfield development, a trend that is likely to continue.

Market adjustments include changes on the supply side that result in lower costs to implement stronger stormwater standards and changes in demand that result in increased consumer willingness to pay for projects that incorporate stronger stormwater controls. Market adjustments that have the potential to lower costs include more widespread availability of materials (such as porous pavers), better technologies that reduce the time and/or expense of installation (such as modular greenroof systems), and improved design and engineering expertise. Increased regulatory certainty as more developers become familiar with the permitting process and as more permitting officials become comfortable with the new regulatory system also will reduce the developers' cost of implementing stronger stormwater controls. Market adjustments also have the potential to increase consumers' willingness to pay for projects that integrate some types of stormwater controls – especially those that add amenities, such as rain gardens and reduce building operating costs, such as greenroofs. Willingness to pay may increase as more consumers recognize and demand the environmental benefits LID provides, as LID techniques become more familiar and main-stream, and as time and increased use demonstrate LID's long-term effectiveness across wider geographic regions and climate conditions.

- Developers and engineers we interviewed reported that new LID materials and technologies are becoming more available, less costly, and more reliable. They indicated that they expect this trend will further reduce costs.
- Some developers in Montgomery County reported that finding engineers and designers who specialize in LID practices and are comfortable with navigating the permit review process is difficult, because this expertise is limited and in high demand. They reported that the professionals with this expertise can charge a premium to work on projects, which developers must factor into their overall costs. This was not identified as a major issue in Olympia or Philadelphia, which suggests that the market may have already responded to the higher demand for those types of services.
- LID is still perceived as a new technology, and consumers don't always fully understand or value the services it provides. As information on LID spreads, demand may increase for developments that incorporate LID – especially those BMPs with enhanced amenities, such as landscaped bioswales, greenroofs, and rainwater catchment. This could lead to higher rents, higher property values, and less time on the market. These demand-side factors can help offset the increased costs that may occur when integrating LID into a project. Anecdotal evidence in Portland and Seattle, where LID techniques have been implemented for over a decade, suggests that property values are enhanced where these techniques are used (Leistra, Weiss, and Helman 2010, Ward, MacMullan, and Reich 2008).
- Demand for the benefits that LID provides can influence whether developers are willing to take on more risk or higher costs to implement LID. Most developers we interviewed reported that demand for the benefits LID provides is limited, and these benefits don't influence their decisions on how to implement stormwater management. With the exception of a developer in Olympia, Washington that specializes in infill residential construction of green homes, the developers we interviewed did not perceive that LID currently offers significant benefits in terms of increased property values or other amenity values. Many recognize, however, that with future market changes, these benefits could become a larger factor in the future.

7. Developers are supportive of incentives that offset costs and ease the transition to stronger stormwater standards. Jurisdictions can use them to increase the level of social benefits derived from LID practices.

All three jurisdictions have or have considered implementing incentives to encourage developers to adopt LID controls as a way of complying with stronger stormwater standards. Jurisdictions themselves have an incentive to offer developers incentives, in part, because many of the benefits LID provides accrue to the jurisdiction or the public at large, but don't register in the developers' private accounting of costs and benefits. Enhancing the private benefits developers can receive from LID by passing through some of the public benefits can create a more economically efficient outcome for society. Incentives come in a variety of different forms, from direct financial payments and subsidies, to efforts to reduce the costs and risks associated with the permitting and review process. Each jurisdiction we focused on has processes in place to help developers navigate the permitting process more efficiently if they propose to

implement LID beyond what current regulations require. Developers generally responded favorably to these efforts and said that they took advantage of them.

- Developers responded favorably to incentives that reduce the uncertainty associated with the permitting, to the extent that these incentives reduce the time (and associated costs) of getting approval to implement LID. Developers identified these techniques that help with the permitting process: streamlined or fast-track permitting, guaranteed permit review times, and access to permitting staff for collaborative problem solving early in the process. All three jurisdictions have fast-track review processes for green development concepts in place. Philadelphia guarantees plan review for redevelopment projects that disconnect 95 percent of impervious area and don't increase the burden on public infrastructure within 5 business days. Developers expressed mixed opinions about how well these fast-track processes actually work in practice.
- Reduced stormwater fees provided many developers with strong incentives to incorporate LID into redevelopment projects. Fees pegged to impervious area coverage tipped the economic equation for at least one developer considering integrating pervious pavement, one of the more common BMPs used in redevelopment. Developers and engineers in Philadelphia indicated that the City's fee reduction program was becoming a useful tool to get buy-in from customers on including BMPs that would qualify for the credit.
- Direct subsidies for LID BMPs on the higher end of the cost scale, such as greenroofs and rainwater catchment systems, can encourage developers to integrate LID into redevelopment projects where other BMPs are not technically feasible. These types of incentives are useful transition tools, helping to build a market for materials and expertise that eventually drives costs down and makes these techniques more broadly affordable in the long run.
- Many developers mentioned that a fee-in-lieu or credit-offset program for stormwater would be an effective way for dealing with exceptionally difficult sites where LID is physically impossible or too costly. Such programs may serve a useful role in a LID regulatory scheme, but they would have to be designed carefully to maximize the environmental benefits that are achievable on-site and collect a payment that is sufficient to actually implement controls off-site that can address the remaining stormwater-related effects.
- Philadelphia has a fee-in-lieu program. Permitting officials said that it is rarely used, because the fee is set such that it is usually cheaper for developers to implement stormwater controls on-site. Permitting officials suggested that this fee-in-lieu program is designed as a useful way to force developers to take a harder look at their site when considering the feasibility of implementing stormwater controls.

APPENDIX A: REFERENCES

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APPENDIX B: LIST OF INTERVIEWEES

Montgomery County, Maryland

Rick Brush, Manager, Montgomery County Department of Permitting Services, Water Resource Plan Review

Steve Shofar, Chief, Montgomery County Division of Watershed Management

David Borchardt, P.E., LEED-AP, Tower Companies

Chris Earley, LEED-AP, Greening Urban

Kenneth Michael, NAI Michael Companies, Inc.

Ken Wallace, McCarthy and Associates

Paul Woodburn, Ben Dyer Associates, Inc.

Mike Novy, P.E., Ben Dyer Associates, Inc.

Guy Semmes, Hopkins & Porter Construction, Inc.

Olympia, Washington

Andy Haub, Planning and Engineering Manager, City of Olympia Public Works Department

Tom Hill, Permit and Inspections Manager, City of Olympia Community Planning and Development

Art Castle, Interim Vice President, Building Industry Association of Washington

Sean Comfort, P.E., AHBL

Scott Bergford, Scott Homes

Damon DeRosa, P.E., LeRoy Surveyors & Engineers

Bill Creveling, P.G., LeRoy Surveyors & Engineers

Philadelphia, Pennsylvania

Chris Crockett, Director of Planning and Research, City of Philadelphia Water Department

Christine Marjoram, Stormwater Plan Review Program Manager, City of Philadelphia Water Department

Howard Steinberg, Onion Flats/Plumbob

Michele Adams P.E., Meliora Environmental Design

Bob Rosenthal, Hovnanaian Homes

Thomas May, P.E., LEED-AP, Urban Engineers

Angelo Waters, P.E., LEED-AP, Urban Engineers



January 28, 2011

Via electronic mail

Executive Officer and Members of the Board
California Regional Water Quality Control Board
San Francisco Region
1515 Clay Street, Suite 1400
Oakland, CA 94612
dbowyer@waterboards.ca.gov

***Re: Comments on December 1, 2010 Draft Special Projects Proposal/LID
Treatment Reduction Credits MRP Provision C.3.e.ii.(ii)***

Dear Mr. Wolfe and Members of the Board:

We write on behalf of the Natural Resources Defense Council (NRDC) and San Francisco Baykeeper. We have reviewed the December 1, 2010 Draft Special Projects Proposal/LID Treatment Reduction Credits MRP Provision C.3.e.ii.(2) (“Draft Proposal”) submitted by BASMAA on behalf of the Permittees to the San Francisco Municipal Regional Permit (Order No. R2-2009-0074) (“MRP”). We appreciate the opportunity to submit the following comments to the Regional Board.

We are strongly disappointed with the Draft Proposal. While we appreciate that the number and type of categories of projects that would qualify for treatment reduction credits has been reduced from that originally, and unjustifiably, proposed in early drafts of the MRP, the Draft Proposal nevertheless presents ill-conceived and unduly broad exemptions from the MRP’s low impact development (“LID”)-based retention and alternative compliance requirements. Inexplicably, the Draft Proposal would provide “Special Projects” with a categorical exemption from meeting any of the LID requirements under section C.3.c.i.(2)(b) of the MRP. The Draft Proposal fails to provide passable technical support or compliance-based reason for such a blanket waiver.¹ Further, its proposed terms are inconsistent with state and federal law, most

¹ An administrative decision must be accompanied by findings that allow a court reviewing the order or decision to “bridge the analytic gap between the raw evidence and ultimate decision or order.” (*Topanga Ass’n for a Scenic Cmty. v. County of Los Angeles* (1974) 11 Cal.3d 506, 515. Abuse of discretion is established if “the order or decision is not supported by the findings, or the

notably with the Clean Water Act's "maximum extent practicable" ("MEP") standard. For the reasons presented below, we strongly urge the Board to reject the Draft Proposal.

A. Any LID Treatment Credit System Must Meet the Federal Clean Water Act's MEP Standard.

Section 402(p) of the Clean Water Act establishes the MEP standard as a requirement for pollution reduction in stormwater permits. "[T]he phrase 'to the maximum extent practicable' does not permit unbridled discretion. It imposes a clear duty on the agency to fulfill the statutory command to the extent that it is feasible or possible." (*Defenders of Wildlife v. Babbitt* (D.D.C. 2001) 130 F.Supp.2d 121, 131 (internal citations omitted); *Friends of Boundary Waters Wilderness v. Thomas* (8th Cir. 1995) 53 F.3d 881, 885 ("feasible" means "physically possible").) As one state hearing board held:

[MEP] means to the fullest degree technologically feasible for the protection of water quality, except where costs are wholly disproportionate to the potential benefits.... This standard requires more of permittees than mere compliance with water quality standards or numeric effluent limitations designed to meet such standards.... The term "maximum extent practicable" in the stormwater context implies that the mitigation measures in a stormwater permit must be more than simply adopting standard practices. This definition applies particularly in areas where standard practices are already failing to protect water quality...

(*North Carolina Wildlife Fed. Central Piedmont Group of the NC Sierra Club v. N.C. Division of Water Quality* (N.C.O.A.H. October 13, 2006) 2006 WL 3890348, Conclusions of Law 21-22 (internal citations omitted).) The North Carolina board further found that the permits in question violated the MEP standard both because commenters' highlighted measures that would reduce pollution more effectively than the permits' requirements and because other controls, such as infiltration measures, "would [also] reduce discharges more than the measures contained in the permits." (*Id.* at Conclusions of Law 19.)

Low Impact Development has been established as "a practicable and superior approach . . . to minimize and mitigate increases in runoff and runoff pollutants and the resulting impacts on downstream uses, coastal resources and communities."² Of note, the U.S. Environmental Protection Agency originally threatened to "consider objecting to the [MRP] permit" if it did not include "additional, prescriptive requirements" for LID.³ Further, NRDC

findings are not supported by the evidence." Cal. Civ. Proc. Code § 1094.5(b); *see also Zuniga v. Los Angeles County Civil Serv. Comm'n*, 137 Cal. App. 4th 1255, 1258 (2006)

² California Ocean Protection Council (May 15, 2008) *Resolution of the California Ocean Protection Council Regarding Low Impact Development*, at 2.

³ Letter from Douglas E. Eberhardt, EPA, to Dale Bowyer, San Francisco Bay Regional Water Quality Control Board (April 3, 2009), at 1.

and Baykeeper submitted several technical studies to the Regional Board to establish that the exempted Special Projects, including “smart growth” or urban infill and redevelopment projects, could in many circumstances meet standards even more stringent than the LID requirements adopted in the MRP.⁴

Yet, here the Permittees propose to allow a broadly defined swath of Special Projects to be granted a complete waiver from meeting the MRP’s LID requirements. Of particular concern, the Draft proposal would exempt *any* development or redevelopment project from the MRP’s LID requirements if it occurs within ½ mile of an existing or planned “transit hub.” (Draft Proposal, at 10.) The Draft Proposal would not obligate any Special Project to demonstrate that it is technically infeasible to implement the MRP’s LID stormwater mitigation measures—merely falling into one of the specified categories would accord the project a complete waiver from the retention requirements, or even the requirement to use biotreatment where onsite retention is technically infeasible.⁵ (Draft Proposal at 6.) The only justification presented for this waiver is a set of generalized and largely unquantified environmental benefits that may, in theory, accrue from the exempted projects, and vague assertions made regarding the complexity involved in procuring approval for smart growth projects.

While we do agree with the environmental preferability of smart growth projects in comparison to their greenfield counterparts (indeed, NRDC is a national advocate of smart growth), in the MS4 permitting context there is no reason to establish a blanket waiver from proven stormwater mitigation requirements simply because a project constitutes “smart growth.” If a project can feasibly implement stormwater treatment measures, it must be required to do so (particularly for regions such as the Bay Area that contain numerous impaired waters). As discussed in the sections below, the Draft Proposal does not present any evidence to demonstrate that all projects in these categories are incapable of complying with the MRP, nor does it present any evidence to demonstrate that any perceived benefits of smart growth or development in proximity to a transit hub will outweigh the water quality detriments created by additional urban runoff. As a result, simply authorizing a blanket waiver such as the one proposed here would fail to properly implement the requirement that development reduce the impacts of stormwater “to the maximum extent practicable.”

⁴ R. Horner (2007) *Initial Investigation of the Feasibility and Benefits of Low-Impact Site Design Practices (“LID”) for the San Francisco Bay Area*, at 16-19 (hereinafter, “Horner Initial Investigation”); R. Horner (2007) *Supplementary Investigation of the Feasibility and Benefits of Low-Impact Site Design Practices (“LID”) for the San Francisco Bay Area*, at 3-5 (hereinafter, “Horner Supplementary Investigation”); *See also*, NRDC letter to San Francisco Regional Board re: Comments on February 11, 2009 Draft San Francisco Bay Municipal Regional Stormwater NPDES Permit, April 3, 2009.

⁵ The Draft Proposal would likewise exempt all designated Special Projects from any requirement to participate in the MRP’s alternative compliance programs, including the requirement to perform offsite mitigation or provide payment of in-lieu fees under section C.3.e.1.

1. The Draft Proposal Fails to Provide Support for Water Quality Benefits Claimed to Arise from Development of Special Projects.

Rather than proposing specific LID treatment reduction credits for different types of “Special Projects,” as specified in the MRP under section C.3.e.ii.(2), the Permittees propose instead to exempt all designated Special Projects from the MRP’s LID requirements entirely. The Draft Proposal states that the benefits of “Smart Growth strategies . . . are expected to offset any potential for increases in pollutant loading that may result from allowing” Special Projects to use alternative compliance measures. (Draft Proposal, at 20.) However, the Draft Proposal provides no credible basis to support such a claim.

The Draft Proposal claims that “[s]mart growth strategies . . . will achieve significant water quality benefits.” (*Id.*) The Proposal then cites to several reports, each of which point to benefits that can, generally speaking, be derived from smart growth development. For example, the Draft Proposal points to a U.S. EPA report that states that “high density” development of 8 houses per acre would produce approximately 20 percent less runoff annually than would medium density development of only 4 houses per acre. (See Draft Proposal, at 21.)⁶ While we would dispute the characterization of typical suburban development on 1/8 acre lots as “high density,” there is nothing to this finding that demonstrates that a 20 percent reduction in runoff will occur for any specific Special Project in particular, let alone that a benefit would accrue to justify a complete and total waiver from requirements to retain runoff onsite or to comply with the MRPs alternative compliance provisions. Neither the Draft Proposal nor the studies it cites (either the EPA report or others cited on pages 21-24) point to specific, quantifiable pollutant load reductions that would occur as a result of smart growth or other development designated as Special Projects; the proposal in no way provides validation for its claim that “increases in pollutant loading” resulting from the proposed blanket waiver would be offset. Effectively, the Draft Proposal provides no evidence of the true water quality benefits of smart growth.

While we do not doubt that such benefits may exist for a particular project, the Draft Proposal’s blanket waiver is simply not calibrated to ensure such benefits are achieved. Nor does the Draft Proposal address the issue that, discussed in section A.3, below, many, if not a majority of designated Special Projects will be able to feasibly implement LID-based retention practices to address some or all of the required volume of runoff, obviating any claimed need for such a credit in the first place.

⁶ Paradoxically, the Draft Proposal repeatedly claims that one of the benefits of smart growth or transit oriented development is that they can “reduce existing impervious surfaces,” but then proposes to exempt the redevelopment of existing impervious surfaces entirely from any requirement to actually do so.

2. The Draft Proposal Overstates the Effectiveness of Proposed Alternative Methods of Compliance in Reducing Stormwater Pollution.

Far from having been “proven capable of providing good stormwater treatment,” the proposed alternative practices the Draft Proposal advocates for represent a demonstrably inferior means of addressing stormwater pollution compared with LID practices that infiltrate, evapotranspire, or harvest and re-use runoff. For instance, retaining the design storm volume onsite would prevent 100 percent of the runoff, and therefore, 100 percent of the pollutants in that runoff, from ever reaching receiving waters. In contrast, under the Draft Proposal a Special Project could implement a vault-based system with conventional treatment BMPs (such as sand filters) that would only attenuate just slightly over half of the total suspended solids (TSS), 40% of the total zinc (TZn), and one-third of the total copper (TCu) and total phosphorous (TP) in that volume of runoff.⁷ For tree-box-type high-rate biofilters, the Draft Proposal acknowledges that it is unable to provide any conclusive data as to “whether effluent quality . . . is as good or better than effluent quality from a bioretention facility.” (Draft Proposal, at 6.) However, unless the tree box filter is designed with the same capacity to store and infiltrate or evapotranspire water as the bioretention system, it is unlikely to provide comparable performance. As we have demonstrated in technical papers previously, full biotreatment systems utilizing an underdrain are likely to attenuate only 57 percent of TSS, 80 percent of TCu, 62 percent of TZn, and 78 percent of TP⁸ even under optimum conditions, let alone when engineered to allow infiltration rates of up to 100 inches per hour. Biotreatment systems with underdrains have additionally proven relatively ineffective for removal of total nitrogen or nitrate.⁹ Given the poor performance of these systems, even allowing partial treatment through such features all but guarantees high pollutant loads and concentrations in the resulting stormwater runoff, and refutes any claim that a blanket waiver will “achieve significant water quality benefits.”

That Special Projects would be “[s]trongly encourage[d]” to implement retention practices is entirely insufficient (see Draft Proposal, at 6); this Language represents, at best, a toothless, hortatory suggestion that will not ensure Special Projects are developed in a manner that reduces stormwater pollution to the MEP. The Regional Board should reject the Draft Proposal’s claims regarding use of alternative practices and the proposal they purportedly support.

⁷ R. Horner (2009) *Assessment of Hydrologic and Water Quality Implications of Stormwater Management under Provisions of the San Francisco Bay Region Municipal Regional Stormwater NPDES Permit*, at 4-5.

⁸ *Id.*, at 2.

⁹ See, BASMAA (December 1, 2010) *Draft Model Bioretention Soil Media Specifications-MRP Provision C.3.c.iii*, at Annotated Bibliography section 3.0 (noting reduction of only 55 to 65 percent of total Kjeldahl nitrogen and only 20 percent of nitrate). We note as well that the Draft Proposal provides no specific design, performance, or sizing standards for these proposed alternative methods, meaning there is absolutely no assurance that they will serve to reduce pollution in an effective manner.

3. The Draft Proposal Fails to Articulate any Demonstrated Basis for a Blanket Waiver of the MRP's LID Requirements.

The MRP requires Regulated Projects to retain a specified volume of runoff onsite using LID practices that infiltrate, evapotranspire, or harvest and reuse rainfall, or, where these practices are technically infeasible to implement, to treat the runoff using biotreatment BMPs or by performing alternative compliance. (MRP, section C.3.c.i.(2)(b).) The Draft Proposal claims, without citation to data or other evidence, that “[d]evelopments where none of the methods prescribed by the Water Board are possible will include smart growth, high density, and transit oriented development.” (Draft Proposal, at 1.) The Draft Proposal then claims, again without support, that a blanket waiver from the MRP’s LID requirements is necessary for all development in the above categories because the development “would otherwise likely be directed to the suburban fringe.” (Draft Proposal, at 3.) However, even disregarding their anecdotal nature, the Draft Proposal itself disqualifies these claims as the basis for any waiver.

In numerous places, the Draft Proposal points out not that a complete (or even partial) exemption is required for these types of development, but that implementing the MRP’s LID requirements will be entirely feasible. The Draft Permit openly points out that “[i]nfiltration is feasible on some of these project sites,” that evapotranspiration “may be implementable for some projects, “ and that even though it may not be “universally applicable,” rainwater capture and reuse “may be implementable.” (Draft Proposal, at 7.) Even in the event none of these practices can be feasibly implemented, the Draft Proposal fully admits that “[b]iotreatment will be implementable on many projects.” Yet, the Draft Proposal insists that a complete waiver is necessary in order to allow for Special Projects to be built. As the Draft Permit states “none of the four permit prescribed LID-options . . . can be counted on to be feasible in *every* case.” Draft Proposal, at 7 (emphasis added). “[I]t is possible,” the Draft Proposal states, “one or more projects proposed somewhere within the 76 regulated municipalities during the permit term would require a choice of additional options for stormwater treatment.”¹⁰ (Draft Proposal, at 9.) The implication being that, because meeting the MRP’s LID requirements may be infeasible for some, or even one Special Project within the 76 municipalities subject to the MRP, no Special Project should be required to meet them. This suggestion is poorly taken, and inconsistent with the requirements of the Clean Water Act’s MEP standard.

Aside from the total lack of support for the Draft Proposal’s assertion that such an exemption is needed, the proposed waiver is, compared to other provisions nationally, a poorly crafted and crude instrument. Even in other jurisdictions where “credits” are granted to smart growth projects, and with which we disagree over need for, these credits are a small fraction of the project’s overall obligation (*e.g.*, reduction of a project’s onsite retention requirement by

¹⁰ The Draft Proposal additionally ignores that even if this were the case, the project would be able to perform alternative compliance under section C.3.e.i. of the MRP.

20%).¹¹ In California, multiple permits have declined to incorporate a credit system, finding instead that allowing the use of alternative compliance to meet the permit's LID requirements suffices to encourage or allow smart growth and urban infill projects to proceed. For example, the Ventura County MS4 Permit introduces its alternative compliance provisions by stating explicitly that they are in place in specifically "[t]o encourage smart growth and infill development of existing urban centers" where onsite compliance with LID requirements may be technically infeasible.¹²

Moreover, the criteria for commercial and mixed-use projects proposed for Special Project status under Category B are not especially strict when compared with other urban settings, and would not appear to warrant a credit; under the Draft Proposal, a project's FAR must be at least 2—*i.e.*, it must be at least two stories tall without any tapering—not a difficult standard to meet in urban areas.¹³ (See Draft Proposal, at 9.) In total, the Draft Proposal would ensure that a significant number of projects that are capable of meeting the MRP's LID requirements will provide stormwater management that is comparably lacking instead. These deficiencies, apart from being inconsistent with federal and state law, will serve to hamstring the MRP's ability to move the Bay Area's many impaired watersheds toward compliance with water quality standards.

4. The Draft Proposal's Transit-Oriented Development Exemption Is Particularly Ill-Conceived and Would Potentially Exempt Numerous Regulated Projects from the MRP's LID Requirements.

Just as it was when originally proposed in the February 11, 2009 Draft MRP, the definition of "transit-oriented development" ("TOD") presented by the Draft Proposal in the context of the MRP's area of coverage is overly broad and would allow the installation of stormwater management BMPs across the Bay Area that are far less protective of water quality than required under the MRP's LID standards. The definition suffers from two central problems.

¹¹ See, e.g., State of West Virginia (July 22, 2009) Department of Environmental Protection, Division of Water and Waste Management, General National Pollution Discharge Elimination System Water Pollution Control Permit, NPDES Permit No. WV0116025, at 14.

¹² Los Angeles Regional Water Quality Control Board (July 8, 2010) Waste Discharge Requirements for Storm Water (Wet Weather) and Non-Storm Water (Dry Weather) Discharges From the Municipal Separate Storm Sewer Systems Within the Ventura County Watershed Protection District, County of Ventura, and the Incorporated Cities Therein, Order No. R4-2010-0108, NPDES Permit No. CAS004002, at section 4.E.III.2.a.

¹³ Additionally, Special Project categories D, and E do not appear to comply with the categories allowed for LID Treatment Reduction Credits under the MRP.

First, and related to comments we submitted to the Regional Board during the MRP adoption process¹⁴ the requirement that a project be located within a half-mile of an “existing or planned transit hub and/or located within an area designated as a transit village . . .” would carve out large areas of the metropolitan Bay Area for waivers from LID requirements under the MRP. The percentage of land and, as a corollary, of development that would qualify for waivers is substantial. The Draft Proposal identifies the amount of new or replaced surface under this category to be between “168 and 503 acres, or 5% to 15% of the total new or replaced impervious surface” for Regulated Projects under the MRP; up to 15 percent of all Regulated Projects would be 100 percent excused from meeting the MRP’s key requirement for reducing stormwater pollution. This analysis, while showing the extensive impact that such a blanket waiver would provide, is perhaps even conservative given the abundance of rail and bus lines in the region.

There are, for instance, 19 BART stations within Alameda County alone. Accounting for the close proximity of some stations to each other, the BART system in Alameda County would create approximately 13.5 square miles of waiver-eligible land, which includes considerable portions of downtown Oakland and Berkeley.¹⁵ This is 30% more than *the entire land area of the City of Berkeley* and doesn’t even account for other rail stops, bus transfer stations, or ferry terminals in Alameda County, let alone transit hubs outside Alameda County but within the MRP’s jurisdiction.¹⁶ Moreover, the TOD Special Projects designation would not set any restrictions on the type or attributes of development that would qualify for a complete waiver from the MRP’s LID requirements. Comparatively low density projects, that will contribute substantial volumes of stormwater runoff and associated pollutant loading, and for which it would be entirely feasible to implement LID-based retention practices, will be authorized to address stormwater by using demonstrably less effective practices, resulting in increased stormwater pollution. This does not constitute reducing stormwater pollutant discharges to the maximum extent practicable.

While the Draft Proposal identifies a group of environmental goals that may be furthered by TOD generally, such as reduced vehicle miles travelled or reduced “automobile-related pollutant impacts,” the document provides no credible reason, either technical or compliance-

¹⁴ NRDC letter to San Francisco Regional Board re: Comments on February 11, 2009 Draft San Francisco Bay Municipal Regional Stormwater NPDES Permit, April 3, 2009, at 23-24.

¹⁵ The radius of waiver eligibility around a transit station is a half-mile, meaning that the total area eligible for a waiver is $\Pi(0.5)^2$ (approximately, 0.79 square miles). With 19 BART stations in Alameda County, this has the potential to create 15 square miles of waiver-eligible land, but the short distances between some BART stations, particularly in downtown Oakland, creates an overlapping area of approximately 1.5 square miles.

¹⁶ Berkeley’s land area is about 10.5 square miles. See <http://www.ci.berkeley.ca.us/ContentDisplay.aspx?id=7164>.

based, to exempt such a huge area from the MRP's LID requirements.¹⁷ Unquantified assumptions about the overall environmental benefits of transit-oriented development are a severely lacking basis for any exemption.

B. Conclusion

For the many aforementioned reasons, the Draft Proposal is ill-conceived, inadequately supported, and unlawful under federal and state law. It requires broad and significant revisions, as well as more thorough documentation, to pass legal muster. We urge the Regional Board to reject the Draft Proposal.

Sincerely,



Noah Garrison
Project Attorney
Natural Resources Defense Council



Ian Wren
Staff Scientist
San Francisco Baykeeper

¹⁷ As discussed in section A.1., while the Draft Proposal points to the problems caused by automobile travel and benefits of TOD generally, it makes no specific claims as to the water quality benefits or the specific pollutant load reductions that will result from development of any Special Project or group of Special Projects.



October 6, 2011

Mr. Dale Bowyer
San Francisco Bay Regional Water Quality Control Board
1515 Clay Street, Ste. 1400
Oakland, CA 94612

Re: Draft Tentative Order R2-2011-XXXX, Amendment Revising Order No. R2-2009-0074

Dear Mr. Bowyer:

Thank you for the opportunity to comment on the subject Amendment. Our comments will focus on two areas of concern: the Special Projects provisions (Provision C.3.e.ii.); and the Santa Clara Permittees Hydromodification Management Requirements (Provision C.3.g., Attachment F).

Special Projects

As a general comment, there appears to be a contradiction in the classification of tree box devices between the introductory description of LID measures in Provision C.3.c. and newly-added language under Provision C.3.e.ii. In the first paragraph under C.3.c Low Impact Development (LID), tree boxes are included with other biotreatment methods described as practices used to adhere to LID principles, including rain gardens, bioretention units, bioswales and planter boxes. In the first paragraph under C.3.e.ii. (1) Special Projects, and repeatedly in subsequent subsections, tree boxes are listed and referred to as one of two types of “non-LID treatment systems”. The proposed language should be clearer and less contradictory so that Permittees and prospective project applicants will understand the circumstances under which the use of this type of treatment control can be used.

The proposed Category A provides a 100% LID credit for projects that create and/or replace one half acre or less of impervious surface area. This minimum size criterion is half of what was proposed in the report presented to the Regional Board on December 1, 2010. The BASMAA report provided very rational arguments justifying the 1-acre threshold, based on typical lot sizes in existing older neighborhoods and the financial viability of developing on these lots. We support the higher 1-acre maximum threshold for Category A, as recommended in the BASMAA report.

The proposed Category B establishes a minimum residential density of 50 dwelling units per acre for projects creating or replacing between ½ acre and 2 acres of impervious surface, in order to receive any LID credit. This is considerably higher than the 30 dwelling units per acre threshold recommended for projects in this category in the BASMAA report. We feel that the proposed density threshold would exclude a significant number of development projects in pedestrian-oriented urban, downtown and business districts throughout the Bay Area that should otherwise qualify for some amount of LID credit. We support the BASMAA recommendation of a 30 dwelling unit per acre threshold for this category.

The Amendment does not include any change in the requirement of C.3.b.ii. (4), which specifies the inclusion of Road Projects in the definition of Regulated Projects, and describes the requirements for runoff treatment. The BASMAA report recommended that Special Projects include a category for street widening with additional lanes, citing the necessity for jurisdictions to expand roadways within urban areas, and listing barriers to implementing runoff treatment controls within street rights-of-way. In addition to barriers such as matching slopes and elevations of existing drainage facilities on adjacent properties, conflicts with utilities and with vehicle, bicycle and pedestrian access, and potential maintenance issues, the report makes a reasonable case for the infeasibility of harvest and reuse, evapotranspiration, and in some cases, bioretention. We strongly agree with their position, and with the contention that the use of tree and vault-type filters is more feasible options for treatment of runoff from roadways. It has been our experience through the design of numerous South Bay Area redevelopment projects that providing LID treatment controls within public street rights-of-way is problematic both from an engineering and policy standpoint. Despite the strong advocacy of green streets designs by the local stormwater programs, very few jurisdictions have actually developed street section standards that include LID treatment controls.

Hydromodification Management Requirements

In making revisions to Attachment F (Provision C.3.g. – Santa Clara Permittees Hydromodification Requirements), we request that the Board not adopt the current applicability map (revision date: November 2010), and consider also revising Section 5 – Potential Exceptions to Map Designations, to include a more realistic approach for project applicants to justify exceptions to the map designation for their project sites .

Based on recent discussions we have had with SCVURPPP and the City of San Jose, we feel that there are subwatershed and catchment area boundaries shown on the Map, at least for some of the developed, urban areas, that were not created based on any type of sound hydrologic studies or locations of existing storm drain systems. We strongly object to the use of this map by local permitting jurisdictions as a tool for implementing Provision C.3.g., which requires the inclusion of HM controls on projects. For certain projects currently mapped in the Green category (Subwatersheds less than 65% impervious), the construction of costly onsite HM controls cannot be justified by their potential erosion impacts to the local receiving waters. Although there were recent studies completed to eliminate the “pink” areas on the map, the scope of the studies was limited to a very few areas, and should have included additional areas that contain potential development sites. We would urge the Board not to adopt the current version of the Map until updated studies are completed that can substantiate the proposed subwatershed and catchment boundaries for areas designated as 65% Impervious, and accurately reflect existing conditions. The poor design quality and readability of the map are further reasons not to adopt it. The only reference elements are the major freeways and creeks, which do not allow a user to specifically locate a project site. There are no local streets, expressways or local monuments plotted. This is unacceptable for a map that potentially affects development sites within an urban area the size of the Santa Clara Valley. It is far less detailed, and therefore less useful, than the other county HM maps adopted with the MRP.

Section 5 discusses the preparation of a “User Guide” that the Program could prepare, which would allow Permittees to “guide the preparation of technical reports for ... determining whether certain projects are discharging to a watercourse that is less susceptible (from point of discharge to the Bay) to hydromodification (e.g., would have a lower potential for erosion than set forth in these requirements).” Although such a User Guide was never developed by the local Program, we feel there is an urgent need for some process that would allow a project



applicant an opportunity to demonstrate a project's erosion potential by providing independent technical reports, and thus analyzing the actual applicability of the HM standard to the project, as described in the above clause. Given the lack of a User Guide, the technical inaccuracy of the Map, and the fact that there are no regional or in-stream projects available for utilizing alternative compliance within the Santa Clara Valley, we feel that the opportunity for project applicants to take advantage of Section 5 would be extremely limited without some revision to the language to allow independent, project-specific studies to be submitted for review by the Permittees.

Thank you again for this opportunity to provide comments on the draft revisions to the Permit. We sincerely hope that you give them serious consideration before taking action on the draft, as we feel that the comments honestly represent the concerns of the South Bay Area development community, and reflect our desire to achieve balance between practicality and water quality objectives of the MRP.

Sincerely,

HMH



Mike Campbell, AICP, CPSWQ
Stormwater Compliance Manager



October 6, 2011

Mr. Dale Bowyer
San Francisco Bay Regional Water Quality Control Board
1515 Clay Street, Ste. 1400
Oakland, CA 94612

Engineering
Planning

Re: Draft Tentative Order R2-2011-XXXX
Amendment Revising Order No. R2-2009-0074

Mailing Address:
P.O. Box 26460
San Jose
CA 95159-6460

Dear Mr. Bowyer:

I am a principal in a local Civil Engineering firm providing site design for development projects throughout Silicon Valley. This letter is written in response to the proposed revisions to the MRP regarding the changes to the Santa Clara Permittees Hydromodification Management Requirements (Provision C.3.g., Attachment F).

2216 The Alameda
Santa Clara
CA 95050
Ph: (408) 236-2400
Fax: (408) 236-2410

We strongly urge the Board not to adopt the proposed revisions to Provision C.3.g., Attachment F or the Santa Clara Permittees HM Map with this revision. The changes as proposed are such that there is no ability to discuss whether a property should be subject to HM controls – if the property is located in a “green” area, then HM controls are required. This “cast in stone” approach is not reasonable. It is our understanding that the HM Map was prepared at a “large scale” level. Therefore, we do not believe it accurately depicts all areas where catchments and subwatershed areas are greater than or equal to 65% impervious. This is especially true for the recent study of the “pink” areas. From discussions when this study took place, we believe there are areas that have been changed to “green” on the Map that should actually be shown as “red”. Section 5 of Appendix F allows the Program to evaluate individual receiving water bodies for implementing alternative methods to achieve HM controls. Similarly, Appendix F should be revised to provide a means to allow the Program (or project proponents) to provide studies and analysis to determine the imperviousness of an individual catchment or subwatershed area. This process is allowed by other regulatory bodies (FEMA, for example, with regard to FIRM maps), and would solve the “cast in stone” concern mentioned above.

In addition, the lack of sufficient identifiable landmarks (major local streets and expressways, or other physical features) makes it very difficult to accurately identify the location of a property on the HM Map. This results in negotiation between the developer and the jurisdiction, particularly for those properties that are on the border between colors.

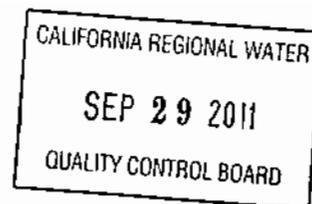
I strongly urge that adoption of the revisions to Provision C.3.g. and the Santa Clara Permittees HM Map be delayed until the issues listed above are addressed.

Sincerely,



Michael C. Sheehy, RCE, QSD
Vice President/Principal Engineer

Water Resources Management
23829 NE Greens Crossing Road
Redmond, WA 98053



September 27, 2011

Regional Water Quality Control Board, San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

SUBJECT: Tentative Order Amending Municipal Regional Storm Water NPDES Permit

Dear Regional Board Members,

The proposed tentative order amending Municipal Regional Storm Water NPDES Permit (MRP) is an important step towards ensuring the long-term performance and effectiveness of biotreatment systems that rely on infiltration of storm water runoff; however, there are issues that must be addressed that were discussed in greater detail in my January 27, 2011 letter including:

- "Life of Facility" vs. "Life of Regulated Project"
- Release of Nutrients From Biotreatment Systems
- Upper Limit on Rate of Infiltration

"Life of Facility" vs. "Life of Regulated Project"

BASMAA's proposal incorporated in the Tentative Order leaves a very significant ambiguity between the terms "***Life of the Facility***" – the biotreatment system and "***Life of the Regulated Project***" – the development project that must be clarified. Various studies and monitoring of biotreatment systems have found that the longevity and effectiveness of engineered soil is decreased by clogging, reduced cation exchange capacity (CEC) with failure as early as the initial year of operation with very high rate failure rates within 5-7 years. Plugging of the infiltration surface and loss of percolation capacity by fine and coarse sediments, reduced CEC resulting in the breakthrough of heavy metals, accumulation of toxic and hazardous pollutants on the infiltration surface will require replacement and rehabilitation of the biotreatment facility multiple times during the "***Life of the Regulated Project***" which in most cases will be in excess of 50-years. This will require the rehabilitation and/or replacement of the facility's biotreatment media or construction of new or additional treatment facilities during the "***Life of the Regulated Project***".

The Operation and Maintenance inspection program requirements of Provision C.3.h. ii. (5) of the MRP provides a good framework for addressing the above concerns. An inspection program is meaningless without criteria, procedures and testing methods and protocols for determining when the infiltration surface has lost its percolation capacity, when CEC has been reduced and the facility is no longer effectively removing heavy metals and other pollutants to the MEP or when toxic and hazardous pollutants have accumulated to levels hazardous to the humans and wildlife. These criteria, procedures and testing methods and protocols must be developed and included in the amendments to the MRP.

Release of Nutrients From Biotreatment Systems

Multiple studies have documented the release of nutrients from biotreatment systems that must be of concern in the San Francisco Bay Area because of building evidence that the historic resilience of the Bay to the harmful effects of nutrient enrichment is weakening. I understand that the Regional Board staff in collaboration with Bay Area stakeholders through the San Francisco Estuary Institute is now developing a San Francisco Bay Nutrient Science Strategy. It is extremely poor public policy to be promoting the use of biotreatment media that would release nutrients at a time when there is a growing threat to San Francisco Bay of harmful effects of nutrient enrichment.

The Regional Board is strongly encouraged to implement the recommendations in my January 27, 2011 letter regarding design standards for biotreatment systems and require MRP permittees investigate and report on the use of alternative filtration media that would not increase the discharge of nutrients in storm water runoff.

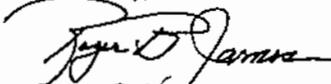
Upper Limit on Rate of Infiltration

The MRP in Provision C.3.c.i.(2)(b)(vi) requires that the soil media specifications and soil testing methods verify a *long-term* infiltration rate of 5-10 inches per hour. It is not clear from the MRP, MRP Fact Sheet or record whether the 10-inches per hour infiltration rate is intended to establish an upper limit for infiltration. The MRP needs to be clarified and an upper limit must be established that addresses excessive high rates of infiltration where there is insufficient filtration and retention of pollutants attached to particles, time for adsorption of pollutants through cation exchange or hydro modification requirements are not achieved.

The General Requirements for Soil Specifications in Attachment L to the tentative order should specify that "The maximum in-place infiltration rate for biotreatment or bioretention facilities constructed with under drains shall be no greater than 10-inches per hour."

Thank you for the opportunity to comment on proposed amendments to the MRP.

Sincerely,



Roger B. James
Senior Consultant



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

75 Hawthorne Street
San Francisco, CA 94105-3901

In reply, refer to WTR-5

OCT 14 2011

Mr. Dale Bowyer
San Francisco Bay Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland CA 9612

RE: Bay Area Municipal Regional Stormwater Permit- Special Projects Proposal/LID
Treatment Reduction Credits Provision

Dear Mr. Bowyer:

Thank you for the opportunity to comment on the proposed amendments to the Municipal Regional Stormwater Permit (MRP) for Treatment Reduction Credits for Special Projects in accordance with provision C.3.e.ii.

As you are aware, EPA provided initial comment on the permittees' draft proposal (January 28, 2011 letter from David W. Smith to Dale Bowyer). At this time, EPA recommended the permittees' proposal be rejected due to deficiencies which EPA believed were at odds with the requirements of the permit. EPA provided comments both on the specific definitions of each Project Category, as well as the proposed text rationale supporting the Project Categories. EPA also raised concerns that the draft proposal exempted projects from the permit's LID provisions.

The revised proposal addresses many of the issues EPA raised in our initial comments. We support the elimination of Project Categories D (retrofitting) and E (road widening) from the special projects provisions. We also support the revised definitions of the remaining Project Categories, which EPA believes will limit reduction credits to projects implementing smart growth principles of high density development, transit oriented development, and infill development. Under the new proposal, there are still projects that would be exempted from implementing LID by receiving 100% reduction credits. We believe these credits should not exceed 50%.

While EPA supports the proposed Project Categories, we encourage the Regional Board to consider limiting the total reduction credit which may be applied to a site. As written, a site may qualify for a 100% reduction credit if certain conditions are met: All projects in Category A are provided 100% reduction credit, but are limited in size to ½ an acre. Projects in Category B may receive 100% reduction credit if densities achieve > 3:1 FAR or > 75 DU/acre, and are limited in size to 2 acres. Projects in Category C may receive 100% credit if a combination of factors are met, including proximity to transit hub, high density, and minimized surface parking. Projects in Category C do not have a size limitation.

EPA believes all projects should be required to implement some LID measures and should not receive 100% exemption from LID requirements. As noted in our comments during the adoption of the MRP, EPA believes LID requirements provide many water quality and non-water quality benefits to address the increased pollutant loads generated from stormwater at newly developed sites. While we support the tiered incentive approach to encourage smart growth policies as consistent with the intent and language of the MURP, we also encourage you to establish an upper boundary of reduction credits that may be applied to a site. EPA would suggest the Reduction Credit be limited to 50% for any site.

We appreciate the opportunity to provide comments on the implementation provisions of the MRP. Please feel free to contact me at (415) 972-3464 if you would like to discuss these comments.

Sincerely,



David W Smith, Manager
NPDES Permits Office