

Public Review Comments

Comment by	Chapter No, Page No	Comment	Responses
KH	Glossary, xi	Referring to bioretention as a stormwater planter is confusing. Typically stormwater planters have impermeable bottoms and vertical sides and are located adjacent to buildings. Bioretention areas have other construction options. Chapter 2 mentions stormwater planters as a type of bioretention. Chapter 3 includes bioretention in the list "(aka "Stormwater Planter" ..."	SSQP staff discussed this comment and agreed to change the name of the "stormwater planter" to "bioretention planter." Revisions have been incorporated.
KH	Glossary, xi	Consider saying California Stormwater Quality Association (CASQA) - "Statewide association of stormwater ..." using a lower case a for the start of the word association.	Suggested edits have been incorporated.
KH	Glossary, xi	Consider being consistent with each of the word - definitions. The formatting is inconsistent.	Glossary style has been standardized (Word - definition).
KH	Chapter 2, 2-6	Second paragraph, consider changing the word "much" to mulch. Consider adding additional discussion on how to choose appropriate mulches for your site and which mulches do not actually float.	Suggested edits have been incorporated: "much" changed to "mulch". Text added regarding non-floating mulch and general mulch guidelines.
KH	Chapter 3, 3-1	Are arborist's reports required as part of the stormwater quality design process?	Some local permitting agencies require this information and some don't. Please refer to the permitting agency for your current project for more information.
KH	Chapter 3, 3-3	Consider changing "Refer to o and Chapter 4" to have o be replaced with more descriptive text. The same would apply with "Refer to o and Chapter 5." There are other instances of this on multiple pages in Chapter 3. Each o is a hyperlink but it is unclear what you are jumping to.	Suggested edits have been incorporated. "o" was replaced with a hyperlink to the applicable steps mentioned later in the chapter.
KH	Chapter 3, 3-14	Consider changing the word "sued" to "used" in the last paragraph on this page. Will the inspection checklist be used in a court of law?	Suggested edits have been incorporated.
KH	Chapter 4/Efficient Irrigation E1-1	Consider including Efficient Irrigation in the table of contents. It seems a little out of place after Chapter 4's reference section or include a list of fact sheets following the references so their new page numbers make sense. The same is true for other fact sheets. It would be convenient to be able to jump to a particular fact sheet from the table of contents.	The TOC has been expanded to list all the fact sheets.
KH	Chapter 5, 5-11	Link to HMP Report appears to be broken. When on the Sacramento Stormwater Website, the link to the report does not work. The US Army Corps links is also broken.	All broken links have been fixed.
KH	Chapter 5, 5-20	Consider including a list of fact sheets included after Chapter 5 in the fact sheet section.	The list of fact sheets is now included in the Table of Contents (TOC).
KH	Chapter 5, 5-24?	Page is blank, but page does not say that it was intentionally left blank.	Text is added to verify that this page is intentionally left blank.
KH	Chapter 5/Compost Amended Soil, CAS-1	If compost amended soil is good for hydrologic soil groups "C" and "D," after the stormwater is filtered by the compost amended soil, where does it go? In type "D" soils, the stormwater may take longer than 48 hours to infiltrate into the natural ground. The requirements say that a relief drain is optional.	The goal of using compost amended soils is to filter and reduce runoff as it flows through the amended soils layer. Additional flow that exceeds the capacity of the amended soil layer will sheet flow into another downstream stormwater measure or the site's drainage system.
KH	Chapter 5/Constructed Wetland Basin, CWB-1	Consider changing the alignment of the word "Advantages." It appears to be centered relative to other text.	Suggested edits have been incorporated.
KH	Chapter 5/Constructed Wetland Basin, CWB-2	For maintenance, are there specific requirements regarding keeping the mosquito fish away from other water bodies? Mosquito fish are not native and should not leave the constructed wetland basin.	The basins outlet should prevent the mosquito fish from leaving the basin. Even if the basin overflows, the overflow structure is typically equipped with a steel screen or plate. Please refer to Figure CWB-1 for more details.
KH	Chapter 5/Infiltration Basin, IB-2	Do you provide guidance on accepted soil permeability tests?	Soil permeability test details are to be determined by the geotechnical engineer and consultation with the permitting agency. Language has been added to this effect to the fact sheet.

KH	Chapter 5/Infiltration Basin, IB-5	Consider checking the margin for the text in Step 8.	Suggested edits have been incorporated.
KH	Chapter 5/Infiltration Basin, IB-6	Consider providing link to Effective Irrigation fact sheet or refer to the page where the reader can find it.	Suggested edits have been incorporated.
KH	Chapter 5/Infiltration Basin, IB-9	Consider providing Infiltration Basin calculations that are not for hydromodification. This goes for other treatment measures. Projects exempt from hydromodification should still be allowed to use stormwater quality measures to treat and infiltrate stormwater quality flows. Please provide additional guidance on options where project infiltrate all of the stormwater quality volume.	The Design Data Summary Sheet (page IB-9) includes steps for sizing the basin for treatment volume only. If the project is exempt from hydromodification, then the applicant can skip step 1b, and figure out the volume as specified in step 1a (treatment only). Projects exempt from hydromodification are still allowed to use infiltration measures to treat the site's treatment volume.
KH	Chapter 5/Infiltration Trench, IT-5	Consider checking the margin for extra returns for a portion of the text in the Long-term Maintenance section.	Suggested edits have been incorporated.
KH	Chapter 5/ Stormwater Planter, SP-1	Consider including bioretention basins as a separate approved treatment measure for larger applications than stormwater planters. Why do you limit the tributary drainage area for stormwater planters/bioretention to less than or equal to 1 acre? Consider adding side slope requirements for larger basins that do not have vertical sidewalls.	This fact sheet has been renamed "Bioretention Planter". Although it identifies a typical contributing drainage area of less than or equal to 1 acre, it does not prohibit use for larger applications. The reference to 1 acre comes from the 2007 manual and is based on the idea of having multiple, small, distributed site design measures to treat and reduce runoff closed to the source. Individual jurisdictions can allow larger basins as they see fit. The fact sheet now indicates that side slopes for planters that do not include vertical sidewalls shall be 3:1 or flatter.
KH	Chapter 5/ Stormwater Planter, SP-6	Link to Clean Water Program resources directs you to a blank page. Consider revising this link.	Broken link has been fixed.
KH	Chapter 5/ Stormwater Planter, SP-6	Consider providing planting guidance for all stormwater quality treatment measures that use plants as part of the treatment process. Please provide links to local agency approved planting lists.	Appendix J with the plant guidance links has been added. A reference to Appendix J has been added to this fact sheet.
KH	Chapter 5/Vegetated Filter Strip, VFS-1	How come the maximum tributary area per filter strip is 5 acres but is only one acre for stormwater planters/bioretention?	The filter strip filters the runoff as it flows through it and removes sediment and pollutants as a flow-based measure. Bioretention planters remove pollutants as the runoff flows through the vertical layers of bioretention soils and the pollutants are trapped in the voids. Because of how they function, the bioretention planters are more susceptible to getting clogged and overloaded with sediment if the tributary area is too large.
KH	Chapter 5/Vegetated Swale, VS-1	How come the maximum tributary area per vegetated swale is 10 acres but is only one acre for stormwater planters/bioretention?	See above response.
KH	Chapter 5/ Vegetated Swale, VS-6	Link to Clean Water Program resources directs you to a blank page. Consider revising this link.	Broken link has been fixed.
KH	Chapter 5/Water Quality Detention Basins, DB-2	For maintenance, are there specific requirements regarding keeping the mosquito fish away from other water bodies? Mosquito fish are not native and should not leave the constructed wetland basin.	Currently, there are no basin maintenance requirements specific to preventing the mosquito fish from leaving the basin, but we are not aware of mosquito fish causing any impacts to local water bodies. In addition, the Sacramento-Yolo Mosquito & Vector Control District has jurisdiction over placement of mosquito fish in detention basins to prevent West Nile Virus.
KH	Chapter 5/Water Quality Detention Basins, DB-9	Consider updating Table DB-2 or remove the draft table note.	Suggested edits have been incorporated. At the time of the draft document release, the table was still a work in progress, but it has since been finalized.
KH	Chapter 5/Water Quality Detention Basins, DB-18	Why would you collect acorns for the water quality detention basins? The trees listed in the fact sheet do not produce acorns.	Text has been deleted.

KH	General Comment	Consider allowing oil/water separators as pre-treatment devices in areas prone to have contamination from oils (parking lots, airplane parking aprons, etc.). These pre-treatment devices improve the function of best management practices downstream and provide for trash capture.	Oil/ water separators (OWS) are allowed as pre-treatment devices, however, the concentrations of free oil and grease in stormwater runoff – even in areas like maintenance stations, is below what these units can remove. They are not effective. OWS are only about 50% efficient for TSS and do not perform for the level of free oil and grease we see in urban runoff, so there is little value in using them.
KH	General Comment	Consider allowing the use of hydrodynamic separators in lieu of forebays for BMPs. Hydrodynamic separators can be effective if used in treatment trains as well.	Hydrodynamic separators are allowed as an option for publicly maintained basins or regional facilities, but they are potentially maintenance intensive. For privately maintained facilities, it's up to the developer and design engineer to select the best design option for the site.
KH	Chapter 5, Page 5-2	Consider adopting underground storage/underground infiltration basins for stormwater quality treatment in addition to having them be used for hydromodification. Require pre-treatment if necessary to ensure that the water infiltrated is clean.	Currently, there is no reliable data to assess the performance of the underground storage units as treatment measures. The Partnership allows manufacturers of these underground systems, as well as other proprietary devices, to submit performance data for their products and seek approval under the Partnership's approval protocol. If submitted performance data for a specific device is approved, the device gets added to the Partnership's list of allowed treatment devices.
KH	General Comment	Improve guidance on the number of percolation or infiltration tests required prior to using an infiltration facility.	Percolation/infiltration test details should be determined by a geotechnical engineer based on site conditions and site design (number and location of BMPs). Language has been added to refer readers to a geotechnical engineer for detailed guidance. Changes made to fact sheets for infiltration basins and infiltration trenches.
KH	General Comment	Provide guidance on treatment trains sized with flow and volume methods if the proposed treatment devices are sized using different methods.	The fact sheet for each treatment measure includes detailed information on sizing each measure. This information includes whether or not the measure is flow or volume based and the required drawdown or flow contact time. Placing these measures in a treatment train does not alter how each measure is sized.
KH	General Comment	Consider including dry wells as BMPs with pretreatment if required.	Dry Wells are not currently allowed by the State and the County's Environmental Management Department (EMD). Including them as a BMP option in the Design Manual will confuse the applicants and delay their project because the proposal will not be approved by EMD. As soon as dry wells are permitted by the State and EMD, and there is detailed siting criteria, the Partnership will consider adding them to the Design Manual.
KH	General Comment	Consider giving more credit to redevelopment projects that decrease the total impervious area in the proposed condition even if in the existing condition no stormwater quality treatment was provided.	The Partnership's MS4 Permit exempts redevelopment projects from complying with the hydromodification management requirement if the imperviousness of the site does not increase in the post project condition. The treatment and LID requirements still apply.
KH	General Comment	Please provide additional clarification for projects that do not fit the standard categories (road, commercial, industrial, residential) including airport projects as the County of Sacramento has airport facilities that may have proposed development.	Please refer to chapter 3 and tables 3-2 and 3-3 for more details on land use categories. An airport facility can be categorized as an industrial land use.
KH	General Comment	Please provide additional clarification on which projects are priority projects. How do you determine what projects are priority projects?	Please refer to chapter 3 and tables 3-2 and 3-3 for more details on priority categories.

KH	General Comment	Please provide additional guidance on project sites that fall under an industrial SWPPP. The industrial SWPPPs require control of stormwater pollution and monitor the contents of their stormwater under that permit.	Industrial sites are subject to the requirements of this Design Manual. However, the site's requirements under the Industrial Permit have to be coordinated with the State Water Resources Control Board. Some measures required under this Design Manual may address some requirements in the Industrial Permit, but that has to be evaluated on a site by site basis.
BWEG	Appendix G	Why is there a manual inside a manual? I think it would be more beneficial to separate the SAHM manual out as a separate document.	A link to http://www.beriverfriendly.net/Newdevelopment/ (location of SAHM and SAHM User's Manual) has been added to the Manual. Appendix G has been removed. Appendix references have been updated.
BWEG	Glossary	remove redundant definitions/terms	Suggested edits have been incorporated.
BWEG	General	Proof read for spelling/word used errors and references callouts that do not exist.	Suggested edits have been incorporated.
BWEG	Chapter 4, Loading Area	Add a detail for loading dock that are not depressed and drain away from the building. Where would the spill drain need to be located in this scenario? It would be helpful to list which, jurisdiction allow for the multiple design options.	The loading dock cover and drainage design criteria has been revised, please refer to the revised fact sheet for more information.
BIA	General Comment	Proposed manual updates will significantly impact and delay all stages of home construction, including planning, building, and real estate sales sectors. Due to the depth and breadth of the implications of the proposed changes to the manual, our association would like to request an extension of the comment deadline to allow the development industry time to provide comprehensive comments on the proposed changes.	The deadline for submitting comments on the draft Design Manual was extended from Nov 30, 2017 to Jan 2, 2018 to accommodate BIA's request. In addition, an additional coordination meeting that included Partnership staff and BIA staff was held on Feb 15, 2018. BIA staff used the meeting to provide additional feedback and comment about the upcoming requirements and implementation challenges. Finally, the proposed LID and hydromodification management criteria was first posted for public review back in November, 2013. Since then, there were multiple opportunities to provide comments and feedback on the requirements. The Partnership is no longer accepting comments on the draft Design Manual.
BIA	General Comment	Enough notice wasn't provided for Focus Group meetings to industry and public. Too much material was covered during an hour and a half meeting in Oct 2017	The Partnership met with BIA four times (10/4/2017, 11/17/2017, 02/15/2018), in addition to holding a public workshop that included attendees from BIA on 10/27/2017. Given that the requirements in the 2018 draft of the Design Manual do not majorly vary from the 2014 draft, and the fact that BIA technical reviewers reviewed and provided comments on the 2014 draft Design Manual, the Partnership is satisfied that enough notice and review time was provided to the BIA technical reviewers.
BIA	General Comment/Feasibility	Updated manual exceeds what's feasible & practicable for the industry posing numerous legal and engineering challenges. local manual language is prescriptive & extends beyond what the State Water Resources Board has outlined in their update.	The language and requirements in the Design Manual is consistent with the requirements of the MS4 General Permit (June 2016). Some of the requirements, such as the LID requirement, is general in the Permit and it leaves it up to the permittees to develop the sizing and compliance criteria. The Partnership's criteria was developed after researching and analyzing other programs in the State as well as other Permits. The Partnership is satisfied that the criteria in the 2018 Design Manual is feasible and implementable.

BIA	General Comment/Feasibility	There is no cohesion between agencies and the various departments required to execute the prescriptive design standards in the updated manual. Agencies will need to be flexible with their standards to ensure builders can meet project deadlines and timetables. There is a strong need for increased communication and collaboration between local agencies and industry stakeholders on best practices. We encourage interagency collaboration and development of best practices to ensure industry understanding and compliance with the new guidelines.	Each of the Partnership agencies have processes for continued collaboration and coordination among all the departments and sections that implement the Design Manual. This interagency collaboration will continue to ensure that the implementation of the new standards is as streamlined as possible.
BIA	General Comment/Implementation	We request more time to effectively analyze the numerous proposed manual changes... the Implementation date of July 2018 is infeasible	The Partnership is not planning to extend the current effective date of the new Design Manual, which is July 1, 2018. However, please note that the Design Manual includes grandfathering criteria for "prior approved" projects that allows projects submitted by July 1, 2018 to be exempt from complying with the 2018 revised Design Manual. Please refer to Chapter 5 in the Design Manual for more details.
BIA	General Comment/Implementation	We would like to discuss the possibility of a phase-in plan in which we collaborated with your office and other local agencies.	The Partnership met with BIA four times (10/4/2017, 11/17/2017, 02/15/2018), in addition to holding a public workshop that included attendees from BIA on 10/27/2017. Nonetheless, Partnership staff from each of the SSQP agencies is happy to meet with BIA to resolve anticipated requirements. Please note that these meetings will not impact the effective date of the Design Manual, but may help address some anticipated implementing issues. Finally, please note that the Design Manual includes grandfathering criteria for "prior approved" projects that allows projects submitted by July 1, 2018 to be exempt from complying with the 2018 revised Design Manual. Please refer to Chapter 5 in the Design Manual for more details.
BIA	General Comment/Implementation	The new manual proposes a new level of legal liability for home owners by calling for long-term covenants that can hold them liable to the state for changing uses of protected parts of their private property and shifts the responsibility of long term stormwater discharge from the local agencies to property owners.	Maintenance agreements and covenants with property owners (including home owners) have been widely used to ensure that the post construction measures are maintained for the life of the project. These agreements and covenants are vetted and approved by agency legal staff and the property owner's responsibilities are clearly explained in the document, as well as an exhibit of the expected maintenance activities.
BIA	General Comment/cost ramifications	Our association suggests that a cost study be conducted to illuminate the true costs of these new standards on future home owners. These updates will increase the overall price of the home and potentially establish costly HOA's to finance maintenance costs.	The new requirements will indeed come with an increased cost, but that does not alleviate the fact that these requirements are mandated by the Partnership's MS4 General Permit. The suggested study is better served being developed by BIA staff and presented to the State when the MS4 permits are being renewed.
BIA	General Comment	Delay the deadline for comments because more time is needed to discuss the concerns in full depth.	The deadline for submitting comments on the draft Design Manual was extended from Nov 30, 2017 to Jan 2, 2018 to accommodate BIA's request. In addition, a coordination meeting that included Partnership staff and BIA staff was held on Feb 15, 2018. BIA staff used the meeting to provide additional feedback and comment about the upcoming requirements and implementation challenges. The Partnership is no longer accepting comments on the draft Design Manual.

VFWC	General Comment	Numbering system is difficult to use, suggest standard number system (1....150, etc.)	The Design Manual numbering system facilitates future targeted edits and revisions of each fact sheet or section without impacting the page numbers of the rest of the document. In addition, we have now added links to the fact sheets in the Table of Contents for easy referencing.
VFWC	Chapter 4 and 5	It appears that the term tributary is improperly used. It appears to be used to define a drainage area. The definition of a tributary: a river or stream flowing in to a large river. Other terms such as 'drainage area' or 'BMP drainage area' would be more appropriate. It might be easiest to just replace the term tributary with drainage.	"Tributary" is used in the definition of the Rational Method. The text has been changed from "tributary area" to "contributing drainage area" in the Manual text and in fact sheets.
VFWC	Chapter 3, Table 3-2	Definition of a priority project not consistent with current MS-4 permit. The permit defines priority single family residential projects as those with greater than 10 units. The current language in the design manual exempts single family residential from hydromodification control measures unless the project is >20 acres. The permit states that: "Although the Permittee's SWMP may include its own definition of Priority Development Projects, that definition must be designed to achieve equivalent protection of water quality". The manual does not identify how equivalent protection of water quality can be achieved if the majority of the land for a small project (<20 acres) is exempt. We urge the SSQP to revise this definition.	The single-family residential (SFR) development threshold adopted for this HMP is consistent with the priority project thresholds approved by the Regional Water Board in May 2005 as proposed in the 2003 Sacramento Stormwater Management Program Development Standards Plan (DSP, 2003). The continued use of the 20-acre SFR threshold for hydromodification management requirements makes sense for several reasons, but the key reason relates to space requirements, restricted outlet controls, and long term maintenance/performance of runoff management facilities.
VFWC	Chapter 4, page 4-1	Landscape irrigation is identified as except from non-stormwater discharges, provided they do not cause or contribute to the violation of receiving water limitations. Summertime urban run-off contains high levels of pesticides and other contaminants. We recommend that landscape irrigation be removed from the list of except discharges.	The list of exceptions to non-stormwater discharge prohibitions was copied from the MS4 General Permit (Section II.B.2, page 14), which was based on the Clean Water Act. On a related note, the Sacramento Stormwater Quality Partnership agencies have programs for water conservation that addresses irrigation runoff. These programs include cash for grass programs that provide rebates to residents to replace water intensive grasses with River Friendly Landscape and drought tolerant plants to help reduce water use and irrigation runoff.
VFWC	Chapter 4, page 4-1	Use of the terms uncontaminated ground water infiltration is unclear. Is what is meant infiltration of runoff that is not contaminated? Or the infiltration of groundwater that is not contaminated. If it is the second, it is hard to imagine what this refers to. Please clarify.	The list of exceptions to non-stormwater discharge prohibitions was copied from the MS4 General Permit (Section II.B.2, page 14), which was based on the Clean Water Act. What is meant by "uncontaminated ground water infiltration" is infiltration of ground water that is not contaminated.
		The list of references contains much useful information. Great addition to the manual	Comment noted, thanks!
VFWC	p. L - 1	A more detailed discussion of grading, soil compaction and the effects on water quality should be more explicit.	Language has been added to the fact sheet regarding the effects of soil compaction on the ability to store and infiltrate runoff.
VFWC	p. 5-8 Applicability Map	We have questions as to the reasons for excluding significant areas of Elk Grove and some areas of Folsom and Citrus Heights. Many of these areas drain into reaches of the creek which are not hardened, or if they are, downstream areas are not hardened thus would be impacted by the effects of hydromodification.	These areas are considered exempt because they fall under the highly developed watersheds exemption. Watershed are considered to be highly developed if the developable area within the watershed is 5% or less. Please refer to Chapter 3 in the Hydromodification Management Plan for more details.
VFWC	p. 5-11	Suggest adding a section discussing dry wells, the challenges of their use in our region, and efforts to make them available in the not to distant future.	Dry Wells are not currently allowed by the State and the County's Environmental Management Department (EMD). Including them as a BMP option in the Design Manual will confuse the applicants and delay their project because the proposal will not be approved by EMD. As soon as dry wells are permitted by the State and EMD, and there is detailed siting criteria, the Partnership will consider adding them to the Design Manual.
VFWC	p. 5-11	"Minor grammatical suggestion: compost-amended soils. Add a hyphen"	Suggested edits have been incorporated.
VFWC	p. 5-16	"minor edit: Low Impact Development Worksheet 2nd sentence line 4: delete 'and' so it reads:you can reduce project runoff by incorporating...."	Suggested edits have been incorporated.

VFWC	p. CAS-1	A hyphen is lacking in compost amended soil in this section and throughout the manual. It would be preferable to use compost-amended.	Suggested edits have been incorporated.
VFWC	p. CAS-1	The inclusion of compost-amended soils is an important BMP. It is good that it has been included in the manual. However, the way it is presented is too narrow in scope. Instead of discussing CAS as a BMP for use in a focused areas, similar to a bioretention cell, CAS should also be presented as an overall design feature similar to preserving natural drainage features. Given the local challenges to deep infiltration we face in the Sacramento region at this time, CAS used on a landscape-scale, as discussed in the above literature, provides an opportunity for the development community to achieve a significant degree of hydromodification management.	Suggested edits have been incorporated.
VFWC	p. CAS-1	Some of the language in this section is confusing. Required surface area of amended soil is equal to 25% of tributary impervious area. Suggest rewording to: equal to 25% of impervious area in the drainage footprint or contributing area. This reflects the fact that the footprint of the area from which runoff will be captured is the relevant parameter. It does not makes sense to consider the local tributary or waterway in which the property of concern located in the calculation.	Suggested edits have not been incorporated, please refer to earlier response regarding the definition of tributary area.
VFWC	p. DP-1/ Disconnected pavement	Suggest adding a picture illustrating a swale between the road and sidewalk	Suggested edits have been incorporated.
VFWC	p. GR-1	One of the limitations of using green roofs in the Sacramento region is our Mediterranean climate and long, hot summers that make them difficult to maintain. This was not noted in the manual. However, the discussion of vector control appears out of place. There is no summer slobber on green roofs to might create pooled water when the temperature is warm. The only potential for standing water would occur in the winter, when vector issue of minimal or no existent.	Vector control is more than mosquitos; as such, the fact sheet has been revised to not focus on mosquito breeding in standing water but address all vectors.
VFWC	p. IB-1 Infiltration Basins	The description of the infiltration basin could be expanded to include not just A and B soil, but also amended soils or the use of slightly deeper basin to accommodate the slower rate of infiltration seen with class C and D soils. The legend for the table on the first page identifies a group of contaminants. It does not include pyrethroids. Please add this pesticide given its ubiquitous nature in our region.	Pyrethroids have been added to the list of contaminants addressed by infiltration basins. However, infiltration basins will only be allowed for A or B soils because even if amended soils are added for sites that have C or D soils, the underlying clay hardpan will still cause the basin to clog and not drain properly as designed.
VFWC	p. INT-1 Interceptor Trees	Consider suggesting the curb cuts be used when trees are planted in the ROW. This will provide additional water to the trees as well as better manage runoff from the streets. By including curb cuts, the additional water during the rainy season can help sustain them during the dry summers in our region.	Suggested edits have been incorporated into the Interceptor Trees Fact Sheet.
VFWC	p. INT-1 Interceptor Trees	Table INT-2 recommends removing fallen leaves from the tree. These leaves decay during the winter and provide valuable nutrients to the tree.	Suggested edits have been incorporated.
MMK	Chapter 1, Page 1-2	Regarding 2nd paragraph: "The current permit (NPDES Permit No. CAS082597) was adopted in December 2002,...). replace "current" with "most recent areawide"? (it's no longer current, correct?)	Suggested edits have been incorporated.
MMK	Chapter 1, Page 1-2	Regarding 4th paragraph: "In July 2003, the Permittees published their Stormwater Quality Improvement Plans, which describe their comprehensive program..." Make this past tense? (are they still "in force"?)	Suggested edits have been incorporated.
MMK	Chapter 1, Page 1-3	Regarding 1st paragraph: "This current version of the manual expands upon the 2007 version to address more prescriptive LID requirements, new hydromodification management requirements, and full capture trash requirements." 1. Replace "current" with "2017" (or 2018?) for clarity. 2. Add to end of sentence "...as required by the 2016 regional permit."	Suggested edits have been incorporated.

MMK	Chapter 1, Page 1-3	The 2nd paragraph states that the 2003 DSP overrides the 2017 permit types. Is this correct?	This is correct as it relates to the definition of implementation thresholds for each land use type. The 2016 MS4 General Permit allows permittees to use prior approved development thresholds (by the Regional Water Board) if available.
MMK	Chapter 1, Page 1-6	Table 1-2, regarding "Priority Project Categories". The term "priority project" is used throughout this plan, but never defined. Suggest stating somewhere what is meant by "priority" to explain why it's important. (Cite that it's defined in the regional permit as "Those projects that are required to incorporate appropriate storm water mitigation measures into the design plan for their respective project. ")	Suggested edits have been incorporated. A definition of "priority projects" has been added to the glossary for reference. In addition, please refer to Chapter 3 and Table 3-2 & 3-3 for more detailed discussion of priority projects.
MMK	Chapter 3, Page 3-3	First bullet. There seems to be an incorrect reference after "Refer to..."	This comment has been addressed. Please see earlier responses.
MMK	Chapter 3, Page 3-4	Table 3-2. Under the "Full Capture Trash Control Column", define "du/acre"	Suggested edits have been incorporated.
MMK	Chapter 3, Page 3-6	What is meant by "(LID)" under the Single Family Residential Impervious Area >1 acre" column? Are only LID measures required? Perhaps change to "(LID only)"?	Yes, only LID measures are required. Suggested edits have been incorporated
MMK	Chapter 5, Page 5-2	Table 5-1. Shouldn't any control measure that addresses LID also address Hydromod and Treatment? If you are retaining on site, you are reducing flows and pollutants discharged. Specifically, vegetated strips & swales.	Despite the fact that vegetated swales and strips, as well as other types of treatment measures, help slow down and reduce the site's runoff, they are not considered stand-alone hydromodification management measures. Hydromodification mitigation volumes are much larger than the typical treatment flow that is used to size vegetated swales and strips. The check marks in the table means that the specific measure can be used as "stand-alone" measures for each of the categories.
MMK	Chapter 5, Page 5-2	Table 5-1. Why isn't an Infiltration Basin LID?	LID measures are designed to be small-scale distributed measures that intercept and retain runoff closer to the source. Infiltration basins are large end-of-pipe facilities that do not meet the intent of the LID design concepts.
MMK	Chapter 5, Page 5-2	Table 5-1. Underground vaults could provide LID & treatment, if the runoff is used on site. This is stated so on the fact sheet.	Underground vaults will be considered an LID measure only if they are used as part of capture and reuse system. The language in the Underground Vaults fact sheet has been revised to clarify this information.
MMK	Chapter 5/ Compost-Amended Soil, Page CAS-8	Step 2b. Includes "Compost-Amended Soil Void Ratio". Double check that "void ratio" is the correct term. The equation in 2c below uses porosity (defined on page CAS-3). Recall that void ratio is not the same as porosity. Void ratio is the volume of voids/volume of solids. Porosity is the volume of voids/total volume. (Total volume is voids+water+solids). I see this error a lot, so just wanted to ask.	Suggested comments will be incorporated, text revised to porosity
MMK	p. DRD-6	Regarding infiltration wells, do you need to add some clarification to distinguish these from dry wells, whose depth is greater than diameter?	Yes, suggested edits have been incorporated
Rancho Cordova	General Comment	Does the grandfathering criteria apply to LID requirements also, or just hydromod?	Yes, text has been incorporated to clarify that the grandfathering criteria also applies to LID.
Rancho Cordova	General Comment	Do the exemptions outlined in the "Municipal Agency Project" heading on Page 5-4 also apply to LID?	No, the municipal agency project exemption only applies to the hydromodification management requirements, per the 2016 MS4 General Permit.
Citrus Heights	Chapter 1, Page 1-5	Table 1-1 Top middle: "topographic lows" meaning natural or existing depressions? Second last: "clean-out" is a noun, use "cleaning"	Suggested edits have been incorporated.
Citrus Heights	Chapter 2, Page 2-6	Second paragraph: "mulch", not "much"	This comment has been addressed. Please see earlier responses.
Citrus Heights	Chapter 3, Page 3-3	Third bullet: "refer to o"?? p.3-10 top: "based on o"?? middle: "see o"??	This comment has been addressed. Please see earlier responses.

Citrus Heights	Chapter 3, Page 3-10	"Alternative driveways" – not in glossary - term appears again on p. AD-1 and p. 5-2, but definition does not appear until p. 5-15	Definition has been added to the glossary.
Citrus Heights	Chapter 3, Page 3-11	"Interceptor trees" – not in glossary – term appears again on p. 5-2, but is not defined until p. 5-13 – concept is overrated. Consider the redwoods in front of the CalEPA building on the day of the LID conference. When the conference started, they provided protection from the rain. By lunchtime, with probably less than ½ inch of rain, there was just as much precipitation under the trees than elsewhere. Moreover, if there is a lot of wind, trees will actually intercept the rain, concentrate it within the drip-line, and create a rain-shadow on the leeward side.	Comment noted.
Citrus Heights	Chapter 4/Fueling Area, Page FA-3	"Spill Control Manhole" – a standard detail drawing would be helpful	Spill control manholes are rarely used upstream of connecting to the sanitary sewer system. The majority of projects utilize a shut-off valve and an oil/water separator. If a spill control manhole is proposed, please refer to the manufacturer standard details.
Citrus Heights	Chapter 4/ Landscaping, Page L-1	"Stabilize disturbed slopes" – slope stability is a different concept from erosion protection; avoid the term. Similarly "energy dissipaters" are not usually an erosion protection measure. Both terms will conjure up more in the mind of an engineer than is intended here.	On the Landscaping fact sheet, instead of "stabilize disturbed slopes..." and "install energy dissipaters...", wording has been changed to "protect disturbed slopes..." and "use methods to slow runoff flow..."
Citrus Heights	Chapter 4/ Landscaping, Page L-2	Middle bullet: "Mediterranean"? Emphasis should be on native plants.	Suggested edits have been incorporated.
Citrus Heights	Chapter 4/ Outdoor Storage Area, Page OS-2	Requirement to pump to sanitary sewer implies protection of the sanitary sewer. How should the wet-well be sized to contain the spill? Should the pump only be operated manually? Subsequent chapters (OW, WA, WM) refer to the "local sanitary sewer permitting agency", I suggest that language be used here as well.	Suggested edits have been incorporated.
Citrus Heights	Chapter 5, Page 5-5	Exempted channels": some of the definitions may apply to channels that the local flood control authority may deem undersized, so hydromodification may be required even so there is no downstream erosion concern. Refer to the local flood control authority.	Suggested edits have been incorporated.
Citrus Heights	Chapter 5/ Disconnected Pavement, Page DP-5	Picture shows pavers right where oil will be dripping from cars. Very bad design. How do you clean oil out of pervious pavers or between pavers?	Please refer to table PP-2 in the Porous Pavement fact sheet for more information on the maintenance of pervious pavers.
Citrus Heights	Chapter 5/ Disconnected Pavement, Page DP-6	Reference in Table DP-1 to "Porous Pavement Fact Sheet elsewhere in this chapter". There is no fact sheet in this chapter. There are other references to "fact sheets" elsewhere in the document that are unclear. P. GR-3 and GR-11 refer to the entire GR chapter as a "fact sheet". Confusing.	There is a Porous Pavement fact sheet in chapter 5. Text edits have been incorporated to further clarify the references to other chapters and fact sheets.
Citrus Heights	Chapter 5/ Green Roof, Page GR-8	Insufficient detail for plant selection. This is a Sacramento Manual, so a specific list of suitable plants should be provided. Avoid Portland references. Green roof concept is overrated in terms of a runoff control and storm-water quality function. Empty planters providing detention would be much more effective. Evapotranspiration is very low during rain events. Benefit of green roofs is cooling of the interior space and absorption of solar energy and carbon.	Appendix J with plant guidance links has been added. With regard to suitable plants for green roof, text has been added regarding stormwater quality function and plant selection.
Citrus Heights	Chapter 5/ Infiltration Trench, Page IT-1	What is the source of the setback requirements from foundations? They are much too general and should be evaluated on a case-by-case basis. As they are, they would limit infiltration trenches to open space and large developments.	The fact sheet states that smaller setbacks maybe allowed if approved by a geotechnical engineer and a soils report, so the project applicant has the option to investigate a smaller setback. In the absence of a geotechnical report, the setback criteria specified in the table IT-1 will be applied.

Citrus Heights	Chapter 5/ Interceptor Tree, Page INT-1	Why should interceptor trees be located within 25 feet of an impervious surface? See general comments above. Trees have many, many benefits. Retaining and evaporating precipitation captured in the canopy is probably the smallest benefit, especially in northern-California-type rainfall. To put it in perspective: ¼ inches of rain put a gallon of water on 6.5 sq.-ft. One gallon evaporates from the same area on a summer day. An oak tree intercepts up to 1000 gallons/year. That amount evaporates from a basketball court on a hot day.	Interceptor trees can prevent and/or delay water from landing on an impervious surface. Much of the intercepted water runs down along the tree's leaves and branches and evaporates, or runs down into the root system. Properly located trees can reduce the effective impervious fraction by diverting rain that would otherwise fall on streets and sidewalks. That's why interceptor trees are required to be located within 25 feet of an impervious surface to receive any credit.
Citrus Heights	Chapter 5/ Porous Pavement, Page PP-2	Are there any data on how quickly the various porous pavements lose their porosity? Block pavers with sand or sandy loam in the voids are not the only pavement that loses porosity over time. This is important because "maintenance" will not cure this, only reconstruction.	As detailed in Appendix B of the manual, the expected life for porous pavement is between 20 and 30 years. The loss of porosity is determined by several site-specific and material-specific factors. No change has been made to the manual or fact sheets.
Citrus Heights	Chapter 5/ Sand Filter, Page SF-13	Any data on maintenance of sand filter? Only the Austin filter provides easy access to the sand for inspecting, raking, and "loosening up". How are sand filters under gravel layers maintained or inspected? Does maintenance amount to reconstruction?	As stated in the description on SF-1, this fact sheet is specific to Austin filters, not other sand filters.
Citrus Heights	Chapter 5/ Water Quality Detention Basin, Page DB-13	Would this be a good plant list for green roofs?	Green roofs have their own microclimates. In the Sacramento area, plants selected for green roofs need to be able to withstand more harsh conditions than those selected for detention basins.
Citrus Heights	Appendix A	Explain what the compliance forms are for and cite section of the permit that requires them.	The forms included in Appendix A are not required by the MS4 Permit, but they facilitate the project submittal process and makes it easier for applicants to know what is required for their project as early as possible in the planning process. The forms also help the agency plan reviewers during the project review process.
Citrus Heights	Appendix B	Suggest inspection check-lists for each type of facility. (provided in Appendix I)	The information presented in Appendix B is specific to the long term maintenance of post construction measures. It is not related to the proper construction of these measures. The example maintenance agreement templates all include an exhibit that details the anticipated maintenance activities for the selected stormwater quality measure for the subject project.
Citrus Heights	Appendix C	Excellent. Please refer to this appendix wherever connections to sewer are mentioned.	Thanks, comment noted.