City of Austin
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Watershed Protection Department
P.O. Box 1088. Austin. Texas 78767

June 24, 2016

Justin Word
Central Texas Regional Mobility Authority
3300 North IH-35, Suite 300
Austin, Texas 78705

Dear Mr. Word,

The City has reviewed the final SH45SW design documents provided by the Central Texas Regional Mobility Authority (CTRMA) for our review and our comments are attached. I have also included a list of environmental commitments made by the Texas Department of Transportation in the Final Environmental Impact Statement, Record of Decision, and related documents. The City would like to request that CTRMA consider reviewing these commitments and confirm that each of these have been addressed in the final design of the SH45SW roadway.

I would like to note the City's appreciation for the extensive cooperation and transparency that CTRMA and their team of consultants has shown the City of Austin during the design phase of the project. I believe it has resulted in tangible improvements in the level of environmental protection for the very sensitive environment where the road will be constructed and provides a model for interagency cooperation on other state road projects.

While the design process has resulted in improvements to the project, the City of Austin remains convinced that the project still represents an unacceptable level of risk to Flint Ridge Cave, adjacent Balcones Canyonlands Preserve land, the City's Water Quality Protection Lands, and the Barton Springs Portion of the Edwards Aquifer. Our detailed comments are attached, but I would like to address one of the City's key concerns, stormwater treatment.

I have reviewed the December 11, 2015 e-mail from Sean Beal regarding the City's recommendation to use the Save Our Springs (SOS) water quality standard for SH45SW wherein CTRMA declined to accept that recommendation and discussed them with key City staff that has been involved in the technical discussions with CTRMA and others on water quality treatment. It is still our opinion that achieving compliance with the City's SOS treatment standards is feasible and is the optimal approach for protecting water quality and achieving the stated environmental goals for the SH45SW project. I would like to address some of the points Mr. Beal made in his e-mail.

SLAT does not have the ability to evaluate systems with multiple non-infiltration Best Management Practices (BMPs) in series…
The City's SLAT tool is able to evaluate multiple non-infiltration treatment methods and this was done by CTRMA team in coordination with City staff and staff from other agencies.

The data needed to fully support SLAT does not exist for BMPs such as PFC pavement or Batch Detention Ponds.
As the e-mail notes, there is limited performance data available for the permeable friction course (PFC) pavement and batch detention ponds that are part of the treatment train, but the lack of data is not a limitation of the tool, it is a limitation of the treatment methods that CTRMA has chosen for the project, which are not well supported by performance data.

The e-mail also states that "*…there is a considerable amount of evidence that the proposed BMPs have been effective at removing constituents that are associated with roadway development…*". Both City of Austin Staff and CTRMA consultants were only able to find one study with performance data for batch detention and only limited data for PFC. Therefore this seems to be an overstatement of the availability of data for significant portions of the treatment train.

Using the defaults [SLAT default values] *may overestimate the developed loading, but we don't have available data to inform us one way or the other.*
Because of the lack of sufficient data for some or all of the pollutants of interest depending on the control, assumptions were made by the interagency work group for most of these contaminants for input into the SLAT tool. We disagree that these assumptions may overestimate the pollutant loads. In fact, our staff believes the assumptions are non-conservative and are better described as a mid-range estimate. It is possible that the tool under predicts pollutant loads from the project rather than over predict loading.

Regarding Dr. Barrett's presentation to the CTRMA Board, we are aware of Dr. Barrett's analysis of City data and disagree with his findings and conclusions. Our staff believes the data does not support his conclusion that the changes in Barton Springs water quality are the result of state required water quality controls. We would be glad to discuss the basis for our opinion with you at your convenience.

To achieve full compliance with the ordinance using retention irrigation, we would need to make some key modifications to the design.
We do believe the current water quality design for SH45SW can be modified to meet SOS treatment standards, the environmental impacts of those changes would be limited, and those impacts are more than sufficiently offset by the environmental benefits. During working group meetings and more recently we discussed converting the batch detention ponds to retention ponds. We understand the concerns with a system composed of a network of mechanical pumps, sprinklers, and controls that would require inspection and maintenance to prevent failure. However, given the fact that operation of the SH45SW tollway will require ongoing inspection and maintenance it may be an optimal setting for retention/irrigation and its associated inspection and maintenance needs. In any event, retention/irrigation is successfully operated in many instances locally.

Most importantly, we estimate an additional 24 acres of the existing natural terrain would have to be disturbed and turned into irrigation fields.
I appreciate the efforts the project team has made to avoid disturbance of portions of the ROW and your interest in preserving these areas for environmental protection. However, it is not

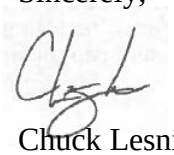
uncommon to place irrigation for retention-irrigation systems in wooded areas and can be done with limited disturbance. It is our opinion that the environmental benefit of using some portion of these undisturbed areas for stormwater irrigation outweighs the limited and temporary impacts of irrigation system installation and maintenance.

Finally, regarding what the entire TWG has agreed upon in terms of intrusion and disruption of the natural areas for water quality, I don't agree that City participants in the TWG have ever agreed that these areas were off the table for consideration for water quality use. I think we made it clear at a couple of recent meetings that the design team should consider environmental cost vs. benefit of all approaches, including disturbance of the natural areas and possibly deepening ponds if the water quality benefits were worth it rather than dismiss them out of hand.

The City stands by our recommendation that SOS should be the minimum water quality design standard if the project is to provide state of the art water quality treatment and the highest level of environmental protection. As noted in Mr. Beal's e-mail, there is little data to support the water quality treatment methodology that the design team has chosen. Given that, it would seem that even projecting that the project will meet state minimum standards may be questionable. This is further reason to take a "belt and suspenders" approach by infiltrating treated stormwater on-site because stormwater retained on the project significantly minimizes the risk of impact to sensitive off-site environmental receptors.

In closing, I want to reiterate my appreciation for the cooperation and effort put forth by the CTRMA team. Please contact me at your convenience if you have any questions. I look forward to continuing to work with you and your team on this and other projects in the Austin area.

Sincerely,



Chuck Lesniak
Environmental Officer
Watershed Protection Department

Cc w/ attachments: Marc A. Ott, City Manager
Robert Goode, Assistant City Manager
Sue Edwards, Assistant City Manager
Joe Pantalion, Watershed Protection Department
Rob Spillar, Transportation Department
John Dupnik, Barton Springs/Edwards Aquifer Conservation District
Jon White, Travis County
Kris Keith, CTRMA/HNTB

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No.	Document	Page	Sec.	Review Comments:
1	ECMP	0	General	There are 3 references in the document to adaptive management and protocols. However, there is no adaptive management description or protocol contained in the document or the others.
2	ECMP	0	General	In most sections, we were expecting the ECMP to answer the remaining questions and comments from the FEIS that were not addressed in the other contract documents. We were expecting more detail than the FEIS on how commitments would be met rather than less detail in the ECMP than provided in the FEIS.
3	ECMP	0	General	The FONSI was contingent on commitment in ROD "TxDOT will require the contractor to prepare an Environmental Compliance Management Plan (ECMP), administered by an on-site, independent compliance manager, to ensure compliance with all environmental laws and commitments" This makes the ECMP the repository for how all the commitments in the ROD or FEIS are to be met. It doesn't meet this requirement. It also separates "commitments" that are above and beyond the regulatory requirements and could be considered superior environmental protection from "environmental laws". This distinction should be made clearer in practice because much of the responses to previous comments are answered by saying "we will meet the regulatory requirements of the state and federal environmental laws", a standard that is inadequate in sensitive areas.
4	ECMP	0	General	An overall suggestion would be to address "as needed" items directly up front rather than when they are needed immanently. For example, the ECM and CPM are supposed to get together and develop pest control strategies "as needed". Putting this off until there is a crisis does not result in a planned or effective response. It is also difficult for the contractor to tell how much this will cost and budget accordingly. This would also apply to "as needed" temporary sediment traps. Although materials may be in the bid documents, the contractor needs to know what "as needed" is, or who decides it to budget for it.
5	ECMP	0	General	Statements throughout that something (fill in the blank) "will be" done beg the questions "by who?" unless it is explicitly stated. Maybe an introductory statement that whenever this occurs, the assumption should be made that it is a directive to the contractor and should be budgeted for.
6	ECMP	0	General	"Monitoring" in the ECMP is really "periodic inspection". It is useful in making immediate responses but not useful in making determinations of long term impact. CEQ provides guidance on mitigation and monitoring requirements of EIS and EA when a FONSI is determined at https://ceq.doe.gov/current_developments/docs/Mitigation_and_Monitoring_Guidance_14Jan2011.pdf. This also begs the question why was no predictive modeling done to compare to future monitoring in the environment.
7	ECMP	0	General	Conflicting guidance from the plans and specifications should be dealt with directly. For example, the ECMP states no pesticides/herbicides will be used, yet Spec 194 on Landscaping includes "Treat the plants and planted areas in accordance with TDA or TSPCB laws and regulations. Follow the manufacturer's instructions for handling and applying pesticides." This doesn't' sound like a prohibition.
8	ECMP	0	General	In previous conversations with TXDOT/CTRMA the City had requested to have high game fencing installed along the ROW to limit animal-vehicle collisions. This recommendation was based on our experience with the deer population in the area and the more frequent sightings of feral hogs in recent years. This could be addressed in plans, specifications, and the ECMP.
9	ECMP	0	General	CTRMA/TXDOT had previously indicated that it would be possible to allow City vehicles to cross under SH45 using the berm of a water quality pond under the bridgework at Bear Creek (north side). This would allow our continued access to a section of City Property that is otherwise cut off from vehicular access by SH45 when Bear Creek is flowing. Some acknowledgement that this is still to be allowed, and notice to the contractor is suggested.
10	ECMP	0	General	Statements that specified work will be implemented "to the greatest extent practicable," "when practical," etc. give the impression that these are not serious commitments. This language should be avoided.
11	ECMP	0	General	Change "crazy tawny ant" to "tawny crazy ant" throughout.

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12	ECMP	4	1.0	We greatly appreciate that CTRMA/TxDOT are "committed to ensuring that existing commitments are met and tracked through the life of the SH 45SW project". Also it is appropriate that "a goal of the ECMP is to ensure that the project's environmental goals – from compliance to stewardship to innovation and leadership – are met and documented in detail". However the level of detail should perhaps be worked out with the TWG group subject matter specialists in some areas such as water quality monitoring and adaptive management. The detail in many sections is inadequate to meet the above goal. Also, the specific environmental commitments in the project from planning to construction should be itemized so that their performance can documented. Interpretation of global and vague commitments should be made to arrive at practical quantifiable performance measures and the monitoring to make sure they are met.
13	ECMP	4	1.0	Adaptive Management presupposes both implementation and effectiveness monitoring as defined in CEQ guidance. The subsequent plans for monitoring in the ECMP are quite vague and need work to be used in any adaptive management process
14	ECMP	4	1.0	Since the ECMP is geared to be a "usable format that can guide day-to-day activities of project team members working on-site during project construction", it would be helpful to review the document from the perspective of the contractors worker on the site and whether they or their supervisors will understand and have enough information to implement the actions needed for each environmental resource category. It seems that for many of these sections more work should be done to give project team members enough guidance to meet the commitments noted.
15	ECMP	4	1	This states that rare cave invertebrates and golden-cheeked warblers live in habitats surrounding the project area, but rare cave invertebrates and habitat for golden-cheeked warblers are found within the project area.
16	ECMP	5	1.0	#1 on the principal goals seem to be regulatory minimums and don't reflect the public statements in the FEIS and elsewhere that the goal is to have a project that is environmentally protective as possible.
17	ECMP	5	1.1	"Protect" should be defined. Is meeting minimum state standards protection or some other standard? Avoid impacts might be a better, clearer goal.
18	ECMP	5	1.1	"Minimize" is a broad term subject to misinterpretation. "Avoid to maximum extent technologically feasible" might be a better term, but it too has problems of interpretation. A quantifiable performance measure would be preferred.
19	ECMP	5	1.1	Referencing only "perimeter BMPs" for sediment controls seems a weak goal as perimeter controls should be the last defense and generally should not be the primary control. A focus on interior controls is recommended.
20	ECMP	5	1.0	Adaptive Management presupposes both implementation and effectiveness monitoring. The subsequent plans for monitoring in the ECMP are quite vague and need work to be used in any adaptive management process. However, we are grateful that "collaborative problem solving" will continue and we hope to be part of this collaboration through the construction phase of the project.
21	ECMP	5	1.1	Compliance monitoring is both implementation and effectiveness monitoring. Only visual inspections are included here.
22	ECMP	5	1.1	The Environmental Compliance Manager would have the authority to enact adaptive management actions including work stoppage and BMP maintenance and repair, as situations warrant. How can this be done if the adaptive management triggers are not specified and the monitoring to compare against the triggers is not included.
23	ECMP	5	1	States that one of the principal goals of the ECMP is to develop comprehensive contingency plans, but the contingency plans are not explained in the document. This may be a terminology problem as Contingency Plans are also required for spills and other catastrophic events.
24	ECMP	6	1.2	Most references to Stormwater Pollution Prevention Plan in the industry (including form 2118) are "SWP3" rather than "SW3P". Not that they will be confused by the contractor, but for bid documents it is recommended they be consistent. Both acronyms appear in the plan set on pages 1183 and 1184 and a number of references throughout the plan set.

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25	ECMP	6	1.1	"Green Mobility Challenge is only mentioned in introduction and the elements developed through it that were incorporated are not identified. Suggest just including link to webpage. http://www.sh45sw.com/environmental/green-challenge.php or the map on this page and where they appear in the bid documents.
26	ECMP	6	1.1	No real instructions for preventing or controlling invasive species., just inspections and "rapid response" mentioned but not described in any detail. Contractor doesn't know how to bid to comply.
27	ECMP	6	1.2	It would be helpful to review contractual bid documents that provide the chain of command relationship between: ECM, CRPE, CTRMA and TXDOT for inspection and enforcement of E&S provisions of plans.
28	ECMP	6	1.2	CRPE responsibility is for structural elements that are listed in the SW3P plan. Please reference the SWP3 plan. The SWP3 plan sheets do not appear to address all of the requirements for an actual SWP3 plan.
29	ECMP	7	1.2	Re ECM independence. The document notes the ECM will not be "beholden" to the contractor, but doesn't explain what the relationship will be. Who will be responsible for selecting, paying, and overseeing the work of the ECM? The relationship should be clearly laid out in the document.
30	ECMP	7	1.2	It is concerning that the "roles and responsibilities of the ECM may be performed by one or multiple personnel as determined by staffing needs and availability". Although a backup third party ECM could be useful when the ECM is absolutely unable to be on site, this should be only under dire circumstances unless the alternate has similar training and is current on all the ECM's activities.
31	ECMP	7	1.2	To be truly independent, the ECM could be employed by BSEACD and funded by CTRMA or TxDOT. The removal of an ECM could be by BSEACD and CTRMA agreement, and mediation could include both agencies.
32	ECMP	7	1.2	ECM relationship with adjacent landowners impacted by runoff (i.e. COA) is not specified. Stop work and problem resolution time frame and decision on remediation is not provided. MOU with COA re: auxiliary inspection of E&S.controls could be useful. ECM should be CPESC-certified or have demonstrated experience with similar EC on large-scale infrastructure projects.
33	ECMP	8	Table	A minor point but the Geologist is charged with "development of Void Mitigation Plans" but I think this could be clarified to read "following TCEQ guidelines" and "in coordination with TCEQ staff".
34	ECMP	9	1.3	The referenced videos on Environmental Mgmt. Systems and Stormwater seem to be focused on compliance with minimum regulatory standards and avoiding regulatory violations. Given the unique sensitivity of the area, a project and site specific training tool should be developed.
35	ECMP	9	1.2	The DEQI is mentioned in this table and in the flowchart in 6.3 but nowhere else in the document. This was probably just an oversight, but since this role also can stop work due to karst invertebrates, a little more information would be warranted.
36	ECMP	9	1.3	The contractor training generally looks good. COA staff have developed training for City S&E controls for engineers and contractors. It may be beneficial to meet with WPD and/or Development Review Department staff before finalizing the curriculum, especially for the "project specific environmental training".
37	ECMP	9	1.3	It is assumed that the "on-site supervisors" are the direct report contractor or subcontractor employed supervisors. Might clarify.
38	ECMP	9	1.3	It is somewhat difficult to gage the adequacy of the environmental training from the internet references to standard TxDOT video courses. Some outline of information to be covered and addition of a post-training test is recommended to clarify the ECMP training.
39	ECMP	9	1.3	What does “project specific environmental training” consist of? How will contractor training be verified, in what stages of construction, and will repeated training be provided for new employees?
40	ECMP	10	1.5	It appears from this section that the normal contractor chain of command is not used for reporting problems to the ECM. While this is appropriate, it might take some emphasis in training.

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41	ECMP	10	1.4	Why in particular, is the City of Austin left off this list as a regulatory partner when it has perhaps been the most engaged member of the TWG. Although this engagement is voluntary, and it has no specific permitting or enforcement authority, it does have a significant interest in the environmental aspects of the project given the adjacent property owned by the City and the resources it protects downstream/gradient from the project. It was hoped that this participation would continue through construction and maintenance.
42	ECMP	10	1.4	Consider adding a COA Inspector as a Regulatory Partner in construction
43	ECMP	10	1.5	ECM should be a CPESC or have demonstrated experience with similar EC on large-scale infrastructure projects and should conduct the inspections and issue the reports. Self-reporting by the contractor is not a preferred scenario. This is similar to TXDOT's current MO which results in inadequate E&S controls and performance.
44	ECMP	10	1.5	Is there documentation that describes the course of action for remedying stop work orders? Time frames, dispute resolution, etc.?
45	ECMP	11	1.5	Terms used here don't include all those discussed in either the November 23, 2015 or July 1, 1015 TWG meetings, including: No disturbance Zones, No construction Zones etc...
46	ECMP	12	Table 1	Weekly Bear Creek Water Quality Monitoring indicates samples will be taken when this is not the plan at all. The "monitoring" is really routine inspection. Suggest a quantitative monitoring plan be developed in addition to inspection program.
47	ECMP	12	2.0	This section needs a preface that clearly gives responsibility for all of the subsequent BMPs to the contractor unless otherwise noted.
48	ECMP	13	Table 2	The inspection of off-site materials is not clear that it is targeting identifying Tawny Crazy Ants, is that clarified in another place in this document? Should reference Section 2.5 Pest Management.
49	ECMP	14	2.0	Also pp. 28,39, and Boring Procedures - "Greatest Extent Practicable" is a weak performance standard. Consider using a quantitative measure or stronger qualitative measure.
50	ECMP	14	2.1	The time for the use of "could include" or "may include" followed by a broad menu should be over at this stage. If the contractor is to select one or several available from this menu, then "will include" would be more appropriate.
51	ECMP	14	2.0	Recommend specifying the type of erosion control matting -- natural fiber that breaks down over time instead of plastic material (small animals can get caught in this type of matting).
52	ECMP	14	2.1	Plans and specs do not provide specific instruction on sequencing and soil disturbance to realistically result in dust control. And rather than using language like "Maximize", there should be prescriptive specifications that govern the materials, application rate and frequency to insure the goals of dust control. Just alike other E&S BMPs.
53	ECMP	14	2.1	Fugitive dust control section specifies erosion control matting and temporary vegetation, but doesn't specify the use of natural fiber matting that breaks down and native vegetation as we discussed.
54	ECMP	15	2.2	Suggest the standard work week and hours be specified explicitly and consistent with the bid rather than generally referred to here.
55	ECMP	16	2.3	In many places in the ECMP, a reference to the plans and specifications is in order. For example, the illumination pages in the plans may help interpret the text in the ECMP here.
56	ECMP	16	2.3	Light control section does not mention dark sky lighting like we discussed.
57	ECMP	17	2.4	Please cover the response and cleanup of sewage spills in the relevant section.
58	ECMP	17	2.4	Please include how the 100-year floodplain and buffers/surface catchments of sensitive features are to be identified so the contractor will know where not to install portable sanitary facilities. This would be needed in advance of inspections that would only note poorly placed facilities.

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59	ECMP	17	2.4	Since the ECMP and role of the ECM are part of the bid documents, it should provide the detailed guidance promised in Section 1.0. The contractor has a great deal of latitude in their interpretation of the ECMP without this necessary detail. Cross referencing specifications in the contract document may be one way to handle this. An example is the non-native/invasive species survey and response protocol is not provided in the ECMP, plans, bid documents, or general notes or referenced to any standard documentation..
60	ECMP	17	2.4	Please include how to handle spills from portable wastewater facilities in section 2.4 or elsewhere. While not hazardous waste, they can occur as shown in the picture in the ECMP page 17.
61	ECMP	17	2.4	No portable sanitary facilities within construction exclusion zone (CEZ)
62	ECMP	17	2.4	Waste Management section says "natural areas and sensitive feature buffers" will be kept free of waste and litter at all times but does not define "natural areas" in terms of the boundaries on the plans. It should have the same limits for placements of dumpsters as that defined for placement of portable sanitary facilities.
63	ECMP	18	2.5	Should add a bullet stating that the invasive species (plants or animals) will be eliminated before the material is brought onto the SH45SW site.
64	ECMP	18	2.5	This section is weak. Consider looking into an actual integrated pest management plan, invasives control plan, WPD published material, or other more complete pest management program to either incorporate, model, or attach to the ECMP. TxDOT may also have it's own publications that could be used although it is not addressed in either the standard specifications or roadside vegetation maintenance guidance documents. To say that pest control will be done "as needed" will guarantee that it will be unplanned.
65	ECMP	18	2.5	Although not mentioned in ECMP, the Plans EPIC pages (1180-1181) include statement: "Preserve native vegetation to the extent practical. Contractor must adhere to Construction Specification Requirements Specs 162, 164 , 192, 193, 506, 730 , 751, 752 in order to comply with requirements for invasive species, beneficial Landscaping, and tree/ brush removal commitments." From a quick read of these specs, it is unclear how they will meet invasives control commitments. Invasives as a group are not mentioned at all in TxDOT standard specifications. Some specific species like Johnson Grass in sodding for erosion control specification are mentioned.
66	ECMP	18	2.5	This should prohibit chemical fertilizers in addition to chemical pesticides and herbicides.
67	ECMP	18	2.5	Pest Management Program section does not describe who will inspect the offsite material source locations. It should also define which materials need to be inspected including any fill, soil, erosion control logs, rock, etc. that will be brought onsite. It also does not define what "pest species control strategies" will be used since chemicals are not to be used.
68	ECMP	19	3.0	Reference any training that TxDOT may have on this subject and state that in all cases, the most stringent parameters of project specific or state/federal guidance and regulations apply.
69	ECMP	19	3.0	It might be useful to review the COA Barton Springs Catastrophic Spill Plan. Following this plan is part of our USFWS 10(a) permit under the ESA. It provides some helpful information on spill transport should a release from the construction (or operation) of SH45SW occur. We would be glad to supply this document and go over the COA protocols with the ECM if requested.
70	ECMP	19	3.1	We suggest that once contractors have set up their operations, the location of storage sites be drawn on plan working sets (sort of intermediate as builts) for use in tracking the possible pathway of a specific spill location. A minimum would be to put on the updated CAD files, ECM copy, and Contractor Copy. Just a requirement for this in the ECMP would be needed. This could also include locations of contractor spill response materials.
71	ECMP	19	3.0	No hazardous materials storage within the CEZ
72	ECMP	20	3.2	Recommend that any equipment that has leaks that are dripping on the ground be shut down until repaired with containment placed under the leak.

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73	ECMP	20	3.1	Uncertain who is responsible to make sure cleanup kits "will be" made available at all hazardous material storage areas. Maybe state assumption at beginning which or all ECMP responsibilities are contractors unless identified otherwise.
74	ECMP	21	3.4	It is a little unclear on the referencing of the main reporting entity. In the ECMP, is called State Emergency Response Center, or just Emergency Response Center. From the TCEQ website, it looks like it is called the State Emergency Response Commission which is really just notifying the spill response hotline at TCEQ since it is one of the 10 agency members of the SERC. Actually, the jurisdiction of spills seems to depend on where and what kind of spill it is. http://www.tceq.state.tx.us/response/spills/jurisdiction.html. It is a weird system, but having the hotline number, knowing who makes the call, calling the regional office of TCEQ seem to be all the reporting needed as a first response. Other agency jurisdictions like TPWD should be contacted by the SERC, but it would be safer to have the numbers here or referenced to in case there is an immediate need. Since there are no phone numbers in this section, a reference to Section 12.0 "contact tree" should be made. However, 12.0 is not actually a contract tree, but a list. A telephone/contact tree is a flow chart directing the order in which contact is to be made under various circumstances.
75	ECMP	22	3.4. 3.5	Recommend that all reportable spills and hazardous materials discovery also be reported to the City of Austin's 24-hour Environmental Hotline, 512.974.2699, which goes directly to the City's Spills and Complaints Response Program investigators. Our experience is that these staff have the fastest response of any local agency (usually within 30 min.) and are responsible for implementing the City's Barton Springs Catastrophic Spill Plan.
76	ECMP	22	3.4	Allows spills to land up to 25 gallons to go unreported – consider reporting regardless of spill volume (same policy as spills to water) given the sensitive karst region?
77	ECMP	24	4.1	The bulleted items don't seem to be Low priority, seven days is too long to wait, and before a storm event has some predictive uncertainties involved. Suggest that the required time schedule be tightened up.
78	ECMP	24	4.0	There is a definite referencing problem throughout the document. If this document is strictly utilitarian and covers in detail the "how" of compliance and environmental superiority, it falls short. For the on-site staff, simple reference to "meet or exceed" TxDOT standards in a manual that is probably not available to those involved and a list of structural construction BMPs will not help. Likewise, when RG-348 is referenced vaguely, it does not help explain the "how" of compliance and meeting environmental goals. If nothing else, providing direct onsite access to these guidance documents via current technology (phone app, tablet documents, wifi access and links) is necessary for everyone with the need to use this information onsite. At a minimum, all the positions mentioned in the ECM should be required to have read these guidance documents as well as have access to them in real time.
79	ECMP	24	4.1	Concerning the "monitoring" of Bear Creek water quality, the parenthetical "(when required)" is inserted. This implies that nothing is required and will not be done unless directed by another agency with jurisdiction or management. It should not be an option to monitor the effects of the project on Bear Creek. This is where the rubber meets the PFC.
80	ECMP	24	4.0	Recommend including COA/BSEAD as additional oversight agencies
81	ECMP	24	4.1	In addition to regularly scheduled inspections, it is most effective to ensure that inspections occur immediately before and after storm events. It is useful to call out protocol for monitoring weather and using radar and a rain gage to set thresholds for pre- and post-inspection (e.g. before and after 0.5 inch rain event or greater).

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82	ECMP	24	4.0	Stormwater Mgmt.: The information provided is very general and will be difficult to track/monitor. Permanent controls are recommended to be rethought to a non-degradation standard for all relevant pollutants, not just TSS. A hydrologic approach that attempts to mitigate impervious cover stormwater effects to the levels required in the COA ECM (1/2" +) would be appropriate and noted here. Structural BMPs should have an ecological basis for nutrient treatment and infiltration and serve as an amenity to the area. This would be consistent with the commitments in the FEIS.
83	ECMP	24	4.0	Stormwater Management section does not define the specifications of erosion control logs containing native materials as we discussed. These materials will also need to be inspected for invasive species.
84	ECMP	25	4.1	"Practicable" (used 16 times in a relatively short document or 20% by page) should be stricken from the ECMP (and the English language) unless quantitatively defined. The phrase "as directed" also, unless followed by who directs.
85	ECMP	25	4.1	Specify the time period for "Medium Priority" deficiency; as currently written, the response time could be longer than for "Low Priority."
86	ECMP	25	4.1	Consider deficiencies in BMPs protecting sensitive features as a high priority
87	ECMP	25	4.1	Recommend that Medium priority include any BMPs that are not performing according to plan (e.g. bypass, failure to withstand design storm, etc.).
88	ECMP	25	4.1	Recommend including protocol for stop work order should contractor be noncompliant in addressing priority deficiencies.
89	ECMP	25	4.1	Recommend including any off-site sediment discharge as a High Priority. Recommend establishing protocol for retrieval and restoration of fugitive sediment, esp. for COA property, sensitive features and receiving waters.
90	ECMP	25	4.1	Medium Priority events should define a time period for repair rather than "as soon as practicable". All of the bullets under medium priority - i.e.." BMPs protecting sensitive features, excessive erosion, and potential to discharge sediment off site" should all be high priority and addressed immediately.
91	ECMP	26	4.2	The monitoring program proposed by the ECMP is qualitative in nature and appears to be based on subjective observations. For the ECMP monitoring program to be effective, it should be quantitative and utilize modern statistical practices in assessing whether an impact is (or has been) occurring. To implement this program, first, measurements of various parameters in the water and sediment of the creek should used as inputs for baseline (prior to construction) conditions. If baseline measurements can not be achieved, then a control station upstream of the impacts can be used as a substitute. From these measurements, prediction intervals can be developed to establish upper limits for future measurements. If future measurements exceed these limits, then an investigation into the source of the potential contamination should be initiated. If the future measurements persist in exceeding the upper limits or if a future measurement is above some biological threshold, then remedial action can be proposed to address the issue. The monitoring program proposed by the ECMP also discusses adaptive management. For the monitoring program to be truly used in adaptive management, it should primarily consist of quantitative measurements and Bayesian statistical methods, which utilize the iterative process in the adaptive monitoring and mitigation program.
92	ECMP	26	4.2	Because it's likely that contractors and employees won't have the referenced documents containing the environmental commitments we recommend that these be listed and summarized in a table in an appendix.
93	ECMP	26	4.2	Could note that COA encourages coordination with TX Dot/CTRMA and the contractor to prevent off-site transport of sediment and the clean-up of any such discharges..
94	ECMP	26	4.2	It was agreed on at the November 23, 2015 meeting that TxDoT/CTRMA would cleanup and mitigate off-site sediment transport onto adjacent lands. This action should be included in this document so the contractor knows it is their responsibility..

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No.	Document	Page	Sec.	Review Comments:
95	ECMP	26	4.2	Include language that the channel of Bear Creek will be inspected even if the creek is not flowing as sediment spills can occur without flowing water as a result of vehicle accidents or negligence.
96	ECMP	26	4.2	Should also note accumulation of sediment within or adjacent to the ROW resulting from construction activity.
97	ECMP	26	4.2	Environmental Compliance Inspections section says the weekly inspections will look for all the environmental commitments including those in the EIS, EPIC sheets, the SW3P, WPAP and various other environmental and regulatory documents. This needs to all be summarized in one location or it will not be possible for the ECM to check for all of these commitments.
98	ECMP	26	4.1	"EPIC sheets" are referenced but not defined and their locations in the plans not provided.
99	ECMP	26	4.2	"As part of the weekly inspection routine, the construction site will be inspected for consistency with the suite of environmental commitments associated with the project. Environmental commitments include those identified in the Environmental Impact Statement (EIS), EPIC sheets, the SW3P, WPAP, and various other environmental and regulatory documents". - This is too vague. Suggest a list in the appendix to avoid confusion later on. Consultant has already worked on commitment lists in responses to the BSEACD agreements and the 1999 Agreed Order. Some are also in the Record of Decision for the Finding of No Significant Impact
100	ECMP	26	4.2	The term "maximum extent practicable" does not lead to non-degradation. Perhaps "maximum extent technologically feasible" would. MEP does not have a regulatory definition. “Practicable” itself is defined in the dictionary as “possible to practice or perform: capable of being put into practice”. Actually, these terms usually do not help unless a number is attached as a limit. Adoption of a numerical limit that would result in meeting water quality standards or baseline water quality downstream would be our preference. This would show superiority in environmental controls if used as a trigger to adaptive management and would be more objective than the visual observations of turbidity in 4.2. There is no reason the project can't use fixed stations with real-time monitoring and telemetry that would capture episodes of sediment release at the earliest possible moments as well as help determine performance of BMPs. See following link for a successful application in a highway construction project. https://www.ysi.com/File%20Library/Documents/Application%20Notes/A587_ICC_Construction_Runoff_Monitoring.pdf . The project had turbidity thresholds that were not be exceeded: Instantaneous Maximum of 150 NTU (well below the withdrawn EPA limit of 280) and Maximum Monthly Average of 50 NTU.
101	ECMP	26	4.2	Suggest that "in **all** instances" sediment discharges to Bear Creek should be reported as High Priority compliance deficiencies. After all, this is what all the other BMPs combined are trying to prevent. This event signifies a major failure of the system and should be addressed a little sooner than "within one week of the original observation". Given the flow path time to reach Barton Springs, a week can release a lot of sediment to the pool. Instead of a specified time, the contractor or subcontractor should propose a response time, the ECM should review and if approved this would be specific to where the contractor is working on the site and the nature of their work. It should be enforceable and have monetary penalties. Again, practicable should be replaced with something like "technologically feasible" or the Webster's definition above.
102	ECMP	26	4.2	Monitoring form for turbidity? Recovery plan for excess turbidity? Baseline standards for acceptable turbidity? Visual assessment is too subjective. Recommend using meters that read NTU and establishing NTU thresholds that require action. Baseline turbidity for Austin Creeks averages 38 NTU (55mg/l TSS).

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No.	Document	Page	Sec.	Review Comments:
103	ECMP	26	4.2	Bear Creek Monitoring Plan: This is an important yet bypassed plan in the ECMP and should not be an afterthought paragraph in the back of the stormwater management best practices section (4.0). Again, terminology and expectations are not time specific or quantitative ("reasonable efforts, as soon as practicable"). Although turbidity is a reasonable measure to utilize, for this project, a more rigorous monitoring plan for Bear Creek is appropriate, including bed sediment and geomorphic measures, hydrologic and erosion assessment, and a biologic component (habitat and community response). It should include background conditions, trigger or threshold values that would require action, and specific quantitative actions to correct documented problems. There should be upstream controls and a spatial component to document the extent of potential downstream effects. Preconstruction and post construction measurements are also necessary to track operational and spill impacts. Therefore, in addition to compliance and impact monitoring during construction by the contractor, a separate program should be developed to determine longer term impacts. In fact, all water quality monitoring might be better left to the owner or a funded impartial third party rather than contractor.
104	ECMP	27	4.2	Bear Creek water quality monitoring section states that if changes in turbidity are observed the sediment laden water should be found and the situation should be remedied as "soon as technologically feasible" or at least as "soon as practicable. It should state that they will be remedied and it will be a high priority deficiency.
105	ECMP	27	4.2	Any discharges of sediment laden water directly to a creek should be high priority and corrected immediately, not as soon as practicable or within one week.
106	ECMP	28	5.1	I was under the impression following TWG meetings in 2015 that the Sensitive Feature Buffers would NOT have any disturbance, language in the first bullet does not reflect that commitment.
107	ECMP	28	5.1	Fencing around the buffers should be chain link with metal posts rather than orange construction fencing since that is easily moved.
108	ECMP	28	5.0	"Greatest extent practicable" With a little research into the other environmental entities with experience and interpretation of "Maximum Extent Practicable" and the like, a less vague, measureable, objective, and enforceable term could be found. As it stands, it would be difficult or impossible to make a call on this in an contractor dispute. This problem occurs in a number of places in the ECMP.
109	ECMP	28	5.1	Description of buffers should better match plans. Just state what is required (reference the plans where appropriate) rather than vague "to the extent possible"
110	ECMP	28	5.0	Protection of Sensitive Features states that features have been avoided where possible and mitigated for in other instances. How have they been mitigated and where is this documented?
111	ECMP	28	5.0	CTRMA/TXDOT stated that achieving superior water quality was a goal, and yet the protection of sensitive features section states that the quality and quantity of recharge water will be preserved to the "greatest extent practicable". This terminology could have many meanings.
112	ECMP	28	5.1	Fencing should be used as a perimeter control for sensitive feature buffers. Several of the Sensitive Feature inspection forms include condition of fencing.
113	ECMP	29	5.2	Spills should never be hosed down or buried inside or outside of a buffer.
114	ECMP	29	5.1	Last bullet in this section. Might remind contractor that no only are pesticides, herbicides, and fertilizer not to be applied within the buffer areas, they are not to be applied anywhere onsite. A similar comment could be made on the last bullet at the bottom of the page. Spills in buffers should not be buried within the buffer, but spills should not be buried anywhere on the site. Spills should be cleaned up and any contaminated soil disposed of property.

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No.	Document	Page	Sec.	Review Comments:
115	ECMP	29	5.1	States that "pesticides, herbicides, and fertilizers" will not be used within the buffer areas; just to clarify, all chemical pesticides, herbicides, and fertilizers are to be prohibited from the project area, correct (p. 18, section 2.5)?
116	ECMP	29	5.2	Remove "evidence of burrowing animals," which could include burrowing fox, coyote, and other native mammals, from the list of "destructive animal use" and focus on non-native animals.
117	ECMP	29	5.1	Recommend that project resources, vehicles, and other items listed as being prohibited in buffer areas also be restricted from surface catchment areas.
118	ECMP	30	6.0	The commitment to preservation of natural flow to and through sensitive features is greatly appreciated and goes beyond the status quo.
119	ECMP	30	6.0	Please reference TCEQ document GI-406 developed specifically for guidance to contractors working on the EA recharge zone. file: http://www.tceq.state.tx.us/publications/gi/gi-406.html. Also, highlight any variations from the TCEQ Void Mitigation Process for SH45SW, especially those which result in increased environmental protection. Also, a link to the more general Edwards information should be provided to the contactor for training personnel https://www.tceq.texas.gov/field/eapp#edwards-aquifer-protection-plans
120	ECMP	30	6.0	The required plan submitted to TCEQ is called different things and it would be good to be explicit and consistent. The ECMP uses Void Protection Plan, the plans use Void Mitigation Measures and Void Mitigation Plan, Void Mitigation Notes and references Water Pollution Abatement Plan and Edwards Aquifer Protection Plan. A Void Protection Plan referenced in the ECMP doesn't appear to be referenced in the TCEQ regulations or guidance. Void Mitigation Plan is used in the TCEQ GI-406 and TCEQ presentations. Perhaps pick a name that TCEQ uses and provide a reference to or list of the TCEQ requirements for such a plan. The template provided by COA (Sylvia Pope) could be used.
121	ECMP	30	6.1	No mention is made of void mitigation procedures that are in the plans (discussed at TWG meeting on 11/23/2015). Make consistent with plans and/or refer to plans
122	ECMP	31	6.1	Again, since so much land adjacent to SH45SW is owned by COA and that it contains so many karst features and COA has responsibility for maintaining the integrity of nearby Flint Ridge Cave for its permit with USFWS, COA should be also be notified and involved with the mitigation of any karst features discovered during construction.
123	ECMP	32	6.2	Simple typo in second bullet "A qualified geoscientist **and** a qualified karst biologist". Reference to a standard for qualification would also be useful.
124	ECMP	32	6.2	Is there some temporary signage that can be put up when a void is discovered and a stop work order is given for an area? Just a notice to all contractors working in the area about the boundaries of the stop work order. These can be removed when the void mitigation process has reached an approved course of action and it has been implemented so work can continue.
125	ECMP	32	6.2	Last bullet. Although the referenced form TCEQ-10256 covers discovery, it does not address protection or mitigation and additional work is needed for an acceptable Void Mitigation Plan
126	ECMP	32	6.2	The sixth bullet states that the project qualified geologist and biologist can make the determination that a feature not sensitive and that work may resume. However, the Edwards Aquifer Protection Program void procedure is that TCEQ must review and approve that determination. The text should be revised to say that work may resume once TCEQ approval is received. All features meeting the criteria for assessment are to be reported to TCEQ.
127	ECMP	33	6.2	Reword bullet to read "All caves in the right-of-way will include…" and remove "would".
128	ECMP	33	6.2	Attachment 2 entitled Geotechnical Drilling Operations has a flowchart at the end entitled Void Discovery Protocols. Might be better to reference as the Figure within the Operations attachment. Also, Void Discovery is included as 2 bullets in the plan set Sequence of Construction sheet. A reference to the more complete protocols in the ECMP would be useful.

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No.	Document	Page	Sec.	Review Comments:
129	ECMP	33	6.2	Cave gates should be designed to minimize alteration of natural flow patterns.
130	ECMP	34	6.3	All voids must be reported to the TCEQ's Edwards Aquifer Protection Program if they have a characteristic listed in the first box. The flowchart should be revised to say that work may resume once TCEQ approval is received.
131	ECMP	35	7.0	Although a major ESA issue of the project, the Barton Springs or Austin Blind salamanders are not mentioned anywhere in the document. The document should include a short section somewhere that addresses why following this ECMP is necessary including the relationship of water quality and quantity protection to the recharge, transport, and impacts of the project on Barton Springs pool and endangered salamanders. This is regardless of their presence onsite as hydrologically, they might as well be..
132	ECMP	35	7.0, 7.1	This section ignores the fact that Golden-cheeked Warbler habitat and observations occur within the project area, including Zone 2 GCWA habitat that should be mitigated through the BCCP.
133	ECMP	35	7.0	The statement "being able to recognize these species and avoid impacting them is the best way to protect them" should be replaced with "identifying, protecting, and buffering the habitat of these species and imposing time constraints to avoid clearing and construction activities during their breeding seasons is the best way to protect them."
134	ECMP	35	7	States that extensive surveys determined that no protected species or their habitats were present. However, Golden-cheeked warblers are found within 300 feet of the project area and their habitat is found within the project area.
135	ECMP	36	7.2	Delete the statement that horned lizards "will likely move away from the project area on their own" unless this can be backed by a supporting evidence.
136	ECMP	36	7.2	Delete the statement that "if found, these species should not be harmed." Unless searches for habitat and individuals of these species are conducted prior to initiating the project, the likelihood of finding them during the project is unlikely (i.e., Bandit Cave Spider).
137	ECMP	36	7.2	Species of Greatest Conservation Need are listed in section 7.3, but not described. How will the contractors or ECM identify these species?
138	ECMP	38	8.0	Who will determine whether nests are inactive and be responsible for removing them? What are the TXDOT Environmental Office methods for preventing migratory birds from building nests?
139	ECMP	39	9.1	Portable chain link is preferable to orange fence for areas such as CEZs and protected trees.
140	ECMP	39	9.1	Protection of Sensitive Features: Language such as “greatest extent practicable, efforts will be made” are not useful in a document like this. Please provide some kind of treatment goals/standards for water quality/quantity that can be directly measured. These could be the ones calculated in the SLAT program to compare with SOS requirements even if non-degradation is not met for every parameter. Another example - “No construction will be allowed in the buffers (not “restricted construction” with no details of what that means). Please include language that encompasses all the types of sensitive features that will be inventoried and documented, not just karst. There is nothing currently that refers to wetlands, rim rock, springs, riparian woodlands or other valuable resources.
141	ECMP	39	9.1	Vegetation Mgmt.: Clearing and then inspecting for sensitive features is not in the right order. Many water quality features are most clearly identified and documented via the vegetation present. Again, since all sensitive features are not karst, a geologist isn’t necessarily the appropriate expert to inspect these features. Please specify where and when seeding will be used for revegetation vs. containerized plants, sod, etc. Depending on time of year and specific locations, seed mixes should be adjusted accordingly (sun, shade, wet, dry, etc.). Soil stabilization/revegetation needs to completed within some pre-determined time frame so that erosion doesn’t occur frequently. Winter mixes of cereal or other cover crops need to be provided.

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No.	Document	Page	Sec.	Review Comments:
142	ECMP	39	9.1	In addition to armoring min. 6" mulch should be placed within dripline if it cannot be fenced. This is effective in preventing compaction or root damage.
143	ECMP	40	9.2	States "the use of fertilizers is prohibited;" just to clarify, all chemical pesticides, herbicides, and fertilizers are to be prohibited from the project area, correct (Section 2.5)?
144	ECMP	40	9.2	Can time for temp seeding be reduced below 14 days?
145	ECMP	40	Table 3	The footnote for Table 3, Project Specific Seed Mix for Permanent Stabilization, refers to Winter Wheat for temporary seeding during the cool season. It is unknown what species "winter wheat" refers to and suggest the specification of Western wheatgrass (*Pascopyrum smithii).* Foxtail millet is specified for temporary warm season seeding but this is a non-native that has been reported to be invasive. We suggest the specification of either cereal rye grain (*Secale sereale*), Oats (*Avena sativa*) or Canada wildrye (*Elymus canadensis*) as an alternative.
146	ECMP	41	10.0	Clarifications: "Oak wilt is caused by a fungus that can be spread…by *pruning and* pruning tools. The fungus is spread by *sap-feeding beetles* (suggest replacing this with "certain insects") *that feed on sap draining from fresh wounds following pruning* (suggest replacing this with visit trees following pruning). Recommend specifying that "susceptible trees" are "oak trees".
147	ECMP	42	12.0	Contact tree should reference or include information to be gathered for first report from TCEQ webpage. http://www.tceq.state.tx.us/response/spills/reporting_info.html
148	ECMP	43	12.0	The Emergency Phone Numbers should include COA Spills (512-974-2550) and COA Wildland Conservation Division (512-972-1662) since spills, fires or other emergency issues could involved adjacent properties.
149	ECMP	79	Appendix 2	The last bullet proposes backfilling with gravel in boreholes where a void is encountered. This will result in a surface connection to the void and poses a threat to groundwater. This be revised to follow a modified protocol where the portion of the borehole containing the void is cased off or filled with gravel but sealed with non-shrink grout above and below the void horizon. Please state the reasoning as to why gravel backfill is deemed appropriate and protective.
150	ECMP	80	Appendix 2	Make sure procedures are consistent with void mitigation procedures shown in plans
151	ECMP	80	Appendix 2	The third bullet lists criteria for conducting down-hole video camera survey of voids. Item 2 criteria of 36 inches is so large that it seems unlikely that any boreholes outside of sensitive feature drainage basins will be inspected if a void is encountered. This should be revised to 12 or 18 inches.
152	ECMP	81	Appendix 2	The flowchart should replace 36 inches with 12 or 18 inches in the right-hand box in the third row.

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No.	Document	Page	Sec.	Review Comments:
	SPECS	General	All	Conflicting guidance from the ECMP, Plans and specifications should be dealt with directly. For example, the Plans and ECMP state no pesticides/herbicides will be used, yet Spec 194 on Landscaping includes "Treat the plants and planted areas in accordance with TDA or TSPCB laws and regulations. Follow the manufacturer's instructions for handling and applying pesticides." This doesn't' sound like a prohibition. There are several other references to chemical usage in the standard specs. Either hierarchy of what controls bid, statement that most stringent environmental stipulation controls, or some other method to resolve the conflicts is needed.
	SPECS	General Notes	Sheet K	TxDOTs oak wilt prevention policy is referenced, but not how to find it. Although probably Section 10.0 of the ECMP is enough, the contractor probably needs to know where to find the actual TxDOT policy.
	SPECS	A-2	General	v3/2016 BSEACD staff are permitted to observe construction of SH45SW. Why in particular, is the City of Austin excluded when it has perhaps been the most engaged member of the TWG. Although this engagement is voluntary, and the COA has no specific permitting or enforcement authority, it does have a significant interest in the environmental aspects of the project given the adjacent property owned by the City and the resources it protects downstream/gradient from the project. It is hoped that this participation would continue through construction and maintenance.
	SPECS	A-7	Item 110	v3/2016 the ECMP and Void Mitigation plan sheets are referenced for void discoveries during excavation, but the Void Protection Plan is not referenced. Void Mitigation Measures are pages in the plan sheets and reference is made to a Void Mitigation Plan. It might be difficult for the Contractor to determine what is what and where to find it in an emergency. Probably should be included in training also.
	SPECS	B-43	SP 506 Temp E&S Controls	Training section should also list any project-specific training
	SPECS	B-108	SS9XXX Impermeable Liner	This SS appears to be inconsistent with that discussed in the Jan. 13, 2016 TWG meeting and should be updated (for example, 30 mil thickness is thinner than explained at meeting). Also there is no mention of the cement-stabilized layer underneath, which will need to be specified and paid for somewhere.
	SPECS	N/A	Item 342 PFC	The TxDOT Standard Spec Item 342 for PFC does not reference a layer thickness, nor does layer thickness appear to be verified prior to final acceptance. For this project, PFC is an important component of the water quality treatment train. Consider adding a special provision to 342 which lists required layer thicknesses and verification methods to ensure this is achieved, as well as any other potential project-specific elements of PFC installation.
	SPECS	N/A	Item 168 Veg. Watering	It is not clear how frequently and by what means the landscape will be watered. Additionally the project team had said that the water would be non-chlorinated. This is not covered in the standard specification. Is a special provision needed?
	SPECS	N/A	Item 164 Seeding for Erosion Ctrl	The standard specification does not include the special seed mix that the project team has indicated will be used (formulated by LBJ Wildflower Center). A special provision or special specification is needed to identify the species, application rates, etc.
	SPECS	N/A	N/A	There is no specification listed for Vegetative Filter Strips. Is enough information given in the plan set that will provide for the construction of these?

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No.	Document	Page	Sec.	Review Comments:
	WPAP	113	Figure 4.2-3	Suggest moving the Shared Use Path (SUP) closer to SH45 in order to increase the buffer for F-18, Cow Pattie Sink. Figure 4.2-3 shows a sizeable gap between the perimeter of the buffer and a stormwater diversion dike.
	WPAP	1220	Geologic Assessment Section 5.0 Table	Flint Ridge Cave isn't listed on the geologic assessment table but should be.
	WPAP	206	Attachment G IPM Plan	The second page of the IPM plan says that the introduction of predatory insects may be used as a temporary measure for ant control. This strategy is discouraged unless the species are specifically targeted to RIFA or tawny crazy ants. Please add this language.
	WPAP	34	Attachment A Factors Affecting Surface Water Quality	Contaminated runoff can infiltrate through permeable soils and affect groundwater quality and not limited simply through "unsealed karst features." Tracer studies on this site in 2007 *and Nov. 2014 show relatively rapid transport through soil and vadose zone.
	WPAP	`121	Attachment D BMPs for Surface Streams	The BMPs utilizing infiltration to remove contaminant loading from stormwater runoff would be expected to increase contamination of downgradient groundwater, as simulated by on site preliminary tracer tests conducted by the City of Austin in 2007* and November 2014. *Hauwert, N. and Cowan, B. 2013, Delineating Source Areas To Cave Drips And Cave Streams In Austin Texas, USA: 13th Sinkhole Conference, Carlsbad, NM. http://www.karstportal.org/node/11735?destination=node/11735 Cowan, B. and Hauwert, N., 2013, Use of Physical and Chemical Response in Cave Drips to Characterize Upland Recharge in the Barton Springs Segment of the Edwards Aquifer, Central Texas, USA: 13th Sinkhole Conference, Carlsbad, NM. http://www.karstportal.org/node/11735?destination=node/11735
	WPAP	99/916	Attachmentt D - SH-45 Soil Boring Procedures	It can be expected that shallow perched groundwater will be encountered in some of the drilled shafts or bores that if not properly mitigated will block or divert groundwater from its original destination. LCRA drilled similar shafts along its parallel right of way, but by using downhole camera were able to identify voids and perched water in order to mitigate flow diversions. It is recommended that each shaft be downhole camered and reported to TCEQ/City of Austin/Barton Springs/Edwards Aquifer Conservation District to review the plugging/filling of any shafts containing voids and perched groundwater. Where or not a boring location is within a surface catchment for a cave has little bearing on whether it might support drips for that cave in the subsurface. During November 2014 tracing tests on the site, we interpreted tracer travel to cave drips beyond the cave surface catchment area.
	WPAP	99	Attachment D - Temporary Best Management Practices and Measures	Based on the methods and standards applied, only a possible temporary reduction in contaminate loading can be expected not a complete prevention of pollution suggested in Attachment D.
	WPAP	1070	Geologic Assessment - Photos Section 4.0 Detailed Descriptions of Karst and Non-Karst Features	Feature 58-a: this large mud filled feature was excavated at least 7 feet deep and was characterized as a non-karst closed depression in the geologic assessment. It appears to be a significant sinkhole which would explain the abrupt bedrock depression and thick soil here. It is located about 350 feet west of Flint Ridge cave entrance. In our sinkhole restoration projects we have to able to excavate features such as this safely with a backhoe and advise additional excavation so that it can be evaluated.
	WPAP	33	Attachment A Factors Affecting Surface Water Quality	Herbicides are listed as a potential water quality constituent in site runoff during construction and operation. This isn't consistent with the ECMP and Plans prohibiting Pesticides and Herbicides. Since this is just a literature list, not a project-specific list, maybe a footnote?

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No.	Document	Page	Sec.	Comments
1	PLANS	68	E&S Control Summary	Can you provide specifications for the following bid items? a. Topsoil b. BFM c. Watering d. Rock dams. *CTRMA Response: The bid document will include Standard Specifications for:* *(a) Item 160 Topsoil* *(b) Item 164 Bonded Fiber Matrix Seeding (a Special Provision will be developed prior to final submittal)* *(c) Item 168 Vegetative Watering* *(d) Item 506 Temporary Erosion, Sedimentation, and Erosion Controls (which discusses Rock Filter Dams Type 5).* **COA Response: How much topsoil will be salvaged and how much brought in? Provision for stockpiling/protecting topsoil? Contractor will only water minimum. Should have schedule for irrigation to ensure vegetative growth. Compare BFM spec to ECM**
2	PLANS	68	E&S Control Summary	Are there bid items/specs for: sedimentation ponds, mulch for temporary erosion control and vehicle mud control prior to entering ROW? *CTRMA Response: Pond items are on the Summary of Water Quality Ponds sheet 60. Salvaged vegetative mulch used to temporarily stabilize the haul road will not be paid for directly, it will be considered subsidiary to the various pay items. Construction exits will be installed to minimize tracking of mud onto adjacent roadways (item 506 6020). See sheets 76 - 77 for Erosion and Sediment Control quantities and 1187 - 1204 for E&S Control layouts.* **COA Response: How will the contractor know how to build the ponds to act as temporary sedimentation ponds? How will the mulch depth be specified and the need for replacement?**
3	PLANS	100	TC Narrative	General Description. “It is imperative that the contractor adhere to the SWPPP, etc.…” Please ID the other contract document language that specifies: Individual responsible for inspection/enforcement; criteria for adherence/failure to adhere to SWPP and elements of CEZ and Hazardous Materials Management. *CTRMA Response: The Environmental Compliance Management Plan (ECMP) specifies the responsibilities of the contractor, Independent Environmental Compliance Manager (IECM), and other parties (Sec 1.2 and 1.5). Hazardous Material Management and response to spills is discussed in Section 3.0. The requirements for compliance with SW3P and consequences for non-compliance are discussed in Sec 4.0. The construction contract will also include fees for contractor failure to comply with the ECMP.* *The Construction Exclusion Zones are shown on the Prohibited Activity Layout sheets 1288 - 1320, along with notes discussing CEZ requirements.* **COA Response: Fees for noncompliance- who determines noncompliance? Cn we see contract language for failure to comply?**
4	PLANS	100	TC Narrative	The onus for inspection and compliance appears to be on the contractor. Is there language that describes the role of the third party ECM. *CTRMA Response: The responsibilities of the IECM are described in Sec 1.2 and 1.5 of the ECMP.***COA Response: As noted in comments on ECMP, contractor having primary responsibility for inspecting and monitoring is problematic. ECM should do this daily as contractors will be grading on a daily basis.**

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No.	Document	Page	Sec.	Comments
5	PLANS	100	Sequence of Construction	Identify party responsible for inspection, completing logs, directing maintenance and enforcement.*CTRMA Response: Under "Environmental Compliance" on sheet 82, the contractor is directed to the ECMP, which outlines responsibilities for inspections, documentation, maintenance and enforcement. These responsibilities are summarized on sheet 82 under this section.* **COA Response: As noted in comments on ECMP, contractor having primary responsibility for inspecting and monitoring is problematic. ECM should do this daily as contractors will be grading on a daily basis.**
6	PLANS	101	Sequence of Construction	No mention of adaptive management or placement of temporary construction phase E&S controls outside of perimeter BMPs and mulching for Haul Road. Mulching is called out as subsidiary to Pay Item 100. Needs to be more specification of the extent of mulch needed and what happens of the subsidiary mulch from ROW prep is inadequate for on-going construction needs.*CTRMA Response: Salvaged vegetative mulch will remain subsidiary, however notes will be added to the ESCP sheets to provide specific requirements regarding placement of mulch. Temporary crossing at Bear Creek must meet the requirements included on sheet 312. Typical sections provided on the E&S Control Plan (HR) sheets indicate a minimum of 1" deep mulch covering.* **COA Response: 1 inch of mulch is too little. Minimum of 4 inches then replace at regular intervals. Should estimate quantities needed and provide explicit bid item to cover shortfall from onsite mulching.**
7	PLANS	101	Sequence of Construction	Please indicate specs for mulching of HR and temporary crossing of Bear Creek.*CTRMA Response: Salvaged vegetative mulch will remain subsidiary to Preparation of ROW, however notes will be added to the E&S Control Plan sheets to provide specific requirements regarding placement of mulch. Temporary crossing at Bear Creek must meet the requirements included on sheet 312. Additional requirements related to permanent stabilization will be added prior to the final submittal* **COA Response: 1 inch of mulch is too little. Minimum of 4 inches then replace at regular intervals. Need new plans to review Sheet 312**
8	PLANS	101	Sequence of Construction	Reference for use of ponds as construction phase sedimentation basins in SWPPP?*CTRMA Response: The ponds will be one of the first items constructed within each phase, so that they can function as temporary sediment basins during construction.* **COA Response: Details, notes or specs on how to construct the pond to function as 2 year storm sedimentation basin?**

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9	PLANS	308	Temp. Crossing	Relating to the temp. haul road crossing, COA ECM 1.6.4: "Where temporary channel crossings are required, compacted earth is not allowed. The designer must demonstrate that the proposed crossing is capable of withstanding a 25 year storm and that failure would not result in a discharge of construction materials" pp 308,309 *CTRMA Response: The only temporary creek crossing proposed is the Bear Creek crossing shown on sheets 312 - 314. This crossing consists of a temporary bridge spanning the limits of the Ordinary High Water Mark (OHWM), so there will be no construction or compaction in the OHWM. Requirement 8 on sheet 312 states that abutment shall be designed to withstand the forces of a 25 year storm. The design team is considering reducing the design storm from 25 year to a 10 year frequency. Gabions and gabion mattresses are specified to minimize impacts of failure (i.e. all material is contained). Grading has been established to minimize placement of fill at the approaches. (Note: This requirement could not be located in Section 1.6.4 of the Environmental Criteria Manual online, or anywhere else in the ECM.)* **COA Response: If LOC includes the creek, then it is likely that contractor will have heavy equipment access into the creek. A formal de-watering/baseflow bypass plan to minimize disturbance and sediment discharge into the creek should be developed and included.**
10	PLANS	527	Stone Riprap Details	Please identify source of sizing dimensions for rock stilling basins. Inconsistent with COA 508S Standards. *CTRMA Response: Rock stilling basin sizing dimensions are based on Chapter 10 of HEC-14 (July 2006). Note: this is now sheet 509.* **COA Response: Have the TXDOT standard riprap rap sizes been verified against the sizing procedure in HEC-14, chpt. 10 (10.4)?**
11	PLANS	528	Riprap Basin	Source of Sizing dimensions? 2:1 slopes into basin are steeper than standard practice. *CTRMA Response: Rock stilling basin sizing dimensions are based on Chapter 10 of HEC-14 (July 2006). Note: this is now sheet 510.* **COA Response: Have the TXDOT standard riprap rap sizes been verified against the sizing procedure in HEC-14, chpt. 10 (10.4)?**
12	PLANS	633	Temp EC Logs	Specs for Logs and installation? *CTRMA Response: Covered under TxDOT Standard Spec 506.* **COA Response: 506 2.10 Recommend using ECM 1.4.5 F.1 for spacing of logs and temp sediment control fences. Also, experience has shown that containment mesh that is biodegradable breaks down easily and limits the usefulness under heavy construction. Recommend specifying that containment mesh have following characteristics: The material mesh opening should be equal to or less than 3/8 inch (10 mm) and the material tensile strength should be equal to or greater than 202 psi (14.2 kg/cm2).**
13	PLANS	633	Temp EC Logs	Typically not recommended for concentrated flow. *CTRMA Response: We will use silt fence checks where the depth will allow us to do so, otherwise, we will continue to use the smaller logs.* **COA Response: Silt fence also not recommended for concentrated flow if used as sedimentation device.**

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14	PLANS	633	Temp EC Logs	Can you provide calculations for the design storm used for sizing, capture volume and expected sedimentation?*CTRMA Response: See Sheet 1186A (computations for ditch checks) and 1186B (computations for sedimentation basins). We will make sure that the both of these BMPs used together will equate to the 2 year storage as shown by the value "V" in the table provided on Sheet 1186B.* **COA Response: Design storm shown on sheets 1186A refers to mean storm, not 2 year. Can you describe the calculation procedure to determine the number of checks, the spacing and how the required storage equates to containment of the 2 year storm runoff? It appears that volume calculations show the available volume for sediment storage behind each check structure. But this does not equate to capture of two year storm and detention for sedimentation. While the checks will intercept some sediment, unless designed to capture the design storm there will be frequent bypass and transport of sediment. Finally, on Sheet 1186 B, it appears that runoff coefficients of .3 were used for disturbed condition. Disturbed conditions with topsoil removed and subgrade impacted by heavy equipment will have a higher runoff coefficient that .3. In addition, it is unclear how the stage/storage/discharge of the pond/skimmer will result in a drawdown time that will achieve a quantified level of sediment removal or the capture volume of the two year storm. Are there details for the skimmers?**

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15	PLANS	1101	EPIC	VII. Other Environmental Issues - Rock berms and filter fabric (i.e. silt fence) are not designed for filtration of sediment. Are there specs available that discuss performance criteria? *CTRMA Response: The high service rock filter dams proposed for the project include sediment control fence, and are designed to control sediment. Performance and maintenance criteria are shown on Type V High Service Rock Filter Dam Details sheet 1286.* *Additionally, the Consent Decree between BSEACD and TxDOT states "No highway runoff during construction or operation shall be allowed to directly enter sensitive recharge feature without filtration of sediments in the runoff using filter fence and fabric lined rock berms." We are doing what the Consent Decree requires.* **COA Response: The drafters of the Consent Decree did not understand the function of silt fence or rock berm. That recommendation is antiquated and should probably be revisited to make sure the BMPs used actually function to prevent off-site transport of sediment. If they are used, then they should be sized to prevent bypass per item 4 in section VII on Sheet 1181.**
16	PLANS	1101	EPIC	Lots of triangular ditches. Should anticipate concentrated flow causing gullies in channel bottom. EIS (H-22) said all swales would be flat bottom with side slopes of 3:1 or flatter. *CTRMA Response: The ditch only has to be flat-bottomed if it is being used as a water quality BMP to remove sediment. The ditches on this project are not being counted as a BMP, so this requirement does not apply. Currently, roadside ditches are designed to adhere to other project constraints and considerations such as limiting disturbance to the natural terrain and constraints with grading between two pavement edges without the need to install lengthy storm sewer systems.* **COA Response: According to FEIS H-22, Upgradient overland flow prevention techniques include interceptor swales, which are diversion drainage swales, not a WQ BMP. And H-22 says that these non-WQ, ditches are to be designed as flat-bottomed with 3:1 slopes or flatter. Please clarify.**
17	PLANS	1102	SW3P	A. General Site Data, 4. Major Soil Disturbing Activities - Indicate party contractually responsible for inspection activities.*CTRMA Response: Added "as described in Section C of this sheet and in the Environmental Compliance Management Plan (ECMP)" to end of the first item.* **COA Response: See comments on ECMP. Contractor in charge of his own inspection is a conflict of interest.**

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18	PLANS	1102	SW3P	A. General Site Data, 4. Major Soil Disturbing Activities - Define Phases and Interim Stabilization Practices per General Permit. *CTRMA Response: Phases and associated interim stabilization practices are described in detail on the Sequence of Construction, sheets 82 - 84A.* **COA Response: Unless more specifically directed and specified, it is likely that tree/vegetative clearing will be performed by a dozer or other grading equipment. Typical practice is for the vegetation to be dozed and uprooted. Under the specific segments SOC it is stated that clearing and mulching trees shall not disturb soil. It will be a challenge to ensure that this happens without explicit means and methods. Finally, the perimeter ESC controls should be installed prior to any vegetative clearing (except for the BMPs themselves) and construction of swales, dikes, etc.**
19	PLANS	1102	SW3P	A. General Site Data, 4. Major Soil Disturbing Activities - Should include a clear statement that erosion control practices should emphasizes source control by quickly stabilizing disturbed areas.*CTRMA Response: Revised third item to include this language.* **COA Response: Reference to ECM does not constitute source control. Discussion at last TWQ discussed adding a time sequence and appropriate BMPs to address temporary stabilization in a manner more timely that the 14 days in the General Permit.**
20	PLANS	1102	SW3P	A. General Site Data, 4. Major Soil Disturbing Activities - Identify contract language that provides authority for ECM and process by which E&S controls are adjusted, including allowances for pay item increases/additions.*CTRMA Response: Contract documents are still being created, but will include the authority of the ECM to direct the contractor to maintain or revise E&S controls as needed.* **COA Response: Would like to review contract documents when available.**
21	PLANS	1102	SW3P	B. Erosion and Sediment Controls - Mulching not included as soil stabilization practice. Discussion to date has emphasized use of mulch to stabilize exposed soil. Please address and provide spec, bid item and quantity.*CTRMA Response: Bonded Fiber Matrix has been added in the latest submittal. See sheet 1182 for inclusion in the SW3P. See sheet 76 for bid item and quantity.* ***COA Response: Mulch still subsidiary. See comment 19.1 inch of mulch is too little. Minimum of 4 inches then replace at regular intervals. Should estimate quantities needed and provide explicit bid item to cover shortfall from onsite mulching.***

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22	PLANS	1102	SW3P	B. Erosion and Sediment Controls - Please provide all design storm assumptions and sizing/spacing calcs for E&S BMPs designed for sedimentation (e.g. temp sediment ponds, silt fences and mulch logs). *CTRMA Response: In the latest submittal, see sheets 1186A, 1186 and 1186B. Since all disturbed areas receive BFM or an equivalent SRB, a very conservative approach, computations for slope surface protection along the project is not provided. Any problem areas along the project, such as slopes steeper than 3:1 or where excessive flow is expected, will be covered with rock or concrete riprap as needed.* **COA Response: See comment 33. Design storm shown on sheets 1186A refers to mean storm, not 2 year. Can you describe the calculation procedure to determine the number of checks, the spacing and how the required storage equates to containment of the 2 year storm runoff? It appears that volume calculations show the available volume for sediment storage behind each check structure. But this does not equate to capture of two year storm and detention for sedimentation. While the checks will intercept some sediment, unless designed to capture the design storm there will be frequent bypass and transport of sediment. Finally, on Sheet 1186 B, it appears that runoff coefficients of .3 were used for disturbed condition. Disturbed conditions with topsoil removed and subgrade impacted by heavy equipment will have a higher runoff coefficient that .3. In addition, it is unclear how the stage/storage/discharge of the pond/skimmer will result in a drawdown time that will achieve a quantified level of sediment removal or the capture volume of the two year storm. Are there details for the skimmers?**
23	PLANS	1102	SW3P	B. Erosion and Sediment Controls - Please include in the SWPPP a map of the locations for temporary sedimentation ponds, calculations for sizing and sediment removal as well as details for the skimmers that were referenced in TWG meetings and the EIS. *CTRMA Response: The permanent Water Quality Ponds, shown on sheets 1334-1350, will be constructed first and will serve as the temporary sedimentation ponds for the project. See sheet 1186B for sizing of the skimmers.* **COA Response: See comment 33. Design storm shown on sheets 1186A refers to mean storm, not 2 year. Can you describe the calculation procedure to determine the number of checks, the spacing and how the required storage equates to containment of the 2 year storm runoff? It appears that volume calculations show the available volume for sediment storage behind each check structure. But this does not equate to capture of two year storm and detention for sedimentation. While the checks will intercept some sediment, unless designed to capture the design storm there will be frequent bypass and transport of sediment. Finally, on Sheet 1186 B, it appears that runoff coefficients of .3 were used for disturbed condition. Disturbed conditions with topsoil removed and subgrade impacted by heavy equipment will have a higher runoff coefficient that .3. In addition, it is unclear how the stage/storage/discharge of the pond/skimmer will result in a drawdown time that will achieve a quantified level of sediment removal or the capture volume of the two year storm. Are there details for the skimmers?**

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24	PLANS	1102	SW3P	C. Other Requirements and Practices - 1. Maintenance. Independent, third party ECM needs to be involved in inspection of E&S pre and post-storm and be the authority in determining “good –working order” and “remedial action”. Please provide contract documents that demonstrate the contractual authority for the ECM to inspect, approve and enforce via stop work orders and monetary penalties any deficiencies and/or discharges of sediment or hazardous materials from site. Mitigation and/or remediation procedure for off-site sediment/pollution impacts (if they were to occur) needs to be defined in contract documents and provision for inclusion in bid-item. Describe p*rocedure for inclusion of COA in the event that adjacent COA lands are impacted. CTRMA Response: The IECM will be involved in inspection of the project and enforcement of environmental requirements (via both stop work orders or issuance of fees). IECM contract documents are still under development, however they are being drafted to include the responsibilities outlined in the ECMP.* **COA Response: Would like to review contract documents when available.**
25	PLANS	1102	SW3P	C. Other Requirements and Practices - 2. Inspection. Independent ECM needs to inspect and verify report in tandem with contractor. All contract documents need to reflect the authority of ECM over and above the contractor in terms of determining effectiveness of pollution controls and mitigation/remediation necessary. *CTRMA Response: The IECM will review contractor's daily reports for concurrence. The ECMP Section 1.2 states "The IECM has the authority to stop work in any situation deemed inconsistent with environmental regulations or the project's environmental goals and commitments." The contract documents are being drafted to allow the IECM's discretion in determining the effectiveness of erosion and sedimentation controls.* **COA Response: Would like to review contract documents when available.**
26	PLANS	1102	SW3P	C. Other Requirements and Practices - 2. Inspection. Please provide reference to the Environmental Compliance Management plan promised in the EIS and the draft contract documents that demonstrate the hiring processes for the Environmental Compliance Manager as promised in EIS. Also include reference in the SWPPP to the contract documents that guarantee the authority of the ECM per the EIS (H-20). *CTRMA Response: Will add reference to the ECMP to Section C.2. Inspection on sheet 1182. The contract documents are still being drafted, but will include the authority of the IECM to stop work and/or issue fees to enforce environmental requirements on this project.* **COA Response: Would like to review contract documents when available.**
27	PLANS	1102	SW3P	C. Other Requirements and Practices - Add items 6 & 7 "Construction vehicle tracking and dust control. Need more specific performance measures than “minimize”. This is a significant source of uncontrolled sediment. Measures should include tire washing on –site and twice daily street sweeping of roadways to the extent determined by the ECM. Methods and frequency of dust control need to be under authority of ECM and goal should be to prevent visible dust (at a minimum) beyond the limits of construction. Bid items need to specify this activity to make sure contractor has pay item or needs to be in a specification as subsidiary to another bid item." *CTRMA Response: The contractor will be held to the requirements shown in the ECMP Section 2.1 Fugitive Dust Control. The IECM will enforce these requirements. Rather than specify the exact measures to be taken by the contractor, it is preferable to allow the IECM the flexibility to work with the contractor to develop and implement the best dust controls for the project.* **COA Response: Are there criteria that can be implemented, like required daily street sweeping?**

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28	PLANS	1104	E&S Control Computations	Design storm is less than one year depth. Discussion in meetings suggested that 2-year design storm would be used and per other City comments we recommend considering greater than the 2-year storm.*CTRMA Response: Design storm was revised to 2-year for 95% submittal. See sheets 1186-1186B for updated calculations.* **COA Response: See comment 33. Design storm shown on sheets 1186A refers to mean storm, not 2 year. Can you describe the calculation procedure to determine the number of checks, the spacing and how the required storage equates to containment of the 2 year storm runoff? It appears that volume calculations show the available volume for sediment storage behind each check structure. But this does not equate to capture of two year storm and detention for sedimentation. While the checks will intercept some sediment, unless designed to capture the design storm there will be frequent bypass and transport of sediment. Finally, on Sheet 1186 B, it appears that runoff coefficients of .3 were used for disturbed condition. Disturbed conditions with topsoil removed and subgrade impacted by heavy equipment will have a higher runoff coefficient that .3. In addition, it is unclear how the stage/storage/discharge of the pond/skimmer will result in a drawdown time that will achieve a quantified level of sediment removal or the capture volume of the two year storm. Are there details for the skimmers?**
29	PLANS	1105-1123	E&S Control Plan - HR	Please provide specification for BECL and SCF and reference to sizing, spacing, sediment trapping for design storm and installation and maintenance criteria. *CTRMA Response: BECL and SCF are both covered by TxDOT standard specification 506, which discusses installation. BECL construction and installation is shown on Temporary Erosion Control Logs sheet 1283. Sediment control fence is embedded in the rock filter dams, as shown on sheet 1286. The locations of BECL and SCF are shown on the Erosion and Sediment Control Plan Segment HR, sheets 1187 - 1204.* **COA Response: See comment 31. 506 2.10 Recommend using ECM 1.4.5 F.1 for spacing of logs and temp sediment control fences. Also, experience has shown that containment mesh that is biodegradable breaks down easily and limits the usefulness under heavy construction. Recommend specifying that containment mesh have following characteristics: The material mesh opening should be equal to or less than 3/8 inch (10 mm) and the material tensile strength should be equal to or greater than 202 psi (14.2 kg/cm2).**
30	PLANS	1105-1123	E&S Control Plan - HR	For haul road segments, BECL/SCF parallel to road will contain water running downslope. Effective used of rolled sedimentation devices would be placed perpendicular to flow. If logs are used, then they can be moved at the beginning of the work day and replaced after work hours and before rain events. Drive over rock berms or similar may also be an effective control.*CTRMA Response: BECL and SCF are typically designed to remove sediment down slope of the haul road, but allow water to pass through. For areas where a greater amount of sheet flow is expected, sediment control fence is used instead of logs. Do not believe this will be an issue.* **COA Response: Since the haul road follows essentially follows existing grade, it has a longitudinal slope component. Water that ponds upslope will travel downhill. Without perpendicular checks, there will be transport of sediment laden runoff down the haul road.**
31	PLANS	1126-1147	E&S Control Plan - GS1/GS2	Where are construction staging areas shown, particularly borrow? Want to protect those areas (as well as spoils) from erosion. *CTRMA Response: There will be no borrow areas on this project. Construction staging/storage is not allowed in CEZs or Prohibited Activity Zones, as delineated on sheets 1288 - 1320. Language will be added under General Notes - General directing contractor to submit proposed staging/storage areas to IECM for approval. COA Response: Is there direction given to E&S controls for fill material?*

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32	PLANS	1126-1147	E&S Control Plan - GS1/GS2	COA criteria require that each detention area must contain the volume of water and sediment that may be mobilized during the 10-year 24-hour storm. Not seeing callouts for ST or ST/PO in WQ basins. Please provide reference for review of specifications, design calcs, details and sections for sedimentation ponds. *CTRMA Response: According to COA Environmental Criteria Manual, Section 1.4.4, "Plan Development and Implementation", under "Drainage Control", "Reviewers shall require calculations to demonstrate that drainage controls have the capacity to withstand the velocity of the 10 year 24 hour storm and all detention sedimentation controls shall be shown to have capture volume for the 2 year 24 hour storm as well as the volume of sediment generated from a two year 24 hour storm". In addition, Section 1.4.5.K.4 states that sedimentation basins should be placed to capture sediment from all areas that are not treated adequately by other sediment control measures. This entire project is covered by other sediment control measures. The use of the ponds as sedimentation basins is an additional conservative measure. Sheet 1186B has computations for the 2 year storm for all of the sedimentation basins. These computations are based on TCEQ/EPA requirements for sediment basin design. COA Response:* **See comment 33. Design storm shown on sheets 1186A refers to mean storm, not 2 year. Can you describe the calculation procedure to determine the number of checks, the spacing and how the required storage equates to containment of the 2 year storm runoff? It appears that volume calculations show the available volume for sediment storage behind each check structure. But this does not equate to capture of two year storm and detention for sedimentation. While the checks will intercept some sediment, unless designed to capture the design storm there will be frequent bypass and transport of sediment. Finally, on Sheet 1186 B, it appears that runoff coefficients of .3 were used for disturbed condition. Disturbed conditions with topsoil removed and subgrade impacted by heavy equipment will have a higher runoff coefficient that .3. In addition, it is unclear how the stage/storage/discharge of the pond/skimmer will result in a drawdown time that will achieve a quantified level of sediment removal or the capture volume of the two year storm. Are there details for the skimmers?**

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1	PLANS	General	All	It is a fairly huge bid package. A hierarchy of applicability should be mentioned somewhere. Like the most restrictive provision of the plans, specs, ECMP, WPAP, or other bid documents are to apply. This would address things like the fact that pesticides and herbicides are included in the txdot standard specifications, but notes on the plans and the ECMP prohibit their use on the entire site. Seeing the txdot specs, the contractor might think it is OK if they haven't' seen the ECMP and know the most stringent of the two restrictions applies, TxDOT would have more insight into how their contractors typically treat this issue.
2	PLANS	35	Sheet 35	The last item of Voids Definitions should be revised to state "Void has evidence of water flowing through or out of it."
3	PLANS	35	Sheet 35	No. 6 of Void Mitigation and Protection Measure please add that the concrete encasement of the pipe will be a minimum of 6 inches beyond the void edge.
4	PLANS	40	Sheet 40	Please add a note that all voids greater than 12" that are encountered in drill shafts shall be inspected with a downhole video camera.
5	PLANS	82	Sheet 82	Under Protection of Sensitive Features: please consider changing the perimeter fencing material to temporary chain-link rather than orange construction fencing in order to provide a more substantial physical barrier to equipment and personnel.
6	PLANS	83	Seq of Const Narrative	Why are spoils being removed from Hat Sink and Cow Pattie Cave? Shouldn't those sensitive features and buffers be left alone (i.e. never receive spoils)?

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7	PLANS	227	Removal	Please add a note that buffer perimeter controls and cave gates and erosion controls are to be installed prior to pavement removal.
8	PLANS	510	Misc Details (Drainage)	Lack of information (cross sections, details) on vegetative filter strips. What are the widths, longitudinal slopes, side slopes? In the plans, they're called ditches rather than VFSs.
9	PLANS	573	Drainage Plan	Lack of information (cross sections, details) on vegetative filter strips. What are the widths, longitudinal slopes, side slopes? In the plans, they're called ditches rather than VFSs.pp 573 and others.
10	PLANS	1180	EPIC	Standard EPIC sheets do not show all environmental commitments that the contractor needs to budget and comply with. This would be a good place to reference the ECMP and attach itemized commitment sheets and practical interpretation of them as appendix to ECMP. TxDOT guidance for EPIC sheets recommends "Never place an incomplete or inaccurate EPIC Sheet in the plans. If the environmental review document or CE/BCE/PCE documentation are not yet finally approved by TxDOT (or by FHWA, as applicable), indicate the status on the EPIC Sheet. The sheet will be completed when the environmental review document or CE/BCE/PCE documentation is finally approved.....The EPIC Sheet may also include commitments made to the public, other entities, and regulators.." This seems to indicate that all of the commitments in the FEIS should be provided to the contractor on the EPIC sheets.
11	PLANS	1180	EPIC	Temporary BMPs noted on this sheet should include those mentioned in the ECMP including Blankets/Matting (ECMP p14), Sand Bag Berms (p 31), and Triangular Filter Dikes (App 2 Boring).
12	PLANS	1180	EPIC	Although this sheet indicates no action on Culture Resources, ECMP Section 11.0 p42 indicates otherwise.
13	PLANS	1180	EPIC	A good example of cross referencing to maintain consistency. EPIC and SWP3 sheets reference Tree Preservation Plan for Oak Wilt Prevention which references ECMP Section 10.0. TxDOT Oak Wilt Prevention Policy is also referenced, and it is assumed that it is covered by the ECMP section 10.0. It also may refer to Manual 2013 on Roadside Vegetation that is more general. Availability of whatever TxDOT document this refers to should also be considered for the Contractor's use.
14	PLANS	1180	EPIC	The ECMP does not mention "the Engineer" although this position is referenced throughout the plans. Just a simple cross reference to the personnel this refers to in the ECMP would be needed. The EPIC guidance mentions "Project Design Engineer", but Contractor just needs to be clear on who he is directed to notify to comply with the plans. Other references are simply "Engineer of Record". As long as Contractor knows who this is, it probably doesn't matter what he/she is called. Clear roles and responsibilities are the issue. Also, method of notification of substitutes and changes in this position should be documented.
15	PLANS	1180	EPIC	Hazardous materials section states "No Action Required" on project specific hazardous materials. However, petroleum products are covered in the ECMP, and should probably be referenced to Section 3.0
16	PLANS	1182	SWP3	Item 5. General Site Data - Speck stony clay loam can have a more rapid effective infiltration rate through commonly found desiccation cracks. Impression from this item is that it is impermeable.
17	PLANS	1182	SWP3	Item 1. E&S Controls - Sodding and Sand Bags are not included as a stabilization practice on the EPIC sheets but included here on the SWP3 sheets. Consistency would be useful for the Contractor.
18	PLANS	1183	SWP3/SW3P	Most references to Stormwater Pollution Prevention Plan in the industry (including form 2118) are "SWP3" rather than "SW3P". Not that the contractor is likely to get confused, but for contract documents it is recommended they be consistent. Both acronyms appear in the plan set on pages 1183 and 1184 and a number of references throughout the plan set.pp. 1183,1184
19	PLANS	1183	SWP3	In general, much of what is missing from the SWP3 is in the ECMP. Either cross reference these sections on the posted SWP3, or post the ECMP in the same location. The point would be consistency. Template for SWP3 can be found at http://www3.epa.gov/npdes/pubs/sw_swppp_template_authstates.doc. pp. 1183,1184

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20	PLANS	1183	SWP3	A SWP3 should have contact info for responsible parties. Although this is covered in the ECMP, the SWP3 is a TCEQ required item and some references to RP would be warranted as a stand alone document. pp. 1183,1184
21	PLANS	1183	SWP3	Guidance from EPA and TCEQ includes noise abatement. Missing here, but could be referenced to the ECMP.pp. 1183,1184
22	PLANS	1183	SWP3	Under Waste Materials, add statement that says “Continual litter pick-up is the responsibility of each on-site employee.” pp. 1183,1184
23	PLANS	1183	SWP3	Under sanitary waste, add statement that says “Portable sanitary facilities will be provided on active job sites and will not be placed within the buffers or surface catchment basins of sensitive features or within the 100-year floodplain of streams.”pp. 1183,1184
24	PLANS	1183	SWP3	Although in the ECMP, there is nothing on pest management in the SWP3. Despite training, the ECMP will not be posted onsite, but the SWP3 will. Cross reference is needed.pp. 1183,1184
25	PLANS	1183	SWP3	The Hazardous Materials Management and Discovery portions or reference to ECMP are also missing from the SWP3. pp. 1183,1184
26	PLANS	1183	SWP3	The Spill and Leak Management and Reporting information is also in the ECMP, but missing from the SWP3. pp. 1183,1184
27	PLANS	1183	SWP3	Endangered species management should be in the SWP3 or referenced to the EPIC or ECMP, especially things for contractor to be aware of during construction.pp. 1183,1184
28	PLANS	1183	SWP3	In the vegetation management section in the SWP3 and ECMP, we would like a statement that says “At no time should any removed vegetation be discarded to the MS4 (curb, inlet, culvert, ditch, waterway).” pp. 1183,1184
29	PLANS	1183	SWP3	A cultural resources section should be in the SWP3 for potential discoveries during construction. pp. 1183,1184
30	PLANS	1183	SWP3	Technically, applicable Federal, Tribal, State or Local programs should be addressed in the SWP3. pp. 1183,1184
31	PLANS	1183	SWP3	Although they are elsewhere in the plans, please add reference to post construction BMP’s indicated (e.g. detention/retention, earth dikes, drainage swales, lined ditches, slope protection, etc.). pp. 1183,1184
32	PLANS	1183	SWP3	Please add the following to Non-Storm Water Discharges list (these are very important): waters used to wash vehicles and equipment where detergents are not used, uncontaminated excavation dewatering, landscape irrigation (i.e. during revegetation) pp 1183,1184
33	PLANS	1196	Erosion and Sediment Control Plan Sheets	Temporary chain-link fencing should be installed at the perimeter of the karst sensitive feature buffer zones as a means of ensuring that the prohibited activities occur outside of the construction exclusion zones. Currently, Construction Perimeter Fencing (CPF) is shown but the report describes it as orange tree fencing. This material is not a strong deterrent to access within karst sensitive feature buffer zones.
34	PLANS	1196	Erosion and Sediment Control Plan Sheets	Please confirm that the roadway will be elevated over the buffers of F110(Jubilee Cave) and F64 and F65. Please shift the path of the SUP where it encroaches into the buffer for F110.
35	PLANS	1202	Erosion and Sediment Control Plan Sheets	Please clarify whether there is a drainage structure in the irregular polygon area on the side of F23(Hat Sink) adjacent to the road. I an outlet or inlet is located within the buffer, then the buffer perimeter should be adjusted to exclude the structure.

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36	PLANS	1217	Erosion and Sediment Control Plan Sheets	Please explain how the configuration and alteration of the F110 (Jubilee Cave) and F64 and F65 buffers meet the standard criteria of TCEQ karst sensitive feature buffers. The description states that the buffer zone of F110 has been modified to 32 feet due to the location of the bridge piers. The buffer on the construction sheet 1217 of the WPAP show portions of the roadway within the buffer so it is unclear whether the buffers meet the criteria. It is understood that the roadway is elevated in this area and the ground disturbance will occur outside of the buffer but there will be an alteration of the direct rainfall infiltration and sunlight for growth of native vegetation.
37	PLANS	1225	Erosion and Sediment Control Plan Sheets	The description for Flint Ridge Cave states that the buffer zone has been widened to a minimum of 150 feet surrounding the feature. However, Sheet 1225 of the WPAP shows a buffer width of 50 feet between the cave footprint and the adjacent road infrastructure. Please explain how this buffer complies with TCEQ criteria.
38	PLANS	1229	Erosion and Sediment Control Plan Sheets	Please explain how the configuration and alteration of the F23 (Hat Sink) buffer meets the standard criteria of TCEQ karst sensitive feature buffers. The description states that the buffer zone has been modified to 12 feet due to the location of the roadway. The buffer on the construction sheets of the WPAP show several different configurations so it is unclear whether the buffer is less than 12 feet. Sheet 1229 depicts an irregular polygon adjacent to the roadway, presumably for the construction of the drainage outlet structure. The buffer should be changed if construction is proposed within the buffer.
39	PLANS	1229	Erosion and Sediment Control Plan Sheets	Please explain how the configuration and alteration of the F55 buffer meets the standard criteria of TCEQ karst sensitive feature buffers. The buffer was reduced to 20 feet for proposed bridge abutments.
40	PLANS	1230	Erosion and Sediment Control Plan Sheets	Please explain how the configuration and alteration of the F16 buffer meets the standard criteria of TCEQ karst sensitive feature buffers. The description states that the buffer zone has been modified to 33 feet to prevent offsite runoff from entering the catchment area. Sheet 1230 doesn't show the cave footprint. Please clarify whether the buffer needs to be modified due to the construction and how the modified buffer would meet the criteria.
41	PLANS	1230	Erosion and Sediment Control Plan Sheets	Please explain how the configuration and alteration of the F18 (Cow Pattie Cave) buffer meets the standard criteria of TCEQ karst sensitive feature buffers. The description states that the buffer zone has been modified to 11 feet to prevent offsite runoff from entering the catchment area. Sheet 1230 shows construction activity within the buffer. Please clarify whether the buffer needs to be modified due to the construction and how the modified buffer would meet the criteria.
42	PLANS	1233	Erosion and Sediment Control Plan Sheets	Please explain whether the configuration of the buffer for F157a (SH 45 Cave) and F157b meet the standard criteria of TCEQ karst sensitive feature buffers. The cave footprint isn't shown on sheet 1233 of the WPAP.
43	PLANS	1259	Permanent Erosion Ctrl Plan	Show permanent erosion controls where haul road may cross Bear Creek. Hatched area should everything potentially disrupted by temporary crossing.(Include for example type of blanket, type of mulch, seeding, areas where gabions and articulated blocks are to be removed, topsoil and/or decompaction treatments.) Could add a note clarifying that permanent E&S is only needed in this area if temporary crossing is used and add a cross-reference to that page on the P&P. pp 1259,1260.

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44	PLANS	1259	Permanent Erosion Ctrl Plan	Show permanent erosion controls where haul road may cross Bear Creek. Hatched area should everything potentially disrupted by temporary crossing.(Include for example type of blanket, type of mulch, seeding, areas where gabions and articulated blocks are to be removed, topsoil and/or decompaction treatments.) Could add a note clarifying that permanent E&S is only needed in this area if temporary crossing is used and add a cross-reference to that page on the P&P. p. 1259,1260
45	PLANS	1268	Erosion and Sediment Control Plan Sheets	Please remove the stipple pattern within the buffer of F157a (SH45 Cave) and F157b due to the similarity with the concrete riprap pattern.
46	PLANS	1288	Prohibited Activity Layout sheets	Temporary chain-link fencing should be installed at the perimeter of the karst sensitive feature buffer zones as a means of ensuring that the prohibited activities occur outside of the construction exclusion zones. Please add this to the legend for all of the Prohibited Activity Layout sheets. 1288-1331A
47	PLANS	1288	Prohibited Activity Layout sheets	The karst sensitive feature buffer zones shown on these sheets is different from those shown on the erosion and sedimentation control sheets. This may be for the purpose of construction phasing so that the fullest extent of the buffer is shown even though a portion of it will be altered with highway construction. It would be helpful to show the pre-disturbance and post-disturbance buffer perimeters. 1288-1331A
48	PLANS	1300	Prohibited Activity Layout sheet 1300	The CEZ should be revised for construction phasing so that the construction of the proposed diversion berm and rip rap apron aren't in conflict with this sheet.
49	PLANS	1300	Prohibited Activity Layout sheet 1303	There is an irregular, partial polygon shape at the northwestern side of the buffer of Hat Sink (F-23). What is the polygon designation and will it result in permanent encroachment into the buffer?
50	PLANS	1339	WQ Pond C	Appears that volume of pond has decreased since last review (October) from 9300 cu ft. to 7381 cu ft.. Is there a rationale for this decrease?
51	PLANS	1352	WQ Pond Misc Details	Pond liner - recommendation by COA is to use concrete pond bottom for durability; more discussion occurred in TWG meetings and emails. Note that SS1160 referenced in the plans is either the wrong reference or was not available to read at the time of this review