

**PETITION OF ENVIRONMENTAL STEWARDSHIP
APPEALING THE DESIRED FUTURE CONDITIONS (DFCs) FOR THE SPARTA,
QUEEN CITY, CARRIZO-WILCOX, CALVERT BLUFF, SIMSBORO, HOOPER,
YEGUA-JACKSON, AND BRAZOS RIVER ALLUVIUM AQUIFERS WITHIN ALL
AREAS OF GROUNDWATER MANAGEMENT AREA 12.**

Summary: The desired future conditions (DFCs) adopted by Groundwater Management Area 12 (“GMA12”) do not adequately consider the groundwater-surface water relationships and do not include protection for the: (1) Colorado River; (2) Brazos River; (3) streams and springs in the region impacted by projected pumping of water from the Carrizo-Wilcox Aquifer Group, Queen City Aquifer, Sparta Aquifer, Yegua-Jackson Aquifer; or (4) Brazos River Alluvium Aquifer within the boundaries of Groundwater Management Area 12. Based on modeling by the Texas Water Development Board, outflows to springs and surface waters in the GMA12 have declined by approximately 50% from 1980 to 1999. GMA12 has not considered a similar “water budget” to determine whether or not this trend is expected to continue through the planning period and has not made adjustments in DFC to mitigate this trend and its impacts on the surface waters and associated ecological and socio-economic impacts on the region as required by Texas laws and regulations. Further, the DFC are based on the 2007 Texas Water Plan demand projections (forward approach) rather than being based on the more scientifically valid “iterative approach” that would estimate the quantity of water the aquifers can yield without being damaged or without damaging the groundwater-surface water relationship.

Desired Future Conditions Being Appealed: Environmental Stewardship (“ES” or “Petitioner”) files this petition to appeal the desired future conditions (DFCs) adopted by GMA 12 by resolution on August 11, 2010 and at a subsequent meeting on August 25, 2010 (file GMA_12_DFC_Submittal, along with ES letter sent to TWDB at a later date to complete the record; **Attachment A**).

Petitioner’s Name:

Environmental Stewardship

**Petitioner’s Representative &
Contact Information:**

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(**Attachment B** is a copy of a resolution adopted by Environmental Stewardship describing the extent and nature of the authority of Mr. Box.)

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Legally Defined Interest: Section 36.108(l) of the Texas Water Code authorizes any person “with a legally defined interest in the groundwater management area” to file a petition with TWDB appealing the approval of the desired future conditions of the groundwater resources. Environmental Stewardship is a non-profit corporation and the owner of real property located in Bastrop County. This ownership is reflected in **Attachment C** to this petition. The goals of Environmental Stewardship include seeking the protection, conservation, restoration and enhancement the ecological functions of the Colorado River and its associated groundwater and watershed in order to optimize water available for beneficial human and environmental uses throughout the basin.

Appeal:

Section 36.108(l) of the Texas Water Code provides that a person with a legally defined interest in groundwater may, by petition, appeal a DFC as “unreasonable.” The adopted DFCs for GMA-12 are not reasonable for the following reasons:

- A. Over-pumping that will result from the adopted DFCs would unreasonably threaten the groundwater-surface water relationship and would harm terrestrial and surface water resources that depend on outflows of water to the surface.
- B. Though there is adequate quantitative data on the Colorado River to consider impacts of the DFCs on the river, these data were not used and the adopted DFCs pose significant risks to the river and its tributaries, especially during periods of drought. Texas Parks and Wildlife Department data were offered but not considered in the DFC process.
- C. Groundwater models make adequate provision for rivers, streams and springs to include in DFCs and numerous public interests urged consideration of these impacts, yet these were not considered and these surface waters will be unreasonably harmed by the adopted DFC.

- D. The adopted DFCs did not consider numerous springs that could have been quantitatively included and, therefore, the adopted DFC will cause unreasonable harm, which will likely cause many springs to go dry.
- E. Flow measurement technology exists to quantitatively monitor river and spring flows in order to protect rivers and springs from unintended consequences, yet these technologies were not considered and are not employed to monitor the impacts of the DFC.
- F. Unreasonably harmful socio-economic impacts will be experienced by the region due to over-pumping (over-drafting) of the aquifers that will result from the adopted DFCs.
- G. The adopted DFCs will make it difficult, if not impossible, for the Lost Pines GCD to meet its commitment to sustainable management of the aquifers.
- H. At § 36.0015, Chapter 36 of the Texas Water Code establishes that Groundwater districts are created to provide for the conservation, preservation, protection, recharging and prevention of waste of groundwater. The adopted DFCs wholly fail to ensure the conservation, preservation and protection of the subject aquifers, and in this fashion the adopted DFCs are contrary to the intents and purposes of the Texas Water Code.
- I. The adopted DFCs do not consider and include the citizen's desire to have the rivers, streams and springs protected as voiced in Opportunity Bastrop County.

Summary of Evidence:

A. The Adopted DFCs Are Not Protective of Surface Waters, Including Impacted Springs and Rivers

1. The Adopted DFCs Fail to Address Concerns Expressed by Texas Parks and Wildlife Department Regarding Surface Water Impacts.

In public comments presented to GMA-12, Texas Parks and Wildlife Department (TPWD) expressed concerns about the potential impacts of groundwater use on springs and base flows to rivers and streams. TPWD estimates that the adopted DFCs will result in a reduction of 98,460 acre-feet per year in flow to surface water bodies from the Carrizo-Wilcox, Queen City and Sparta Aquifers by 2060. Considering this fact, TPWD urged GMA-12 to include stream flow in the GMA-12's desired future conditions metric and to 1) consider impacts to surface water during DFC deliberations, 2) include quantitative impacts to surface water in DFC definitions, and 3) improve the GAMs in their representation of Groundwater/Surface water interaction. GMA-12 wholly ignored these recommendations.

TPWD proposed that stream flow be used as a DFC metric because (1) stream-flows have a direct impact on the environment, (2) surface water rights have been authorized contingent on the historical stream-flow record, and (3) stream-flows are a highly visible characteristic of the Texas landscape. TPWD further emphasized the importance of springs because they support unique aquatic environments including rare species, serve as a barometer of local aquifer conditions, are relatively inexpensive means of monitoring groundwater, and provide important base-flows to rivers. Base-flows are dependent on aquifer discharge, are important component of natural flow regime, and support habitats during dry periods.

Representatives of TPWD informed GMA-12 that TPWD has several years of data regarding the impact of groundwater resources on base flows of surface water bodies. GMA-12 wholly ignored this information.

This information was reiterated in a presentation to the GMA-12 at a public hearing on October 30, 2008 by Environmental Stewardship and called to the attention of the LPGCD Board of Directors in Environmental Stewardship's letter dated June 18, 2008. Texas Parks and Wildlife Department, the Texas Living Waters Project, a coalition of Environmental Defense Fund, the Lone Star Chapter of the Sierra Club, and the National Wildlife Federation also made comments at the October 30, 2008 hearing and submitted comment letters.

(The above-cited documents are provided in APPENDIX 2, ATTACHMENTS E-I)

2. The Adopted DFCs Fail to Address Groundwater-Surface Water Interactions Confirmed by Recent Studies

As discussed in Texas Water Development Report 365 ("Aquifers of the Gulf Coast of Texas"), LCRA staff has previously evaluated the groundwater gains and losses of the Colorado River as

it flows through Bastrop and Fayette Counties. This evaluation demonstrated that the hydrology of the lower Colorado River is fundamentally interconnected with the hydrology of the aquifers over which it flows. For example, in the Bastrop-Smithville area, during dry periods the Colorado River gains 50 cubic feet per second from the Calvert Bluff, Carrizo, Queen City, and Sparta aquifers addressed in the DFC. The primary conclusion reached by Geoffrey P. Saunders, P.G., C.G.W.P. of the LCRA, as set forth in Report 365, was that “The lower Colorado River is a gaining stream that receives groundwater contribution from major and minor aquifers.” The adopted DFCs fail to adequately account for this dependence of the Colorado River on the aquifers addressed in the DFCs.

(The above-cited documents are provided in APPENDIX 2, ATTACHMENTS J-K)

3. Information Developed in the Groundwater Models is Adequately Dependable to be Included in the DFCs

It appears that there is adequate science and technology available to use the historical and developing data on the groundwater-surface water relationship of the Colorado River and the Carrizo-Wilcox aquifer to merit quantitative inclusion in the desired future conditions. As demonstrated in Section B, the Carrizo-Wilcox GAM has been developed and calibrated to base-flow data on the Colorado River and several streams within the region. The LCRA-San Antonio Water System Project demonstrates that the science and technology are available and in use on the Colorado River to model and monitor the groundwater-surface water interactions. **This same science and technology should be employed to protect the Carrizo-Wilcox Aquifer and the Colorado and Brazos rivers from over-pumping in our region.**

Carrizo-Wilcox GAM 2003. Based on the data reviewed in developing the Central Carrizo-Wilcox GAM, the model was calibrated and verified to the historical period of 1980-2000 and included the Colorado River, Middle Yegua Creek, and the East Yegua Creek as calibration targets. The Colorado River base flow was adjusted from 32,400 ac-ft/year to 26,100 ac-ft/year to correspond to the 1918 USGS study. It is clear that the GAM for the central part of the Carrizo-Wilcox has been calibrated to include base flows for the Colorado River and three tributaries in Bastrop and Lee counties. It is expected that GAM analysis of various pumping regimes would have corresponding impacts on these surface water features and therefore could be used to predict the impact of these regimes on these surface waters (See GMA-12 Surface Water Outflow Prediction. Section A).

(The above-cited documents along with additional details are provided in ATTACHMENT F.)

LCRA-SAWS LSWP Groundwater Model. Though most groundwater availability models (GAM) are weak in representing the groundwater-surface water relationships, the LCRA SAWS Water Project (LSWP) Groundwater Flow Model for the Chicot and Evangeline Aquifers in Colorado, Wharton, and Matagorda Counties was developed to simulate the groundwater-surface water interaction of these aquifers with the Colorado River. The study included the task to “develop and calibrate a groundwater model capable of simulating the impacts of the LSWP's

pumping activities on drawdown, land subsidence, groundwater availability estimates, and changes in surface water-groundwater interactions.”

The following paragraph from the report describes the conceptual context of the model: “All of the interaction between groundwater and the rest of the hydrological cycle occurs in the shallow groundwater system. . . . **Based on the groundwater system described by Young and Kelley (2006), a groundwater model should explicitly represent a shallow flow system to provide a reasonable representation of the vertical hydraulic gradients and the interaction between groundwater and surface water.**”

The LSWP model used six calibration targets to represent the base flows for the Colorado, West Lavaca, East Lavaca, Brazos-Colorado East, and Colorado Lavaca river basins. The authors of the model reported “the model provides excellent matches to the field data.” The model has been used to predict changes in the groundwater contribution to base-flow in the Colorado River from projected pumping rates over the 80-year life of the proposed LCRA-SAWS project.

A monitoring program was set up in four locations along the Colorado River at Eagle Lake, Wharton, Bay City and Wadsworth. Shallow wells (<100 ft) have been located near river gages in these locations to provide additional data to demonstrate the Colorado is a gaining stream and to demonstrate large differences in hydraulic head in shallow and deep aquifers.

(The above-cited documents are provided in APPENDIX 2, ATTACHMENT L.)

4. The DFCs Lack Quantitative Spring Flow Criteria, and Thus Fails to Adequately Protect Against Adverse Impacts on Springs

There are many documented and undocumented springs in Bastrop and Lee Counties that have continued to flow throughout the last two droughts. These springs are important to the environmental and socio-economic health of the region, as expressed by citizens in the area in comments to GMA12. These springs can serve a meaningful role as “canaries in the coal mine.” Texas Parks and Wildlife Department has an ongoing program to help locate, document, and monitor springs throughout the State.

Springs are an integral part of the groundwater-surface water interaction (see TPWD comments in other sections of this letter). Attachment M lists about thirty (30) springs and seeps that have been partially documented along the Colorado River and elsewhere in Bastrop County. Many springs provide base-flows to the creeks and streams in the counties, such as the two on Alum Creek, a tributary to the Colorado that emerges from the Lost Pines in the Bastrop State Park area. A map of the “Wilbarger” and “El Camino Real” Paddling Trails prepared by Environmental Stewardship and TPWD serves as an example of the many springs that have been documented along that reach of the river.

Environmental Stewardship has had discussions with the TPWD staff with the intent of establishing a monitoring network in Bastrop and Lee counties to provide a current base-line record of the condition of springs in these counties. TPWD had indicated that they would train

local volunteers and help locate an appropriate repository for data such that the records would be publicly available in the future.

DFC criteria related to spring flow is a key means to ensure that the DFC is adequately protective of surface water impacts. The DFCs adopted by GMA 12 improperly exclude any such criteria.

(The above-cited documents are provided in APPENDIX 2, ATTACHMENTS M-N.)

5. The DFCs Lack Quantitative Criteria Related to the Colorado River, Resulting in a Failure to Prevent Important Surface Water Impacts

Historical data related to the flow of the Colorado River is available that could serve as the basis for quantitative DFC criteria related to this critical surface water feature. The groundwater availability model for the central Carrizo-Wilcox Aquifer (“Groundwater Availability Model for the Central Part of the Carrizo-Wilcox Aquifer in Texas”, Appendix B titled “Surface Water–Groundwater Interaction in the Central Carrizo-Wilcox Aquifer”) made limited use of such data. This document cites a 1918 USGS Low Flow study of the Colorado River from about Utley down to Smithville (river miles 380-425). Base-flow increases across the aquifer outcrop area were estimated to be 36 cfs (26,062 ac-ft/yr). A flow-duration curve generated from the Smithville gage indicated that “even during conditions of extremely low flow, the Colorado River (was) still gaining reach across the outcrop of the Carrizo-Wilcox aquifer.” The flow increase documented in the 1918 study may be compared with the results obtained from the model to estimate the low end of groundwater discharge in the Colorado River across the outcrop.

LCRA Water Management Plan Advisory Committee– 2010-11. According to one of LCRA’s Model Runs being used to evaluate possible changes to the current 2010 Water Management Plan, a quantity of releases needed to meet one year of environmental needs for the Colorado River and Matagorda Bay during a drought-of-record was estimated to be 48,600 ac-ft/year, a quantity estimated using WMP WAM assuming 2020 demands, backup stored water for only subsistence instream flow criteria, and storable inflows for only Threshold MBHE criteria (the maximum calculated by the model occurred in 1954). In the current 2010 WMP, the LCRA Board approved setting aside an average of 33,400 ac-ft/year of firm water from lakes Buchanan and Travis for environmental releases, primarily to help meet critical instream flow.

As demonstrated above, the contribution of the Carrizo-Wilcox and other aquifers in the Utley to Smithville segment of the Colorado River (as it intersects with the Simsboro and other Wilcox formations) is in the range of 25,000 – 36,000 ac-ft/year. The LCRA WAM Modeling is based on gaged flows and therefore considers the contributions of the aquifers through these river segments. Were these flows not available during a drought-of-record or worse-than-drought-of-record, the Colorado River and Matagorda Bay would receive 50-75% less water than LCRA estimates is needed to help meet the “subsistence” level of instream flows and “threshold” level of freshwater inflows to Matagorda Bay due to over-pumping of the aquifers. Were the “gaining” aspect of the river to be reversed to become “losing” to the extent of 10,000 or more

ac-ft/year (as estimated by the Region K report), this threat to the Colorado River and Matagorda Bay is even more exacerbated. With surface water that is otherwise allocated, and with management rules that allow environmental flows to be curtailed during a drought emergency, calls on water rights in the basin could easily go beyond the amount of water available were these “gaining inflows” to the river not available, leaving the river and estuary essentially dry.

Environmental Flows (instream flows) for Colorado River at Bastrop.

Environmental flows for the Colorado River at Bastrop have been recommended by the Lower Colorado River Authority – San Antonio Water System Water Project (LSWP) and re-affirmed by the Colorado and Lavaca Basins and Matagorda and Lavaca Bays Expert Science Team (CL BBEST). The subsistence instream flow recommendations for Bastrop range from 123-275 cfs depending on the month of the year; with the higher flows during the months of February, March and May to protect spawning habitat of the State threatened blue sucker fish, *Cycleptuselongatus*. The contribution of water flow to the river, by the Carrizo-Wilcox aquifer of 30-50 cfs (see above) represents 14-41% of the total flow of the river during drought conditions in the Utley to Smithville reach. According to one of LCRA’s model runs being used to evaluate possible changes to the current 2010 WMP, about 48,600ac-ft/year (~67 cfs) would need to be released from the Highland Lakes to supplement the Carrizo-Wilcox contribution in order to help meet certain critical levels of instream flows and the freshwater inflows to the Matagorda Bay. (The balance of 23-158 cfs would have to come from return-flows from the City of Austin, run-of-river, or storable inflows if inflows to the Highland Lakes are adequate, and other sources above Bastrop.) As noted above, without gaining flows the river and estuary could essentially go dry during a serious drought.

To provide reasonable protection for the Colorado River, the DFC should include criteria to ensure a minimum level of base flow from the Carrizo-Wilcox Aquifer to the Colorado River.

(The above-cited documents along with additional details are provided in APPENDIX 2, ATTACHMENT O.)

B. The Adopted DFCs Allow Mining of the Relevant Aquifers, Contrary to the Region K Water Plan and the Policies of the Lost Pines Groundwater Conservation District

1. The Adopted DFCs Allow Mining of the Subject Aquifers

To effectively protect groundwater resources, a desired future condition must include criteria that truly determine the amount of water that can be pumped on a sustainable basis. Under the Rules of the Texas Water Development Board, a DFC must be physically possible.¹ A DFC based solely on the anticipated demand for water without fully considering the recharge of the aquifer can result in a situation where more water is taken from the aquifer than is being replenished into the aquifer. This circumstance constitutes the mining of an aquifer, and results in a level of pumping that is not physically possible to sustain in the long run.

¹31 TAC § 356.45(c)(1).

The DFCs adopted by GMA-12 result in aquifer mining, and are simply not physically sustainable. For example, as recently as 2009, the Lost Pines Groundwater Conservation District had indicated that sustainable drawdown levels for the Simsboro aquifer were 50 feet in Bastrop County and 150 feet in Lee County. The adopted DFC allows a 145 foot drawdown of the Simsboro Aquifer in Bastrop County, and a 345 foot drawdown in Lee County resulting in a calculated district-wide average of 237 foot drawdown. Nothing has been produced to show that the drawdown numbers in the DFCs are sustainable.

As an example of the impact that one district has on another, the permitted pumping in Post Oak Savannah GCD in Burleson County was evaluated by the Lost Pines GCD in considering the Aqua Water Application in September, 2008. The drawdown levels for the Simsboro aquifer in Bastrop and Lee counties were simulated in the September 17, 2008 GAM run which were presented at the Lost Pines GCD Board Meeting. Using the then-current proposed “desired future condition” being considered by GMA-12 and the 31,000 acre-feet per year already permitted by Post Oak Savannah GCD in the Porter’s Branch Well Field, the 2060 drawdown in the Simsboro aquifer in Bastrop and Lee counties were estimated to be 84 feet and 266 feet respectively; exceeding the sustainable drawdown levels targeted for the Simsboro aquifer initially set by the Board of 50 and 150 ft in Bastrop and Lee counties respectively. At that time, in order to accommodate out-of-district pumping, the LPGCD indicated it might be necessary to propose more lenient future conditions of 150 feet in Bastrop County and 300 feet in Lee County. In consideration of the permitted pumping conditions in surrounding counties, Aqua Water was denied 4 wells and granted only 3 of the 7 wells needed to meet their projected demand. From these GAM runs it is evident that excessive groundwater pumping in Burleson County has an undesirable impact on Bastrop and Lee counties. Since September 2008 Post Oak Savannah GCD has permitted an additional 40,000 acre-feet per year of groundwater further exacerbating this scenario.

(The above-cited documents are provided in APPENDIX 3, ATTACHMENT P.)

2. Region K has Adopted a Policy Strongly Opposing Groundwater Mining

Groundwater availability is a central concern for the Lower Colorado Regional Water Planning Group (“Region K”). This Region encompasses Bastrop and Fayette Counties, which are also within GMA-12. As Region K and GMA-12 have overlapping jurisdiction, the planning documents for these two entities should be consistent.

Further reinforcing the observations noted above by the Texas Parks and Wildlife Department, as well as the LCRA staff, the 2011 Region K water plan recognizes the Carrizo-Wilcox Aquifer as a major aquifer in the Region K planning area, and acknowledges that continued pumping from the Carrizo-Wilcox aquifer as the result of future pumping demands could reverse the current gaining relationship between the Colorado River and this Aquifer.²

² Region “K” Water Plan for the Lower Colorado Regional Water Planning Group, Vol. 1 (February 2010) at 1.2.1.4 and 1.2.4 (p. 1-23 and 1-53) (The entirety of the report is incorporated herein for all purposes).

As noted and affirmed in its 2011 Water Plan, Region K passed a resolution regarding the “mining of groundwater” on February 9, 2000, which strongly opposes the over-utilization of groundwater, including the mining of groundwater, within its region at rates that could lead to eventual harm to the groundwater resources, except during limited periods of extreme drought. The DFCs adopted by GMA-12 will facilitate the mining of aquifers in Region K. In this way, the adopted DFCs are contrary to the current water quality management plan, and the water management principles adopted by Region K.

(The above-cited documents are provided in APPENDIX 3, ATTACHMENTS Q-T)

3. The Adopted DFCs are Contrary to the Goal of the Lost Pines Groundwater Conservation District to Develop Groundwater in a Sustainable Fashion

The mission of the Lost Pines Groundwater Conservation District as stated in the September 15, 2004 Management Plan, is “to preserve and to protect interests in groundwater within Bastrop and Lee counties”. In fulfilling its mission, the District has indicated it will endeavor to maintain the aquifers in the District on a sustainable basis that it defines as “development and use of groundwater in a manner that can be maintained in perpetuity.” In keeping with this objective, the District initially indicated that sustainable drawdown levels for the Simsboro aquifer were 50 feet in Bastrop County and 150 feet in Lee County. Yet, the adopted DFCs reflect an average drawdown of 237 feet in Bastrop and Lee counties. The pumping levels associated with such a drawdown are not sustainable, and are thus contrary to the adopted policies of the Lost Pines Groundwater Conservation District. On June 23, 2011, the Simsboro Aquifer had dropped 18 feet as reported by The Bastrop Advertiser.

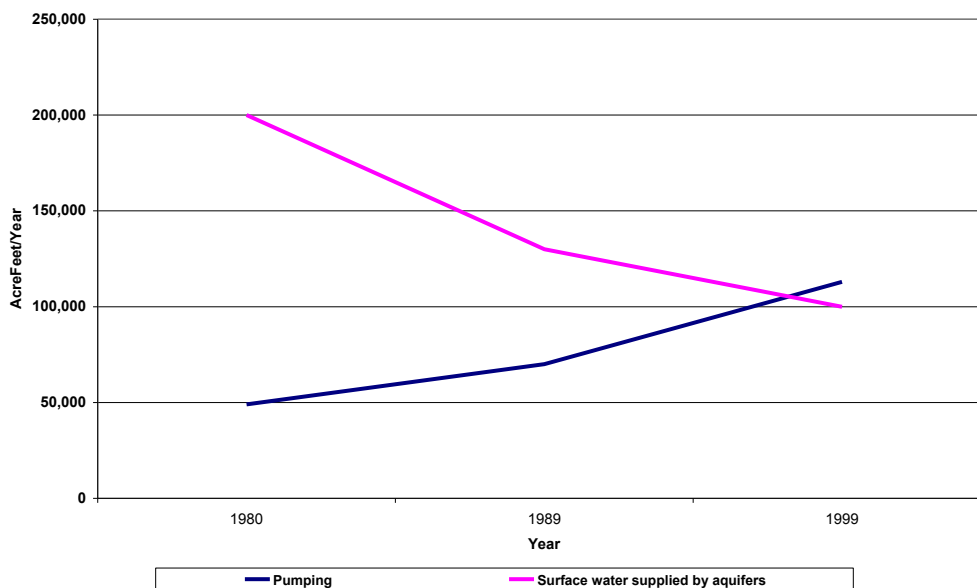
(The above-cited documents are provided in APPENDIX 3, ATTACHMENTS U-V.)

4. TWDB Hutchison Presentation to Lost Pines GCD Predicted Declining Outflows to Surface Waters and Springs

Bill Hutchison, Director of Groundwater Resources, Texas Water Development Board, gave a presentation titled “Joint Planning in Groundwater Management Area 12” to the Lost Pines GCD on November 18, 2009. The presentation included a section on (1) a groundwater budget for GMA 12 and (2) a model run for GMA 12. The data presented for GMA 12 was from 1980-99, and included pumping, surface water outflows, and outflows to springs. Changes that “capture” water due to pumping were quantified for outflows to surface water and springs. Over the 20-year period, pumping increased an average of 64,000 ac-ft/year and outflows to surface water and springs decreased by 50% an average of 55,000 ac-ft/year.

Figure 1

Groundwater - Surface Water Relationship
Central Carrizo-Wilcox and Related Aquifers (1980 - 1999)



Environmental Stewardship extracted the pumping and surface and spring water outflow data to produce Figure 1, depicting the change in the groundwater-surface water relationship from 1980 to 1999. With increased pumping, outflows to surface water and springs decreased by 100,000 ac-ft/year during the period. This information provided evidence that, lacking significant reduction in pumping patterns, the trend will likely continue and should be given meaningful consideration in the development of a DFC.

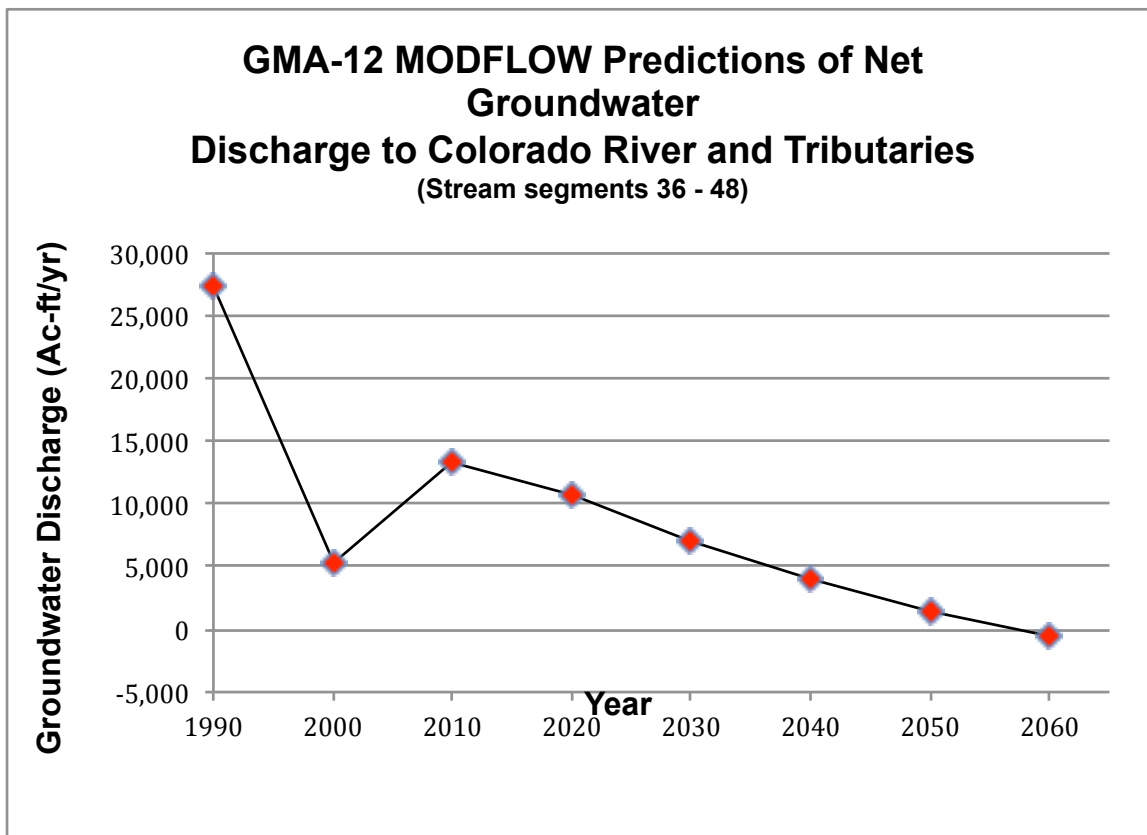
(The above-cited documents are provided in APPENDIX 3, ATTACHMENT W-Y)

5. GMA-12 Surface Water Outflows Predict the Colorado River Will Become a “losing” River by 2060

George Rice examined modeling performed by GMA 12. He found that, according to GMA 12’s model, groundwater pumpage will cause a reduction in the amount of groundwater that discharges to the Colorado River. The model predicts that groundwater discharge will decrease from approximately 10,000 acre feet per year in 2010, to minus 700 acre feet per year in 2060. That is, the Colorado River will change from a stream that gains water as it flows across aquifer outcrops, to a stream that loses water. The model confirms that the groundwater-surface water relationship between the Carrizo-Wilcox Aquifer, the Colorado River, and tributaries is threatened as predicted by Region K and Mr. Hutchison’s presentation to Lost Pines GCD.

(The above-cited documents are provided in APPENDIX 3, ATTACHMENT Z.)

Figure 2



C. The Adopted DFCs Will Produce Negative Socio-Economic Impacts on the Region

The Bureau of Economic Geology conducted a study of the Carrizo-Wilcox aquifer and concluded that Bastrop County was at risk of running short of water due to the potential for unresolved conflicts in Regional Water Plans associated with water management strategies that exceed the managed available groundwater (MAG) estimated from the desired future conditions (DFC). Based on the analysis they developed economic impact values associated with ac-ft deficits within the major economic sectors. Using those values and the estimated over-draft in Bastrop County, Environmental Stewardship has estimated the socio-economic impacts to be in the range of \$256,000,000 by 2060.

(The above-cited documents are provided in APPENDIX 4, ATTACHMENT AA.)

D. The Adopted DFCs Disregard the Citizens' Desire to Have the Rivers, Streams, and Springs Protected.

1. Opportunity Bastrop County – A Citizens' Vision for Bastrop County

The citizens of Bastrop County have indicated their vision for the environment (desired future conditions) through Opportunity Bastrop County, a document that was adopted by the Commissioners Court in December 2007 and the Smithville City Council in May 2008. Citizens who participated in the “town hall” meetings and surveys indicated that they were very concerned about the environmental issues facing Bastrop County, especially in the face of rapid growth. These issues relate to groundwater protection, aquifer recharge, water conservation, land use practices, preservation of farm and ranch land and wildlife habitat, rainwater collection, air quality, and waste disposal. Water quality and quantity was the most important single issue, as well as the most important environmental issue, according to comments and survey results.

This information was called to the attention of the LPGCD Board of Directors in Environmental Stewardship’s letter dated May 21, 2008 and a copy of the OBC document was provided to each Board member.

The citizens of Bastrop County desire that the county’s aquifers, including the Colorado River alluvium, be preserved and protected, and that the springs and riparian habitats be identified and protected as indicated in the following information taken from the Opportunity Bastrop County document:

Identify and preserve significant springs and riparian habitat (page 7)

The County should identify significant springs and other riparian features that contribute to water quality and have potential for nature-tourism. Springs along the river provide a considerable portion of its total flow after it leaves Travis County, especially in times of drought and low water releases from the Highland lakes. This flow supports river floating sports and fishing and dilutes Austin’s effluent. Increased ground water pumping may result in these springs drying up and reducing surface water in the Colorado River and other streams in the County.

Establish strong relationship with Lost Pines Groundwater Conservation District and Municipal Utility Districts (page 7)

Groundwater provides municipal drinking water for most city and rural residents in the County. This groundwater derives from the Carrizo-Wilcox Aquifer, which reaches from the Hooper Formation in the west to the Carrizo Formation in the east. It provides water to riverbank terraces and springs along the Colorado as the river flows through Bastrop County.

One of the concerns voiced at several meetings was the ‘over pumping’ of groundwater, when more water is taken from the aquifer than is replenished. According to the LPGCD, currently more water use is permitted than is capable of being recharged into the aquifers from rainwater. With continued population growth, and the potential for groundwater to be pumped to users outside of the County, inadequate aquifer recharge will increase in magnitude and consequences.

The Lost Pines Groundwater Conservation District (LPGCD) is charged with conserving groundwater in Bastrop and Lee counties. Texas law regarding groundwater districts and water mining exemptions limit LPGCD's ability to protect groundwater resources.

Working closely with LPGCD can ensure that water management in new development minimizes negative impacts on existing well owners and future water supplies. The County's involvement can ensure that desired future conditions for water sources and supplies adequately protect those resources.

Becoming a stakeholder in the work of the Lower Colorado Regional Water Planning Group (LCRWPG – Region K) will help ensure adjacent cities and counties have similar objectives and use per-customer targets. Such conservation plans need to be incorporated into city/county regulations where possible.

(The above-cited documents are provided in APPENDIX 5, ATTACHMENT BB-CC.)

2. LCRA Survey on Citizen's Values – (October 24, 2009 press release)

During the summer of 2008 LCRA conducted a community conversation about water supply to obtain citizens' input to help shape the types of water supplies that LCRA will study in their effort to plan for our grandchildren and great-grandchildren. More than 220 people attended three community conversations about water supply held in Burnet, Wharton and Austin. These were unique opportunities for neighbors to sit down together and discuss their values about water supply and wishes for future generations. Also, nearly 500 interested stakeholders participated in the process through the LCRA website. In all, participants suggested 189 water supply options and gave more than 150 values that they hold regarding water supply. LCRA staff compiled and analyzed the public input. The three water supply options mentioned most often were conservation, desalination and reuse. **The values that were mentioned most often were clean water, protection of the environment, recreation and lifestyle, and availability.**

(The above-cited document is provided in APPENDIX 5, ATTACHMENT DD.)

Conclusion: The Adopted DFCs Undermine the Ability of the Groundwater Conservation Districts in GMA 12 to Fulfill Their Statutory Duty to Protect Surface Water Resources

Sec. 36.0015 of the TWC establishes that groundwater Conservation Districts are created in order to provide for the conservation, preservation, protection, recharging, and prevention of waste of groundwater, and of groundwater reservoirs or their subdivisions. The Water Code further makes clear that groundwater conservation districts are the state's preferred method of groundwater management.

This management objective is achieved through the development of desired future conditions by each GMA, the formulation of a management plan consistent with that DFC by each district, and, ultimately, the issuance of permits consistent with each District's management plan. In

evaluating the adequacy of a DFC, it is important to evaluate it in relationship to the subsequently-developed management plans and permits which the DFC will shape.

Groundwater districts are responsible to develop a management plan that addresses conjunctive surface water management, natural resources, and drought conditions.³ Furthermore, a District management plan must address desired future conditions in a quantitative manner. The interaction between surface water and groundwater cannot be ignored in the development of a management plan, since such a plan must include, for each aquifer, the annual volume of water that naturally discharges from the aquifer to springs and any surface water bodies, including lakes, streams, and rivers.⁴ A DFC is not adequate if it fails to fully take into account these considerations that each district must consider when developing a management plan. Similarly, in issuing permits, each District is responsible with considering any impact that the permit may have on existing permit holders. These considerations at issue in the development of a management plan and each permit cannot be ignored in the development of a DFC.

Consideration of these issues is consistent with the explicit provisions of the Board's rules regarding desired future conditions. At Section 356.45(d), those rules are clear that factors relevant to an evaluation of whether an adopted DFC is reasonable include both (1) environmental impacts including, but not limited to, impacts to spring flow or other interaction between groundwater and surface water and (2) the socio-economic impacts reasonably expected to occur.

In Robert Mace's April 9, 2009 letter (APPENDIX 6, ATTACHMENT EE), which was provided to the Lost Pines GCD, he reinforces the above stating that TWDB rules require them to consider, among other things, "the environmental impacts including, but not limited to, impacts to spring flow or other interactions between groundwater and surface water" in relation to any petition to the TWDB challenging the reasonableness of an adopted desired future condition. It is appropriate for the GMAs and GCDs to likewise consider these same environmental impacts in setting the desired future conditions for the groundwater resources.

By logical extension, it is reasonable that GCDs should exercise a high level of diligence by considering the impact of their overall groundwater withdrawal in establishing desired future conditions and management plans as established described above. How can rules be written to address these issues if these issues have not been contemplated in the process of establishing the conditions that the rules are to administer?

It is incumbent upon GCDs to consider these factors relative to the overall withdrawal of water within their jurisdiction as reflected in their desired future conditions. **As such, GCDs have a duty to show that it has adequately evaluated the impact of the proposed desired future conditions on the existing permit holders, spring-flows and base flows to the surface waters of the region before adopting such desired future conditions that might significantly alter current conditions.**

³Texas Water Code § 36.1071.

⁴ 31 TAC § 356.5(a)(5)(D)

Based on these requirements grounded in the Texas Constitution, Texas Water Code, and Texas Administrative Code, the Groundwater Management Areas and the GCDs have a duty and responsibility to take actions in setting the desired future conditions of the groundwater resources in a manner that protects the rivers, streams and springs of the counties, and estimate the volume of water that can be withdrawn without significantly impacting current conditions.

As discussed above, GMA-12 has failed to fulfill this duty. Environmental Stewardship, on behalf of these natural resources has requested, and re-asserts its request, that GMA12 and the GCDs take such actions as are necessary to protect base flows to the Colorado and Brazos rivers, streams and springs in the counties by including them in the desired future conditions of the area. Environmental Stewardship further petitions the Texas Water Development Board to find that the adopted DFCs are unreasonable.

Affidavit: I, Steve Box, affirm that the facts as stated above are true and correct to the best of my knowledge.

Steve Box, Executive Director
Environmental Stewardship

SWORN AND SUBSCRIBED to before me on
this the _____ day of _____, 2011.

Notary Public for and in the State of Texas

My Commission Expires: _____

DISTRIBUTION LIST

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GMA-12 Groundwater Conservation Districts

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Lost Pines Groundwater Conservation District

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APPENDIX 1

THE ATTACHMENTS LISTED BELOW FOLLOW THIS PAGE:

Desired Future Conditions Being Appealed

ATTACHMENT A – GMA-12 Adopted Desired Future Conditions

Petitioner's Representative

ATTACHMENT B – Resolution adopted by Environmental Stewardship describing the extent and nature of the authority of Mr. Box.

Legally Defined Interest

ATTACHMENT C – Environmental Stewardship Warranty Deed

Expert Testimony

ATTACHMENT D – Affidavit by Dr. George Rice, Groundwater Hydrologist representing Environmental Stewardship

APPENDIX 2

A. **The adopted DFCs are Not Protective of Surface Water, Including Impacted Springs and Rivers: Additional Details not found in petition text.**

1. Texas Parks and Wildlife Department

THE ATTACHMENTS LISTED BELOW FOLLOW THIS PAGE:

ATTACHMENT E– TPWD Presentation to GMA-12 on May 10, 2007, by Daniel Opdyke, Power Point Presentation

ATTACHMENT F– TPWD offer of data. Post Oak Savannah Groundwater conservation District, Groundwater Management Area 12 Meeting Minutes, March 1, 2007, 10:00 a.m. Public Comments: Dan Opoyke (Opdyke).

ATTACHMENT G– Environmental Stewardship presentation to GMA12 on October 30, 2008, by Steve Box, Power Point Presentation

ATTACHMENT H– Texas Parks and Wildlife Department letter to GMA-12 dated October 30, 2008.

ATTACHMENT I– Texas Water Project letter to GMA-12 dated October 30, 2008.

2. Texas Water Development Board Reports

THE ATTACHMENTS LISTED BELOW FOLLOW THIS PAGE:

ATTACHMENT J– Low Flow Gain-Loss Study of the Colorado River in Texas, Geoffrey P. Saunders, Lower Colorado River Authority. 2006. In Aquifers of the Gulf Coast of Texas. TWDB publication 365. Aquifers of the Gulf Coast of Texas. TWDB publication 365.

ATTACHMENT K– Low-Flow Gain-Loss Study of the Colorado River in Bastrop County, Texas. Geoffrey P. Saunders, Lower Colorado River Authority. In Aquifers of the Upper Coastal Plains of Texas. Texas Water Development Board Report 374, October 2009.

3. Groundwater Model Data is Adequately Dependable

The Central Carrizo-Wilcox GAM was calibrated and verified to the historical period of 1980-2000. Table B-4 in the study shows the calibration targets of the Colorado River, Middle Yegua Creek, and the East Yegua Creek; gives the layer, row and column of the target cells for the river and creeks; and gives the estimated base-flow increase across the outcrop. The Colorado River base flow increase was adjusted from 32,400 ac-ft/year to 26,100 ac-ft/year to correspond to the 1918 USGS study cited above.

Table 6 gives calibration targets for the Colorado River, Big Sandy Creek, Middle Yegua Creek, and East Yegua Creek; all found within Bastrop and Lee Counties.

THE ATTACHMENTS LISTED BELOW FOLLOW THIS PAGE:

ATTACHMENT L– Surface Water–Groundwater Interaction in the Central Carrizo-Wilcox Aquifer by David O’Rourke and Ken Choffel. HDR Engineering Services, Inc.

LCRA-SAWS LSWP Groundwater Model (NUMBER THIS ITEM?)

THE SOURCES LISTED BELOW ARE INCORPORATED BY REFERENCE:

LCRA-SAWS LSWP Project Study Archives:

<http://www.lcra.org/water/lswp/groundwater.html>

- a. [Groundwater Model for Chicot and Evangeline Aquifers \(October\)](#) (18.5MB PDF)
- b. [Updates to the Initial 2006 Model Calibration \(March\)](#) (5MB PDF)
- c. [Updated Groundwater Model Calibration Report \(March\)](#) (5MB PDF)

4. DFCs Lack Quantitative Spring Flow Criteria

THE BELOW ATTACHMENTS FOLLOW THIS PAGE:

ATTACHMENT M– A list of about thirty (30) springs and seeps that have been partially documented along the Colorado River and elsewhere in Bastrop County. Many springs provide base-flows to the creeks and streams in the counties, such as the two on Alum Creek, a tributary to the Colorado that emerges from the Lost Pines in the Bastrop State Park area.

ATTACHMENT N– Maps of the “Wilbarger” and “El Camino Real” Paddling Trails prepared by Environmental Stewardship and TPWD identifying the location of the many springs that have been documented along the reach of the Colorado River between Utley and Tahitian Village in Bastrop County.

5. DFCS Lack Quantitative Criteria Related to the Colorado River

Historical Records– Historical records were included in developing the groundwater availability model for the central Carrizo-Wilcox Aquifer: Groundwater Availability Model for the Central Part of the Carrizo-Wilcox Aquifer in Texas. This document cites a 1918 USGS Low Flow study of the Colorado River from about Utley down to Smithville (river miles 380-425). Base-flow increases across the aquifer outcrop area were estimated to be 36 cfs (26,062 ac-ft/yr). A flow-duration curve generated from the Smithville gage indicated that “even during conditions of extremely low flow, the Colorado River (was) still a gaining reach across the outcrop of the Carrizo-Wilcox aquifer. According to the report, “the flow increase documented in the 1918 study may be compared with the results obtained from the model to estimate the low end of

groundwater discharge in the Colorado River across the outcrop (i.e., few, if any, modeled aquifer discharge quantities should be less than this value).”

In this same report, a base-flow separation analysis for the Colorado River from Bastrop to Smithville was conducted using gage records from the years 1960-75 and 1997-2000. These studies estimated increase across that portion of the aquifer at 25,773 ac-ft/yr (35.599 cfs).

THE FOLLOWING SOURCE IS INCORPORATED BY REFERENCE:

Groundwater Availability Model for the Central Part of the Carrizo-Wilcox Aquifer in Texas. Alan R. Dutton, Bob Harden, Jean-Philippe Nicot, and David O'Rourke. February 2003.

THE ATTACHMENT LISTED FOLLOWS THIS PAGE:

ATTACHMENT O- Potential One Year Minimum Storage Approach, 4/8/2011

Environmental Flows (instream flows) for Colorado River at Bastrop

THE SOURCES LISTED BELOW ARE INCORPORATED BY REFERENCE:

LCRA-SAWS Water Project reports are incorporated by reference:
http://www.lcra.org/water/lswp/aquatic_habitat.html

- a. [Colorado River Flow Relationships to Aquatic Habitat and State Threatened Species: Blue Sucker Long term Monitoring Plan \(September\)](#) (.4MB PDF)
- b. [Instream Flow Guidelines - Relationships to Aquatic Habitat and State Threatened Species: Blue Sucker \(March\)](#) (6MB PDF)

Colorado and Lavaca Rivers and Matagorda and Lavaca Bays Basin and Bay Stakeholder Committee and Expert Science Team, BBEST Environmental Flow Regime Recommendations Report is incorporated by reference:
http://www.tceq.state.tx.us/permitting/water_supply/water_rights/eflows/colorado-lavaca-bbse

APPENDIX 3

B. **The Adopted DFCs Allow Mining of the Relevant Aquifers, Contrary to the Region K Water Plan and the Policies of the Lost Pines Groundwater Conservation District**

1. The Adopted DFCs Allow Mining of the Subject Aquifers

THE ATTACHMENT LISTED BELOW FOLLOWS THIS PAGE:

ATTACHMENT P – Lost Pines Groundwater Conservation District Board Meeting, September 17, 2008, Agenda and Minutes

2. Lower Colorado Regional Water Planning Group (Region K)

THE ATTACHMENTS LISTED BELOW FOLLOW THIS PAGE:

ATTACHMENT Q - 2006 Region “K” Water Plan for the Lower Colorado Regional Water Planning Group, Section 1.2.4.2 Threats Due to Water Quantity Issues, pages 1-42-44; with emphasis added

ATTACHMENT R - 2006 Region “K” Water Plan for the Lower Colorado Regional Water Planning Group, Section 8A-8, RESOLUTION OF THE LOWER COLORADO REGIONAL WATER PLANNING GROUP REGARDING MINING OF GROUNDWATER, February 9, 2000.

ATTACHMENT S - Groundwater Availability in the Carrizo-Wilcox Aquifer in Central Texas – Numerical Simulation of 2000 through 2050 Withdrawal Projections. Alan R. Dutton. Report of Investigation No. 256. 1999.

ATTACHMENT T - Environmental Stewardship letter to Lost Pines GCD dated June 18, 2008.

3. Contrary to goals of LPGCD

THE ATTACHMENTS LISTED BELOW FOLLOW THIS PAGE:

ATTACHMENT U– Lost Pines Groundwater Conservation District Management Plan, September 15, 2004, Revised: August 10, 2010. Pages 1, 18-20.

ATTACHMENT V–GMA 12 Meeting Consultants Progress Report, Milano Community and Civic Center, Milano, Texas, August 28, 2008.

ATTACHMENT W – Drought dropping Simsboro aquifer, the *Bastrop Advertiser* and the *Smithville Times*, June 23, 2011.

4. TWDB Hutchinson Presentation to Lost Pines GCD

THE ATTACHMENTS LISTED BELOW FOLLOW THIS PAGE:

ATTACHMENT X– Joint Planning in Groundwater Management Area 12. Bill Hutchison. Presentation to Lost Pines GCD. November 18, 2009. Power Point Presentation

ATTACHMENT Y – GMA-12 GAM Calibration Results (Graph of data from Bill Hutchison Presentation to LPGCD. Prepared by Environmental Stewardship)

Groundwater-Surface Water Relationship – Central Carrizo-Wilcox and Related Aquifers (1980-1999) (Graph of data from Bill Hutchison Presentation to LPGCD. Prepared by Environmental Stewardship)

5. GMA-12 Surface Water Outflow Prediction

THE ATTACHMENT LISTED BELOW FOLLOWS THIS PAGE:

ATTACHMENT Z - GMA-12 MODFLOW Predictions of Net Discharge of Groundwater to Colorado River and Tributaries

APPENDIX 4

**C. SOCIO-ECONOMIC IMPACTS ON THE REGION: Additional Details not found
in petition text.**

THE BELOW ATTACHMENTS FOLLOW THIS PAGE:

ATTACHMENT AA- Socio-Economic Impacts of DFC Groundwater Over-draft –Bastrop
& Lee Counties. Environmental Stewardship. 2011.

APPENDIX 5

D. THE CITIZENS DESIRE TO HAVE THE RIVERS, STREAMS AND SPRINGS PROTECTED: Additional Details not found in petition text.

**1. Opportunity Bastrop County – A Citizens’ Vision for Bastrop County
THE BELOW ATTACHMENTS FOLLOW THIS PAGE:**

ATTACHMENT BB- Opportunity Bastrop County. Adopted by Bastrop County Commissioners Court, December 10, 2007. Environmental Exerts.

ATTACHMENT CC- Environmental Stewardship letter to Lost Pines GCD dated May 21, 2008.

**2. LCRA Survey on Citizen’s Values
THE BELOW ATTACHMENTS FOLLOW THIS PAGE:**

ATTACHMENT DD- LCRA Press Release dated October 24, 2009

APPENDIX 6

Conclusion

THE BELOW ATTACHMENTS FOLLOW THIS PAGE:

ATTACHMENTEE - Robert Mace's letter to Laura Marbury, Environmental Defense Fund, April 9, 2009