

Middle Rio Grande Endangered Species Act Collaborative Program
PHVA/Hydrology Ad Hoc Work Group Meeting
January 24th 1:00 pm – 4:00 pm
Reclamation

Actions

- The PHVA workgroup should send any comments on the draft summary of URGWOM results, as presented in PowerPoint slides, to Craig Boroughs by February 7th, 2011.
- Stephen Kissock will ask William DeRagon when the Corps plans to submit their draft BA.
- Rolf Schmidt-Peterson will distribute an electronic copy of the table of existing Middle Rio Grande Biological Opinions (BOs) to the PHVA work group for comments.
- Terina Perez and Dagmar Llewellyn (with Craig Boroughs's assistance) will develop a 1-hour PHVA/Hydrology refresher presentation for a future work group meeting. *(continued from 12/08/10)*
- Leann Towne will follow up on the inclusion of the City's agreement with MRGCD (to keep a certain amount of water in the diversions in the 1990s) into the water operations calendar. *(continued from 12/08/10)*
- Nabil Shafike will prepare a brief draft explanation describing the limitations of the model's predictions of Compact credits that will include (1) the acknowledgement that the model predictions of Compact credit does not reflect what has been observed; (2) a note that the PHVA work group and URGWOM Technical Team will continue to work on this issue; and (3) a list of possible reasons for the discrepancy including confidence issues in regards to existing Elephant Butte data for studying the problem area in the model and prepare a presentation of the suggested fix.

Decision

- The October 26, 2010 meeting minutes were approved with no changes.

Meeting Summary

- Leann Towne brought the meeting to order and introductions were made. Lori Robertson and Jen Bachus from U.S. Fish and Wildlife Service (Service) were thanked for coming to the meeting. Approval of the October and December minutes was moved to the end of the agenda so that attendees could review the minutes.
- All December action items were completed or are in process. The PHVA work group was provided with a copy of the draft summary of URGWOM results, as presented in PowerPoint slides, for their review; any comments on the summary are due to Craig Boroughs by February 7th, 2011.
- Meeting attendees were notified that the Corps will be staying with their current Biological Assessment (BA). The hydrology component will be mostly focused on recruitment and overbank flows. The previous model runs from last year will be used. Stephen Kissock will ask William DeRagon when the Corps plans to submit their draft BA.
- Attendees were provided with a draft table documenting existing BOs in the Middle Rio Grande. The Interstate Stream Commission (ISC) suggested that existing BOs in the system that provide

coverage need to be part of the Environmental Baseline for the upcoming analysis. The spreadsheet catalogues the BOs, the year they were initiated, information on coverage and terms, whether URGWOM explicitly or implicitly addresses the actions, and other specific information. There are 32 BOs in total for the Rio Grande with the majority being related to the 2003 BO in one way or another. The table can be used to determine which of the BOs is water related and whether URGWOM covers them either implicitly or explicitly. The table could also be used to look at other types of permitting; questions have been asked on how to deal with wastewater and storm water - and as far as it is known, there are no BOs that address either. Since the EPA is responsible for wastewater and storm water, it's not clear if it's a federal action or not. Rolf will distribute an electronic copy of the table to the PHVA workgroup for comments.

- Meeting attendees were reminded that from the continued calibration work with URGWOM, it was determined that the inflows between San Marcial and Elephant Butte Reservoir are underestimated in the model which results in an overestimation of the cumulative Compact debt. Nabil explained that he has tested a regression equation for improving the representation of inflows along the reach and the estimations of deliveries to Elephant Butte. It's not believed that there is much historical data available to do a better calibration. Nabil should have a presentation to look at the suggested fix in a couple weeks. He will include (1) the acknowledgement that the model predictions of Compact credit does not reflect what has been observed; (2) a note that the PHVA work group and URGWOM Technical Team will continue to work on the issue; and (3) a list of possible reasons for the discrepancy including confidence issues in regards to Elephant Butte data available for studying the problem area in the model.
- Attendees were updated that the PVA data-needs letter will be discussed at the PVA work group meeting on Friday and the PHVA work group should expect to receive it shortly after that. Once received, the PHVA work group can discuss what the limitations are. The biggest data limitation is in regard to the 50 year scenarios.
- Reclamation has decided to adjust what is being put into their draft BA. It will include regular operations, river maintenance, and the supplemental water that is anticipated to be available in the future. The Baseline is Current Operations described as a "snapshot" in time of what's occurring now. From a technical standpoint, it would be good to have the San Marcial and Elephant Butte inflow changes incorporated into the model for preparing this draft document, but it's not known if the model changes can be implemented in time. Reclamation's draft is not expected to go out sooner than May.
- Craig Boroughs presented results from the new model runs for the 2003 BO Targets with just Reclamation Flow Tools and updated runs for 2003 BO target with all PHVA flow tools. Changes to the previous model and ruleset included: (1) edits to the calculation of Central wasteway flows; (2) dates for the shutdown of all LFCC pumps - regardless of the river flow, set to July 15th to represent using the pumps to manage the recession after the continuous flow requirement and after the runoff; and (3) as a technical model change, a setting in the Heron priority table for movement of Reclamation lease water from Heron to Abiquiu was set to 1 to assure the water is moved. Model run results in regards to policy per Article VIII of the Compact were reviewed. Rolf will send an evaluation of historical flows up to 2004 to Dagmar.
- The October 26, 2010 meeting minutes were approved with no changes. Some edits were made to the December 8th minutes; once the changes have been incorporated they will be distributed to the work group for approval.

Next Meeting: March 24th from 1:00 PM to 3:00 PM

- Tentative agenda items include: (1) presentation of suggested fix to the limitations of the model's predictions of Compact credits; (2) PVA letter of needs

Middle Rio Grande Endangered Species Act Collaborative Program
PHVA/Hydrology Ad Hoc Work Group Meeting
January 24th 1:00 pm – 4:00 pm
Reclamation

Introductions

- Leann Towne brought the meeting to order and introductions were made. Lori Robertson and Jen Bachus from U.S. Fish and Wildlife Service (the Service) were thanked for coming to the meeting.

Agenda Review

- Approval of the October and December minutes was moved to the bottom of the agenda so that attendees could review the minutes.

Review Action Items from December 8th meeting

- **Terina Perez and Dagmar Llewellyn (with Craig Boroughs's assistance) will develop a 1-hour PHVA/Hydrology refresher presentation for a future work group meeting.**
 - Exact needs and the timing for a refresher have not been defined; discussion on the needs can continue at a later meeting.
- **Leann Towne will follow up on the inclusion of the City's agreement with MRGCD (to keep a certain amount of water in the diversions in the 1990s) into the water operations calendar.**
 - Incomplete. This action item will be carried over to March.
- **Leann Towne, Dagmar Llewellyn, and Craig Boroughs will draft a summary of model results that highlights the key points of information.**
 - Key points of the model results were summarized into tables. The summary tables were updated with the new results and are included in Craig's presentation.
- **Leann Towne will continue to follow up with Chris Banet to keep BIA informed of the work group's progress and status.**
 - The PHVA work group was provided with a copy of the draft summary of URGWOM results, as presented in PowerPoint slides, for their review; any comments on the summary are due to Craig Boroughs by February 7th, 2011.

Action: Any comments on the draft summary of URGWOM results, as presented in PowerPoint slides, are due to Craig Boroughs by February 7th, 2011.

- **Stephen Kissock will let the PHVA work group know the Corps' plans for the hydrology component and if the Corps intends on using the newest model runs in their analysis.**
 - Complete.
 - The hydrology component would be mostly focused on recruitment flows and overbank flows from simulations completed last year.
 - The U.S. Army Corps of Engineers (the Corps) will be staying with their current Biological Assessment (BA). The previous runs from last year will be used.
 - The analysis will be different from what the Bureau of Reclamation (Reclamation) BA will have.
 - It's not known if the Corps knows when they will be releasing their draft BA.

Action: Stephen Kissock will ask William DeRagon when the Corps plans to submit their draft BA.

- **Rolf Schmidt-Petersen will talk with the Service to determine what entities already have ESA coverage; the list will be provided to the PHVA work group to include a description of how the model addresses those in the write up.**
 - Attendees were provided with a draft table documenting existing Biological Opinions (BOs) in the Middle Rio Grande.
 - Documenting BOs relates to both the Consultation Team and the PHVA work group's process/modeling. The Interstate Stream Commission (ISC) suggested that existing BOs in the system that provide coverage need to be part of the Environmental Baseline for the upcoming analysis.
 - The next step for the listed BOs is to determine if URGWOM appropriately addresses those issues.
 - The spreadsheet catalogues the BOs, the year they were initiated, information on coverage and terms, whether URGWOM explicitly or implicitly addresses the actions, and other specific information. There are 32 BOs in total for the Middle Rio Grande with the majority being related to the 2003 BO in one way or another but not many are related to water.
 - Ten of the BOs relate to river maintenance; some relate to sediment plugs; one to safe harbor agreements; and one pertains to removal of islands below the Isleta Diversion Dam. The Santa Fe Buckman Direct Diversion and the Albuquerque Bernalillo County Water Utility Authority (Authority) Surface Water Diversion relate to M&I. Another BO relates to movement of Rio Grande Silvery Minnows from San Marcial to Albuquerque.
 - The Buckman Direct Diversion covers endangered species and is in the list of items to be addressed as part of additional needed model development and for future analyses.
 - The Authority's BO covers groundwater pumping which is included in URGWOM. The Service commented that this may not be the case regarding BO coverage.
 - There is good coverage of the water related BOs in URGWOM, except the Buckman Direct Diversion still needs to be added to the model.
 - URGWOM attempts to look at groundwater and surface water combined in regards to impacts to the overall water supply. URGWOM now includes the Authority's anticipated surface water diversions, anticipated groundwater pumping, and anticipated releases of San Juan-Chama Project water for their surface water diversion and to offset for depletions related to groundwater pumping.
 - Attendees discussed what it means when the BOs are tiered off of the 2003 BO.
 - Tiering off is when you have more of a site specific explanation incorporating a reference to the information from the 2003 BO. If a project has been conceptualized as part of the bigger process, compliance can go more quickly. Time can also be saved by not having to repeat species status or biological baseline.
 - A suggestion had been made for habitat restoration and river maintenance activities to be tied better to the next BO. This would help to streamline the process for some of those activities.
 - ISC is trying to get a handle on the details of the coverage for the Authority's surface water diversion and what that means for other non-federal agencies.

- The table could also be used to look at other types of permitting; questions have been asked on how to deal with wastewater and storm water - and as far as it is known there are no BOs that address either. Since the EPA is responsible for wastewater and storm water, it's not clear if it's a federal action or not.
- Rolf will distribute an electronic copy of the table to the PHVA work group for comments. It was suggested to include Federal action agency in the table.

Action: Rolf Schmidt-Peterson will distribute an electronic copy of the table of existing Middle Rio Grande Biological Opinions (BOs) to the PHVA work group for comments.

- **Nabil Shafike will prepare a brief draft explanation describing the limitations of the model's predictions of Compact credits that will include (1) the acknowledgement that the model predictions of Compact credit does not reflect what has been observed; (2) a note that the PHVA work group and URGWOM Technical Team will continue to work on this issue; and (3) a list of possible reasons for the discrepancy including confidence issues in regards to existing Elephant Butte data for studying the problem area in the model.**
 - Nabil looked at the model calibration with reference to a test run set up for 50 years (using the Excel wrapper to link 10-year runs in series). After including a regression equation for representing the inflows along the reach from San Marcial to Elephant Butte, local inflows to the reach appear to be represented fairly accurately.
 - It was explained that the calibration and validation for the new Middle Rio Grande configuration in URGWOM had been completed with good calibration to San Marcial, but it was later identified that the amount of flow getting to Elephant Butte was underestimated which results in an overestimation of the Compact debt. Analyses for the first draft of the Reclamation BA will still reflect this situation, so Nabil was tasked with writing a description of the limitations of the model's predictions of Compact credits.
 - Nabil should have a presentation to look at the suggested fix in a couple weeks. He will include (1) the acknowledgement that the model predictions of Compact credit does not reflect what has been observed; (2) a note that the PHVA work group and URGWOM Technical Team will continue to work on this issue; and (3) a list of possible reasons for the discrepancy including confidence issues in regards to existing Elephant Butte data for studying the problem area in the model and prepare a presentation of the suggested fix.
 - There is not much historical data available to complete more detailed investigations of the inflows along the San Marcial to Elephant Butte reach.
 - Reclamation plans to use the current model; corrections can be included in the next draft.
- **David Gensler will write a PVA data-needs letter for the PHVA work group within the next week.**
 - Meeting attendees were updated that details for a PVA data-needs letter will be discussed at the PVA meeting on Friday (1/27), and the PHVA work group should expect to receive it shortly after that meeting. The letter will basically state the need for model results using 50 year hydrologic sequences.
 - Based on the final request, the PHVA group can lay out what can be provided and what the limitations are in regards to providing the information. The biggest

limitation pertains to the work required to produce model results for 50-year analysis periods. A monthly timestep analysis could be completed with Jesse Roach's monthly timestep Powersim model for the basin, but it may not be possible to provide the needed information, in regards to river drying and supplemental water needs for targets, from monthly timestep simulations.

- URGWOM results for 50-year sequences could be produced if the sequences are composed of five of the current 10-year sequences. As long as the 50-year sequences are plausibly assembled, the exceedence level for the 50-year sequences could be determined. There was concern that there is not enough data to reasonably develop a 50-year sequence. That is, the model database only includes data for years back to 1975, so any 50-year sequence would still only be composed of hydrologic conditions evident since 1975 (and not include conditions experienced in the 1950s).
- Nabil noted that he could first provide output from one 50-year model run, and the PVA work group could show how they would use it.
 - Results for one 50-year sequence could be provided that represents one possible future, but the sequence would contain five of the current 10-year sequences, and it might not be good for a stochastic evaluation of potential conditions for 50 years into the future.
 - As many sequences as possible are needed by the PVA work group, but it was noted that if you only have one sequence, you can reasonably expect it to incorporate extremes.
- **David Gensler will let Leann Towne know several days in advance if PHVA work group representatives would be needed for the next PVA work group meeting (in order to schedule PHVA member attendance).**
 - Complete. This will be something that is ongoing and done before every PVA work group meeting.
- **Craig Boroughs will check all the latest model runs to see if any contractors for San Juan-Chama Project water are still left "shorted" of their full allocation at Heron Reservoir after additional allocations are supplied on July 1st.**
 - Complete – included in Craig's presentation.

New Model results discussion (after changes)

- Reclamation has decided to adjust what is being put into their first draft BA. There will be regular operations, river maintenance, and the supplemental water that is anticipated to be available in the future will be added.
 - Reclamation won't be using a pre-ESA Management scenario. The draft will assume that there will be some supplemental water available, Low Flow Conveyance Channel (LFCC) pumping, and Cochiti deviations will continue through year 2013.
 - The Baseline is Current Operations described as a "snap shot" in time. The model results with the Reclamation Tools will be compared to Current Operations. It's not known yet exactly how this comparison will be presented. Reclamation will be meeting with the Service and are trying to write summaries that describe Current Operations and varying levels of drying.
 - From a technical standpoint, it would be ideal to have the additional model calibration work related to inflows along the San Marcial and Elephant Butte reach completed for this draft, but it is not known if that work can be implemented in time.
 - It was discussed that the ESA regulatory definition of environmental baseline is everything that happened historically by federal agencies and anything that was done by non-federal agencies that has affected the species that's led up to today.

- At this point, Reclamation is not coordinating the Environmental Baseline discussion with the Corps.
- The draft is expected no earlier than May.
- Craig Boroughs presented results from the new model runs for the 2003 BO Targets with just Reclamation Flow Tools and updated runs for the 2003 BO target with all PHVA Flow Tools. *Please refer to the actual presentation for additional details.*
 - Changes to the previous model and ruleset included: (1) edits to the calculation of Central wasteway flows; (2) dates for the shutdown of all LFCC pumps - regardless of the river flow, set to July 15th to represent using the pumps to manage the recession after the continuous flow requirement and after the runoff; and (3) as a technical model change, a setting in the Heron priority table for movement of Reclamation lease water from Heron to Abiquiu was set to 1 to assure the water is moved.
 - These model runs are still not accurately reflecting the accumulation of Compact debt; this issue will be further reviewed.
 - Model run results in regards to policy per Article VIII of the Compact were reviewed.
 - Twenty new model runs were completed using the five 10-year hydrologic sequences with the 2003 Biological Opinion Targets with all PHVA Flow Tools and the 2003 Targets with just Reclamation Flow Tools along with companion runs for each with an unlimited supply of supplemental water included.
 - Reclamation Flows Tools include:
 - Reclamation leases of San Juan-Chama Project water (12,000 acre-ft/year for the first five years and 8000 acre-ft/year for the following five years) and
 - LFCC Pumping through July 15th.
 - Deviations in Cochiti Dam operations (through year 3) to provide recruitment or overbank flows are included.
 - Model run results in regards to policy per Article VIII of the Compact were reviewed. No Article VIII releases occur in the Reclamation Tool runs for any sequence.
 - Allocations of San Juan-Chama Water at Heron
 - Each year an amount of water is allocated to the contractors. During the drier sequences, there could be the situation where water is not available in that Project pool so the contractors do not get their allocation. To date, the project allocation has never been shorted in actual operations.
 - In the runs with just Reclamation Flow Tools, a full allocation cannot be made in the following years:
 - 70 percent exceedence sequence – year 6
 - 90 percent exceedence sequence – year 5, year 7, and year 8

- In the updated models runs, the total supplemental water needed to meet the 2003 BO are slightly higher with the latest model changes.
 - There are also differences in the total supplemental water needed for runs with all PHVA Flow Tools versus just Reclamation Flow Tools. The differences are subtle but changes in the system can slightly impact just what needs to be done to meet the flow requirements under the BO.
 - The additional supplemental water needed is higher for the runs with just Reclamation Flow Tools with an additional 48,000 acre-ft/year needed over the 10-year analysis period with just Reclamation Flow Tools versus All PHVA Flow Tools.
- Resulting Compact Credits over the 10 year periods for each hydrologic sequence were reviewed.
 - For the 10 and 30 percent exceedence sequences, conditions are wet, so the Compact Credit drops sooner due to the higher delivery requirement.
- Article VII Status was reviewed.
- Increased Angostura Diversions were also discussed
 - The diversions increase at Angostura to the canal capacities when the District runs out of water in storage.
 - If the shortage situation occurs before June 15th, there would be no flow directly below Angostura, except any supplemental water, at a time when the continuous flow requirement is actually still in place.
- MRGCD Supply
 - The amount of water in storage for MRGCD affects the need for supplemental water because a significant amount of supplemental water is needed for the 100 cfs target at Central when MRGCD is in shortage operations.
 - A question remains regarding how much the pending correction to the modeled inflows from San Marcial to Elephant Butte Reservoir might impact the MRGCD Supply. It could improve the District's available supply.
 - It would be interesting to look in detail at historical flows. An evaluation of historical flows up to 2004 was completed for the Governor's office. Rolf will send an evaluation of historical flows up to 2004 to Dagmar.
- The presentation included summary tables for Supplemental Water, Compact Compliance, and Irrigation Storage and Release for BO Targets with Reclamation Tools.
- Numerous Excel graphs with results were presented with results from the All PHVA Flow Tools and Reclamation Flow Tools model runs.

- Results were presented for when there is not enough flow provided naturally to have recruitment flow and when Cochiti deviations were performed.
- Even when targets are always being met, there is still drying as allowed at times under the 2003 BO.
- In the BA, the Reclamation Flow Tools run could be compared with the associated unlimited supply run where it makes sense. The volumes could not be used but the drying that would occur could be described.
- The configuration for river drying charts used to review model output was reviewed (Refer to the sample Figure 1 below). The chart shows a comparison of the occurrence of river drying between two model runs. The orange bars represent the timing for when river drying is indicated for the reach under the “Scenario”, which is the model run with All PHVA Flow Tools for the presented example (70 percent exceedence hydrologic sequence). The purple bars indicate when drying is evident for the “Control”, which is the model run with Just Reclamation Flow Tools in the sample chart. For the example, significantly more river drying is evident along the Isleta to San Acacia Reach with Just Reclamation Flow Tools (the purple bar) for 2013. This difference is due to less Emergency Drought Water being available under the model run with Just Reclamation Flow Tools. Otherwise, the timing for river drying is similar between the model runs.
- A comparison of the timing for recruitment flows is also presented in Figure 1 where the red bars represents times when recruitment flows (at least 3000 cfs for 7 days at Central) are provided for the Scenario, the model run with All PHVA Flow Tools (70 percent exceedence hydrologic sequence), and the green bar represents the times when recruitment flows are provided for the Control, the model run with Just Reclamation Flow Tools. The timing that recruitment flows are provided is essentially the exact same because the occurrence of recruitment flows is a function of the hydrologic sequence. Policy for Cochiti deviations is also the same between the two sample scenarios. The timing for when Cochiti Deviations are implemented is depicted by the blue and brown bars, for the Scenario and Control, respectively, as evident for year 2010 in the sample plot.

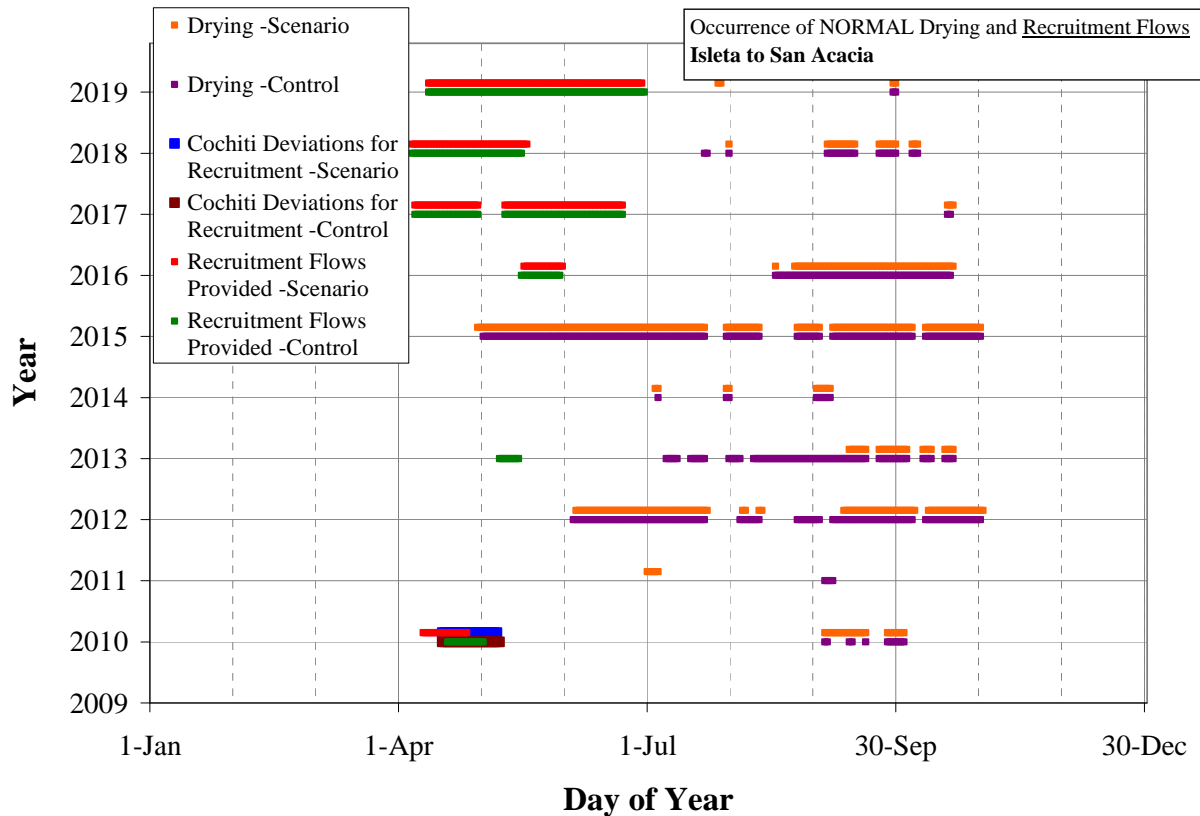


Figure 1. Sample Chart Depicting Model Run Results for River Drying along the Reach from Isleta to San Acacia and the Occurrence of Recruitment Flows between Two Runs both with the 70 percent Exceedence Hydrologic Sequence (Control: Just Reclamation Tools and Scenario: All PHVA Flow Tools)

Approve Oct 26th and December 8th, 2010 meeting minutes

Decision: The October 26, 2010 meeting minutes were approved with no changes.

- Some edits were made to the December 8th minutes; once the changes have been incorporated they will be distributed to the workgroup for approval.

Next Steps and Schedule Next Meeting

- Tentative agenda items include: (1) presentation of suggested fix to the limitations of the model's predictions of Compact credits; (2) PVA letter of needs

**PHVA/Hydro Work Group
24 January 2011 Meeting Attendees**

NAME	POSITION	AFFILIATION	PHONE NUMBER	EMAIL ADDRESS	Primary, Alternate, Other
Craig Boroughs	Tech Team	Contractor (BOR)	970-513-4459	boroughs@bhandh.com	O
Stephen Kissock	PHVA/Hydro Co-Chair	COE	342-3291	stephen.r.kissock@usace.army.mil	P
Nabil Shafike	Tech Team	ISC	383-4053	nabil.shafike@state.nm.us	O
Leann Towne	PHVA/Hydro Co-Chair	Reclamation	462-3579	ptowne@usbr.gov	P
Warren Sharp	Tech Team	Reclamation	462-3637	wsharp@usbr.gov	O
David Gensler	PHVA/Hydro member	MRGCD	505-247-0234	dgensler@mrgcd.com	P
Marc Sidlow	Tech Team	COE	342-3381	Marc.s.sidlow@usace.army.mil	P
Lori Robertson	---	FWS	761-4710	Lori_robertson@fws.gov	O
Jen Bachus	---	FWS	761-4714	Jennifer_bachus@fws.gov	O
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Dagmar Llewellyn	Tech Team	Reclamation	462-3594	dllewellyn@usbr.gov	O
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