

AMENDMENT NO. 16

AGREEMENT FOR PROFESSIONAL SERVICES
BETWEEN
THREE RIVERS LEVEE IMPROVEMENT AUTHORITY
AND
MBK ENGINEERS

THIS SIXTEENTH AMENDATORY AGREEMENT is made and entered into this 28th day of June, 2011, by and between the THREE RIVERS LEVEE IMPROVEMENT AUTHORITY ("TRLIA") and MBK ENGINEERS ("CONTRACTOR"), who agree as follows:

1. **Recitals.** This Amendment is made with reference to the following background recitals:

- 1.1. Effective August 23, 2003, the parties entered into an agreement ("AGREEMENT") to provide basic services with a contract value of \$55,800 and an end date of February 3, 2004.
- 1.2. Effective September 11, 2003, the parties entered into Amendment 1 to the AGREEMENT in the amount of \$8,000 for a total contract value of \$63,800.
- 1.3. Effective January 6, 2004, the parties entered into Amendment 2 to the AGREEMENT in the amount of \$30,000 for a total contract value of \$93,800.
- 1.4. Effective March 19, 2004, the parties entered into Amendment 3 to the AGREEMENT in the amount of \$45,400 for a total contract value of \$139,200 and to extend the contract end date to March 30, 2004.
- 1.5. Effective April 22, 2004, the parties entered into Amendment 4 to the AGREEMENT in the amount of \$50,100 for a total contract value of \$189,300 and to extend the contract end date to July 31, 2004.
- 1.6. Effective August 3, 2004, the parties entered into Amendment 5 to the AGREEMENT in the amount of \$8,000 for a total contract value of \$197,300 and to extend the contract end date to September 7, 2004.
- 1.7. Effective October 6, 2004, the parties entered into Amendment 6 to the AGREEMENT in the amount of \$97,650 for a total contract value of \$294,950 and to extend the contract end date to December 7, 2004.
- 1.8. Effective January 26, 2005, the parties entered into Amendment 7 to the AGREEMENT in the amount of \$35,000 for a total contract value of \$329,950 and to extend the contract end date to April 30, 2005.
- 1.9. Effective March 15, 2005, the parties entered into Amendment 8 to the AGREEMENT in the amount of \$108,200 for a total contract value of \$438,150.
- 1.10. Effective September 6, 2005, the parties entered into Amendment 9 to the AGREEMENT in the amount of \$187,200 for a total contract value of \$625,350 and to extend the contract end date to July 31, 2006.
- 1.11. Effective April 18, 2006, the parties entered into Amendment 10 to the AGREEMENT in the amount of \$549,359 for a total contract value of \$1,174,709 and to extend the contract end date to December 31, 2006.
- 1.12. Effective December 12, 2006, the parties entered into Amendment 11 to the AGREEMENT in the amount of \$707,980 for a total contract value of \$1,882,689 and to extend the contract end date to December 31, 2007.

- 1.13. Effective January 8, 2008, the parties entered into Amendment 12 to the AGREEMENT in the amount of \$629,056 for a total contract value of \$2,511,745 and to extend the contract end date to December 31, 2008.
 - 1.14. Effective January 27, 2009, the parties entered into Amendment 13 to the AGREEMENT in the amount of \$572,472 for a total contract value of \$3,084,217 and to extend the contract end date to December 31, 2009.
 - 1.15. Effective December 15, 2009, the parties entered into Amendment 14 to the AGREEMENT in the amount of \$569,020 for a total contract value of \$3,653,237 and to extend the contract end date to December 31, 2010.
 - 1.16. Effective September 28, 2010, the parties entered into Amendment 15 to the AGREEMENT in the amount of \$661,887 for a total contract value of \$4,315,124 and to extend the contract end date to December 31, 2011
 - 1.17. The parties now desire to amend the AGREEMENT to modify the total contract value.
2. **Sixteenth Amendment to Agreement.** The AGREEMENT is hereby amended as follows:
- 2.1. The scope of services is increased by the efforts described in Attachment A.
 - 2.2. The total contract value is amended in the amount of \$526,270 for a total contract value of \$4,841,394.
 - 2.3. The contract end date remains at December 31, 2011
3. **No Effect on Other Provisions.** Except for the amendments in Section 2, the remaining provisions of the Professional Services Agreement shall be unaffected and remain in full force and effect.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement on

June 28th, 2011.

THREE RIVERS LEVEE IMPROVEMENT
AUTHORITY



Paul G. Brunner
Executive Director

MBK ENGINEERS



Ric Reinhardt
Principal

ATTEST:
DONNA STOTTEMEYER
SECRETARY, THREE RIVERS



APPROVED AS TO FORM:
SCOTT L. SHAPIRO
GENERAL COUNSEL, TRRIA



ATTACHMENT A

Amendment 16 SOW

Amendment 15 Task 7, Goldfields Analysis, contains the following efforts

- Conduct surveying of the features in the Goldfields.
- Perform hydraulic modeling to determine flows that may potentially exit the Goldfields.
- Coordinate effort with CVFPB and Corps
- Manage Alternative Analysis
- Coordinate with Stakeholders
- Manage Environmental, Design, & Funding for Selected Solution.
- Create floodplain maps showing 100-year and 200-year floodplains from the Goldfields.
- QA/QC model and mapping results

Amendment 16 to the MBK contract addresses the extra effort that has been and continues to be spent on Task 7, the Goldfields Hydraulic Analysis. This analysis has been much more complicated than originally envisioned in the earlier scopes of work for the Goldfields Analysis. MBK has concentrated extensive effort on developing an accurate detailed model of the Goldfields and then determining how flows move through the Goldfields as well as trying to identify the most likely points of failure in the Yuba River training walls. These have been much more difficult tasks than first realized.

In addition to the complications encountered in the original efforts MBK has had to add additional effort as follows:

- Perform sensitivity analysis of the grid size to determine the appropriate grid size and run time for one model which encompasses the entire study area. This was not envisioned in the original scope because MBK envisioned having two FLO2d models (one of the goldfields and one of the floodplain).
- Model development began just as a new version of FLO2d was released. Frequent updates during the model development caused work to increase to review and implement the changes. As a result of all the updates, MBK developed and implemented additional QC procedures.
- MBK prepared additional QC, implemented additional model development procedures, and calibrated the model and increased the model documentation as a result of DWR comments.
- Additional effort required to diagnose topography changes (key crossing failure and mining changes) that became apparent during field visits and data review.