DATE October 3, 2007
TO Jerry L. Maxwell, General Manager
FROM Donald J. Polmann, Director of Science and Engineering

SUMMARY Tampa Bay Water is required by FDEP and Hillsborough County EPC to submit a Comprehensive Annual Reservoir Report (CARR) each year. HDR is the design engineer of record for the C W Bill Young Regional Reservoir and will prepare and submit the WY2007 CARR in April 2008. Staff recommends HDR's contract be amended to provide for HDR to prepare and submit the WY2008, WY2009, and WY2010 CARR documents, which will include evaluation of current soil cement flat plate maintenance practices and procedures.

RECOMMENDATION Approve Amendment No. 8 with HDR, Inc., in the amount of $1,688,289 for an additional 31 months of monitoring for preparation and submittal of the CARR.

COST/FUNDING SOURCE $1,688,289/Uniform Rate

DISCUSSION The FDEP and Hillsborough County EPC permits for the C W Bill Young Regional Reservoir require the preparation and submittal of a Comprehensive Annual Reservoir Report (CARR). In August 2005, Contract Amendment No. 7 with HDR, the design engineer of record for the project, was approved that provided for HDR to prepare and submit the first three CARRs (WY2005, WY2006, and WY2007). HDR's Amendment No. 7 will run its course in September of 2008 after the submittal of the WY2007 CARR in April 2008, but before the submittal of the WY2008 CARR in April 2009. The CARR documents and reports the results of monitoring and maintenance activities associated with the reservoir. One ongoing activity is maintenance of cracks in the flat plate soil cement on the interior face of the reservoir. The purpose of the flat plate soil cement is to prevent wave erosion of the interior earthen embankment, and it was designed into this project as a favorable alternative to segmented concrete mats or placed boulders (riprap). Soil cement also has the advantages of facilitating visual inspection to allow for targeted maintenance activity.
FDEP has determined the cracks do not pose a threat to the stability of the embankment (Attachment 1), but FDEP, HDR, and Tampa Bay Water all concur that the cracks need to be filled. Current maintenance procedures consist of gravity filling the cracks with grout using a general utility as-needed contractor. Other crack filling techniques (such as special grout mixes or employing specialized pressure grouting contractors) may be more effective for long-term maintenance of the cracks. Staff has asked HDR to investigate the current crack filling techniques to optimize the annual cost of this aspect of reservoir maintenance. HDR has submitted an interim report on this subject (Attachment 2) which charts a course of data collection to guide the optimization effort.

Staff recommends the Board approve Amendment No 8 with HDR, Inc (Attachment 3) in amount of $1,688,289 for a 31-month extension to the contract for monitoring, compilation, and submittal of the WY2008, WY2009, and WY2010 CARRs. Amendment No 8 will also include data collection training, and activity to collect and analyze data to verify that existing maintenance practices are optimized, or develop processes that do optimize flat plate soil cement maintenance practices.

BACKGROUND The C.W. Bill Young Regional Reservoir is located in southern Hillsborough County. The facility is designed to store up to 15 billion gallons from the Tampa Bypass Canal, Hillsborough and Alafia Rivers. Construction of the facility was completed in 2005 and following approval from FDEP, was placed into full operational status in June 2005.

The following is a summary of Contract No 99-19 with HDR to date:

- November 11, 1998 Board selected HDR to perform Design Services for the Tampa Bay Regional Reservoir for the sum of $7,535,498.
- February 28, 2000 Board approved Amendment No 1 to HDR’s contract for Design and Permitting Services, and Engineering Services During Construction in the amount of $4,272,913.
- June 19, 2000 Board approved Amendment No 2 to HDR’s contract for Stage A Activities for a feasibility analysis of Potable Water Aquifer Storage and Recovery in the amount of $60,000.
- November 13, 2000 Board approved Amendment No 3 to HDR’s contract for Design and Permitting Services in the amount of $499,240. Additional services provided under this amendment included five more aquifer performance tests (at the request of the Hillsborough Water Resource Team), preparation of a Water Use Permit application for dewatering during construction, attendance at more pre-application meetings (total of 27) than originally scoped, and installation of piezometers and stream flow gages for base-line data collection.
- October 15, 2001  Board approved Amendment No 4 to HDR’s contract for Design and Permitting Services in the amount of $453,300  Additional services provided under this amendment included design changes resulting from regulatory input and the arbitration award, support during bidding, and permitting efforts beyond the scope of the existing contract

- April 15, 2002  Board approved Amendment No 5 to HDR’s contract for Additional Engineering Services During Construction and Start-Up in the amount of $4,001,482  This amendment was processed to provide additional regulatory-required inspection services, and to address a construction schedule increase from 16 months to 27 months

- July 21, 2003  Board approved Amendment No 6 to HDR’s contract for Design Services during Construction in the amount of $1,639,111  This amendment was associated with flooding that occurred on the construction site during the El Nino of 2002  Activities included design and operation of a site water treatment facility, additional regulatory reporting and analysis, and additional inspection services  A portion of these costs was recovered through an insurance settlement

- August 15, 2005  Board approved Amendment No 7 to HDR’s contract for Start-up and Reporting Phase Services in the amount of $604,341  This amendment covered engineering services during the first three years of operation

Attachments
Memorandum

TO                Richard W Cantrell, Director
                  Southwest District

THROUGH           John Coates, P E , Chief
                  Bureau of Mine Reclamation

FROM              Fred Noble, P E , Administrator
                  Technical Services Section, Bureau of Mine Reclamation

DATE              September 5, 2007

SUBJECT           Tampa Bay Water C W Bill Young Regional Reservoir

Per your request, I visited the Tampa Bay Water C W Bill Young Regional Reservoir on August 30, 2007 to investigate reports of cracking in the flat-plate soil-cement on the interior slope of the dam. I was accompanied by Dr. David Carrier, P E , the Department’s expert consultant for this project, representatives of HDR Engineering, and representatives of Tampa Bay Water.

Subsequent to our site visit, Dr. Carrier provided you a letter dated September 4, 2007 discussing issues related to the flat-plate soil-cement, potential for sinkhole activity, and structural integrity of the dam. Based on my observations and discussions with Dr. Carrier, I concur with the opinions enumerated in his September 4 letter that the cracking in the flat-plate soil-cement is not due to sinkhole activity and that it has not impaired the structural integrity of the reservoir.

If you have any questions, please call me at 850-488-8217.
September 4, 2007

Mr. Richard W. Cantrell  
Director, Southwest District  
Florida Department of Environmental Protection  
13051 North Telecom Parkway  
Temple Terrace, FL 33637-0926

Dear Mr. Cantrell:

As requested, this is a progress report on the safety status of the Tampa Bay Water C. W. Bill Young Regional Reservoir.

First, it is my professional opinion that the cracking which has occurred in portions of the flat-plate soil-cement is not due to sinkhole activity.

Second, it is my professional opinion that the structural integrity of the reservoir has not been impaired by the cracking.

Here is the background:

1. Flat-Plate Soil-Cement

Flat-plate soil-cement is a 16-inch thick liner on the upstream (or “inside”) slope of the dam (see Figure 1). Its function is to prevent erosion of the earthen embankment due to either waves or rain. Because the water level can fluctuate over a wide range, the flat-plate soil-cement extends from the bottom of the reservoir up to the maximum pool level of 136.5 feet above NGVD (National Geodetic Vertical Datum of 1929; or, in layman’s terms, above “mean sea level”). And, because the reservoir might have to temporarily hold excess rainwater during a major storm, as well as large waves, the dam has a freeboard of 8.5 feet above the maximum pool level, such that the crest of the dam is at elevation 145 feet. The freeboard zone is lined with
another form of soil-cement called stair-step. No cracking has occurred in the stair-step soil-cement.

Both the flat-plate and stair-step soil-cement were made by mixing 8 to 9% cement with selected soils obtained from the interior of the reservoir. The mixing was done with a special plant that was erected during construction. Both the flat-plate and the stair-step soil-cement were compacted (or densified) to the same degree: an average of 98% relative compaction based on Standard Proctor. However, different methods and equipment were used: stair-step is more labor-intensive and it is thicker. Because the soil-cement does not contain aggregate (or gravel), its compressive strength is only about one-tenth that of typical concrete.

2. Potential for Sinkhole Activity

During the design phase for the reservoir, which was done by HDR and various subcontractors, extensive subsurface investigations were performed to evaluate the foundation conditions, including the potential for sinkhole activity. These field investigations included borings, ground-penetrating radar, and seismic refraction and reflection surveys. Based on these investigations, HDR modified the northwest alignment of the dam in order to avoid a suspicious area.¹

During the permitting phase, as a consultant to the Florida Department of Environmental Protection, I reviewed all of this data, which filled several three-inch binders. I concluded that the investigations were adequate and thorough; certainly more thorough than for any dam that had been built in Florida up to that time. Nonetheless, I included a specific condition in the permit that requires TBW to conduct a side-scan sonar survey (or comparable technology) to detect the formation of sinkholes in the bottom of the reservoir. These surveys must be performed annually for the first five years of operation, every other year for the next ten years, and once every five years thereafter for the life of the reservoir.

Although side-scan sonar is a well-developed technique for dredging projects and other marine works, as well as for archaeological investigations, to my knowledge, this was its first application for sinkhole detection in a Florida reservoir (maybe in the United States).

The first survey was completed in June of last year by the University of South Florida under contract to HDR. In order to increase the accuracy of the survey, HDR also elected to include bathymetry. No sinkholes were found. The second survey should be completed in the near future.

¹ Hairline cracking occurs throughout the flat-plate soil-cement. This was anticipated and requires no repair. The severe cracking that is the subject of this report has occurred only in the northeast and southwest portions of the dam, not in the northwest portion where the alignment was modified.
In the meantime, there is much that can be learned from other evidence:

a. **The cracking pattern is not consistent with sinkhole formation.** The cracks that have occurred in the northeast and southwest portions of the reservoir indicate that the 16-inch thick slabs of flat-plate soil-cement have moved downslope; that is, in a direction parallel to the as-constructed slope of 3 horizontal to 1 vertical (see Figure 1). There is no saucer- or bowl-shaped depression. (I will discuss the cracking damage in more detail in Section 3 below.)

b. **The crest of the dam has not settled.** Just after construction of the dam was completed, eleven survey markers (or settlement monuments) were established in the crest road, distributed around the perimeter of the dam. These markers are surveyed monthly and indicate that no settlement has occurred. A twelfth marker was installed in June of this year, in the vicinity of the cracking in the northeast. The elevation of this marker is consistent with the other eleven markers: 145 feet plus a few inches.

c. **The piezometers have not shown a significant change.** Piezometers are special instruments that have been installed in the interior of the dam and in the foundation soils, in order to monitor the water level (or pressure). Ten lines of piezometers were originally installed around the perimeter of the dam. An eleventh line was added in May of this year, in the vicinity of the cracking in the northeast. The water levels measured by the piezometers fluctuate with the pool level in the reservoir, but have shown no significant up-or-down movement that could be associated with a sinkhole.

d. **Finally, most importantly, the toe drain outfalls have not shown a significant increase in water flow.** As shown in Figure 1, a toe drain, blanket drain, and interior drain system is located in the downstream (or “outside”) portion of the dam. This drainage system runs completely around the perimeter of the dam. Spaced at intervals are ten pipelines, or outfalls, that carry seepage water away from the dam. The quantity of water flow from each outfall is measured monthly. The flows fluctuate with the pool elevation, but no significant increase has occurred that could be associated with a sinkhole.

For all of the above reasons, I have concluded that the cracking in the flat-plate soil-cement is not due to sinkhole activity.

Of course, while no evidence for sinkhole activity has been found, the search for any such evidence will continue, particularly as the reservoir is re-filled during the rainy season.

3. **Structural Integrity**

The structural integrity and safety of the dam is under continuous, methodical review.
First, the dam is “driven” several times a day by the security guard. Next, the dam is inspected weekly by Veolia Water technicians under contract to TBW. These technicians have been formally trained to look for problems and to alert the proper authorities if necessary. They prepare weekly inspection reports that are passed on to HDR. HDR in turn prepares a Monthly Inspection and Embankment Performance Monitoring Report that is submitted to FDEP. This report includes data from the settlement monuments, the piezometers, and the toe drain outfalls as described above. HDR also conducts a formal annual inspection and prepares a signed and sealed report that is submitted to FDEP.

And HDR prepares the Comprehensive Annual Reservoir Report (CARR), which consists of the annual inspection report, bundled together with other required reports. The CARR is also submitted to FDEP.

As a consultant to FDEP, I review and comment on the monthly reports, the annual inspection report, and the CARR. In addition, I conduct random monthly inspections, and at other times as necessary. During each visit, I take photographs and report my observations via e-mail to FDEP. So far this year, I have inspected the reservoir thirteen times and have taken approximately 600 photographs.²

For purposes of this report, I will divide the cracking into primary and secondary. Primary cracking refers to damage to the flat-plate soil-cement for which the exact mechanism or combination of mechanisms is not yet known. Determining these mechanisms is the subject of an ongoing investigation, primarily by HDR with input from myself and others. An example is the first cracking observed in late December 2006 in the northeast portion of the dam. At that time, the cracks were not visible from the crest, but were spotted by a Veolia technician, Jay Sheridan, who was in a boat on the reservoir doing some other maintenance work. The pool level then was approximately 121 feet, or about 15.5 feet lower than the maximum of 136.5 feet, which was first reached in November 2005.³

On December 27, 2006, I was notified about the cracking by Barry Meyer of HDR. I inspected the area on January 2, 2007, when the pool level was approximately 120 feet. At that

² During the two-year construction period, I visited the site approximately every two weeks. I have no idea how many photographs I took, but they probably number in the thousands.

³ Beginning in May 2005, the reservoir was filled more-or-less continuously from about elevation 84 feet up to the maximum level of 136.5 feet in November 2005. The reservoir remained essentially full until April 2006, when the level was pulled down, reaching approximately 115 feet in July 2006. No cracking was observed at that time. The reservoir was then partially re-filled, reaching a level of approximately 131 feet in October 2006. Thus, the reservoir was in its second stage of lowering when the first cracking was observed in December 2006. The pool level at that time was 6 feet higher than the minimum of 115 feet that had been reached in July 2006.
time, there were three significant cracks, running parallel to the crest, for approximately 300 to 400 feet (see Figure 2). The cracks merged and gradually feathered together at either end, curving down to the water, in an arcuate pattern. The topmost crack occurred at a maximum elevation of approximately 129 feet. The second crack, which was the widest and deepest, occurred at a maximum elevation of approximately 125 feet. At that time, the maximum crack width was approximately 1-3/8 inch (see Figure 3); and the maximum depth was approximately 15-1/2 inches, the full thickness of the flat-plate soil-cement (see Figure 4).

Eventually, three other zones of cracking would occur, as the pool level continued to be drawn down, reaching a minimum of about elevation 90 feet in July 2007. One of these zones is also located in the northeast portion of the dam; and the other two are located in the southwest portions of the dam. Altogether, these four zones of cracking occur on approximately 7% of the perimeter of the dam. This primary cracking occurred after the water level had been dropped, and is due to the change in stress associated with lowering the pool. The pool level has been rising since July (reaching approximately 104 feet on August 30), and no new primary cracking has been observed.

The exact mechanism for this primary cracking is not yet known, although sinkhole activity (see above) and upstream slope instability (rotational shear surface) have been ruled out. One early contender was high water pressure trapped behind the soil-cement. When the reservoir is filled, water passes through the soil-cement and saturates the earthen embankment, up to the geomembrane seepage barrier (see Figure 1). Then, when the pool is drawn down, the water tries to escape from the embankment, back through the soil-cement. If the rate of pool drawdown is too rapid, the excess water pressure could have cracked the soil-cement. And, in fact, I noticed that the relative movement perpendicular to the slope at each crack was outward on the upslope side of the crack; and inward on the downslope side of the crack (see Figure 2). This pattern suggested that high water pressure had pushed outward against the underside of the soil-cement and caused the cracking. Furthermore, later, when the cracks were wider (see Figure 7), I could see the geotextile beneath the soil-cement. The geotextile was undamaged and it appeared as if the soil-cement had slid on the geotextile, giving more credence to the high water pressure hypothesis.

However, the actual rate of drawdown had not exceeded the design value. Furthermore, why would this affect only about 7% of the perimeter of the dam? So, many other hypotheses have been proposed.

For example, when the flat-plate soil-cement was constructed, it was placed in "stripes" roughly 30-feet wide running up the slope. Are the joints between these stripes possible planes

---

4 Geotextile is a porous, non-woven, plastic "cloth" lying directly beneath the flat-plate soil-cement; it acts as a filter and is sometimes called "filter fabric" or "filter cloth". The geotextile is not to be confused with the geomembrane seepage barrier shown in Figure 1. The geomembrane is located deeper within the embankment and is a solid sheet of plastic.
of weakness? Or does the placement of the geotextile allow the formation of loose soil zones?

These and other mechanisms will be systematically studied until the answer is found.

So, this is primary cracking. Secondary cracking refers to damage where it is obvious that the cause is erosion due to infiltration of rainwater into the cracks, leading to undercutting and subsequent breakage. An example is shown in Figure 5, which I found during my inspection on August 14, in the vicinity of the original primary cracking observed in December/January. A block of soil-cement, roughly 5 feet on a side, dropped vertically downward about 2 feet into the slope, due to erosion. Note that one edge of the block is on a joint, which can be seen as the organically-stained strip in the upper photograph in Figure 5. This area, as well as the joint, was repaired shortly afterward and the result is shown in Figure 6, taken on August 30.

In between the primary and secondary category, there is a transition category. For example, on June 7, I found cracks up to 5 to 6 inches wide in the northeast portion of the dam (see Figure 7); and on July 3, I found cracks up to 10 inches wide, also in the northeast portion of the dam (see Figure 8). But I do not believe it is known yet whether this severe cracking is primary or secondary, or a combination of both. That is, were the original, as-yet unknown primary mechanisms still operating and caused the cracks to continue to widen? Or did the rainwater infiltration cause additional movement that would not have occurred otherwise? Or were both primary and secondary mechanisms happening simultaneously?

In any event, the cracking is being intensively studied. And, as described in Section 2 above, no evidence has been found that indicates the damage is more than superficial. The data indicate the interior seepage barrier and drainage system are functioning as designed.

Thus, it is my opinion that the cracking in the flat-plate soil-cement has not impacted the structural integrity of the dam. In layman’s terms, the dam remains safe. In geotechnical engineering terms, the dam continues to have a probability of failure of less than 0.0001 in any year. This is the standard for dams of this type, and was the standard used for design and permitting.

Of course, close monitoring of the safety of the dam will continue as before. Please let me know if you have any questions.

Sincerely,

ARGILA ENTERPRISES, INC

W. David Carrier III, P.E.
President
Florida Professional Engineer 27347
Figure 2: Cracking in Flat-Plate Soil-Cement in Northeast Portion of Dam (Jan 2, 2007)
Figure 3: Maximum Width of Crack = 1-3/8 inch (Jan 2, 2007)
Figure 4: Maximum Depth of Crack = 15-1/2 inches (Jan 2, 2007)
Figure 5: Collapsed Block of Flat-Plate Soil-Cement in Northeast Portion of Dam (Aug 14, 2007)
Figure 6: Repaired Block of Flat-Plate Soil-Cement Shown in Figure 5 (Aug 30, 2007)
Figure 7: Cracking in Northeast Portion of Dam (Jun 7, 2007)
Figure 8: Cracking in Northeast Portion of Dam (Jul 3, 2007)
1.0 Introduction

This report describes the status of ongoing efforts to identify and address the cause(s) of cracking that has been documented along a portion of the flat-plate soil cement that lines the interior embankment slope of the C.W. Bill Young Regional Reservoir, with the intended purpose of developing best management practices for long-term soil-cement maintenance.

The embankment slope protection is made up of a 16-inch thick layer of soil-cement atop a layer of non-woven textile filter fabric that extends as a flat-plate from the bottom of the reservoir to the maximum reservoir pool elevation. Above the maximum pool elevation to the top of the reservoir, the soil-cement layer was constructed in a stair-step configuration. The flat-plate is designed to protect the earthen embankment against erosion from rainfall, wave action, and from the lowering and rising of water in the reservoir during normal operation. The stair-step configuration is designed to minimize wave action and run-up resulting from storm events when the reservoir is full. The soil-cement is not a structural stability component of the reservoir. The embankment ranges in width from 80 feet at the maximum pool elevation to more than 300 feet at the base, the maximum depth of water in the reservoir (bottom to operating maximum) is about 50 feet. The reservoir’s freeboard, i.e., the height from the maximum pool elevation to the crest of the embankment is 8.5 feet.

The soil-cement layer is a mixture of native soils excavated at the site of the reservoir, portland cement, and water that is compacted to a high density in a manner similar to the embankment soils. Soil-cement has been used for slope protection for over fifty years in the United States and is typically specified as a cost-effective measure when suitable rock is not available within a reasonable distance of the facility being constructed. The soil-cement flat-plate installation commenced on December 30, 2003 and was completed on October 19, 2004.

Compacted soil-cement is a durable, but relatively low strength composite material (about 1/10th the compressive strength of concrete). It does not contain aggregate stone and is not reinforced with steel in this and other similar applications. Shrinkage cracking of soil-cement is a natural characteristic of the material and is evidence that the soil-cement is hardening. At the reservoir, characteristically narrow shrinkage cracks are present in the flat-plate layer in many locations, however, in the northeast and the southwest quadrants cracking beyond what would normally be expected for shrinkage cracks is exhibited. Increased monitoring by Tampa Bay Water, FDEP, and HDR has taken place, as well as a limited, targeted program of crack filling undertaken by Tampa Bay Water’s as-needed contractor.
Observations and Actions Taken - 2007

The reservoir's post-construction phase commenced in June 2005 when filling was initiated. Approximately five months later in November, the level in the reservoir reached the maximum pool elevation and remained nearly constant for approximately four months until April 2006. The first period of drawdown lasted about five months (April - August 2006), followed by a relatively brief (2 months) period of re-filling until October. A long period of drawdown coinciding with lower than normal rainfall extended from October 2006 until August 2007 when the lowest water level was recorded since filling began in June 2005.

In December 2006, cracking greater than that anticipated from shrinkage was first observed by a representative of Veolia (the contract operator at the reservoir) and confirmed by Tampa Bay Water, FDEP and HDR. The initial observation occurred about three months after the reservoir's water level was lowered for the second time, i.e., cracks were not observed during the first drawdown period noted above (April - August 2006). The first larger-than-expected cracks appeared in the northeast quadrant of the reservoir. Over time as the reservoir pool elevation continued to be lowered, more cracks developed in the northeast quadrant and also in the southwest quadrant. The cracks generally ran parallel to the water's edge and in many cases increased in width over time. Eventually, some of the cracks grew wide enough to allow rainwater to pass from the surface of the protective flat-plate through the underlying geotextile fabric and likely down the embankment slope toward the bottom of the reservoir between the geotextile and the underlying soils. During the relatively wet month of June 2007, the flow of rainfall runoff through the expanding cracks in the two zones resulted in some erosion of near-surface underlying embankment soils. In two isolated locations, small sections (20 to 30 sq ft) of the flat-plate dropped into the eroded areas.

During this time representatives of Tampa Bay Water, FDEP, HDR, and Veolia worked together to inventory, categorize, and evaluate potential causes of the cracks. In mid-July 2007, following the heavy rains of June and after the erosion beneath the flat-plate was observed, HDR prepared two technical memoranda describing observations and outlining recommended near term investigation and repair actions, these are summarized below:

**Investigation Activities**

- Mapping of crack formation – this was accomplished by recording visual observations and employing aerial photography.
- Survey of vertical offset – at a few locations, surveying techniques were used to measure the amount of vertical deflection of the flat-plate.
- Ground penetrating radar (GPR) – in the areas of cracking, a ground penetrating radar survey was conducted to determine if this geophysical technique is accurate in determining the presence of erosion beneath the flat-plate. The information obtained from the survey is inconclusive and the technique's applicability to be useful in this application is still being evaluated.
- Installation of piezometers – piezometers were recommended to be installed in the lower portions of the embankment in areas where cracks were occurring, as well as in areas where they were not occurring to measure pore pressures in the embankment soils. This activity has not yet been carried out because the reservoir is still being filled as is normal this time of the year. This activity is planned for the Spring of 2008 when the water level is low enough to allow piezometer installation.
• Testing of materials - cores of the flat-plate soil-cement were drilled at various locations. The cores were catalogued and preserved for later testing (thickness, quality, strength). Subsurface soil samples were obtained for laboratory testing to determine total and dry unit weight and moisture content. To date, not all testing has been completed, but initial observations and results indicate that the soil-cement material and subsurface soils generally conform to specifications.

• Lateral slope movement – a recommendation was made to develop a method to determine if the flat-plate is moving laterally in the areas of cracking. A specific method to be utilized is still being discussed.

**Repair Activities**

• Maintenance of cracks – material and application techniques were recommended for filling of cracks wider than two inches. This activity began in April and continued through August 2007. Some additional filling of cracks less than two inches wide is currently taking place.

• Mitigation of erosion – two areas where erosion has taken place under the flat-plate, were filled with concrete. This maintenance at those two eroded locations is complete.

**3.0 Preliminary Findings and Recommendations for Future Activities**

Although the exact cause of the cracking has not yet been established, it is our opinion that the structural integrity of the reservoir embankment has not been compromised. It is also our opinion, based on observations and data collected to date, that sinkholes can be ruled out as a cause of the cracking, in this we concur with the findings of FDEP dated September 5, 2007. To evaluate other possible causes and to optimize the facility’s maintenance plan, the existing monitoring program will be enhanced and carried out by Tampa Bay Water staff and HDR with additional review provided by the FDEP and its independent dam safety expert, Dr. David Carrier and Tampa Bay Water’s System Engineer, Black & Veatch. The program monitoring will encompass the following activities:

• **Mapping** – additional mapping will be conducted within the areas where cracking has occurred to document changes over time. Various techniques will be used and explored to record basic information.

• **Underwater Inspection** – inspection by certified divers will be undertaken to further examine the lower sections of the embankment flat-plate, bench, and toe of slope that are underwater for most of the year. This activity is considered necessary because during the inspections conducted during late July, 2007 (when the pool was at its lowest level), an observation was made at one specific location along the bench of the embankment slope that the thickness of the flat-plate was significantly less than specified. It is necessary to determine whether this condition is isolated to the location observed.

• **Surveying** – three types of surveying have been completed or are currently under way. 1) land surveying using traditional methods to detect settlement of the embankment, 2) side scan sonar to detect the presence or absence of sinkholes in the bottom of the reservoir, and 3) ground penetrating radar surveying (if applicable) to detect erosion beneath the flat-plate. The following is anticipated for each of the three methods:
  - **Land Surveying** – additional survey monuments will be installed at the crest of the embankment and at the bottom of the soil-cement stair step, the purpose...
of which will be to detect settlement. Surveying of existing points along the flat-plate to record changes in the surface will continue. To date, survey data at 12 existing monument locations has indicated no settlement of the embankment.

- **Side Scan Sonar Survey** – this method was first employed last year and is part of the annual permit compliance monitoring program. As noted above, the survey is intended to detect the presence or absence of sinkholes below the bottom of the reservoir. Additional review of last year’s survey documentation will be undertaken to determine if the imagery provides any clues regarding the presence or absence of cracking along the inundated portions of the embankment (the focus last year was the bottom of the reservoir rather than the slopes). If the imagery reveals cracks, it would help determine when the cracks initially formed. This year’s survey is scheduled to take place in October 2007.

- **Ground Penetrating Radar Survey** – if it is determined that the ground penetrating radar survey conducted during the summer of 2007 yields useful information regarding possible erosion beneath the flat-plate, additional surveying will be performed. The effort to determine the usefulness of this technique is continuing – an attempt to correlate the interpretations made by the survey company to actual conditions is being conducted by HDR using small diameter boring equipment (hammer drill). Other geophysical techniques will also be considered for possible use in the effort to map the extent of erosion beneath the flat-plate.

- **Subsurface Evaluation** – in order to determine the characteristics of underlying soils in the areas of cracking, samples will be collected at several locations and tested in a soils laboratory. The results from these tests will be compared to samples collected and tested in areas where no cracking has been detected.

- **Lateral Movement Measurement** – in order to determine if the embankment is moving laterally, instruments (extensometers) will be installed at a number of locations. The location and configuration of the extensometers are under review.

- **Material Testing** – the following material testing will be undertaken:
  - **Cores** – additional cores will be obtained in areas where cracking has occurred, as well as areas where none has occurred. The thickness of the flat-plate will be recorded and the cores will be tested to determine if their compressive strength meets specification. Other material properties will also be assessed.
  - **Frictional Resistance Test** – a laboratory test will be conducted to measure the frictional resistance provided by the geotextile fabric that underlies the soil-cement flat-plate. The results will be compared to the coefficient of friction used in the design of the flat-plate/geotextile system.

- **Water Pressure Monitoring** – additional piezometers with data loggers will be installed at selected locations along the flat-plate to measure pore water pressures beneath the flat-plate soil-cement. The purpose of the data will be to determine if the buildup of water pressure below the soil-cement flat-plate is contributing to or causing the cracking that has been occurring. The piezometers will be installed in areas of cracking and in control areas of no cracking.

In addition to the activities described above, steps will be taken to optimize maintenance of the embankment protection system in an effort to develop long-term best management practices. First, HDR will evaluate several grout mix designs so that the most appropriate mix or mixes will
be employed in the future to fill cracks that may develop. Second, HDR will explore options for introducing grout under pressure by consulting with specialty contractors. Third, HDR will examine the merits of introducing interior slope drains at flat-plate construction joints and intraday construction joints in the areas of cracking. The objectives of the evaluations will be to 1) develop a specification that would be used later to solicit bids to perform crack and erosion mitigation to complement/improve the interim repairs using methods undertaken during the summer of 2007 and 2) determine if the introduction of drains is necessary in the areas of cracking.

The activities described are comprehensive and collaborative. The information obtained will be examined by Tampa Bay Water staff, HDR, FDEP, and Tampa Bay Water’s system engineer. The overarching objectives will be to determine the root cause of the cracking that has affected about 10% of the total interior embankment protection system and to optimize repair and maintenance operations to minimize the potential for a recurrence within or expansion of the areas of cracking. An approximate timeline of the program activities is presented below:

<table>
<thead>
<tr>
<th>Schedule of Activities</th>
<th>Description of Activity</th>
<th>Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Short-term</td>
</tr>
<tr>
<td><strong>Monitoring and Data Gathering</strong></td>
<td>Mapping of Cracks</td>
<td>Oct 2007</td>
</tr>
<tr>
<td></td>
<td>Underwater Inspections</td>
<td>Oct 2007</td>
</tr>
<tr>
<td></td>
<td>Land Surveying</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Side Scan Sonar</td>
<td>Oct 2007</td>
</tr>
<tr>
<td></td>
<td>Ground Penetrating Radar</td>
<td>TBD</td>
</tr>
<tr>
<td></td>
<td>Subsurface Soil Characterization</td>
<td>Oct - Nov 2007</td>
</tr>
<tr>
<td></td>
<td>Lateral Movement Measurements</td>
<td>Start Nov 2007</td>
</tr>
<tr>
<td></td>
<td>Frictional Resistance Test</td>
<td>Nov 2007</td>
</tr>
<tr>
<td></td>
<td>Ground Water Monitoring - New Piezometers</td>
<td>Start Nov 2007</td>
</tr>
<tr>
<td><strong>Engineering Evaluations</strong></td>
<td>Grout Mix(es)</td>
<td>Oct 2007</td>
</tr>
<tr>
<td></td>
<td>Pressure Grout Methods</td>
<td>Oct 2007</td>
</tr>
<tr>
<td></td>
<td>Slope Drains in Area of Cracking</td>
<td>Dec 2007</td>
</tr>
<tr>
<td><strong>Specification Package</strong></td>
<td>Specification</td>
<td>Dec 2007</td>
</tr>
<tr>
<td></td>
<td>Bid Form</td>
<td>Dec 2007</td>
</tr>
<tr>
<td><strong>Future Reports to Board of Directors</strong></td>
<td>Update + Bid Package</td>
<td>Dec 2007</td>
</tr>
<tr>
<td></td>
<td>Update + Opinion of Root Cause</td>
<td>Feb 2008</td>
</tr>
<tr>
<td></td>
<td>Update</td>
<td>April 2008</td>
</tr>
</tbody>
</table>
ATTACHMENT 3

TAMPA BAY WATER, A REGIONAL WATER SUPPLY AUTHORITY
EIGHTH AMENDMENT TO AGREEMENT
NO 99-19

THIS EIGHTH AMENDMENT is made and entered into this _______ day of
________________, 2007, by and between TAMPA BAY WATER, A Regional Water Supply
Authority, an interlocal governmental agency created and existing pursuant to Sections 373 1962 and
163 01, Florida Statutes, acting by and through its Board of Directors, the governing board thereof
("TAMPA BAY WATER"), and HDR ENGINEERING, INC., a corporation in the State of Florida
("CONSULTANT")

WHEREAS, TAMPA BAY WATER has retained the CONSULTANT for Professional
Services under Agreement Number 99-19 as amended, and

WHEREAS, TAMPA BAY WATER selected CONSULTANT in accordance with the
provisions of the Florida Consultant’s Competitive Negotiation Act for services to be performed
under Agreement Number 99-19 as amended, and

WHEREAS, TAMPA BAY WATER desires to continue to utilize CONSULTANT for
services based upon the terms and conditions set forth in Agreement Number 99-19, as hereby
further amended

NOW, THEREFORE, in consideration of the foregoing premises, which shall be deemed an
integral part of this Eighth Amendment to Agreement Number 99-19, TAMPA BAY WATER and
the CONSULTANT, intending to be legally bound, agree as follows

1 The Scope of Services and Schedule of Project Compensation attached hereto as
Exhibit A is approved and incorporated herein as an addition to the Scope of Services
and increases the total project compensation by an additional $1,688,289 to the
Agreement
Schedule B, Sections 11 and 12 of the above referenced Agreement are hereby replaced by Section III of Tampa Bay Water's Administrative Policies and Procedures Number 62-32, Policy to Standardize Consultant Fees Charged to Tampa Bay Water, attached hereto as Exhibit B.

This Eighth Amendment is hereby made a part of, and incorporated in its entirety, into Agreement Number 99-19, as amended.

In all other respects, Agreement Number 99-19, as amended, is hereby reaffirmed by the parties and remains in full force and effect.

[REMAINDER OF PAGE INTENTIONALLY LEFT BLANK]
IN WITNESS WHEREOF, the parties hereto have caused these presents to be executed by their duly qualified representatives.

WITNESSES

__________________________
Signature

__________________________
Print Name

__________________________
Signature

__________________________
Print Name

HDR ENGINEERING, INC

By _________________________

Its _________________________

Date _________________________

ATTEST

__________________________
Secretary

TAMPA BAY WATER, A Regional Water Supply Authority

By _________________________

Its _________________________

Date _________________________

(SEAL)

APPROVED AS TO FORM

__________________________
Office of the General Counsel
Scope of Services
C W “Bill” Young Regional Reservoir
HDR Engineering Services for Water Years 2008, 2009, and 2010
of Reservoir Operations

This Scope of Services identifies tasks to be performed by HDR Engineering, Inc (CONSULTANT) for TAMPA BAY WATER’s “Water Years” 2008, 2009, and 2010 of reservoir operation. Tasks associated with Year 3 reservoir start-up activities in Amendment 6 and Amendment 7 of Contract 99-19 are combined in this scope, and in the attached Schedule of Project Compensation. Other tasks included in this scope cover services to meet permit conditions for WY2008, WY2009, and WY2010 and for the investigation and development of maintenance practices for the flat-plate soil-cement The original project compensation for start-up services in Amendment 7 was estimated at $1,155,011 of which approximately $631,600 has been liquidated to date, leaving $523,411 available from the original Amendment 7 budget. An additional $75,000 was included in the WY2008 budget to replenish the owner’s allowance of Amendment 7. Therefore, there is a total of $598,411 available for Amendment 7 services. Amendment 8 provides for an extension of the contract for a term of 31 months and reflects an increase of up to $1,688,289 for the permit compliance and soil-cement monitoring and maintenance activities to be performed by the CONSULTANT through April 2011.

Monitoring and reporting of water quality, water levels, and embankment conditions are required by FDEP’s Environmental Resource Permit (ERP) and the Hillsborough County Environmental Protection (EPCHC) Commission’s Wetland Authorization. Monitoring and reporting requirements are detailed in the permit and the reservoir Operations and Maintenance Plan. Data collection and reporting will be completed by TAMPA BAY WATER, the facility operations contractor, and the CONSULTANT. The CONSULTANT tasks for the soil-cement monitoring and maintenance activities will include the development of a monitoring and reporting plan, installing monitoring plan components, overseeing soil-cement maintenance activities, and analyzing the soil-cement maintenance monitoring plan data to prepare monthly reports. The CONSULTANT will prepare a comprehensive soil-cement maintenance monitoring report that includes a summary of all data collected through WY2010, a technical assessment of the monitoring results, and a discussion of potential mechanisms for the soil-cement crack formations.

13 10 5 Year 4 - Reservoir Permit Compliance
(September 2008 through September 2009)

Monthly Reservoir Embankment Performance Monitoring Report The CONSULTANT shall prepare a Monthly Reservoir Embankment Performance and Monitoring Report as required in FDEP permit special condition (SC) 33. A draft report shall be submitted to TAMPA BAY WATER by the 20th day of the month immediately following the reporting month. The final report shall be
submitted to the TAMPA BAY WATER, FDEP, and HCEPC no later than the
last day of the month immediately following the reporting month. This report
shall include all elements as required by the permit.

Comprehensive Annual Reservoir Report  The CONSULTANT shall
prepare the WY2008 Draft Comprehensive Annual Reservoir Report (CARR)
and submit to TAMPA BAY WATER by January 2, 2009. After review by
TAMPA BAY WATER, the CONSULTANT shall revise the draft CARR as
necessary and submit said report to the FDEP and the EPCHC by February 3,
2009. By March 3, 2009 the CONSULTANT shall meet with TAMPA BAY
WATER, the FDEP and EPCHC staff to review the draft CARR. Following
this meeting the CONSULTANT shall finalize the CARR and submit the
appropriate number of copies to FDEP and EPCHC, and TAMPA BAY
WATER on or before April 3, 2009. This report shall include all elements as
required by the permit.

Stormwater Management System Inspection Report  The CONSULTANT
shall inspect the stormwater management system and submit to the FDEP Form

Train Tampa Bay Water Staff  The CONSULTANT shall train Tampa Bay
Water Staff to prepare section of the monthly and annual reports, and trend
analyses.

As-needed Services  The CONSULTANT shall provide design, inspection and
permitting assistance as needed for reservoir operations during the term of this
Amendment. Services must be authorized by TAMPA BAY WATER in
writing in advance.

13 10 6 Year 5+ - Reservoir Permit Compliance
(September 2009 through April 2011)

Monthly Reservoir Embankment Performance Monitoring Report  The
CONSULTANT shall review the Monthly Reservoir Embankment Performance
and Monitoring Reports prepared by Tampa Bay Water as required in FDEP
permit special condition (SC) 33. Tampa Bay Water shall submit a draft report
to HDR for review by the 20th day of the month immediately following the
reporting month. The CONSULTANT shall submit the final report to TAMPA
BAY WATER, FDEP, and HCEPC no later than the last day of the month
immediately following the reporting month. This report shall include all
elements as required by the permit.

Comprehensive Annual Reservoir Report for WY2009  The
CONSULTANT shall review section of the WY2009 draft CARR prepared by
TAMPA BAY WATER and prepare sections of the WY2009 draft CARR as
needed. By January 1, 2010 all sections of the draft WY2009 CARR shall be
ready for review by TAMPA BAY WATER and the CONSULTANT. After review by TAMPA BAY WATER and the CONSULTANT, the CONSULTANT will revise the draft CARR as necessary and submit said report to the FDEP and the EPCHC by February 3, 2010. By March 3, 2010 the CONSULTANT shall meet with TAMPA BAY WATER, the FDEP and EPCHC staff to review the draft CARR. Following this meeting the CONSULTANT shall finalize the CARR and submit the appropriate number of copies to FDEP and EPCHC, and TAMPA BAY WATER on or before April 2, 2010. This report shall include all elements as required by the permit.

Comprehensive Annual Reservoir Report for WY2010: The CONSULTANT shall review section of the WY2010 draft CARR prepared by TAMPA BAY WATER and prepare sections of the WY2010 draft CARR as needed. By January 3, 2011 all sections of the draft WY2010 CARR shall be ready for review by TAMPA BAY WATER and the CONSULTANT. After review by TAMPA BAY WATER and the CONSULTANT, the CONSULTANT will revise the draft CARR as necessary and submit said report to the FDEP and the EPCHC by February 3, 2011. By March 3, 2011 the CONSULTANT shall meet with TAMPA BAY WATER, the FDEP and EPCHC staff to review the draft CARR. Following this meeting the CONSULTANT shall finalize the CARR and submit the appropriate number of copies to FDEP and EPCHC, and TAMPA BAY WATER on or before April 1, 2011. This report shall include all elements as required by the permit.


Train Tampa Bay Water Staff: The CONSULTANT shall train Tampa Bay Water Staff to prepare section of the monthly and annual reports, and trend analysis.

As-needed Services: The CONSULTANT shall provide design, inspection and permitting assistance as needed for reservoir operations during the term of this Amendment. Services must be authorized by TAMPA BAY WATER in writing in advance.

14.0 Flat-Plate Soil-Cement Monitoring and Maintenance Activities (September 2007 through April 2011)

Monitoring Plan Development and Reporting: The CONSULTANT shall prepare a Flat-plate Soil-cement Maintenance Monitoring Plan with a description of 10 monitoring transect locations (7 monitoring and 3 controls). The CONSULTANT shall prepare a Monthly Maintenance Monitoring Report for submittal to Tampa Bay Water by 20th day of the month immediately
following the reporting month The CONSULTANT shall prepare a Comprehensive Maintenance Monitoring Report summarizing all data collected through WY 2010, a technical assessment of the results including a discussion of potential mechanisms for the crack formations.

**Soil-cement Maintenance Monitoring Components** The CONSULTANT shall assist with mapping of maintenance areas The CONSULTANT shall prepare an inventory of construction joints requiring maintenance The CONSULTANT shall conduct an underwater inspection of the flat-plate soil-cement at selected locations The CONSULTANT shall insure that the following monitoring elements are installed in the flat-plate soil-cement:

1. Shallow inclinometers
2. Large scale extensometer
3. Wave action instrumentation
4. Interior embankment piezometers at select transects

The CONSULTANT shall provide test results from physical and geophysical test including,

1. Testing used to delineate areas requiring pressure grouting
2. Thickness and material properties of soil-cement at construction joints and interday joints in areas requiring maintenance
3. Soil quality to a depth of approximately 6 ft below the flat-plate soil-cement along the monitoring transects
4. Friction coefficient between the geotextile and the soil-cement

**Soil-cement Maintenance Alternative Evaluation** The CONSULTANT shall evaluate the following:

1. Grout mix designs for gravity filling and pressure grouting
2. Pressure grouting methods
3. Interior slope drains on construction and interday joints

**Soil-cement Maintenance Supervision** The CONSULTANT shall supervise the following flat-plate soil-cement maintenance activities:

1. Maintenance of construction joints
2. Maintenance of crack grouting
3. Pressure grouting
4. Other maintenance activities as needed
## Schedule of Project Compensation Amendment #8 Contract 99-19

<table>
<thead>
<tr>
<th>Description</th>
<th>Task</th>
<th>Activity</th>
<th>HDR Fee</th>
<th>Subcontractor Fee</th>
<th>Task Total for WY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>13 10 3</td>
<td>WY2008 Permit Compliance</td>
<td>$162,540</td>
<td>$87,050</td>
<td>$249,590</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>WY2008 Monitoring Plan Development and Plan Components</td>
<td>$157,590</td>
<td>$351,925</td>
<td>$509,515</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>WY2008 Maintenance Alternative Evaluation and Maintenance Supervision</td>
<td>$54,630</td>
<td>$43,800</td>
<td>$98,430</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Owners Allowance</td>
<td></td>
<td>$100,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Subtotal</td>
<td>$374,760</td>
<td>$482,775</td>
<td>$857,535</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Amendment 7 Original Budget</td>
<td>$1,155,011</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Amendment 7 Budgeted Increase for WY2008</td>
<td>$75,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Amendment 7 Original Budget Liquidated (through Sep 07)</td>
<td>$631,600</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total available from Amendment 7 Original Budget</td>
<td>$598,411</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>WY2008 Additional Budget for Amendment 8</td>
<td>$359,124</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>13 10 5</td>
<td>WY2009 Permit Compliance</td>
<td>$265,720</td>
<td>$51,100</td>
<td>$316,820</td>
</tr>
<tr>
<td>WY2009 and 13 10 6</td>
<td>13 10 6</td>
<td>WY2010 Permit Compliance</td>
<td>$130,816</td>
<td>$54,950</td>
<td>$185,766</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>WY2009 &amp; WY2010 Maintenance Alternative Evaluation and Maintenance Supervision</td>
<td>$99,936</td>
<td>$0</td>
<td>$99,936</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Owners Allowance</td>
<td></td>
<td>$150,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Subtotal</td>
<td>$817,740</td>
<td>$361,425</td>
<td>$1,129,165</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WY2009 Budget for Amendment 8</td>
<td>$653,722</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>WY2010 Budget for Amendment 8</td>
<td>$675,443</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total Amendment 8 Budget</td>
<td>$1,329,165</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

T:\Optm\Lantnp\14\FEE amend 8
TAMPA BAY WATER

ADMINISTRATIVE POLICIES AND PROCEDURES

<table>
<thead>
<tr>
<th>TITLE</th>
<th>Policy to Standardize Consultant Fees Charged to Tampa Bay Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUMBER</td>
<td>62-32</td>
</tr>
<tr>
<td>DIVISION/DEPARTMENT</td>
<td>Finance</td>
</tr>
<tr>
<td>EFFECTIVE DATE</td>
<td>September 1, 2004 (supercedes August 1, 2003)</td>
</tr>
</tbody>
</table>

APPROVED

(Signature of GM or Chairman)

I PURPOSE

This policy establishes a standardized method for setting fees proposed and/or charged to Tampa Bay Water by consultants and other third parties providing personal/professional services to Tampa Bay Water. These procedures are intended to provide a simplified, efficient mechanism for administering fee structures that will be comparable among entities providing the same or like services.

II SCOPE

This policy is applicable to the services of consultants hired directly by Tampa Bay Water and to the services of sub-consultants who perform work for Tampa Bay Water which are charged through to Tampa Bay Water under another consultant’s billing. This policy shall be utilized in the process of requesting proposals for services and in the actual billing of services to Tampa Bay Water by the consultants. Personal/professional services include, but are not limited to, companies and individuals providing the following services: engineering, surveying, architectural, auditing, accounting, computer programming and software design, public relations and design, environmental and hydrologic data collection, monitoring and analysis, construction management, land agent services, water supply sampling and testing, records management services, and other as-needed professional or personal services. This policy does not apply to construction contractors, legal services, or to the purchase of goods and products or the provision of services relative to the maintenance and repair of those goods or products.

This policy applies to Proposals and Bid requests issued after the effective date of the policy and the resulting contracts/services. It does not apply to contracts existing on or prior to the effective date.
III POLICY

A) All individuals or companies providing personal/professional services to Tampa Bay Water shall be required to utilize one of the three methods described below to determine their hourly rate(s) or total fees when proposing and billing fees for services.

B) The specific method to be used must be established by the project manager, with Director approval, at the time Requests for Proposals/Qualifications (RFP) or Bid requests are issued. A single RFP or Bid shall not utilize both the Raw Labor Rate and the Hourly Rate method. However, contracts for both specified tasks and as-needed services may utilize a rate method and a Fixed Fee method when determined by the project manager to be necessary. Requests for Proposals/Qualifications or Bid requests must state the standard fee method required for the services being proposed. Each contract prepared must also contain a fee schedule based on the required method. Furthermore, all contracts issued as a result of a single RFP or Bid must utilize the method specified in the RFP or Bid. Staff is also encouraged to use the same standard fee method for all services of a particular type (For example, all engineering services would use the same standard fee method, regardless of the specific nature of the tasks or the department requesting the services).

C) Regardless of which of the following three methods is used, the final Rate or Fixed Fee must reflect the final total rate or fee to be billed to Tampa Bay Water inclusive of all direct, indirect and overhead costs and profit component. No additional cost recovery or profit will be allowed in addition to the established Rate or Fixed Fee except as described under "Sub-consultant/Outside Services" and "Out-of-State Travel".

1 Raw Labor Rate with Multiplier method
For purposes of this policy, the Raw Labor Rate is defined as the gross wage rate per hour earned by or paid to one or more classes of employee of the consultant, without regard to or inclusion of employee benefits, administrative costs or any other costs of the consultant. The permitted billing method is the Raw Labor Rate X (times) a multiplier which shall not exceed 3.33 (multiplier includes all employee benefits, labor overhead, general and administrative overhead, direct charges and profit).

a) The multiplier to be used for a specific contract or group of contracts shall be established by Tampa Bay Water and stated in the Request for Proposals/Qualifications or Bid request that is published by Tampa Bay Water. Such multiplier will be established by Tampa Bay Water based on industry trends, vendor history or such other market indicators as may be available, but in no case shall it exceed the maximum multiplier of 3.33.

b) By revision of this policy, Tampa Bay Water may, but has no obligation to, change its maximum allowable multiplier based on the Consumer...
Price Index, industry trends or such other market indicators as are determined to be appropriate. Such change shall be made no more frequently than semi-annually and will be effective only for Requests for Proposals/Qualifications/Bids published and contracts executed or amended after the effective date of the policy revision.

2 Hourly Rate – all inclusive method
Total hourly rate all inclusive of labor, employee benefits, labor overhead, general and administrative overhead, direct charges and profit.

3 Fixed Fee method
In those instances where Tampa Bay Water is contracting for a fixed, specified task or tasks and the department director determines it to be in the best interest of Tampa Bay Water, the Request for Proposals/Qualifications/Bids may specify that the vendor shall propose a single all-inclusive Fee for the defined task(s). The Request for Proposals/Qualifications/Bids must state the task(s) to be performed to which the all-inclusive fee applies and must state that no other fees, direct charges or other charges will be paid by Tampa Bay Water to the vendor relative to the defined tasks.

D) Fee Schedules submitted by consultants and other third parties under methods C)1 and C)2 shall be itemized by labor position or function as appropriate for the particular contract.

E) All invoices submitted to Tampa Bay Water for payment for contracts awarded under methods C)1 and C)2 shall show, at a minimum, number of hours worked, dates worked, rate, name and position of personnel performing the work and amount due for the service. Invoices submitted under method C)3 shall show, at a minimum, the dates of service, description of service and amount due for the service. Project Managers may specify inclusion of additional information when needed.

F) Sub-consultant/Outside Services
Sub-consultant or Outside Services in excess of $300 may be submitted to Tampa Bay Water by the lead consultant for reimbursement at actual cost plus an administrative markup not to exceed 5%. Copies of the Sub-consultant/Outside service invoice approved by the consultant must accompany the consultant invoice submitted to Tampa Bay Water. If the executed contract requires that a consultant pay a sub-consultant prior to requesting reimbursement for those costs, the sub-consultant invoice submitted must include the date paid by the consultant. The Sub-consultant/Outside Services invoice shall also adhere to the fee and cost standards established by this policy. Reimbursement shall not be made for services or costs that do not comply with this policy or which do not have proper documentation including, but not limited to, invoices, time sheets, travel reports, paid receipts, and so forth. Sub-consultant/Outside Services include, but are not limited to, services such as rental of highly-specialized equipment which is not used routinely by the...
consultant, bulk printing of reports, bulk mailings, photography, placement of advertisements and laboratory fees. It does not include rental of vehicles, computers, purchase of software, travel or other expenses which are considered to be direct costs or general and administrative overhead and should be included in the established Rate or Fixed Fee. Reimbursement of lesser amounts or other exceptions is discouraged and requires written project manager approval prior to incurring the cost. The written approval must be itemized for each activity and occurrence. A copy of this prior written approval must be submitted to the Finance Department with the invoice requesting reimbursement.

G) Direct Charges
Direct Charges, as referred to in C), are to be included in the established Rate or Fixed Fee and shall not be considered for additional reimbursement. These costs include, but are not limited to, the following:

- Computer time
- Use of any equipment owned by the consultant (e.g., vehicles, monitoring equipment, cameras, etc.)
- In-house printing
- Research materials
- Telecommunications (e.g., phones, long distance, faxes, networking)
- Postage (including overnight, regular mail and courier services)
- Tolls
- Parking
- Gas
- Vehicle Mileage
- Meals (including business meetings)
- In-State Travel (including, but not limited to, airfare, car rental, hotel and taxi)

H) Out-of-State Travel
For purposes of this policy, Out-of-State Travel is defined as travel between the State of Florida and another point outside the State of Florida by a consultant/sub-consultant or their employee (traveler) which occurs in the performance of tasks authorized by Tampa Bay Water. When an RFP/Bid covers services that require Out-of-State Travel, a provision may be included in the fee arrangement to reimburse the consultant for the Out-of-State Travel subject to the following limitations:

a) Airfare/Mileage
Tampa Bay Water will reimburse the actual cost of round-trip airfare between the Out-of-State Metropolitan Area where traveler’s assigned office or residence is located and the Tampa Metropolitan Area or between the Florida Metropolitan Area where traveler’s assigned office or residence is located and the temporary Out-of-State work location for each task assigned. If an assigned task requires a stay greater than one week, Tampa Bay Water shall reimburse (1) one additional round-trip airfare between...
traveler’s assigned office area/residence and temporary work location for each included weekend or (2) the actual cost of hotel/lodging for the included weekend(s). Tampa Bay Water reserves the right to specify on a task by task basis whether it will reimburse weekend airfare or lodging depending on the length of time of the tasks and the expected cost. The Tampa Bay Water Project Manager shall make this determination when tasks are assigned. All airfare must be Coach Fare or lower and the lowest available fares and advance booking shall be utilized to minimize cost whenever possible when selecting airlines and schedules. Tampa Bay Water reserves the right to deny reimbursement of airfares that are excessive due to the failure of the traveler to either advance book or to use the most cost effective airlines when they had sufficient notification from Tampa Bay Water to do so.

If a traveler travels by private vehicle rather than air, they will be reimbursed the lesser of (1) the actual vehicle mileage traveled at the mileage rate currently in effect for Tampa Bay Water travelers or (2) the airfare that would have been charged had they elected to fly as determined by Tampa Bay Water.

b) Hotel/Lodging

For work assignments of one week or less, Tampa Bay Water shall reimburse the actual cost of hotel room or comparable accommodations for the period beginning with the night before the first day of service to Tampa Bay Water and ending on the night of the last day of service to Tampa Bay Water. Nights before and after this period including holiday nights and weekend nights will not be reimbursed unless the consultant is actually working for Tampa Bay Water on the holiday or week-end days. If an assigned task requires a stay greater than one week, Tampa Bay Water shall reimburse for (1) one additional round-trip airfare between traveler’s assigned office area/residence and temporary work location for each included weekend or (2) the actual cost of hotel/lodging for the included weekend(s) as described in a) above. If the assignment is to last for an extended period of time beyond one month and the traveler obtains lodging on a monthly basis which is clearly less costly than other lodging alternatives, Tampa Bay Water shall reimburse that lodging cost as well as the cost of one round-trip airfare per month for the traveler to return to their home. Reimbursement of actual hotel/lodging costs shall be limited to 115 percent (1.15) of the GSA published per diem rate for the specific city or Metropolitan area plus applicable taxes. (See http://policyworks.gov/org/main/mt/homepage/mt/perdiem/perd03d.html or www.gsa.gov “per diem rates”)

c) Shuttle/Taxi

Tampa Bay Water will reimburse the cost of shuttle service/taxi from airport to hotel and between the hotel and temporary work location(s) and places providing meals. There will be no reimbursement for transportation
from traveler’s home or assigned office to airport, including the cost of airport parking

d) Rental Car
The cost of a rental car at the location of temporary assignment will be reimbursed when use of a vehicle is necessary or when it is the most cost-effective transportation available for commuting between hotel and work location(s). Reimbursement will be limited to economy or compact class of vehicles, except that another class may be used if the cost for the period of use is lower than or equal to the cost of the economy or compact class for the same period. Consultant must provide evidence of this cost savings. If another type of vehicle is required for the tasks assigned, this must be approved in writing by the project manager prior to reimbursement.

e) Meals
Meals will be reimbursed at the per diem rate and based on the hours of travel as established from time to time by the State of Florida applicable to State travelers on overnight travel. There will be no meal per diem for travel which does not include an overnight stay. Meal per diem will not be paid for weekends and holidays unless the traveler is actually working for Tampa Bay Water on those days.

f) Supporting Documentation
The following supporting documentation must be included with any request for reimbursement of Out-of-State Travel costs:

1. Tampa Bay Water Travel Reimbursement Form for Consultants, completed with dates and times of travel, days worked for Tampa Bay Water, detail of expenses incurred and business purpose
2. Copy of airline ticket and boarding pass as proof of travel
3. Copy of paid hotel/lodging bill
4. Copy of receipt for taxi/shuttle if greater than $1000 individually or $2500 in the aggregate
5. Copy of paid rental car invoice/agreement

the work assignment for that individual is expected to last longer than one year (Such assignments are deemed indefinite in accordance with the Internal Revenue Service regulations and, as such, do not constitute deductible travel expenses to the traveler.)