

CITY OF CORPUS CHRISTI
CONTRACT FOR PROFESSIONAL SERVICES

FOR PROJECT (No./Name) E16336 Packery Channel Monitoring

The City of Corpus Christi, a Texas home rule municipal corporation, P.O. Box 9277, Corpus Christi, Nueces County, Texas 78469-9277 (City) acting through its duly authorized City Manager or Designee (Director) and Texas A&M University – Corpus Christi, a Texas public university, 6300 Ocean Dr., Corpus Christi, Nueces County, Texas 78123, (TAMU-CC), hereby agree as follows:

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ARTICLE I – SCOPE OF SERVICES

1.1 TAMU-CC shall provide to City its Scope of Services, to be incorporated herein and attached to this Agreement as **Exhibit A**. The approved Scope of Services defines the services to be performed by TAMU-CC under this Agreement.

1.2 TAMU-CC shall comply with City standards, as specified in the Unified Development Code (UDC) or Code of Ordinances at the time of the execution of the contract, throughout the duration of the Project, unless specifically and explicitly excluded from doing so in the approved Scope of Services attached as **Exhibit A**. A request made by either party to deviate from City standards after the contract is executed must be in writing.

1.3 TAMU-CC shall use reasonable efforts to provide labor, equipment and transportation necessary to complete all services agreed to hereunder in a timely manner throughout the term of the Agreement. Persons retained by TAMU-CC to perform work pursuant to this Agreement shall be employees or subcontractors of TAMU-CC. TAMU-CC must provide City with a list of all subcontractors that includes the services performed by subcontractor. Changes in TAMU-CC's team that provides services under this Agreement must be agreed to by the City in writing.

1.4 TAMU-CC shall not begin work on any phase/task authorized under this Agreement until they are briefed on the scope of the Project and are notified in writing to proceed. If the scope of the Project changes, either TAMU-CC or City may request a review of the changes with an appropriate adjustment in compensation.

1.5 TAMU-CC will provide monthly status updates (project progress or delays) in the format requested by the City with each monthly invoice.

ARTICLE II – COMPENSATION

2.1 The Compensation for all services (Basic and Additional) included in this Agreement and in the Scope of Services for this Agreement shall not exceed **\$257,745**.

2.2 TAMU-CC's fee will be on a lump-sum basis as detailed in **Exhibit A** and will be full and total compensation for all services and for all expenses incurred in performing these services, with invoices to be submitted three times yearly in conjunction with seasonal surveys.

2.3 TAMU-CC agrees to complete the Scope of Services in accordance with the approved project schedule and budget as defined in **Exhibit A**, including completing the work in phases defined therein.

2.4 The Director of Engineering Services may request the TAMU-CC to undertake additional services or tasks provided that no increase in fee is required. Services or tasks requiring an increase of fee will be mutually agreed and evidenced in writing as an amendment to this contract. TAMU-CC shall notify the City within three (3) days of notice if tasks requested requires an additional fee.

2.5 Invoices submitted or supporting documentation must contain contract amounts, current invoice, previous invoice total, remaining balance, and percent complete. City will make prompt payments in response to TAMU-CC's invoices. Missing information may result in delay of payments.

2.7 TAMU-CC certifies that title to all services covered by a Payment Request shall pass to City no later than the time of payment. TAMU-CC further certifies that, upon submittal of a Payment Request, all services for which Payment Requests have been previously issued and payments received from City shall, to the best of TAMU-CC's knowledge, information and belief, be free and clear of liens, claims, security interests or encumbrances in favor of TAMU-CC or other persons or entities making a claim by reason of having provided labor or services relating to this Agreement.

2.8 The final payment due hereunder shall not be paid until all deliverables have been received by City. Final billing shall indicate "Final Bill – no additional compensation is due to TAMU-CC."

2.9 City may withhold compensation to such extent as may be necessary, in City's opinion, to protect City from damage or loss for which TAMU-CC is responsible, because of:

2.9.1 delays in the performance of TAMU-CC's work;

2.9.2 failure of TAMU-CC to make payments to subcontractors or vendors for labor, materials or equipment;

2.9.3 damage to City; or

2.9.4 persistent failure by TAMU-CC to carry out the performance of its services in accordance with this Agreement.

2.10 When the above reasons for withholding are removed or remedied by TAMU-CC, compensation of the amount withheld shall be made within 30 days. City shall not be deemed in default by reason of withholding compensation as provided under this Agreement.

2.11 In the event of any dispute(s) between the Parties regarding the amount properly compensable for any phase or as final compensation or regarding any amount that may be withheld by City, TAMU-CC shall be required to make a claim pursuant to and in accordance with the terms of this Agreement and follow the procedures provided herein for the resolution of such dispute. In the event TAMU-CC does not initiate and follow the claims procedures as required by the terms of this Agreement, any such claim shall be waived.

2.12 Request of final compensation by TAMU-CC shall constitute a waiver of claims except those previously made in writing and identified by TAMU-CC as unsettled at the time of final Payment Request.

2.13 All funding obligations of the City under this Agreement are subject to the appropriation of funds in its annual budget. The City may direct TAMU-CC to suspend work pending receipt and appropriation of funds.

ARTICLE III – TIME AND PERIOD OF SERVICE

3.1 This Agreement shall be effective upon the signature of an authorized representative of TAMU-CC, the signature of the City Manager or designee (Effective Date) and approval of City Council.

3.2 This service shall be for a period of one year beginning on the Effective Date.

3.3 TAMU-CC agrees to begin work on those authorized Services for this Agreement upon receipt of the Notice to Proceed from the Director of Engineering Services. Work will not begin on any phase or any Additional Services until requested in writing by TAMU-CC and written authorization is provided by the Director of Engineering Services.

3.4 Time is of the essence for this Agreement. TAMU-CC shall perform and complete its obligations under this Agreement in a prompt and continuous manner so as to not delay the Work for the Project, in accordance with the schedules approved by City. TAMU-CC and City are aware that many factors may affect the TAMU-CC's ability to complete the services to be provided under this Agreement. TAMU-CC must notify the City within three business days of becoming aware of a factor that may affect TAMU-CC's ability to complete the services hereunder.

3.5 City shall perform its obligations of review and approval in a prompt and continuous manner so as to not delay the project.

ARTICLE IV – INSURANCE REQUIREMENTS

4.1 TAMU-CC must not commence work under this Agreement until all insurance required has been obtained and such insurance has been approved by the City. TAMU-CC must not allow any subcontractor to commence work until all similar insurance required of any subcontractor has been obtained. The City understands that TAMU-CC is a governmental entity with certain protections under state law. The City will accept a self-insurance coverage letter from TAMU-CC in lieu of the certificate of insurance required by **EXHIBIT C**.

4.2 TAMU-CC must not allow any subcontractor to commence work until all insurance required of any subcontractor has been obtained. Minimum Insurance Requirements are shown in **EXHIBIT C**.

ARTICLE V – TERMINATION OF AGREEMENT

5.1 By TAMU-CC:

5.1.1 The City reserves the right to suspend this Agreement at the end of any phase for the convenience of the City by issuing a written and signed Notice of Suspension. TAMU-CC may terminate this Agreement for convenience in the event such suspension extends for a period beyond 120 calendar days by delivering a Notice of Termination to the City.

5.1.2 TAMU-CC must follow the Termination Procedure outlined in this Agreement.

5.2 By City:

5.2.1 The City may terminate this Agreement for convenience upon seven days' written notice to TAMU-CC at the address of record.

5.2.2 The City may terminate this Agreement for material breach of this Agreement upon ten days' written notice to TAMU-CC identifying the breach in reasonable detail. If TAMU-CC begins, within three days of receipt of such notice, to correct its failure and proceeds to diligently work to cure such breach within the ten days, the Agreement will not terminate. If TAMU-CC again fails to perform under this Agreement, the City may terminate the Agreement for cause upon seven days' written notice to the TAMU-CC with no additional cure period. If the City terminates for cause, the City may reject any and all proposals, for the Packery Channel Monitoring Program submitted by TAMU-CC for up to two years.

5.3 Termination Procedure

5.3.1 Upon receipt of a Notice of Termination and prior to the effective date of termination, unless the notice otherwise directs or TAMU-CC takes action to cure a failure to perform under the cure period, TAMU-CC shall immediately begin the phase-out and discontinuance of all services in connection with the performance of this Agreement. Within 30 calendar days after receipt of the Notice of Termination, unless TAMU-CC has successfully cured a failure to perform, TAMU-CC shall submit a statement showing in detail the services performed under this Agreement prior to the effective date of termination. City retains the option to grant an extension to the time period for submittal of such statement.

5.3.2 TAMU-CC shall submit all completed and/or partially completed work under this Agreement, including but not limited to specifications, designs, plans and exhibits.

5.3.3 Upon receipt of documents described in the Termination Procedure and absent any reason why City may be compelled to withhold fees, City shall reimburse TAMU-CC for all costs and non-cancelable commitment incurred in the performance of the services up to the effective date of termination, not to exceed the maximum cost specified in Section 2.1. There will be no compensation for anticipated profits on services not completed.

5.3.4 TAMU-CC acknowledges that City is a public entity and has a duty to document the expenditure of public funds and TAMU-CC shall reasonably cooperate with City's efforts to comply with such duty.

ARTICLE VI – RIGHT OF REVIEW AND AUDIT

6.1 TAMU-CC grants City, or its designees, the right to audit, examine or inspect, at City's election, all of TAMU-CC's records relating to the performance of the Work under this Agreement, during the term of this Agreement and retention period herein. The audit, examination or inspection may be performed by a City designee, which may include its internal auditors or an outside representative engaged by City. TAMU-CC agrees to retain its records for a minimum of four (4) years following termination of the Agreement, unless there is an ongoing dispute under this Agreement, then such retention period shall extend until final resolution of the dispute.

6.2 TAMU-CC's records include any and all information, materials and data of every kind and character generated as a result of and relevant to the Work under this Agreement (TAMU-CC's Records). Examples include billings, books, general ledger, cost ledgers, invoices, production sheets, documents, correspondence, meeting notes, subscriptions, agreements, purchase orders, leases, contracts, commitments, arrangements, notes, daily diaries, reports, drawings, receipts, vouchers, memoranda, time sheets, payroll records, policies, procedures, and any and all other agreements, sources of information and matters that may, in City's and TAMU-CC's reasonable judgment, have any bearing on or pertain to any matters, rights, duties or obligations under or covered by any Agreement Documents.

6.3 City agrees that it shall exercise the right to audit, examine or inspect TAMU-CC's Records only during TAMU-CC's regular business hours. TAMU-CC agrees to allow City's designee access, upon reasonable advance written notice, to all of TAMU-CC's records reasonably necessary for City or its designee(s), to perform such audit, inspection or examination. TAMU-CC also agrees to provide adequate and appropriate work space necessary to City or its designees to conduct such audits, inspections or examinations.

6.4 TAMU-CC shall include this audit clause in any subcontractor, supplier or vendor contract.

ARTICLE VII – OWNER REMEDIES

7.1 The City and TAMU-CC agree that in the event the City suffers actual damages as a result of material breach of this Agreement by TAMU-CC, the City may elect to pursue its actual damages and any other remedy allowed by law.

ARTICLE VIII – TAMU-CC REMEDIES

8.1 If TAMU-CC is delayed due to uncontrollable circumstances, such as strikes, riots, acts of God, national emergency, acts of the public enemy, governmental restrictions, laws or regulations or any other causes beyond TAMU-CC's reasonable control, then the City shall excuse the failure for the duration of the event and for such a time as is reasonable to allow TAMU-CC to resume performance under this Agreement.

8.2 If TAMU-CC requests a remedy for a condition not specified above, TAMU-CC must file a Claim as provided in this Agreement.

ARTICLE IX – CLAIMS AND DISPUTE RESOLUTION

9.1 Filing of Claims

9.1.1 Claims arising from the circumstances identified in this Agreement or other occurrences or events, shall be made by Written Notice delivered by the party making the Claim to the other party after the start of the occurrence or event giving rise to the Claim and stating the general nature of the Claim.

9.1.2 Every Claim of TAMU-CC, whether for additional compensation, additional time or other relief, shall be signed and sworn to by a person authorized to bind the TAMU-CC by his/her signature, verifying the truth and accuracy of the Claim.

9.1.3 The responsibility to substantiate a claim rests with the party making the Claim.

9.1.4 Within thirty (30) calendar days of receipt of notice and supporting documentation, City will meet to discuss the request, after which an offer of settlement or a notification of no settlement offer will be sent to TAMU-CC. If TAMU-CC is not satisfied with the proposal presented, TAMU-CC will have thirty (30) calendar days in which to (i) submit additional supporting data requested by the City, (ii) modify the initial request for remedy or (iii) request Mediation.

9.2 Alternative Dispute Resolution

9.2.1 All negotiations pursuant to this clause are confidential to the extent allowed by law and shall be treated as compromise and settlement negotiations for purposes of applicable rules of evidence.

9.2.2 Before invoking mediation, the parties agree that they shall first try to resolve any dispute arising out of or related to this Agreement through discussions directly between those senior management representatives within their respective organizations who have overall managerial responsibility for similar projects. This step shall be a condition precedent to the use of mediation. If the parties' senior management representatives cannot resolve the dispute within thirty (30) calendar days after a party delivers a written notice of such dispute, then the parties shall proceed with the mediation process contained herein.

9.2.3 Mediation

9.2.3.1 In the event that City or TAMU-CC shall contend that the other has committed a material breach of this Agreement, the party alleging such breach shall, as a condition precedent to filing any lawsuit, request mediation of the dispute.

9.2.3.2 Request for mediation shall be in writing, and shall request that the mediation commence no less than thirty (30) or more than ninety (90) calendar days following the date of the request, except upon agreement of both parties.

9.2.3.3 In the event City and TAMU-CC are unable to agree to a date for the mediation or to the identity of the mediator or mediators within thirty (30) calendar days of the request for mediation, all conditions precedent in this Article shall be deemed to have occurred.

9.2.3.4 The parties shall share the mediator's fee. Venue for mediation shall be Nueces County, Texas. Any agreement reached in mediation shall be enforceable as a settlement agreement in any court having jurisdiction thereof. No provision of this Agreement shall waive any immunity or defense. No provision of this Agreement is a consent to suit.

9.3 City shall use the dispute resolution process provided in Chapter 2260, Texas Government Code, and the related rules adopted by the Texas Attorney General to attempt to resolve any claim for a breach of contract made by the City that cannot be resolved in the ordinary course of business. City shall submit written notice of a claim of breach of contract to TAMU-CC's designated official, who will examine City's claim and any counterclaim and negotiate with City in an effort to resolve the claim.

9.4 TAMU-CC and City agree that neither party shall be responsible for payment of attorney's fees pursuant to any law or other provision for payment of attorneys' fees. To the extent authorized by law, both Parties expressly waive any claim to attorney's fees should litigation result from any dispute between the parties to this Agreement.

9.5 No Waiver of Governmental Immunity. NOTHING IN THIS ARTICLE SHALL BE CONSTRUED TO WAIVE EITHER PARTY'S GOVERNMENTAL IMMUNITY FROM LAWSUIT, WHICH IMMUNITY IS EXPRESSLY RETAINED TO THE EXTENT IT IS NOT CLEARLY AND UNAMBIGUOUSLY WAIVED BY STATE LAW.

ARTICLE X – MISCELLANEOUS PROVISIONS

10.1 Use of Local Expertise/Local Professional Participation. The City Council's stated policy is that City expenditures on contracts for professional services be of maximum benefit to the local economy.

10.2 Assignability. Neither party will assign, transfer or delegate any of its obligations or duties under this Agreement to any other person and/or party without the prior written consent of the other party, except for duties delegated to personnel of TAMU-CC staff. This includes subcontracts entered into for services under this Agreement. No part of the TAMU-CC fee may be assigned in advance of receipt by the TAMU-CC without written consent of the City.

The City will not pay the fees of expert or technical assistance and consultants unless such employment, including the rate of compensation, has been approved in writing by the City.

10.3 Ownership of Intellectual Property.

10.3.1 "Intellectual Property" means know-how, copyrights, patents, trade secrets, ideas, thoughts, concepts, processes, techniques, data, development tools, models, drawings, specifications, prototypes, inventions, software, and other intellectual property.

10.3.2 "Project IP" means all Intellectual Property that is authored or conceived and reduced to practice in the performance of this Agreement.

10.3.3 Ownership of Project IP will be as follows:

10.3.3.1 Title to any Project IP made or conceived solely by TAMU-CC personnel vests in TAMU-CC.

10.3.3.2 Title to any Project IP made or conceived solely by City personnel vests in City.

10.3.3.3 Title to any Project IP made or conceived jointly by personnel of both TAMU-CC and City ("Joint IP") vests jointly in TAMU-CC and City.

10.3.4 In the absence of a written agreement to the contrary, TAMU-CC and City will be independent owners of any corresponding patent rights in any Joint IP under 35 USC §262 with no obligation of accounting to one another.

10.3.5 TAMU-CC grants City an irrevocable, royalty-free, non-transferable, nonexclusive right and license to use, reproduce, display, perform and otherwise practice without restriction any copyrightable materials (technical data, reports, etc.) delivered by TAMU-CC under this Agreement.

10.3.6 Nothing in this Agreement grants either party any rights to any of the other party's Intellectual Property that is not Project IP.

10.4 Standard of Care. Services provided by TAMU-CC under this Agreement shall be performed with the professional skill and care ordinarily provided by competent professionals practicing in the same or similar locality and under the same or similar circumstances; and performed as expeditiously as is prudent considering the ordinary professional skill and care of a competent professional.

10.5 Disclaimer of Warranties. TAMU-CC makes no warranties, express or implied, as to any matter, including, without limitation, warranties as to the conduct, completion, success or particular results of the Project, or the condition, ownership, merchantability, or fitness for a particular purpose of the Project results or any Project IP or that the use of any Project IP or Project results will not infringe any intellectual property right of a third party.

10.6 Licensing. TAMU-CC shall be represented by personnel with appropriate licensure, registration and/or certification(s) at meetings of any official nature concerning the Project, including scope meetings, review meetings, pre-bid meetings and preconstruction meetings.

10.7 Entire Agreement. This Agreement represents the entire and integrated Agreement between City and TAMU-CC and supersedes all prior negotiations, representations or agreements, either oral or written. This Agreement may be amended only by written instrument signed by both the City and TAMU-CC.

10.8 Controlling Law. This Agreement is governed by the laws of the State of Texas without regard to its conflicts of laws. Venue for legal proceedings lies exclusively in Nueces County, Texas.

10.9 Severability. If, for any reason, any one or more Articles and/or paragraphs of this Agreement are held invalid or unenforceable, such invalidity or unenforceability shall not affect, impair or invalidate the remaining Articles and/or paragraphs of this Agreement but shall be confined in its effect to the specific Article, sentences, clauses or parts of this Agreement held invalid or unenforceable, and the invalidity or unenforceability of any Article, sentence, clause or parts of this Agreement, in any one or more instance, shall not affect or prejudice in any way the validity of this Agreement in any other instance.

10.10 Conflict Resolution Between Documents. TAMU-CC hereby agrees and acknowledges if anything contained in TAMU-CC-prepared **Exhibit A**, Scope of Services or in any other document prepared by TAMU-CC and included herein, is in conflict with the terms of this Agreement, this Agreement and/or the Task Order shall take precedence and control to resolve said conflict.

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CITY OF CORPUS CHRISTI

Keith Selman
Assistant City Manager

Date

TEXAS A & M UNIVERSITY – CORPUS CHRISTI

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Vice-President, Division of Research,
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6300 Ocean Drive, Unit 58436
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APPROVED AS TO LEGAL FORM

Assistant City Attorney Date

ATTEST

City Secretary _____ Date _____

Project No. E16336
Accounting Unit: 3278-717
Account: 550950
Activity: E16336013278EXP
Account Category: 50950
Fund Source Name: Packery Channel TIF#2

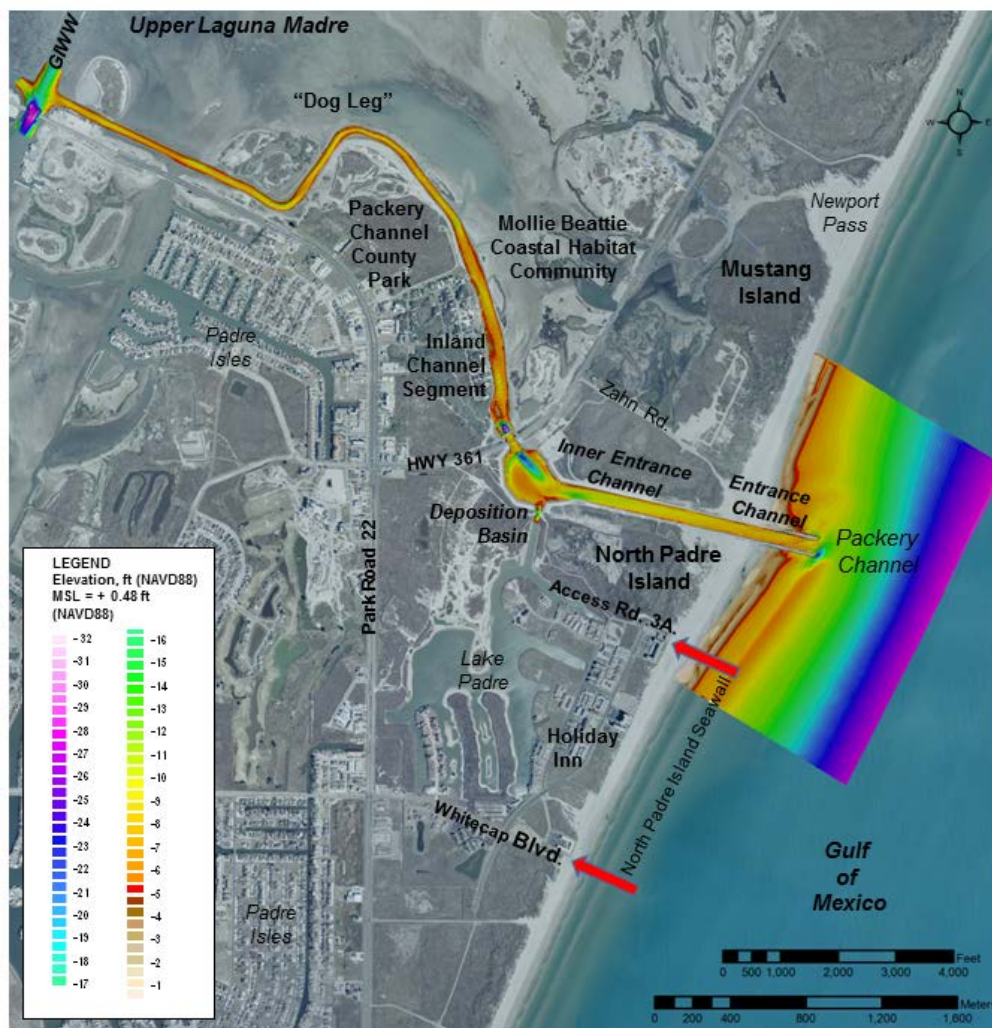
\$257,745.00

Encumbrance No. _____

Packery Channel Monitoring Program 2017/2018

Project Tasks and Cost Estimate

May 12, 2016 (Revised: April 09, 2017)



Packery Channel Monitoring Area: Channel and nearshore morphology (Sep 2016)

Submitted to:
The City of Corpus Christi

Submitted by:
Deidre D. Williams
The Conrad Blucher Institute for Surveying and Science
Texas A&M University-Corpus Christi

Packery Channel Monitoring Program 2017/2018

Purpose

To continue to support the City of Corpus Christi's vested interest in the inlet/beach infrastructure including Packery Channel, North Padre Island Beach and Mustang Island Beach, in addition to sensitive habitat that comprise the Packery Channel System. The City of Corpus Christi will hereafter be referred to as the "City." The monitoring program specifically addresses concerns related to the nourished beach fronting the North Padre Island (NPI) Seawall. The monitoring program supports the City of Corpus Christi's pro-active management of this dynamic system. This proposal describes the monitoring effort for the 12-month period commencing upon contract execution to include the Winter 2018 Survey.

The monitoring program consists of three seasonal assessments of shoaling and scour in the channel and nearshore (Gulf of Mexico), one survey that measures changes in the width/depth of the inland channel segment, and measurement of beach width/volume. The monitoring program has also provided for Disaster Preparedness and investigations that have been identified by the City staff during the monitoring year as well as water current monitoring. **The TIRZ Committee did not approve the Disaster Preparedness task (Task 2-5) for the 2017-monitoring year.** All monitoring components that were not approved by the TIRZ Committee are referenced in this proposal so it is clear what was approved by the TIRZ, and what was not approved, along with the implications of not conducted tasks. The components that have been conducted since 2008 but are not included during the 2017 monitoring year are indicated by red font with strikethrough. References to the monitoring components that were not approved by the TIRZ Committee are highlighted in yellow.

The following services are provided as related to the key management concerns for the City of Corpus Christi:

- Conduct a *Summer Seasonal Survey* (Coincides with the 2006 construction completion date providing for calculation of annual rate of change since completion for project assessment applicable to the USACE and TGLO performance assessments)
- Conduct a *Winter Seasonal Survey* and assessment of performance (Coincides with completion of first full maintenance dredge (Dredge#1) and beach nourishment as well as peak winter condition)
- Conduct a *Spring Seasonal Survey* and assessment of performance (Represents season of peak shoaling observed since construction)
- Provide pre- and post-dredge/nourishment monitoring (Periodic performance assessment)
- Provide results of *trend analysis* for future dredge planning, *dredge deferment* (Forecasting for dredge planning and conservation of funds)
- Advise on navigation safety and placement of aids to navigation (Public safety)
- Provide beach nourishment planning and support in coordination with dredge planning (Forecasting beach nourishment planning)
- Conduct beach profile and shoreline position surveys in order to qualify for CEPRA grant funding and meet obligations of existing TGLO agreements related to beach width along NPI Seawall (CEPRA #1113) (meet obligations to TGLO CEPRA)

- ~~Provide for Disaster Preparedness surveys and analysis/guidance (Hurricane Preparedness and response)~~
- Document changes in the Mollie Beattie Coastal Habitat Community (MBCHC) and identify related impact to the adjacent Inland Channel Segment of Packery Channel (Dredge planning)
- Maintain active monitoring program consisting of, at a minimum, one annual beach profile survey in order to maintain FEMA reimbursement eligibility (FEMA reimbursement eligibility)
- Archive data and provide as needed for application to engineer assessment of structural stability of coastal structures: jetties, revetment, bridge reinforcement (Archival of Historic Data and support of structural assessment)
- Provide information appropriate for public awareness and community education/outreach (Public information and outreach)
- ~~Maintain water current monitoring stations in Packery Channel and the Gulf Intracoastal Waterway for navigation safety and validation of hydrodynamic models (Future change in channel configuration)~~
- Support and collaborate on coastal projects and concerns in the vicinity of the study area (Coastal system project guidance)
- ~~Provide for additional surveys/analysis at the discretion of Council/Staff that are indicated by seasonal analysis or relevance to the Packery Channel system (new projects).~~

Focus of Monitoring Year 2017

Monitoring and analysis will continue to focus on supporting the following key issues identified for 2017/2018, in order to provide guidance in support of dredge and nourishment planning and adaptive beach management and maintenance operations.

Assessment based on analysis of the most recent survey data (Sep/Oct 2016) indicates that dredging to maintain channel navigability should be conservatively anticipated within two (2) years, based on the rate of shoaling measured since the maintenance dredge was completed in Mar 2013 (Williams 2016, 2017). A discussion of the anticipated sand volume required to re-establish the design width of the beach fronting the NPI Seawall is provided by Williams (2016).

The following are specific areas of concern/interest over the next monitoring year include:

- **Entrance Channel Shoaling and Navigation**
Monitor changes in area of historic localized shoaling in the entrance channel that has previously stimulated the recommendation of two Notices to Mariners (Sep 2011 and July 2014). The most recent summer survey conducted in Sep 2016 (peak in shoals common during this time) and the Feb 2016 (peak season for scour) survey indicated no imminent navigation limitation. Although the depth related to the development of a linear cross-channel sand wave near the channel mouth documented during Sep 2016 will be reassessed during the Winter 2017 survey (planned for Apr 2017 due to delay in contract authorization).
- **Reduction in Scour at Mouth and Potential for Ebb Shoal Development**
An additional region of interest is located in the nearshore surrounding the channel mouth where ebb shoal development is common at Texas inlets. An ebb shoal is an elevated feature that typically develops offshore of the mouth of an inlet. The development of

shoaling at or offshore of the channel mouth occurred at Packery Channel after Hurricane Ike introduced a significant volume of sand into the channel over a few days as sand was purged from the system intermittently until June 2010. Although no persistent shoaling has been identified around or across the channel mouth since the maintenance dredge (Mar 2013); bypassing bar formation has repeatedly developed seasonally, extending from the nearshore region south of the inlet. This seasonal bar development is driven by persistent and strong seasonal forcing out of the southeast during the summer months. Bypassing bars provide an opportunity for the introduction of sand toward and into the inlet mouth. Since the maintenance dredge, longshore bars originating on the north side of the inlet have developed and approached the inlet mouth during the winter season. In addition, deep scour at the mouth has been less developed than after construction, with the shallower nearshore depths merging at the channel mouth. The expansion of the beach (widening) adjacent to the inlet has resulted in an increase in sand volume and impoundment in the nearshore near the north jetty. After a period of stability (2009-2012), the beach on the north side of the inlet has experienced a gradual increase in width and volume (2012-2016). Therefore, the nearshore region surround the inlet is a focus area for the 2017/2018 monitoring year from a beach and inlet management perspective.

- **Beach Nourishment at North Padre Island Seawall**

Although 50% of the beach fronting the NPI Seawall is wider than the TGLO defined Target width of 200 ft; 50% of the beach continues to erode and an approximately 1,000-ft alongshore segment is under 150 ft wide. This segment of the beach is approximately 50% of the design (Target) width established during the beach nourishment completed during the winter of 2012/2013. After an initial year of rapid erosion (approximately 20-30 ft/yr) after the maintenance nourishment, the rate of recession moderated with a period of relative stability observed through Oct 2015. The contribution of purposeful management of sand accreting on the seawall and that generated during beach access maintenance contributed to the previous (2014/2015) period's stability. The rate of recession increased over the 2016 survey year during which no purposeful placement of sand was applied. At the present rate of recession, the shoreline at the south end of the seawall is anticipated to approach the pre-maintenance nourishment baseline (2011) position within two years (Winter 2018/2019). The rate of recession could increase under the influence of tropical storms or other extreme events such as extended periods of high water level and inundation such as observed during spring 2016, which could require action in the form of bollard relocation or adaptive sand management on the part of City Parks and Recreation beach operations staff.

Beach stability may be reinforced by the mechanical lateral movement of sand toward the south, as sand is made available during standard maintenance of beach driving lanes within limits of permit authority and Beach Maintenance Plan guidelines. A focus of the 2017/2018 monitoring period will be to quantify the rate of recession over the spring/summer period and identify contributions of any adjustment to beach maintenance practices such as lateral sand redistribution between the south jetty and Whitecap Blvd. If no adaptive sand management techniques are employed it is anticipated that the beach will continue to erode resulting in a greater length of beach meeting the 150-ft wide Action Width and the bollards will require adjustment northward.

Shoreline Change and Increase in Beach Width at North Packery

The beach north of Packery Channel, between the north jetty and Newport Pass, experienced a period of accretion and persistent shoreline advance between Sept 2012 and Sep 2016. This resulted in an increase in beach width along this entire, greater than 4,000 ft, stretch of beach. Previously, shoreline advance related to impoundment and sheltering by the jetties did not extend north beyond MM204. In addition, the region between MM204 and Newport Pass was often impassible due to the narrow width of the beach—which was typically less than 100-ft wide. During this recent period of increasing stability, the beach between MM204 and the Newport Pass nearly doubled in width. According to beach operations staff, this section of beach supported two driving lanes during Spring Break 2017; implemented for the first time in many years due to the significant increase in beach width since 2012.

A focus during 2017/2018 will be on investigating how this increase in beach width translates into the nearshore barred region and the potential contribution of the associated increase in sand volume in the nearshore to shoaling at the mouth and potential for transport into the channel mouth. The recent change toward stability in this area is attributed to a both the lack of tropical storm activity in the Gulf along with maintenance practices and may be related to a greater influence of strong winter forcing over the recent winter seasons, between 2012 and 2015, on sediment transport directed toward the south.

• ~~Continuation of Real-time Water Current Monitoring~~

~~Water current velocity has been monitored in the GIWW and in Packery Channel since 2006, prior to the completion of Packery Channel. This data provides information on potential changes in hydrodynamics (water flow) as changes in channel morphology and bank width occur due to shoaling and scour. Additional changes in the channel system are proposed by local developers including the connection of the Laguna Madre to the Gulf of Mexico via Lake Padre and Packery Channel. The impact of this additional channel on water velocity throughout the connected channel system has not been studied using hydrodynamic models to date. The current monitoring stations provide a baseline data set as well as provide for analysis of change in flow as changes are made to the hydrodynamic system. This data is necessary to validate hydrodynamic models for application to prediction of future changes in flow as planned and future changes are made to the channel system. The funding for these stations was originally provided by the USACE with contributions as recently as 2014. No additional sponsorship is presently available to maintain these stations. Although sponsorship alternatives will continue to be investigated, funding for this component is requested for 2017/2018 to maintain continuity and avoid interruption of data collection.~~

This component of the water current monitoring has been defined and funded in the Event Category (Task 2-5). The Reinvestment Zone #2 Board (2017) did not approve task 2-5, therefore, this component will not be funded during 2017. Without continued measurement of water velocity collected through current monitoring, the accuracy of hydrodynamic models that assist in understanding how changes, such as new channels, impact the entire system -- including Packery Channel -- are less accurate and no post-construction

assessment of change to flow velocity in Packery Channel will be possible. Scour and removal of sand from the system, which makes dredge deferment possible, is related to the velocity of flow through the channel system.

Background

- Monitoring began in August 2003, prior to construction (originally a collaboration between TAMUCC/USACE funded by the USACE Galveston District, and the Coastal Hydraulics Laboratory, Coastal Inlets Research Program).
- Inlet opened during Hurricane Emily (July 2005), one year prior to completion of construction (October 2006).
- Sponsorship of project authority transferred to the City of Corpus Christi (2008).
- Initiation of Packery Channel Monitoring Program sponsored by the City of Corpus Christi (2008).
- Limited dredge in Deposition Basin at ramp to facilitate boat entry (Jan 2010).
- Notice to Mariners issued regarding elevation of Entrance Shoal (Sep 2010).
- Dredge #1 (Phase 1) of channel from Deposition Basin to Entrance Channel to within 550 ft of the channel mouth (completed March 2012). Total pay volume was 190,757 cu yd (HDR). Completion of dredge was deferred to Winter 2012/2013 due to start of spring break.
- Dredge #1 (Phase 2) of Inner Entrance Channel and Entrance Channel completed to within 550 ft of channel mouth (completed March 2013). Total volume was \approx 48,757 cu yd. Remaining 550 ft of Entrance Channel shoal was not removed and dredging was terminated due to start of spring break.
- Notice to Mariners issued regarding elevation of Entrance Channel Shoal (Jul 2014).
- No peak in shoaling identified and limited potential for navigation interruption in primary channel from Nov 2014 to Feb 2016.
- Across-channel sand wave developed at the end of the summer season Sep 2016. Status of this feature will be assessed during the Winter 2017 Survey to determine if a notice to mariners is indicated at that time.

Ongoing Contribution of Program

- Program supports pro-active management of the inlet and beach infrastructure by the City of Corpus Christi and meets the criteria of a continuous and consistent monitoring program as applied to submissions for FEMA and CEPRA reimbursement and grants, respectively.
- Analysis has supported City decision to defer dredging, originally predicted at an interval of every 1-3 years, to 5 years. Deferred dredging provides an opportunity to conserve funds
- Analysis has identified need (shoaling and inland channel segment expansion) for placement of aids to navigation.
- Seasonal survey data identified need for initiation of two Notice to Mariners during September 2010 and July 2014 due to shoaling and potential for imminent limited navigation at the channel mouth.
- Data and analysis compiled and applied to support City request for FEMA reimbursement after Hurricane Ike.
- Data and analysis document measured seasonal condition of shoaling (as opposed visual interpretation often reported by community-which is not always accurate).

- Data and analysis applied to assess the post-dredge 2011/2012 condition for recommendation of Dredge #1 (Phase 2) to complete to specifications.
- Monitoring of nourishment fronting seawall for vehicular access concerns and bollard placement/adjustment (TGLO agreement).
- Analysis and guidance to support alternative dredge/nourishment funding sources sought by Parks and Recreation staff, such as a CEPRA grant submitted during 2015 and planned for 2017.
- Grants for supplementary funding submitted during 2015 and 2016 (RESTORE).

Why Monitoring and Analysis toward Proactive Management Guidance is Important

- **Dredge planning and beach management:**
Monitor seasonal persistence of bypass bar and intermittent nearshore shoaling in close proximity of mouth for potential ebb shoal formation.
- **Proactive beach management toward limiting shoaling:**
Monitor increasing sand impoundment in nearshore adjacent to north and south jetties: implement planning for adaptive management strategies potentially including lateral redistribution of sand.
- **Dredge planning and deferment:**
Track changes in the rate of post-dredge channel shoaling and identify breaks in trends.
- **Nourishment planning and adaptive management between nourishment events:**
Quantify change in post-nourishment beach width and sand volume along the NPI Seawall.
- **Navigation safety:**
Recommend navigation warnings, as needed, should the potential for depth limited navigation increase seasonally and support dredge implementation or placement of navigation aids.
- **Beach Operation/Management:**
Track changes in beach profile and shoreline position survey data for application to planning beach nourishment, adaptive sand management or bollard placement/relocation
- **Environmental Stewardship:**
Track changes in the Inland Channel Segment bank expansion that could impact protected habitat, residential property, and Nueces County Park boundaries.
- ~~**Disaster Preparedness:**
Prepare to mobilize rapidly to monitor post-storm (Hurricane/Tropical) conditions as needed for Disaster Preparedness as defined in the Event Task 2-5.(Event Monitoring-Task 2-5 NOT authorized for 2017/2018 as per Reinvestment Zone #2 Board).~~
- ~~**Time Sensitive Monitoring Support and Rapid Response**
Provide for timely monitoring of additional areas of concern within the study area as identified by seasonal monitoring or to support City of Corpus Christi directives that may arise during the contract period.
(Rapid response under the Event Monitoring Task 2-5 NOT authorized for 2017/2018 as per Reinvestment Zone #2 Board).~~
- **Documentation of Performance Assessment**
Document and assess performance, potential issues and adaptive strategies to manage new challenges that are identified through seasonal surveys and trend analysis.

Seasonal Monitoring and Long-term Channel Management

Successful management of this dynamic inlet/beach system relies on effective monitoring to support proactive maintenance planning and long-term management strategies. Monitoring at Packery Channel provides for the tracking of changes (Trend Analysis) over seasonal windows of change as well as longer-term historic intervals which allows both the 1) identification of trends in sediment transport (shoaling/scour) and 2) deviation from established trends that could indicate a change in system dynamic and an associated need for *management action*. The monitoring program has documented both a seasonal and event driven component to sediment transport in this system with shoaling most prevalent during the late spring and summer as well as during storms (Hurricane Ike for example). In contrast, scour is well developed during the winter and early spring resulting in a reduction of shoal elevation (peaks), and a reduction in shoaling in the entrance channel over the winter and early spring. The channel has shoaled at an average rate of $\approx 25,000$ to $30,000$ cy/yr (Mar 2013 to Feb 2016) over the first three years since the maintenance dredge was completed. An increase in the rate of shoaling to $35,000$ cy/yr was indicated over the recent survey year (2016). In addition, a linear increase in shoaling was documented over the spring and summer seasons for the first time since the maintenance channel dredge was completed in 2013.

The results of the Winter 2017 Survey is critical toward identifying if shoaling continued at a high rate over the winter months or moderated as it has over the last three years. The winter survey was conducted during April 2017 rather than between the months of February and March, having been delayed by contract authorization by the City.

The highest rate of shoaling has been identified during the spring season, while the annual summer survey, which marks the anniversary of construction completion (Oct 2006), has documented moderation in the rate of shoaling. The winter surveys were initiated to identify the impact of seasonal channel flushing and to quantify seasonal reduction in the rate of shoaling, which has been documented since 2013. Continued occurrence of a reduction in shoaling over the winter months may allow for a deferment of dredging, while sustained shoaling or an increase in shoaling may indicate the need for dredge implementation sooner than anticipated.

Monitoring Program Tasks

The 2017/2018 contract period for the Packery Channel Monitoring Program, as approved by *Reinvestment Zone #2 Board*, consists of all Tasks and subtasks that have been authorized since 2008 with the exception of Task 2-5. *All Tasks and subtasks are outlined below as a guide following the successful program implemented (2008-2016). In addition, the decrease in level of guidance, efficiency and timeliness of deployment associated with the lack of authorization of Task 2-5 is described for clarification.*

One of the primary goals of the 2017/2018 monitoring year is to measure and document the continued changes in the status of channel shoaling as the impending dredge event (Dredge#2) approaches. The next dredge event (Dredge#2) is conservatively anticipated within two years, or winter 2018/2019. Continued seasonal monitoring will assist in the identification of whether dredging can be deferred to conserve funds for future management concerns. The monitoring program will continue to assist the City in the anticipation of future dredge events and document

the annual pre-storm beach width and volume condition to maintain FEMA reimbursement eligibility should the area sustain damage during seasonal hurricanes. The monitoring will directly support the City of Corpus Christi in applying for CEPRAs grant funds to support of dredging and subsequent nourishment of the beach fronting the North Padre Island Seawall (submission anticipated during 2017). The monitoring program directly supports the City in meeting obligations of the TGLO agreement to restrict vehicular access along the NPI Seawall when the beach reaches a width of 150 ft or less (measured at MHHW).

Streamlined Monitoring Program and Budget Reduction

The key components of the monitoring program were reviewed for efficiency of budget and necessity of tasks during 2016. This review was in response to a request from the Island Strategic Action Committee (ISAC) and City Council to streamline the budget and conserve funds. The effectiveness of the monitoring program has been internally reviewed and updated several times previously based upon the results applied to guide inlet and beach management. The first two years of the City-sponsored monitoring program included four surveys per year (2006 to 2008). The first revision of the program reduced the number of full surveys to three seasonal surveys (2008 to 2011) based on the identification of the key periods of change in sediment transport that had been identified. An additional reduction in effort included limiting the areal extent of the spring transition survey to the Deposition Basin/Entrance Channel and nearshore around the mouth, which was implemented during the 2012 monitoring year and continued through 2016. Meetings were held with ISAC representatives to review the components of the monitoring program during 2016. The review process found that the tasks, as outlined, have contributed to the overall success of the monitoring program by providing documentation toward TGLO and USACE obligations as well as providing guidance for City operation management of the inlet and adjacent beaches.

Adjustments were made to accommodate the budget streamline request primarily under four subtasks; Task 1-2 Aerial Photography, Task 2-1 Beach Profile Survey, Task 2-2 Shoreline Position Survey and Task 2-4 Inland Channel Segment and MBCHC. The proposed reduction in effort was purposefully reviewed in an effort to both conserve funds while maintaining the effectiveness of the monitoring program to support the City, the USACE and the TGLO's directives and obligations. The standard seasonal surveys are imperative to monitoring the evolution of shoaling and beach erosion as well as for the guidance of dredge and nourishment planning. The changes in effort are detailed within the description of each task in the following sections.

The proposed reduction in cost for the 2017/2018 contract period will aid in offsetting an increase associated with the shift in Facilities & Administrative Cost (F/A), previously referred to as Indirect Costs or IDC, calculation from 53% of Salaries & Wages to 35% of Modified Total Direct Costs (MTDC). This change is in accordance with the University's Department of Health and Human Services (DHHS)-approved rate agreement dated April 10, 2015 (~~Attachment~~~~Exhibit~~ A). For further information on F/A please review the information provided by TAMU (<https://www.tamus.edu/business/budgets-and-accounting/accounting/facilities-administrative-costs/facilities-administrative-cost-brochure/>). Finance and administration charges can be compared to "overhead" charged by the private sector. The increase in cost of Task 1-1 and 2-1 are due to salary and fringe adjustments as well as anticipated staff available for the 2017-2018 monitoring year.

In an effort to contribute toward future reduction in monitoring costs while maintaining the guidance benefits of the monitoring program, CBI has applied for supplementary funding through grant submissions pursued both during 2015 and 2016, including CEPRA and RESTORE grant submissions. The two pending proposals include a portion of the beach profile and shoreline position monitoring in the broader area of the proposed scope of work. Additional tasks within these proposals would support the City of Corpus Christi in management of coastal resources under City jurisdiction through the provision of wave and current measurements near Packery Channel and through inundation modelling. In 2015, CBI collaborated with the City of Corpus Christi in developing a CEPRA proposal, although it was not selected for funding during that cycle. CBI will assist the City staff in the preparation of a CEPRA grant proposal during the 2017/2018 contract year. In addition, the City has been supplied alternatives analysis for review and fiscal planning for long-term sustainability of the monitoring program.

Contract Period

The contract period will initiate upon authorization and continue for 12 months. The first survey of the contract period will be the spring seasonal survey conducted during June/July 2017. The final survey of the contract period is the peak winter survey that is conducted during Feb/Mar 2018 (weather dependent).

Collaboration

The Packery Channel Monitoring Program benefits from collaboration with Naismith Marine Services (NMS) on successful surveying of Packery Channel as well as the beaches along North Padre Island and Mustang Island. The collaboration between TAMUCC and NMS has produced high-resolution data sets that support trend analysis conducted by CBI and successful City guidance. The collaboration provides a two-step QA/QC process drawing on both strengths of technical survey expertise of NMS and the analytical coastal dynamics expertise of CBI/TAMUCC.

Task Implementation

Tasks 1 and 2, including subtasks, may be conducted simultaneously or independently and in the order that best supports the monitoring program goals.

Note: Task 2-5 has been authorized since 2008 and successfully provided for the rapid mobilization for storm damage assessment (Disaster Preparedness) after Hurricane Ike (2008). Because Task 2-5 provides for City staff authorization of emergency surveys there was no delay in surveying after Ike and survey crew was able to conduct the post-storm survey within one week, corresponding to conditions were safe for the survey crew, of the storm impacting the Texas coast.

Task 2-5 was not recommended by the Reinvestment Zone #2 Board for the proposed 2017/2018 monitoring year. Therefore, NO DISASTER PREPAREDNESS capability is provided for 2017/2018. This means that any surveys that are needed beyond those listed in Task 2-1 Task 2-2, Task 2-3 and Task 2-4 would require additional action on the part of City staff and allocation of funds that could result in delay of surveys and thus delay in response to storm damage or other emergency needs. Delaying surveys can limit and delay assessment and implementation of restoration if required. Surveys document the condition during a window of time. If that window

is not captured, there is no data to describe the changes or identify if action such as dredging or navigation warnings are indicated.

Task 1. Project Management

1-1. Project Management, Analysis and Reporting

Description

Project management includes historic analysis, reporting, survey organization and scheduling; as well as presentations and generation of guidance materials in support of the management of the inlet and associated beach and wetland by the City of Corpus Christi. This includes meetings with City staff for periodic project assessment and guidance. Task 1 provides additional support including coordination with surveyors, engineers and other environmental professionals to assist the City of Corpus Christi with related projects including potential dredge operations. Task 1 provides for compilation and transfer of data sets requested by engineers associated with dredge planning and structural assessment. Preparation of survey/analysis information to support proposal development and compilation of relevant data and analysis appropriate for the City to submit for FEMA reimbursement for storm damage and assistance with planning for alternate project funding.

Cost:

Salary/Wages/Benefits/Supplies/Travel/F&A: \$ 57,184 (CBI)

Estimated Cost Task 1-1: \$ 57,184

Streamlined Cost Savings: N/A

1-2. Aerial Photography

Description: This task originally provided for the acquisition of an annual set of rectified orthometric aerial photographs of the Packery Channel region including the entire channel from the GIWW to the Gulf of Mexico (GOM); including North Padre and Mustang Islands from the south end of the seawall to Newport Pass as well as a higher resolution set that focused on the dynamic region that includes the basin and adjacent beaches that could be applied to spatial analysis. Aerial imagery documents changes in areas that are not presently surveyed but still of interest to City staff due to the proximity and association due to existing or potential hydraulic connection to Packery Channel. These areas include the Lake Padre, Padre Isles and Laguna Madre as well as sensitive wetland habitat.

Streamlined Task 1-2:

The streamlined task will provide for one set of high altitude lower resolution aerial imagery that covers the entire study area from the GIWW to the Gulf and the adjacent beaches from south of Bob Hall Pier (MM 238) to north of Newport Pass at (MM 196). The high resolution set of aerial imagery will not be provided. The set of lower resolution images will be applied in ArcGIS environment for comparative analysis of change relative to key features and as a reference for overlay of data and terrain models for reporting. Quotes received during 2016 indicated that the estimated cost of aerial photography is comparable to the 2014 and 2015 effort. The cost for the acquisition of two sets of imagery is estimated at \$12,000. The cost of only the lower resolution imagery of the full study area is estimated at \$7,750. To further reduce costs associated with rectified aerial imagery, alternate public sources will be investigated.

Implications of Reduction in Imagery

Although the high altitude imagery does cover the majority of the study area there are limitations in resolution and image clarity as applied to focused analysis over small spatial areas such as along the beach at the inlet mouth and along the NPI seawall as well as bank boundaries bordering the MBCHC. Higher resolution imagery (low-altitude) may need to be re-introduced in future proposals depending on review at the close of the 2017/2018 monitoring year.

Purpose: For interpretation of large-scale changes in vegetation, dune line, and inter-tidal regions adjacent to the inland segment of the channel as well as along Padre and Mustang Islands. Aerial imagery also documents development that may influence changes in the study area. Aerial imagery is particularly important in providing for documentation of adjacent regions that are outside of the topographic survey area such as the wetland regions. In addition, the aerial imagery is applied to orient the viewer spatially with reference to the channel and beach elevation data. The aerial images are critical for application to the development of visuals and explanation aids that are developed for the City staff, City Council, residents and laypersons as well as for reporting purposes.

Schedule:

- (1) The annual set of imagery has been flown during late February or early March (pending weather/sea conditions) since the 2013 dredge/nourishment event. The target season for imagery has shifted to late winter/early spring from late summer (Sept/Oct) in order to capture seasonal low water levels that expose shallow areas and channel boundaries along the Inland Channel Segment that would otherwise be submerged. This is important in providing for qualitative evaluation in areas bordering the survey footprint or avoided that cannot be surveyed using standard methodology due to sensitive habitat. The opportunity to capture the spring aerial photography flight was missed during 2017 year due to delays in contract authorization and therefore the imagery may be taken during August 2017 or postponed to Feb/Mar 2018 as directed by City staff. Postponing until 2018 would result in no aerial documentation during 2017.
- (2) QA/QC of imagery and integration into GIS project to initiate upon receipt of images

Cost:

Aerial photography: \$7,750 (Vendor acquired)

Salary/Wages/Supplies/Travel/F&A: \$ 8,033 (CBI)

Estimated Cost Task 1-2: \$ 15,783

Streamlined Cost Savings: \$5,799

Task 2. Measurement of Morphologic Change in Packery Channel and along Mustang and Padre Island.

2-1. Beach Profile Surveys

Description:

Beach profile surveys provide detailed information describing changes in elevation, morphology and bathymetry at 18 specified locations along the beach stretching from the Nueces Kleberg County Line to north of Fish Pass at Mustang Island State Park. Historic data exists for these locations (1995-2015). The beach profile survey has been conducted annually during the peak summer period, which corresponds to the completion of the Packery Channel construction. This data set provides for analysis of change in volume and morphology (bars, berm, and dunes) that is reflective of seasonal forcing. Elevation measurements are taken along transects that initiate landward of the dune or other landward limiting feature (seawall or pavement) and extend offshore

up to one mile into the Gulf of Mexico. The surveys capture the region of active sediment transport and therefore extend offshore to a depth, referred to as the depth of the closure, beyond which indicates the most offshore point defining the region of sediment sharing between the subaqueous and subaerial beach. The surveys extend both to the north and to south of the direct area of influence of Packery Channel in order to determine if changes occurring around the inlet and NPI seawall are localized or common to the surrounding beaches. This allows confirmation of the influence of nourishment and sheltering capabilities of the jetties on beach stability.

A transect grid with closer spacing of profiles is applied along the beach fronting the North Padre Island (NPI) Seawall in an effort to quantify volumetric change and document changes in beach profile with greater detail. The closer spacing in transect data is necessary due to significant change in volume and beach width with distance alongshore. This information is applied to monitor change before, during and after nourishment of the beach fronting the seawall and along the area south near Whitecap Blvd. This detailed data set provides the necessary information to better define the littoral sand budget (volume of sand both in the nearshore as well as on the dry beach, referred to as the berm) in this area and assess beach nourishment performance.

Streamlined Task 2-1:

Streamlining Task 2-1 effort reduces the number of intensive NPI seawall surveys from three to two. This includes the elimination of the transition beach profile survey previously conducted during the spring. Two surveys, one conducted at the peak of winter forcing and one conducted at the peak of summer forcing will be conducted during 2017/2018.

Implications of Reduction Survey Effort: The elimination of any seasonal survey provides a gap in data history and gap in information and understanding of dynamics should a storm or variability in typical forcing result in an increase in erosion in the region preceding and during that time. Data gaps decrease effectiveness of trend analysis and early identification of new areas of accelerated erosion and identification of changes in the beach morphology that are associated with management practices such as maintaining the driving lanes.

Purpose: To document changes in features such as the dune toe (seaward limit of dunes) berm crest (most landward point of active sediment transport on the beach), and sand bars. The data are applied to determine regions of erosion and to calculate volumetric change along historically surveyed areas of the beach. This data set is critical to the calculation of sand volume that is required for sand placement during nourishment and documentation for FEMA reimbursement. Data is also applied to verify shoreline position data and to determine the maximum region of sheltering along the beach (Zone of Influence) that is provided by the jetties. Two profile locations occupied during the annual survey are required to assist in determining long-term change in the volume of sand in the nearshore immediately adjacent to the inlet for interpretation of potential for introduction of sand into the channel mouth. An additional set of beach profile transects was added to better describe the beach fronting the NPI Seawall to facilitate more accurate monitoring of changes in the recent beach nourishment. This focused survey along the nourishment area includes profiles at 400-ft to 1100-ft spacing to accommodate more accurate beach volume calculations for FEMA application and for TGLO reporting. This was needed due to the rapid change in width and volume with alongshore position in this region targeted for nourishment which is anticipated during the winter of 2018/2019.

Schedule:

(1) One annual full baseline survey conducted during peak summer condition (Sep/Oct 2017).

(2) Two intensive seasonal surveys of beach nourishment area fronting the NPI seawall (Sept/Oct 2017 and Feb/Mar 2018). The peak winter survey (Feb/Mar) corresponds to the completion of beach nourishment in March 2013.

Additional surveys may be required if data indicate that the rate of change has increased during the study period. These additional surveys were provided for in Task 2-5 in all previous contract amendments (2008-2016) but were not approved by Reinvestment Zone #2 Board for the 2017 monitoring year. Additional surveys would require funding allocation and authorization, which delays the survey and analysis process.

Cost (Task 2-1):

Annual Survey: \$ 19,900.00 (NMS)

NPI Seawall Surveys: \$11,950.00 (NMS)

Salary/Wages/Benefits/Supplies/Travel/F&A: \$14,196 (CBI)

Estimated Cost Task 2-1: \$46,046

Streamlined Cost Savings: \$3,746

2-2. Shoreline Position Surveys

Description: Elevation data are collected by RTK GPS starting from near the dune toe (or other landward limiting feature such as the seawall) and continuing across the beach to the water line. The data is collected along a zigzag path in order to cover the entire beach face efficiently and economically. The beach is surveyed from south of the Nueces Kleberg County Line to north of Fish Pass at Mustang Island State Park.

Purpose: Shoreline position surveys are an efficient and low-cost way to measure changes in the elevation of the dry beach berm over the broad study area. Within days, the elevation of a large section of the beach can be measured to determine changes in shoreline position from which regions of beach erosion and accretion can be determined and potential “hot spots” can be identified. Monitoring the seasonal position of the shoreline assists in management of beach vehicular access south of the inlet and addresses persistent regions of shoreline recession and resulting narrowing of beach that have been identified fronting the North Padre Island Seawall and Whitecap Blvd. In contrast, the data is applied to monitor shoreline advance adjacent to the inlet as an indicator an increase in nearshore expansion, which could influence sediment transport into the channel mouth. This data set is instrumental to the management of bollard placement along the North Padre Island Seawall and all adaptive maintenance activities described in the City’s Beach Maintenance Plan.

Streamlined Task 2-2:

Effort in Task 2-2 was reduced from three surveys to two seasonal surveys. The transition season survey will be eliminated during 2017. The transition survey documents a dynamic period when the beach responds to reversals in forcing as winter fronts and seasonally high water levels continue to influence sediment transport. The implication of the loss of information during the spring will be re-evaluated during review and preparation of the 2018/2019 monitoring contract.

Implications of Reduction Survey Effort:

The elimination of any seasonal survey provides a gap in the data history and gap in information and understanding of dynamics should a storm or variability in typical forcing result in an increase in erosion in the region. This reduces the effectiveness of the analysis of trends, which are applied to identify management strategies, particularly important to determining if the restricted beach area fronting the south end of the seawall should be expanded or decreased in alongshore length.

Schedule:

(2) Two Seasonal Surveys. Tentative survey schedule: Sep 2017 and Jan/Feb 2018.

Additional surveys may be required if data indicate that the rate of change has increased during the study period. These additional surveys were provided for in Task 2-5 in all amendments (2008-2016) but were not approved by Reinvestment Zone #2 Board for 2017. Therefore additional surveys that are indicated as necessary during analysis will require a contract amendment or other authorization, as well as allocation of funding before they can be conducted.

Cost (Task 2-2):

Survey: \$7,800 (NMS)

Salary/Wages/Benefits/Supplies/Travel/F&A: \$ 8,500 (CBI)

Estimated Cost Task 2-2: \$16,300

Streamline Cost Savings: \$ 3,663

2-3. Surveys of Channel and Nearshore Depth and Morphology (Features of seafloor and bottom of channel)

Description: The bathymetric surveys combine single-beam (nearshore/offshore) and multi-beam (channel) sonar coverage to provide high-resolution data sets that describe the morphology (shoals, scour and sandbars) on the channel bottom and seafloor. The analysis of seasonal data sets is applied to interpret pathways of sediment transport and to anticipate development and persistence of features such as bypass bars, channel shoals and ebb shoals.

Purpose: Data is applied to define morphologic features such as shoals (areas of deposition) and scour (areas of erosion) in the channel, nearshore and around structures. The data are applied to interpret trends in sediment transport as well as to calculate volumetric change indicating sand loss or gain, to prepare for nourishment projects, and to identify potential regions of shoaling which could limit navigation. A primary application of this data is to identify trends in shoaling which provides guidance in future dredge planning and deferment as well as the identification of navigation hazards.

Schedule:

(3) Three Seasonal Surveys. Tentative survey schedule: Jun/Jul 2017 (abbreviated-Basin to Gulf only), Sep/Oct 2017, and Feb/Mar 2018. *Additional surveys may be required if analysis indicates that shoaling is rapidly increasing and depth-limited navigation is imminent. Such surveys have been accommodated for by the Event Task (Task 2-5) budget. Note that the Reinvestment #2 Board did not approve Task 2-5, therefore additional surveys indicated as necessary during analysis will require a contract amendment or other authorization, as well as allocation of funding before they can be conducted.*

Cost (Task 2-3):

Survey: \$ 79,300 (NMS)

Salary/Wages/Benefits/Supplies/Travel/F&A: \$ 23,944 (CBI)

Estimated Cost Task 2-3: \$ 103,244

Streamline Cost Savings: N/A

2-4. Inland Channel Segment and Mollie Beattie Coastal Habitat Community (MBCHC)

Description: The Inland Channel Segment bordering MBCHC continues to modify as the region adjusts to changes in water flow in the channel and periodically over the wetland as well as under the influence of storms and ever-increasing usage (boat wake). These changes are best captured seasonally through a network of cross-sections that document changes in wetland extent, channel boundaries and shoreline change. Elevation is measured along transects or survey lines, that are

roughly perpendicular to channel orientation. The surveys start at the location of the mean higher high water (MHHW) shoreline position located along the western residential shore and then extend across the channel to the location of MHHW shoreline position or until a limiting feature (such as coverage of a raised placement area) is defined. The position of the MHHW shoreline position is measured along the residential side of the channel extending from the HWY 361 Bridge to the Relief Channel west of the abrupt turn or dogleg in the channel that borders Packery Channel County Park. The MHHW position is not as well defined along the MBCHC due to extended sections of submerged area, therefore a MHHW position survey is not conducted on the east side of the channel.

Purpose: These surveys define morphologic change in the inland segment of the channel that borders the MBCHC as well as changes in the elevation across sections of the wetland. The purpose is to evaluate the response of the channel and wetland to the opening of the inlet and assess the approach to an equilibrium status. Analysis of this data set provides quantification of change in the primary (-5 ft) and upper bank (MSL) width along the channel bordering the MBCHC. These surveys also assist in tracking changes in the channel associated with the migration of numerous sand waves in the channel. The shifting peaks of these sand waves can reduce water depth and potentially influence navigation. In addition, the MHHW position of the west side of the inland channel segment (residential) is compared to historic survey data surveys to determine historic change in position which is relevant to channel marker placement and maintenance. Changes in the Inland Channel Segment, bank width and MBCHC can influence navigation and operation of this shallow segment of Packery Channel. This survey provides for trend analysis toward successful operation and maintenance of the Inland Channel Segment. The transect survey data set may be applied to pre-dredge planning should dredging of the inland channel be indicated.

Streamlined Task 2-4:

Effort in Task 2-4 was reduced from two surveys to one annual survey that corresponds to the channel and nearshore annual survey conducted during Sep/Oct 2017.

Implications of Reduction Survey Effort:

Elimination of seasonal surveys eliminates the opportunity to quantify seasonal change or event driven change that occurs between the annual surveys. Reduces the effectiveness of trend analysis that may indicate an increase or decrease in shoaling, scour and channel bank position and to identify navigation hazards.

Schedule:

Tentative annual survey schedule: Sept/Oct 2017 to coincide with annual peak summer survey. *Additional surveys may be required if data indicate that the rate of change has increased during the study period. These additional surveys were provided for in Task 2-5 in all amendments (2008-2016) but were not approved by Reinvestment Zone #2 Board for 2017. Therefore, if additional surveys are indicated as necessary during analysis these surveys will require a contract amendment or other authorization, as well as allocation of funding before they can be conducted.*

Cost (Task 2-4):

Survey: \$ 9,400 (NMS)

Salary/Wages/Benefits/Supplies/Travel/F&A: \$ 9,788 (CBI)

Estimated Cost Task 2-4: \$ 19,188

Streamline Cost Savings: \$ 13,307

2-5. Event/Transitional Survey and/or Dredge Support
(NOT APPROVED BY Reinvestment Zone #2 Board for 2017)

Description: In a continued effort to respond to City of Corpus Christi budgetary constraints, the monitoring program continues at a modified schedule to include (2) seasonal surveys (Sept/Oct 2017 and Jan/Feb 2018) and (1) transitional reduced cost survey (June 2017). To accommodate needs related to Disaster Preparedness and Readiness an Event Task was created to provide for rapid deployment and disaster preparedness. This task has been included in each annual amendment proposal since 2008. To accommodate monitoring concerns beyond the seasonal surveys defined in Task 2-1, 2-2, 2-3 and 2-4; the Event Task (2-5) provides for event surveys or other survey requirements as directed by City staff. Such support outside of seasonal surveys could include, but is not limited to, dredge support, engineering support, environmental assessment (wetland, endangered species, modeling hydrodynamics), and sand placement activities outside the seasonal survey scope. The primary purpose of the event surveys is to facilitate timely pre- or post-storm surveys and assess damage to provide as guidance toward post-storm response (emergency dredging and nourishment primarily). Surveys may be indicated beyond the seasonal designation, such as after storms (Disaster Preparedness), and to assist with the investigation of sensitive environmental habitat or anthropogenic influences on the coastal environment that are identified during the course of the three seasonal surveys. The cost is based upon the typical seasonal survey suite but may be utilized as needed in support of management concerns as directed by City staff.

Task 2-5 cost is based upon the following Monitoring suite for budget development but may be utilized as needed in support of City of Corpus Christi Packery Channel management concerns on an as needed basis. Funds not allocated at the end of the contract period are conserved for future applications:

- a. Beach profile survey (1) Task 2-1
- b. Shoreline position survey (1) Task 2-2
- c. Abbreviated bathymetry survey (1) Task 2-3
- d. Full bathymetric channel and nearshore survey (1) as described in Task 2-3.

Since 2008, all funds not allocated toward authorized effort have been conserved and reinvested in subsequent monitoring years. If no allocation is approved then these funds are not accessed. These funds are not transferred to TAMU-CC until work is approved, conducted and an invoice is submitted.

Water Current Monitoring (Task 2-5)

(NOT APPROVED BY Reinvestment Zone #2 Board for 2017)

The TIRZ #2 Board did not approve funding of Task 2-5 which accommodated the maintenance of the water current monitoring stations in the Gulf Intracoastal Waterway (GIWW) and Packery Channel as well as the online dissemination of the water velocity data. Monitoring changes in current flow provides data for future studies of hydrodynamic change potentially associated with the addition of channels in the Lake Padre region of the study area or future changes to the channel system that are yet to be identified. This data is also provided online for public access and public safety as the velocity of water flow in the channel can impact navigation. Monitoring includes the public online data access to real time measurement of water current velocity (<http://lighthouse.tamucc.edu/qc/138> and <http://lighthouse.tamucc.edu/qc/150>) because water

~~velocity can impact navigation safety. These stations were previously funded by the USACE (2006-2014), but no funding has been identified or secured for 2017/18 to date. Funding partners will continue to be explored to support these stations in the future.~~

~~**Purpose:** This data is applied to support analysis and define forcing responsible for changes in morphology, wetland boundaries, and bathymetry of Packery Channel. The monitoring stations provide water current velocity measurements and provide online real-time access for navigation and hydrodynamic modelling related to environmental concerns in the system.~~

~~**Past Applications:**~~

- ~~1. Analysis of sediment transport and changes in scour and shoaling~~
- ~~2. Application to navigation safety (online public service)~~
- ~~3. Backeasting: Hydrodynamic model to determine the contributing factors to the failure of the bulkhead along the north bank of the Deposition Basin after Hurricane Ike (Reed 2011).~~
- ~~4. Forecasting: A conceptual hydrodynamic study of the influence of opening a channel to flow between Lake Padre and the Upper Laguna Madre to determine areas of peak flow within the existing channel system.~~

~~**Task 2-5 Schedule**~~

~~Surveys conducted post-storm and as directed and authorized by City staff and relative to management concerns during 2017/2018. Water current monitoring is continuous over the study period and publically available online in real-time. Other tasks as directed/authorized by City of Corpus Christi staff.~~

~~**Cost:**~~

~~Survey: \$ 56,000 (NMS)~~

~~Salary/Wages/Benefits/Supplies/Travel/F&A: \$17,897 (CBI)~~

~~**Estimated Cost Task 2-5:** up to \$ 73,897~~

~~**Streamline savings N/A:** Unallocated funds reinvested~~

Budget Totals

Total Estimated Cost of 2017/2018 Monitoring Program

Task 1-1, 1-2 and Task 2-1, 2-2, 2-3 and 2-4

(Excludes Event Task, Task 2-5) as requested by TIRZ Committee):

\$ 257,745

Total Streamline savings (Task 1-1, Task 2-1, Task 2-2 and Task 2-4): \$26,515

~~Total Estimated Cost of 2017/2018 Monitoring Program:~~

~~Task 1 and Task 2 (Includes Event Task Task 2-5 as defined and implemented 2008-2016):~~

~~\$ 331,642~~

Cost Savings to City of Corpus Christi

In an effort to directly address budgetary constraints and comprehensive use of available funds, CBI has provided cost savings through the following:

- 1. Conservation of funds in the Event Category 2010-2012 (Task 2-5).
Savings to City \approx \$ 63,381.72*
- 2. Conservation of funds in the Event Category 2014/2015 (Task 2-5).
Savings to City \approx \$ 60,000*
- 3. Conservation of funds in the Event Category 2015/2016 (Task 2-5).
Savings to City \approx \$ 6,989
The cost savings decreased during 2015/2016 as funds were applied to conduct the annual summer survey budgeted for 2016/2017 due to delay in contract authorization.*
- 4. Online data visualization through Coastal Habitat Restoration (CHRGIS) (Sponsored by TGLO/CEPRA) <http://cartogram.tamucc.edu/chrgis/maps/>
Data shown is only that which represents TGLO objectives related to CEPRA (#1113)*

Deliverables:

ASCII data sets (x,y,z) NAVD88 State Plane south Zone FIPS 4205

Email status report (as updates are available)

Status Reports (post-survey documentation)

Note: all surveys may be rescheduled based upon study findings or weather and sea conditions. Additional surveys may be recommended upon seasonal findings or evidence of change based upon observations in the field.

Budget next Page

**Packery Channel Monitoring Program
Estimated Budget
2017/2018**

Personnel

Principal Investigator \$ 43,807

Database Management/Support and Technical Staff \$ 13,761

Subtotal Personnel (Salary/Wages) \$ 57,568

Benefits \$ 18,499

Total Personnel \$ 76,067

Travel (Transportation to Surveys)

Rental vehicle and fuel \$ 550

Other Project Costs

Materials and Computer (software upgrades
repair allowance, backup/archive, desktop computer) \$ 5,000

Surveying/post processing (Subcontract) \$ 128,350

Aerial Photography (Contract/PO) \$ 7,750

Total Travel and Other \$ 141,650

Subtotal Personnel \$ **76,067**

Subtotal Travel and Other \$ 141,650

Total Salary/Wages/Benefits/Other \$ 217,717

F&A (35%) \$ 40,028

Project Total (Task 1 (subtasks 1-2) and Task 2 (subtasks 2-4) \$ 257,745

Excluding Event Task (2-5)

Total Streamline savings and cost reduction \$ 26,000

~~Project Total (Task 1 (subtasks 1-2) and Task 2 (subtasks 1-5) up to \$ 331,642~~

~~Including Event Task (2-5) up to \$73,897~~

~~Which provides for Disaster Preparedness (Hurricane Response)~~

References

- Reed, C.W., Lin, L. (2011). Analysis of Packery Channel Public Access Boat Ramp Shoreline Failure, *Journal of Coastal Research*, Special Issue 59, <http://dx.doi.org/10.2112/SI59-015.1>, 150-155 pp.
- Williams, D.D. (2015). Packery Channel Monitoring Program: Assessment of Beach Nourishment and Maintenance Strategies south of Packery Channel, Corpus Christi Texas. Technical Report for the City of Corpus Christi, TAMUCC-CBI-CDL-TR-2015-03, 27 p.
- Williams, D.D. (2016). Packery Channel Monitoring Program: Assessment of Channel Shoaling and Implications for Beach Nourishment along the North Padre Island Seawall (Mar 2013 to Oct 2015). Technical Report for the City of Corpus Christi, TAMUCC-CBI-CDL-TR-2016-01, 23 p.
- Williams, D.D. (2017 in press). Packery Channel Monitoring Program: Assessment of Channel Shoaling and Shoreline Change with Implications for Beach Nourishment and Adaptive Beach Management (Mar 2016 to Sep/Oct 2016). Technical Report for the City of Corpus Christi, TAMUCC-CBI-CDL-TR-2017-01

Attachment A

TAMUS and the Department of Health and Human Services (DHHS) have signed a new Facilities & Administrative Cost Rate Agreement for TAMUCC. Please find attached copy of the fully executed Rate Agreement for the period 09/01/15-08/31/18. **Effective September 1, 2015, the new F&A rate for on campus projects for FY 2016 is 34%. Effective September 1, 2016, the F&A rate will increase to 35% for FY 2017. This rate will remain in effect until 8/31/2018.** Note the new Rate should be applied to **MTDC** base as originally approved on September 1, 2011. Also, note the “**off-campus definition**” is different than in the past. **Off campus rate is 24%.**

It is TAMUCC's policy to request the appropriate federally negotiated indirect cost rate in the proposal budget for all sponsored projects regardless of funding source, unless a sponsoring agency's **written** policy will not permit full recovery of indirect costs. **ALL FORTHCOMING PROJECTS WITH A START DATE OF 9/1/2015 OR LATER SHOULD CALCULATE INDIRECT COSTS AT THE NEW NEGOTIATED RATE.**

The Facilities and Administrative Rate Agreement (F&A), often referred to as Indirect Costs, is the process of recovering the portion of costs that support sponsored projects, but are not directly charged to sponsored funds. The total costs associated with organized research can be categorized as either direct costs or indirect costs (also referred to as Facilities & Administrative (F&A) costs).

F&A (Indirect) Costs: As defined in OMB A-21, F&A costs are those that are incurred for common or joint objectives and therefore cannot be identified readily and specifically with a particular sponsored project, instructional activity or any other institutional activity. They are real costs incurred by the colleges/centers and the institution in support of sponsored activities but cannot be directly identified with a specific grant or contract. The costs result from shared services such as libraries, physical plant operation and maintenance, utility costs, general, departmental, unit/department and sponsored projects' administrative expenses and depreciation for buildings and equipment and student administration and services.

Types of Indirect Cost Base

- Modified Total Direct Costs (MTDC)

OMB A-21 defines **Modified Total Direct Costs** as follow, “consist of salaries and wages, fringe benefits, materials and supplies, services, travel, and subgrants and subcontracts up to the first \$25,000 of each subgrant or subcontract (regardless of the period covered by the subgrant or subcontract). Equipment, capital expenditures, charges for patient care, tuition remission, rental costs, scholarships, and fellowships as well as the portion of each subgrant and subcontract in excess of \$25,000 shall be excluded from modified total direct costs.”

As specified in this definition, some costs are **excluded** from Total Direct Costs (TDC) to arrive at the MTDC base to which F&A (indirect cost) rates are applied. OMB A-21 also provides for exclusions of other items of cost where necessary to avoid a serious inequity in the distribution of costs. Any questions on determination of the MTDC base should be directed to the Office of Sponsored Research Administration (OSRA).

- Total Direct Costs (TDC)

Direct Costs: As defined in OMB A-21, “direct costs are those which can be identified specifically with a particular sponsored project, an instructional activity or any other institutional activity, or that can be directly assigned to such activities relatively easily with a high degree of accuracy. The portion of salary and fringe benefits of a faculty member performing an experiment or a specialized laboratory supply necessary for performing an experiment are examples of direct costs to a sponsored project. Other general categories are: supplies, contractual services, travel and communication, equipment and computer use.”

- Salaries and Wages (S&W)

Include PI salary, other personnel salary and fringe benefits

- Other as specified by the sponsor in the RFP

For **Non-federal** agencies and other **Non-profit organizations**, if a sponsor has a written policy that limits the allowable rate of indirect costs, PIs should consult with the ORSA to discuss whether TAMUCC will accept the restriction.

Assessment of indirect costs to a sponsored project allows TAMUCC to recover some of its contribution to the support of the project. Therefore, **assessment of waivers** is rarely given except in exceptional circumstances. Waiver requests should be directed to the Vice President for Research.

EXHIBIT C

Insurance Requirements

Geotechnical and Construction Materials Testing Contracts

1.1 Consultant must not commence work under this Agreement until all required insurance has been obtained and such insurance has been approved by the City. Consultant must not allow any subcontractor to commence work until all similar insurance required of any subcontractor has been obtained.

1.2 Consultant must furnish to the Director of Engineering Services with the signed agreement a copy of Certificates of Insurance (COI) with applicable policy endorsements showing the following minimum coverage by an insurance company(s) acceptable to the City's Risk Manager. **The City must be listed as an additional insured on the General liability and Auto Liability policies, and a waiver of subrogation is required on all applicable policies. Endorsements must be provided with COI. Project name and or number must be listed in Description Box of COI.**

| TYPE OF INSURANCE | MINIMUM INSURANCE COVERAGE |
|--|--|
| 30-written day notice of cancellation, required on all certificates or by applicable policy endorsements | Bodily Injury and Property Damage Per occurrence - aggregate |
| Commercial General Liability including: 1. Commercial Broad Form 2. Premises – Operations 3. Products/ Completed Operations 4. Contractual Liability 5. Independent Contractors 6. Personal Injury- Advertising Injury | \$1,000,000 Per Occurrence \$2,000,000 Aggregate |
| AUTO LIABILITY (including) 1. Owned 2. Hired and Non-Owned 3. Rented/Leased | \$500,000 Combined Single Limit |
| PROFESSIONAL LIABILITY (Errors and Omissions) | \$1,000,000 Per Claim If claims made policy, retro date must be |

| | |
|--|---|
| | prior to inception of agreement, have extended reporting period provisions and identify any limitations regarding who is insured. |
|--|---|

1.3 In the event of accidents of any kind related to this agreement, Consultant must furnish the City with copies of all reports of any accidents within 10 days of the accident.

1.4 Consultant shall obtain and maintain in full force and effect for the duration of this Agreement, and any extension hereof, at Consultant's sole expense, insurance coverage written on an occurrence basis, by companies authorized and admitted to do business in the State of Texas and with an A.M. Best's rating of no less than A- VII. **Consultant is required to provide City with renewal Certificates.**

1.5 Consultant shall be required to submit a copy of the replacement certificate of insurance to City at the address provided below within 10 days of the requested change. Consultant shall pay any costs incurred resulting from said changes. All notices under this Article shall be given to City at the following address:

City of Corpus Christi
Attn: Engineering Services
P.O. Box 9277
Corpus Christi, TX 78469-9277

1.6 **Consultant agrees that with respect to the above required insurance, all insurance policies are to contain or be endorsed to contain the following required provisions:**

- 1.6.1 List the City and its officers, officials, employees and elected representatives as additional insured by endorsement, as respects operations, completed operation and activities of, or on behalf of, the named insured performed under contract with the City with the exception of the professional liability/Errors & Omissions policy;
- 1.6.2 Provide for an endorsement that the "other insurance" clause shall not apply to the City of Corpus Christi where the City is an additional insured shown on the policy;
- 1.6.3 Provide thirty (30) calendar days advance written notice directly to City of any suspension, cancellation or non-renewal of coverage, and not less than ten (10) calendar days advance written notice for nonpayment of premium.

1.7 Within five (5) calendar days of a suspension, cancellation or non-renewal of coverage, Consultant shall provide a replacement Certificate of Insurance and applicable endorsements to City. City shall have the option to suspend Consultant's performance should there be a lapse in coverage at any time during this Agreement. Failure to provide

and to maintain the required insurance shall constitute a material breach of this Agreement.

1.8 In addition to any other remedies the City may have upon Consultant's failure to provide and maintain any insurance or policy endorsements to the extent and within the time herein required, the City shall have the right to order Consultant to remove the exhibit hereunder, and/or withhold any payment(s) if any, which become due to Consultant hereunder until Consultant demonstrates compliance with the requirements hereof.

1.9 Nothing herein contained shall be construed as limiting in any way the extent to which Consultant may be held responsible for payments of damages to persons or property resulting from Consultant's or its subcontractor's performance of the work covered under this agreement.

1.10 It is agreed that Consultant's insurance shall be deemed primary and non-contributory with respect to any insurance or self-insurance carried by the City of Corpus Christi for liability arising out of operations under this agreement.

1.11 It is understood and agreed that the insurance required is in addition to and separate from any other obligation contained in this agreement.