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November 9, 2006

Ms. Jessica C. White
Coastal Protection and Restoration Division
NOAA/NOS/Office of Response and Restoration
1445 Ross Avenue
Dallas, TX 75202-2733

Ref: Meeting Summary – Greens Bayou
Ecological Services Analyses – October 17, 2006
GB Biosciences (GBB) Corporation
Greens Bayou Plant, Houston Texas
Hazardous Waste Permit No: HW-50205
Compliance Plan No: CP-50205
TCEQ S.W.R. No: 30522
EPA I.D. No: TXD000836486

Dear Ms. White,

The purpose of this correspondence is to provide the State of Texas and Federal Natural Resource Trustees and Texas Commission on Environmental Quality (TCEQ) an official copy of the summary of the jointly held technical meeting at the TPWD offices in Austin on October 17, 2006.

The Trustees, TCEQ and representatives from GBB, ISK Magnetics, OCC/Tierra Solutions and their consultant team who attended the meeting reviewed the attached summary. All of the comments were incorporated in the summary. The summary was written by GBB consultant, Integral. Also enclosed is the attendee list for the October 17, 2006 meeting. The next scheduled meeting is December 4 and 5, 2006 in Austin.

GBB and the other stakeholders appreciate the opportunity to continue working with the Trustees and TCEQ in a cooperative manner to bring an acceptable and environmentally sound resolution relative to Greens Bayou.

Please feel free to contact me at 713-450-8075 if you need additional information regarding the GB Plant Site or Greens Bayou.

Sincerely,

Martin M. Fontenot, Jr. Q.E.P.
GB Biosciences Corporation
Site Remediation Manager

CC: Mr. Frank Rigsby
ISK Magnetics, Inc.
2237 Haden Road
Houston, TX 77015

Mr. David Rabbe
Tierra Solutions, Inc.
Two Tower Center Blvd., 10th Floor
East Brunswick, NJ 08816

Electronic Copies:
All Attendees

Ms. Jessica C. White
NOAA
November 9, 2006

MEETING SUMMARY
GREENS BAYOU ECOLOGICAL SERVICES ANALYSIS
OCTOBER 17, 2006

INTRODUCTION

A meeting was held on October 17, 2006, at the Texas Parks and Wildlife (TPWD) offices in Austin, Texas, to discuss the data and the technical approaches to be used for the ecological services analysis (ESA) to be conducted for Greens Bayou. Meeting attendees included representatives from GBB, ISK Magnetics (ISKM), and OCC/Tierra Solutions[1] (the Companies); their consultant team; TCEQ, and state and federal natural resource trustees (Trustees). Other attendees included representatives from the Port of Houston Authority (PHA), and the PHA consultant. A list of attendees is included as Attachment 1.

The purpose of the meeting was to identify and discuss technical issues related to evaluation of ecological services associated with the benthic habitats in Greens Bayou, and the estimation of potential chemical effects on those services . Topics also discussed during this meeting included potential water column impacts of dredging during remedy implementation, the size and type of potentially injured habitat in the area of the CDF, and possible restoration projects. The discussions were centered around technical issues that will need to be resolved to complete the ESA, and to conduct a Habitat Equivalency Analysis (HEA) to try and reach a settlement on natural resource damages related to the remediation of benthic habitats in Greens Bayou. A copy of the meeting agenda is included as Attachment 2.

DISCUSSION AND AGREEMENTS

The meeting started with introductions and a review of the agenda. Jessica White requested that the agenda be modified to add an item regarding Port of Houston Authority (PHA) participation and an initial statement about the decision approach by the Trustees. Jessica White also noted that the Trustees would like to have Ron Gouguet participate by telephone in the discussion of how to determine injury levels for benthic habitats.

The following bullets summarize key discussions and agreements reached between the parties.

- **Participation by Port of Houston Authority (PHA) representatives.** Two representatives of PHA attended the meeting (Dana Blume and Wendell Mears),

[1] Represented at this meeting by BBL Sciences, an Arcadis Company.

and Trustees asked them to clarify their purpose for attending. The PHA General Counsel would like them to stay involved in the technical process as observers to see that settlement terms are maintained, because PHA considers itself an interested party as owner of the bayou sediments. Trustees expressed some reservations about the possibility that PHA's participation might open the process to wider public participation. The PHA representatives indicated that they would be willing to sign confidentiality agreements. The Trustees agreed to the attendance of PHA's representatives at this meeting, but indicated that they may seek counsel's opinion about the potential impact of such participation by PHA.

- **Trustee goal for ESA process.** On behalf of the Trustees, Jessica White stated their goal for the process of conducting the ESA to be a "reasonably conservative injury evaluation" that avoids putting a burdensome requirement for scientific certainty on any party and balances the cost of restoration against the cost of reducing uncertainty. The Trustees agreed that the current process of frequent communication (in the form of technical meetings and conference calls) and documentation of agreements is an acceptable approach for cooperatively conducting the ESA.
- **Distribution of ESA analyses and information.** Information and analyses developed or produced by the Trustees and the Companies during the course of the ESA will be distributed to all of the attendees of this meeting except the PHA representatives and Johanna Gregory, who is participating as part of her training. The Companies will send information directly to the Trustee team.
- **Sediment data set review and revision.** The characteristics of the sediment data set distributed on October 13, 2006 were reviewed and discussed. A revised data set will be distributed that will include data for all chemicals of concern (COCs) (at the Trustees' requests). The revised data set will also include TOC, grain size, other information on physical conditions, and some assessment polygon characteristics (e.g., size and area of benthic habitat); data will be removed for stations that are not in the assessment polygons. Preliminary review of the data has identified some potential issues, specifically including ambiguous station identifiers, different coordinates for some stations, and data marked as unvalidated. These issues will be further investigated, documented, and resolved if possible, and the results will be distributed. The data set may be further augmented by the addition of benthic macroinvertebrate community data and toxicity test results, if and when these data are used for ESA analyses. Use of a web-based tool to provide secure access to authoritative versions of the data set and ancillary documentation will be evaluated. Data will be distributed in both Microsoft Access and Microsoft Excel formats.
- **Definition of baseline service level.** Potential stressors of the biotic community in Greens Bayou were reviewed. There was a consensus among the Trustees and Companies that baseline service levels in the Bayou are reduced by stressors other

than chemicals. The Trustees stated that adjustment of the baseline service level to account for the effects of non-chemical stressors in the Bayou might not be relevant if the restoration project occurs in an area subject to the same stressors. The Trustees agreed that restoration areas would not be subject, however, to the effects of barge grounding and tugboat traffic, and that some adjustment to the baseline service level is appropriate to account for these non-chemical effects. Neither the Trustees nor the Companies had information on other factors that might lead to spatial variations in baseline service level throughout the Bayou.

- **Relating service loss to chemical concentrations.** Judi Durda presented a review of toxicity studies for DDT-spiked sediment, toxicity results from the Montrose site, and amphipod toxicity results from Greens Bayou, which all show DDT toxicity thresholds in the range of 1-10 parts per million (ppm). The Trustees requested copies of the recent published literature on toxicity of DDT-spiked sediment. The parties also agreed that the PCL of 157 parts per billion (ppb) is a risk threshold for the ESA, and that exceeding that level would be associated with some level of service loss. However, the amount of service loss associated with exceeding the PCL is not yet determined and ultimately will be set after further analysis. Ron Gouguet acknowledged that established sediment quality guideline values (SQGs) have limited predictability for DDT, and he is not opposed to the indications that toxicity is primarliy observed at higher levels in DDT-only exposures. He suggested that using SQGs for natural resource damage assessments (NRDA), however, provides settlement certainty if not scientific certainty. Ron Gouguet listed the following methods that could be used to derive service loss estimates from toxicity data: 1) set benthic service loss equal to level of response observed in the sediment toxicity tests used to derive the SQG; 2) set benthic service loss equal to pMax scores from logistic regressions of national toxicity:chemistry data sets; 3) use site-specific data to update or replace SQGs [and re-compute pMax scores]; and 4) predict endpoints from pMax scores following a method published by Jay Field of NOAA (and co-authors). He noted that no matter what method is used, ultimately either an agreement must be reached between the Companies and the Trustees or more work would need to be done. After discussion, there was agreement that applying the logistic regression modeling approach to DDT-specific sites could be useful and should be investigated. The Trustees and Companies also agreed to each develop direct estimates of service losses in relation to DDx concentrations using the published spiked sediment bioassay data and other information presented at the meeting, to see if agreement can be reached using this method of direct estimation. The Trustees stated that they also would like to consider other approaches, such as using pMax values for all chemicals, and evaluating the approaches used at other DDT sites.

- **Sediment accumulation and benthic community recovery rates.** Relative service levels at post-remedial sediment depths greater than original grade were discussed. The Trustees indicated that the original grade should represent 100 percent of the baseline service level, and that service levels should decrease as the post-remedial depth increases. Neither the Trustees nor Companies had immediate suggestions regarding data or methods to relate water depth to service level. Richard Seiler suggested that dredged areas adjacent to the channel would never recover to their original grade. The Trustees and Companies agreed to ask Don Hayes to provide insights into the question of recovery to grade throughout Greens Bayou, as well as how sedimentation varies throughout the Bayou and how the slopes and locations of dredged areas affect sediment accumulation.
- **Chemical degradation rates.** The Trustees and Companies agreed that the scientific literature data is the only feasible source of useful information on DDx degradation rates.
- **Benthic macroinvertebrate recolonization rates.** The Trustees and Companies agreed that recolonization of suitable habitat in Gulf Coast estuaries by benthic macroinvertebrates may begin within as soon as a single season.
- **Effects of uncertain side slopes on post-remedial conditions.** There is some uncertainty about final side slopes in the dredged area, and this results in uncertainties about potential recovery times. The Trustees and Companies agreed to review the 90% (final) design documents during the December 2006 meeting and thereafter take a 'reasonably conservative' approach to dealing with uncertainty associated with implementation.
- **Water column impacts during dredging.** The Trustees agreed to review Appendix J of the November 2005 comment response document, which contains an analysis of water column impacts during dredging. This document had been provided to Jessica White via email on October 16.
- **Habitat area affected by CDF construction.** The Companies requested further information about the derivation of TPWD's estimate of 14 acres of potentially impacted wetland habitat in the area of the CDF. The Trustees (Andy Tirpak) provided figures and text that summarized TPWD's wetland habitat delineation. The wetland habitat area shown on the figures consisted of only 6.52 acres (4.35 acres of marsh and 2.17 acres of flatwoods), and the Trustees agreed to obtain further information and present it during the November 7 conference call.
- **Preliminary identification of potential restoration projects.** The Trustees (Don Pitts and Andy Tirpak) described the ongoing restoration project at the Baytown Nature Center, and identified some parcels within the project that could be included for additional restoration actions. The master plan for the Baytown Nature Center will be completed soon, and will identify specifics of possible additional restoration areas. Andy Tirpak emphasized that feasible restoration

projects are dependent on timing. The opportunities available will differ depending on when settlement is reached and on the completion of the final restoration plan.

INFORMATION EXCHANGED

The following information in electronic form was provided by the Trustees during the meeting:

- Documents and figures describing the results of TPWD's assessment of habitat in the area of CDF construction.
- Documents describing relative habitat service levels for different habitat types developed by state and federal Trustees, and the habitat weighting approach used for Lavaca Bay.

ACTION ITEMS

The following action items were identified during the meeting. These action items should be addressed before the upcoming conference call on November 7th, unless otherwise noted.

- Distribute revised database, including all COCs and polygon areas—**Companies (Integral Consulting)**
- Further investigate and resolve some possible issues with the data set, including ambiguous station identifiers, differing coordinates for the same station identifier, and presence of unvalidated data. Results or resolutions will be documented and distributed as they are completed—**Companies (Integral Consulting)**
- Evaluate the use of a web-based system for making current and authoritative versions of data sets and possibly other documents available to all participants in the ESA—**Companies (Integral Consulting)**
- Distribute scientific literature on toxicity test results from spiked sediment bioassays for DDT—**Companies (Judi Durda)**
- Evaluate or propose relationships between DDx concentrations in sediment and service levels, using the methods suggested by Ron Gouguet. Results to be presented during the conference call on November 7th.—**Trustees and Companies**
- Evaluate whether COCs other than DDx are considered to be contributing substantially to service loss—**Trustees**
- Determine how the estimate of 14 acres of affected wetland habitat at the CDF location was developed, and possibly arrange to have Andrew Sipocz participate in the November 7 conference call—**Trustees**

- Determine whether Don Hayes will be available for the December 2006 meeting, to provide a description of sediment accumulation in Greens Bayou—**Companies (Integral Consulting)**
- Arrange for an update on the 90% (final) remedial design at the December meeting—**Companies (Integral Consulting).**

ATTACHMENT 1
LIST OF ATTENDEES

GBB ESA MEETING

OCTOBER 17, 2006

NAME	ORGANIZATION	Phone	EMAIL
1) JUDI DUROA	Integral Consulting	410.573.1982	jduroa@integral-corp.com
2) France Webster	Malcolm Pirnie	713 960-7724	fwebster@pirnie.com
3) FRANK RIGSBY	ISK MAGNETICS	713-393-3770	rigsbyf@iskamericas.com
4) MARTY Fontenot	GB BIOSCIENCES	713-450-8075	marty.fontenot@syngenta.com
5) Richard Seiler	TCEQ	512-239-2523	rseiler@tceq.state.tx.us
6) Jessica White	NOAA	214-665-2217	jessica.white@noaa.gov
7) Tammy Ash	USFWS	361-994-9005	tammy-ash@fws.gov
8) Andy Turpak	TPWD	281-534-0137	andy.turpak@tpwd.state.tx.us
9) Don Pitts	TPWD	512-912-7154	don.pitts@tpwd.state.tx.us
10) Johanna Gregory	TPWD	512-912-7103	johanna.gregory@tpwd.state.tx.us
11) Tim Iannuzzi	BBL on behalf of Tierra/OCC	410-295-1205 Ext. 13	tiannuzzi@bbl-inc.com
12) Wendell Mears	Gahagan & Bryant Assoc for Port & Houston	832-518-2112	wdmears@gba-inc.com
13) Dana Blume	Port	713 670 2805	dblume@poha.com
14) Dreas Nielsen	INTEGRAL	206-957-0312	dnielsen@integral-corp.com

ATTACHMENT 2
DRAFT AGENDA

Draft Agenda
Greens Bay Bayou Ecological Service Analysis

October 17, 2006

8:30 – 9:00
Introductions, meeting objectives, agenda review

9:00 – 10:00
Data base overview
- Data subset for ESA—distribution and questions
- Data selection criteria

Estimation of historical conditions at each sediment polygon
- Extrapolation or interpolation of core data

10:00 – 10:15
Break

10:15 – 11:00
Establishing baseline habitat value (review of Trustee approaches/examples)
Variations in baseline habitat value throughout Bayou

11:00 – 12:30
Methods for relating service losses to chemical concentrations
- Dose response from DDT-only toxicity tests
- Dose response of fraction of samples with effects in BEDS database
- Logistic regression model
- ERM quotients
- Others

12:30 – 1:30
Lunch

1:30 – 2:30
Methods for evaluating benthic macroinvertebrate recovery rates
- Sediment accumulation
- Chemical degradation
- Benthic recolonization
- Side slope and capping variations

2:30 – 3:00
Water column impacts during dredging

GBB ESA_10-17_Agenda_v1.doc

Draft Agenda
Greens Bay Bayou Ecological Service Analysis

October 17, 2006

3:00 – 4:00

CDF footprint and potential injury

- Types and sizes of habitat
- Services
- Evaluation approach

4:00 – 4:30

Preliminary identification of restoration projects (Trustees)

4:30 – 5:00

Summarization of action items
Planning for next meeting

GBB ESA_10-17_Agenda_v1.doc