



Earth Venture Instrument – 1 PEA Technical, Management, and Cost Evaluation Overview

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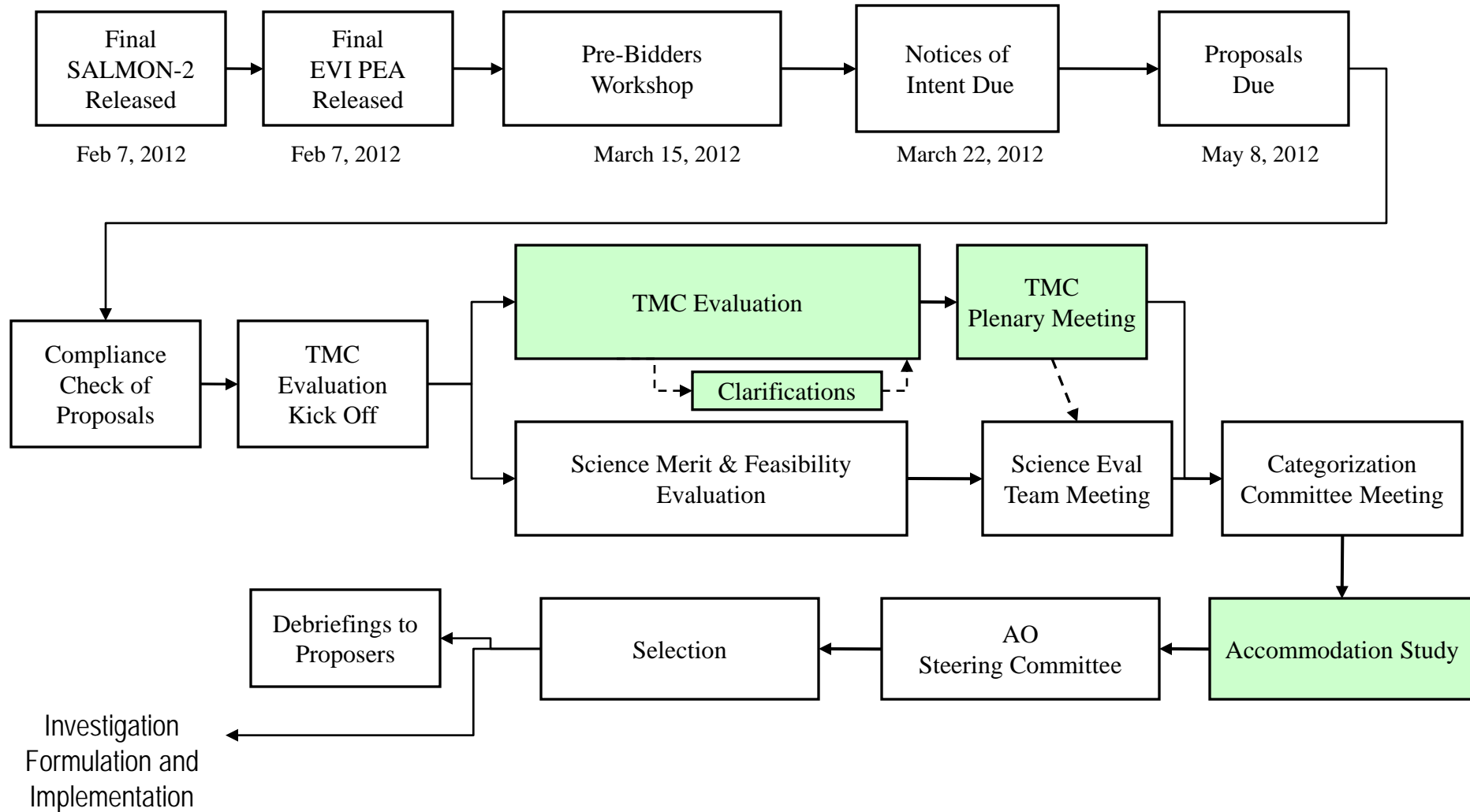
Introduction

Purpose of this presentation

- Present to the community the Earth Venture Instrument-1 (EVI-1) PEA overview of the “TMC Feasibility of the Investigation Implementation, including Cost Risk” criteria that are assessed by the Technical, Management and Cost (TMC) panel.
- Instrument considerations for Pre-Phase A proposals.
- To collect comments and answer questions.
- Important Note: This PEA is to the SALMON-2 AO which is based on SMD’s Standard PI-Led Mission AO.
- **All proposers must read the final EVI PEA & the final SALMON-2 AO carefully, and all proposals must comply with the requirements and constraints**



Proposal Evaluation Flow





EVI-1 Document Structure Overview

- A second Stand Alone Missions of Opportunity Notice (SALMON-2) is has been released.
- The EVI solicitation is the Program Element Appendix (PEA J) to the SALMON-2 AO.
- The EVI PEA will state EVI-unique requirements and define which SALMON-2 policies are not applicable to EVI. (EVI PEA 4.7)
- Proposals will be evaluated according to the evaluation criteria set forth in Section 7.2 of the SALMON-2 AO. (EVI PEA 6.1)
- Additional Evaluation Factors are identified in EVI PEA 6.1



EVI Solicitation Highlights

- The EVI solicitation includes the SALMON-2 and PEA-J which have descriptive text and numbered requirements.
- There are 94 Requirements in the body of SALMON-2
 - Example: Requirement 76
- There are 71 Requirements in the Appendix B of SALMON-2 and
 - Example: B-5
- There are 23 Requirements in the PEA-J
 - Example: J-6



EVI Solicitation Highlights

- SALMON-2 AO Body
 - Section 1 Description of Opportunity
 - Section 2 AO Objectives
 - **Section 3 Proposal Opportunity Period (Requirement 1-2)**
 - Section 4 Policies Applicable to this AO
 - **Section 5 Requirements and Constraints (Requirement 3-88)**
 - **Section 6 Proposal Submission Information (Requirement 89-94)**
 - Section 7 Proposal Evaluation, Selection, and Implementation
 - Section 8 Conclusion



EVI Solicitation Highlights

- SALMON-2 Appendices
 - Appendix A General Instruction and Provisions from NASA FAR Supplement, Part 1872-705-1
 - **Appendix B Requirements for Proposal Preparation (Requirements B-1 - B-71)**
 - Appendix C Glossary of Term and Abbreviations
 - Appendix D Program Library
 - Appendix E Requirements for Subsequent Phases
 - **Appendix F Compliance Checklist**
 - **Appendix G Requirements Crosswalk**
 - Appendix H Certifications



EVI Solicitation Highlights

- EVI PEA J
 - Section 1 Background
 - Section 2 Science and Program Objectives
 - Section 3 Proposal Opportunity Period and Schedule
 - ***Section 4 Requirements and Constraints***
 - ***Requirement J-1 - J-20***
 - **Section 5 Proposal Preparation and Submission**
 - **Requirements J-21 - J-23**
 - Section 6 Proposal Evaluation, Selection, and Implementation



EVI Evaluation Criteria

Technical Management and Cost

- 7.2.4 TMC Feasibility of the Investigation Implementation, including Cost Risk

The technical and management approaches of all submitted investigations will be evaluated to assess the likelihood that they can be successfully implemented as proposed, including an assessment of the likelihood of their completion within the proposed cost and schedule. The factors for feasibility of investigation implementation include the following, as applicable for the investigation being proposed:

- Factor C-1. Adequacy and robustness of the instrument implementation plan.
- Factor C-2. Adequacy and robustness of the mission design and plan for mission operations.
- Factor C-3. Adequacy and robustness of the flight systems.
- Factor C-4. Adequacy and robustness of the management approach and schedule, including the capability of the management team.
- Factor C-5. Adequacy and robustness of the cost plan, including cost feasibility and cost risk.



Clarifications

- Proposers should be aware that, during the evaluation and selection process, NASA may request clarification of specific points in a proposal; if so, such a request from NASA and the proposer's response must be in writing.
- In particular, before finalizing the evaluation of the feasibility of the mission implementation (see Section 7.2.4), NASA will request clarification on specific, potential major weaknesses in the feasibility of mission implementation that have been identified in the proposal.
- NASA will request clarification in a uniform manner from all proposers.
- The ability of proposers to provide clarification to NASA is extremely limited, as NASA does not intend to enter into discussions with proposers. A typical limited response is to direct NASA's attention to pertinent parts of the proposal without providing further elaboration. (7.1.1 SALMON-2)
- No clarifications will be requested concerning findings from evaluation of the classified appendix regarding heritage. (SALMON-2 5.10.3)



TMC Evaluation Ratings

- The third criterion, TMC feasibility of the proposed investigation, including cost risk, will be reported as Low Risk, Medium Risk, or High Risk.
- **Low Risk** There are no problems evident in the proposal that cannot be normally solved within the time and cost proposed. Problems are not of sufficient magnitude to doubt the Proposer's capability to accomplish the investigation well within the available resources.
- **Medium Risk** Problems have been identified, but are considered within the proposal team's capabilities to correct within available resources with good management and application of effective engineering resources. Mission design may be complex and resources tight.
- **High Risk** One or more problems are of sufficient magnitude and complexity as to be deemed unsolvable within the available resources.



Accommodation Study

- The review panel evaluating the third evaluation criterion, technical, management, and cost (TMC) feasibility of the proposed investigation, including cost risk, will also assess the following factor:
 - The extent to which the proposed instrument is compatible with potential satellite platform interfaces and operations.
- This assessment will not contribute to the TMC feasibility risk rating, but will be provided as comments to NASA.
- After the evaluation, but prior to the selection decision, NASA will perform an accommodation study of selectable proposals to assess the extent to which the proposed instrument is compatible with potential satellite platform interfaces and operations. (*EVI PEA 6.1*)



Cost Requirements and Constraints

EVI PEA 4.4.1

- Requirement J-7. Proposals shall be for complete investigations including Phases A-E.
- Requirement J-8. The proposed PI-Managed Mission Cost shall be no more than \$90M in FY 2014 dollars. The PI-Managed Mission Cost excludes the integration of the instrument to the selected platform, but includes proposed science team and key management and engineering staff activity in Phase D. Proposals shall assume two years for Phase D.
- Requirement J-9. Proposals shall include detailed plans and budgets for Phases A-F for costs that are within the PI-Managed Mission Cost (see Table 1).
- Requirement J-10. Proposals shall include integration plans and planning budgets that occur during Phase D, with the assumption that this phase will take two years. With the exception of the PI-Managed science and engineering cost for Phase D identified in Requirement J-8, these costs are outside the PI-Managed Mission Cost.
- Requirement J-11. Proposals shall include plans and planning budgets for the required costs to minimally support the project and science during a potential gap between instrument delivery (end of Phase C) and the start of integration with the spacecraft (start of Phase D). These budgets should be on a per year basis for up to four years. These costs are outside the PI-Managed Mission Cost.



Schedule Requirements and Constraints

- EVI PEA 4.4.2
- Each selected investigation under the EVI solicitation will be expected to deliver an instrument that can be integrated onto a selected platform by September 30, 2017. Nominally, this will span the years of FY 2013-FY 2017. This is expected to cover development Phases A through C. Proposals that include a more rapid instrument development timeline may be selected, provided the required budget phasing can be accommodated by NASA.
- It is expected that once an appropriate platform is determined, preferably before the Preliminary Design Review, minor changes to the selected instrument will be required. Appropriate schedule margin should be planned to account for such changes.
- Requirement J-12. Proposals shall include a development schedule that delivers an instrument for integration onto the selected platform no later than September 30, 2017.



Classified Proposal Appendix regarding Heritage

- The use of a classified appendix regarding heritage is being permitted by SMD for this AO as a trial.
- NASA will endeavor to use the information in the classified appendix regarding heritage to better understand the proposed investigation.
- However, NASA cannot guarantee that this process will be fully successful in informing the review panel of the impact of a classified appendix regarding heritage which they have not read. (SALMON-2 5.10.3)



Eligibility to Propose

- Section 4.1 of the EVI-1 PEA J: Eligibility to Propose
- Refer to Section 4.2 of the SALMON-2 AO for the rules on participation policy. For this particular PEA, NASA will place full or partial limitations (as described in the SALMON-2 AO) on organizations that will be involved in the evaluation process. **Earth Resources Technology Inc. (ERT) is subject to the “Full Limitation” as described in Section 4.2.1 of the SALMON-2 AO. There is no limitation on the Aerospace Corporation for EVI-1.**



SALMON-2 Section 7.2.4 Cost Factor C-5

- Factor C-5 Adequacy and robustness of the cost plan, including cost feasibility and cost risk. This factor includes proposal elements such as cost, cost risk, cost realism, and cost completeness including assessment of the **basis of estimate**, the adequacy of the approach, the methods and rationale used to develop the estimated cost, the discussion of cost risks, the allocation of cost reserves by phase, and the team's understanding of the scope of work (covering all elements of the investigation, including contributions). Proposals will be evaluated for the adequacy of the cost reserves and whether proposals with inadequate cost reserves demonstrate a thorough understanding of the cost risks. This factor also includes an assessment of the proposed cost relative to estimates generated using parametric models and analogies. Also evaluated under this factor are the proposed cost management tools to be used on the project.



Proposal Structure and Page Limits		
Section	Contents	Page Limits
A	Graphic Cover Page	1
	Export Controlled Material statement	0.5
	Optional Restriction on Use statement	0.5
	PI Commitment	1
B	Fact Sheet	2
C	Table of Contents	None
D	Science, Exploration, or Technology Investigation	20
E	Experiment Implementation	
F	Investigation or Mission Implementation	15
G	Schedule Foldout	→ (none on Schedule
	Management	Foldout(s))
→ H	Cost and Cost Estimating Methodology	8
	Cost Table B3	→ (none on Table B3)
I	Acknowledgement of E/PO requirements Optional Student Collaboration plan	1 + 2 for optional student collaboration
J	Appendices (no others permitted):	
J.1	Table of Proposal Participants	None
J.2	Letters of Commitment	None
J.3	Resumes	None
J.4	Summary of Proposed Program Cooperative Contributions	None
J.5	Draft International Participation Plan	None
	Discussion on Compliance with U.S. Export Laws and Regulations	
J.6	Compliance with Procurement Regulations by NASA PI Proposals	None
J.7	Discussion of End-of-Mission Spacecraft Disposal Requirements	None
→ J.8	Master Equipment List (MEL)	→ None
→ J.9	Heritage	→ None
J.10	List of Abbreviations and Acronyms	None
J.11	List of References (optional)	None



Proposal Section H - Cost

- Section H of the Proposal is limited to 8 pages plus Table B3 (no limit on Table)
- Requirement B-50. This section shall include the estimated cost of the proposed investigation. The estimated cost shall encompass all proposed activities, including all applicable mission phases, flight systems, ground systems, contributions, any other AO-specific activities, and all cost reserves. These costs shall be consistent with the policies and requirements described in Section 4 and Section 5 of this AO.
- Requirement B-51. This section shall include a description of the methodologies used to develop the estimate. See next page
- Requirement B-52. This section shall include a discussion of cost risks.
- Requirement B-53. This section shall provide a foldout cost table, Table B3, which will not be counted against the page limit.
- Requirement B-54. This section shall include a statement as to whether the proposer's approved forward pricing rates were used or NASA's inflation/deflation indices were used. If the proposer's approved forward pricing rates were used, this section shall include an explanation for how the forward pricing rates were derived.



SALMON-2 Appendix B

- Requirement B-51. This section shall include a description of the methodologies used to develop the estimate.
 - The cost estimating methodology discussion in this section shall provide an overview of the cost estimate development process.
 - Any additional cost estimates or other validation efforts shall be described, the results presented, and any significant discrepancies discussed.
 - The rationale for the proposed cost reserve levels shall be presented.
 - Proposers shall provide additional Basis of Estimate data to assist the validation of their cost estimates.
 - Examples of useful Basis of Estimate data include cost comparisons to analogous items/missions, vendor quotes, and parametric model results.



Proposal Appendix J.8

- Heritage Appendix J.8
- Requirement B-70. This section shall discuss each element of any heritage from which the proposed investigation derives substantial benefit, including heritage from spacecraft subsystems, instruments, ground systems, flight and ground software, test set ups, simulations, analyses, etc. This discussion shall be at an appropriate level of granularity (e.g., component, assembly, subsystem) to clearly separate the heritage element from other elements of the design. The discussion of each element shall include:
 - a concise description of the design heritage claimed;
 - the anticipated benefits to the proposed investigation;
 - a brief rationale supporting the claim that the benefits of heritage will be achieved; and
 - for any proposed elements with substantial design heritage, **a comparison of the cost of the heritage items to the proposed cost.**



Proposal Appendix J.9

- Master Equipment List Appendix J.9
- Requirement B-69. This section shall include a Master Equipment List (MEL) summarizing all flight element subsystem components and individual instrument element components to support validation of proposed mass estimates, design heritage, and cost. **A template for this MEL is included as Table B5.**
 - For each component, current best estimates (CBE) and contingency for mass and power, number of flight units required, and some description of the heritage basis must be provided. Power values should represent nominal steady-state operational power requirements. Information to be provided includes identification of planned spares and prototypes, required deliveries for simulators and testing, contingency allocations for individual components, and other component description/characteristics. Certain items (like electronic boxes and solar arrays) should include additional details, as applicable, to identify and separate individual elements.



Basis of Estimate (BOE) Appendix C

- Basis of Estimate (BOE) — A record of the procedures, ground rules and assumptions, data, environment, and events that underlie a cost estimate's development or update. Good documentation of the BOE supports the cost estimate's credibility.



Notice of Intent (NOI) Due March 22, 2012

- Logon to NSPIRES: Current NOIs: Create NOI: Select EVI-1:NOI Title:
- NOI Details: Summary: Businesses Data: Budget: Program Specific Data: Proposal Team

The screenshot shows the NSPIRES (NASA Solicitation and Proposal Integrated Review and Evaluation System) web interface. The header includes the NASA logo and the system name. A navigation menu at the top lists 'Account Mgmt', 'Organization Mgmt', 'Proposals', and 'Reviews'. On the left, a sidebar menu is expanded to 'Proposals', with sub-items for 'Current Proposals/NOIs' and 'Submitted Proposals/NOIs'. Below this, there are sections for 'View Proposal' (with 'Proposal Information' selected), 'Cover Page Elements' (with 'Proposal Summary', 'Business Data', 'Budget', 'Program Specific Data', and 'Proposal Team' listed), and 'View NOI'. The main content area displays 'View NOI' for a test NOI by Cindy Daniels. It features a 'Program Specific Data' section with an 'Edit' button and a text area. Below this is a 'Program Specific Data Summary' section with four numbered items: 1. Short Title (with a text input field), 2. Organizational lead information (with a text area), 3. Classified heritage appendix (with radio buttons for Yes, No, and Not sure), and 4. Instrument description (with a text area).



Reference Documents

- The SOMA office develops white paper and lessons learned documents related to TMC evaluations of SMD missions and instrument proposals.
- These documents are available at <http://soma.larc.nasa.gov/>
 - ***Instrument Considerations for Pre-Phase A Proposals***
 - Based on a review of past SMD instrument evaluations
 - Looked at what information was missing from instrument proposals that led to weaknesses
 - Provides guidelines on what information is needed for instrument proposals.
 - This is not specific to the EVI PEA but may be helpful to proposers to consider.



Questions

- Questions or comments must be sent to Ken Jucks
- kenneth.w.jucks@nasa.gov (subject line to read " EVI-1 PEA")



Backup Slides

- Requirement B-53. This section shall provide a foldout cost table, Table B3, which will not be counted against the page limit. Table B3 shall identify the proposed cost required in each mission phase and in each fiscal year; the costs shall be in real year dollars (RY\$). The top portion of Table B3 shall contain cost data relevant to the PI-Managed Mission Cost. The lower portion shall contain cost data for contributions. The rows in Table B3 shall be the NASA standard WBS elements, as defined in NPR 7120.5D NID. The WBS must provide adequate insight into each individual instrument. The columns in Table B3 shall be grouped and subtotaled by mission phase and shall be labeled with the appropriate fiscal years. Fiscal years that span more than one mission phase shall be split into two columns by mission phase. The final columns total is in real year dollars (RY\$). Proposers shall use their own approved forward pricing rates. For organizations that are without approved forward pricing rates, proposers may use the most recent NASA inflation/deflation indices available at <http://www.nasa.gov/offices/ipce/CA.html>. The NASA FY 2011 new start inflation index for use in FY 2012 is provided in Table B4.



Cost Table B3

Excel Template for Table B3 is in EVI Library at
http://essp.larc.nasa.gov/EV-I/evi_programlibrary.html

Total Mission Cost Funding Profile Template
 FY costs in Real Year Dollars (RYS), Totals in Real Year Dollars (RYS) and Fiscal Year 2014 Dollars (FY14\$)

WBS#	WBS Element	Phase A			Phase B			Phase C				Phase D				Phase E				RYS		FY14\$			
		FY2012	FY2013	Total	FY2013	FY2014	Total	FY2014	FY2015	FY2016	FY2017	Total	FY2014	FY2015	FY2016	FY2017	Total	FY2017	FY2018	FY2019	FY...	Total	Total	Total	
01	Project Management																								
1.1	Key Management and Eng staff during Phase D																								
02	Systems Engineering																								
2.1	Key Management and Eng staff during Phase D																								
03	Safety & Mission Assurance																								
04	Science / Technology																								
	Breakout pre-launch science from technology development activities																								
	Science Team Activity within Phase D																								
05	Payload(s) List each instrument separately																								
5.Y	Key Management and Eng staff during Phase D																								
5.1	Instrument 1																								
5.1.1	Instrument 1 Component A																								
5.1.2	Instrument 1 Component B																								
5.1.n	Instrument 1 Component n																								
5.2	Instrument 2																								
5.2.1	Instrument 2 Component A																								
5.2.2	Instrument 2 Component B																								
5.2.n	Instrument 2 Component n																								
5.X	Instrument X																								
5.X.1	Instrument X Component A																								
5.X.2	Instrument X Component B																								
5.X.n	Instrument X Component n																								
07	Mission Operations																								
08	Launch Vehicle / Services																								
09	Ground System(s)																								
	Breakout non-standard cost, e.g., coordinating ground stations																								
10	Systems Integration & Testing																								
11	Education and Public Outreach																								
12	SC cost above 1% of the PI-Managed Mission Cost Reserves																								
	Breakout unencumbered and encumbered reserves																								
	PI-Managed Mission Cost																								
	Investigation Costs during a potential gap between completion of instrument and start of integration (planning budget up to 4 years, on a per-year basis)																								
	Integration and test to selected platform (within Phase D) (planning budget nominally 2 years)																								
	Student Collaboration (SC) Optional Up to 1% of the PI-Managed Mission Cost																								
	Outside PI Managed Costs - NASA Funded																								
	Contributions																								
	List by organization and WBS element																								
	Total Contributions																								
	Total Mission Cost																								

Label columns with actual fiscal years. Add or remove FY columns as necessary.

