

Overview

This revised budget justification for the award "Gemini in the Era of MMA: High Image Quality and Rapid Response" describes the request for approval for fiscal years 2019 through 2024 (10/1/2018 – 9/31/2024). The narrative describes key costs as presented on NSF FastLane Form 1030.

AURA Gemini requests approval based on 2 CFR Subpart D Title 2 Part 200.308. The proposed move exceeds the threshold as described in the above citation. AURA Gemini requests to move funds from line G-5 "Other Direct Costs, Contracted Services" to Line A, B, and C " "Personnel and Fringe Benefits" to cover costs of CSA 1539773 O&M staff working on projects funded by CSA1839225 from the CSA 1839225 funds.

The costs listed in G-5 associated with the up-scope option of the ASM has been reduced to support the necessary FTEs in previously planned in-kind contributions from CSA 1539773. O&M staff paid from O&M CSA funds was deemed unallowable under CSA 1839225. Funds for relocation and training for new hires were added as they were overlooked in the original approved budget. See page 3 for comparative budget information.

Line B2 - Other Professionals: 6.838.763

Personnel costs are estimated on the basis of Job Descriptions representing the skills and knowledge required by the projects in this budget request: Project Manager, Project Support Associate, Electronics Engineer, Mechanical Engineer, Systems Engineer, Software Engineer, Optical Engineer, Detector Engineer, AO Scientist and PIO Coordinator using averages of current salaries for staff in comparable positions within Gemini Observatory.

Fringe Benefits: 3,841,333

The rate of FY 2019 rate of 56.17% is applied to 83% of the base pay - the "work hours" of the salary of personnel noted in the section above.

Table 2 – FY19 Proposed Rates						
Fringe Benefit Rates						
Description	Rate	Base				
U.S. Dollar (\$) Paid Employees	56.17%	Salaries and wages				
Chilean Employees	40.23%	Salaries and wages				
Temporary Employees	16.22%	Salaries and wages				

Line D - Capital Equipment: 3,305,230

Permanent equipment includes adaptive optics, real time computer and components, mechanical, electronics and facilities equipment. The capital items in the proposal are anticipated to be "custom-made." Most equipment, estimates were based on historical costs associated with similar purchased equipment, with allowance made for changes in design and technology. In some circumstances components that are "COTS" (Commercial off-theshelf) costs were estimated from vendor price lists.

Line E1 - Domestic Travel

Travel costs are estimated based on historical costs for similarly scaled Gemini Projects.

Description	Total Cost
Standard functional travel	401,946

Line E2 – Foreign Travel

Foreign travel costing assumptions are described in detail in the CEP.

Description	Total Cost
Standard functional travel	541,216
Total Travel	943,161

Line G1 - Materials and Supplies: 191,314

See the CEP for an explanation of materials & supplies.

Line G2 – Publication Costs: 0

Line G5 - G7 - Other: 9,350,480

Manufacturing of project components may be obtained through a procurement process resulting in a sub contract. See the CEP for details.

Line I – Indirect Costs: 1,479,837

Standard AURA-Gemini indirect costs are explained in the CEP.

Line J - Total Direct and Indirect Costs: 25,974,118

GEMMA - SUMMARY BUDGET - ALL PROJECTS							
AT 5/23/19	FYE19	FYE20	FYE21	FYE22	FYE23	FYE24	TOTAL
Senior Personnel	0	0	0	0	0	0	0
Other Personnel	1,066,404	1,873,191	1,737,063	1,127,480	610,221	424,404	6,838,763
Total Salaries and Wages	1,066,404	1,873,191	1,737,063	1,127,480	610,221	424,404	6,838,763
Fringe Benefits	598,999	1,052,171	975,708	633,306	342,761	238,388	3,841,333
Total Salaries/Wages/Benefits	1,665,404	2,925,363	2,712,771	1,760,786	952,982	662,791	10,680,096
Equipment	0	0	156,160	2,768,430	380,640	0	3,305,230
Domestic Travel	104,041	93,101	70,053	48,589	46,766	39,395	401,946
Foreign Travel	101,875	160,140	96,087	52,075	48,636	82,404	541,216
Total Travel	205,916	253,241	166,140	100,664	95,402	121,799	943,161
Participant Support	0	0	0	0	0	0	0
Other Direct Costs: Materials and Supplies	28,177	38,560	35,576	16,592	60,714	11,694	191,314
Other Direct Costs: Publication/Documentation/Dissemination	0	0	0	0	0	0	0
Other Direct Costs: Consultant Services	12,000	0	12,000	0	0	0	24,000
Other Direct Costs: Computer Services	0	0	0	0	0	0	0
Other Direct Costs: Subawards	0	0	0	0	0	0	0
Other Direct Costs: Other	119,920	1,515,449	1,870,720	1,941,515	2,235,420	1,667,455	9,350,480
Total Other Direct Costs	160,098	1,554,010	1,918,297	1,958,108	2,296,134	1,679,148	9,565,794
Total Direct Costs	2,031,417	4,732,614	4,953,367	6,587,987	3,725,158	2,463,738	24,494,281
Indirect Costs - Calculated on Total Project in IDC Account	189,306	333,908	538,823	218,567	115,892	83,340	1,479,837
Total Direct and Indirect Costs	2,220,723	5,066,522	5,492,190	6,806,554	3,841,050	2,547,078	25,974,118
CSA Period of Performance Start:	10/1/18						
CSA Period of Performance End:	9/30/24						

CONTRACT, MTDC & BASIS FOR FEES							
AT 5/22/19							
CONTRACTS by Project	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	-Total Fiscal Years
GR2120000 GNAO/RTC	25,235	1,198,572	1,834,266	1,905,061	2,126,042	1,594,532	8,683,708
GR2150000 PIO, Publications, Education MMA	0	207,500	0	0	0	0	207,500
TOTAL CONTRACTS	25,235	1,406,072	1,834,266	1,905,061	2,126,042	1,594,532	8,891,208
MTDC ADJUSTMENT - Contract Pmts over \$25k per year	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	-Total Fiscal Years
GNAO/RTC Contracts -4contracts over 6 years @ \$25k each	(235)	(1,123,572)	(1,784,266)	(1,855,061)	(2,101,042)	(1,569,532)	(8,433,708)
PIO, Publications, Education MMA		(182,500)					(182,500)
Total MTDC Adjustment	(235)	(1,306,072)	(1,784,266)	(1,855,061)	(2,101,042)	(1,569,532)	(8,616,208)
Basis for Fees	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	-Total Fiscal Years
GR2120000 GNAO	25,000	75,000	50,000	50,000	25,000	25,000	250,000
GR2150000 PIO, Publications, Education MMA	0	25,000	0	0	0	0	25,000
Basis for Fees - Contracts	25,000	100,000	50,000	50,000	25,000	25,000	275,000

WBS 1.1 PMO Mgmt Account				22% Comp	lexity Factor	•		
May 23, 2019		FYE19	FYE20	FYE21	FYE22	FYE23	FYE24	TOTAL
Senior Personnel		0	() (0 0	0	0	0
Other Personnel		173,923	157,71	7 157,92	162,666	166,904	181,968	1,001,105
Total Salaries and Wages		173,923	157,71	7 157,92	3 162,666	166,904	181,968	1,001,105
Fringe Benefits		97,693	88,59	88,70	91,369	93,750	102,211	562,321
Total Salaries/Wages/Benefits		271,616	246,30	7 246,630	5 254,035	260,653	284,179	1,563,425
Equipment		0	() (0 0	0	0	0
Domestic Travel		34,331	41,04	5 21,229	21,882	36,740	24,944	180,171
Total Travel		64,382	79,45	3 29,679	34,252	65,598	68,066	341,435
Participant Support		0	() (0 0	0	0	0
Other Direct Costs: Materials and Supplies		24,389	25,69	7 25,713	8,229	5,051	4,834	93,914
Other Direct Costs: Publication/Documentation/Dissemination		0	() (0 0	0	0	0
Other Direct Costs: Consultant Services		0	(0 (0 0	0	0	0
Other Direct Costs: Computer Services		0	() (0 0	0	0	0
Other Direct Costs: Subawards		0	() (0 0	0	0	0
Other Direct Costs: Other		87,685	109,37	7 36,454	36,454	109,377	72,923	452,272
Total Other Direct Costs		112,075	135,07	5 62,16	3 44,684	114,429	77,757	546,186
Total Direct Costs	_	448,072	460,83	338,482	332,971	440,680	430,002	2,451,046
Indirect Costs - Calculated on Total Project in IDC Account	_	0	() () 0	0	0	0
Total Direct and Indirect Costs		448,072	460,83	338,482	332,971	440,680	430,002	2,451,046
Total Direct and Indirect Costs WBS 1.2 & 1.3 GNAD/RTC		448,072		338,48 2% Complex		440,680	430,002	2,451,046
	FYE19					440,680 FYE23	430,002 FYE24	2,451,046 TOTAL
WBS 1.2 & 1.3 GNAO/RTC	FYE19		2	2% Complex	ity Factor			
WBS 1.2 & 1.3 GNAO/RTC May 23, 2019		FY 0	2 E20	2% Complex FYE21	ity Factor	FYE23	FYE24	
WBS 1.2 & 1.3 GNAO/RTC May 23, 2019 Senior Personnel	653	FY 0 ,188 1,	2 E20 0	2% Complex FYE21 0	FYE22 0	FYE23 0	FYE24	TOTAL
WBS 1.2 & 1.3 GNAO/RTC May 23, 2019 Senior Personnel Other Personnel	653	FY 0 ,188 1, ,188 1,	2 E20 0 106,285	2% Complex FYE21 0 1,073,066	Ty Factor FYE22 0 826,643	FYE23 0 443,317	FYE24 0 242,436	TOTAL 0 4,344,935
WBS 1.2 & 1.3 GNAO/RTC May 23, 2019 Senior Personnel Other Personnel Total Salaries and Wages	653	FY 0 ,188 1, ,188 1, ,896	2 E20 0 106,285 106,285	2% Complex FYE21 0 1,073,066 1,073,066	FYE22 0 826,643 826,643	FYE23 0 443,317 443,317	FYE24 0 242,436 242,436	TOTAL 0 4,344,935 4,344,935
WBS 1.2 & 1.3 GNAO/RTC May 23, 2019 Senior Personnel Other Personnel Total Salaries and Wages Fringe Benefits	653 653 366	FY 0 ,188 1, ,188 1, ,896	2 E20 0 106,285 106,285 621,400	2% Complex FYE21 0 1,073,066 1,073,066 602,741	ty Factor FYE22 0 826,643 826,643 464,326	FYE23 0 443,317 443,317 249,011	FYE24 0 242,436 242,436 136,176 378,613 0	TOTAL 0 4,344,935 4,344,935 2,440,550 6,785,485 3,305,230
WBS 1.2 & 1.3 GNAO/RTC May 23, 2019 Senior Personnel Other Personnel Total Salaries and Wages Fringe Benefits Total Salaries/Wages/Benefits	653 653 366 1,020	FY 0 ,188 1, ,188 1, ,188 1, ,896 ,083 1,	2 E20 0 106,285 106,285 621,400 727,686 0 39,331	2% Complex FYE21 0 1,073,066 602,741 1,675,806	ty Factor FYE22 0 826,643 826,643 464,326 1,290,969	FYE23 0 443,317 443,317 249,011 692,329 380,640 10,026	FYE24 0 242,436 242,436 136,176 378,613 0 14,451	TOTAL 0 4,344,935 4,344,935 2,440,550 6,785,485
WBS 1.2 & 1.3 GNAO/RTC May 23, 2019 Senior Personnel Other Personnel Total Salaries and Wages Fringe Benefits Total Salaries/Wages/Benefits Equipment Domestic Travel Foreign Travel	653, 653, 366, 1,020, 24, 36,	FY 0 ,188 1, ,896 ,083 1, 0 ,143 ,247	2 E20 0 106,285 106,285 621,400 727,686 0 39,331 62,765	2% Complex FYE21 0 1,073,066 602,741 1,675,806 156,160 39,030 49,872	ity Factor FYE22 0 826,643 826,643 464,326 1,290,969 2,768,430 23,929 28,868	FYE23 0 443,317 443,317 249,011 692,329 380,640 10,026 19,778	FYE24 0 242,436 242,436 136,176 378,613 0 14,451 39,281	TOTAL 0 4,344,935 4,344,935 2,440,550 6,785,485 3,305,230 150,910 236,811
WBS 1.2 & 1.3 GNAO/RTC May 23, 2019 Senior Personnel Other Personnel Total Salaries and Wages Fringe Benefits Total Salaries/Wages/Benefits Equipment Domestic Travel	653, 653, 366, 1,020, 24, 36,	FY 0 ,188 1, ,896 ,083 1, 0 ,143 ,247	2 E20 0 106,285 106,285 621,400 727,686 0 39,331	2% Complex FYE21 0 1,073,066 602,741 1,675,806 156,160 39,030	ity Factor FYE22 0 826,643 826,643 464,326 1,290,969 2,768,430 23,929	FYE23 0 443,317 443,317 249,011 692,329 380,640 10,026	FYE24 0 242,436 242,436 136,176 378,613 0 14,451 39,281 53,732	TOTAL 0 4,344,935 4,344,935 2,440,550 6,785,485 3,305,230 150,910
WBS 1.2 & 1.3 GNAO/RTC May 23, 2019 Senior Personnel Other Personnel Total Salaries and Wages Fringe Benefits Total Salaries/Wages/Benefits Equipment Domestic Travel Foreign Travel Total Travel Participant Support	653, 653, 366, 1,020, 24, 36, 60,	FY 0 ,188 1, ,896 ,083 1, ,083 1, 0 ,143 ,247 ,390 0	2 E20 0 106,285 621,400 727,686 0 39,331 62,765 102,096 0	2% Complex FYE21 0 1,073,066 602,741 1,675,806 156,160 39,030 49,872 88,902 0 0	ity Factor FYE22 0 8226,543 826,643 464,326 1,290,969 2,768,430 23,929 28,868 52,797 0	FYE23 0 443,317 249,011 692,329 380,640 10,026 19,778 29,804 0	FYE24 0 242,436 242,436 136,176 378,613 0 14,451 39,281 53,732 0	TOTAL 0 4,344,935 2,440,550 6,785,485 3,305,230 150,910 236,811 387,721 0
WBS 1.2 & 1.3 GNAO/RTC May 23, 2019 Senior Personnel Other Personnel Total Salaries and Wages Fringe Benefits Total Salaries/Wages/Benefits Equipment Domestic Travel Foreign Travel Total Travel Participant Support Other Direct Costs: Materials and Supplies	653, 653, 366, 1,020, 24, 36, 60,	FY 0 ,188 1, ,896 ,083 1, ,083 1, 0 ,143 ,247 ,390 0 ,288	2 E20 0 106,285 621,400 727,686 0 39,331 62,765 102,096 0 6,863	2% Complex FYE21 0 1,073,066 602,741 1,675,806 156,160 39,030 49,872 88,902 0 6,863	ity Factor FYE22 0 8226,643 826,643 464,326 1,290,969 2,768,430 23,929 28,868 52,797 0 6,863	FYE23 0 443,317 249,011 692,329 380,640 10,026 19,778 29,804 0 55,663	FYE24 0 242,436 242,436 136,176 378,613 0 14,451 39,281 39,281 53,732 0 6,860	TOTAL 0 4,344,935 4,344,935 2,440,550 6,785,485 3,305,230 150,910 236,811
WBS 1.2 & 1.3 GNAO/RTC May 23, 2019 Senior Personnel Other Personnel Total Salaries and Wages Fringe Benefits Total Salaries/Wages/Benefits Equipment Domestic Travel Foreign Travel Total Travel Participant Support Other Direct Costs: Materials and Supplies Other Direct Costs: Publication/Documentation/Dissemination	653, 653, 366, 1,020, 24, 36, 60,	FY 0 ,188 1, ,188 1, ,188 1, ,2896 0 ,143 1, ,247 0 ,247 0 ,288 0	2 E20 0 106,285 621,400 727,686 0 39,331 62,765 102,096 0 6,863 0	2% Complex FYE21 0 1,073,066 602,741 1,675,806 156,160 39,030 49,872 88,902 0 6,863 0 0	ity Factor FYE22 0 826,643 826,643 464,326 1,290,969 2,768,430 23,929 28,868 52,797 0 6,863 0	FYE23 0 443,317 443,317 249,011 692,329 380,640 10,026 19,778 29,804 0 55,663 0	FYE24 0 242,436 136,176 378,613 0 14,451 39,281 53,732 0 6,860 0	TOTAL 0 4,344,935 2,440,550 6,785,485 3,305,230 150,910 236,811 387,721 0
WBS 1.2 & 1.3 GNAO/RTC May 23, 2019 Senior Personnel Other Personnel Total Salaries and Wages Fringe Benefits Total Salaries/Wages/Benefits Equipment Domestic Travel Foreign Travel Total Travel Participant Support Other Direct Costs: Materials and Supplies Other Direct Costs: Consultant Services	653, 653, 366, 1,020, 24, 36, 60,	PY 0 ,188 1, ,896 0 ,143 ,247 ,390 0 ,288 0 0 0	2 E20 0 106,285 106,285 621,400 727,686 0 39,331 62,765 102,096 0 6,863 0 0 0 0 0 0 0 0 0 0 0 0 0	2% Complex FYE21 0 1,073,066 602,741 1,675,806 156,160 39,030 49,872 88,902 0 6,863 0 0 6,863 0	ity Factor FYE22 0 826,643 826,643 464,326 1,290,969 2,768,430 23,929 28,868 52,797 0 6,863 0 0 0	FYE23 0 443,317 443,317 249,011 692,329 380,640 10,026 19,778 29,804 0 55,663 0 0	FYE24 0 242,436 242,436 136,176 378,613 0 14,451 39,281 53,732 0 6,860 0 0 0 0 0	TOTAL 0 4,344,935 2,440,550 6,785,485 3,305,230 150,910 236,811 387,721 0
WBS 1.2 & 1.3 GNAO/RTC May 23, 2019 Senior Personnel Other Personnel Total Salaries and Wages Fringe Benefits Total Salaries //Wages/Benefits Equipment Domestic Travel Foreign Travel Total Travel Participant Support Other Direct Costs: Materials and Supplies Other Direct Costs: Consultant Services Other Direct Costs: Computer Services	653, 653, 366, 1,020, 24, 36, 60,	FY 0 ,188 1, ,188 1, ,896 0 ,143 ,247 ,390 0 ,288 0 0 0 0 0 0 0 0 0	2 E20 0 106,285 106,285 621,400 727,686 0 39,331 62,765 102,096 0 6,863 0 6,863 0 0 0 0 0 0 0 0 0 0 0 0 0	2% Complex FYE21 0 1,073,066 602,741 1,675,806 156,160 39,030 49,872 88,902 0 6,863 0 6,863 0 0 0 0 0	ity Factor FYE22 0 826,643 826,643 464,326 1,290,969 2,768,430 23,929 28,868 52,797 0 6,863 0 0 0 0 0 0 0 0 0 0 0 0 0	FYE23 0 443,317 443,317 249,011 692,329 380,640 10,026 19,778 29,804 0 55,663 0 0 0 0 0 0	FYE24 0 242,436 136,176 378,613 0 14,451 39,281 53,732 0 6,860 0 0 0 0 0 0 0 0 0	TOTAL 0 4,344,935 2,440,550 6,785,485 3,305,230 150,910 236,811 387,721 0
WBS 1.2 & 1.3 GNAO/RTC May 23, 2019 Senior Personnel Other Personnel Total Salaries and Wages Fringe Benefits Total Salaries //Wages/Benefits Equipment Domestic Travel Foreign Travel Participant Support Other Direct Costs: Materials and Supplies Other Direct Costs: Consultant Services Other Direct Costs: Subawards	653 653 366 1,020 24 36 60 60 2,	PY 0 ,188 1, ,896 0 ,143 ,247 ,390 0 ,288 0 0 ,288 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 E20 0 106,285 521,400 727,686 0 39,331 62,765 102,096 0 6,863 0 6,863 0 0 0 0 0 0 0 0 0 0 0 0 0	2% Complex FYE21 0 1,073,066 602,741 1,675,806 156,160 39,030 49,872 88,902 0 6,863 0 0 6,863 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ity Factor FYE22 0 826,643 826,643 464,326 1,290,969 2,768,430 2,3,929 28,868 52,797 0 6,863 0 0 0 0 0 0 0 0 0 0 0 0 0	FYE23 0 443,317 443,317 249,011 692,329 380,640 10,026 19,778 29,804 0 555,663 0 0 0 0 0 0 0 0	FYE24 0 242,436 242,436 378,613 0 14,451 39,281 53,732 0 6,860 0 0 6,860 0 0 0 0 0	TOTAL 0 4,344,935 4,344,935 2,440,550 6,785,485 3,305,230 150,910 236,811 387,721 0 85,400 0 0 0 0 0 0 0 0 0 0 0 0
WBS 1.2 & 1.3 GNAO/RTC May 23, 2019 Senior Personnel Other Personnel Total Salaries and Wages Fringe Benefits Equipment Domestic Travel Foreign Travel Total Travel Participant Support Other Direct Costs: Materials and Supplies Other Direct Costs: Consultant Services Other Direct Costs: Subawards Other Direct Costs: Subawards	653 653 366 1,020 24 36 60 2, 2, 2, 2, 2, 2, 2, 2,	PY 0 ,188 1, ,896 0 ,143 0 ,143 ,247 ,247 ,247 ,248 0 0 0 0 0 0 0 0 0 0 1, 235 1,	2 E20 0 106,285 621,400 727,686 0 39,331 62,765 102,096 0 6,863 0 0 0 0 108,633 0 0 109,205 102,096 0 109,205 102,096 102,097 102,096 102,097 102,096 102,097 102,0	2% Complex FYE21 0 1,073,066 602,741 1,675,806 156,160 39,030 49,872 88,902 88,902 0 6,863 0 0 0 0 0 0 1,834,266	ity Factor FYE22 0 826,643 826,643 464,326 1,290,969 2,768,430 23,929 28,868 52,797 0 6,863 0 6,863 0 0 0 0 0 0 0 1,905,061	FYE23 0 443,317 249,011 692,329 380,640 10,026 19,778 29,804 0 55,663 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	FYE24 0 242,436 136,176 378,613 0 14,451 39,281 53,732 0 6,860 0 6,860 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	TOTAL 0 4,344,935 2,440,550 6,785,485 3,305,230 150,910 236,811 387,721 0 85,400 0 0 0 0 0 0 0 0 0 0 0 0
WBS 1.2 & 1.3 GNAO/RTC May 23, 2019 Senior Personnel Other Personnel Total Salaries and Wages Fringe Benefits Equipment Domestic Travel Foreign Travel Total Travel Participant Support Other Direct Costs: Materials and Supplies Other Direct Costs: Computer Services Other Direct Costs: Subawards Other Direct Costs: Other Total Other Direct Costs	653 653 366 1,020 24 36 60 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2,	FY 0 ,188 1, ,896 1, ,083 1, 0 1, ,143 2,247 ,247 2,247 0 2,248 0 0 0 0 0 0 0 0 0 1,143 ,248 0 0 0 0 0 0 1,143 ,238 1,143 0 1,143 0 1,143	2 E20 0 106,285 621,400 727,686 0 39,331 62,765 102,096 0 6,863 0 0 6,863 0 0 0 198,572 205,435	2% Complex FYE21 0 1,073,066 602,741 1,675,806 156,160 39,030 49,872 88,902 6,863 0 6,863 0 0 6,863 0 0 1,834,266 1,841,129	ity Factor FYE22 0 826,643 826,643 464,326 1,290,969 2,768,430 23,929 28,868 52,797 0 6,863 0 0 6,863 0 0 0 0 0 1,905,061 1,911,924	FYE23 0 443,317 249,011 692,329 380,640 10,026 19,778 29,804 0 55,663 0 0 55,663 0 0 0 0 0 0 0 0 0 0 2,126,042 2,181,705	FYE24 0 242,436 242,436 378,613 0 14,451 39,281 53,732 0 6,860 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	TOTAL 0 4,344,935 2,440,550 6,785,485 3,305,230 150,910 236,811 387,721 0 85,400 0 0 0 0 0 0 0 0 0 8,683,708 8,769,108
WBS 1.2 & 1.3 GNAO/RTC May 23, 2019 Senior Personnel Other Personnel Total Salaries and Wages Fringe Benefits Equipment Domestic Travel Foreign Travel Total Travel Participant Support Other Direct Costs: Materials and Supplies Other Direct Costs: Consultant Services Other Direct Costs: Subawards Other Direct Costs: Subawards	653 653 366 1,020 24 36 60 2, 2, 2, 2, 2, 2, 2, 2,	FY 0 ,188 1, ,896 1, ,083 1, 0 1, ,143 2,247 ,247 2,247 0 2,248 0 0 0 0 0 0 0 0 0 1,143 ,248 0 0 0 0 0 0 1,143 ,238 1,143 0 1,143 0 1,143	2 E20 0 106,285 621,400 727,686 0 39,331 62,765 102,096 0 6,863 0 0 0 0 108,633 0 0 109,205 102,096 0 109,205 102,096 102,097 102,096 102,097 102,096 102,097 102,0	2% Complex FYE21 0 1,073,066 602,741 1,675,806 156,160 39,030 49,872 88,902 88,902 0 6,863 0 0 0 0 0 0 1,834,266	ity Factor FYE22 0 826,643 826,643 464,326 1,290,969 2,768,430 23,929 28,868 52,797 0 6,863 0 6,863 0 0 0 0 0 0 0 1,905,061	FYE23 0 443,317 249,011 692,329 380,640 10,026 19,778 29,804 0 55,663 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	FYE24 0 242,436 136,176 378,613 0 14,451 39,281 53,732 0 6,860 0 6,860 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	TOTAL 0 4,344,935 2,440,550 6,785,485 3,305,230 150,910 236,811 387,721 0 85,400 0 0 0 0 0 0 0 0 0 0 0 0

WBS 1.4 Ops Software Upgrade		22% 0	Complexity	Factor	
March 4, 2019	FYE19	FYE20	FYE21	FYE22	TOTAL
Senior Personnel	0	0	0	0	0
Other Personnel	193,907	528,245	425,433	130,484	1,278,069
Total Salaries and Wages	193,907			130,484	
Fringe Benefits	108,917	-		73,293	717,892
•					
Total Salaries/Wages/Benefits	302,824			203,777	1,995,961
Equipment	0	_	0	0	0
Domestic Travel	0	_,		2,777	11,277
Foreign Travel	12,443			10,837	108,180
Total Travel	12,443	52,674	40,725	13,614	119,457
Participant Support	0	0	0	0	0
Other Direct Costs: Materials and Supplies	0	0	0	0	0
Other Direct Costs: Consultant Services	0	0	0	0	0
Other Direct Costs: Computer Services	0	0	0	0	0
Other Direct Costs: Subawards	0	0	0	0	0
Other Direct Costs: Other	0	0	0	0	0
Total Other Direct Costs	0	0	0	0	0
Total Direct Costs	315,267	877,634	705,124	217,392	2,115,417
Indirect Costs - Calculated on Total Project in IDC Account	0			0	0
Total Direct and Indirect Costs	315,267	877,634	705,124	217,392	2,115,417
CSA Period of Performance Start:	10/1/18			-	
CSA Period of Performance End:	9/30/24				
WBS 1.5 PIO, Publications, Education		No Comple	xity Factor		
WBS 1.5 PIO, Publications, Education May 22, 2019	FYE19	No Comple FYE20	xity Factor FYE21	FYE22	TOTAL
	FYE19 0	· · · ·		FYE22	TOTAL 0
May 22, 2019		FYE20	FYE21		TOTAL 0 214,654
May 22, 2019 Senior Personnel	0	FYE20 0	FYE21 0	0	0
May 22, 2019 Senior Personnel Other Personnel	0 45,387	FYE20 0 80,944	FYE21 0 80,636	0 7,687	0 214,654
May 22, 2019 Senior Personnel Other Personnel Total Salaries and Wages	0 45,387 45,387	FYE20 0 80,944 80,944	FYE21 0 80,636 80,636	0 7,687 7,687	0 214,654 214,654
May 22, 2019 Senior Personnel Other Personnel Total Salaries and Wages Fringe Benefits	0 45,387 45,387 25,494	FYE20 0 80,944 80,944 45,466	FYE21 0 80,636 80,636 45,293	0 7,687 7,687 4,318	0 214,654 214,654 120,571
May 22, 2019 Senior Personnel Other Personnel Total Salaries and Wages Fringe Benefits Total Salaries/Wages/Benefits	0 45,387 45,387 25,494 70,880	FYE20 0 80,944 80,944 45,466	FYE21 0 80,636 80,636 45,293 125,929	0 7,687 7,687 4,318 12,005	0 214,654 214,654 120,571
May 22, 2019 Senior Personnel Other Personnel Total Salaries and Wages Fringe Benefits Total Salaries/Wages/Benefits Equipment	0 45,387 45,387 25,494 70,880 0	FYE20 0 80,944 80,944 45,466 126,410 0	FYE21 0 80,636 80,636 45,293 125,929 0	0 7,687 7,687 4,318 12,005 0	0 214,654 214,654 120,571 335,225 0
May 22, 2019 Senior Personnel Other Personnel Total Salaries and Wages Fringe Benefits Total Salaries/Wages/Benefits Equipment Domestic Travel Foreign Travel	0 45,387 45,387 25,494 70,880 0 45,567	FYE20 0 80,944 80,944 45,466 126,410 0 9,949	FYE21 0 80,636 45,293 125,929 0 4,073	0 7,687 7,687 4,318 12,005 0 0	0 214,654 214,654 120,571 335,225 0 59,589
May 22, 2019 Senior Personnel Other Personnel Total Salaries and Wages Fringe Benefits Total Salaries/Wages/Benefits Equipment Domestic Travel Foreign Travel Total Travel Participant Support	0 45,387 45,387 25,494 70,880 0 45,567 23,134	FYE20 0 80,944 45,466 126,410 0 9,949 9,065	FYE21 0 80,636 45,293 125,929 0 4,073 2,761 6,834 0	0 7,687 4,318 12,005 0 0 0 0 0	0 214,654 214,654 120,571 335,225 0 59,589 34,960
May 22, 2019 Senior Personnel Other Personnel Total Salaries and Wages Fringe Benefits Total Salaries/Wages/Benefits Equipment Domestic Travel Foreign Travel Total Travel Participant Support Other Direct Costs: Materials and Supplies	0 45,387 45,387 25,494 70,880 0 45,567 23,134	FYE20 0 80,944 45,466 126,410 0 9,949 9,065	FYE21 0 80,636 45,293 125,929 0 4,073 2,761 6,834	0 7,687 4,318 12,005 0 0 0	0 214,654 214,654 120,571 335,225 0 59,589 34,960
May 22, 2019 Senior Personnel Other Personnel Total Salaries and Wages Fringe Benefits Total Salaries/Wages/Benefits Equipment Domestic Travel Foreign Travel Total Travel Participant Support Other Direct Costs: Materials and Supplies Other Direct Costs: Publication/Documentation/Dissemination	0 45,387 25,494 70,880 0 45,567 23,134 68,701 0 1,500 0	FYE20 0 80,944 45,466 126,410 0 9,949 9,065 19,014 0	FYE21 0 80,636 45,293 125,929 0 4,073 2,761 6,834 0 3,000 0	0 7,687 4,318 12,005 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 214,654 214,654 120,571 335,225 0 59,589 34,960 94,549 0 12,000 0
May 22, 2019 Senior Personnel Other Personnel Total Salaries and Wages Fringe Benefits Total Salaries/Wages/Benefits Equipment Domestic Travel Foreign Travel Total Travel Participant Support Other Direct Costs: Materials and Supplies Other Direct Costs: Consultant Services	0 45,387 25,494 70,880 0 45,567 23,134 68,701 0	FYE20 0 80,944 45,466 126,410 0 9,949 9,065 19,014 0 6,000 0 0	FYE21 0 80,636 45,293 125,929 0 4,073 2,761 6,834 0 3,000 0 12,000	0 7,687 4,318 12,005 0 0 0 0 0 0 0 1,500 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 214,654 214,654 120,571 335,225 0 59,589 34,960 94,549 0
May 22, 2019 Senior Personnel Other Personnel Total Salaries and Wages Fringe Benefits Total Salaries/Wages/Benefits Equipment Domestic Travel Foreign Travel Total Travel Participant Support Other Direct Costs: Materials and Supplies Other Direct Costs: Consultant Services Other Direct Costs: Computer Services	0 45,387 25,494 70,880 0 45,567 23,134 68,701 0 1,500 0 12,000 0	FYE20 0 80,944 45,466 126,410 0 9,949 9,065 19,014 0 6,000 0 0 0 0	FYE21 0 80,636 45,293 125,929 0 4,073 2,761 6,834 0 3,000 0 12,000 0	0 7,687 4,318 12,005 0 0 0 0 0 0 0 1,500 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 214,654 214,654 120,571 335,225 0 59,589 34,960 94,549 0 12,000 0
May 22, 2019 Senior Personnel Other Personnel Total Salaries and Wages Fringe Benefits Total Salaries/Wages/Benefits Equipment Domestic Travel Foreign Travel Total Travel Participant Support Other Direct Costs: Materials and Supplies Other Direct Costs: Consultant Services Other Direct Costs: Subawards	0 45,387 25,494 70,880 0 45,567 23,134 68,701 0 1,500 0 12,000 0 0 0	FYE20 0 80,944 45,466 126,410 0 9,949 9,065 19,014 0 6,000 0 0 0 0 0 0	FYE21 0 80,636 45,293 125,929 0 0 4,073 2,761 6,834 0 3,000 0 12,000 0 0	0 7,687 4,318 12,005 0 0 0 0 0 0 0 1,500 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 214,654 214,654 120,571 335,225 0 59,589 34,960 94,549 0 12,000 0 24,000 0 0
May 22, 2019 Senior Personnel Other Personnel Total Salaries and Wages Fringe Benefits Total Salaries/Wages/Benefits Equipment Domestic Travel Foreign Travel Total Travel Participant Support Other Direct Costs: Materials and Supplies Other Direct Costs: Consultant Services Other Direct Costs: Computer Services Other Direct Costs: Subawards Other Direct Costs: Other	0 45,387 25,494 70,880 0 45,567 23,134 68,701 0 1,500 0 12,000 0 12,000 0 0 7,000	FYE20 0 80,944 45,466 126,410 0 9,949 9,065 19,014 0 6,000 0 6,000 0 0 0 0 0 0 0 0 0 0 0 0	FYE21 0 80,636 45,293 125,929 0 4,073 2,761 6,834 0 3,000 0 12,000 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 7,687 4,318 12,005 0 0 0 0 0 0 1,500 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 214,654 214,654 120,571 335,225 0 59,589 34,960 94,549 0 12,000 0 24,000 0 24,000 0 0
May 22, 2019 Senior Personnel Other Personnel Total Salaries and Wages Fringe Benefits Total Salaries/Wages/Benefits Equipment Domestic Travel Foreign Travel Total Travel Participant Support Other Direct Costs: Materials and Supplies Other Direct Costs: Consultant Services Other Direct Costs: Subawards Other Direct Costs: Other Total Other Direct Costs	0 45,387 25,494 70,880 0 45,567 23,134 68,701 0 1,500 0 12,000 0 12,000 0 0 7,000	FYE20 0 80,944 80,944 45,466 126,410 0 9,949 9,065 19,014 0 6,000 0 0 0 0 0 0 0 0 0 0 0 0 0 207,500	FYE21 0 80,636 45,293 125,929 0 4,073 2,761 6,834 0 3,000 0 12,000 0 0 12,000 0 0 12,000	0 7,687 4,318 12,005 0 0 0 0 0 0 0 1,500 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 214,654 214,654 120,571 335,225 0 59,589 34,960 94,549 0 12,000 0 24,000 0 24,000 0 24,000 0 214,500
May 22, 2019 Senior Personnel Other Personnel Total Salaries and Wages Fringe Benefits Total Salaries/Wages/Benefits Equipment Domestic Travel Foreign Travel Total Travel Participant Support Other Direct Costs: Materials and Supplies Other Direct Costs: Consultant Services Other Direct Costs: Subawards Other Direct Costs: Other Total Other Direct Costs	0 45,387 25,494 70,880 0 45,567 23,134 68,701 0 1,500 0 12,000 0 12,000 0 7,000 20,500 160,082	FYE20 0 80,944 45,466 126,410 0 9,949 9,065 19,014 0 6,000 0 6,000 0 0 0 0 0 0 0 0 0 0 0 0	FYE21 0 80,636 45,293 125,929 0 0 4,073 2,761 6,834 0 3,000 0 12,000 0 12,000 0 0 12,000 0 0 12,000	0 7,687 4,318 12,005 0 0 0 0 0 0 0 1,500 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 214,654 214,654 120,571 335,225 0 59,589 34,960 94,549 0 12,000 0 24,000 0 24,000 0 0
May 22, 2019 Senior Personnel Other Personnel Total Salaries and Wages Fringe Benefits Total Salaries/Wages/Benefits Equipment Domestic Travel Foreign Travel Total Travel Participant Support Other Direct Costs: Materials and Supplies Other Direct Costs: Consultant Services Other Direct Costs: Computer Services Other Direct Costs: Other Total Other Direct Costs: Other Total Other Direct Costs: Other Total Other Direct Costs: Other Indirect Costs - Calculated on Total Project in IDC Account	0 45,387 25,494 70,880 0 45,567 23,134 68,701 0 1,500 0 12,000 0 12,000 0 7,000 20,500 160,082 0	FYE20 0 80,944 45,466 126,410 0 9,949 9,065 19,014 0 6,000 0 6,000 0 0 0 0 0 0 0 0 0 207,500 213,500 358,924 0	FYE21 0 80,636 45,293 125,929 0 4,073 2,761 6,834 0 3,000 0 12,000 0 12,000 0 0 12,000 0 0 12,000 0 0 12,000 0 0 12,000 0 0 0 12,000 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 7,687 4,318 12,005 0 0 0 0 0 0 1,500 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 214,654 214,654 120,571 335,225 0 59,589 34,960 94,549 0 12,000 0 24,000 0 24,000 0 24,000 0 214,500 250,500 680,273 0
May 22, 2019 Senior Personnel Other Personnel Total Salaries and Wages Fringe Benefits Total Salaries/Wages/Benefits Equipment Domestic Travel Foreign Travel Total Travel Participant Support Other Direct Costs: Materials and Supplies Other Direct Costs: Consultant Services Other Direct Costs: Subawards Other Direct Costs: Other Total Other Direct Costs Total Other Direct Costs Total Other Direct Costs Total Direct Costs Indirect Costs Indirect Costs Indirect and Indirect Costs	0 45,387 25,494 70,880 0 45,567 23,134 68,701 0 1,500 0 12,000 0 12,000 0 0 7,000 20,500 160,082 0 160,082	FYE20 0 80,944 80,944 45,466 126,410 0 9,949 9,065 19,014 0 6,000 0 0 0 0 0 0 0 0 0 0 0 0 0 207,500	FYE21 0 80,636 45,293 125,929 0 0 4,073 2,761 6,834 0 3,000 0 12,000 0 12,000 0 0 12,000 0 0 12,000	0 7,687 4,318 12,005 0 0 0 0 0 0 0 1,500 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 214,654 214,654 120,571 335,225 0 59,589 34,960 94,549 0 12,000 0 24,000 0 24,000 0 24,000 0 214,500 250,500
May 22, 2019 Senior Personnel Other Personnel Total Salaries and Wages Fringe Benefits Total Salaries/Wages/Benefits Equipment Domestic Travel Foreign Travel Participant Support Other Direct Costs: Materials and Supplies Other Direct Costs: Consultant Services Other Direct Costs: Computer Services Other Direct Costs: Other Total Other Direct Costs: Other Total Other Direct Costs: Other Total Other Direct Costs: Other Other Direct Costs: Computer Services Other Direct Costs: Other Total Other Direct Costs: Other Total Other Direct Costs Indirect Costs - Calculated on Total Project in IDC Account	0 45,387 25,494 70,880 0 45,567 23,134 68,701 0 1,500 0 12,000 0 12,000 0 7,000 20,500 160,082 0	FYE20 0 80,944 45,466 126,410 0 9,949 9,065 19,014 0 6,000 0 6,000 0 0 0 0 0 0 0 0 0 207,500 213,500 358,924 0	FYE21 0 80,636 45,293 125,929 0 4,073 2,761 6,834 0 3,000 0 12,000 0 12,000 0 0 12,000 0 0 12,000 0 0 12,000 0 0 12,000 0 0 0 12,000 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 7,687 4,318 12,005 0 0 0 0 0 0 1,500 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 214,654 214,654 120,571 335,225 0 59,589 34,960 94,549 0 12,000 0 24,000 0 24,000 0 24,000 0 214,500 250,500 680,273 0