

ID	WBS	Task Name	Duration	Start	Finish	Predecessors	Resource Names	Cost	Work														
										2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
1	1	Low Background Counting	0 d	Thu 10/1/09	Thu 10/1/09			\$0.00	0 h			◆ 10/1											
2	1.1	Project Start	0 d	Thu 10/1/09	Thu 10/1/09			\$0.00	0 h			◆ 10/1											
3	2	S4 Science Operations	782 d?	Thu 10/1/09	Fri 9/28/12			\$704,191.76	6,256 h			■											
4	2.1	S4 Science Operations	782 d?	Thu 10/1/09	Fri 9/28/12		S4 operations	\$704,191.76	6,256 h			■											
5	3	Homestake Characterization	2245 d	Thu 10/1/09	Wed 5/9/18			\$20,000.00	108,088 h			■											
6	3.1	Muon measurements	2152 d	Thu 10/1/09	Fri 12/29/17			\$0.00	17,232 h			■											
7	3.1.1	Muon Measurements at the Surface	1 d	Thu 10/1/09	Thu 10/1/09		DULBCF staff	\$0.00	8 h			10/1											
8	3.1.2	Muon Measurements at the 800-ft level	240 d	Thu 10/1/09	Wed 9/1/10		DULBCF staff	\$0.00	1,920 h			■											
9	3.1.3	Muon Measurements at the 2000-ft level	1 d	Thu 10/1/09	Thu 10/1/09		DULBCF staff	\$0.00	8 h			10/1											
10	3.1.4	Muon Measurements at the 4850-ft level	870 d	Wed 9/1/10	Tue 12/31/13		DULBCF staff	\$0.00	6,960 h														
11	3.1.5	Muon Measurements at the 7400-ft level	1042 d	Thu 1/2/14	Fri 12/29/17		DULBCF staff	\$0.00	8,336 h														
12	3.2	Gamma ray measurements	2152 d	Thu 10/1/09	Fri 12/29/17			\$0.00	20,936 h			■											
13	3.2.1	Initial gamma ray survey	390 d	Thu 10/1/09	Wed 3/30/11		S4 staff	\$0.00	3,120 h			■											
14	3.2.2	Gamma Ray Measurements at the Surface	75 d	Thu 10/1/09	Wed 1/13/10		DULBCF staff	\$0.00	600 h			■											
15	3.2.3	Gamma Ray Measurements at the 800-ft level	1 d	Thu 10/1/09	Thu 10/1/09		DULBCF staff	\$0.00	8 h			10/1											
16	3.2.4	Gamma Ray Measurements at the 2000-ft level	239 d	Thu 10/1/09	Tue 8/31/10		DULBCF staff	\$0.00	1,912 h			■											
17	3.2.5	Gamma Ray Measurements at the 4850-ft level	870 d	Wed 9/1/10	Tue 12/31/13		DULBCF staff	\$0.00	6,960 h														
18	3.2.6	Gamma Ray Measurements at the 7400-ft level	1042 d	Thu 1/2/14	Fri 12/29/17		DULBCF staff	\$0.00	8,336 h														
19	3.3	Neutron measurements	1955 d	Mon 7/5/10	Fri 12/29/17			\$0.00	25,744 h			■											
20	3.3.1	Fabricate neutron detectors	2 d	Mon 7/5/10	Tue 7/6/10		DULBCF staff	\$0.00	16 h			7/6											
21	3.3.2	Deploy neutron detectors (install at 800L??)	1 d	Wed 7/7/10	Wed 7/7/10	20	DULBCF staff	\$0.00	8 h			7/7											
22	3.3.3	Neutron Measurements at the 4850-ft level	870 d	Wed 9/1/10	Tue 12/31/13		DULBCF staff	\$0.00	6,960 h														
23	3.3.4	Neutron Measurements at the 7400-ft level	1042 d	Thu 1/2/14	Fri 12/29/17		DULBCF staff	\$0.00	8,336 h														
24	3.3.5	Muon-induced Neutron Measurements at the 300 (o	1303 d	Wed 1/2/13	Fri 12/29/17		DULBCF staff	\$0.00	10,424 h														
25	3.4	Radon measurements	2045 d	Thu 7/8/10	Wed 5/9/18			\$0.00	44,176 h			■											
26	3.4.1	Radon Measurements at the different levels	847 d	Thu 7/8/10	Fri 10/4/13	21	DULBCF staff	\$0.00	6,776 h														
27	3.4.2	Radon Monitoring System at different levels	1065 d	Mon 12/3/12	Fri 12/30/16		DULBCF staff	\$0.00	8,520 h														
28	3.4.3	Radon Diffusion Study	2045 d	Thu 7/8/10	Wed 5/9/18	21	DULBCF staff	\$0.00	16,360 h														
29	3.4.4	Radon Emanation Study	1565 d	Mon 1/2/12	Fri 12/29/17		DULBCF staff	\$0.00	12,520 h														
30	3.5	Kiesel/European cross correlation	260 d	Tue 7/5/11	Mon 7/2/12		Kiesel consult	\$20,000.00	0 h														
31	4	Shielding and Simulation Studies	1109 d	Thu 10/1/09	Tue 12/31/13			\$0.00	32,656 h			■											
32	4.1	Screener shielding studies	780 d	Mon 1/4/10	Fri 12/28/12			\$0.00	12,480 h			■											
33	4.1.1	Characterize lead, copper, and poly shielding	780 d	Mon 1/4/10	Fri 12/28/12		S4 staff	\$0.00	6,240 h														
34	4.1.2	Simulate lead, copper, and poly shielding	780 d	Mon 1/4/10	Fri 12/28/12		S4 staff	\$0.00	6,240 h														
35	4.2	Conduct cosmogenic muon/neutron MC	262 d	Mon 12/31/12	Tue 12/31/13	34	S4 staff	\$0.00	2,096 h														
36	4.3	Benchmark MC with NMM and neutron detectors	440 d	Thu 10/1/09	Wed 6/8/11		S4 staff	\$0.00	3,520 h			■											
37	4.4	Water Shield Simulation Studies	1040 d	Thu 10/1/09	Wed 9/25/13			\$0.00	10,400 h			■											
38	4.4.1	Determine background levels	260 d	Thu 10/1/09	Wed 9/29/10		S4 staff	\$0.00	2,080 h			■											
39	4.4.2	Simulate water shielding	520 d	Thu 9/30/10	Wed 9/26/12	38	S4 staff	\$0.00	4,160 h														
40	4.4.3	Study muon signal & optimize PMT placement	260 d	Thu 9/27/12	Wed 9/25/13	39	S4 staff	\$0.00	2,080 h														
41	4.4.4	Study Gd vs. boron loading	260 d	Thu 9/27/12	Wed 9/25/13	39	S4 staff	\$0.00	2,080 h														
42	4.5	Immersion Tank Simulation Studies	520 d	Wed 9/15/10	Tue 9/11/12			\$0.00	4,160 h			■											
43	4.5.1	Simulate liquid scintillator tank	130 d	Wed 9/15/10	Tue 3/15/11		S4 staff	\$0.00	1,040 h			■											
44	4.5.2	Study LS light yield	130 d	Wed 3/16/11	Tue 9/13/11	43	S4 staff	\$0.00	1,040 h														
45	4.5.3	Conduct PMT optimization	130 d	Wed 9/14/11	Tue 3/13/12	44	S4 staff	\$0.00	1,040 h														
46	4.5.4	Simulate combined LS and water	130 d	Wed 3/14/12	Tue 9/11/12	45	S4 staff	\$0.00	1,040 h														
47	5	Early Screening Activities	2437 d?	Thu 10/1/09	Mon 2/4/19			\$8,683,274.30	#####			■											
48	5.1	Alpha screening	2148 d	Wed 9/1/10	Mon 11/26/18			\$314,751.96	14,672.17 h			■											
49	5.1.1	Procure first XIA screener	1 d	Wed 9/1/10	Wed 9/1/10		XIA Ar gas har	\$75,000.00	0 h			9/1											
50	5.1.2	Install and commission first XIA screener at Soudan	66 d	Thu 9/2/10	Thu 12/2/10	49	CDMS staff	\$26,400.00	528 h			■											
51	5.1.3	Conduct CDMS screening at Soudan	2081 d	Fri 12/3/10	Mon 11/26/18		Technician (CI	\$19,580.97	332.97 h														
52	5.1.4	Procure second XIA screener	1 d	Thu 9/1/11	Thu 9/1/11		XIA Ar gas har	\$75,000.00	0 h														
53	5.1.5	Install and commission second XIA screener at Sour	66 d	Fri 9/2/11	Fri 12/2/11	52	CDMS staff	\$26,400.00	528 h														
54	5.1.6	Conduct CDMS screening at Soudan	1820 d	Mon 12/5/11	Mon 11/26/18		Technician (CI	\$17,371.00	291.2 h														
55	5.1.7	Procure third XIA screener	1 d	Mon 9/3/12	Mon 9/3/12		XIA purge gas	\$75,000.00	0 h														
56	5.1.8	Install and commission third XIA screener at Soudar	66 d	Tue 9/4/12	Tue 12/4/12	55	DULBCF staff	\$0.00	528 h														
57	5.1.9	Conduct screening at Soudan	1558 d	Wed 12/5/12	Mon 11/26/18		DULBCF staff	\$0.00	12,464 h														

Project:
Date: Fri 7/2/10

Task
Split

Progress
Milestone

Summary
Project Summary

External Tasks
External Milestone

Deadline

Page 1

ID	WBS	Task Name	Duration	Start	Finish	Pred	Resource Names	Cost	Work	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
58	5.2	Neutron detectors	2190 d	Mon 7/5/10	Mon 11/26/18			\$0.00	33,560 h														
59	5.2.1	Purchase components for neutron detectors	10 d	Mon 7/5/10	Fri 7/16/10		DULBCF staff	\$0.00	80 h														
60	5.2.2	Fabricate neutron detectors	80 d	Mon 7/19/10	Fri 11/5/10	59	DULBCF staff	\$0.00	640 h														
61	5.2.3	Install neutron detectors at Soudan	10 d	Mon 11/8/10	Fri 11/19/10	60	DULBCF staff	\$0.00	80 h														
62	5.2.4	Integrate neutron detectors with shield	10 d	Mon 11/22/10	Fri 12/3/10	61	DULBCF staff	\$0.00	80 h														
63	5.2.5	Run detectors	2100 d	Mon 11/8/10	Mon 11/26/18		DULBCF staff	\$0.00	16,800 h														
64	5.2.6	Purchase components for neutron detectors	10 d	Mon 1/3/11	Fri 1/14/11		DULBCF staff	\$0.00	80 h														
65	5.2.7	Fabricate neutron detectors	80 d	Mon 1/17/11	Fri 5/6/11	64	DULBCF staff	\$0.00	640 h														
66	5.2.8	Install neutron detectors at Davis	10 d	Mon 5/9/11	Fri 5/20/11	65	DULBCF staff	\$0.00	80 h														
67	5.2.9	Integrate neutron detectors with shield	10 d	Mon 5/23/11	Fri 6/3/11	66	DULBCF staff	\$0.00	80 h														
68	5.2.10	Run detectors	1875 d	Mon 9/19/11	Mon 11/26/18		DULBCF staff	\$0.00	15,000 h														
69	5.3	GeMPI screeners	2145 d	Mon 9/6/10	Mon 11/26/18			\$1,326,000.00	50,416 h														
104	5.4	HPGe screeners	2155 d	Mon 11/1/10	Mon 2/4/19			\$765,180.00	70,128 h														
147	5.5	Beta screeners	2244 d	Tue 6/1/10	Mon 1/7/19			\$671,801.04	45,468.8 h														
163	5.6	Other Gamma Screeners	2105 d	Mon 11/1/10	Mon 11/26/18			\$360,000.00	16,080 h														
171	5.7	Radon Emanation Chamber	2105 d	Mon 11/1/10	Mon 11/26/18			\$87,500.00	16,080 h														
179	5.8	End of early screening tasks	0 d	Mon 1/7/19	Mon 1/7/19	178,1		\$0.00	0 h														
180	5.9	DULBCF Activities (hammock task)	2417 d?	Thu 10/1/09	Mon 1/7/19		DULBCF oper.	\$5,158,041.30	19,336 h														
181	6	Post S4 Scientific Operations	327 d	Mon 10/1/12	Tue 12/31/13			\$0.00	0 h														
182	6.1	Post S4 Scientific Operations	327 d	Mon 10/1/12	Tue 12/31/13			\$0.00	0 h														
183	7	FAARM Design Phases	1872 d	Thu 10/1/09	Mon 12/5/16			\$1,124,979.85	6,517.32 h														
184	7.1	FAARM Conceptual Design	310 d	Thu 10/1/09	Wed 12/8/10			\$162,237.45	1,052.12 h														
185	7.1.1	Conceptual design phase 1	120 d	Thu 10/1/09	Wed 3/17/10		Engineer-civil	\$78,188.31	511.05 h														
186	7.1.2	Design review	30 d	Thu 3/18/10	Wed 4/28/10	185		\$0.00	0 h														
187	7.1.3	Conceptual design phase 2	120 d	Thu 4/29/10	Wed 10/13/10	186	Project Manag	\$77,424.18	498.48 h														
188	7.1.4	Design review	30 d	Thu 10/14/10	Wed 11/24/10	187		\$0.00	0 h														
189	7.1.5	Conceptual design updates from design review	10 d	Thu 11/25/10	Wed 12/8/10	188	Project Manag	\$6,624.96	42.58 h														
190	7.1.6	Conceptual design complete	0 d	Wed 12/8/10	Wed 12/8/10	189		\$0.00	0 h														
191	7.2	FAARM Preliminary Design	795 d	Thu 12/9/10	Wed 12/25/13	190		\$332,179.68	1,965.6 h														
192	7.2.1	Preliminary design phase 1	440 d	Thu 12/9/10	Wed 8/15/12		Engineer-mech	\$74,930.02	457.6 h														
193	7.2.2	Design review	30 d	Thu 8/16/12	Wed 9/26/12	192		\$0.00	0 h														
194	7.2.3	Completion of preliminary design with S4 funding	0 d	Wed 9/26/12	Wed 9/26/12	193		\$0.00	0 h														
195	7.2.4	Preliminary design phase 2	275 d	Thu 9/27/12	Wed 10/16/13	194	Engineer-elect	\$247,645.75	1,452 h														
196	7.2.5	Design review	30 d	Thu 10/17/13	Wed 11/27/13	195		\$0.00	0 h														
197	7.2.6	Preliminary design updates from design review	20 d	Thu 11/28/13	Wed 12/25/13	196	Engineer-mech	\$9,603.91	56 h														
198	7.2.7	Preliminary design complete	0 d	Wed 12/25/13	Wed 12/25/13	197		\$0.00	0 h														
199	7.3	FAARM Final Design	763 d	Wed 1/1/14	Mon 12/5/16			\$630,562.72	3,499.6 h														
200	7.3.1	Final design phase 1	316 d	Wed 1/1/14	Thu 3/19/15	201S	Engineer-civil	\$290,415.25	1,643.2 h														
201	7.3.2	Design review	30 d	Thu 3/19/15	Thu 4/30/15	202S		\$0.00	0 h														
202	7.3.3	Final design phase 2	317 d	Thu 4/30/15	Mon 7/18/16	203S	Engineer-civil	\$301,527.10	1,648.4 h														
203	7.3.4	Design review	30 d	Mon 7/18/16	Mon 8/29/16	204S		\$0.00	0 h														
204	7.3.5	Final design updates from design review	10 d	Mon 8/29/16	Mon 9/12/16	205S	Engineer-civil	\$9,655.09	52 h														
205	7.3.6	Documents ready for procurement	0 d	Mon 9/12/16	Mon 9/12/16	206S		\$0.00	0 h														
206	7.3.7	Procurement approved, funding authorized	0 d	Mon 9/12/16	Mon 9/12/16	207S		\$0.00	0 h														
207	7.3.8	Bidding phase	30 d	Mon 9/12/16	Mon 10/24/16	208S	Engineer-civil	\$28,965.28	156 h														
208	7.3.9	Contracting phase	30 d	Mon 10/24/16	Mon 12/5/16	209S		\$0.00	0 h														
209	7.3.10	FAARM Notice to Proceed	0 d	Mon 12/5/16	Mon 12/5/16			\$0.00	0 h														
210	8	FAARM Scientific Elements	978 d	Wed 1/1/14	Fri 9/29/17			\$2,161,305.94	10,356 h														
211	8.1	Procure radon mitigation system	481 d	Tue 5/5/15	Tue 3/7/17			\$99,078.06	88 h														
212	8.1.1	Determine requirements & prepare RMS procureme	110 d	Tue 5/5/15	Tue 10/6/15	213S	Post doc (FAA	\$4,203.06	88 h														
213	8.1.2	Issue RMS documents for bidding	10 d	Tue 10/6/15	Tue 10/20/15	214S		\$0.00	0 h														
214	8.1.3	Prepare quotes for RMS (by vendors)	44 d	Tue 10/20/15	Mon 12/21/15	215S		\$0.00	0 h														
215	8.1.4	Accept quotes, issue purchase order for RMS	10 d	Mon 12/21/15	Mon 1/4/16	216S	Radon mitigati	\$69,875.00	0 h														
216	8.1.5	Prepare and deliver RMS (by vendors)	260 d	Mon 1/4/16	Mon 1/2/17	240S		\$0.00	0 h														
217	8.1.6	Build temporary enclosure in module	22 d	Mon 1/2/17	Tue 1/31/17	240	Radon mitigati	\$25,000.00	0 h														
218	8.1.7	Transport RMS to site and install on module floor	15 d	Wed 2/1/17	Tue 2/21/17	217		\$0.00	0 h														
219	8.1.8	RMS begins operation in temporary location	0 d	Tue 2/21/17	Tue 2/21/17	218		\$0.00	0 h														

Project:
Date: Fri 7/2/10

Task

Split

Progress

Milestone

Summary

Project Summary

External Tasks

External Milestone

Deadline

Page 2

ID	WBS	Task Name	Duration	Start	Finish	Predc	Resource Names	Cost	Work	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
220	8.1.9	Radon mitigation in progress	10 d	Wed 2/22/17	Tue 3/7/17	219		\$0.00	0 h										3/7				
221	8.2	Water Shield Active Veto	456 d	Wed 1/1/14	Wed 9/30/15			\$101,779.73	3,900 h														
222	8.2.1	Order sample PMTs	22 d	Wed 1/1/14	Thu 1/30/14		Water shield s	\$10,000.00	0 h														
223	8.2.2	Screen sample PMTs	0 d	Thu 1/30/14	Thu 1/30/14	222	DULBCF staff	\$0.00	0 h														
224	8.2.3	Bench test sample PMTs	130 d	Fri 1/31/14	Thu 7/31/14	222	Undergraduate	\$30,141.13	1,300 h														
225	8.2.4	Procure PMTs+electronics	44 d	Fri 8/1/14	Wed 10/1/14	223,2		\$0.00	0 h														
226	8.2.5	QA PMTs and database	260 d	Thu 10/2/14	Wed 9/30/15	225	Undergraduate	\$61,638.60	2,600 h														
227	8.3	Immersion Tank Instrumentation	456 d	Fri 1/1/16	Fri 9/29/17			\$826,986.66	5,336 h														
228	8.3.1	Order sample Qupids	22 d	Fri 1/1/16	Mon 2/1/16	226F	Immersion tan	\$15,000.00	0 h														
229	8.3.2	Screen sample Qupids	130 d	Tue 2/2/16	Mon 8/1/16	228	DULBCF staff	\$0.00	1,040 h														
230	8.3.3	Bench test sample Qupids	130 d	Tue 2/2/16	Mon 8/1/16	228	Post doc (FAA	\$31,976.72	1,300 h														
231	8.3.4	Procure Qupids+electronics	44 d	Tue 8/2/16	Fri 9/30/16	229,2	Immersion tan	\$700,000.00	0 h														
232	8.3.5	QA Qupids + database	260 d	Mon 10/3/16	Fri 9/29/17	231	Post doc (FAA	\$65,392.39	2,600 h														
233	8.3.6	Build and test calibration system	66 d	Mon 10/3/16	Mon 1/2/17	231	Post doc (FAA	\$14,617.54	396 h														
234	8.4	Nylon Vessel	241 d	Fri 1/29/16	Mon 1/2/17			\$1,133,461.49	1,032 h														
235	8.4.1	Procure nylon vessel	110 d	Fri 1/29/16	Fri 7/1/16	236S	Immersion tan	\$750,000.00	0 h														
236	8.4.2	Build dedicated clean room at a university	88 d	Fri 7/1/16	Wed 11/2/16	237S	Immersion tan	\$300,000.00	0 h														
237	8.4.3	Build nylon vessel	43 d	Wed 11/2/16	Mon 1/2/17	240S	Technician (F/	\$63,461.49	1,032 h														
238	8.4.4	Design & build insertion jig	66 d	Fri 9/30/16	Mon 1/2/17	240S	Immersion tan	\$20,000.00	0 h														
239	9	FAARM Conventional Construction	381 d?	Mon 9/12/16	Mon 2/26/18			\$5,779,613.40	1,788.8 h														
240	9.1	Module occupancy (DUSEL ensures radon < 100 Bq/m^3)	0 d	Mon 1/2/17	Mon 1/2/17			\$0.00	0 h														
241	9.2	Civil-Architectural	220 d	Mon 1/2/17	Fri 11/3/17			\$1,677,900.00	0 h														
242	9.2.1	Site Preparation	30 d	Mon 1/2/17	Fri 2/10/17	209,2	Civil-Site Prep	\$0.00	0 h														
243	9.2.2	Concrete	0 d	Fri 2/10/17	Fri 2/10/17	242	Civil-Concrete	\$0.00	0 h														
244	9.2.3	Masonry	30 d	Mon 4/17/17	Fri 5/26/17	247	Civil-Masonry	\$303,900.00	0 h														
245	9.2.4	Metal	115 d	Mon 2/13/17	Fri 7/21/17			\$1,099,000.00	0 h														
246	9.2.4.1	General	40 d	Mon 5/29/17	Fri 7/21/17	244	Civil-General r	\$26,000.00	0 h														
247	9.2.4.2	Structural steel decks	45 d	Mon 2/13/17	Fri 4/14/17	243	Civil-Structural	\$1,073,000.00	0 h														
248	9.2.5	Wood and Plastics	30 d	Mon 7/24/17	Fri 9/1/17	246	Civil-Wood and	\$9,000.00	0 h														
249	9.2.6	Thermal and Moisture	10 d	Mon 7/24/17	Fri 8/4/17	246	Civil-Thermal a	\$32,000.00	0 h														
250	9.2.7	Doors and Windows	10 d	Mon 8/7/17	Fri 8/18/17	249	Civil-Doors and	\$29,000.00	0 h														
251	9.2.8	Finishes	30 d	Mon 8/21/17	Fri 9/29/17	250	Civil-Finishes	\$159,000.00	0 h														
252	9.2.9	Specialties	15 d	Mon 10/2/17	Fri 10/20/17	251	Civil-Specialtie	\$26,000.00	0 h														
253	9.2.10	Equipment including material handling	15 d	Mon 4/17/17	Fri 5/5/17	247	Civil-Equipmer	\$20,000.00	0 h														
254	9.2.11	Furnishings	10 d	Mon 10/23/17	Fri 11/3/17	252	Civil-Furnishin	\$0.00	0 h														
255	9.2.12	Special Construction	10 d	Mon 10/23/17	Fri 11/3/17	252	Civil-Special C	\$0.00	0 h														
256	9.3	Science Equipment	381 d	Mon 9/12/16	Mon 2/26/18			\$2,369,276.00	0 h														
257	9.3.1	Water shield	156 d	Mon 7/24/17	Mon 2/26/18			\$1,890,000.00	0 h														
258	9.3.1.1	Shield outer tank	30 d	Mon 7/24/17	Fri 9/1/17	246	Shield outer ta	\$600,000.00	0 h														
259	9.3.1.2	Torus support structure	20 d	Mon 9/4/17	Fri 9/29/17	258	Torus support	\$175,000.00	0 h														
260	9.3.1.3	Shield inner torus	30 d	Mon 10/2/17	Fri 11/10/17	259	Shield inner to	\$1,000,000.00	0 h														
261	7.2.1	Shield plumbing	40 d	Mon 10/2/17	Fri 11/24/17	259	Shield plumbir	\$25,000.00	0 h														
262	9.3.1.5	Stainless (or titanium?) Frame	44 d	Mon 11/27/17	Thu 1/25/18	261	Immersion tan	\$50,000.00	0 h														
263	9.3.1.6	Install N2 blanket & tank roof/clean room floor	22 d	Fri 1/26/18	Mon 2/26/18	262	Immersion tan	\$40,000.00	0 h														
264	9.3.2	Ultra-pure water system	247 d	Mon 9/12/16	Tue 8/22/17			\$303,000.00	0 h														
265	9.3.2.1	Water system supply provided by LBNE	66 d	Mon 9/12/16	Mon 12/12/16	206	Water system	\$0.00	0 h														
266	9.3.2.2	Water system plumbing inside FAARM	22 d	Mon 7/24/17	Tue 8/22/17	246	Water system	\$25,000.00	0 h														
267	9.3.2.3	Water purification system	22 d	Mon 7/24/17	Tue 8/22/17	246	Water purificat	\$278,000.00	0 h														
268	9.3.3	Cryogen systems (fixed plumbing only)	22 d	Mon 7/24/17	Tue 8/22/17			\$0.00	0 h														
269	9.3.3.1	Cryogen fixed plumbing	22 d	Mon 7/24/17	Tue 8/22/17	246		\$0.00	0 h														
270	9.3.4	Machine shop equipment (simple machines, clean t	50 d	Mon 7/24/17	Fri 9/29/17	246	Machine shop	\$6,000.00	0 h														
271	9.3.5	Physics/Chemistry lab equipment	90 d	Mon 10/23/17	Fri 2/23/18			\$11,000.00	0 h														
272	9.3.5.1	Wet Bench for etching, acid baths, cleaning + fi	90 d	Mon 10/23/17	Fri 2/23/18	252	Wet Bench for	\$10,000.00	0 h														
273	9.3.5.2	Shelves and purge cabinet	90 d	Mon 10/23/17	Fri 2/23/18	252	Shelves and p	\$1,000.00	0 h														
274	9.3.6	Biology/Geology lab equipment	90 d	Mon 10/23/17	Fri 2/23/18			\$149,276.00	0 h														
275	9.3.6.1	Wet Bench for nucleic acid extraction	90 d	Mon 10/23/17	Fri 2/23/18	252	BGE-wet benc	\$39,000.00	0 h														
276	9.3.6.2	HEPA filtered laminar flow through hood	90 d	Mon 10/23/17	Fri 2/23/18	252	BGE-HEPA filt	\$15,000.00	0 h														

Project:
Date: Fri 7/2/10

Task

Split

Progress

Milestone

Summary

Project Summary

External Tasks

External Milestone

Deadline

Page 3

ID	WBS	Task Name	Duration	Start	Finish	Predecessor	Resource Names	Cost	Work	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
277	9.3.6.3	Cabinet storage with lead shielding – 1 m^3	90 d	Mon 10/23/17	Fri 2/23/18	252	BGE-cabinet s	\$95,276.00	0 h											2/23			
278	9.3.7	Computer systems	90 d	Mon 10/23/17	Fri 2/23/18			\$10,000.00	0 h											2/23			
279	9.3.7.1	Computer systems	90 d	Mon 10/23/17	Fri 2/23/18	252	Computer syst	\$10,000.00	0 h														
280	9.4	Infrastructure Systems	260 d?	Mon 12/5/16	Fri 12/1/17			\$1,732,437.40	1,788.8 h														
281	9.4.1	Heating, ventilation and air conditioning	52 d	Mon 7/24/17	Tue 10/3/17			\$960,000.00	0 h														
282	9.4.1.1	HVAC	30 d	Mon 7/24/17	Fri 9/1/17	246	Infrastructure-l	\$613,000.00	0 h											9/1			
283	9.4.1.2	Chilled water	30 d	Mon 7/24/17	Fri 9/1/17	246	Infrastructure-l	\$294,000.00	0 h											9/1			
284	9.4.1.3	Exhaust	30 d	Mon 7/24/17	Fri 9/1/17	246	Infrastructure-l	\$23,000.00	0 h											9/1			
285	9.4.1.4	Move and install radon mitigation system in per	22 d	Mon 9/4/17	Tue 10/3/17	284	Radon mitigati	\$30,000.00	0 h											10/3			
286	9.4.2	Fire Protection	50 d	Mon 9/25/17	Fri 12/1/17			\$93,000.00	0 h														
287	9.4.2.1	Sprinklers	25 d	Mon 9/25/17	Fri 10/27/17	290	Infrastructure-:	\$31,000.00	0 h											10/27			
288	9.4.2.2	Sensors and alarms	25 d	Mon 10/30/17	Fri 12/1/17	287	Infrastructure-:	\$62,000.00	0 h											12/1			
289	9.4.3	Plumbing	45 d	Mon 7/24/17	Fri 9/22/17			\$90,000.00	0 h														
290	9.4.3.1	Plumbing	45 d	Mon 7/24/17	Fri 9/22/17	246	Infrastructure-l	\$90,000.00	0 h											9/22			
291	9.4.4	Electrical	50 d	Mon 7/24/17	Fri 9/29/17			\$198,000.00	0 h														
292	9.4.4.1	Clean power	25 d	Mon 8/28/17	Fri 9/29/17	293	Infrastructure-l	\$36,000.00	0 h											9/29			
293	9.4.4.2	Industrial power	25 d	Mon 7/24/17	Fri 8/25/17	246	Infrastructure-l	\$162,000.00	0 h											8/25			
294	9.4.5	Lighting	30 d	Mon 8/28/17	Fri 10/6/17			\$32,000.00	0 h											10/6			
295	9.4.5.1	General	30 d	Mon 8/28/17	Fri 10/6/17	293	Infrastructure-l	\$32,000.00	0 h											10/6			
296	9.4.6	Security System	45 d	Mon 8/28/17	Fri 10/27/17			\$0.00	0 h											10/27			
297	9.4.6.1	Security system	45 d	Mon 8/28/17	Fri 10/27/17	293	Infrastructure-:	\$0.00	0 h											10/27			
298	9.4.7	Voice/Data Cabling & Data Network Equipment	45 d	Mon 8/28/17	Fri 10/27/17			\$19,000.00	0 h											10/27			
299	9.4.7.1	Voice/Data Cabling & Data Network Equipment	45 d	Mon 8/28/17	Fri 10/27/17	293	Infrastructure-l	\$19,000.00	0 h											10/27			
300	9.4.8	Contruction engineering	260 d?	Mon 12/5/16	Fri 12/1/17		Engineer-civil	\$340,437.40	1,788.8 h											12/1			
301	9.5	Conventional construction Beneficial Occupancy	0 d	Fri 12/1/17	Fri 12/1/17	295,2		\$0.00	0 h											12/1			
302	10	FAARM Installation & Commissioning	561 d	Mon 12/4/17	Mon 1/27/20			\$4,614,524.23	25,272 h														
303	10.1	FAARM screening starts 1	0 d	Wed 6/12/19	Wed 6/12/19	338S		\$0.00	0 h												6/12		
304	10.2	Phase 1: Moderate Cleanliness	170 d	Mon 12/4/17	Fri 7/27/18			\$92,258.87	1,812 h														
305	10.2.1	Establish moderate cleanliness protocols	5 d	Mon 12/4/17	Fri 12/8/17	301	Technician (F/	\$506.71	8 h											12/8			
306	10.2.2	Clean entire FAARM	20 d	Mon 12/11/17	Fri 1/5/18	305	Technician (F/	\$16,336.27	480 h											1/5			
307	10.2.3	Water Shield Commissioning	145 d	Mon 1/8/18	Fri 7/27/18			\$75,415.89	1,324 h														
308	10.2.3.1	Fill water shield	10 d	Mon 1/8/18	Fri 1/19/18	306	Technician (F/	\$1,043.82	16 h											1/19			
309	10.2.3.2	Water shield system test	10 d	Mon 1/22/18	Fri 2/2/18	308	Technician (F/	\$1,043.82	16 h											2/2			
310	10.2.3.3	Drain shield and clean	10 d	Mon 2/5/18	Fri 2/16/18	309	Technician (F/	\$1,043.82	16 h											2/16			
311	10.2.3.4	Install PMTs & Electronics	20 d	Mon 2/19/18	Fri 3/16/18	310	Graduate stud	\$13,569.64	240 h											3/16			
312	10.2.3.5	Test PMTs and Calibrate	20 d	Mon 3/19/18	Fri 4/13/18	311	Graduate stud	\$13,569.64	240 h											4/13			
313	10.2.3.6	Fill water shield	5 d	Mon 4/16/18	Fri 4/20/18	312	Graduate stud	\$3,392.41	60 h											4/20			
314	10.2.3.7	Conduct purity and transparency tests	20 d	Mon 4/23/18	Fri 5/18/18	313	Graduate stud	\$13,569.64	240 h											5/18			
315	10.2.3.8	DAQ system test (Muon Run)	40 d	Mon 5/21/18	Fri 7/13/18	314	Graduate stud	\$27,139.28	480 h											7/13			
316	10.2.3.9	Drain shield and clean	10 d	Mon 7/16/18	Fri 7/27/18	315	Technician (F/	\$1,043.82	16 h											7/27			
317	10.3	Phase 2: Tight Cleanliness	461 d	Mon 4/23/18	Mon 1/27/20			\$4,522,265.36	23,460 h														
318	10.3.1	Establish tight cleanliness protocols	15 d	Mon 7/30/18	Fri 8/17/18	316	Technician (F/	\$1,565.73	24 h											8/17			
319	10.3.2	Monitor particulate level and radon	391 d	Mon 7/30/18	Mon 1/27/20	316		\$0.00	0 h												1/27		
320	10.3.3	Immersion Tank Commissioning	376 d	Mon 8/20/18	Mon 1/27/20			\$154,030.61	2,612 h														
321	10.3.3.1	Install nylon vessel	22 d	Mon 8/20/18	Tue 9/18/18	318	Graduate stud	\$10,333.80	264 h											9/18			
322	10.3.3.2	Install Insertion jig	10 d	Wed 9/19/18	Tue 10/2/18	321	Graduate stud	\$4,697.18	120 h											10/2			
323	10.3.3.3	Install QUPIDs & Electronics	20 d	Wed 9/19/18	Tue 10/16/18	321	Graduate stud	\$9,394.37	240 h											10/16			
324	10.3.3.4	Test QUPIDs and Calibrate	20 d	Wed 10/17/18	Tue 11/13/18	322,3	Graduate stud	\$9,394.37	240 h											11/13			
325	10.3.3.5	Fill with purified liquid scintillator	5 d	Wed 11/14/18	Tue 11/20/18	324	Graduate stud	\$52,348.59	60 h											11/20			
326	10.3.3.6	Install Top Loading Clean Room	10 d	Wed 11/21/18	Tue 12/4/18	325	Graduate stud	\$4,697.18	120 h											12/4			
327	10.3.3.7	LS Purity studies	20 d	Wed 12/5/18	Tue 1/1/19	326	Graduate stud	\$9,408.46	240 h											1/1			
328	10.3.3.8	DAQ system test	30 d	Wed 1/2/19	Tue 2/12/19	327	Graduate stud	\$14,514.30	360 h											2/12			
329	10.3.3.9	Fill Water Shield	5 d	Wed 2/13/19	Tue 2/19/19	328	Technician (F/	\$537.57	8 h											2/19			
330	10.3.3.10	Combined Water + LS test	80 d	Wed 2/20/19	Tue 6/11/19	329	Graduate stud	\$38,704.79	960 h												6/11		
331	10.3.3.11	Immersion tank screening begins	0 d	Tue 6/11/19	Tue 6/11/19	330		\$0.00	0 h												6/11		
332	10.3.3.12	Immersion tank screening	164 d	Wed 6/12/19	Mon 1/27/20	331		\$0.00	0 h													1/27	
333	10.3.4	Gamma screener installation and commissioning	440 d	Mon 4/23/18	Mon 12/30/19			\$2,306,310.96	11,264 h														

Project:
Date: Fri 7/2/10

Task
Split

Progress

Milestone

Summary

Project Summary

External Tasks

External Milestone

Deadline

Page 4

