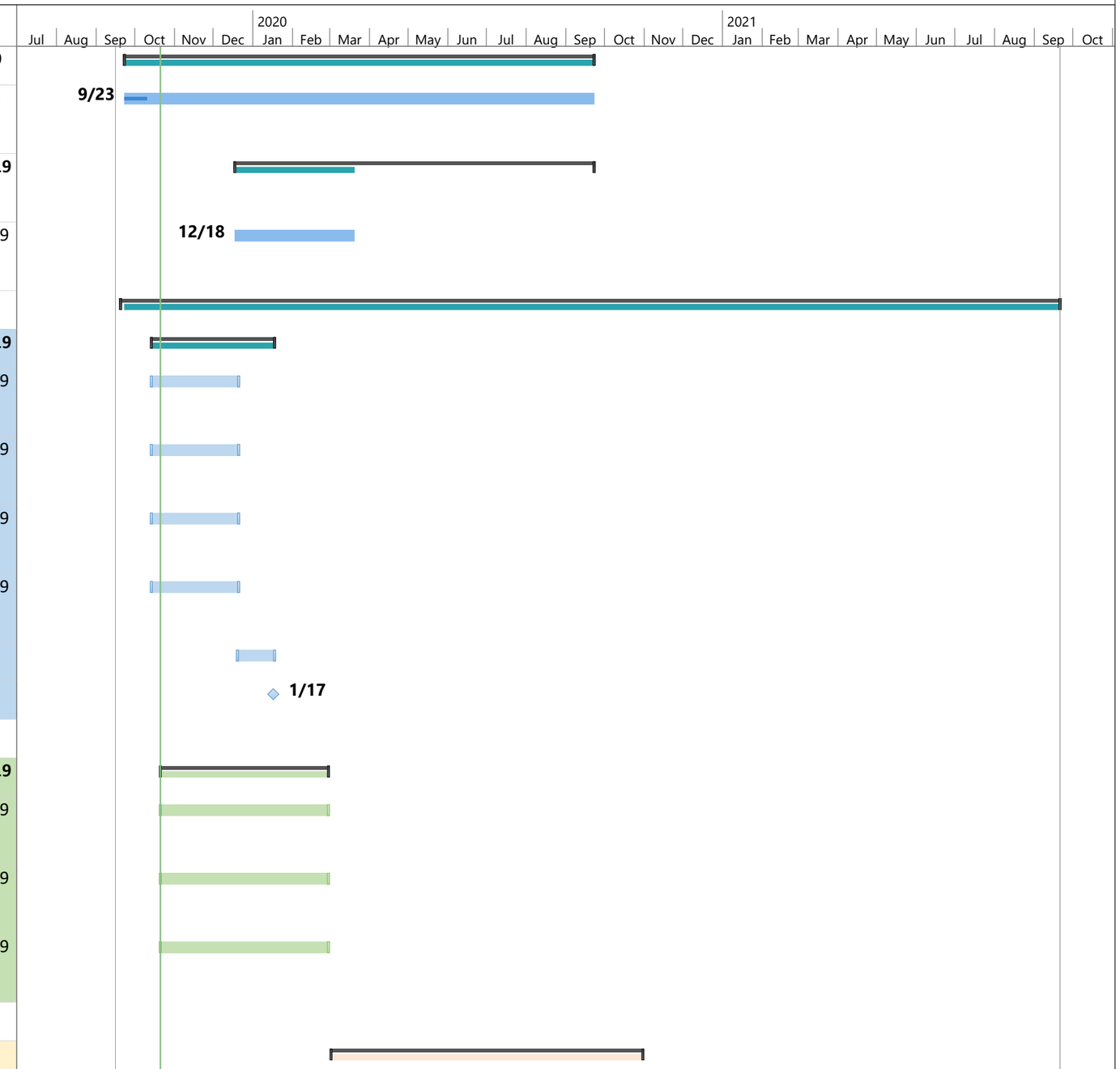
EMS Basin Study
Groundwater Modeling Sub-Team

ID		Text3	Line No.	Task Name	Duration	Work	Start
1				**Update Groundwater Model**	**262 days**	**26.5 hrs**	**Mon 9/23/19**
2				Update Groundwater Model (existing conditions)	262 days	26.5 hrs	Mon 9/23/19
3				**Run Groundwater Model with Climate Model**	**200 days?**	**36.64 hrs**	**Wed 12/18/19**
4				Run Climate Model (future scenarios)	67 days	0 hrs	Wed 12/18/19
5		**5.0**		**GW Tasks**	**522 days?**	**1,476 hrs**	**Fri 9/20/19**
6		**5.A**		**1. Compile Data**	**70 days?**	**369 hrs**	**Mon 10/14/19**
7		5.A.1	1	Obtain data from Reclamation and Pinal Partnership	50 days	240 hrs	Mon 10/14/19
8		5.A.1	2	Obtain data from ADWR databases	50 days	17 hrs	Mon 10/14/19
9		5.A.3	3	Coordination with CAP staff @ CAP:SAM model	50 days	24 hrs	Mon 10/14/19
10		5.A.5	5	Compile additonal data	50 days	32 hrs	Mon 10/14/19
11		5.A.6	6	Prepare Technical Memorandum	21 days	56 hrs	Fri 12/20/19
12			52	Technical Memorandum	0 days	0 hrs	Fri 1/17/20
13						0 hrs	
14		**5.B.1**		**2. Review ADWR Model**	**95 days?**	**58 hrs**	**Mon 10/21/19**
15		5.B.1.a	7	Review ADWR Pinal Model	95 days	48 hrs	Mon 10/21/19
16		5.B.1.b	8	Coordinate with ADWR @ updates to existing Pinal Model.	95 days	10 hrs	Mon 10/21/19
17		5.B.1.b	9	Document proposed revisions to existing ADWR Pinal Model	95 days	0 hrs	Mon 10/21/19
18						0 hrs	
19		**5.B.2**		**3. Update and Calibrate Model**	**175 days?**	**581 hrs**	**Mon 3/2/20**



Revised 10/21/2019

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ID		Text3	Line No.	Task Name	Duration	Work	Start
20		5.B.2.a.i	10	Review and update ADWR revised geology as needed.	87 days	42 hrs	Mon 3/2/20
21		5.B.2.a.iii	12	Identify wells drilled after 2009 in Pinal AMA	87 days	28 hrs	Mon 3/2/20
22		5.B.2.a.iii	13	Analyze driller logs and supporting geophysical logs	87 days	49 hrs	Mon 3/2/20
23		5.B.2.a.ii	11	Review gravity measurements and seismic data	87 days	9 hrs	Mon 3/2/20
24		5.B.2.b.i	14	Collect and analyze additional aquifer tests that were performed after 2009	87 days	34 hrs	Mon 3/2/20
25		5.B.2.b.ii	15	Investigate and potentially update values for vertical hydraulic conductivity.	87 days	21 hrs	Mon 3/2/20
26		5.B.2.b.iii	16	Coordinate and incorporate any additional aquifer test data.	87 days	7 hrs	Mon 3/2/20
27		5.B.2.c	17	Obtain updated reports from ADWRs RoGR database and use to update model.	87 days	33 hrs	Mon 3/2/20
28		5.B.2.c	18	Verify mode is using actual pumping rates	87 days	21 hrs	Mon 3/2/20
29		5.B.2.d	20	Review recharge components	87 days	33 hrs	Mon 3/2/20
30		5.B.2.d	21	Update model recharge components to current conditions.	87 days	10 hrs	Mon 3/2/20
31		5.B.2.d	25	Evaluate and revise lag times for agricultural recharge	87 days	42 hrs	Mon 3/2/20
32		5.B.2.g	28	Evaluate canal seepage	87 days	26 hrs	Mon 3/2/20
33		7.A	52	Technical Memorandum	87 days	8 hrs	Mon 3/2/20

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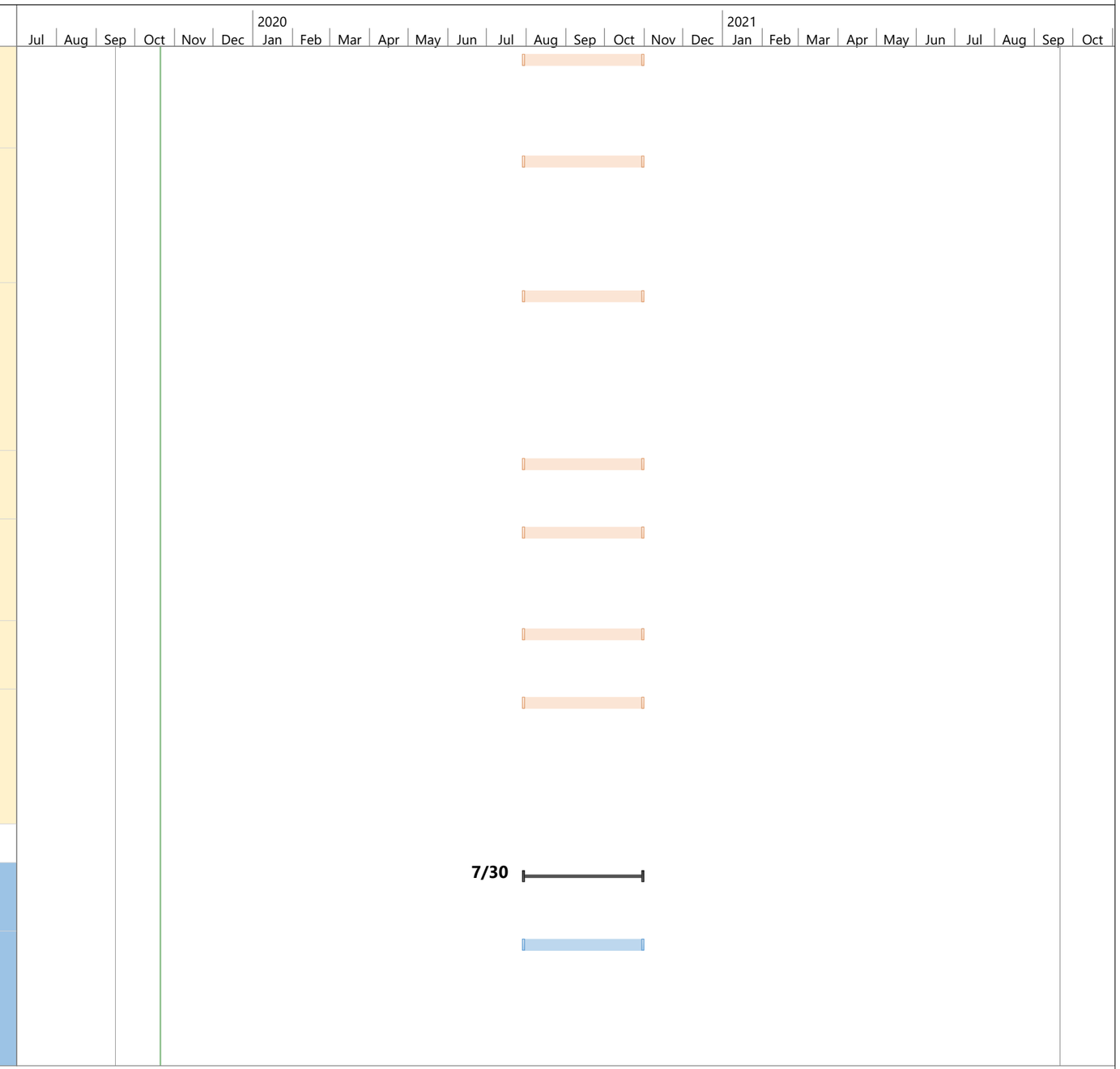
ID		Text3	Line No.	Task Name	Duration	Work	Start
34		5.B.2.i	31	Update model calibration targets (hydrographs) using ADWRs GWSI.	67 days	29 hrs	Thu 7/30/20
35		5.B.2.i	32	Work with Pinal Partnership and Reclamation on selecting the wells used for calibration targets on vertical hydraulic gradients.	67 days	28 hrs	Thu 7/30/20
36		5.B.2.j	33	Analyze water level measurements and develop water level contour maps with flow directions for UAU, MSCU, and LAU.	67 days	48 hrs	Thu 7/30/20
37		5.B.2.k	34	Obtain additional land subsidence data since 2009.	67 days	19 hrs	Thu 7/30/20
38		5.B.2.k	35	Prepare subsidence package outside of Groundwater Vistas program.	67 days	41 hrs	Thu 7/30/20
39		5.B.2.k	36	Update land subsidence targets for model calibrations.	67 days	21 hrs	Thu 7/30/20
40		5.B.2.m	39	Analyze observed versus simulated heads for transient state. Update and recalibrate Pinal model.	67 days	32 hrs	Thu 7/30/20
41						0 hrs	
42				**4. Develop future climate conditions model**	**67 days?**	**50 hrs**	**Thu 7/30/20**
43		5.A.4	4	Coordination with USBR Technical Services on incorporation of climate projections	67 days	14 hrs	Thu 7/30/20



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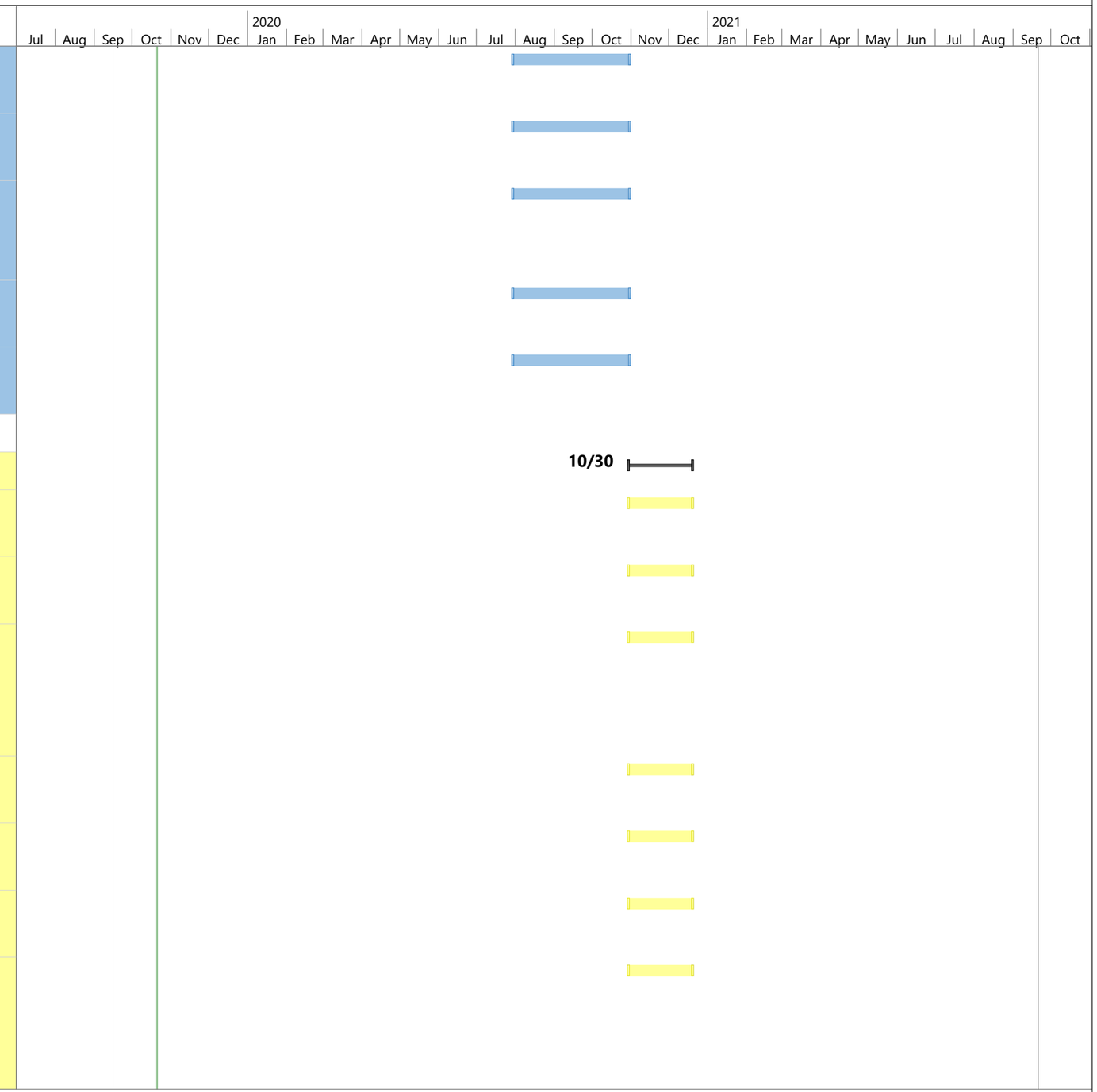
ID		Text3	Line No.	Task Name	Duration	Work	Start
44		5.B.2.d	22	Update Model using future recharge	67 days	0 hrs	Thu 7/30/20
45		5.B.2.d	24	Review and revise mountain front recharge due to climate change.	67 days	0 hrs	Thu 7/30/20
46		5.B.2.f	27	Evaluate changes of evapotranspiration to riparian vegetation	67 days	0 hrs	Thu 7/30/20
47		5.B.2.h	29	Update surface water boundaries for planning scenarios	67 days	25 hrs	Thu 7/30/20
48		5.B.2.h	30	Update all other boundary conditions	67 days	11 hrs	Thu 7/30/20
49						0 hrs	
50				**5. Planning Scenarios**	**36 days?**	**184 hrs**	**Fri 10/30/20**
51		5.B.2.c	19	Collect future pumping rates	37 days	11 hrs	Fri 10/30/20
52		5.B.2.d	23	Update Models future artificial recharge	37 days	25 hrs	Fri 10/30/20
53		5.B.2.e	26	Devise method or algorithm for converting agricultural use to municipal per growth projections.	37 days	50 hrs	Fri 10/30/20
54		5.C.	40	Develop five planning scenarios	37 days	25 hrs	Fri 10/30/20
55		5.C.	41	Run 5 planning scenarios with updated model.	37 days	24 hrs	Fri 10/30/20
56		5.B.2.l	37	Simulate land subsidence in model prediction scenarios.	37 days	11 hrs	Fri 10/30/20
57		5.B.2.l	38	Prepare maps of model predicted land subsidence for each planning scenario at selected years.	37 days	38 hrs	Fri 10/30/20



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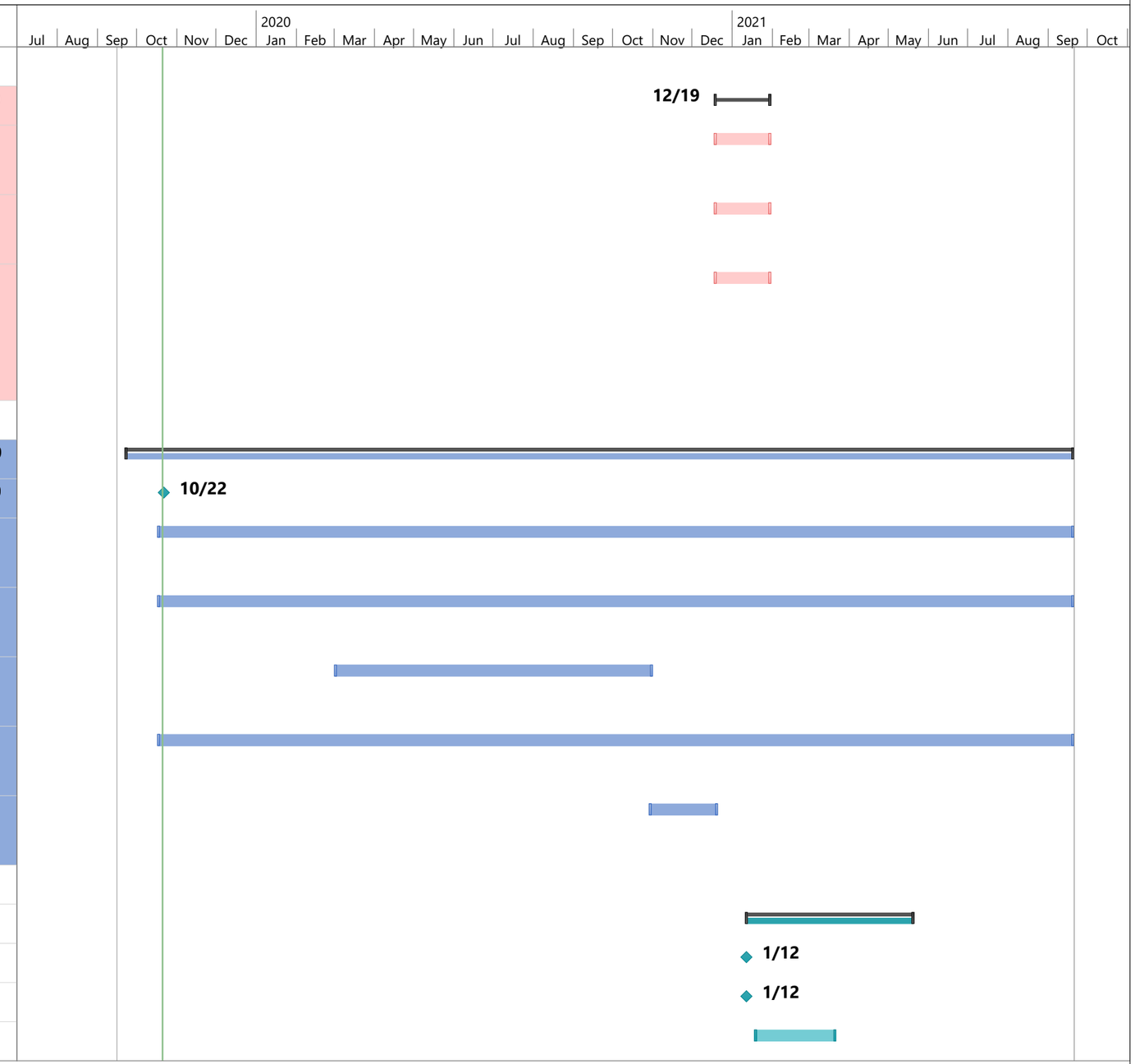
ID		Text3	Line No.	Task Name	Duration	Work	Start
58						0 hrs	
59				**6. Mitigation Strategies**	**30 days?**	**79 hrs**	**Sat 12/19/20**
60		5.D	42	Develop an array of adaptation and mitigation strategies	31 days	34 hrs	Sat 12/19/20
61		5.D	43	Refine adaptation strategies to three	31 days	21 hrs	Sat 12/19/20
62		5.D	44	Run model with one of the existing planning scenarios using each of the three adaptation strategies.	31 days	24 hrs	Sat 12/19/20
63						0 hrs	
64		**6.0**		**7. Meetings and Project Mgmt**	**521 days?**	**0 hrs**	**Mon 9/23/19**
65		6.A	45	Kick-off Meeting [1]	0 days	0 hrs	Tue 10/22/19
66		6.B	46	Monthly Updates/Summaries [24]	502 days	0 hrs	Fri 10/18/19
67		7.B	53	Biweekly Reports via Email	502 days	0 hrs	Fri 10/18/19
68		6.C	47	Meeting to review technical results of updated model [2]	175 days	0 hrs	Mon 3/2/20
69		6.D	48	Quarterly Meetings or Stakeholder Meetings [10]	502 days	0 hrs	Fri 10/18/19
70		6.E	49	Scenario Development Workshop [1]	37 days	0 hrs	Fri 10/30/20
71						0 hrs	
72		**7.0**		**8. Final Report**	**92 days**	**155 hrs**	**Tue 1/12/21**
73		6.F	50	Draft report presentation [1]	0 days	0 hrs	Tue 1/12/21
74		6.G	51	Final report presentation [1]	0 days	0 hrs	Tue 1/12/21
75		7.C	54	Draft Report	45 days	8 hrs	Tue 1/19/21



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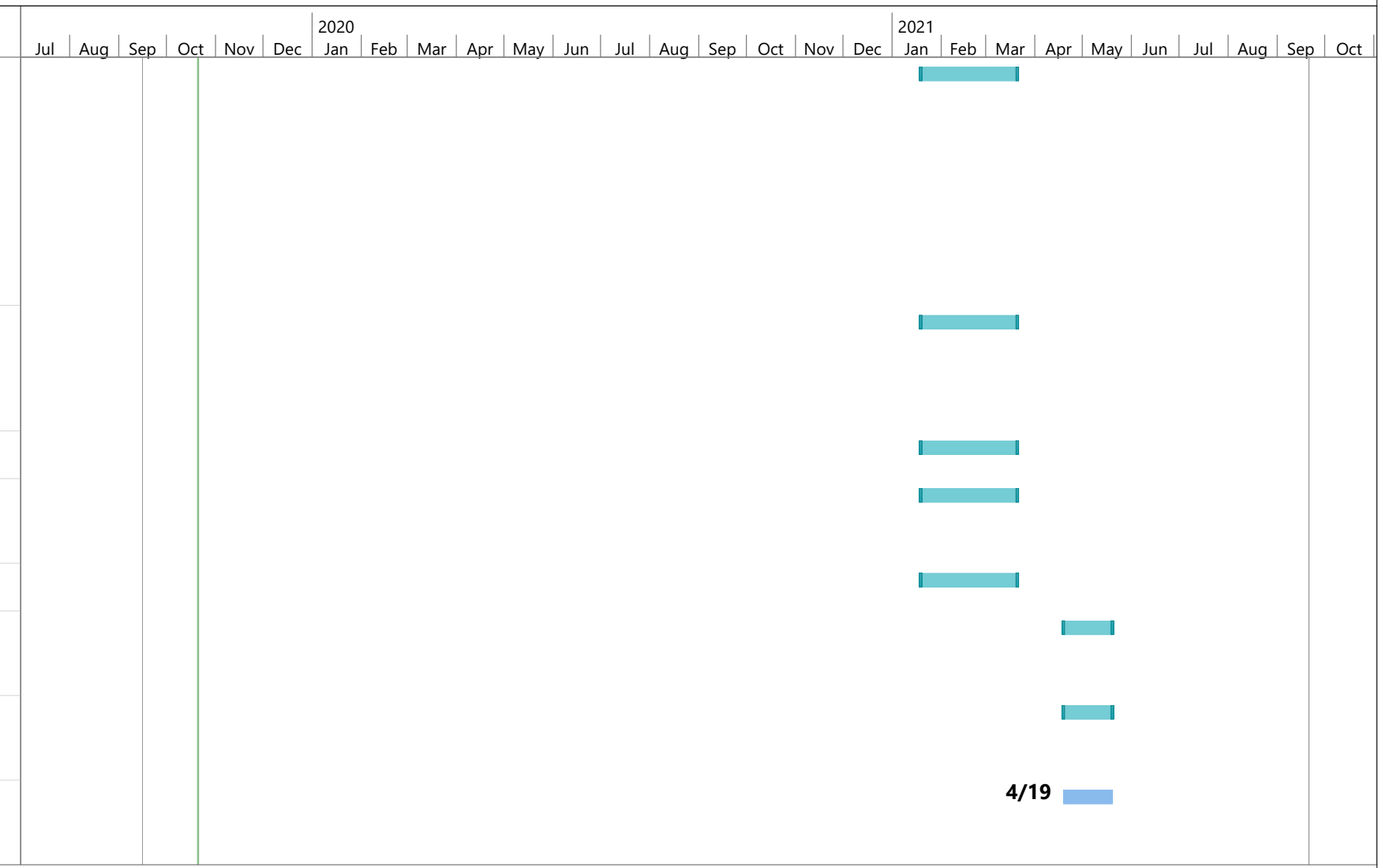
ID		Text3	Line No.	Task Name	Duration	Work	Start
76		7.C.1	55	Maps - depth to water, water level elevation through time, change in depth to water through time, pairwise comparison of scenarios	45 days	28 hrs	Tue 1/19/21
77		7.C.2	56	Preparation of representative hydrographs	45 days	25 hrs	Tue 1/19/21
78		7.C.3	57	Subsidence map	45 days	22 hrs	Tue 1/19/21
79		7.C.5	59	Summaries of sub-basin water budgets	45 days	22 hrs	Tue 1/19/21
80		7.D	60	Final Report	45 days	36 hrs	Tue 1/19/21
81		7.C.4	58	Prepare and format electronic files	23 days	4 hrs	Mon 4/19/21
82		7.E	61	Final electronic file of groundwater model	23 days	10 hrs	Mon 4/19/21
83				Groundwater Model Complete	23 days	184 hrs	Mon 4/19/21