

# Odell Dam Safety Analysis

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# Proposal Presentation

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- Project Understanding
- Scope of Services
- Project Schedule
- Proposed Budget



# Project Understanding

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- Background and Existing Conditions
- Stakeholders
- Constraints
- Approach



# Background & Existing Conditions

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- Location?
- Dam Type and Size?
- Dam Purpose?
- Why Hazardous?





# Stakeholders

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- Client – Mark Lamer
- Dam Owner – Pinewood Country Club, INC.
- Others





# Constraints

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- Weather hinders transportation and collection of data.
- Negligence of data collection.
- Human error.
- Lack of pre-existing data.



# Approach Techniques

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- Soil Analysis
- Survey Analysis
- Geotechnical Analysis
- Structural Analysis
- Hydraulic Analysis
- Failure Assessment



# Approach Questions

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- Pertinent Analysis Questions
  - Under what mode is the dam most likely to fail?
  - At what storm recurrence interval and discharge will cause the dam to fail?
  - What are the results of a dam failure?





# Scope of Services

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- Task 1 - Project Management
- Task 2 - SOTA Researching
- Task 3 - Site Inventory
- Task 4 - Geotechnical Analysis
- Task 5 - Watershed Analysis
- Task 6 - Dam Failure Analysis
- Task 7 - Modeling Dam Breach Inundation
- Task 8 - Final Reporting

# Task 1 – Project Management

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- Task 1.1 - Odell Dam Team Meetings
- Task 1.2 - Technical Adviser Meetings and Communication
- Task 1.3 - Client Meetings and Communication
- Task 1.4 - Communication with the Owners of Pinewood Country Club



# Task 2 – SOTA Researching

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- Task 2.1 - Light Detection and Ranging (LiDAR).
- Task 2.2 - Past Dam Failures.
- Task 2.3 - State and Federal Dam Safety References.
  - Federal Emergency Management Agency (FEMA).
  - Arizona Department of Water Resources (ADWR).
  - United States Army Corp of Engineers (USACE).
  - United States Geological Survey (USGS).

# Task 3 – Site Inventory

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- Land Survey
  - Cross Sections
  - Key Safety Deficiencies
  - Geometric Data





# Task 4 – Geotechnical Analysis

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- Soil Properties
  - Water Content
  - Specific Weight
  - Angle of Repose.



# Task 5 – Watershed Analysis

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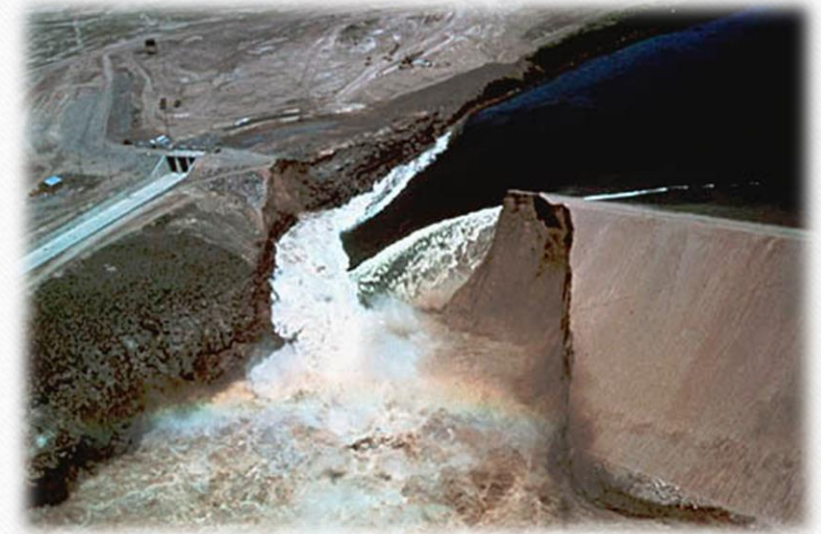
- Task 5.1 - Use of LiDAR.
- Task 5.2 - Determine Watershed.
- Task 5.3 - Determine Storm Recurrence Intervals (5, 10, 50, 100, 500, 1000 year).



# Task 6 – Dam Failure Analysis

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- Task 6.1 - Geotechnical Failure Analysis.
- Task 6.2 - Structural Failure Analysis.
- Task 6.3 - Hydraulic Failure Analysis.
- Task 6.4 - Dam Failure Probability.



# Task 7 – Modeling Dam Breach Inundation

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- Task 7.1 - Hydraulic Modeling Software.
- Task 7.2 - Determine properties below the water line.



# Task 8 – Final Reporting

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- Task 8.1 - Comprehensive Recommendation.
- Task 8.2 - Client Presentation/UGrads.
- Task 8.3 – Creation of Odell Dam website.



## Excluded Scope of Services

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- Full geotechnical evaluation of the dam.
- Full work of surveying data.
  - Topographic Survey retrieved by LiDAR data.
  - Full hydrographic survey.

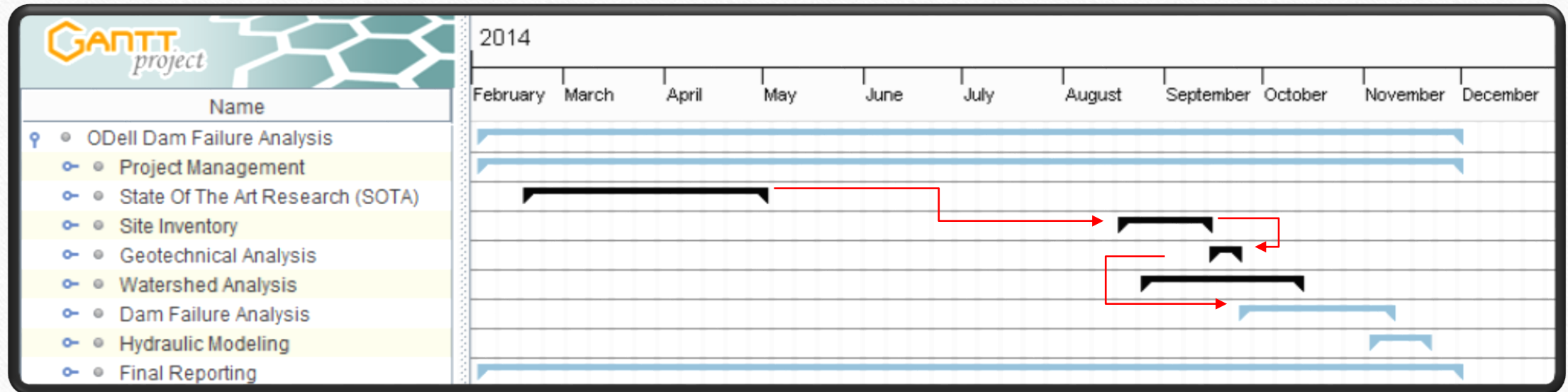


# Proposed Staffing Plan

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	Main Task	Task Lead	Student Engineers	Hours Per Person	Total Hours
1	Project Management	Braedan	Braedan, Sharlot, Ibrahim, Chandler, Yaowan	20	100
2	SOTA	Sharlot	Braedan, Sharlot, Ibrahim, Chandler, Yaowan	8	40
3	Site Inventory	Chandler	Braedan, Chandler, Ibrahim	53.33	160
4	Geotechnical Analysis	Braedan	Braedan, Sharlot	50	100
5	Watershed Analysis	Ibrahim	Ibrahim, Chandler	50	100
6	Dam Failure Analysis	Yaowan	Chandler, Yaowan	50	100
7	Hydraulic Modeling	Chandler	Chandler, Braedan	60	120
8	Final Reporting	Braedan	Braedan, Sharlot, Ibrahim, Chandler, Yaowan	30	150
<b>Total Hours:</b>					<b>870</b>

# Project Schedule - Gantt Chart





# Proposed Budget per Job Title

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Task	Total hours	Base pay	Benefits %	Actual Pay	Profit %	Billable Per Hour	Total
General Engineer	283.33	\$ 45.00	50	\$ 67.50	20	\$ 81.00	\$ 22,950.00
Geotechnical	183.33	\$ 50.00	50	\$ 75.00	20	\$ 90.00	\$ 16,500.00
Hydraulic	303.33	\$ 50.00	50	\$ 75.00	20	\$ 90.00	\$ 27,300.00
Total	770.00						\$ 80,100.00

# Proposed Budget per Task Lasting

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Task	Total hours	Group	Cost per task	Billable + 20% profit
SOTA	40	G. Engineer	\$ 3,240.00	\$ 3,888.00
Site Inventory	160	G. Engineer	\$ 12,960.00	\$ 15,552.00
Geotechnical	100	Geotechnical	\$ 9,000.00	\$ 10,800.00
Watershed	100	Hydraulic	\$ 9,000.00	\$ 10,800.00
Dam Failure	100	Geotech/Hydraulic/G. Engineer	\$ 8,700.00	\$ 10,440.00
Modeling	120	Hydraulic	\$ 10,800.00	\$ 12,960.00
Final Reporting	150	Geotech/Hydraulic/G. Engineer	\$ 13,050.00	\$ 15,660.00
<b>Total</b>	<b>770</b>			<b>\$ 80,100.00</b>



# Questions?

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