

Technical Reviewers' Rating Summary

Proposal Number	G-034-09	Application Title	Aerial Pipeline Inspection	Submitted By
Double M Helicopters, Inc. 10	Request For	\$575,000.00	Total Project Costs	
		\$2,350,000.00		

Section A. Scoring

Statement	Weighting Factor	G-34-09A	G-034-09C	Average Weighted Score
1. Objectives	9	3	4	27
2. Achievability	7	3	3	21
3. Methodology	8	3	4	24
4. Contribution	8	4	4	32
5. Awareness / Background	5	3	4	15
6. Project Management	3	2	3	6
7. Equipment / Facilities	2	3	5	8
8. Value / Industry - Budget	4	3	5	16
9. Financial Match - Budget	4	3	5	16
Average Weighted Score		155	200	177
	Total: 50			250 possible points

OVERALL RECOMMENDATION

FUND		X
FUNDING TO BE CONSIDERED	X	
DO NOT FUND		

Section B. Ratings and Comments

- The objectives or goals of the proposed project with respect to clarity and consistency with North Dakota Industrial Commission/Oil and Gas Research Council goals are:

I think the research goals of the equipment and technology are well stated and worth pursuit. The part that is unclear to me is who the project work will be performed for and who would be entitled to the data.

- Reviewer: G-34-09A
- Rating: 3

Environmentally the project scope aligns with the goals of the OGRC by minimizing spill volumes through early detection. The project utilizes aerial surveillance along with a video camera for thermal imaging and laser technology to detect, measure and quantify hydrocarbon releases.

- Reviewer: G-034-09C

- Rating: 4

2. With the approach suggested and time and budget available, the objectives are:

Will depend on flyable days over the course of the project, but with a large window of 12-18 months, it should be achievable.

- Reviewer: G-34-09A

- Rating: 3

The project timetable is dependent on flyable days and equipment maintenance. Weather could have an impact on the timetable. Also, equipment maintenance is unknown.

- Reviewer: G-034-09C

- Rating: 3

3. The quality of the methodology displayed in the proposal is:

I like the concept. I think the use of the latest technology to detect hydrocarbons is good. The use of helicopters to get closer to the ground while inspecting is also good. This should be better than higher altitude surveillance with fixed wing aircraft. I would be concerned with who the gathered data is given to other than the company that owns the pipeline or a regulatory agency that has jurisdiction over the pipeline.

- Reviewer: G-34-09A

- Rating: 3

The methodology identifies the technology required (video and laser) to detect and identify hydrocarbon emissions. The technology can identify the chemical composition of fugitive emissions, and quantify parts per million present at that location. Suspect fugitive emissions will be reported immediately. Data collected will be compared to the prior years spill data. Pipeline companies will have access to the data.

- Reviewer: G-034-09C

- Rating: 4

4. The scientific and/or technical contribution of the proposed work to specifically address North Dakota Industrial Commission/Oil and Gas Research Council goals will likely be:

If this technology proves out, it could be very beneficial to the industry and regulatory agencies. Early detection of hydrocarbon leakage will surely lead to reduced contamination and remediation costs.

- Reviewer: G-34-09A

- Rating: 4

The project aligns with the OGRC goal relating to environmental impact. This project has the potential to detect spills early and mitigate environmental impacts.

- Reviewer: G-034-09C

- Rating: 4

5. The background of the principal investigator and the awareness of current research activity and published literature as evidenced by literature referenced and its interpretation and by the reference to unpublished research related to the proposal is:

Great qualifications for operating the helicopter and its equipment packages. I didn't see a lot of knowledge about the pipeline industry or how it operates. It was more of a regulatory approach.

- Reviewer: G-34-09A

- Rating: 3

There are technical qualifications and expertise relating to helicopter operations, safety, health, and hazardous materials response and law enforcement. The video and laser equipment operations will be addressed in the OEM training (as per budget).

- Reviewer: G-034-09C

- Rating: 4

6. The project management plan, including a well-defined milestone chart, schedule, financial plan, and plan for communications among the investigators and subcontractors, if any, is:

Would have liked to see a more detailed plan with a GANTT chart or something similar to how the work in the six identified sectors would be carried out. It basically just stated it would take 12-18 months depending on flyable days per month. It was pretty generic.

- Reviewer: G-34-09A

- Rating: 2

A timetable is provided but there was no milestone chart submitted. A budget summary is included.

- Reviewer: G-034-09C

- Rating: 3

7. The proposed purchase of equipment and the facilities available is:

Equipment to be used appears to be good quality.

- Reviewer: G-34-09A

- Rating: 3

The project is dependent on purchasing the FLIR 8000E video camera and the Boreal Gas Finder AB laser equipment. Both are critical to early detection of spills.

- Reviewer: G-034-09C

- Rating: 5

8. The proposed budget "value"¹ relative to the outlined work and the commitment from other sources is of:

Under the Budget section in the report it states in the wording that the project will cost \$1.235-million. The table with the dollar numbers adds up to \$2.35-million as well as this number being stated a couple times in the beginning of the application. I assume this is just a typo? In-kind commitment was a high dollar value. Would have liked to see more of a breakdown of how this number was determined as 300 hrs times \$1,500/hr for a helicopter as expressed in Appendix A is only \$450,000.

- Reviewer: G-34-09A

- Rating: 3

The applicant's in-kind share is \$1.2M and other project sponsor's share is \$575,000.

- Reviewer: G-034-09C

- Rating: 5

9. The “financial commitment”² from other sources in terms of “match funding” have been identified:

No comment

- Reviewer: G-34-09A

- Rating: 3

Same as #8.

- Reviewer: G-034-09C

- Rating: 5

1 “value” – The value of the projected work and technical outcome for the budgeted amount of the project, based on your estimate of what the work might cost in research settings with which you are familiar. A commitment of support from industry partners equates to a higher value.

2 “financial commitment” from other sources – A minimum of 50% of the total project must come from other sources to meet the program guidelines. Support less than 50% from Industrial Commission sources should be evaluated as favorable to the application; industry partnerships equates to increased favorability.

General Comments

I like the concept. As one who has used aerial monitoring in my previous jobs, I have always believed helicopters to be the best choice for aerial surveillance. I am unclear as to who this work is supposed to be done for as part of this project. Is it for a regulatory group to sponsor this or specific companies? If all the pipelines in ND (shown on the maps included) are to be investigated, have these companies been contacted and agreed to that? I don't know who would have the legal authority to do all these various pipelines other than a regulatory agency as most companies do these as part of their business. It may be better to try and prove the technology by getting one of the major companies who operates one of these pipelines to partner with this project.

- Reviewer: G-34-09A

Merits: Many operators currently utilize fly over surveillance. This project incorporates the technology of video and laser. The video can detect a pipeline anomaly and the laser technology can identify emission levels. The result is an increase of spill detection by identifying small spills undiscovered by current fly over methods. Early spill detection should result in less pipeline and production downtime. It also has the potential to mitigate the spill volume and environmental impact. Questions & Concerns: Spill detection is dependent on weather. Real time surveillance is limited to actual flight time and dependent on the frequency of flight schedule. The project states that the data will be available to pipeline companies. It does not state how it will be available, i.e. through the Internet, webpage. Is the technology limited to hydrocarbon releases? Can it identify produced water releases? How does snow cover or adverse weather affect spill detection?

- Reviewer: G-034-09C