



Optimizing Oil- Change Intervals



Technical POC:
Code ESC421
(805) 982-1340

Management POC:
Code ESC45
(805) 982-1674

Innovation...

Leadership...

Performance

6/3/2004

- Optimize oil-change intervals of Navy vehicles to reduce HW disposal and O&M costs
- Minimize oily waste generation from Vehicle Maintenance Facilities
- Develop optimum vehicle preventive maintenance (PM) program



2.III.01.b Advanced Control and
Destruction Capability for Hazardous
Waste (HW)
Priority: High



3.I.13.a Reuse/Recycle of
Hazardous/Polluting Material
Priority: High



- The Navy generates over a million gallons of used POL annually



- High maintenance and disposal costs



Project Approach:

- Research Technologies
- Choose most promising
- Test/Demonstrate in the field
- Tech Transfer

Technical Objectives:

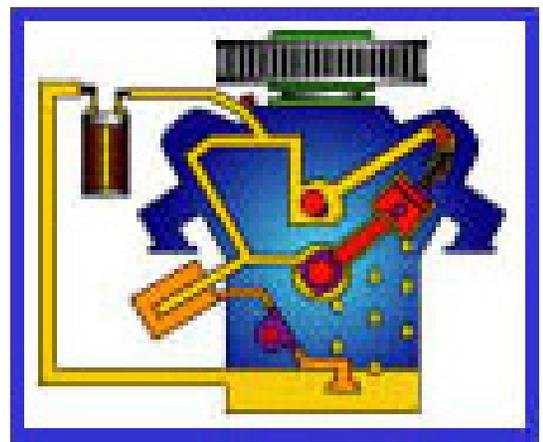
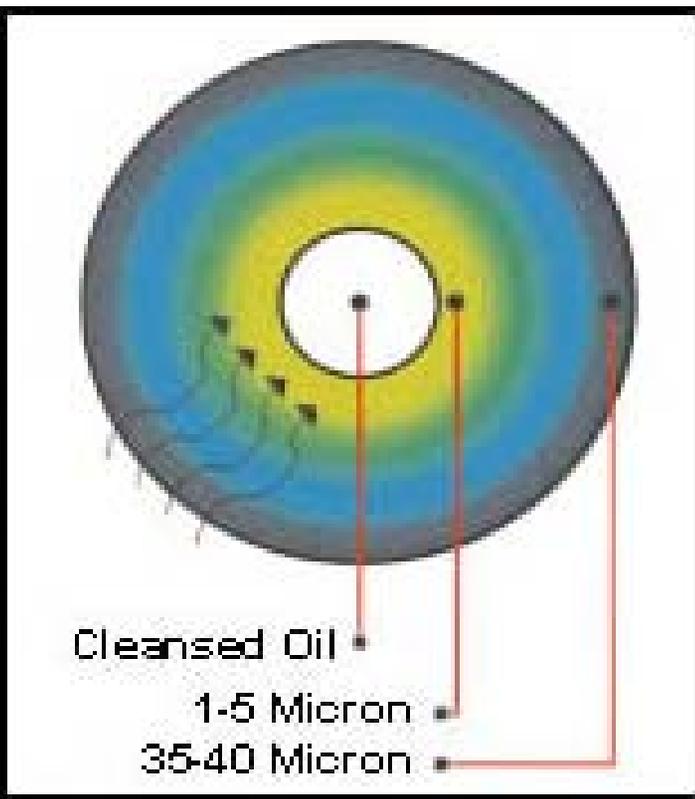
- Apply and implement technologies to minimize oily waste generated at Navy Vehicle Maintenance Facilities
- Reduce operational, maintenance and disposal costs.

Technologies Screened:

- By-pass oil filters
- Full-flow vortex oil filters
- Synthetic oil
- Onsite oil condition sensor/monitor

Sources of Technologies:

- Industry
- ONR/NAVSEA
- Army TARDEC



Oil Guard By-pass oil filter



Lubri-Sensor



Oil Insyte by Volker Sensor Inc.

Condition Parameters for Extending Change Intervals:

- Viscosity
- Total Base Number (TBN)
- Soot

Current Practice

- Petroleum oil and standard filter
- OEM recommended schedule (e.g. every 8,000 miles)

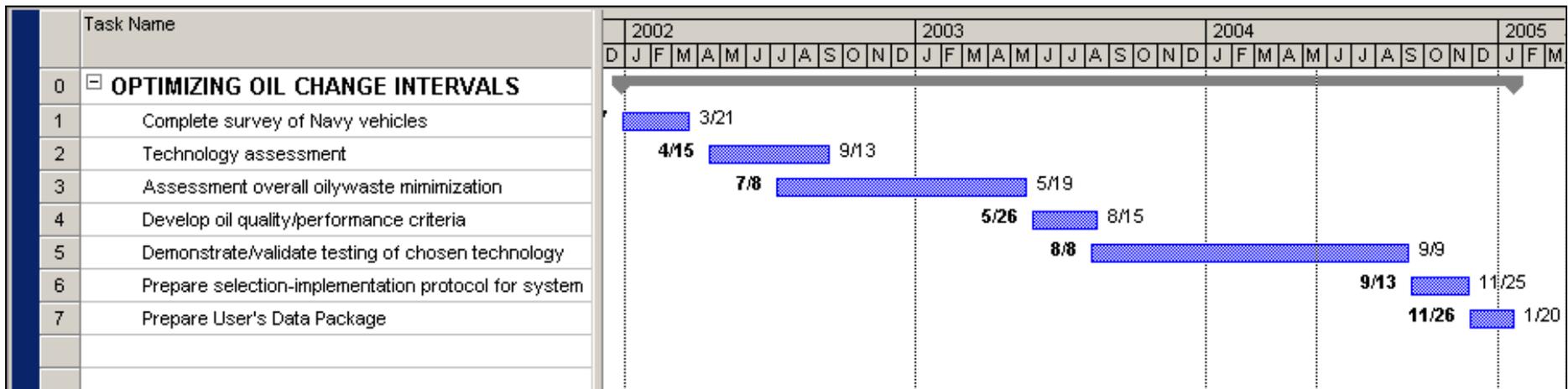


Proposed Solution

- Condition based oil maintenance to minimize oily waste generation
- Increase engine life, availability and reliability
- Reduce operational and maintenance costs
- Oil life extension 2-3 fold
- Payback < 3yrs

Status Quo vs. Condition Base w/ Bypass (Double Oil Life)

Item	Status Quo	Bypass Filter w/ In-Shop Analysis
	\$K	\$K
Capital Costs		
RDT&E	0	565
Material (23,500 vehicles)	0	5875
Installation	0	1175
total	0	7615
Annual Costs		
Oil Change and Disposal	2820	1410
total	2820	1410
Annualized capital cost @ 4%, 10 yrs	0.0	923.9
Total annual cost	2820.0	2333.9
PW of savings (4%, 10 Yr)		3942.5
Savings/R&D Investment Ratio (ROI)		7.0



- San Diego, PWC Transportation Dept, Mr. Mike Malaca
- Camp Pendleton, Mr. Mitch Maynard
- 31st Naval Construction Regiment, Equipment Officer CWO2 Matthew Kiefer
- Army Tank Automotive Research, Development and Engineering Center (TARDEC), Mr. Steve Moyer

- Surveyed Navy vehicles and current practice
 - OEM recommended intervals
 - Some using By-pass filter but w/ no onsite oil analysis
 - GSA
 - Identified oilywaste type
- Technology Assessment

- Oil quality criteria
 - Viscosity: 10W30 oil, 9.3 – 12.5 cSt (gasoline)
15W40 oil, 9.3 – 16.3 cSt (diesel)
 - TBN > 3 (want TBN to be high)
 - Soot (diesel engines) < 4%
- Dem/Val
 - Procured Bypass filtration & oil condition monitor system
 - Selected test site & vehicles
 - Test Plan
 - Installed By-pass filters at PWC San Diego

San Diego PWC Transportation Dept.

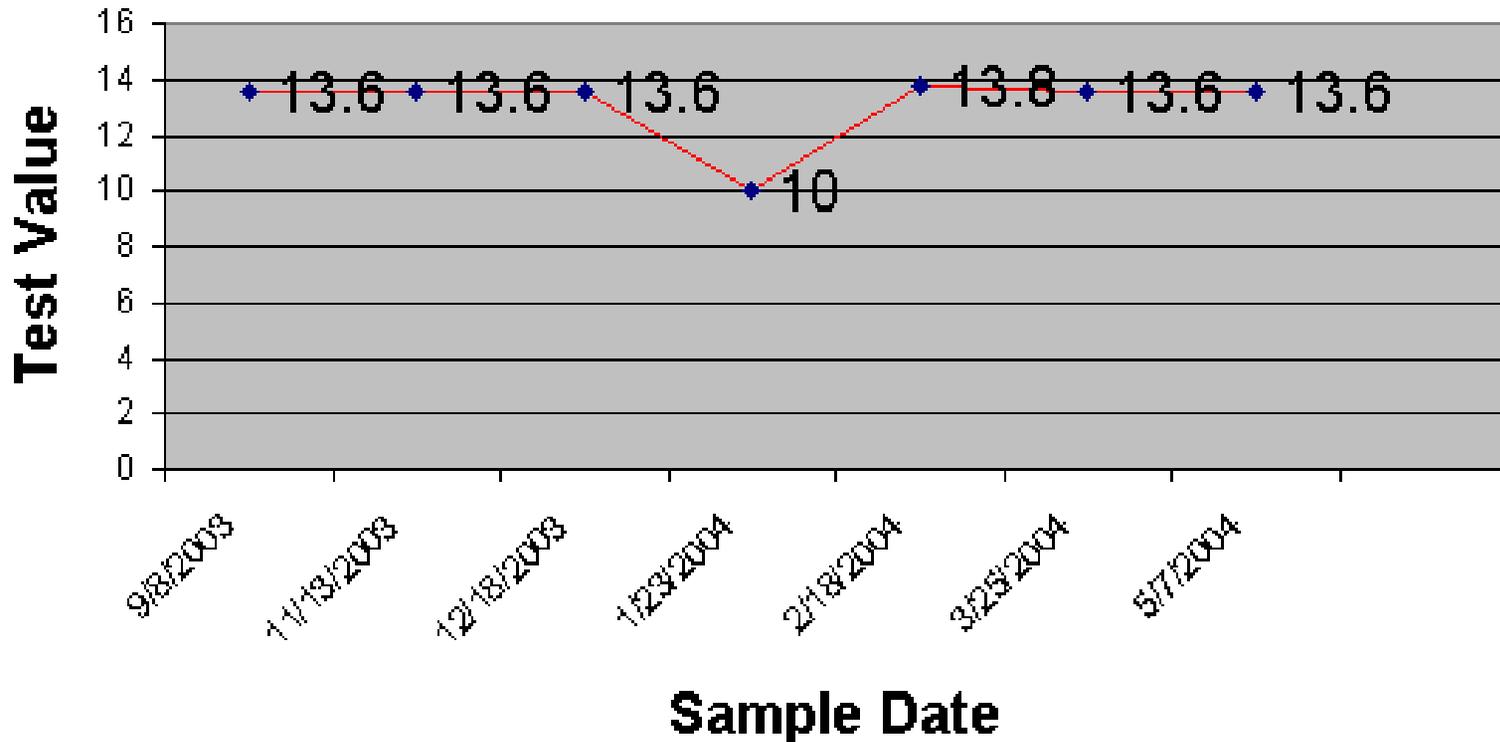


Identified vehicle maintenance facility oilywaste types:

1. Used motor oil
2. Contaminated diesel fuel
3. Used transmission fluid
4. Hydraulic oil
5. Oil & fuel filters
6. Contaminated oil
7. Contaminated gasoline
8. Brake fluid
9. Grease
10. Anti-freeze

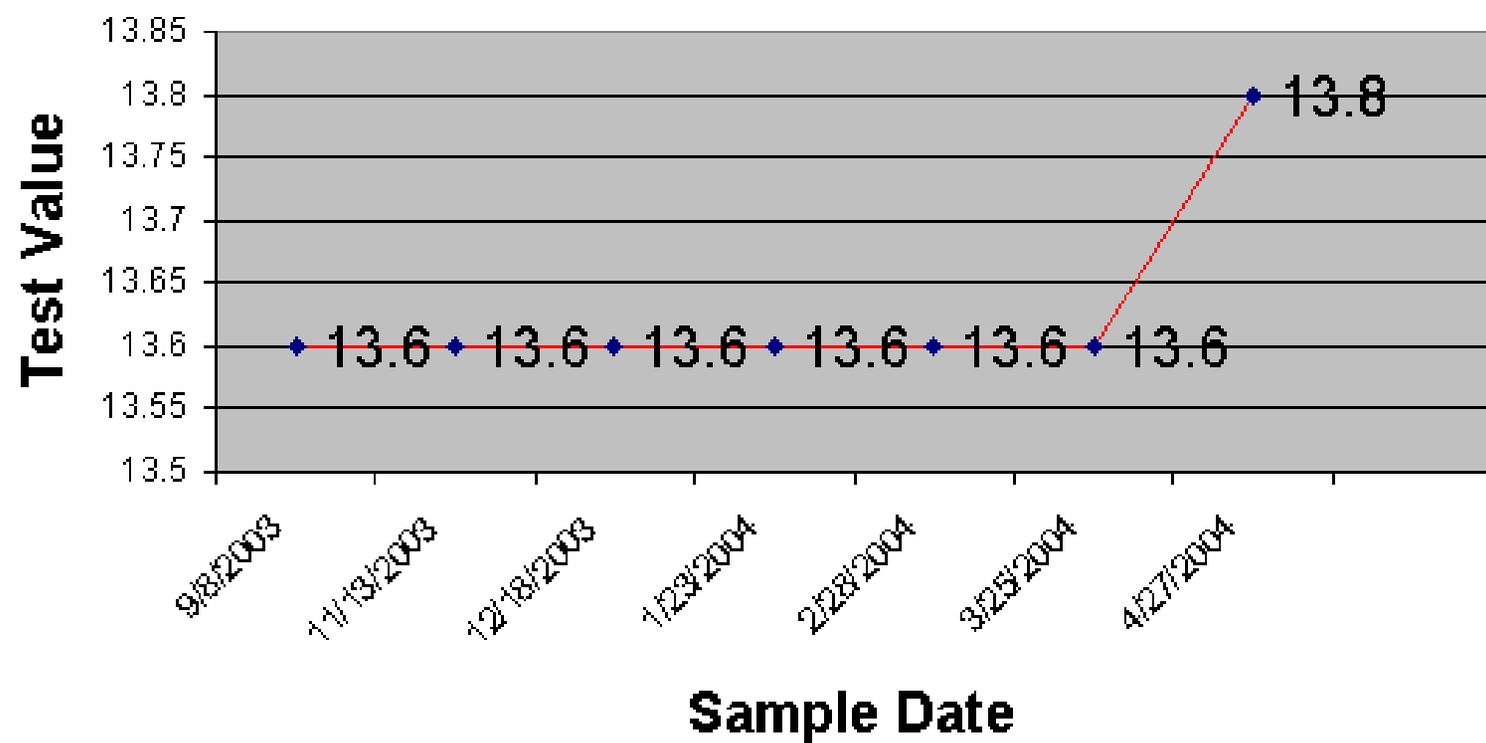
Chevy Express Van (#93-35498)
(5,407 miles)

Result History for VISC100c



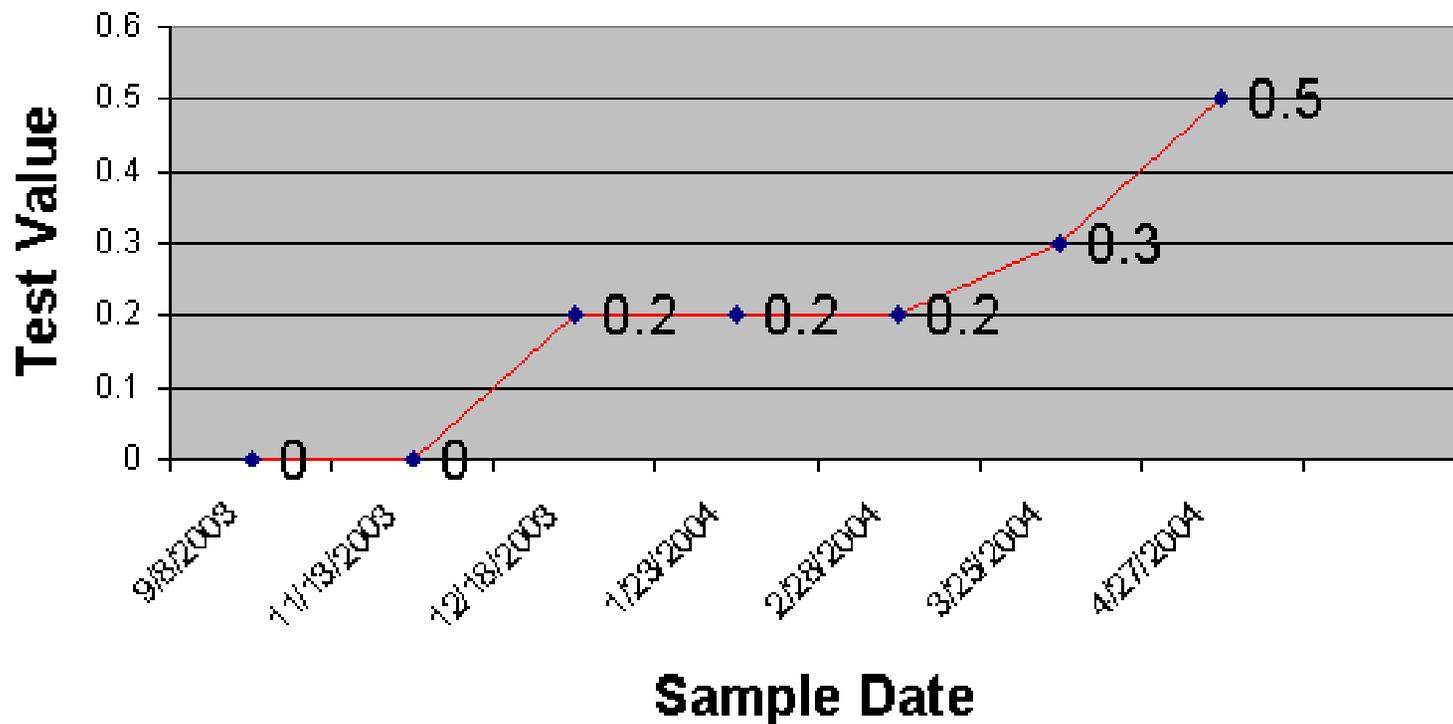
**Cummins Diesel (#58-02531)
(8,861 miles)**

Result History for VISC100c



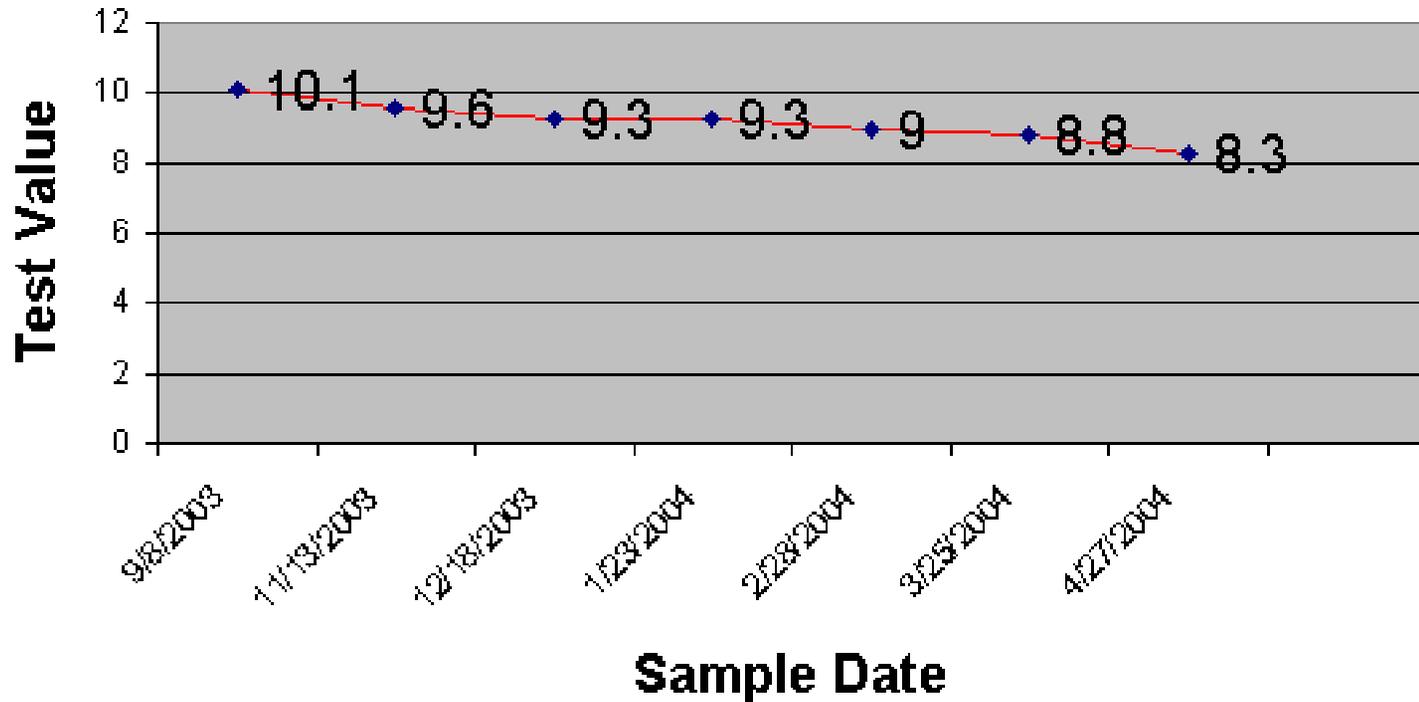
Cummins Diesel (#58-02532)
(8,913 miles)

Result History for SOOT



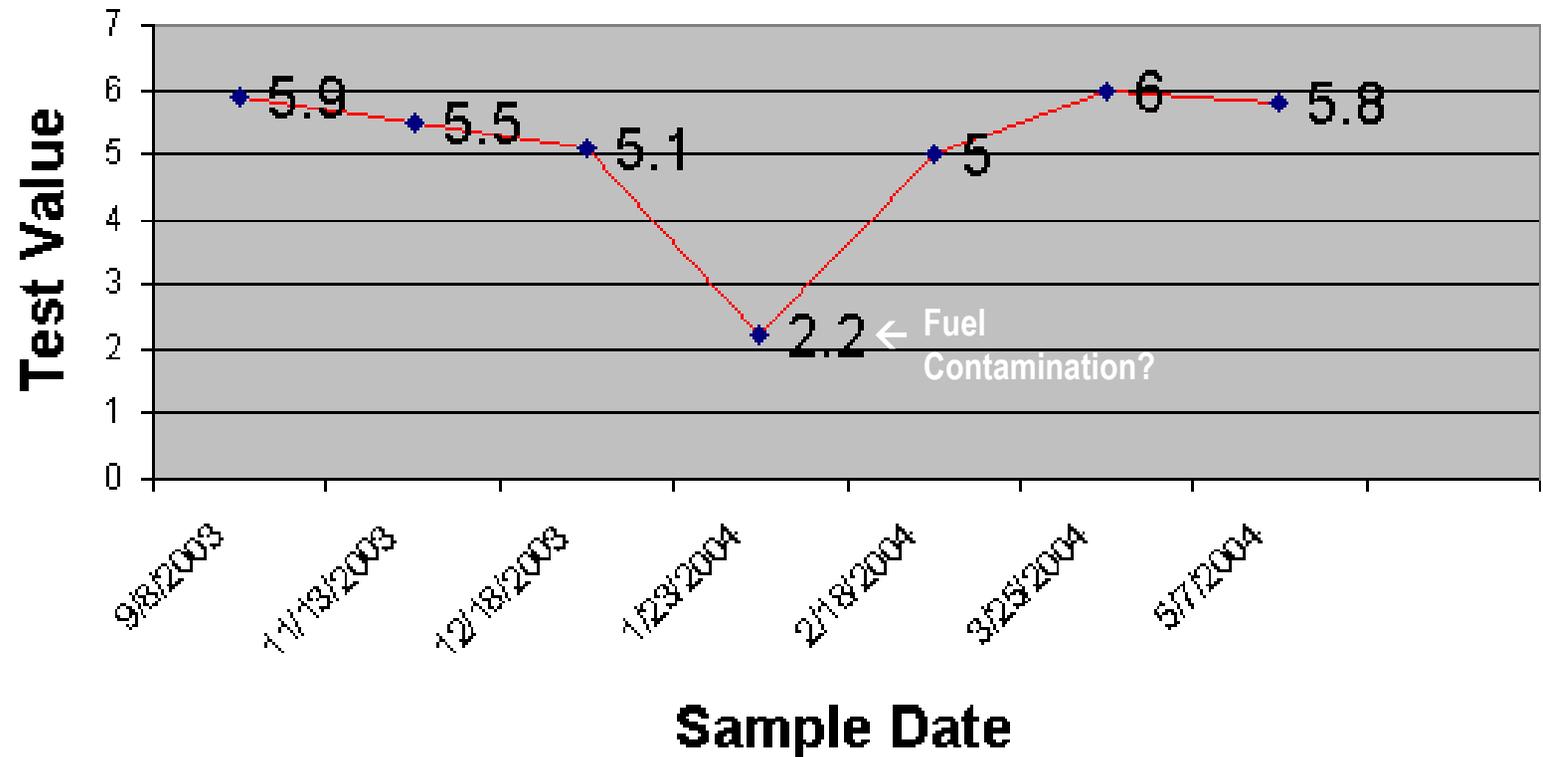
Cummins Diesel (#58-02531)

Result History for TBN



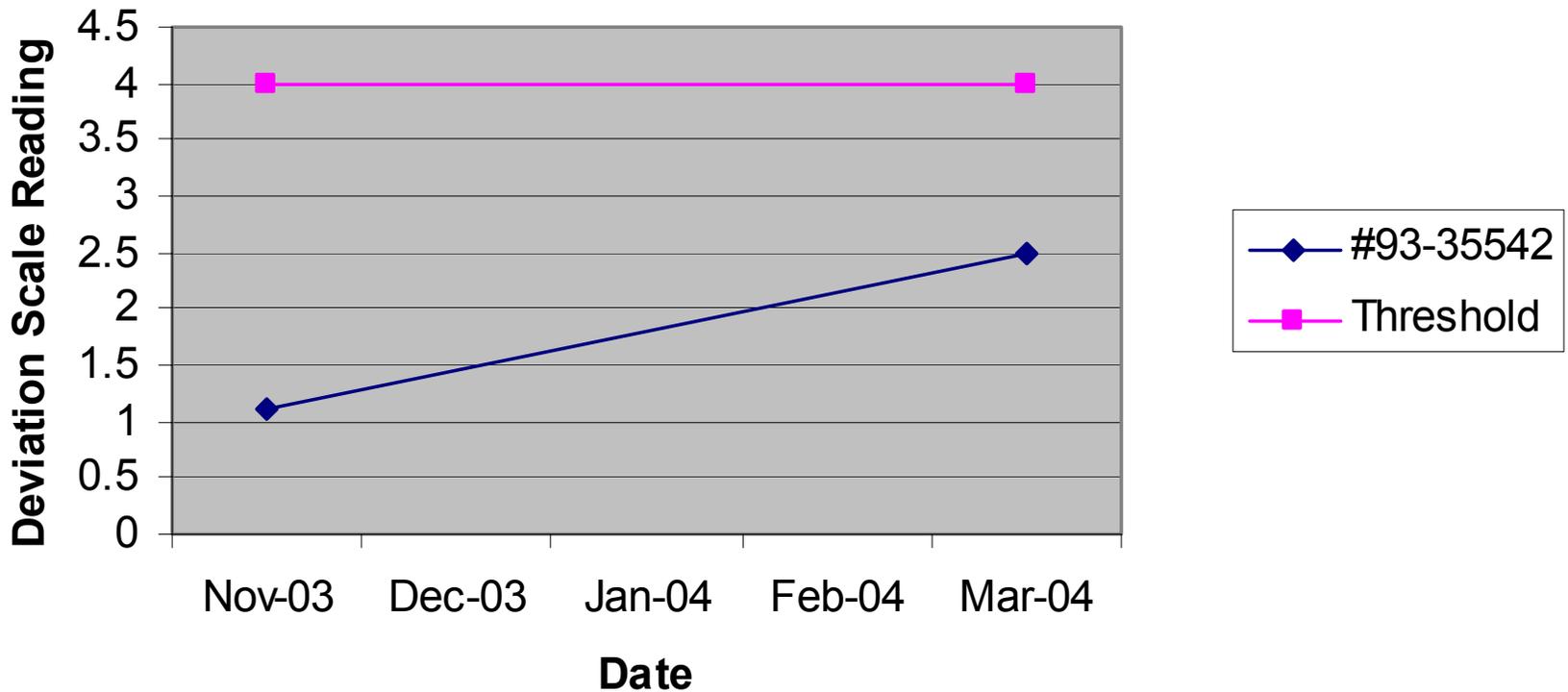
Chevy Express Van (#93-35498)
(5,407 miles)

Result History for TBN



Chevy Express Van (#93-35542) (4,248 miles)

Lubri-Sensor



- 1. Coordinated with NAVSEA, PWC, EFDs, GSA, and ARMY**
- 2. Private sector sensor developers**
- 3. ESC Tech Implementation Team**

Navy Benefits	Navy will reduce procurement, maintenance and disposal costs
Customer Capability	Improved capability through better equipment reliability
Products	Technology and maintenance management implementation
Project Milestones	MS 4 (Q4,FY04). Demonstrate/validate chosen technologies

- Reduce used oil disposal cost by extending oil change intervals by 2-3 fold
- Improve equipment reliability and availability
- Minimize oilywaste from vehicle maintenance facilities
- Reduce overall O&M cost on vehicles





*"Tomorrow's Solutions
Today"*



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