

Clean Diesel ClearingHouse<sup>SM</sup> (CDCH<sup>SM</sup>)

*Support for Addressing Nonroad  
Retrofit Challenges*

---

[www.cleandieselclearinghouse.org](http://www.cleandieselclearinghouse.org)

Susan S. Stephenson, Project Manager  
*Emissions Advantage*

ssstephenson@emissionsadvantage.org  
443-510-6911

---

May 31, 2012

*West Coast Collaborative Partners Meeting*

- Established in 2003 to provide education, training, program development, and financial and technical assistance to those involved in developing/implementing strategies to reduce pollutant emissions, greenhouse gases, and fuel/energy consumption from vehicles, engines and equipment
- Driven by client requests/interests, EA was “transformed” to non-profit operation in January, 2011.
- Clients include U.S. EPA, state/local governments, fleet operators, industrial producers, NGOs/community groups, regional environmental agencies, air quality officials, school districts, SEP grant recipients, Native American organizations and others

- Hands-on experience in development/application of retrofit emission control technology, and implementation and operational support for low emission technologies in a wide range of fleet applications throughout the U.S. and internationally
- EA's three founding principals, collectively have over 100 years of experience in vehicle emission control, and extensive experience in development and implementation of diesel engine emission reduction/retrofit programs
- Throughout the U.S., on-road vehicles and nonroad equipment of various types (including construction equipment, materials handling equipment, turf maintenance equipment, marine vessels, et. al.) involved in diesel emission reduction projects undertaken by EA number in the thousands

- Development and evaluation of program mission requirements and priorities
- Analysis of practical options for reducing emissions and fuel consumption from existing engines, vehicles and equipment
- Emission/fuel reduction program design and development of implementation plans
- Recruiting interested engine/vehicle/equipment operators to participate in voluntary programs and in public outreach
- Analysis of stakeholder needs and development of education and outreach tools to support their needs
- Acquisition and application of funding for program/project implementation

Comprehensive, interactive training approach for those involved in planning and implementing programs to reduce emissions and fuel use from existing engines and for fleet operators and technicians that are, or may become involved with these emission reduction activities.

Hundreds of attendees have included representatives from:

- Federal (including EPA and FHWA), regional, state and local air quality agencies
- Federal, state, and local transportation agencies
- Metropolitan and regional planning organizations
- International, state, municipal and tribal government officials
- Fleet owners, technicians, and operators
- Marine port and airport authorities
- National and state industry trade associations
- National, regional, state and local community/environmental groups
- Retrofit product manufacturers, dealers and installers

# CDCH Background - NYSERDA Initiative

---

- Need for a diesel retrofit clearinghouse arose from discussions with several New York State agencies and other entities with common interests/problems related to retrofit product selection and monitoring compliance with Best Available Technology (BAT) regulations
- Approached the New York State Energy Research and Development Authority (NYSERDA) to provide funding to seed the development of what has become the CDCH
- Issued RFP for program/database/clearinghouse development
- Contract awarded to Emissions Advantage team from competitive proposal/interview selection process

# CDCH Goal

---

Create a useful, web-based, clearinghouse that will provide users with the ability to ascertain approved Best Available Technology (BAT) for construction equipment applications in NYS, by approving entity, that can:

- Serve the compliance monitoring needs of New York State agencies and additional benefits to vehicle/ equipment operators, retrofit product manufacturers and others
- Be expanded geographically (including internationally)
- Be broadened to cover other air quality improvement program needs, and other nonroad/on-road applications
- Become self sustaining based on demonstrated value

# CDCH

## CLEAN DIESEL CLEARINGHOUSE



### ABOUT the Clean Diesel ClearingHouse

The CDCH is a trusted, web-based tool that enables users to determine the best available emission reduction technology (BAT), including verified products (and other product options allowed by specific program requirements) for retrofitting diesel-powered vehicles and equipment.

The CDCH can be used to support retrofit product selections that satisfy BAT regulations, as well as voluntary emission reduction program requirements. It is under development and is expected to be available for use in Summer 2012.

[Home](#)[Technologies](#)[Projects](#)[Guidance](#)[BAT Information](#)[Background](#)

### Search For Retrofit Options

Simple –

Obtain information on diesel retrofit products available to satisfy regulatory agency or voluntary program emission reduction requirements.

Detailed –

Submit or update fleet profile or vehicle/equipment characteristics in order to select retrofit products.

### Submit Compliance Report

- Submit required reports to monitoring organizations.

### Access Compliance Reports

- Review and analyze required reports from contractors and project participants.



# Project Advisory Group (PAG)

---

Formed to allow NYSERDA and CDCH development team to:

- Receive broad range of national-level input on CDCH design, content and use functions.
- Provide input/guidance for guiding expansion needs for CDCH content and geographic domain
- Disseminate information about the CDCH and make stakeholders/constituencies aware of its availability
- Assist in identifying sources for and/or providing data on mandatory and voluntary diesel emission reduction programs

# CDCH Project Advisory Group

---

American Association of Port Authorities  
California Air Resources Board  
Diesel Technology Forum  
Manufacturers of Emission Controls Association  
Natural Resources Defense Council  
New Jersey DEP  
New York City DEP  
New York City DOT  
New York State DEC  
New York State DOT  
Northeast Diesel Collaborative  
Port Authority of NY and NJ  
Southeast Diesel Collaborative  
The Associated General Contractors of America  
U.S. Environmental Protection Agency – HQ  
U.S. DOT FHWA  
West Coast Collaborative

# Operational Features

---

- Web interface for data entry and user outputs
- Maximum use of easy-to-use data entry forms with drop-down menus
- Initial bandwidth adequate for hundreds of multiple users – will be expanded as needed
- Best practices administration, security and tracking features

# Primary Search and Reporting Features

---

Main search functions of CDCH -- ability to find:

- Retrofit options, limitations/constraints, manufacturers, installers, service providers
- Equipment/retrofit product matches and application constraints
- Equipment operators using same retrofit products
- BAT/other regulatory requirements (e.g., RICE-NESHAP)/ voluntary program requirements and reporting mechanisms
- Guidance documents and reference info

Provide for compliance reporting, monitoring, and data analysis

# Search for Requirements and Retrofit Options

## Vehicle/Equipment Selection

Industry\*

Make\*

Model\*

Model Year\*   HP

Type\*

## Agency/Program Selection

State\*

City/C

Agency/Program\*

### Vehicle/Equipment Summary

Komatsu, Model 420  
Wheel Loader  
1996, 272 HP

### Agency/Program Summary

New York  
New York City DEP

**Search**

# Search Results

New York City Department of Environmental Quality  
Komatsu, Model 420, Wheel Loader, 1996, 272 HP

Technical Documents

Fleet Experience

Installers

## Available Verified Technologies to Meet BAT Requirements

### Category I

Any system using a product that appears as approved for continuous use on the VERT list, or is on the EPA- or CARB verified list of these are 4 verified DPF (DPF) that primarily reduces particulate matter (PM) emissions by a minimum of 85%, and secondarily reduces oxides of nitrogen (NOx) emissions.

### Category II

These are 0 verified DOC or CARB verified diesel oxidation catalyst (DOC), catalyzed wire mesh filter (CWF) or flow through filter (FTF) that primarily reduces PM emissions by a minimum of 50%, and secondarily reduces NOx emissions.

### Category III

These are 3 verified DOC or CARB verified diesel oxidation catalyst (DOC) that reduces PM emissions by 25%.

Please log in and complete the Fleet Vehicle/Equipment Data Entry Screen to allow more specific information to be provided.

### CAUTION!

Even though there are verified retrofit products available for the vehicle/equipment make and model specified above, various installation, duty cycle, operating constraints and engineering issues may preclude the use of some or all retrofit products for the vehicle/equipment application specified above. Please log in and complete the Fleet Vehicle/Equipment Data Entry Screen to allow more specific information to be provided.

More Results

# Database Content

---

For database search processes:

- Vehicle/equipment inputs
  - Based on Power Systems Research database
  - Year; make; model; HP; displacement; aspiration; other
- Verified and other retrofit products allowed by regulations/programs
  - EPA; CARB; VERT; others
  - Manufacturers/Make; model; applications; emission reductions; dealers
  - Product/install/maintenance costs
- BAT regulations, other regulations and voluntary program requirements
- Previous retrofit experience

Process to create reporting/monitoring functions for mandatory and voluntary emission reduction programs

# Agency/Program Inputs

---

For organizations desiring to use CDCH for compliance reporting/monitoring, EA will set up an “agency account” from the following information, as examples:

- Agency/program manager contact person(s) and contact info, by project
- Projects to which emission reduction requirements apply
- BAT regulation, other regulation and voluntary program emission reduction requirements, and summaries
- Types/description of vehicles/equipment covered by regulations/emission reduction requirements
- Emissions targeted for reduction
- Verification agencies permitted
- Targeted retrofit technologies
- Requirements for waivers
- Compliance reporting requirements and formats



# CDCH Outputs

---

Vehicle/Equipment Operator under BAT or other regulation, or involved in a voluntary emission reduction program:

- Summary from vehicle/equipment - *input by user*
- Geographic area - *input by user*
- Summary of BAT or other regulation, or emission reduction program requirement for specified project
- Retrofit product selection guidance to provide specifically available retrofit products (verified and others allowable by program), cost range, and application/installation constraints
- Retrofit manufacturer product information for specifically available retrofit products
- Summary info on number and operating experience of other like vehicles/equipment with same retrofit products
- Retrofit product distributor/installer info
- Retrofit guidance documents, fact sheets, web links

# CDCH Outputs

---

Agency User (with no access to fleet compliance information):

- All of those publically available plus:
  - Retrofit manufacturer product information

Agency User (with access to fleet compliance information):

- All of those above plus:
  - Retrofit product selection guidance
  - Retrofit product distributor information
  - Operational information from previous projects
  - Vehicle/equipment operator compliance data and analysis of results-to-date

# Search for Requirements and Retrofit Options - Detailed

## Vehicle/Equipment Selection

Industry\*  ▼

Make\*  ▼

Model\*  ▼

Type\*  ▼

Model Year\*  HP

Class Rating\*  ▼

VIN/Serial No.\*

Engine Make\*  ▼

Engine Model\*  ▼

## Agency/Program Selection

State\*  ▼

City/County\*  ▼

Agency/  
Program\*  ▼

### Vehicle/Equipment Summary

Komatsu, Model 420  
Wheel Loader  
1996, 272 HP

### Agency/Program Summary

New York  
New York City DEP

**Search**

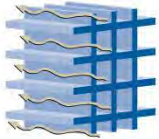
# DOCs or DOC Mufflers – a cost-effective solution

... for Emission Reduction

One-piece DOC Muffler



Diesel oxidation catalysts (DOCs) have thousands of small open channels. DOC technology is a flow-through emissions technology.



Take-apart DOC Muffler



DOCs  
See back page



### Broad Engine Coverage

- Four-stroke diesel engines for on-road applications with engine horsepower ranges of 150-600 hp
- Take-apart style DOC Muffler models ideal for older vehicles (1960-1990) that tend to generate greater emissions. This design provides easy access to the catalyst in the event of face plugging from engine malfunction

### Easy to Install

- DOC Mufflers are direct replacements for most OEM mufflers. DOCs are designed to be installed in-line into the existing exhaust system between the muffler and the turbocharger
- No maintenance requirement

### Compliant

- Verified by U.S. EPA Voluntary Retrofit Program with no model year limitations
- Verified for CARB's Diesel Risk Reduction Program (DRRP) for model year 1988-2002<sup>1</sup>
- Removes 15-30% of diesel particulate matter (PM)
- Meets U.S. Federal noise regulations
- Meets Engine OE backpressure limits

### Acceptable Fuel Types

- Low Sulfur Diesel (LSD - < 500 ppm sulfur)
- Ultra Low Sulfur Diesel (ULSD - < 15 ppm sulfur)
- Biodiesel – maximum B20 blend (20% biodiesel/80% petrol diesel). Biodiesel blend stock must meet ASTM D 6751 and blend with ASTM D 975 (1-D or 2-D)

### Durable and Warranted

- Meets U.S. EPA and CARB DRRP warranty requirements
- Constructed of aluminized-409 grade stainless steel for strength and corrosion resistance

### Engineered for Performance

- Patented flow distribution devices<sup>1</sup> enhance catalyst performance, deliver uniform airflow and temperatures across the catalyst, and reduce exhaust backpressure

## "Total Emissions" Approach to Eliminate Crankcase Emissions

Medium- and heavy-duty turbocharged diesel engines have open crankcase vents because blow-by contaminants can foul turbocharger and aftercooler components if unfiltered. The Donaldson Spiracle™ Crankcase Filtration System eliminates harmful and unwanted crankcase emissions and allows the crankcase to be closed without degrading performance.

Other Spiracle Crankcase Filtration System benefits include reducing in-cabin emissions and under hood odors/fumes. It also reduces engine oil consumption and maintains a cleaner engine compartment. For more information, go to [www.donaldson.com/en/exhaust/support/datalibrary/002428.pdf](http://www.donaldson.com/en/exhaust/support/datalibrary/002428.pdf)

DOC Muffler + Spiracle CFS Kits are available. Contact Donaldson or visit [www.donaldson.com/emissions](http://www.donaldson.com/emissions).



## Manufacturer Contact Details

Steve Truman  
1510 Westview Road  
Hunter, KS 21212  
Phone 212.123.4567  
Email: [steve.truman@cat.com](mailto:steve.truman@cat.com)

[Back to List](#)

[Technical Documents](#)

[Fleet Experience](#)

[Installers](#)

| Product Model          | Distributor/ Installer |
|------------------------|------------------------|
| ADP-44                 | Smith Reman Products   |
| <a href="#">PDP-36</a> | Smith Reman Products   |

| Product Model | Distributor/ Installer |
|---------------|------------------------|
| NONE          | NONE                   |

| Product Model | Distributor/ Installer |
|---------------|------------------------|
| ProClean-16   | XYZ Equipment          |
| XTC-RE64      | Eastern Diesel         |
| DOC-26        | Smith Reman Products   |

# Additional Potential Data/Analysis

---

The CDCH is more than just a retrofit product database; it can provide data on:

- Vehicle/equipment inventory population
- Vehicle/equipment operating location
- Vehicle/equipment hours operated/miles traveled
- Vehicle/equipment/emission inventory estimates
- Emission reduction estimates from applied retrofits
- Age and make-up of vehicles/equipment in use
- Issues/problems with retrofit products
- Cost range of retrofit products, installation and maintenance
- Population and distribution of in-use retrofits

# Compliance Report

|            |
|------------|
| Fleet Data |
| Projects   |
| Reports    |

|                   |  |                               |                |
|-------------------|--|-------------------------------|----------------|
| <b>Contractor</b> | Jones Construction                       | <b>Report No.</b>             | 213            |
| <b>Address</b>    | 156 Eastview Drive<br>New York, NY 12345 | <b>Report Period</b>          | 1/1/11-1/31/11 |
| <b>Phone</b>      | 123.456.7891                             | <b>Agency Project Contact</b> | Tim Burton     |
| <b>Email</b>      | jjones@construction.com                  | <b>Agency Phone</b>           | 212.111.1111   |

|                          |                                   |              |
|--------------------------|-----------------------------------|--------------|
| <b>Project</b>           | Croton Water Treatment Facility ▾ |              |
|                          | I95 Ramp                          |              |
| <b>Monitoring Agency</b> | Croton Water Treatment Facility   |              |
|                          | James Bridge                      |              |
| <b>BAT Location</b>      | <b>City/County</b>                | <b>State</b> |
|                          | New York City                     | New York     |

|                           |                                 |                            |              |              |      |           |                       |           | DEP approved BAT installed (DEP sticker must be applied to vehicle indicating BAT type and date installed) |       |       |              |               |           |
|---------------------------|---------------------------------|----------------------------|--------------|--------------|------|-----------|-----------------------|-----------|--|-------|-------|--------------|---------------|-----------|
| Prior Months Used On Site | Days Used this Reporting Period | Est. Future Usage (Months) | Type         | Make         | Year | Model No. | VIN/Serial No.        | HP Rating | Date Installed   | Make  | Model | BAT Category | Waiver Status | Decal No. |
| 3                         | 5                               | 2                          | Wheel Loader | Komatsu      | 1996 | WA420     | 825035                | 272       | 5/21/2009  | ABCD  | B251  | I            | NA            | 123456    |
| 4                         | 20                              | 6                          | Dump Truck   | Freightliner | 1998 | T-8000    | 1234WERTXY<br>Z567890 | 370       | 7/2/2010   | DKJHF | 15GH  | II           | NA            | 789104    |
| 2                         |                                 |                            | Dozer        | Caterpillar  | 1983 | D8N       | 159027                | 175-299   |  |       |       |              |               |           |

**[www.cleandieselclearinghouse.org](http://www.cleandieselclearinghouse.org)**

**Susan S. Stephenson, Project Manager**  
***Emissions Advantage***

**ssstephenson@emissionsadvantage.org**  
**443-510-6911**