

# **Cyanide Code Transportation Verification Audit**

## **SUMMARY AUDIT REPORT**

### **Sentinel Sodium Cyanide Transportation Operations**

**Audit Dates: August 16-17, 2006**

**Lead Auditor: Nicole Jurczyk**

**Technical Auditor: Eric Adair**

**Management System Solutions, Inc.**

**[www.mss-team.com](http://www.mss-team.com)**



## SUMMARY AUDIT REPORT

**Name of Cyanide Production Operation:** Sentinel Transportation, L.L.C. – Carlin Sodium Cyanide Terminal (Carlin, NV)  
**Names of Facility Owners:** Sentinel Transportation, L.L.C.  
**Names of Facility Operators:** Sentinel Transportation, L.L.C.  
Bob Claytor  
Sentinel Transportation, L.L.C.  
**Names and Addresses of Responsible Managers:** 3 miles east of Carlin on old Highway 40  
Carlin, NV 89822 USA  
Tel. (775) 754-6046  
Fax. (775) 754-2275

### Location detail and description of operation:

Sentinel Transportation, L.L.C. is a hazardous material bulk trucking company that has operated in the US and Canada for over 50 years. The Sentinel sodium cyanide operation is located in Carlin, Nevada, and is part of the overall DuPont sodium cyanide transportation supply chain. The terminal is one of 45 Sentinel truck terminals located across the US. In Carlin, Sentinel occupies approximately 7 acres of a site that adjoins a sodium cyanide packaging operation that was certified to the ICMI Cyanide Code in mid-2006 using the Cyanide Production Protocol. Cyanide loading and packaging takes place at the packaging operation and was audited during the aforementioned certification process.

Sentinel headquarters is located in Wilmington, Delaware. Although only the Carlin terminal was within scope of the audit, upper level Sentinel management is very involved with the operation of the terminal. In addition to the nine Carlin Terminal employees, the U.S. Safety Manager and the Regional Operations Manager were audited in order to confirm conformance to Cyanide Code requirements. The Carlin employees include a Terminal Manager, a mechanic, and drivers.

Sodium Cyanide that is loaded by the adjoining packaging company is delivered by Sentinel to gold mining operations in the Rocky Mountain region and in western North America (including Canada). Sentinel has been the carrier providing this service from DuPont's Carlin sodium cyanide packaging operation since 1989.

Sentinel is responsible for route determination, shipment scheduling and tracking, inventory control, truck inspections, preventive maintenance, training, safety program management, and emergency response planning. The sodium cyanide is transported in bulk cargo tanks and semi-bulk metal bins to mine sites. The Carlin terminal is only used for the shipping of sodium cyanide.

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### *Auditor's Finding*

This operation is

- ☒ in full compliance  
☐ in substantial compliance \*(see below)  
☐ not in compliance

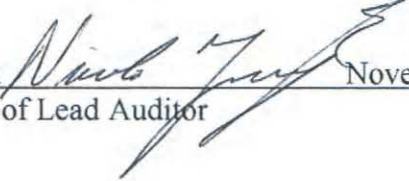
with the International Cyanide Management Code.

\* For cyanide transportation operations seeking Code certification, the Corrective Action Plan to bring an operation in substantial compliance into full compliance must be enclosed with this Summary Audit Report. The plan must be fully implemented within one year of the date of this audit.

Audit Company:	Management System Solutions, Inc. <a href="http://www.mss-team.com">www.mss-team.com</a>
Audit Team Leader:	Nicole Jurczyk E-mail: <a href="mailto:CodeAudits@mss-team.com">CodeAudits@mss-team.com</a>
Names and Signatures of Other Auditors:	Eric Adair 
Date(s) of Audit:	August 16-17, 2006

I attest that I meet the criteria for knowledge, experience and conflict of interest for Code Verification Audit Team Leader, established by the International Cyanide Management Institute and that all members of the audit team meet the applicable criteria established by the International Cyanide Management Institute for Code Verification Auditors.

I attest that this Summary Audit Report accurately describes the findings of the verification audit. I further attest that the verification audit was conducted in a professional manner in accordance with the International Cyanide Management Code Verification Protocol for Cyanide Transportation Operations and using standard and accepted practices for health, safety and environmental audits.

Sentinel Sodium Cyanide Transportation Operation  November 7, 2006  
Name of Facility Signature of Lead Auditor Date

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Name of Facility Lead Auditor Date

## SUMMARY AUDIT REPORT

**1. TRANSPORT:**      *Transport cyanide in a manner that minimizes the potential for accidents and releases.*

Transport Practice 1.1:      *Select cyanide transport routes to minimize the potential for accidents and releases.*

The operation is      ☒ in full compliance with      Transport Practice 1.1  
                                 ☐ in substantial compliance with  
                                 ☐ not in compliance with

*Summarize the basis for this Finding/Deficiencies Identified:*

Sentinel uses a documented routing selection method that takes into account population density, infrastructure, pitch & grade, proximity to water bodies, and prevalence and likelihood of poor weather and resulting poor driving conditions. Records and interviews with the drivers, Terminal Manager, Regional Operations Manager, and the U.S. Safety Manager were used to confirm that all necessary considerations were made during the determination of all cyanide transportation routes. Community input regarding the transport of cyanide is gathered through the use of the U.S. Department of Transportation (DOT) web site that indicates whether communities have restricted use of specific roadways for the transportation of hazardous materials. Truck routes are reviewed by multiple levels of the organization on an annual basis. Sentinel is a registered hazardous materials transporter through the U.S. DOT Pipelines and Hazardous Material Safety Administration (PHMSA).

Transport Practice 1.2:      *Ensure that personnel operating cyanide handling and transport equipment can perform their jobs with minimum risk to communities and the environment.*

The operation is      ☒ in full compliance with      Transport Practice 1.2  
                                 ☐ in substantial compliance with  
                                 ☐ not in compliance with

*Summarize the basis for this Finding/Deficiencies Identified:*

All drivers have a Class A Commercial Drivers License (CDL) with a Hazardous Materials endorsement and tank endorsement, when applicable. Annual Mine Safety and Health Administration (MSHA) training records were reviewed for all drivers and were found to be acceptable. Drivers were interviewed and were found to have an appropriate level of knowledge and safety awareness. In addition to training required by law, internal training is given at defined intervals to ensure that all personnel operating and handling cyanide transportation equipment is trained in a manner that minimizes the potential for cyanide releases and exposures. The training is carried out using videos, computer-based training, and classroom sessions. Internal training records were reviewed and found to be acceptable.

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Transport Practice 1.3:      *Ensure that transport equipment is suitable for the cyanide shipment.*

The operation is      ☒ in full compliance with      Transport Practice 1.3  
                                 ☐ in substantial compliance with  
                                 ☐ not in compliance with

*Summarize the basis for this Finding/Deficiencies Identified:*

Sentinel transports cyanide using equipment designed by U.S. manufacturer engineers to meet U.S. DOT weight rating standards. Gross Vehicle Weight Rating (GVWR) is certified by the manufacturer and documented on each vehicle with a label. Cargo Tank Specification plates were reviewed during the audit. Cargo tank specifications met those prescribed by the United States Department of Transportation for the transport of cyanide solutions. Sentinel tractors and trailers and DuPont cargo tank semi-trailers are rated for weights that exceed maximum loaded weights. Records showed that preventive maintenance activities are being performed as planned. Truck scales with digital readouts are used to confirm that the cargo tank trailers are not overloaded beyond their rated load capacities. Shipping records confirmed that equipment is not being overloaded.

Transport Practice 1.4:      *Develop and implement a safety program for transport of cyanide.*

The operation is      ☒ in full compliance with      Transport Practice 1.4  
                                 ☐ in substantial compliance with  
                                 ☐ not in compliance with

*Summarize the basis for this Finding/Deficiencies Identified:*

Bins and cargo tanks are inspected before starting a trip to ensure all closures are properly secured and all lines, valves and caps are closed. Bins are secured to flat bed trailers to insure they do not move or tip over during transportation. Appropriate placards are displayed on all four sides of the transport vehicles. Pre-defined checklists showing the required maintenance tasks are used to record actions. The Safety Program includes limitations on drivers' hours in accordance with Federal Motor Carrier Safety Regulations (FMCSR). Drivers are provided with fatigue training and are monitored monthly for adherence to driving hour limitations through spot checks done at the terminal and monthly audits performed by an external company. A drug abuse prevention program is established and computer-based annual refresher training is part of the internal required training. Safety Program records were reviewed and were sufficient to demonstrate conformance to the 1.4 Code requirements.

Transport Practice 1.5:      *Follow international standards for transportation of cyanide by sea and air.*

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The operation is ☒ in full compliance with  
☐ in substantial compliance with Transport Practice 1.5  
☐ not in compliance with

*Summarize the basis for this Finding/Deficiencies Identified:*

Sentinel does not ship cyanide by sea or by air. This section of the Cyanide Code does not apply to the operation.

Transport Practice 1.6:      *Track cyanide shipments to prevent losses during transport.*

The operation is ☒ in full compliance with  
☐ in substantial compliance with Transport Practice 1.6  
☐ not in compliance with

*Summarize the basis for this Finding/Deficiencies Identified:*

The following documentation is used to track inventory and movement of cyanide: bills of lading, vehicle weight upon filling, vehicle weight upon arrival at destination, and shipping papers indicating the number of packages and amount of material. All of the abovementioned documents were reviewed. Material management practices were found to be appropriate. Material Safety Data Sheets are shipped with every shipment. Additionally, each driver has detailed information with him at all times regarding cyanide hazards and emergency response. The systems used for tracking the location of drivers and the status of deliveries were reviewed by the audit team. Records and interviews confirmed that Sentinel has appropriate control over the movement of the cyanide shipments.

**2. INTERIM STORAGE:**      *Design, construct and operate cyanide trans-shipping depots and interim storage sites to prevent releases and exposures.*

Transport Practice 2.1:      *Store cyanide in a manner that minimizes the potential for accidental releases.*

The operation is ☒ in full compliance with  
☐ in substantial compliance with Transport Practice 2.1  
☐ not in compliance with

*Summarize the basis for this Finding/Deficiencies Identified:*

Storage at the Sentinel site is limited to pre-shipment storage in trailers prior to a delivery. All vehicles are parked within a secure perimeter fence. Additionally, the site is secured through the use of cameras and alarm systems.

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There are signs that warn people not to come on-site. Visual contact is maintained with all visitors after they enter the gate. Visitors are escorted at all times. Multiple systems are used to secure the vehicles. The transportation equipment is designed to securely contain the contents. A checklist is used by the adjacent packaging facility to confirm that the secondary containment on the cargo tank is secure. Loading of cyanide is done within secondary containment at the adjoining packaging operation.

### **3. EMERGENCY RESPONSE: *Protect communities and the environment through the development of emergency response strategies and capabilities***

Transport Practice 3.1: *Prepare detailed emergency response plans for potential cyanide releases.*

The operation is ☒ in full compliance with  
☐ in substantial compliance with Transport Practice 3.1  
☐ not in compliance with

*Summarize the basis for this Finding/Deficiencies Identified:*

Sentinel Transportation, LLC has a detailed emergency response plan (ERP) for the corporation and a Carlin Terminal addendum that addresses all of the additional requirements for the transportation of cyanide. Both documents were reviewed in detail and were found to be appropriate. Drivers have the following information with them at all times: the ERP and the ERP Addendum, emergency response fact sheets from DuPont, and the North American Emergency Response Guidebook (ERG). Sentinel only transports cyanide via truck. Different chemical and physical forms of cyanide, roadway infrastructure differences, and the roles of the different emergency responders are discussed in the plan.

Transport Practice 3.2: *Designate appropriate response personnel and commit necessary resources for emergency response.*

The operation is ☒ in full compliance with  
☐ in substantial compliance with Transport Practice 3.2  
☐ not in compliance with

*Summarize the basis for this Finding/Deficiencies Identified:*

Training on the emergency response plan including the Addendum was given to all employees. Records from a classroom session were reviewed. Training is refreshed annually. The training records were reviewed. Drivers were interviewed and awareness of emergency procedures was confirmed. The emergency equipment list is part of the pre-trip checklist. Sign-off sheets are brought into the office prior to a delivery. These sign off sheets are maintained as records and confirm that emergency items such as the North American Emergency Response Guidebook

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(ERG), Material Safety Data Sheets, personal protective equipment and spill equipment are on the truck. Interviews with drivers confirmed that they understood their responsibilities to confirm that the emergency equipment is in working condition.

Transport Practice 3.3:      *Develop procedures for internal and external emergency notification and reporting.*

The operation is      ☒ in full compliance with      Transport Practice 3.3  
                                 ☐ in substantial compliance with  
                                 ☐ not in compliance with

*Summarize the basis for this Finding/Deficiencies Identified:*

The notification procedures are described in detail within the Emergency Response Plan (ERP) Addendum and the Manager's checklist. During the emergency, the notification actions of the driver, local manager, regional, and national safety managers are detailed and are practiced once per year. The notification call list is checked for accuracy once per year when the plan is reviewed and tested. The DuPont Cyanide Hotline offers much of the support in determining further notification needs. CURA is a service provider that is contracted by Sentinel to manage all regulatory notifications following an emergency or release. The phone numbers for the DuPont Cyanide Hotline and for CURA are both part of the ERP Addendum. The ERP and Addendum are reviewed and tested once each year. During this activity, the phone numbers are checked for accuracy.

Transport Practice 3.4:      *Develop procedures for remediation of releases that recognize the additional hazards of cyanide treatment chemicals.*

The operation is      ☒ in full compliance with      Transport Practice 3.4  
                                 ☐ in substantial compliance with  
                                 ☐ not in compliance with

*Summarize the basis for this Finding/Deficiencies Identified:*

Remediation of a spill would be managed by an emergency response service provider named CURA. The cyanide experts at the DuPont Cyanide Hotline would coordinate with CURA to ensure appropriate clean up and remediation of contaminated solids or soils. Remediation of soils is, therefore, not addressed specifically in the Sentinel documentation. The Emergency Response Plan (ERP) Addendum, however, does address the requirement that none of the chemicals such as sodium hypochlorite, ferrous sulfate, or hydrogen peroxide be used to treat a release to surface water. The ERP Addendum statement reads as follows: "If any sodium cyanide briquettes or runoff reaches surface water, no chemical neutralization will be attempted during remediation that involves the introduction of sodium hypochlorite, ferrous sulfate and hydrogen peroxide into the contaminated water".

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Transport Practice 3.5:      *Periodically evaluate response procedures and capabilities and revise them as needed.*

The operation is      ☒ in full compliance with  
                                 ☐ in substantial compliance with      Transport Practice 3.5  
                                 ☐ not in compliance with

*Summarize the basis for this Finding/Deficiencies Identified:*

The Emergency Response Plan (ERP) including the Carlin Terminal Addendum and the notification call list are reviewed and tested at least annually. An ERP refresher training is also given annually. The last drill conducted was done in coordination with a mine site and the DuPont Cyanide Hotline. This drill was done in August 2006. The telephone numbers on the call list were reviewed and checked for accuracy during the audit. The Emergency Response Plan's performance is reviewed after actual emergencies and after the annual drill. Changes are made to the plan, as needed. Pages 16 and 17 of the ERP are used to critique the drill and/or execution of the plan in the case of an actual emergency. The audit team confirmed that the ERP undergoes regular revisions and reviews.

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