



Guideline to legislation on the transportation of bitumen and Bitumen spill protocol

Manual 34 September 2013



excellence in bituminous products

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**Guidelines to legislation on
the transportation of bitumen
and
Bitumen spill protocol**

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Manual 1	Technical guidelines: Construction of bitumen rubber seals
Manual 2	Bituminous products for road construction and maintenance (CD)
Manual 3*	Test methods for bitumen rubber
Manual 4*	Specifications for rubber in binders
Manual 5	Guidelines for the manufacture and construction of hot mix asphalt
Manual 6*	Interim specifications for bitumen rubber
Manual 7	SuperSurf: Economic warrants for surfacing unpaved roads
Manual 8	Guideline for the safe and responsible handling of bituminous products (CD)
Manual 9***	Bituminous surfacings for temporary deviations
Manual 10	Appropriate standards for low volume roads and temporary deviations (CD)
Manual 11	Labour enhanced construction for bituminous surfacings
Manual 12	Methods and procedures - Labour enhanced construction for bituminous surfacings (CD)
Manual 13	LAMBS - The design and use of large aggregate mixes for bases
Manual 14***	GEMS - The design and use of granular emulsion mixes
Manual 15*	Technical guidelines for seals using homogeneous modified binders
Manual 16**	REACT - Economic analysis of short-term rehabilitation actions
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Manual 18	Appropriate standards for the use of sand asphalt
Manual 19	Guidelines for the design, manufacture and construction of bitumen-rubber asphalt wearing courses (under review)
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Manual 22	Hot mix paving in adverse weather
Manual 23	Code of practice: loading bitumen at refineries (CD)
Manual 24	User guide for the design of hot mix asphalt
Manual 25	Code of practice: Transportation, off-loading and storage of bitumen and bituminous products (CD)
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Manual 27	Guidelines for thin hot mix asphalt wearing courses on residential streets
Manual 28	Best practice for the design and construction of slurry seals (CD)
Manual 29	Guide to the safe use of solvents in a bituminous products laboratory (CD)
Manual 30	A guide to the selection of bituminous binders for road construction (CD)
Manual 31	Guidelines for calibrating a binder distributor to ensure satisfactory performance (CD)
Manual 32	Best practice guideline for warm mix asphalt (CD)
Manual 33	Interim design procedure for high modulus asphalt (CD)

* These manuals have been withdrawn and their contents have been incorporated in a manual entitled: *The use of modified binders in road construction* published as Technical Guideline 1 by the Asphalt Academy.

** This manual has been withdrawn and its software programme incorporated in TRH12: *Flexible pavement rehabilitation investigation and design*.

*** These manuals have been withdrawn and their contents have been consolidated with the second edition of Manual 10

Technical guidelines

TG1	The use of modified binders in road construction
TG2	Bitumen stabilised materials
TG3	Asphalt reinforcement for road construction

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1.

**Guidelines to legislation on
the transportation of bitumen**

Foreword

The carriage of dangerous goods by road creates risks to drivers, other road users, the public, the emergency services, and in the case of some substances, to the environment. The transportation of classified goods and substances is therefore regulated by a number of statutory Acts, Regulations, Local Bylaws, and also by international protocols and treaties when such transportation involves cross border operations.

The transportation of dangerous goods on South African roads is, in the main, regulated by:

- The National Road Traffic Act 1996 (Act 93 of 1996) (as amended); and
- The Hazardous Substances Act, 1973 (Act No. 15 of 1973).

Interpreting the various regulatory requirements, in particular those applicable to the correct classification of bitumen and its derivatives, can be somewhat confusing. Sabita has therefore taken the initiative to provide guidance - to Sabita members, as well as to bitumen consignors, transporters and other interested parties - that will assist in understanding the applicable legislation. Hopefully this guide will facilitate improved decision making and full compliance with regulatory requirements in future.

1. Objective

The primary objectives of this guide are:

- To provide a brief and concise interpretation of relevant requirements, specifically applicable to the road transportation of bitumen and modified bitumens, within southern Africa;
- To clearly classify bitumen and modified bitumens in the context of the current regulatory framework as applicable to road transport;
- To identify the correct emergency information (placards, warning signs and documentation) that should be displayed on vehicles carrying bitumen and modified bitumens;
- Generally provide for a reference to assist with resolution of potential disputes between transporters and law enforcement agencies in cases of roadside inspections.

This guide is primarily aimed at road transport operations involving the transportation of bitumen within the borders of South Africa and does not cover rail, air or marine transportation of bitumen.

2. References

This publication is not intended to be a comprehensive guide to the requirements for transportation of bitumen. For such a comprehensive and correct understanding, and to facilitate the application of this guideline, the following referenced documents are indispensable.

2.1 Standards

- SANS 1518: *Transportation of dangerous goods - design requirements for road vehicles;*
- SANS 10228: *Identification and classification of dangerous substances and goods;*
- SANS 10229: *Packaging of dangerous goods for road and rail transportation in South Africa;*
- SANS 10231: *Transportation of dangerous goods - operational requirements for road vehicles;*
- SANS 10232-1: *Transportation of dangerous goods -emergency information systems, Part 1: Emergency information system for road transportation;*
- SANS 10232-3: *Transportation of dangerous goods -emergency information systems, Part 3: Emergency response guides;*
- SANS 10233: *Intermediate bulk containers for dangerous substance;*
- SANS 10232-4: *Transport of dangerous goods - emergency information systems - transport emergency card.*

2.2 Legislation

National Road Traffic Act 1996 (Act 93 of 1996) (as amended): Chapter VIII: *Dangerous goods; and Regulations VIII - Transportation of dangerous goods and substances by road*

Hazardous Substances Act, 1973 (Act No. 15 of 1973): *Regulations Governing the Conveyance of Hazardous Substances by Road Tanker*

2.3 Industry publications

Industry Protocol for Responding to Bitumen Spills on Land and/or Adjacent Water Environments, Sabita, December 2012

Sabita Dangerous Goods Transportation Legislation Guidelines, 2013.

3. Definitions and abbreviations

Term	Definition
Ambient temperature	23°C ± 2°C
Acceptable risk	A risk that is so small and consequences so slight, or associated benefits (perceived or real) so great, that society is willing to take or be subjected to that risk.
Asphalt	<p>Asphalt refers to a mixture of aggregate and bituminous binders (straight run or modified) used for road construction and maintenance.</p> <p><i>Note. In the USA the term asphalt is used to describe what is generally known as bitumen in the rest of the world. Care should therefore be exercised when interpreting emergency information from USA sources.</i></p>
Auto-ignition temperature	<p>The temperature above which a substance, when exposed to air, might ignite in the absence of a source of ignition as a result of contact with a hot surface or by self-heating alone.</p> <p><i>Note: Auto-ignition temperature is not an intrinsic property of the substance. It depends upon the surrounding physical circumstances including the size and shape of the substance and the degree of ventilation around it. Therefore, the auto-ignition temperature for any substance can only be indicated approximately.</i></p>
BBRT	A Bitumen Bulk Road Tanker designed specifically for transporting liquid bitumen at elevated temperature.
Bitumen	In the context of this guide means paving grade bitumen (previously known as penetration grade bitumen). Straight-run bitumen is derived from crude oil and produced at a refinery. It is the most widely used bitumen and may also be considered as the parent bitumen from which the other types are produced. Bitumen is very viscous or near solid at ambient temperatures and softens gradually when heated.
Bituminous binder	A modified bitumen, or mixture of bitumen with fluxes or other substances, used for road sealing or the manufacture of asphalt mixes.
<p>Note: Tar is a coal tar derivative and is known to cause skin cancer in humans. Bitumen is a product of petroleum crude oil distillation and IS NOT carcinogenic. The use of tar in road construction was abolished in South Africa in 1985, and the terms bitumen and tar are not interchangeable.</p>	

Term	Definition
Bitumen emulsion	A dispersion of bitumen in water achieved by the use of suitable chemical emulsifying agents.
Boil-over (froth-over)	The rapid increase in volume caused by the presence of water in hot bitumen and the subsequent overflow from a tank.
Burn	Refers to either a chemical or thermal burn, the former may be caused by corrosive substances and the latter by liquefied cryogenic gases, hot molten substances, or flames.
Classified goods and substances	Commodities, goods and substances classified as "dangerous goods" and listed in SANS 10228.
Consignee	The person/organisation receiving or accepting the dangerous goods which have been transported in a vehicle.
Consignor	<p>The person who offers dangerous goods for transport in a vehicle (including the manufacturer or his or her agent, duly appointed as such) SANS 10231 defines the consignor as one of the following:</p> <ul style="list-style-type: none"> • Product manufacturer; • Product owner; • Product custodian; • The party that contracts the operator.
Contaminant	Any substance present in an environmental medium at concentrations in excess of natural background concentrations.
Cutback bitumen	Bitumen whose viscosity has been reduced by the addition of a relatively volatile flux such as kerosene, to render it more fluid for ease of application.
Dangerous goods	Commodities, substances and goods listed in SANS 10228:2012 Edition 6.
Dangerous goods placard	Single placard with separate, delineated zones for goods identification, telephonic advice numbers and the appropriate hazard class diamond.
Danger warning diamond	Orange diamond that complies with the requirements of paragraph 5.5 of SANS 10232-1:2007 Edition 3 and that is displayed on the front of the vehicle.
Designated space	Container, of colour orange and marked with the word "DOCUMENTS" in black, which is permanently fixed in a clearly visible space near the centre of the cab so as to be easily accessible from either one of the doors or through a broken front window

Term	Definition
Drum	Drum means a flat-ended or convex-ended cylindrical packaging made of metal, fibreboard, plastics, plywood or other suitable materials. This definition also includes packaging of other shapes e. g. round taper-necked packaging or pail-shaped packaging. Wooden barrels or Jerri-cans are not covered by this definition. Note: Drums used for transporting bitumen shall conform to an acceptable design standard and marked in accordance with the requirements of SANS 10229-1 (2010).
Elevated temperature substance	Means a substance which is transported or offered for transport: <ul style="list-style-type: none"> • in the liquid state at a temperature at or above 100°C; • in the liquid state with a flashpoint above 60°C and which is intentionally heated to a temperature above its flashpoint; or • in a solid state and at a temperature at or above 240°C.
Exempt quantity	Quantity of dangerous goods which, if not exceeded in the total load, is exempt from the requirements of SANS 10231 (2010): <i>Transport of dangerous goods - Operational requirements for road vehicles.</i>
Emergency response guide	A "first responders" emergency response guide as documented in the Emergency Response Guidebook published by the U.S. Department of Transport and incorporated as an integral part of SANS 10232-3.
Exposure	In this document exposure means contact between bitumen and the external surfaces of the human body or ground or any water source on land or sea.
First responder	First person to arrive at the scene of an incident, which is able to correctly identify the goods and hazards, and to communicate with an emergency service, either directly or through a base station
Flammable liquids	Flammable liquids are defined in the UN Model Regulations as liquids, mixtures of liquids or liquids containing solids in solution or suspension which give off a flammable vapour (have a flash point) at temperatures of not more than 60-65C. This includes liquids offered for transport at temperatures at or above their flash point or substances transported at elevated temperatures in a liquid state and which give off a flammable vapour at a temperature at or below the maximum transport temperature.

Term	Definition
Flash point	The lowest temperature at which the application of a small flame in a prescribed manner causes the vapour above a flammable product to ignite when the product is heated under prescribed conditions.
Free-phase	Chemical present in soil or water in its natural physical form under ambient conditions, for example, solid, liquid or gas.
Freight container	Free-standing containment unit, used for the transport of dangerous goods, of a permanent character and strong enough for repeated use, designed specifically for the carriage of goods by more than one mode of transport and that complies with the requirements of ISO 1496-1.
Groundwater	Subsurface water beneath the water table in fully saturated geological formations.
Hardstand area	An area that is covered by impervious construction material such as asphalt, concrete or brick.
Immiscible	In this document refers to a material that does not mix readily with water.
Incident	An event during the transport or storage of dangerous goods which includes incidents such as leakage, spillage, fire, explosions.
Large spill	A spill that involves quantities greater than 200l for liquids and greater than 300kg for solids.
Miscellaneous dangerous substances	These are substances which, during transport, present a danger or hazard not covered by other classes. This class includes, but is not limited to, environmentally hazardous substances and substances that are transported at elevated temperatures.
Modified bitumens	Modified bitumens refers to other types of bituminous binders produced by altering the characteristics of 'straight-run bitumen' and includes any of the following: Cut back bitumen Bitumen emulsions Polymer modified bitumen.
MSDS	Material Safety Data Sheet/s.
Operator	The person (Haulier) responsible for the use of a motor vehicle of any class contemplated in Chapter VI of the National Road Traffic Act, 1996, and who has been registered as the operator of such vehicle.
Package	The complete product of the packing operation, consisting of the packaging and its contents prepared for transport. In accordance with the Hazardous Substances Act, package means anything by or in which any substance is covered, enclosed, contained or packed.

Term	Definition
Packaging	One or more receptacles and any other components or materials necessary for the receptacles to perform their containment and other safety functions.
Packing group	Group symbol that indicates the degree of danger/hazard of the primary property of a specific substance in accordance with internationally recognised classifications.
Pathway	The route or means that controls the release and migration of a contaminant to environmental media, for instance soil to water or soil to air.
Paving grade bitumen	Paving grade bitumen is normal "straight-run bitumen" derived from crude oil and produced at a refinery. It is the most widely used bitumen and may also be considered as the parent bitumen from which the other types are produced.
Polymer Modified Bitumen (PMB)	Bituminous binders containing selected polymers to produce enhanced performance characteristics.
Proper shipping name	Description used for dangerous goods in transport documentation, in the marking of packages, and in the placarding of containers and vehicles to ensure that goods can be readily identified during transport.
Receptacle	A container that is used to receive and hold dangerous goods and that can be fitted with a means of closure.
Remediation	The management of a contaminated site to prevent, minimise, or mitigate damage to human health or the environment. Remediation may include both direct physical actions (e.g. removal, destruction, and containment of contaminants) and institutional controls.
Risk assessment	A process designed to determine the qualitative aspects of hazard identification and usually a quantitative determination of the level of risk based on deterministic or probabilistic techniques.
Road tanker <i>(as defined by the Hazardous Substances Act)</i>	A goods vehicle which has one or more temporary or permanent tanks or a tank or tanks made up of different compartments with a total capacity of not less than 500l, which forms part of or is attached to it, other than a tank used solely for the operation of the vehicle as a means of transport.
Short term exposure	Exposure to a contaminant in a medium usually severe enough to induce an effect. Often referred to as an acute exposure.
Single load	Dangerous goods cargo comprising either a single substance or goods that have the same UN number.

Term	Definition
Small spill	A spill involving quantities of less than 200l for liquids and less than 300kg for solids.
Soil	Normally defined as the unconsolidated material on the immediate surface of the earth that serves as a natural medium for terrestrial plant growth.
Containment source	Contaminant source contains a concentration of contaminant(s) - a substance that is in or on land that has the potential to cause an impact to human health or the environment.
Tank (As defined by the Hazardous Substances Act)	A container having a full capacity of 500l or more, used for transporting grouped hazardous substances, and mounted permanently or temporarily on a vehicle other than for the purpose of supplying fuel for propulsion of the vehicle and includes a tank having two or more compartments.
Transport emergency card	A card that lists the hazards and emergency information for a dangerous substance being transported, and that is intended for use by the driver during an incident, or by the emergency services, if required. The transport emergency card can either be generated from the European Council of Chemical Manufacturers' Federation (CEFIC) system, called a TREMCARD, or in accordance with SANS 10232-4, called a TREC.
United Nations number	A unique four digit number allocated to an item of dangerous goods listed in SANS 10228.
Viscosity	Measure of a liquid's internal resistance to flow. This property is important because it indicates how fast a material will leak out through holes in containers or tanks. By comparison, water has a much lower viscosity than bitumen hence it flows more readily.
Viscous	A thick, sticky consistency between solid and liquid.

3.1 Abbreviations

DGD	Dangerous goods declaration
ERG	Emergency response guide
IATA	International Air Travel Association
ICAO	International Civil Aviation Organisation
IBC	Intermediate bulk containers
NOS	Not Otherwise Specified
TREC	Transport emergency card in accordance with SANS 10232-4
TREMCARD	Transport emergency card, generated from the European Council of Chemical Manufacturers' Federation (CEFIC) system
UN No.	United Nations number

4. Dangerous goods classification system

For purposes of transportation legislation, dangerous goods are classified in nine classes and three packing groups in accordance with the *United Nations Recommendations on the Transport of Dangerous Goods: Model Regulations*. The hazard class of dangerous goods is indicated either by its class (or division) number, or its name and packing group/s as applicable.

In South Africa the UN model regulations have been adopted as the relevant standard as encompassed in SANS 10228:2012 Edition 6: *The identification and classification of dangerous goods for transport by road and rail modes*. The identification and classification of dangerous goods for transport is done in accordance with a system that encompasses the following components:

Dangerous goods hazard classes:

Class 1	-	Explosives;
Class 2	-	Gases;
Class 3	-	Flammable liquids;
Class 4	-	Flammable solids (substances liable to spontaneous combustion, substances that, on contact with water, emit flammable gases;
Class 5	-	Oxidising substances and organic peroxides;
Class 6	-	Toxic and infectious substances;
Class 7	-	Radioactive material;
Class 8	-	Corrosive substances;
Class 9	-	Miscellaneous dangerous substances and articles, including environmentally hazardous substances.

Dangerous goods packing groups:

Packing Group I	-	Substances presenting High Danger;
Packing Group II	-	Substances presenting Medium Danger.
Packing Group III	-	Substances presenting Low Danger.

Dangerous goods identification numbers:

Classified goods and substances have each been allocated a specific UN number that is recognised and applied internationally.

4.1 Classification of bitumens

Note: The Hazardous Substances Act lists bitumen as a Group II Hazardous Substance under the heading "Tars, liquid, including road asphalt and oils, bitumen", UN No. 1999. This classification is outdated and incorrect! Refer to Note¹ on page 20 and to the definition of bitumen in this guide.

By applying the appropriate classification system, bitumen and modified bitumens should be classified as indicated in the table below:

Table 1. Classification of bitumen for road transport

A - Bitumen transported in road tankers: (hot liquid bitumen)				
Bitumen type	UN Name and description	Class	UN No.	ERG No.⁴
Paving grade bitumen ¹ and Polymer modified bitumen	Elevated temperature liquid, n.o.s., at or above 100°C and below its flash point	9	3257	Sabita ERG 1/2013
Cutback bitumen²:				
Temperature above 100°C MC - Medium curing bitumen cut-back with kerosene	Elevated temperature liquid, flammable, n.o.s., with flash point above 37,8C (100°F), at or above its flash point;	3	3256	Sabita ERG 1/2013
SC - Slow Curing bitumen cut-back with diesel (Gasoil)	Elevated temperature liquid, flammable, n.o.s., with flash point above 60C (140F), at or above its flash point; or	3	3256	
Temp. below 100°C	Flammable liquid, n.o.s.	3	1993	
Bitumen emulsions ³	Not normally within scope of the DG classification criteria	NA	NA	NA
B - Bitumen transported by road in drums or bags				
Paving grade bitumen; polymer modified bitumen and bitumen emulsions	If these types of bitumen are transported in drums or bags at ambient temperature they do not pose any significant risk to health, safety, property or the environment.	NA	NA	NA
Cutback bitumen: MC - Medium Curing bitumen cut-back with kerosene	Flammable liquid, n.o.s.	3	1993	Sabita ERG 1/2013
SC - Slow Curing bitumen cut-back with diesel (Gasoil)	Flammable liquid, n.o.s.	3	1993	

Notes:

1. *In the past paving grade bitumen (previously known as penetration grade bitumen) was [incorrectly] classified as Tars, liquid Class 3, under UN No. 1999. As a result of a submission by Sabita to SANS (the competent authority), authority was granted (SANS Ref 5140/DG/122 dated February 2005) to reclassify paving grade bitumen to Class 9, Packing Group III under UN 3257. However, the necessary amendments have unfortunately not been made to relevant regulations and standards incorporated under the regulations, and this could result in disputes with law enforcement agencies in case of a roadside inspection during bitumen transportation. A copy of the reclassification agreement can be downloaded from the HSE section of the Sabita website.*
2. *Classification of MC and SC cutback bitumen is dependent on the composition of the blend (which could have a kerosene or diesel content ranging from 10% to 50% by volume) and the temperature at which the product will be maintained during transport.*
3. *Bitumen emulsions are usually handled at ambient temperatures, are not flammable and are not considered a significant threat to the environment. However if emulsions are transported at elevated temperatures consignors should use the UN 3257 classification.*
4. *The ERG guidebook provides a list of potential hazards and appropriate emergency responses associated with dangerous goods and applicable in an incident. Appropriate guides, intended for use by first responders, are identified by a 3-digit number that should be displayed on the TREC. Note that the designated ERG128 is NOT appropriate for bitumen. Sabita has developed ERG 1/2013, considered to be more appropriate, and this will be submitted to the competent authority (SANS) for approval.*

5. Emergency information requirements

The emergency information requirements for transportation of dangerous goods are mandated in SANS 10232-1, *Transportation of dangerous goods -emergency information systems, Part 1: Emergency information system for road transportation*. These requirements will not be discussed in this guide in any detail, but the overall information system requirements are listed briefly and thereafter bitumen specific requirements are illustrated with examples.

5.1 Emergency information system for transportation of bitumen

The emergency information system referred to is aimed at assisting emergency response teams in the mitigation of an incident involving dangerous goods.

The primary purpose of the system is to provide critical information in connection with the goods or substances involved - such information being designed to enable prompt, sufficient and effective response to the incident such that potential adverse impacts on human life, assets and the environment are limited.

SANS 10232-1 outlines the mandatory requirements for communicating critical health and safety information on vehicles carrying dangerous goods.

5.2 Placarding of vehicles

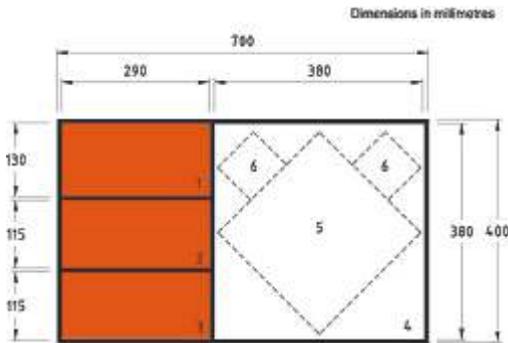
Dangerous goods placards and hazard class diamonds are affixed to a rigid vehicle, semi-trailer or trailer, at the front, sides and rear as is applicable and appropriate for the vehicle configuration.

Note: *The placards must be clean, legible, not defaced and clearly visible from the roadside at all times!*

5.3 Requirements for placards

The construction, dimensions, wording and colour requirements of dangerous goods placards and hazard class diamonds must strictly conform to the minimum design specifications set out in SANS 10232-1.

Standard size placard



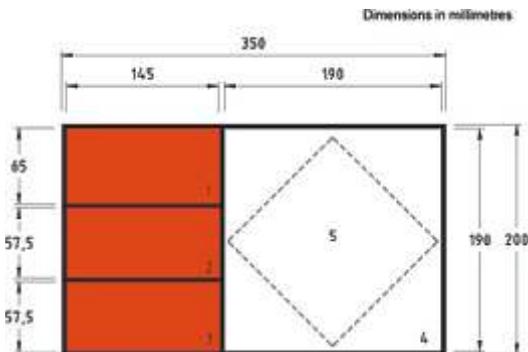
Legend

- 1) Goods identification zone
- 2) Operator telephonic advice zone
- 3) Specialist telephonic advice zone
- 4) Hazard class diamond zone
- 5) Position of hazard class diamond or mixed load diamond
- 6) Position(s) of subsidiary risk diamond(s)

Legend

1. Goods identification zone
2. Operator telephonic advice zone
3. Specialist telephonic advice zone
4. Hazard class diamond zone
5. Position of hazard class diamond or Mixed Load Diamond
6. Position of subsidiary risk diamond(s)

Reduced size placard



Legend

- 1) Goods identification zone
- 2) Operator telephonic advice number zone
- 3) Specialist telephonic advice number zone
- 4) Hazard class diamond zone
- 5) Position of hazard class warning diamond

Legend

1. Goods identification zone
2. Operator telephonic advice zone
3. Specialist telephonic advice zone
4. Hazard class diamond zone
5. Position of hazard class diamond or Mixed Load Diamond
6. Position of subsidiary risk diamond (s)

Figure 1. Requirements for placards

Note: Appendix A of this guide provides examples of the placarding requirements for bitumen loads.

5.4 Emergency information documents

Any vehicle used for the transport of dangerous goods shall have at least the following documents safely stowed in the designated space in the cab of the vehicle:

Mandatory

- Transport emergency card (TREC);
- Dangerous goods declaration (DGD).

Note: *Appendix B and C of this guide provides examples of a typical TREC and DGD for bitumen loads.*

Optional (not legislated but considered to be best practice)

- Trip journey plan;
- A copy of the relevant ERG for the class of goods or substance carried (See Appendix E of this guide);
- A Bitumen Burns Card (See Appendix F of this guide);
- A blank copy of the incident report form as per Annex B of SANS 10232-3:2011 Edition 3.1 (See Appendix D of this guide)

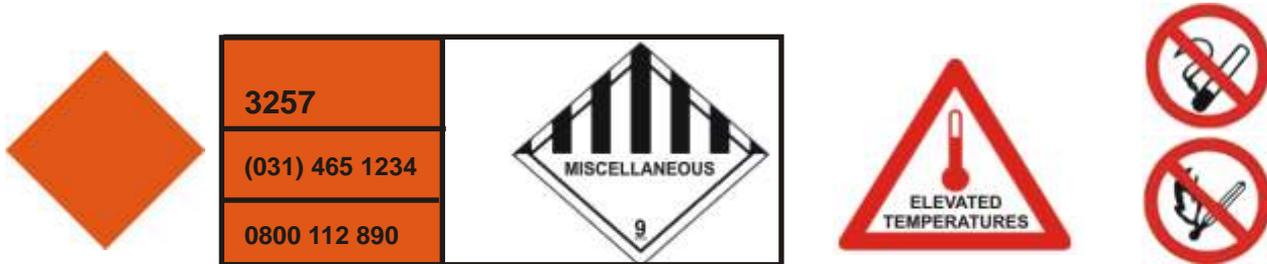
Appendix A

Placards and hazard warning signs for bitumen transported by road or air⁵

A.1 - Hot liquid bitumen transported in road tankers (Use standard size placards)

Danger warning diamond: Must be displayed on front of vehicle	Placard: Must be displayed at the rear and on both sides of a road tanker (including any trailers that may be attached)	Additional warning signs required
--	--	--

Bitumen type: Paving grade bitumen and polymer modified bitumen



Bitumen type: Cutback bitumen - MC (medium curing bitumen cut-back with kerosene)
Cutback bitumen - SC (slow curing bitumen cut-back with diesel (Gasoil))



Note. Use UN No. 3256 if transport temperature is at or above 100°C and Use UN No. 1993 if transport temperature is below 100°C

A.2 - Cutback bitumen transported in drums (Use reduced size placards if GVM is less than 3 500kg)

Bitumen type: Cutback bitumen - MC (medium curing bitumen cut-back with kerosene)
Cutback bitumen - SC (slow curing bitumen cut-back with diesel (Gasoil))

Danger warning diamond: Must be displayed on front of vehicle	Placard: Must be displayed at the rear and on both sides of a road tanker (including any trailers that may be attached)	Additional warning signs required
--	--	--



Warning signs on drums: Affix the warning class diamond and the additional warning signs to each individual drum



⁵ Note. Emergency telephone numbers displayed on the above placards are for illustration purposes ONLY and users must ensure that contact numbers applicable to their operations are reflected on all placards used by them

A.3 - Bitumen sample packaging for conveyance by road or air

Bitumen type: Cutback bitumen - MC (medium curing bitumen cut-back with kerosene)
 Cutback bitumen - SC (slow Curing bitumen cut-back with diesel (Gasoil))

Use only approved UN specification packaging in accordance with the appropriate packing instructions. The recommended method for samples is combination packaging comprised of a metal container (inner packaging) and G4 type box (outer packaging) as in the example below.



Hazard warning labels for packaging

<p>Inner packaging</p>	<p>Affix the warning class diamond (100mm x 100mm) to each individual metal container</p>	
<p>Outer packaging</p>	<p>Affix the warning class diamonds to the box on the same sides I.E. two opposite sides of the package) as where the UN No. and proper shipping name is marked on the box</p>	 

Appendix B - Example TREC for cut-back bitumen

Transport Emergency Card - Road transport of cutback bitumen MC 30 in accordance with SANS 10232-4

Proper shipping name

Elevated temperature liquid, flammable, n.o.s., with flash point above 37,8°C), at or above its flash point

UN No.	3256
Class	3
Subsidiary risk	
Packing group	III
ERG No.	Sabita 1/2013

Appearance

Black viscous liquid

Danger

- Will cause burns if hot material contacts skin. Causes skin irritation and vapour, mist or fume may cause eye irritation;
- Ingestion of hot product is unlikely but will cause severe burns.

Personal protective equipment - Hot material:

- Impervious overalls covering full body and limbs, with legs worn over protective boots;
- Safety helmet, full face visor and heat resistant neck flap / apron;
- Chemical splash goggles;
- Long PVC gloves;
- Leather apron;
- Safety boots.

Emergency response equipment

Foam or dry chemical

Driver first actions - Only if it can be carried out without personal risk

- Immediately contact emergency personnel;
- Put on appropriate personal protective equipment;
- Evacuate people from immediate surrounding areas.

Driver special/additional actions - Only if it can be carried out without personal risk

Protect drains from spills and prevent entry of product;

If possible, contain the product and avoid dispersal of spilt material into waterways and drains.

Driver actions in case of fire - Only if it can be carried out without personal risk

Do not attempt to deal with any major fire.

First aid

In case of bitumen burns:

- NO ATTEMPT SHOULD BE MADE TO REMOVE BITUMEN FROM AFFECTED SKIN AREAS;
- Drench the affected skin area with clean (if possible) running water until the bitumen has cooled and hardened.

Special information for emergency services

In case of fire extinguish with water spray or preferably with foam or dry chemical;

Do not use water jet;

Avoid spraying directly into storage containers because of the danger of boil-over;

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Additional information

- Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment;
- Spills may form a film on water surfaces causing physical damage to organisms. Oxygen transfer could also be impaired;
- Spillages are unlikely to penetrate the soil



Emergency telephone numbers 0800 112 890

Prepared by AC Kermans, Bitusales Ltd. from the best knowledge currently available; no guarantee is provided that the information is sufficient or correct under all circumstances.

Reference: HSE/DGT/005

Date: 09/2012

Appendix C - Example DGD for cut-back bitumen

Dangerous goods declaration			Consignment Note No: 101 11X			
Consignor:	JD Edwards, Coastal Refinery, 100 High Rd, Port Elizabeth Tel: 041 100 1000		Operator:	B Higgins, Higgins Road freight, 200 South Ave, Port Elizabeth Tel: 041 200 2000		
Product manufacturer			Reg. no. vehicle:	XYZ 200 EC		
Product owner			Consignee:	ABC Paving Contractors, 300 Marine Drive, Port Elizabeth Tel: 041 300 3000		
Product custodian			Additional information on handling, transport, storage: Liquid heating burners shall be switched off during transit			
Party contracting the operator:	JD Edwards, Coastal Refinery, 100 High Rd, Port Elizabeth Tel: 041 100 1000					
Shipping name	UN No. class	Hazard	Packing Group	Quantity and type of packaging	Gross mass kg	Net mass/vol kg/l
Elevated temperature liquid, flammable (Cutback bitumen)	3256	3	III	Rigid road tanker	15000kg	14123l

Declarations

Consignor: (Mark appropriate box with X)

Product owner Product manufacturer Product custodian

Party that contracts the operator

"I hereby declare that the content of this consignment is fully and accurately described above by the proper shipping name, and is classified, packaged, marked and labelled/placarded and in all respects in proper condition for transport in accordance with the relevant national legislation."

Signed: JD Edwards

Date: 2013-06-07

Driver

"The consignment described above has been received into my vehicle. My vehicle is correctly placarded and I am in possession of all necessary transport documentation pertaining to the transport of dangerous goods, including information to be followed in case of an emergency."

Signed: J K Williams

Date: 2013-06-07

Appendix D. Example incident notification form

Incident notification

An incident involving the carriage of dangerous goods by road

1. Name of company _____
2. Date and time of incident _____
3. Location of the incident _____
4. Vehicle registration number _____
5. Driver's name and licence number _____
6. PrDP endorsement _____
7. Brief description of the incident _____

8. Cause of the incident _____

9. Number of casualties: Fatalities _____ Injuries _____
10. UN Number of goods involved _____
11. Brief details of damage to property caused by dangerous goods _____

12. Approximate quantity of goods spilled or released _____
13. Brief details of release of vapour (direction of travel and area affected) _____

14. If goods were involved in a fire, give brief details of the extent to which the goods were affected _____

15. Type of load (bulk/packaged goods/tanker/freight container/tank container) _____

16. Dangerous Goods Declaration(s) completed correctly (Yes/No?) _____
17. Correct Transport Emergency Card(s) (in accordance with SANS 10232-1) available in the vehicle (Yes/No?) _____

18. Was the correct information obtained from the specialist advice number (Yes/No?) _____
19. Which emergency services were activated, if any? _____
20. Brief details of clean-up operation, if applicable _____

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Low to Moderate Hazard Substances-
Bitumen (UN1993/UN3256/UN3257)

Potential hazards

Fire or explosion

Flammable: Can be ignited by sparks or flames:

- In case of fire DO NOT USE WATER JET. Use foam, dry chemical or carbon dioxide extinguisher or spray;
- Vapours may form explosive mixtures with air;
- Vapours are heavier than air and can spread along the ground or float on water surfaces to remote ignition sources;
- Do not allow hot molten product to come into contact with water or other liquids;
- Avoid spraying directly into storage containers because of the danger of boil-over;
- Runoff to sewer may create fire or explosion hazard;
- Containers may explode when heated;
- Runoff from fire control or dilution water may cause pollution.

Health

Caution: Substance may be transported at elevated temperatures up to + 160C:

- Will cause severe burns if hot material contacts eyes or skin;
- Vapour, mist or fume may irritate the nose, mouth and respiratory tract;
- Fire may produce irritating or toxic gases. Decomposition products may include the following materials:
 - carbon dioxide;
 - carbon monoxide;
 - sulphur oxides.
- Vapours in confined spaces may cause dizziness or suffocation.

Public safety

Immediately contact emergency services:

As an immediate precautionary measure, isolate spill or leak area for at least 50 meters in all directions;
Warn people not to touch or walk through spilt material;
Keep unnecessary and unprotected personnel from entering affected area;
Keep up wind and out of low areas.

Protective clothing

Structural fire-fighters' protective clothing will only provide limited protection:

- Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Evacuation

Large Spill:

Consider initial downwind evacuation for at least 50 meters;
If on severe down-slope consider evacuation for at least 100 meters below spill.

Fire:

If tank, rail car or road tanker is involved in a fire, ISOLATE for 100 meters in all directions; also, consider initial evacuation for 200m in all directions.

Appendix E - Emergency response guide for bitumen (continued)

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ERG 1/2013

Low to Moderate Hazard Substances-
Bitumen (UN1993/UN3256/UN3257)

Emergency response

Fire

Caution: Do not use straight streams/jets:

Small Fire

- Dry chemical, CO², water spray or regular foam.

Large Fire:

- Water spray, fog or regular foam;
- Move containers from fire area if you can do it without risk.

Fire involving tanks or road/rail tanker loads:

- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles;
- Cool containers with flooding quantities of water until well after fire is out;
- ALWAYS stay away from tanks engulfed in fire;
- For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let the fire burn.

Spill or leak

- Dike far ahead of liquid spill for later disposal;
- A vapour suppressing foam may be used to reduce vapours;
- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area);
- Do not touch or walk through spilled material;
- Stop leak if you can do it without risk;
- Protect drains from spills and prevent entry of product, since this may result in blockage on cooling.

First aid

Note: In case of bitumen burns this section must be read in conjunction with the Bitumen Burns Tag (see Appendix F) which reflects best practice guidance for treatment of bitumen burns!

- Move victim to fresh air;
- Call emergency medical service;
- Give artificial respiration if victim is not breathing;
- Administer oxygen if breathing is difficult;
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes;
- **Do not remove clothing if adhering to skin;**
- **Do not attempt to remove any bitumen adhering to exposed skin areas;**
- **In the unlikely event of ingestion of liquid bitumen DO NOT INDUCE VOMITING**

ATTACH TO THE PATIENT

BitSafe



Burns Tag

TREATMENT OF BITUMEN BURNS

NOTES FOR THE GUIDANCE OF FIRST AID AND MEDICAL PERSONNEL

All persons working with hot bitumen should be familiar with these recommendations in order to administer first aid to burn victims. This tag should accompany the patient and be placed in a prominent position before the patient is transported to a doctor or hospital.

NO ATTEMPT SHOULD BE MADE TO REMOVE THE BITUMEN FROM THE BURNED AREA AT THE WORKSITE!

- **First Aid**
 - When bitumen contacts the skin, the affected area should be washed immediately by splashing it with copiously running water for at least five minutes.
 - The cooling treatment should be continued until the bitumen has cooled and hardened.
 - No attempt should be made to remove the bitumen from the burn victim.
 - A burn relief dressing should be applied as soon as possible.
 - Eye contact or hot steam caused burns. Both need medical attention. Specialist care for affected areas should also have the same effect as a burn relief dressing.

See other side

ATTACH TO THE PATIENT

BitSafe



Burns Tag

- **Further treatment and medical care**
 - The bitumen layer will be firmly attached to the skin, and removal should NOT be attempted except at a medical facility under the supervision of a doctor. The cold bitumen will form a waterproof stable layer over the burn which will prevent the burn from drying out. If the bitumen is removed from the wound there is a possibility of complications.
 - The bitumen should be left in place and covered with a dressing containing a paraffin-based ointment (e.g. Feniverin). Such treatment will have the effect of softening the bitumen, enabling it to be removed over a period of days.
 - The dressing should be changed daily or when soiled or dry, or when the any solvent bitumen can be gently removed. Petroleum-based and biodegradable or petroleum jelly may be used under medical supervision.
 - The degree and extent of burns, and the general condition of the patient will dictate when transfer to a specialised burn unit is indicated.
- **Circumferential burns**

Where hot bitumen completely encircles a limb or other body part the cooled and hardened bitumen may have a tourniquet effect. The bitumen should be removed as described above and the patient referred urgently for specialist medical attention.
- **Eye burns**

If hot bitumen enters an eye, it should be flushed with water until the bitumen has cooled. No attempt should be made by unqualified personnel to remove the bitumen. The patient should be referred urgently for specialist medical assessment and treatment.

While considerable effort has been made to ensure the accuracy of the information provided, neither Sabita nor its members can accept liability for any loss, damage or injury whatsoever resulting from the use of this information.



A member of Equinor Group

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2.

Bitumen spill protocol

Preface

This document has been developed by Sabita to outline for the bituminous products industry acceptable industry protocols for responding to bitumen spills on land and/or adjacent water environments

In South Africa, bitumen is mainly sourced from oil refineries (Durban, Cape Town and Sasolburg) where the residue from the crude oil refining process is used for the manufacture of bitumen. When shortfalls occur in local supplies, however, bitumen is also imported via the ports of Cape Town, Durban and Richards Bay.

Hot bulk bitumen is transported mainly by road in Bitumen Bulk Road Tankers (BBRTs) at elevated temperatures, typically between 100°C and 200°C. The bitumen is loaded into BBRTs at a refinery, port or storage depot, and distributed to users across southern Africa. Routes travelled by BBRTs with hot liquid bitumen vary from high density industrial areas, built up residential areas, rural landscapes, across rivers and estuaries, etc. on municipal roads, regional roads and national highways.

During 2011-2012 a number of incidents occurred that resulted in large bitumen spills on land. Spills of up to 20 tons of bitumen have been reported, and feedback from key industry operators was that the response to some of these incidents was not at an acceptable level.

Typical bitumen spill problems include:

- Ignorance of the properties and characteristics of bitumen and bituminous products;
- Uncertainty of authorities about accepted response and treatment protocols;
- Legal considerations regarding contractual involvement;
- Bureaucratic delays in awarding response contracts;
- Selection and award to a competent contractor (with a good track record);
- Logistics on site - for example, getting the correct trained staff and response materials to site on time.

Recognising that conventional oil spill response and remediation procedures and techniques are not necessarily "fit for purpose", this Sabita initiative seeks to establish a structured co-ordinated approach to the understanding and management of bitumen spills.

Aim of this protocol

Sabita acknowledges that bitumen hauliers may have their own spill response plans and agreements with spill response contractors in place. Since Sabita does not wish to interfere, in any way, with these arrangements the aim of this protocol is:

- To create awareness of the unique characteristics of bitumen and bituminous products and the potential challenges facing spill responders;
- To establish a nationally accepted protocol, endorsed by all interested parties, for the immediate/initial response to bitumen spills;
- To establish a discussion forum and central information centre for interested parties with regard to current best practice for bitumen spill response strategies.

Scope of this protocol

The response plan established in accordance with this protocol applies to bitumen spills resulting from incidents occurring when bitumen is in transit on any public road or port within the jurisdiction of a municipal, provincial or national government authority.

This protocol does not cover bitumen spills on any proprietary premises or production facility (i.e. refineries, asphalt plants, storage depots).

1. Bitumen types and their characteristics

Conventional oil spill recovery techniques will not be effective for bitumen spills, and it is therefore essential to have a basic knowledge of the types of bitumen, their properties and typical characteristics that could influence spill response strategies.

1.1 General description of bitumen

Bitumen is a dark brown to black cementitious adhesive and waterproofing material used for road construction, road maintenance and other industrial waterproofing and corrosion proofing applications. Used as is (straight-run bitumen produced at refineries) or modified, bitumens used in the asphalt industry are generally referred to as *bituminous binders*. Bitumen is very viscous or near solid at ambient temperatures, and softens gradually when heated. For greater ease of handling (i.e. pumping, transporting, mixing with aggregate, spray paving, etc.) bitumen must be heated to temperatures ranging from 100°C up to 200°C, to reduce its viscosity.

1.2 Bitumen types

1.2.1 Paving grade bitumen (previously known as penetration grade bitumen)

Paving grade bitumen is the most widely used bitumen and may also be considered as the parent bitumen from which the other forms are produced. Characteristics associated with paving grade bitumen that could influence spill response strategies include:

- **Flash point:** 160°C - 250°C depending on the grade;
- **Auto ignition temperature:** 300°C;
- **Temperature of liquid in transit:** Minimum 100°C and up to 200°C.

Note: *If water is mixed with hot bitumen, the water undergoes a very rapid and sudden expansion, something in the order of 20 to 30 times its original volume. Water should therefore be used with utmost care in any attempt to cool down (and thereby solidify) hot bitumen in confined spaces and within containment bunds/dykes.*

1.2.2 Cut-back bitumen

A way of reducing the viscosity of bitumen is to add a solvent to the bitumen, which is then referred to as cut-back bitumen. Cutback bitumen consists of bitumen that has been diluted in solvent (cutter or flux diluents) to make it more fluid for application. The fluidity (viscosity) of cutback bitumens (or cutbacks as they are known), depends on the degree of hardness of the bitumen and the proportion of diluents.

Cutbacks vary in behaviour according to the type of cutter or flux used as the diluents. The diluents (cutters) most commonly used in South Africa are kerosene for MC (Medium Curing) grades, and diesel for SC (Slow Curing) grades.

Note: *Rapid curing grades that use gasoline or white spirit as the cutter are no longer supplied or used in South Africa.*

Characteristics of cutbacks that could influence spill response strategies include:

- **Flash point:** 27°C to 66°C depending on the grade;
- **Auto ignition temperature:** 149°C to 316°C depending on the proportion of diluents;
- **Temperature of liquid in transit:** Variable between 65°C and 120°C.

The diluents used in cutbacks are lighter than the bitumen with which they are mixed, causing spilled bitumen to initially float on water or be suspended just below the surface. However the diluents are also relatively volatile and will evaporate, altering the buoyancy characteristics of the bitumen. Therefore:

- As the lighter portions of a cut-back bitumen spill begin to evaporate, the progressively heavier bitumen is likely to begin sinking — rendering useless the conventional clean-up equipment designed to recover floating oil;
- If the spilled bitumen eventually assumes neutral buoyancy and becomes suspended between the water surface and the bottom, then it is unlikely that any response technologies can be successfully applied to significantly control the spill.

The diluents are also flammable, with significantly lower flammable limits compared to bitumen — which is considered to be "not flammable". The effect of this is that the flammable limits of the cutback bitumen are altered,

and it is likely that the vapour above the surface of hot cutback bitumen will be a flammable mixture and could ignite in the presence of an ignition source.

1.2.3 Bitumen emulsions

Bitumen emulsions are dispersions of bitumen in water, and normally comprise between 30% and 80% bitumen by volume. Bitumen emulsions have a low viscosity compared to the bitumen from which they are produced.

- **Flash point:** Not determined. Emulsions will not burn under normal circumstances;
- **Auto ignition temperature:** Not known. However under severe fire conditions the water may evaporate completely and the residual bitumen could ignite;
- **Temperature of liquid in transit:** Variable between ambient and 80°C. (Bitumen emulsions are usually handled at ambient temperature; however some new high bitumen content emulsions are handled at elevated temperatures (40°C to 80°C).

Characteristics of bitumen emulsions that could influence spill response strategies:

Bitumen emulsions are considered non-hazardous, posing no, or very limited, threat to the environment. This is probably based on the premise that emulsions are handled at much lower temperatures and that the bitumen is dispersed in water. However the reality is that ALL spills must be cleaned up and certain characteristics can prolong recovery efforts and unnecessarily escalate overall remediation costs. Note the following:

- Because of their lower viscosity and greater fluidity, emulsions are more likely to spread rapidly and affect larger areas than other bitumens;
- Emulsions could also migrate more rapidly from a land spill site into adjacent or nearby water environments. Trials conducted in the UK (in sea water) suggest that emulsion spills into water "do represent a serious challenge for oil spill response".

1.2.4 Modified binders

Modified bituminous binders are bitumens that have been modified by the addition of rubber compounds, e.g. polymers such as styrene butadiene styrene (SBS), polybutadiene (PBD) and ethylene vinyl acetate (EVA). Characteristics of modified binders that could influence spill response strategies:

- **Flash point:** 230°C;
- **Auto ignition temperature:** 370°C;
- **Temperature of liquid in transit:** 145°C to 185°C.

Note. *Refer to paragraph 1.2.1 - Paving grade bitumen for further information.*

2. Bitumen spill response planning

2.1 Objective

The objective of response planning is to develop, implement and maintain a management system, including plans and procedures, which when activated in any bitumen spill situation will minimise the harmful effects on:

- Human life and health;
- The environment;
- Own and/or third party assets;
- Company and industry image or reputation.

A further objective is to assist in the return to normal and safe operations.

Note. *The essence of any response is to contain, assess and act. However, action is the most important since the quicker the response the less the damage and the less contingent liability.*

2.2 Organisation, roles and responsibilities

2.2.1 Bitumen spill - first response communication procedure

Notification and immediate response to bitumen spill incident		
Responsible person	Action required	When
(1) Driver OR If driver is incapacitated (2) 3rd party person on site	Notify Operator's despatch office.	Immediately
Despatch supervisor	Use spill notification checklist to gather required information and provide advice to driver.	During call
Driver or 3 rd party	Best possible effort to contain the spill. Get help to regulate traffic and control access to the spill zone.	Until response team arrives
Despatch supervisor	Notify Operator's emergency response co-ordinator.	Immediately
Operator's emergency response co-ordinator	Despatch an incident controller AND spill response team to the spill site.	As soon as possible
Incident controller	Assess on-site conditions (including a risk assessment) and decide on appropriate action to effectively contain the spill and manage recovery of product.	On arrival at spill site
Incident controller	Provide situational report (SITREP) to Operator's emergency response co-ordinator and remain on site for duration of recovery operation.	Ongoing
Operator	Inform relevant asset owner of the incident (i.e. appropriate roads authority, land owner, port authority, etc).	As soon as possible
Spill response team	Proceed with recovery/site remediation as directed.	After stabilising and securing site

2.2.2 Spill recovery resources - contractors and suppliers

Sabita recognises no responsibility to dictate to hauliers which spill response contractors/suppliers they should use, and also has no intention

of doing so. However it is in the best interest of all stakeholders to assure that minimum acceptable standards for bitumen specific response capabilities are agreed upon, and that a "preferred supplier agreement" is in place to ensure prompt and appropriate response.

2.2.3 Other sources for bitumen spill response information and advice

2.2.3.1 Sabita head office:

- Sabita will maintain an updated copy of this protocol on the public section of its internet website as a service to interested parties;
- Sabita's head office may be contacted, Mondays to Fridays 08:00 - 16:00, on 021 531 2718 for bitumen specific information or advice.

2.2.3.2 MSDS and bitumen load documents:

A product MSDS must be available on board a vehicle and must be consulted as a first information resource at a spill site. However, the MSDS and UN Classification number for the on-board product may not necessarily be the most appropriate, and responders should **IN ALL CASES** examine the load documents to correctly identify the type of bitumen involved in the spill.

Sabita has developed a bitumen specific Emergency Response Guide (ERG) which is considered more appropriate for application to most bitumen spill scenarios. The Sabita ERG 1/2013 is appended to this document as Appendix 1.

Appendix 1. Emergency Response Guide (ERG) for bitumen

Sabita ERG -
1/2013

Low to Moderate hazard substances:
Bitumen (UN1993/UN3256/UN3257)

Potential hazards
Fire or explosion
Flammable - can be ignited by sparks or flames: <ul style="list-style-type: none">• In case of fire DO NOT USE WATER JET. Use foam, dry chemical or carbon dioxide extinguisher or spray;• Vapours may form explosive mixtures with air;• Vapours are heavier than air and can spread along the ground or float on water surfaces and may reach remote ignition sources;• Do not allow hot molten product to come into contact with water or other liquids;• Avoid spraying directly into storage containers because of the danger of boil-over;• Any runoff to a sewer may create fire or explosion hazard;• Containers may explode when heated;• Runoff from fire control or dilution water may cause pollution.
Health
Caution: Substance may be transported at elevated temperatures up to 160C. <ul style="list-style-type: none">• Will cause severe burns if hot material contacts eyes or skin;• Vapour, mist or fume may irritate the nose, mouth and respiratory tract;• Fire may produce irritating or toxic gases. Decomposition products may include the following materials:<ul style="list-style-type: none">o carbon dioxide;o carbon monoxide;o sulphur oxides.• Vapours in confined spaces may cause dizziness or suffocation.
Public safety
Immediately contact emergency services. <ul style="list-style-type: none">• As an immediate precautionary measure, isolate spill or leak area for at least 50 meters in all directions;• Warn people not to touch or walk through spilt material;• Keep unnecessary and unprotected personnel from entering affected area;• Keep upwind of the spill and out of low areas.

Protective clothing

Structural fire-fighters' protective clothing will only provide limited protection.

- Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Evacuation

Large Spill:

- Consider initial downwind evacuation for at least 50 m;
- If on severe down-slope consider evacuation for at least 100 m below spill.

Fire:

- If tank, rail car or road tanker is involved in a fire, ISOLATE for 100 m in all directions; also, consider initial evacuation for 200 m in all directions.

Emergency response

Fire

CAUTION: Do not use straight streams/jets.

Small Fire:

- Dry chemical, CO², water spray or regular foam.

Large Fire:

- Water spray, fog or regular foam;
- Move containers from fire area if you can do it without risk.

Fire involving tanks or road/rail tanker loads:

- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles;
- Cool containers with flooding quantities of water until well after fire has been extinguished;
- ALWAYS stay away from tanks engulfed in fire;
- For massive fires, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let the fire burn.

Spill or leak

- Dike far ahead of liquid spill for later disposal;
- A vapour suppressing foam may be used to reduce vapours;
- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area);
- Do not touch or walk through spilled material;
- Stop any leak if you can do so without risk;
- Protect drains from spills and prevent entry of product, since this may result in blockage after cooling.

First aid

Note: *In case of bitumen burns this section must be read in conjunction with the Bitumen Burns Tag which reflects best practice guidance for treatment of bitumen burns!*

- Move victim to fresh air;
- Call emergency medical service;
- Give artificial respiration if victim is not breathing;
- Administer oxygen if breathing is difficult;
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes;
- Do not remove clothing if adhering to skin;
- Do not attempt to remove any bitumen adhering to exposed skin areas;
- In the unlikely event of ingestion of liquid bitumen DO NOT INDUCE VOMITING.

Appendix 2 - Bitumen spill notification checklist

Date:	Time:		
Caller name:	Caller contact number::		
Where did the spill occur: (include GPS coordinates if available)			
Initiating event: (Tick where applicable)			
Collision with vehicle/structure	<input type="checkbox"/>	Vehicle roll-over	<input type="checkbox"/>
Pipe or tank rupture	<input type="checkbox"/>	Other	<input type="checkbox"/>
Type of bitumen: (Tick where applicable)			
Paving grade	<input type="checkbox"/>	Cut-back	<input type="checkbox"/>
Emulsion	<input type="checkbox"/>	Polymer modified	<input type="checkbox"/>
Prevailing weather conditions: (Hot/cold, wind direction/strength, rain, poor visibility etc.)			
Terrain description: (Flat, undulating hills and valleys, dense vegetation, marshland etc.)			
Has the spill reached any body of water?: (If YES, describe)			
Has any damage occurred to soils, groundwater, surface water, drinking water, utilities, land surface, plants, wildlife or third party? (If yes, describe)			
Describe surrounding land use type: (Commercial, industrial, residential, agricultural etc)			
Describe the ground cover at the site: (lawn, asphalt, gravel, veld etc)			
Is the spill continuing or has it stopped?			
How much bitumen was released? (Estimate)			

Notes

Notes