



Project	<b>Extractive Activities</b>
Topic	<b>Preliminary discussion - Accounting for stripping costs in the production phase</b>

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## Introduction

1. In June 2009 a request was received for guidance in respect of the accounting treatment of stripping costs during the production stage of the mine. The full text of the IFRIC request received has been included in Appendix A.
2. The purpose of this paper is to provide the IFRIC with background for a preliminary discussion on the topic.
3. As such, this paper:
  - a. Provides a brief general background to the mining industry (paragraphs 4 - 10),
  - b. Discusses stripping activities as they occur both in the development and in the production phase (paragraphs 11 - 20);
  - c. Discusses the methods of accounting for stripping costs currently being applied in practice (paragraphs 21 - 23), and
  - d. Proposes the next step in the IFRIC's discussion of this issue (paragraphs 24 - 25).

## Background

4. In surface mining operations it is necessary to remove overburden and other waste materials to gain access to ore, in order to extract minerals from that ore. This removal activity is known as stripping (or pre-stripping).

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This paper has been prepared by the technical staff of the IASCF for discussion at a public meeting of the IFRIC. The views expressed in this paper are those of the staff preparing the paper. They do not purport to represent the views of any individual members of the IFRIC or the IASB. Comments made in relation to the application of an IFRS do not purport to be acceptable or unacceptable application of that IFRS—only the IFRIC or the IASB can make such a determination.

Decisions made by the IFRIC are reported in *IFRIC Update*.

Interpretations are published only after the IFRIC and the Board have each completed their full due process, including appropriate public consultation and formal voting procedures. The approval of an Interpretation by the Board is reported in *IASB Update*.

5. Surface mining is a type of mining where soil and rock overlying the mineral deposit are removed, and is different from underground mining, where the overlying rock is left in place and the mineral is removed through shafts or tunnels. Surface mining is done when deposits of the ore are found near the surface, and the layer of overburden is relatively thin. Strip mining (typically for coal) and open pit mining (e.g. for copper) are types of surface mining. Refer to Appendix B for diagrams depicting variations of surface mining.
6. For purposes of context, most mines go through a life cycle of 5 phases – exploration, evaluation, development (and construction), production and closure. The phases often overlap.
7. The *exploration* phase is when discovery of mineral resources takes place. During the *evaluation* phase, costs are incurred for proving the technical feasibility and commercial viability of any resources that were found.
8. The *development* phase is where access to the mineral reserve is established, and preparations are made for commercial production. Stripping costs are an example of development costs (also called pre-production stripping). The *production* phase is where saleable product is obtained from the mineral reserve. Often, however, development activities will continue after production has begun – production stripping is an example of this. Both the development and production phases are discussed in more detail further on in the paper.
9. *Closure* occurs after mining operations have ceased, and includes restoration of the site.
10. In this paper, the focus is on stripping costs as they occur in the development and production phases only.

#### **The development phase**

11. The development phase of the mine is reached when the entity declares that *proved and probable reserves* (proved and probable mineral reserves reflect estimated quantities of economically recoverable reserves, which can be recovered in the future from known mineral deposits) have been identified, and some portion of the mineral deposit can be mined and processed economically.

12. Development activities include the establishment of access to the reserves and other preparation for commercial production, including building of shafts, roads, tunnels, and removal of overburden (stripping).
13. For IFRS preparers, costs relating to development (or start-up) activities are accounted for in accordance with IAS 16 *Property, Plant and Equipment* – such costs will be expensed as incurred, unless they are directly attributable to bringing an item of property, plant and equipment to the location and condition necessary to operate as management has intended.
14. Given the above, costs arising from development activities are usually capitalised to the extent that they are expected to be recouped through successful exploitation of the proved and probable reserves. Each unit of product ultimately sold (generating the future economic benefit for the entity) will bear its proportionate share of development costs.
15. Significant accounting issues in the development phase include consideration of what development costs should be capitalised, and determining the cut-off between where development ends and production begins. Once commercial production begins, development costs cease to be capitalised.
16. Entities use various captions in their financial statements to describe the capitalised development expenditure, including ‘mineral assets’, ‘mine properties’, ‘mine infrastructure’, and ‘mine plant and facilities’.

**The production phase**

17. The production phase of the mine commences when saleable minerals are extracted (produced), regardless of the level of production or revenue.
18. Stripping activity can occur after the mine enters the production phase (also known as ‘production stripping’), because development may continue through the removal of overburden in portions of the mine, to reach ore that will be extracted in the current or in later periods.
19. There are a number of good operational and economic reasons why an area will be stripped in the current period, but only mined in a future period – for example, an entity may need to hire specialist machinery required to perform the stripping and would consequently strip as much overburden as possible, in

the time the machine is available. Climate conditions may also dictate the timing of stripping activities.

20. The nature of the stripping activity performed during the production phase is the same as stripping done in the development phase. As discussed above, development stripping costs are generally capitalised. The issue is whether stripping costs incurred during the production phase of the mine, specifically where they create a future benefit, should also be capitalised.

### **Current practice**

21. There is no consensus regarding the accounting for production stripping costs. Current practice is diverse, compounded by the lack of authoritative accounting guidance in IFRS for the mining industry. Capitalisation of stripping costs requires management to apply critical accounting estimates and judgements that management of an entity would need to make.
22. In practice, the following four approaches to accounting for production stripping costs are seen:

*a. Expense stripping costs when incurred*

Typically done when the amount of overburden to be stripped is expected to be consistent from period to period over the life of the mine, and/or when the stripping costs are expected to be immaterial.

*b. Capitalise stripping costs as a cost of inventory, as variable production costs*

This approach is mandated in the FASB ASC Subtopic 930-330 *Extractive Activities—Mining—Inventory*<sup>1</sup>, which prohibits the capitalisation of production phase stripping costs.

Some entities reporting under IFRS have adopted this approach (using the hierarchy available in paragraph 12 of IAS 8 *Accounting Policies, Changes in Accounting Estimates and Errors*).

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<sup>1</sup> EITF 04-6 *Accounting for Stripping Costs Incurred during Production in the Mining Industry*

- c. *Capitalise stripping costs and attribute to reserves benefited in a systematic and rational manner*

In contrast to the US GAAP approach described in point b, the Canadian Emerging Issues Committee issued EIC-160 *Stripping Costs Incurred in the Production Phase of a Mining Operation* in March 2006, which states that production stripping costs should be accounted for according to the benefit received by the entity – therefore, stripping costs should be accounted for as variable production costs, but may be capitalised if the stripping activity can be shown to represent a ‘betterment’ to the mineral property. Betterment is said to occur when the stripping activity provides access to sources of reserves that will be produced in future periods, which otherwise would not have been accessible.

EIC-160 states further that such capitalised stripping costs should be amortised in a rational and systematic manner over the reserves that directly benefit from the specific stripping activity.

- d. *Capitalise stripping costs using a strip ratio*

A number of IFRS preparers use a variant of the Canadian approach, where the quantum of stripping costs to be capitalised in a period is determined by use of a strip ratio (or mine strip ratio). The strip ratio is calculated as:

Estimated total waste material in tonnes

Estimated total proved and probable reserves

This ratio will be calculated for the life of the mine (hence establishing the *average* strip ratio). The *actual* strip ratio is then calculated each period and compared to the average strip ratio. Stripping costs incurred within ‘normal’ levels will be included in operating costs in the period, but any excess stripping costs (actual strip ratio > average strip ratio) are capitalised.

Usually, the converse will also apply – when the actual strip ratio < average strip ratio, any previously capitalised costs are expensed (also sometimes a form of amortisation) in the period - but limited to zero. In

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very rare instances, entities have reflected a 'liability' or credit balance for deferred stripping costs.

23. Appendix C includes some examples of the treatment of deferred stripping by entities operating under the various accounting frameworks.

### **Next step**

24. The staff will present a second paper on this topic on day 2 of the IFRIC meeting, in which a brief technical discussion will be provided, along with the assessment of whether the IFRIC agenda criteria are met.
25. It is hoped that the information in this paper and the preliminary discussion at the initial session will provide sufficient background for the IFRIC members to assess whether the issue of accounting for production stripping costs should be added to the IFRIC agenda.

## Appendix A – IFRIC potential Agenda Item Request

A1 The staff received the following IFRIC agenda request. All information has been copied without modification by the staff.

A2 [XXXX] request IFRIC to address accounting for the costs of removal or overburden and other waste material during the production phase of a mine, as it is not specifically addressed in IFRS.

### Background

A3 Mining methods can be considered in two major categories. Often the mineral deposit is quite deep underground and access to the deposit is by means of a shaft or ramp. If the mineral deposit is close to the surface it will be accessed by removing any non mineral material that lies between the surface and the deposit. For each mine the decision is made on the basis of safety and the cost, amount of mineral that will be recovered and other economic factors for each method

A4 The term “surface mining” refers to mines where the mineral deposit is accessed by removing non-mineral material that lies between the surface and the deposit (overburden). The deposit may be deep and require the development of a pit to extract all the minerals. In this case it will usually be necessary to remove both the overburden and also material around the deposit (waste material) in order that the sides of the pit are structurally secure. The deeper the pit, the wider the area around the deposit that may need to be removed. In other surface mining operations the deposit is not deep but extends over a large area and only the overburden needs to be removed.

A5 During the development of a surface mine, sufficient overburden and waste material is removed to provide access to the part of the deposit that will be mined initially. It is generally accepted that these costs are capitalized as part of the cost of the mine. However this often does not provide access to the total mineral deposit. This might be for economic reasons – why spend money now to access a part of the deposit that will not be mined for several years – or for physical reasons – in a pit, access to lower portions of a deposit cannot occur until the higher portions have been mined. Consequently it is common for overburden and

waste material to be removed during production in order to provide access to additional parts of the ore body.

### Accounting Issue

A6 Within the mining industry the costs of removal of overburden and other waste material are commonly referred to as “stripping costs”. IFRSs do not specifically address the accounting for stripping costs incurred during the production phase of a mine and in practice several different methods are used.

1. Some companies expense all stripping costs in the period incurred. In many cases the overburden is only removed shortly before the mineral ore is extracted. Although removing overburden from a part of the deposit that will be mined in the next period represents a benefit to the next period, the cost may not be material and the amount may be fairly consistent from year to year. This is the most simple method and minimizes accounting costs. This method tends to be only used where stripping costs applicable to future production are not significant.
2. EITF 04-6, *Accounting for Stripping Costs Incurred during Production in the Mining Industry*, states that “stripping costs incurred during the production phase of a mine are variable production costs that should be included in the costs of the inventory produced (that is extracted) during the period the stripping costs are incurred”. This is consistent with the guidance on the costs of inventories in IAS 2, *Inventories*. Specifically, paragraph 12 of IAS 2 states “The costs of conversion of inventories include costs directly related to the units of production, such as direct labour. They also include a systematic allocation of fixed and variable production overheads that are incurred in converting materials into finished goods.” Overburden removal might be viewed as directly related to the units of production, or as a production overhead incurred in converting the mineral deposit into ore available for processing. In any event it fits into the definition of a cost of inventory.

However many in the mining industry have observed that this ignores the fact that stripping costs incurred in a period may benefit future production



rather than current period production. If the overburden is only removed shortly before the mineral ore is extracted this may not be material.

However in some situations there are operational reasons to incur significant costs in one period that provide access to parts of the deposit that will be mined over several future years. For example, a company may intend to expand an open pit mine to a considerably deeper depth than the current mine design will permit. This would require widening the pit to ensure safe access to the deeper part of the deposit, and widening the pit will require removing considerable amounts of waste material. EITF 04-6 would include the costs of widening the pit in the cost of inventory produced in the current period, even though the costs are not related to current period production.

While EITF 04-6 is a US pronouncement and not part of IFRSs, this accounting practice has been adopted by a number of companies that report under IFRSs.

3. An approach that has long been favoured by the mining industry (and is often used by companies that report under IFRSs) is the use of an average stripping ratio. Under this approach the actual ratio of overburden to mineral ore extracted is compared to the expected average ratio over the life of the mine (in accordance with the formal mine plan). When the actual stripping ratio exceeds the expected mine average, the excess is deferred. The actual stripping ratio for a period may differ from the expected mine average for several reasons. As discussed above, operational reasons may result in the amount of overburden and waste material removed to benefit future periods varying from one year to the next. Also the amount of overburden and waste material that must be removed to access the mineral ore may vary in different parts of the deposit. For example, in a strip mine the depth of overburden may vary across the deposit.

Companies following this approach will defer costs when the actual stripping ratio exceeds the expected mine average i.e. they will record a deferred stripping asset. If the actual stripping ratio is less than the

expected mine average a liability is not recorded, on the grounds that the “under-expenditure” does not meet the definition of a liability.

This raises the question as to whether an expenditure on stripping costs that is higher than the expected mine average is an asset. Where the difference is due to unusually high expenditures made to access mineral ore that will be mined in future periods, the definition of an asset may be met. It is less clear that the definition of an asset is met when the difference occurs because the overburden removed in the period was deeper than the mine average. Use of the stripping ratio approach to defer costs in that scenario appears to be based on matching the production costs to production volumes over the life of the mine rather than on the definition of an asset. In practice, the difference between the actual and expected stripping ratio may be due to a combination of the characteristics of the current area being stripped and how much advance stripping is being done.

4. Deferred stripping is addressed under Canadian GAAP in EIC-160, *Stripping Costs Incurred in the Production Phase of a Mining Operation*. EIC-160 states “stripping costs should be accounted for according to the benefit received by the entity. Generally, stripping costs should be accounted for as variable production costs that should be included in the costs of the inventory produced (that is, extracted) during the period that the stripping costs are incurred. However, stripping costs should be capitalized if the stripping activity can be shown to represent a betterment to the mineral property. A betterment occurs when the stripping activity provides access to sources of reserves that will be produced in future periods that would not have otherwise been accessible in the absence of the activity.”

This approach appears to be directionally consistent with the Framework definition of an asset: “a resource controlled by the entity as a result of past events and from which future economic benefits are expected to flow to the entity.” It relies on the removal of overburden and other waste material providing a future economic benefit (expressed in accordance

with Canadian GAAP as a betterment to the mineral property). It also recognizes, consistent with EITF 04-6, that overburden removal costs are production costs and should be included in inventory costs. Unlike EITF 04-6, but consistent with component accounting in IAS 16, stripping costs that benefit future production would be initially capitalized and amortized over the appropriate future production, at which time the amortization would be included in inventoriable production costs.

This approach requires specific reserves to be identified for purposes of amortizing capitalized stripping costs and the production of those reserves to be separately recorded. (Amortization over the total remaining reserves will only be appropriate if the overburden and other waste removal benefits the total remaining reserves.) As a result this approach requires more accounting effort and, other than by Canadian companies, is not believed to be used extensively.

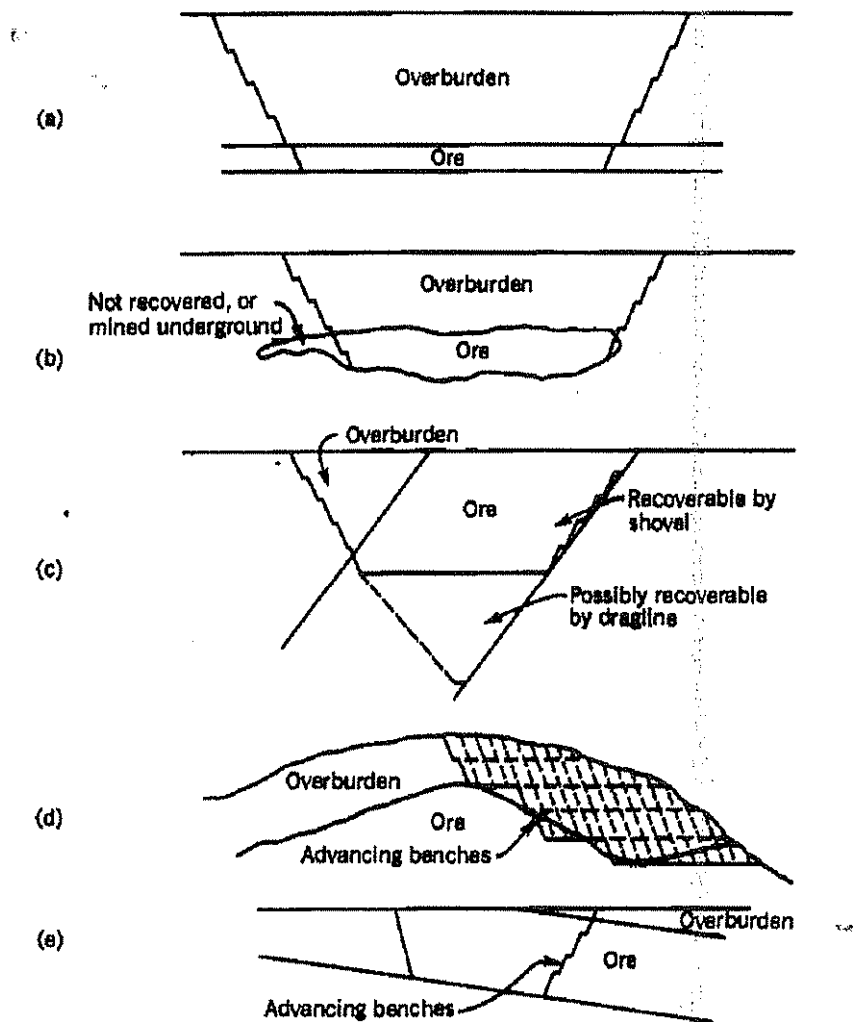
## **Conclusion**

A7 IFRSs do not specifically address accounting for the costs of removal of overburden and other waste material during the production phase of a mine. This paper identifies four different approaches. These different approaches can result in significantly different amounts being charged to expense in any given period.

A8 The IFRIC issues interpretations on “issues where unsatisfactory or conflicting interpretations have developed, or seem likely to develop in the absence of authoritative guidance”. It is therefore requested that the IFRIC add this issue to its agenda.

## Appendix B

## Types of surface mining



**FIGURE 7.2.** Variations of open pit mining. (a) Flat-lying seam or bed, flat terrain. Example: iron, taconite. (b) Massive deposit, flat terrain. Example: iron. (c) Pitching seam or bed, flat terrain. Example: anthracite. (d) Massive deposit, high relief. Example: copper. (e) Thick-bedded deposits, little overburden. Example: nonmetallics, western U.S. coal.

Diagrams courtesy of *Introductory Mining Engineering*, by Howard L. Hartman and Jan M. Mutmanský

## Appendix C

Name of entity	Annual financial year ended	Accounting framework	Product mined	Summary of accounting policy for deferred stripping during production
Anglogold Ashanti	31 December 2008	IFRS	Gold	Excess stripping costs are deferred based on a stripping ratio approach.
BHP Billiton	30 June 2008	Australian GAAP, and IFRS as adopted by the EU (Dual listed entity)	Aluminium, copper, coal, iron ore, inter alia.	When the ratio of waste to ore is not expected to be constant, production stripping costs are accounted for as follows: <ul style="list-style-type: none"> <li>• All costs are initially charged to the income statement and classified as operating costs</li> <li>• Any excess stripping costs are deferred based on a stripping ratio approach.</li> </ul>
Xstrata Plc	31 December 2008	IFRS as adopted by the EU	Copper, coal, ferrochrome, nickel, inter alia	When the ratio of waste to ore is not expected to be constant, excess stripping costs are capitalised based on a stripping ratio approach.  Where the ore is expected to be evenly distributed, waste removal is expensed as incurred.
Teck Cominco Limited	31 December 2008	Canadian GAAP	Copper, coal, zinc	Canadian GAAP allows the capitalization of deferred stripping costs when such costs are considered a betterment of the asset.
Oz Minerals Limited	31 December 2008	Australian GAAP	Copper and gold	Removal of waste costs incurred once an operation commences production activity (production stripping costs) are capitalised as mine property and development assets.
Rio Tinto Plc	31 December 2008	Australian GAAP	Diamonds, aluminium, coal, bauxite, copper, inter alia	Excess stripping costs are deferred based on a stripping ratio approach.