

# **Extractive Industry Financial Accounting: Where To From Here?**

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*By far the most important, difficult and complex policy issue to resolve in the context of the extractive industry concerns the accounting for preproduction costs and mineral reserves, and the disclosure of relevant supplementary data about them. The accounting profession has been unable to settle this particular issue, except in the most contrived of senses. Indeed, many consider the issue to be unresolvable. This paper focuses on the primary financial statements and proposes a partial solution to the issue. The Proposed Method describes a set of new procedures and primary financial statements that are intended to be more serviceable and possess greater predictive power than is currently the case.*

## **1. Introduction**

In Australia, the Crown owns minerals *in situ*. They are considered to be fortuitous gifts of nature, with the benefits belonging to the community, as well as to whoever currently possesses the mineral rights. Minerals are an important contributor to the economy as a whole. However, this contribution, although already significant, has yet to be fully realised. At the present time, mineral rights are not allocated in an efficient manner – to those with the best information and greatest expertise to acquire and exercise those rights. Moreover, once allocated – misallocated! – they are often not used efficiently and effectively.

The capital requirements of the extractive industry are very large and getting larger. Therefore, the efficient allocation of resources – whether at the individual level, the corporate level, or the national level – is becoming ever more central in importance. Accounting has an important role to play in the allocation process, though it should be remembered that financial accounting is only one element of the total information system.

Accountants have a responsibility to provide at least some of the necessary decision-relevant information to the Government, the community, and to individuals and entities within the community. Governments can use accounting information – including that in the primary financial statements – to expropriate the opportunity for wealth from groups of individuals, and redistribute resources to other more efficient members of society. In their turn, all members of society must allocate their resources as efficiently as possible.

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The large size of the Australian extractive industry will allow even modest gains in allocation efficiency to translate into sizeable and sustainable additions to national income as well as to the returns of individual entities, investors and lenders. Consequently, the concept of efficient resource allocation has implications for the economy as a whole, as well as for an entity's or an individual's well-being.

### 1.1 The Industry

There are many features of the extractive industry that make it a high-risk activity. For example, there are intrinsic geological risks – the stock of minerals available for development and economically recoverable, and ore grades, are unknowns; there are intrinsic economic risks – economic conditions, such as prices, costs and technology, can change significantly; and, there are intrinsic political risks – Government action can change the viability of a venture. There is also the human element to consider – for example, in assumptions used, interpretations made, measurements determined, and data reported. Economies, entities and individuals alike are held to ransom by the lack of available information about these risks and elements.

Financial accountants have a responsibility to identify the financial features and events about which decisions makers need information, and to provide it in an appropriate way. At the present time, what little financial data they and others do provide has a misleading air of precision. In summary, uncertainty is unavoidable and risks are inherently pervasive. Financial accountants must understand and be responsive to this aspect of the industry's environment.

### 1.2 The Intended Focus of Financial Accounting

The central focus of financial accounting is to provide data that is utilitarian in nature. In other words, the accounting system design process for a particular reporting entity should begin with an examination and assessment of the entity's industry environment and its associated risks. This is regarded as essential because decision-relevant accounting disclosures to interested parties are simply representations of the underlying facts being reported. These representations are made within the context of a representational model of the reporting entity. The representational model comprises three parts – the industry environment, its associated risk, and accounting policies. The quality of decision-relevant data depends on the ability of accounting policy designers to set in place policies that appropriately model the firm, its environment and risks, and, accordingly, appropriately report the underlying facts.

### 1.3 The Reality

The currently used historical cost-based policies – successful-efforts accounting, full-cost accounting, area-of-interest accounting, and the variations on these – fail to communicate sufficient, accurate, or useful information concerning assets, earnings, or cash flows to interested parties. Not one of them accounts for reserves *per se*. Not one of them appropriately portrays the unusual economic characteristics of exploration and discovery. All of them improperly define and value assets. All of

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them improperly reflect the significant economic event of discovery. All of them improperly signal future cash flows. All of them improperly measure earnings. In essence, the historical cost-based methods produce data that are not verifiable, comparable, or useful.

### 1.4 The Returns

As a result of providing decision makers with poor quality financial information, poor allocative decisions are frequently made. The end result is unsatisfactory investment. In Australia, the Australian Mining Industry Council has provided evidence that despite the high risk, the return on investment in the industry is no better than average – too many resources are spent looking for a small number of viable reserves. Many companies make no return at all. A very few successful companies are responsible for the positive return – but, in a statistical sense, these companies are outliers or anomalies.

Accountants have to take some of the responsibility for this parlous state of affairs because of the poor quality of their output. Their output often provides a misleading investment picture.

### 1.5 Implications

In the extractive industry, information is at least as important to allocative decision makers as land, labour, capital and raw materials. Investment in this industry has always depended upon information and technology concerning 'unique contexts'. The objective of financial accounting is to promote the efficient allocation of scarce resources among competing alternatives.

Primarily, the comparison of alternatives incorporates assessments of the prospective return on investment and lending opportunities – the amount, timing and uncertainty of those returns – and a belief that any relevant information must be capable of changing or confirming those assessments. The relevant information should at least indicate the viability, earnings capacity, and worth, of the operations in question. It has long been recognised that without such information an assessment, let alone a comparative assessment, may not be possible. The overall emphasis here is firmly on the predictive power of information. Virtually all decisions involve predictions.

Nevertheless, it has been recognised that very little predictive information can be garnered from an examination of extractive industry financial statements. The Balance Sheet, Income Statement, and Cash Flow Statement – taken either together or separately – are insufficient as a basis on which to reach an informed lending or investment decision.

It may be said that none of the current methods used to account for preproduction costs and mineral reserves can produce a single period's financial statements that will make evident, even approximately, the underlying facts. For example, there is a lack of correlation between current activities and most expenses, and between costs incurred and the value of reserves discovered. Furthermore, the numbers

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reported in the financial statements are unavoidably subject to arbitrary measurement/forecasting/manipulation in both the geologic and financial dimensions, so that financial statements do not portray an economically accurate picture. The historical cost-based methods generate data that are not verifiable, comparable, or useful.

Despite the inescapable and troublesome list of difficulties, we still tend to use the financial statements as, at least implicitly, the base for analysis. In the meantime, many prospective lenders and investors spend considerable time evaluating the quality, quantity, and value of the reserves owned (but not yet produced) and many other aspects of the business. If investors and lenders are to be treated equitably – kept fully informed in a timely way – it seems clear that the primary financial statements will have to be joined by an appropriate set of supplementary data on reserves, operations, and other relevant areas. In fact, there are a multitude of matters an analyst must examine when assessing a company, many of which have only a little - or even perhaps nothing – to do with a company's primary financial statements *per se*. This data is critical to many decisions and should be available to decision makers.

The public disclosure of the widely disparate sort of data referred to here has now become widely accepted as necessary if decision makers are to be fully informed about the underlying facts and, accordingly, make more knowledgeable decisions. This is the notion of full disclosure. Financial statement accounting is only one component of a total information system. However, accountants have tended to continue to interpret full disclosure in terms of aggregate financial numbers and the bottom line. Full disclosure also avoids the problem of monopolistic profits for those who hold insider information. Disclosure should always be made unless it can be shown that no abnormal returns can be earned or that the cost of making the disclosure exceeds any expected abnormal returns.

Predictive power in the context of investment and lending decisions encompasses several criteria such as relevance, credibility, reliability and comparability. These criteria should be addressed in a context wider than simply the primary financial statements. The primary financial statements should probably be found within – simply be a component of – a more comprehensive package of disclosures.

This would be a step toward 'substance' (and away from 'form'), would recognise that financial statement numbers are not precise measures of performance and position, and would acknowledge that supplementary data complements these measures. This would surely be a more serviceable state of affairs since many decision makers are ignorant of the peculiarities and nature of the extractive industry – much less the specific company and its reserves. They are less likely to be misled if full disclosure is made in terms of a complementary and consistent total package.

To leave things as they stand is to sanction primary financial statements that do not fully or accurately report significant data. Silence and the *status quo* are not the answer. The magnitude of the expenditure at each phase of activity demands that additional compensatory and supplementary disclosures be made to investors and

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lenders to keep them fully informed and to render the total information package more useful.

Moreover, decision makers must be assured that information is of a certain standard – in terms of both quality and quantity – that allows meaningful comparison between alternatives. Alternatively, they must be made aware of its limitations. Many investors and lenders see only precision in financial statements. However, major uncertainties characterise the contents of financial statements emanating from companies in the extractive industry. Interested parties should be able to easily distinguish between facts and non-facts (estimates) and to identify which data fits which description.

The regulators have not been prepared to go far in pursuing these modifications. Certainly they have had no option but to abandon current economic valuation as a viable notion. However, they have been reluctant to abandon all valuation and have, accordingly, elected to return to the highly unsatisfactory historical cost-based methods of measuring and reporting preproduction costs and mineral reserves. Seemingly, there is nowhere else to turn in the accounting measurement policy spectrum. The primary financial statements star in their role as the abandoned orphan. The supplementary disclosures continue in their role as the isolated and erratic, but well-meaning, mentor.

## 2. Toward a Solution – A Proposed Method and the Primary Financial Statements

The central notion underpinning this Proposed Method is the classification and segregation of factual and non-factual financial data. Fact and fiction are separated – mixing the two gives neither.

It does this by dividing the Balance Sheet into two parts<sup>2</sup> – a *Mineral Investment* section and a *Statement of Financial Position* section. The former reports preproduction costs, estimated mineral reserves, and the equivalent utilised equity. The latter reports those assets that have an identifiable arms-length exchange value, liabilities, the shareholders' investment, and any residual surplus or shortfall. The Proposed Method also incorporates:

- some changes to terminology. These changes are aimed at reducing jargon, thereby enhancing the ease with which the lay decision maker can

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<sup>2</sup> The idea for a divided Balance Sheet came from two primary sources. The first was the use of a separate Capital Account – within the Balance Sheet – to report receipts and expenditures of a capital nature by railway and utility companies around the turn of the previous century (Carter, 1926). This method of presenting accounting statements was termed the Double Account system (Edwards, 1985; Walker et al., 2000). The second was the observation of Morgenstern (1963) that Balance Sheets should be cellular, reflecting the differing levels of measurement accuracy of various data. Development of the idea was fostered by Chambers, who himself noted the possibilities of a divided Balance Sheet in the extractive industry context (1979). A segregated system of accounting in which funds and value flows are kept rigidly apart was proposed by Rayman (1969).

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understand the data. For example, the terms *shareholders' interest*, *shareholders' surplus*, *shareholders' shortfall*, *creditors' shortfall*, *gain (or loss) in exchange value of held assets*, *wealth at start (and end) of year*, and *liabilities to creditors*, are all terms not currently found in the financial statements of companies in the extractive industry.

- some changes to the structure of the Income Statement. These are aimed at ensuring periodic net profit (or loss) represents the real change in the reporting entity's wealth over the period. This involves the separate reporting of operating profit (or loss), the net gain (or loss) in exchange values of held assets, and a capital maintenance adjustment related to the change in general purchasing power over the period.
- two additional financial statements – the *Reconciliation of Shareholders' and Creditors' Surplus or Shortfall*, and the *Reconciliation of Entity's Wealth at Start and End of Year*. The former reconciles a reporting period's opening balance of shareholders' and creditors' shortfall – or *shareholders' surplus* – with the closing balance. The latter reconciles the entity's wealth at the start of the period with its wealth at the end.

The Proposed Method would set-off preproduction amounts – which are sunk costs – against equivalent amounts of shareholders' capital – and, if needed, of liabilities to creditors – in the Mineral Investment section. The balance of these costs and the corresponding equity amount would be reduced or increased at the end of each reporting period according to outlays made and outcome decisions reached – whether or not a reserve had been discovered; whether or not the search for a reserve was to continue. Preproduction items having an identifiable arms-length exchange value – for example, a drilling rig – would be recorded in the Statement of Financial Position section as assets.

In the Cash Flow Statement, sunk costs would be reported as a use of cash resources affecting financing activities – analogous to the payment of a dividend – and assets would be reported as a use of cash resources affecting investing activities.

If an exploration project was unsuccessful, the preproduction amount and the equivalent shareholders' capital – and, if needed liabilities to creditors – would be written off the Mineral Investment section. If the project was successful, the preproduction amount would be merely reclassified as an *estimated mineral reserve* within the Mineral Investment section. This amount – and the equivalent amount of shareholders' capital and liabilities to creditors – would be increased as further amounts were invested in the reserve. The periodic amortisation or depletion of the estimated mineral reserve amount recorded in the Mineral Investment section would not be required. The amount would be written-off upon termination of producing operations pertaining to the reserve (or on abandonment or loss of the reserve).

Only if a mineral reserve had a current arms-length exchange value at the end of a reporting period would a value for it ever be recognised as a *mineral reserve* asset in the Statement of Financial Position (the reserve estimate would be transferred – and re-classified – from the Mineral Investment section). Once this exchange value ceased to be current, the mineral reserve would be removed from the Statement of

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Financial Position and returned to the Mineral Investment section as an estimated mineral reserve at its pre-transfer amount. A gain in exchange value, and a loss in exchange value, respectively, would be reported in the Income Statements of the relevant periods. A change in current arms-length exchange value from period to period would be immediately recorded as either a gain, or a loss, in the Income Statement depending upon the direction of the change during the period. There would be no periodic amortisation or depletion charge associated with the reserve (asset). The reporting of a mineral reserve exchange value in the Statement of Financial Position would be a very rare event and would be, in almost all cases, of very limited duration.

The depreciation or amortisation of property, plant and equipment, and other similar assets reported in the Statement of Financial Position – including preproduction items having an identifiable, arms-length exchange value – would not be required. They would be accounted for in the same way mineral reserve assets would be accounted for. That is, they would be reported at their current (at the end of the reporting period) arms-length exchange values, and changes in these would be reported as gains or losses in exchange value on the Income Statement as they occurred.

The Income Statement would be divided into three sections:

- the *operating activities* section, which would show revenues and expenses and operating profit (or loss) resulting from the production of minerals from mines and wells;
- the *change in exchange value of held assets* section, which would show the changes in arms-length exchange values of assets held during the period and reported in the Statement of Financial Position; and,
- the *capital maintenance adjustment* section, which would show the effect of changes in the general purchasing power of money during the period. This effect would be the amount that would be needed to maintain the purchasing power of the entity's wealth at the start of the period.

The change in the shareholders' and creditors' surplus or shortfall over the reporting period would be shown in the financial statement – *Reconciliation of Shareholders' and Creditors' Surplus or Shortfall*. The general calculation would see the total amount of creditors' and shareholders' interests deducted from the total amount of assets reported in the Statement of Financial Position.

Any asset shortfall would be borne first by shareholders and then by creditors. Any asset surplus would accrue only to shareholders. The change in the wealth of the entity over the reporting period would be shown in the financial statement – *Reconciliation of Entity's Wealth at the Start and End of Year*. The general calculation would see the total amount of creditors' interests deducted from the total amount of assets reported in the Statement of Financial Position.

Profits would be retained – that is, would not normally be available for dividend distributions – until such time as there was a shareholders' surplus, whereupon

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dividend distributions could commence. The distributions would normally be limited to the amount of the surplus.

It would not be the responsibility of accountants to ensure that capital was preserved for shareholders since minerals are non-renewable and their replacement through new discovery is becoming increasingly problematic. Consequently, companies would be allowed to make returns of capital under certain conditions. These conditions would be:

- the company was from the beginning a venture company that would, therefore, liquidate upon conclusion of the venture;
- the company, not being a venture company, would announce that it had become a venture company limited to its current ventures following the approval of shareholders at a special shareholders' meeting;
- distributions that were returns of capital would be clearly described as such, and not as dividends; and,
- distributions that were returns of capital would not prejudice the security of creditors.

The Proposed Method would be used integrally with a set of supplementary decision-relevant data. These data could be of less credible and less reliable nature, though still decision-relevant. For example, they could include data that are reliant on assumption and guesswork. Sufficient data would be provided so that decision makers could make their own adjustments, estimations and assessments, better understand the limitations of the initial data, and reach their own conclusions concerning the future. This would recognise that the future is – and should remain – the responsibility of the individual decision maker.

### 3. The Proposed Method's Advantage

The primary advantage asserted for the Proposed Method is that the divided Balance Sheet, since it would resemble a cash account, could be expected to be more easily understood by external parties. That is, it would clearly display the amounts received from shareholders and creditors, the amount spent on sunk costs, the amount spent on items possessing an identifiable exchange value, and the amount left unspent, without confusion. It would place the allocative decision maker on explicit notice that assets – financial resources – had been used up, and that the current effect on equity was more uncertain than with an investment in a tangible asset that had an identifiable exchange value. It would serve notice that expenditure was undertaken with the expectation of recouping the investment's rewards in the much longer run – the very nature of the industry does not lend itself to early profits.

In the mean time, there would be no disputing that the entity's wealth at the end of the period was significantly less than it was at the beginning – since most preproduction costs have no monetary equivalence they cannot form part of a period's closing wealth. It would serve notice that preproduction cost has no relevance for estimating reserve value or evaluating financial accomplishment – expectations do not represent wealth at points in time. It would serve notice that the



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sunk costs were not available to pay debts, or for other things – dated debts must be covered by dated capacity to pay them. It would serve notice that the amount of an estimated mineral reserve, in the interim, did not in any way represent the economic value of the mineral reserve or a minimum amount of financial capacity. It would avoid confusing dated value and prospective value – the two are very different. That is, it would correctly state the company's current financial position – facts to date, and not prospects and expectations.

The Proposed Method would also be conducive to determining a sensible net profit figure based on measurements of wealth. Measurements of wealth are crucial to the measurement of economic income. Revenues are considered to be inflows or other enhancements of the net assets of an entity, while expenses are considered to be outflows or other using up of the net assets of an entity. That is, revenues and expenses are all increases or decreases in money, or the monetary worth of net assets, occurring during each accounting period. Some, particularly managers, may oppose this approach because it would often give the financial statements an appearance of volatility. However, they should show volatility when there is volatility. To do otherwise would obscure differences between entities – obscure risk – and distort allocative decisions by affecting return expectations for a level of perceived risk.

In this context, the accuracy of earnings measurement depends on the accuracy with which the changes in net assets –wealth – can be measured. The Proposed Method, by focusing on the appropriate measurement of net assets to in turn arrive at net profit, would thereby avoid the deficient traditional accounting processing notions such as the arbitrary and useless periodic matching of expenses with their supposedly associated revenues. It would include all increases and decreases in wealth and classify them appropriately. It would not distort current operating performance since it would exclude costs that do not relate to current performance. It would show the real increase in wealth across a period by including a capital maintenance – purchasing power – adjustment. Increased real monetary wealth through the pursuit of profit is the true concept against which the success of corporate activity should be judged.

Even if one wished to continue utilising the revenue and expense view of earnings calculation the Proposed Method would accommodate this. In the absence of any reasonable geographical and temporal correlation between costs and revenues, the only meaningful way of associating costs and revenues in the extractive industry would be to restrict the association to a matching of revenues and costs with a particular period – instead of with each other. That is, the matching notion would be replaced with the concept it grew out of - the accrual notion. This is the only approach that would include and deal neutrally with all economic effects pertaining to a company.

That is, while matching is a fiction, the accrual approach refers to real-world phenomena. The accrual approach does not speculate about the future. It reports financial facts as they occur. It thereby would avoid the arbitrary, discretionary and manipulative allocative practices inherent in current accounting policies. It would not obscure the effect of actions or events in order to prevent what some believe to be

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uneconomic actions. It would be in accord with the notion that financial statements should disclose historical and contemporary financial information. In essence, internal and intertemporal allocations have no role to play in any attempt to adapt to external circumstances.

Accordingly, the Proposed Method would provide allocative decision makers – whether inside or outside the company – with universally needed reporting-relevant information concerning current financial position – current financial capacity – and past financial performance before an adaptive decision is made. It would promote genuine comparison of alternatives and more valid inferences drawn from them.

### 4. Credibility and Reliability

One of the most likely points of contention concerning the Proposed Method is whether or not there is ever a point at which an estimated mineral reserve amount reported in the Mineral Investment section may be reasonably judged to be sufficiently credible and reliable to warrant its reclassification as an asset for inclusion in the Statement of Financial Position – other than when there is a current arms-length exchange value available. For example, some argue that *proved developed* reserves should be assets reported on the Balance Sheet. This positive and often ebullient attitude towards this class of mineral reserve is now seemingly held in connection with most, if not all, such mineral reserves – if only for a short time.

Evidence of this may be found in the large number of companies formed to explore for and exploit mineral reserves. For instance, in the enthusiastic way existing producers seek to increase their production and production capacity as if profits were directly and only associated with output; in the ease with which capital is raised from the public and from investment houses for mineral ventures with discovered and proved reserves. Also, in the way share prices can rocket upward on the basis of the flimsiest of rumour about mineral reserves in the regularity of mineral booms; and, in the extensive and often onerous, even crippling, royalties and other charges and controls imposed on the producing part of the extractive industry by the Government.

However, in the absence of current arms-length exchange values, the following more disciplined positions have been adopted in the Proposed Method:

- The risks inherent in the industry dictate that most preproduction expenditure is accounted for as a sunk cost in the Mineral Investment section.
- It is impossible to credibly and reliably measure the value of a mineral reserve at the time of its discovery. There are major uncertainties with respect to the propriety of the assumptions used to determine, among other things, the quantity of reserves, the rate of production, selling prices, future development costs, future production costs including income taxes, and discount rates. The fact of discovery should be recognised in the Mineral Investment section by reclassifying the preproduction costs as an estimated mineral reserve.

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- Even after a mineral reserve is in production, the risks continue to be so significant that it should not be recognised – either at cost or at some other value – among the assets disclosed on the Statement of Financial Position. It should continue to be disclosed in the Mineral Investment section and classified as an estimated mineral reserve. The widely perceived (but incorrect) notion of how to be a success – discover large reserves that can be produced in bulk – is becoming more and more unacceptable as time goes by. The difficulty of making credible and reliable measurements of reserves in production is evident in the frequency and extent of continuing measurement revisions.
- There is technically a point towards the end of the life of a mineral reserve at which it may be reasonably judged to be credibly and reliably measureable, but by that late stage such a measure has little serviceability in terms of predictive power and does not therefore warrant reclassification of the reserve. Unpredictability and uncertainty are still pervasive. For example, many long-producing mines and wells have closed prematurely – forced closure is common – and many have closed and then reopened later, as conditions changed. Many are also continuing on a precarious basis, possibly only through selective mining of the highest ore grade. Reserves are defined as much by economics as by geology.

At the end of the day, it is doubtful whether the value of known reserves can ever be estimated precisely enough to warrant representations in the Statement of Financial Position. This conclusion accords with the view that valuation in accounting is the process of assigning meaningful monetary amounts to assets. Assets are any severable means controlled by an entity that are reliably measured in monetary terms. That is, if they have a current arms-length exchange value, they may be reported on the Statement of Financial Position. Similarly, revenues and gains should only be recognised in the Income Statement when they have been realised through conversion into other assets as the result of an exchange transaction, or when there are changes in current arms-length exchange values.

## 5. Conclusion

In conclusion, most preproduction expenditure does not give rise to either a financial or an economic resource. This is sufficient reason for not automatically capitalising it on the Balance Sheet. Preproduction expenditure is incurred in the *hope* of future gain. On the other hand, when such expenditure is incurred, there is no visible cause-and-effect relationship between it and current revenue so that its automatic expensing is not warranted either. It is argued that the Proposed Method may be a solution to this fundamental difficulty. It is also argued that this method may be a solution to the subsequent, but also fundamental difficulty of attaining reasonably precise mineral reserve quantity and value measurements. These arguments are made because the proposed method could classify ‘data without misrepresentation, compress them without distortion, [and] report them without concealment’ (Littleton, 1953:p216).

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In essence, the Proposed Method would produce serviceable primary financial statements by reporting the factual effects of all that had actually happened prior to the end of a reporting period, not what might happen if contingent events and circumstances turn out to occur. The factual data would be visible. It would avoid mixing fact with the hypothetical. The disclosure of anything that is contingent upon the future cannot indicate current position in terms of that data.

The industry requires accurate internal and temporal classification; a separation of items without credible and reliable monetary equivalence from items with credible and reliable monetary equivalence. Needed are Income Statements and Balance Sheets that are factual and not dependent upon estimates about the future; an equal accounting of equal facts and circumstances; full recognition that a specific reported amount can change its classification from time to time; and, the full disclosure of reporting-relevant data. In this way, allocative decision making may be improved.

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