MUNICIPAL PROPERTY ASSESSMENT CORPORATION

ASSESSMENT METHODOLOGY GUIDE

ASSESSING PHARMACEUTICAL MANUFACTURING PLANTS IN ONTARIO

2016 BASE YEAR

JUNE 2015

This document describes the assessment methodology that MPAC currently expects to use for the 2016 Assessment Update for properties for which the current use is as a pharmaceutical manufacturing plant and for which the current use has been determined by MPAC to be the highest and best use. Assessors exercise judgment and discretion when assessing properties and may depart from MPAC's preferred assessment methodology when assessing a particular property, however, any deviation from these guidelines must be thoroughly documented.

This document has been prepared by MPAC to help assessed persons review how the current value of the property likely will be determined, illustrate the uniform application of valuation parameters to the property type and consider whether MPAC's subsequent assessed value is correct and equitable in comparison to the assessed value of similar real property so as to ensure the fair distribution of the property tax burden. The information in this document will help property owners to meet the requirements of subsection 39.1(4) of the Assessment Act and Rule 16 of the Assessment Review Board when providing reasons for making a Request for Reconsideration or filing an Appeal to the Assessment Review Board.

MUNICIPAL PROPERTY ASSESSMENT CORPORATION

April 30, 2015

The Municipal Property Assessment Corporation (MPAC) has published Methodology Guides for the following industries:

- Mining;
- Oil Refineries;
- Chemical Manufacturing;
- Pharmaceutical Manufacturing;
- Food Manufacturing;
- Aerospace.

These Assessment Methodology Guides represent MPAC's preferred assessment methodologies in Ontario and are intended to provide clarity and transparency as to how property types in the above mentioned industries typically will be assessed.

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As part of the preparation of Assessment Methodology Guides, MPAC consulted with affected property taxpayers, municipalities, and representatives. MPAC engaged the International Property Tax Institute as an independent facilitator to undertake consultation sessions which included the following industries:

- Mining;
- Oil Refineries;
- Chemical Manufacturing;
- Pharmaceutical Manufacturing;
- Food Manufacturing;
- Aerospace.

MPAC would like acknowledge and thank the following parties who participated in the consultation process (September 2014 – March 2015).

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Property Tax Services
DuCharme, McMillen & Associates Canada, Ltd.
AEC Property Tax Solutions
Equitable Value
Altus
Ryan

Questions about the consultation process can be directed to consultation@mpac.ca.

Table of Contents

Part 1 - Introduction

The Municipal Property Assessment Corporation (MPAC) – www.mpac.ca – is responsible for accurately assessing and classifying property in Ontario for the purposes of municipal and education taxation.

In Ontario, property assessments are updated on the basis of a four-year assessment cycle. The next province-wide Assessment Update will take place in 2016 when MPAC will update the assessments of Ontario's more than five million properties to reflect the legislated valuation date of January 1, 2016. Assessments updated for the 2016 base year are in effect for the 2017-2020 property tax years. Ontario's assessment phase-in program prescribes that assessment increases are phased in over a four-year period. Any decreases in assessment are applied immediately.

The accurate valuation of large special purpose industrial properties such as pharmaceutical manufacturing plants for property tax purposes presents a number of challenges due to the size and specialized nature of the properties concerned and the fact that very few, if any, of them are bought, sold or leased in the market on a regular basis.

For that reason, it is important to ensure that the valuation methodology applied is capable of providing a realistic estimate of current value at the relevant valuation date which, in turn, enables all stakeholders to understand the valuation process and have confidence in the fairness and consistency of its outcome.

This Methodology Guide has been prepared for the benefit of MPAC assessors, property owners and their representatives, municipalities and their representatives, Assessment Review Board members, provincial officials, and the general public.

It should be noted that "large" in the context of industrial properties means a property that falls within the definition of the "Large Industrial Property Class" contained in section 14 (1) of Ontario Regulation 282/98. In general, this refers to an industrial property in excess of 125,000 square feet in terms of "exterior measured area."

The following definitions may be helpful in reviewing this Methodology Guide:

Special Purpose Properties:

> *"A limited market property with a unique physical design, special construction materials, or layout that restricts its utility to the use for which it was built."*
>
> [Appraisal Institute]
>
> *"Specialized property is property that is rarely, if ever, sold in the market except by way of sale of the business or entity of which it is part, due to the uniqueness arising from its specialized nature and design, its configuration, size, location, or otherwise."*
>
> [International Valuation Standards Committee]

The characteristics of special purpose properties are likely to include:

- Unique improvements, design, layout, size, construction materials and/or building services that facilitate one or a limited number of uses.
- Generally contains machines and machine fittings that are designed to facilitate one purpose.
- Adaptation to other uses is typically challenging requiring significant alterations and rarely finding economically viable uses for all of the improvements.
- Limited market possibilities, except as a going concern business.
- Typically has specialized building services.
- They tend to serve large market areas that are more regional, national or international in scope.
- The expansive geographic scope of these properties typically requires research of regional, national or international data to support a market value analysis.
- Understanding the "market" for special purpose properties also requires understanding of the industry in which it operates, i.e., what is the nature, condition and financial health of the potential buyers and sellers.

1.1 Properties Covered by this Guide

This Methodology Guide relates to pharmaceutical manufacturing plants which include many different types of property with a variety of processes taking place within them.

The list of properties within Ontario that are covered by this Methodology Guide change from time to time. A current list of the properties covered by this Methodology Guide can be found in Appendix A.

Brief Introduction to the Industry and Process

The pharmaceutical manufacturing industry makes products used for the treatment of human and animal diseases and ailments. These include patented and generic prescription only medicines, over the counter medicines, dental products, animal treatment and husbandry products, and substances such as vitamins and hormones which may be incorporated into foodstuffs.

Diagram 1 provides an indication of the general processes that take place in the manufacture of a pharmaceutical product.

Diagram 1

Activities

Pharmaceuticals are manufactured in two principal stages, primary and secondary. Primary processing is the extraction and production of the active ingredient from itssources. It includes processes such as organic synthesis, biological processing, extraction of animal and vegetable substances and inorganic chemical preparation. Secondary processing is the conversion of the active ingredient into products suitable for administration.

The common products of secondary processes include:

- Tablets or powders - These may be coated so that the stomach acid does not destroy the active ingredient.
- Capsules - Capsules consist of an outer gelatin covering enclosing the mixture of active substance which is in granular or powder form.
- Liquids - These may be in the form of solutions, suspensions, emulsions or gels. They may be aqueous or ethanol based. Syrups are commonly formulated for administration to children.
- Creams and ointments - These usually consist of an oil in water emulsion (cream) or a water in oil emulsion (ointment).
- Aerosols - These contain inhalable products or products suitable tor external use.
- Injectables - A liquid or suspension which must be completely free of particulate matter and micro-biological contamination.

The two stages may take place on the same production site, on adjacent production sites, or on separate distant sites. In some cases they are carried out by different sectors within the industry or separate companies within a pharmaceutical group.

Raw materials delivery, handling and storage

The raw materials used in primary processes are generally received on site in kegs or drums in either powder or liquid form. Organic solvents such as toluene and methanol are typically received into bulk storage tanks, but some raw materials used in smaller quantities are received in drums. Because it is inert, nitrogen gas is often used to replace air in storage vessels, plant and dryers when they contain flammable, volatile materials. It is also used as a coolant for freeze-drying products and may be supplied in liquefied form from a liquid storage facility or on-site air separation plant. Acids and alkalis may be received in bulk tor use in manufacturing processes, in wastewater neutralization and in wet scrubbers. In addition, fuel oil may be stored tor steam generation systems.

For both primary and secondary processes, the majority of raw materials are delivered by truck bulk tanker, depending on the materials and quantities used.

Drums, kegs and bags are transferred from the trucks to the storage area by fork-lift truck, typically on pallets to aid transfer. Raw materials delivered by tanker are either pumped

or fed under pressure to bulk storage vessels, usually by coupling the tanker to vessel inlet transfer pipework.

Drums and kegs are normally handled within the storage area by fork-lift trucks which may be modified with drum clamping equipment. Materials in bags and small kegs may be transferred manually within the storage area and to various parts of the works. Materials received by bulk road or rail tankers are typically not manually handled (except in emergencies) once in the storage tank. Bulk stored materials (e.g., solvents) are transferred within the works by pumping. Gaseous materials such as nitrogen are transferred using the available storage pressure.

Primary processes

The processes used in the bulk production of the active ingredient may involve fermentation, chemical synthesis or extraction. To ensure the safety and efficiency of pharmaceutical products, the process for manufacturing the active ingredient must be carefully controlled to ensure consistent standards of purity and quality. This is because all drugs are active in very small doses and some drugs are very potent. In addition, impurities can adversely affect the action of a drug (e.g., can produce adverse side-effects or can be toxic).

Chemical synthesis

Most pharmaceutical active ingredients are produced by organic synthesis from a range of raw materials, principally organic compounds. Organic chemical synthesis reactions usually involve the weighing and mixing of raw materials and transference into batch reactors. The mixture may be in a dispersed form, i.e., in a solvent. These solvents are almost exclusively organic and may be chlorinated or non-chlorinated. In up to date primary production plants, solvents are recovered extensively from waste air streams, wastewater streams, and from completed reactions.

Solvents are used in reaction and purification. Reaction solvents facilitate close molecular proximity for all reactants and are often selected for their boiling point. Where the boiling point equals the desired reaction temperature, heat is continuously supplied to keep the reaction mass boiling and the solvent vapors are continuously condensed and returned to the reactor.

The reacted products are typically washed with water or solvents, or both in turn, prior to filtration. After filtration the residual solids are often dried under nitrogen. If required, further purification can be carried out using a variety of operations including color

removal by adsorption onto activated carbon and filtration, crystallization and evaporation techniques, as well as further washing and drying operations.

Common products prepared using synthetic chemistry include barbiturates, codeine, caffeine, salicylic acid and its derivatives, and vitamins.

Fermentation

The utilization of the growth of micro-organisms, under controlled process conditions, to produce pharmaceutical chemicals is generally performed using fermentation techniques. Common fermentation products include antibiotics such as penicillins, steroids, vitamins and biological products such as antitoxins and toxins. These processes mostly involve taking the initial culture (inoculum), weighing and mixing the nutrients and other additives, and transferring them all to a fermentation tank. The fermentation can either be anaerobic or aerobic. The cultureis then filtered to remove the micro-organisms from the raw liquor containing the product. Occasionally the required chemical is contained within the micro-organismand, in this case, the cell walls are broken before filtration.

The product is cooled and subjected to solvent extraction in order to concentrate it in a single medium prior to primary purification processing. Color can be removedfrom the mixture by adsorption onto activated carbon granules. The carbon is then removed by filtration. Other processes may include crystallization and drying operations. Primary purification is followed by final purification, where the product is either crystallized from a liquid or dried, followed by grinding and blending from dry operations, as in the case of penicillin.

Extraction

A diverse range of pharmaceutical drugs is produced by extraction from natural and biological sources such as plants, animal glands and parasitic fungi.

Secondary processes

The active substance from primary manufacture must be presented as an accurate dose in a form which can be conveniently administered to the patient e.g., tablets, capsules, creams, ointments, ampoules for injection. Diluents may be added to the active substance to achieve the correct dose and other ingredients may be necessary to ensure that the final dosage form is palatable, stable and behaves exactly as intended. For example, tablets must be hard enough to withstand transport but they must disintegrate

easily after administration to the patient. Finally, the product must be packed appropriately.

Formulation, filling and packaging plants have changed significantly over recent years. Their layout has improved with better understanding of the requirementsfor movement of materials and personnel, and the provision of a healthy working environment.

Secondary production consists of a series of unit operations arranged in a specific sequence, carried out in batches of 50 to 800 kg. The process units are, in general, dedicated for a period of time to a series of batches, after which they are cleaned and re-used for another product. The main steps in the operation are:

- Sieving and milling - The active ingredient is usually supplied already milled in the required physical form. Other raw materials are sieved and milled to ensure that the physical size of the solid components is correct and uniform.

- Weighing - This is usually manual but may be automated for large quantity ingredients in modern facilities.

- Mixing and blending - When making tablets and capsules the active substance must be thoroughly mixed with the diluents and other ingredients to manufacture a stable, palatable and effective final product. The mix must be homogenous to ensure each tablet or capsule contains the same amount of active substance. Blending may be dry or wet. Wet blending operations use water where possible; otherwise syrups or solvents are used. Starch or sugar is generally added to the blend in order to dilute the active ingredient to the required concentration. Similarly for creams and ointments, mixing must give a completely uniform product which will not separate on storage and will deliver the drug effectively when applied to the skin. The powdered active ingredient is mixed with the carrier and sometimes heated, to produce a homogeneous product with the correct flow properties.

- Granulation - Granulation, or agglomeration, is a precursor to the majority of tablet compression processes and to some encapsulation processes. Powders are often unsuitable for pressing since the individual components may dissociate too easily and generate a lot of dust. Granulation can be wet or dry.

- Drying - Drying operations take place in tray ovens, fluidized beds; or dryers using vacuum, tumbling, spraying, freezing, infra-red or microwave techniques.

- Tablet pressing - Tablets are produced in tablet presses by direct compression of the blended materials. Modern tablet presses compress 8 000 to 12 000 tablets per minute and provide automatic control and monitoring of tablet weight. Some tablets are printed with a butanol/ethanol based ink.

- Tablet coating - Coating imparts physical strength to the tablet and delays break-up once swallowed. Aqueous or solvent-based coatings may be used which are typically sprayed onto the tablet and then dried. Cellulose may be applied, for example, to prevent the material from being digested in the stomach. Traditionally sugar coatings have been used; these have generally been superseded by polymer films.

- Filling and packing - Automated mechanical methods of packaging include filling bottles and making blister packs. Aerosol cans are filled, weighed and leak tested. Traditionally, chlorofluorocarbon (CFC) propellants have been used. Nitrogen gas is a substitute. Butane is now widely used in externally applied products but it is hazardous and flammable. Alternative technologies are emerging which preclude the need for chemical propellants. The 'envirospray' makes use of the reaction between two additives, citric acid and sodium bicarbonate, to release carbon dioxide which forces out the product. This propellant formula is being increasingly utilized in pharmaceutical applications.

Transfer of finished products

The quantity of finished products varies considerably depending on the market targeted by the particular company. Intermediate formulations may be produced in large quantities in either liquid dispersion or solid form. Final products can be in avariety of forms (e.g., liquids, tablets, powders and aerosols).

Active substances must be transported in a safe and secure way. Sealed steel kegs with polythene liners are normally used which may be transported by road, rail, sea or air. Final transfer of products from storage areas for transport is usually by fork-lift truck.

The finished pharmaceutical product is normally packed directly in the form in which it will be dispensed to the patient. The packs are collated into outer cardboard boxes for shipment to wholesalers. Occasionally, bulk tablets and capsules may be transported to a separate packaging unit in sealed steel, fiberboard or plastic kegs.

Controlled Environments

Due to the need to meet appropriate clinical, health and hygiene standards, pharmaceutical manufacturing plants often contain specialized buildings or rooms with controlled environments and/or special interior finishes to walls, floors and ceilings (e.g., ceramic tiles) to prevent the risk of contamination of the products. In comparison with other types of industrial buildings, there may be specialized HVAC systems, special washable surfaces, additional cleansing facilities for staff, separate changing rooms, separate areas for storing and packaging materials and finished products, research laboratories, etc. It is these specialized facilities that makes large pharmaceutical manufacturing plants unique and means they cannot easily be adapted or used for other industrial purposes.

Machinery and Equipment

Pharmaceutical manufacturing plants may contain large amounts of, often very specialized, machinery and equipment.

1.2 Legislation

The main legislation governing the assessment of properties in Ontario for property tax purposes is contained in the *Assessment Act* 1990 (as amended).

The Act contains important definitions, including what property is taxable and how it should be valued.

The Act (section 1(1) Definitions) states that property must be assessed at its "current value" which means, in relation to land:

> *"… the amount of money the fee simple, if unencumbered, would realize if sold at arm's length by a willing seller to a willing buyer."*

It should be noted that, in accordance with Section 3(1) 17 of the Act, all items of machinery and equipment, and the foundations upon which they rest, used for manufacturing, though assessable, are exempt from taxation.

Other relevant legislation will be referred to as necessary in this Methodology Guide.

1.3 Valuations - General

Valuations of property are carried out for a variety of purposes. This Methodology Guide is provided specifically for assessors involved in the valuation of pharmaceutical manufacturing

plants for property tax purposes in Ontario and other stakeholders who have an interest in the valuation.

The legislation governing the assessment of properties for property tax purposes in Ontario is set out above. It requires an assessment of the current value of all relevant properties as of a specific valuation date.

The valuation process follows a number of systematic steps intended to ensure that all relevant data is obtained and analyzed before being used in the provision of an estimate of the market value of the property concerned as of the relevant date.

Many professional bodies provide guidance on how the valuation process should be undertaken and this Methodology Guide reflects the accepted guidance on the valuation of large special purpose properties such as pharmaceutical manufacturing plants.

In broad terms, the valuation process involves the following key steps:

- Ensuring a clear understanding of the purpose for which the valuation is being provided.
- Researching the legal framework concerning the valuation.
- Determining what needs to be valued.
- Identifying the date of the valuation.
- Analyzing the relevant market (local, regional and/or international depending upon the type of property to be valued).
- Considering the highest and best use of the subject property (as explained later, it is assumed that the use of the property as a pharmaceutical manufacturing plant is the highest and best use of the property being valued for the purposes of this Methodology Guide.)
- Obtaining pre-inspection data about the property to be valued.
- Carrying out a site inspection of the property to be valued.
- Taking appropriate measurements and recording details of other relevant information.

- Carrying out an inspection of any comparable properties that may be of assistance in ascertaining the value of the subject property.
- Determining the appropriate method, or methods, of valuation to be used.
- Carrying out the valuation.
- Reviewing the valuation.
- Finalizing and reporting the valuation.

In general, it is appropriate to consider the value of a property by three different perspectives or approaches to value:

- the direct (sales) comparison approach
- the income approach
- the cost approach

As suggested by the title, in the **direct (sales) comparison approach**, value is indicated by recent sales of comparable properties in the market. In the case of large special purpose industrial properties such as pharmaceutical manufacturing plants, there are generally very few, if any, sales or other market transactions which can be relied upon to provide an indication of market value; for this reason, the sales comparison approach is not used in the valuation of pharmaceutical manufacturing plants.

> *"The sales comparison approach is applicable to all types of real property interests when there are sufficient recent, reliable transactions to indicate value patterns or trends in the market …. When data is available, this is the most straightforward and simple way to explain and support a value opinion …. When the market is weak and few market transactions are available, the applicability of the sales comparison approach may be limited. For example, the sales comparison approach is usually not applied to special-purpose properties because few similar properties may be sold in a given market, even one that is geographically broad. To value special-purpose properties, the cost approach may be more appropriate and reliable."*
>
> [The Appraisal of Real Estate, 12th edition, page 419]

In considering any sales evidence, it is critical to ensure that the property sold falls within the same use class as the property to be valued; in the case of special purpose properties, the sale

should relate to a property that has the same highest and best use as the subject property otherwise it is unlikely to be a reliable indicator of value.

However, if a sale of such a property does take place, it is important for the transaction to be analyzed to see if it may provide useful information that may assist when reviewing a valuation prepared by the application of another approach.

In the **income approach** or, more accurately, the income capitalization approach, value is indicated by a property's revenue-earning power, based on the capitalization of income. This method requires a detailed analysis of both income and expenditure, both for the property being valued and other similar properties that may have been sold, in order to ascertain the anticipated revenue and expenses, along with the relevant capitalization rate. As already indicated, in the case of large special purpose industrial properties such as pharmaceutical manufacturing plants, there are unlikely to be any sales or rents of comparable properties from which relevant data can be obtained, so this approach is not used.

However, it may be necessary to consider both the income and expenses of pharmaceutical manufacturing plants when looking at depreciation within the cost approach; in particular, in considering the issue of obsolescence.

In the **cost approach**, value is estimated as the current cost of reproducing or replacing the improvements on the land (including buildings, structures and other taxable components), less any loss in value resulting from depreciation, and then adding the market value of the land.

The cost approach is the most appropriate method of valuing large special purpose industrial properties such as pharmaceutical manufacturing plants and will therefore be the subject of detailed guidance in the following parts of this Methodology Guide.

Using the cost approach also helps to exclude the value of the business being carried out within the property and is one of the reasons why this method of valuation is used for pharmaceutical manufacturing plants.

1.4 The Use of this Methodology Guide

This Methodology Guide is intended to:

- Ensure that pharmaceutical manufacturing plants are assessed at their correct current

- Ensure the assessments of pharmaceutical manufacturing plants are fair, accurate, predictable, and transparent.
- Provide direction to assessors to ensure that MPAC takes a consistent approach to valuing pharmaceutical manufacturing plants.
- Ensure that MPAC's methodology for valuing these properties is well documented and aligns with industry standards for market valuation in a mass appraisal environment.
- Explain MPAC's valuation methodology to municipalities, taxpayers, ARB Members and other stakeholders.

MPAC assessors are expected to follow the procedures in the Guide. However, this Guide is not intended to be a substitute for an assessor's judgment in arriving at the current value for a particular property.

1.5 Consultation and Disclosure

MPAC is committed to providing municipalities, taxpayers and all its stakeholders with the best possible service through transparency, predictability and accuracy. In support of this commitment, MPAC has defined three levels of Disclosure as part of its delivery of the 2016 province-wide Assessment Update.

Three Levels of Disclosure (2016 Assessment Update)

Level 1 – **Methodology Guides** explaining how MPAC approached the valuation of particular types of property; in this case, pharmaceutical manufacturing plants.

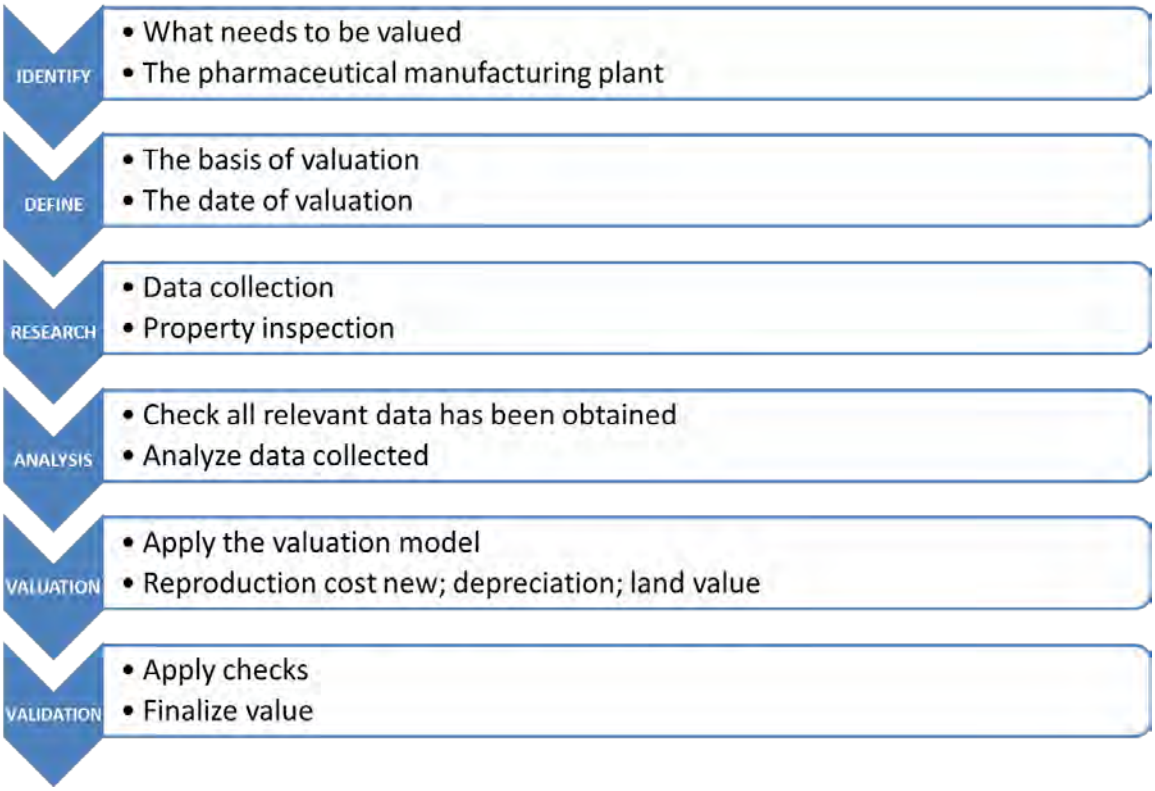
Level 2 – **Market Valuation Reports** explaining how the methodology outlined in Level 1 has been applied at the sector level for the purposes of each assessment.

Level 3 – **Property Specific Valuation Information**, available to property taxpayers, their representatives and municipalities.

Part 2 - The Valuation Process - Preparation

2.1 Six Main Steps

The assessor should follow the six main steps outlined in the chart below.



2.2 Identify What Needs to be Valued

The assessor needs to identify the extent of the property to be valued. The definition of land is all encompassing. Land includes not only the land itself (“terra firma”) but also buildings, structures, machinery and fixtures, or any part of such items.

2.3 Define the Basis of Value and Date of Valuation

The definition of value was identified previously and is the "current value" of the property which, in accordance with the Act, is:

> *"… the amount of money the fee simple, if unencumbered, would realize if sold at arm's length by a willing seller to a willing buyer.”*

This means that the assessor is concerned with the "market value" of the property and therefore needs to consider what data is required to enable an assessment of market value to be prepared at the relevant valuation date. It should be noted that, for the purposes of this Methodology Guide, "market value" and "current value" have the same meaning.

The relevant legislated valuation date will differ for each four-year reassessment. The assessor should be clear about what valuation date is to be used for the particular reassessment.

In preparing a valuation, the assessor will need to take into account all relevant, value-significant evidence available that may assist in determining the value of the particular pharmaceutical manufacturing plant at the valuation date. The market conditions, i.e., the economic circumstances that underlie supply and demand, that give rise to value are likely to change between reassessments, so it is important to ensure that only those factors that are relevant at the specified valuation date are taken into account.

However, the assessor should have regard to the physical circumstances at roll return and value the land and improvements as they exist at that time assuming a sale on the valuation date, or at a later date if there have been changes to the property after the reassessment date.

2.4 Research - Data Collection

Data collection involves two main activities:

1. Collection of data relating to the pharmaceutical manufacturing plant to be valued.
2. Collection of market evidence or other data that will assist in the valuation.

Collection of Data Relating to the Pharmaceutical Manufacturing Plant to be Valued

The assessor should start by considering what information is available from current MPAC records concerning the property and then checking to ensure it is accurate and up to date.

The following types of data relating to the property to be valued need to be collected:

- If recent, purchase price/date, and/or construction costs, relating to the property.
- Layout plans, building plans, elevations, cross-sections, specifications, etc., relating to the property.
- A description of the process (or processes) undertaken at the property.

- Specific and detailed information concerning:
    - the use of each part of the property
    - the functionality (what it does and how well it does it) of the property
    - the utility (i.e., the usefulness) of the property
    - the productive capacity of the property
    - recent/projected trends in production
    - recent/projected trends in the cost of inputs
    - recent/projected trends in the value of outputs
    - recent/projected trends in profitability
- Any particular aspects of the pharmaceutical manufacturing plant that create inefficiencies.
- Any repairs or other remedial works that are required or planned.
- Any plans to change the existing pharmaceutical manufacturing operation.
- Any plans to alter, extend or demolish any parts of the property (and why).
- How the existing property compares with a modern equivalent facility (and the location and other details concerning a modern equivalent pharmaceutical manufacturing plant).
- Information with regard to the zoning of the property.
- Information about the locality in which the property is situated.
- Any other relevant information that may be available from other sources concerning the property (e.g., company accounts, the municipality, the Internet, etc.).
- Information available about competition from other pharmaceutical manufacturing plants.

Property Inspection

The assessor should take steps to collect the above information either in advance of a property inspection or during a property inspection. A property inspection will provide the following data:

- Confirmation of the data (size, layout, etc.) contained in plans, drawings, etc.
- Confirmation of the use of the various buildings, structures, etc.
- Details of the age/condition of the buildings, structures and other improvements.
- Confirmation of the information provided in respect of necessary repairs, etc.
- Details of any cost estimates provided in respect of necessary repairs, etc.
- Photographic record of the site, buildings, structures, other improvements, etc.
- Details of any other matters noted - positive or negative - with regard to the property.
- Commentary on the location of the property, transport links and access to the site.

The above factors should be used as a check-list by the assessor to ensure that all relevant information is obtained prior to the valuation being undertaken.

How the information obtained may be used in the valuation is shown and discussed in Part 3 of this Methodology Guide.

Collection of Market Evidence or Other Data that will Assist in the Valuation.

In the case of many types of property, market value can be derived from the evidence of sales or leases (rentals) of similar properties in the same locality as the property to be valued. However, in the case of large specialized properties such as pharmaceutical manufacturing plants, such market data is unlikely to be available in sufficient volume to provide a reliable indication of value.

Nevertheless, the assessor should seek whatever data may be available in terms of sales, leases, etc., of similar large industrial properties, particularly any sales of land to be used as a pharmaceutical manufacturing plant, and consider whether or not such data may provide evidence that could assist in the valuation of a pharmaceutical manufacturing plant.

In addition to collecting data about the pharmaceutical manufacturing plant to be valued, and any market evidence that may exist, the assessor needs to carry out wider research that will assist in determining the value of the subject property. Such research is likely to include:

- The state of the pharmaceutical manufacturing industry. For example, the economic

- Trends in the pharmaceutical manufacturing industry.

- Any evidence available to indicate the value of the properties used in the pharmaceutical manufacturing industry, e.g. sales, leases, construction costs, etc., in Ontario, Canada, North America, and, possibly, worldwide.

Much of the information required about the state of the industry, economic trends, etc., will be contained in the Market Valuation Reports that form part of MPAC's Level 2 Disclosure. The assessor should ensure that the information contained in that report is properly reflected in the valuation to the extent that it has an impact on the value of the individual pharmaceutical manufacturing plant.

Confidentiality

As outlined above, it is important to be aware that, in order to enable MPAC to produce an accurate valuation of the property concerned, information needs to be obtained from a variety of sources.

This will include information from MPAC's records, from the owner or operator of the property, from the municipality in which the property is located, from the assessor's visit to the property, and from other sources.

All stakeholders in the property tax system have an interest in ensuring that the current value provided by MPAC is correct; in order to achieve this, it is necessary for all parties to cooperate in the provision of information.

It is appreciated that some of the information outlined above may be of a commercially sensitive nature. MPAC recognizes the need to ensure that any information provided to them is properly safeguarded and only used for the purpose for which it is supplied. Assessors should appreciate the nature of this undertaking and ensure data is treated accordingly.

If after an appeal has been filed, MPAC receives a request for the release of actual income and expense information, or other sensitive commercial proprietary information, the usual practice is to require the person seeking the information to bring a motion before the Assessment Review Board, with notice to the third parties, requesting that the Assessment Review Board order production of the requested information. The release of such information is at the discretion of the Assessment Review Board.

Exception

S. 53 (2) This section does not prevent disclosure of that information,

(a) to the assessment corporation or any authorized employee of the corporation; or

(b) by any person being examined as a witness in an assessment appeal or in a proceeding in court involving an assessment matter. 1996, c. 4, s. 43; 1997, c. 43, Sched. G, s. 18 (34).

2.5 Analysis of Data Collected

Having carried out the data collection outlined previously, the assessor needs to analyze it and reach a conclusion regarding the appropriate valuation method to use and how it should be applied.

As already indicated, for the purposes of this Methodology Guide, it is assumed that the assessor will conclude that there is insufficient evidence available to enable either the direct comparison approach or income approach to be adopted. For that reason, the assessor will be adopting the cost approach and using the data collected to ensure that the cost approach is properly applied.

2.6 The Valuation

Having undertaken the necessary steps outlined above, the assessor should now be in a position to apply the appropriate valuation model. In the case of large pharmaceutical manufacturing plants, the assessor will be using the cost approach and detail on how that model should be applied is contained in Part 3 of this Methodology Guide.

2.7 Validating the Results

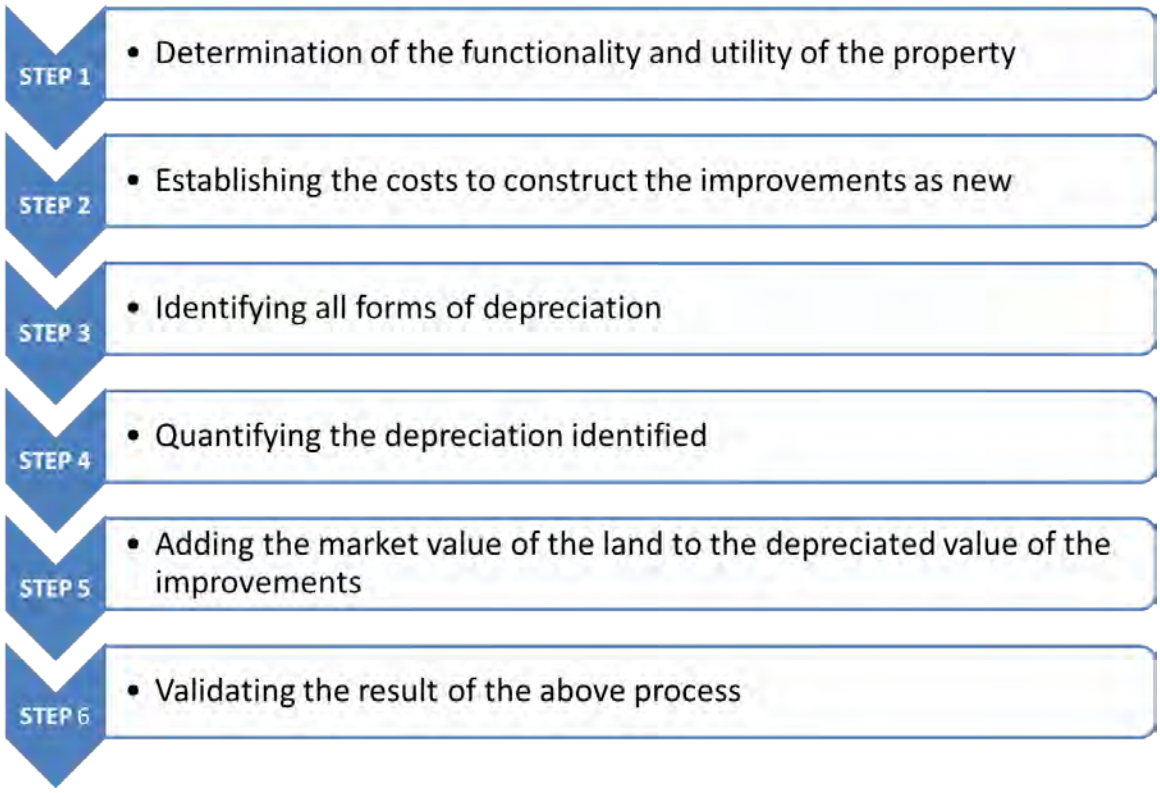
Once the assessor has completed the valuation, it is necessary to validate the results by carrying out a series of checks to ensure that all relevant parts of the property have been included in the valuation, that there has been no double-counting of any adjustments made for depreciation, that the resulting valuation has been compared with any market evidence that may be available in relation to pharmaceutical manufacturing plants or similar properties, and that the final valuation is in line with the valuation of other similar properties in Ontario.

Part 3 - The Valuation - Application

3.1 Summary of Cost Approach

As already indicated, the primary valuation approach to be used for the valuation of pharmaceutical manufacturing plants is the cost approach.

Using the cost approach derives a value by estimating the cost to replace the functionality and utility of a property. In broad terms, this requires six main steps:



This Methodology Guide is designed to assist the assessor to navigate through the valuation approach and produce an accurate estimate of current value of pharmaceutical manufacturing plants utilizing the recognized cost approach methodology.

3.2 Recommended Procedure

The Methodology Guide recommends a valuation process with the six main steps outlined above. Additional detail about each of those steps is set out below:

1. Property Evaluation

- Evaluate the property's functionality (what it can do).
- Evaluate the utility of the property (the expected benefits to be derived).

2. Determine Reproduction Cost New

- Establish the value of the subject property by using a cost manual (i.e., MPAC's Automated Cost System - ACS) to determine reproduction cost as new.

3. Identify Depreciation

- Evaluate the physical state and condition of the property.
- Consider how the functionality and utility of the subject property compares to a modern and efficient property.

4. Quantify Depreciation

- Apply a breakdown approach to depreciation whereby each separate element of depreciation is identified and applied, as follows:
    - Apply physical depreciation due to age from the typical depreciation tables found in the cost manual.
    - Make adjustments as required to age-related depreciation due to the actual state and condition of the property.
    - Apply functional obsolescence as required.
    - Apply external obsolescence as required.

5. Value the Land

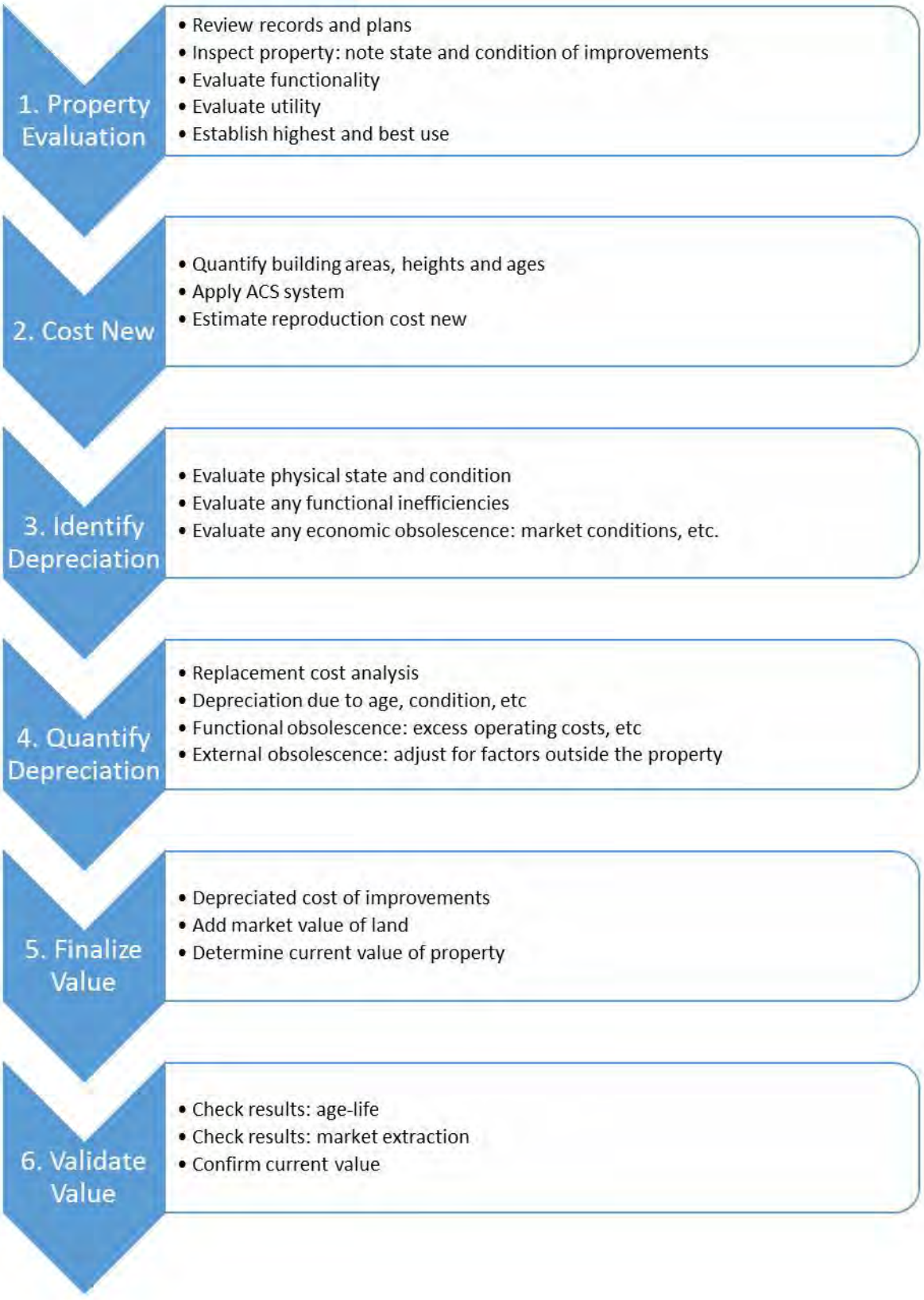
- Estimate the market value of the land and add it to the value of the improvements.

6. Validate the Results

- Apply checks - age-life and market extraction (if market data available) - to ensure that there has been no double-counting of adjustments and the final valuation is consistent and accurate.

This Guide is designed to assist the assessor in the application of the cost approach to establish the current value assessment of food processing plants. It does not replace the assessor's judgment. The chart on the following page summarizes and outlines the six main steps in the valuation approach.

Outline of the Cost Approach Process



3.3 Definition of Terms

Each of the steps outlined in the chart above in the recommended procedure (section 3.2) will be considered in detail in this Methodology Guide. Where appropriate, terms are defined as they are encountered in the text but, in addition, there is a Glossary of Terms in Appendix B.

3.4 Detailed Procedure

The following steps should be followed when valuing a pharmaceutical manufacturing plant. The assessor should always bear in mind that it is the actual property that is being valued, even though consideration may be given to how the actual property may be replaced by a different type of property (in terms of size, layout, etc.) when considering valuation issues such as functional obsolescence.

1. Property Evaluation

The first step in the process is to determine the type of property being valued and whether it falls within the property types, i.e., pharmaceutical manufacturing plants, covered in this Methodology Guide. Once satisfied that it does, the assessor needs to collect the information required to establish the current value of the property.

Part 2 of this Methodology Guide outlined the nature of the information to be collected prior to the valuation being carried out. The notes below add more detail about this process.

Review Assessment Records

Typically, there is some historical information on file in the assessment records, or available from assessment databases. The assessor will need to check this information carefully and ensure it is accurate and up to date.

In particular, the assessor should check MPAC's applications, i.e., the Integrated Property System (IPS) and the Source of Uniform Records for Cost Evaluation (SOURCE).

Information from the Municipality

The municipality should have provided MPAC with plans, etc., but the assessor needs to check to ensure they are the latest plans, drawings, etc. The drawings required include the following:

- plot plan(s)
- floor plan(s) - including horizontal measurements

- elevations - including vertical measurements
- cross-sections of the buildings at the property

Ideally, these drawings, plans etc., should be in electronic (e.g., CAD) format. The assessor should also check with the municipality to see whether it holds any other relevant information about the property that may be useful in the valuation process.

Information from the Owner

It is important to set up an appointment with the owner or operator to inspect the property and to discuss the operations that take place at the property. Part 2 of this Methodology Guide outlines the type of information that should be sought from the owner or operator of the property either before or during the inspection.

Review Municipal Plans

Municipalities have zoning and planning information available for all properties, especially areas in transition where there are often special studies or secondary planning documents. This type of information will be helpful in confirming that use as a pharmaceutical manufacturing plant is the highest and best use of the property and may assist in gaining a wider appreciation of value-significant features of the locality.

Internet

Along with maps and photographic records, the Internet has general information on most properties. Some of this information may be out of date, but a search of the Internet can often provide useful information about the nature of the area and the market. Articles about pharmaceutical manufacturing plants selling or being re-developed, information and statistics on pharmaceutical manufacturing and related manufacturing sectors, and general economic information can all be found on the Internet.

Property Inspection

The value of any large industrial property relates to its utility; how well/efficiently it serves as a base for the process for which it is used i.e., in this case, a pharmaceutical manufacturing plant. Understanding a property and its utility requires a property inspection to gain insights into the condition and utility of the property and the nature of the locality and surrounding properties.

Before inspecting the property, the following steps for the assessor are recommended*:*

- Prepare a list of questions that need to be asked (see Part 2 of this Methodology Guide).
- Arrange with the owner/operator to see the interior of the plant.
- Check with the owner to see if there are any safety requirements for the tour (hard hat, special shoes, safety glasses, high-visibility vest, etc.).
- If possible, review the site plans, building plans, floor plans, elevations and cross-sections.
- Take a camera (ensure owner has provided permission for interior photos).
- Take a notebook, recording device or inspection sheet to note the nature, state and condition of the pharmaceutical manufacturing plant and any other properties inspected.
- If the pharmaceutical manufacturing plant requires measurement, take a measuring device.
- Let the owner know how long the inspection should take.

Inspecting the Property

- Take notes about the location of the pharmaceutical manufacturing plant.
- Note the access and egress to the pharmaceutical manufacturing plant.
- Review the use and condition of the parking lot.
- Ask questions about how the plant functions.
- Ask questions about other pharmaceutical manufacturing plants which may be used as benchmarks.
- Make notes of conversations as well as items seen during the inspection.
- Note the condition of the improvements (buildings, structures, etc.).
- Take photographs as required (with permission).

The inspection should establish all relevant details about the site improvements, their construction, condition, use, function and utility. Also, the property inspection provides an opportunity to ensure that the record includes all the items that should be assessed, and that all items previously captured are still present in their stated form.

Details should be confirmed and notes made about the quality and type of construction materials and finishes used for the following:

- landscaping
- site preparation
- foundations
- framing
- walls
- floors
- ceiling structures
- roof coverings
- plumbing
- lighting/electrical
- heating, ventilation, air conditioning (HVAC)
- doors
- elevators
- stairs
- fire systems and sprinklers
- finishes
- paving
- yard improvements

- other assessable items
- availability of municipal services

The state and condition of these improvements should also be noted and comments made about whether a possible variance should be applied to the effective age of any improvement.

The assessor should take photographs to supplement notes when possible.

Assembly and Verification of Data

Once the property has been inspected, the assessor should use the observations to refine the data available and consider the application of the valuation process:

- Are there any valuation issues to be taken into account with respect to the subject property or its location?
- Are there any comparable properties that need to be considered?
- Is there any other new information to be considered?
- Is any additional research needed?

The assessor should now take steps to verify the data, to ensure that the records about the property are accurate, and that the data concerning any transactions relating to other comparable properties properly reflect market conditions.

Check Record of Improvements against Inspection Notes

The assessor needs to check to ensure existing records are up to date. Upgrades to roofing, lighting, and HVAC systems (those components with a shorter lifespan) often occur. Small additions are also made. The building records need to be updated to reflect the current state and condition of the property.

Evaluate Functionality and Utility

Utility reflects the use or usefulness of a property. The amount of utility is a measure of the benefits likely to be generated in the foreseeable future. Functionality concerns what a property can do and how efficiently it can perform those tasks. The more efficient and functional a property is, the greater the benefits that can be generated, the higher the utility, and the higher the value. The assessor needs to have a clear understanding of both the functionality and the utility of the pharmaceutical manufacturing plant to enable an accurate

valuation to be prepared. Due to the specialized nature of the pharmaceutical manufacturing operation, the assessor will need to discuss both functionality and utility with the owner or operator of the plant.

Functionality

Evaluating the functionality and utility of a property requires points of comparison. Some points are general in nature; for example, a pharmaceutical manufacturing plant with a lot of excess space tends not to be as efficient in terms of operating costs when compared to a plant of a more appropriate size. Some points are specific to current operations; for example, a disjointed production flow. In both instances, the assessor has to understand the most appropriate replacements for the existing improvements and whether existing functionality and utility conditions affect the value of the property in comparison to a more efficient pharmaceutical manufacturing plant.

Establishing how well a property fulfills its desired functions requires knowledge of both the property and the processes being carried out there. An inspection may provide visual clues about how well the property works. The assessor should take note of any unused areas, excess or insufficient space or heights, or any process that seems inefficient, disjointed or out of place. Such occurrences may indicate the presence of functional obsolescence. However, a more complete determination of functionality and utility requires input from the operator of the property.

Functionality Questions

There are a number of questions that may help to build up a picture of the functionality of a pharmaceutical manufacturing plant; these include:

- Are there any areas where the layout or design makes the process difficult or inefficient?
- Are there any unused areas?
- Are there excess heights in any buildings on site?
- Is the clear height sufficient?
- Is access to the site adequate?
- Is the site large enough/laid out for current operations?

- Is the process disjointed?
- Are the property services adequate?
- How well do the building services work?
- Are the improvements in good condition?
- Has the intended use of any of the improvements changed?
- Is the property working one, two, or three shifts?
- How easy would it be to adapt the process to incorporate recent technological developments? (i.e., how flexible is the layout?)
- What is the cost of production compared to a modern, efficient pharmaceutical manufacturing plant?
- What components of the plant meet modern standards?

This Methodology Guide is concerned with the valuation of pharmaceutical manufacturing plants; the primary concern therefore is to assess how well the property meets the needs of a pharmaceutical manufacturing operation. However, if the property could be used for other similar purposes, possibly a different type of pharmaceutical manufacturing, consideration will need to be given to evaluating the functionality and utility of the property in relation to other possible uses.

Evaluate Property Utility

Utility is the ability of a property to satisfy a particular want, need or desire.

Functional utility is represented by the ability of a property, or part of a property, to be useful and to perform the function for which it is intended, according to current market needs and standards; in other words, the efficiency of a property in terms of style, design and layout.

Utility in the valuation process is addressed in the highest and best use analysis through consideration of the use of the property that produces the most profitable return.

Highest and Best Use

Determining the highest and best use is fundamental to establishing the current value of a property. It requires that the value determined be the highest amount that could be obtained for the reasonable use of that property under the current zoning environment. The market value of a property is predicated on a determination of highest and best use as defined below:

> *"The reasonably probable and legal use of vacant land or an improved property that is physically possible, appropriately supported, financially feasible, and that results in the highest value."*
>
> [The Appraisal of Real Estate, third Canadian edition, page 12.1]

This definition is further qualified as follows:

- Legal uses are those that qualify under existing government regulations – especially zoning by-laws.
- Uses that are physically possible on the subject site are uses that could be accommodated within the site configuration, location, size, or soil conditions.
- Appropriately supported uses restrict the potential options to uses that would be reasonably and probably considered by the market.
- Financial feasibility means the need for probable economic success of a potential use.
- The highest and best use must be the most profitable use for the entire property collectively – land, buildings, and other improvements.

The process of establishing highest and best use considers each of these points; eliminating uses that do not qualify under the various criteria and evaluating the feasibility and value of uses that meet the criteria.

A review of the state and condition of the improvements, the functionality of the property, and the expected utility allows for a more informed judgment on the highest and best use of the property.

In general, it is assumed that the highest and best use of a pharmaceutical manufacturing plant is likely to be the existing use. However, the question of highest and best use should still be examined to confirm this assumption.

When considering an alternative highest and best use, it is important to remember the principle of consistent use; this means the existing improvements have to be valued according to how well they may serve that alternative use.

For the purposes of this Methodology Guide, it is assumed that the highest and best use of the property to be valued is as a pharmaceutical manufacturing plant.

2. Determination of Cost New

The application of the cost approach to determine the current or market value of a property is based on the concept that it is possible to establish what it would cost a notional purchaser to replace the property with another of equal utility. When a property is new, or has very little life remaining, it is relatively easy to rationalize the amount such a purchaser would pay. It is the value during the period in between those two extremes that present challenges; this is where the task of ascertaining replacement costs, and identifying and quantifying depreciation, is necessary to enable the determination of current value.

The cost approach derives a value by estimating the cost to replace the functionality and utility of a property. As a reminder, in broad terms, this requires six steps:

1. Determine the functionality and utility of the property (what the property can do and how well it does it).

2. Establish the costs as new to construct the improvements that can complete these functions.

3. Identify all forms of depreciation.

4. Quantify all forms of depreciation (the difference between the cost as new and the market value of the improvements, i.e., the amount the improvements would sell for as of the valuation date).

5. Add the market (i.e., current) value of the land to the depreciated value of the improvements.

6. Validate the results of the above process.

Given the means to establish the cost new, i.e., using MPAC's costing system (ACS), the cost approach can be applied to value pharmaceutical manufacturing plants. This Methodology Guide is designed to assist the assessor to navigate through the valuation process and

produce an accurate estimate of current value utilizing the recognized cost approach methodology.

Reproduction Cost New

Having assembled all the data needed to complete the cost analysis, including an inspection of the property, the next step is to derive a reproduction cost new.

Reproduction cost is defined by the Appraisal Institute as follows:

> *"The estimated cost to construct, as of the effective appraisal date, an exact duplicate or replica of the building being appraised, insofar as possible, using the same materials, construction standards, design, layout, and quality of workmanship, and embodying all the deficiencies, super-adequacies, and obsolescence of the subject improvements."*
>
> [The Appraisal of Real Estate, 14th edition, page 569]

The assessor should be aware that it is sometimes advocated that the cost approach should start by using the replacement cost rather than reproduction cost. However, there are risks of inconsistency and double-counting within the valuation if replacement cost is used as the starting point. It should always be remembered that it is the actual pharmaceutical manufacturing plant which has to be valued, not a different property. That is why it is important to start the valuation processing by ascertaining the reproduction cost new of the actual plant.

Replacement cost is defined by the Appraisal Institute as follows:

> *"The estimated cost to construct, as of the effective appraisal date, a substitute for the building being appraised using contemporary materials, standards, design, and layout."*
>
> [The Appraisal of Real Estate, 14th edition, page 570]

In general, the assessor should start the cost analysis with reproduction cost new, although the use of replacement cost may be used at a later point in the valuation when considering the impact of depreciation.

Developing Cost New

After collecting the data, the assessor should evaluate the existing improvements and select the components from the information found in the ACS system that best reflects the existing

materials and construction styles according to the quality and functionality of those improvements. Adjustments for replacement materials are discussed below.

Cost estimates of other structures and improvements such as yard improvements, fences, paving, lighting, etc. are then added.

Once the cost parameters are entered, the ACS system will provide a summary of reproduction cost new for the pharmaceutical manufacturing plant. It is then a matter of determining any adjustments to reflect depreciation.

The ACS system produces cost estimates that reflect a "whole building," i.e., foundations, floor structure, frame and span, exterior base walls and additives, roof finishes, interior finishes, building services (including electrical, plumbing, HVAC, fire protection, etc.) and other built-ins.

The assessor should be aware that ACS component costs include labour, material and equipment prevailing at the relevant valuation date; costs also reflect geographical variations within Ontario.

An example of the output from the ACS system is shown in Table 1 below:

Table 1

Municipal Property Assessment Corporation

This Assessment Information was generated from an independent format. Reference your Assessment Notice for current Roll values and coding.

PROPERTY DETAILS - STRUCTURE ASSEMBLY VALUE LIST

Market Value Base Year : 2005 **Valuation Method :** ACS

Building: PUMP HOUSE **Life Table:** OR50 **(Totals:** Total RCN = 24,054 % Good = 20.00 Obsolescence Amt: 1,203)

Structure Element	Element Group	Assembly Description	Area/ Quantity	U/M	Net Rate	Add. Fctr.	RCN	Asmb Eff Yr	% Obs.	% Good	Net Value
FOUNDATIONS	FOUNDATION WALL ON STRIP FOOTING - CONCRETE	WALL 4' DEPTH <=12" THICK	36.00	LF	131.84		4,746		5.00	20.00	902
FLOOR STRUCTURE	LOWEST CONCRETE FLOOR (ON FILL)	LIGHT <= 4" THICK	144.00	HSF	4.45		641		5.00	20.00	122
STR. FRAME & SPAN - 1ST FLOOR	LOAD BEARING - WOOD FRAME ROOF >10 <45 SLOPE (NOT INCLUDING ROOF FINISHES)	SPAN <=30'	144.00	HSF	4.06		585		5.00	20.00	111
EXTERIOR WALLS - BASE	BASE WALL - MASONRY	>8" THICK - SOLID BRICK	307.80	SF	42.29		13,017		5.00	20.00	2,473
EXTERIOR WALLS - BASE	BASE WALL - WINDOWS	WOOD FRAMED DOUBLE HUNG	34.20	SF	31.50		1,077		5.00	20.00	205
ROOF FINISHES	SLOPED ROOF (INCLUDING ALLOWANCE FOR AVERAGE ROOF SLOPE)	METAL - LIGHT 30 TO26 GA PREFINISHED	144.00	HSF	4.67		672		5.00	20.00	128
FLOORS WALLS & CEILINGS	CEILING - SUSPENDED ON FRAME	DRYWALL - PAINTED	144.00	HSF	2.60		374		5.00	20.00	71
FLOORS WALLS & CEILINGS	WALLS - APPLIED TO SURFACE	REGULAR PAINT	307.80	VSF	0.67		206		5.00	20.00	39
ELECTRICAL	LIGHTING - OPEN STRIP FLUORESCENT	AVERAGE >=.50 <1.00 WATTS/SQ FT	144.00	HSF	2.31		333		5.00	20.00	63
HEATING & COOLING	HEATING - ELECTRIC BASEBOARD OR RADIANT	AVERAGE	144.00	HSF	1.00		144		5.00	20.00	27
OVERHEADS	OVERHEAD EXPENSES	QUANTITY ADJ. FACTOR	21,795.00	$	-0.11		-2,397		5.00	20.00	-456

3. Identification of Depreciation

Depreciation has been defined as:

> *"The loss in utility and hence value from any cause."*
>
> [*Basics of Real Estate Appraising,* Appraisal Institute of Canada, 1991, page 284]

Depreciation is the difference between cost new and the market value of the property improvements. There are three classes of depreciation to consider:

1. Physical Depreciation
2. Functional Obsolescence
3. External Obsolescence

Both physical and functional depreciation can be sub-divided into two types:

1. Curable (where it is cost-effective to fix).
2. Incurable (where it is not cost-effective, or impossible, to fix).

All elements of depreciation affect the value of a property.

Physical depreciation - deterioration due to age - is a relatively simple and straightforward concept and is therefore widely understood, but functional and external obsolescence are more complex. Various definitions of functional and external obsolescence exist, but the following are used by the Appraisal Institute:

> ***"Functional obsolescence** is caused by a flaw in the structure, materials, or design of an improvement when the improvement is compared with the highest and best use and the most cost-effective functional design requirements at the time of the appraisal. A building that was functionally adequate at the time of construction can become inadequate or less appealing as design standards, mechanical systems, and construction materials evolve.*
>
> *Functional obsolescence is attributable to defects within the property lines, in contrast to external obsolescence, which involves conditions outside the property lines and therefore outside the control of the owner and occupants. Functional obsolescence, which may be curable or incurable, can be caused by a deficiency - that is, some aspect of the subject property is below standard in respect to market norms. It can also be*

caused by a super-adequacy - that is, some aspect of the subject property exceeds market norms."

[The Appraisal of Real Estate, 14th edition, page 623]

***"External obsolescence** is a loss in value caused by negative externalities, i.e., factors outside a property. It is almost always incurable. External obsolescence can be temporary or permanent. For example, value loss due to an oversupplied market may be regained when the excess supply is absorbed and the market works its way back to equilibrium. In contrast, the value loss due to proximity to an environmental disaster may be permanent.*

In the aftermath of the financial crisis of 2008, external obsolescence in oversupplied real estate markets was significant, but those losses in value were not expected to be permanent in areas where the economic base was sufficiently diverse to eventually recover. External obsolescence is sometimes called economic obsolescence because economic factors outside the control of property owners, like mortgage interest rates and changing employment levels, can have large effects on the value of real estate.

External obsolescence usually has a market-wide effect and influences a whole class of properties, rather than just a single property. However, external obsolescence may affect only one property when its cause is location, e.g., proximity to negative environmental factors or the absence of zoning and land use controls. In fact, the causes of external obsolescence can be broadly characterized as either market obsolescence or locational obsolescence. Most properties experience market obsolescence from time to time as a result of the natural expansion and contraction of the real estate market. In contrast, locational obsolescence is caused by proximity to some detrimental influence on value such as heavy traffic, a landfill, or other undesirable land use outside the property being appraised. For both market and locational obsolescence, the value-influencing factor is outside the property and outside the control of the property owner and occupant."

[The Appraisal of Real Estate, 14th edition, pages 632-633]

Depreciation can be quantified in a number of ways (see step 4 below), but in order to help with the quantification process, it is first important to identify all the forms of depreciation that are present at the pharmaceutical manufacturing plant.

Identifying Depreciation due to Age

All properties suffer physical decline as they age. The amount of depreciation applied depends on three factors:

- The expected life assigned to the building or structure.
- The quality of the construction.
- Whether any variance to the effective age has been identified by the assessor.

Improvements - Life Expectancies

The life of an improvement can be characterised in three different ways:

1. Economic life - the period where the utility of the improvement is positive, i.e., it contributes to the value of the operation. An improvement can have more than one economic life under different uses.
2. Useful life - the period of time over which the components of the improvement may reasonably be expected to perform the functions for which they are designed[1].
3. Physical life - the period until an improvement deteriorates to the point where it becomes unusable.

Age-related depreciation is generally applied on the basis of the effective age of a structure[2]. A brand new pharmaceutical manufacturing plant has very little depreciation (if any), whereas a plant approaching the end of its economic life is likely to have a significant amount of depreciation.

The ACS system reflects physical depreciation from normal wear and tear by reference to useful life tables. However, where necessary, the assessor can override the age-related useful life table by using an effective age input. It should be noted that overriding the ACS age-related table can lead to difficulties and inconsistencies within the valuation, so it should be done with caution and only where it is clearly warranted.

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[1] The Appraisal of Real Estate, 3rd Canadian Edition, Sauder School of Business. page 19.6

[2] Effective age should relate to the state and condition of the improvements taking into account when the improvements were built and their remaining economic life; however, the average actual build date of the improvements (weighted by size or costs new) is often used as a proxy for effective age.

Quality of Construction

There are typical life expectancies for all types of industrial improvements depending on their construction and use. For example, typical metal frame construction tends to have a 50 year life expectancy. In general, the more robust the improvements, the longer the life expectancy.

Most buildings found at a pharmaceutical manufacturing plant would be assigned a typical expected useful life based on construction styles. However, there may be some more intensive or specialized uses at a particular plant that tend to shorten the life of a property due to greater physical wear and tear.

Variances in Effective Age

If additional depreciation is required to adequately capture the difference in value between cost new and current value, it can be accomplished by adjusting the effective age or adjusting the expected useful life. However, the assessor should note the concerns about making such adjustments stated previously.

A determination of effective age is completed by evaluation of the physical state and condition of the improvements. If the condition of the improvements is typical for the age of the structure, then no adjustments are required. If the improvements are worse than typical, then an age variance can be applied (assigning an older effective age increases the depreciation). If the improvements have recently been upgraded or renovated, then the effective age can be raised; this lowers the amount of age-related depreciation applied by the ACS cost system.

Evaluating Physical State and Condition

During the inspection, items that were in poor repair should have been noted. Items in poor repair should be addressed as follows:

- Does the item requiring repair or replacement change the remaining useful life of the property or that part of the property that is affected? The assessor should attempt to determine from the owner or operations personnel if there are any excess operating costs associated with the condition.

- If repair or replacement is required in the immediate future, the assessor should request any information or studies completed on the estimated costs.

- If the condition of the improvement changes the effective age of the component, the physical depreciation of that component should be adjusted to reflect its change in value.

- If the repair or replacement is a matter of deferred maintenance, the assessor should determine if the condition changes the amount that a purchaser would pay for the property.

The assessor should make a note of the improvements/items requiring additional consideration.

If the improvement is in poor condition, has suffered from unusual environmental conditions (for example, flooding), or has been poorly maintained, then the effective age should be adjusted to indicate an older building; this will result in higher rates of depreciation.

Deferred Maintenance and Cost to Cure

In addition to general depreciation due to age, there may be specific elements in the pharmaceutical manufacturing plant that require more detailed analysis: for example, a building, or part of it, may be in need of a new roof in order to continue operations.

Deferred maintenance occurs when the property has not been properly maintained and the item (e.g., a leaky roof) suffers from premature loss in value. Cost to cure issues arise when, in the normal life of the property, a particular item (e.g., the roof) has to be replaced.

In both instances, i.e., the need to repair or replace, the potential purchaser of the pharmaceutical manufacturing plant would be out of pocket by the amount it would cost to fix the issue. In both instances, after the problem is fixed, the value of the property will increase. However, until the money is spent on remedial works, the property is affected by depreciation.

Clearly the typical purchaser would pay more for a pharmaceutical manufacturing plant with buildings that have fully effective roofs than a plant with leaky ones (all other factors being equal). If the replacement of the relevant building component would be done by a purchaser as of the valuation date, then any value remaining in the component being replaced should be deducted from the property value. If the condition exists, but only calls for remedial action over time, then only a portion of the existing value should be deducted.

However, there is typically an additional element of depreciation involved as well: the difference in the cost of repair versus the cost to install the building component as if it were being constructed when new.

The amount of this depreciation is often difficult to quantify. Whereas ACS will be able to provide an estimate of how much it costs to build a roof as new, the cost to fix/rebuild an existing roof can be more challenging to estimate. For example, there will be costs incurred in removing the defective part of the structure and existing activities in the building concerned may have to be discontinued or transferred elsewhere whilst the repair work is carried out. The cost of completing the repair work would therefore be higher than simply building a new roof as part of a new construction. Typically, the estimates for such cost to cure projects are not readily available, so an estimate has to be made.

Despite these limitations on calculating an accurate depreciation amount for cost to cure, it remains important to identify situations where such depreciation exists and to make some form of deduction from value. Such adjustments may best be done by increasing the effective age of the structure to increase the amount of physical deterioration applied.

Table 2 shows a simple example of the difference between the cost of a roof component at the time of constructing a new building and the cost to replace one in situ, i.e., the cost to cure to be deducted from the reproduction cost new.

Table 2

Item	**Cost (as part of RCN – ACS)**	**Cost to Cure (separate cost)**
Roof	$150,000	$200,000
Ancillary works	$25,000	$50,000
Total	$175,000	$250,000
Curable physical deterioration		$250,000

Table 3 shows a more detailed example of excess costs and their impact on value.

Table 3

Obsolescence	**Annual Excess Costs**	**Cost of Correction**	**Capitalization of Costs @ 6.4176**	**Affect on Value**
Heating	$1,128,518	$3,954,100	$7,242,377	$3,954,100
Security	$500,698	n/a	$3,213,279	$3,213,279
Clear Heights	$1,126,100	n/a	$7,226,859	$7,226,859
Material Flow	$1,274,000	n/a	$8,176,022	$8,176,022
Roof Conditions	n/a	$809,905		$809,905
Paving Conditions	n/a	$662,101		$662,101
Totals	$4,029,316	$5,426,106		$24,042,267

Note: Assumes a discount rate of 10% and a life expectancy of 10 years.

Functional Obsolescence

The two main questions in relation to functional obsolescence that need to be considered by the assessor are:

1. **Identification** - does it exist and, if so, what type of functional obsolescence is it?
2. **Quantification** - what method should be used and how should it be applied?

Identifying Functional Obsolescence

The existence of functional obsolescence can often be identified by addressing several questions:

1. Are there excess operating costs inherent in the operation of the existing improvements?

2. Are there any inefficiencies in the improvements - excess space, excess height, or disjointed layout/construction?

3. Could the existing improvement be replaced with a more modern, efficient substitute, and, if so, what would the modern replacement building consist of?

4. How would a potential vendor or purchaser view this property?

These questions should be discussed with the pharmaceutical manufacturing plant operations or facility manager. The assessor should attempt to get a sense of the seriousness of the problems encountered (if any) in the operation of the property. It is also necessary to determine whether these problems relate to the real estate alone or a combination of real estate, machinery and equipment and/or other business factors.

A pharmaceutical manufacturing plant that is inefficient or costs more to produce an item than its modern counterpart may be suffering from functional obsolescence and may have lost some value. One way to measure this impact is to establish the amount of the excess operating cost and convert it into a present value. For example, an older, inefficient HVAC system in a building may cost $25,000 more per year to operate than a more modern system.

It is sometimes difficult for the assessor alone to make such a determination. Assistance is often required from the pharmaceutical manufacturing plant owner or operator. Typical examples of excess operating costs include:

- Excess costs of heating or other services.
- Excess costs of goods movement due to inefficient layout.
- Excess maintenance costs.
- Costs of carrying excess space.

By addressing these and similar questions, it becomes possible to identify the presence of functional obsolescence. Methods of quantifying this obsolescence are discussed in the next section of this Methodology Guide.

External Obsolescence

As with functional obsolescence, the two main questions in relation to external obsolescence that need to be considered by the assessor are:

1. **Identification** - does it exist and, if so, what has given rise to the external obsolescence?

2. **Quantification** - what method should be used and how should it be applied?

Identifying External Obsolescence

There are a number of factors that may produce external obsolescence including:

1) A change in market demand for the products or services. In such cases the pharmaceutical manufacturing operation may have lost some ability to generate revenue and therefore the value of the plant may have gone down. For example, the supply of a new drug has increased and/or the consumption of an older drug has dropped, causing an over-capacity situation in the industry.

2) A change in the attractiveness of the location. Commonly referred to as locational obsolescence, this decline in value is caused by a variety of factors that change the attractiveness, and therefore value, of a location. For example, the closure of an existing highway may adversely affect the value of properties in a particular locality.

3) A change in government restrictions or regulations. For example, a new regulation that means additional quality control measures have to be taken in a particular pharmaceutical manufacturing process may result in a requirement to spend money and a corresponding reduction in value.

4) Physical site restrictions. The demand for a service may be such that expansion is desired. However, due to zoning or physical restrictions, this may not be possible on the existing site. Anything from the unfulfilled need for more parking spaces to a desired building expansion may cause this form of external depreciation.

5) A decline in general economic conditions. A recession can cause a drastic and long-term fall in the demand for a pharmaceutical product. This may result in creating oversupply situations for pharmaceutical manufacturing operations and a corresponding drop in demand and value for the properties used for producing the drugs.

6) Changes in the availability of services. Municipal restrictions on waste disposal, the closing of a rail spur line, and other similar changes in services can cause a decline in value due to this type of external obsolescence factor.

In the case of more specialized properties such as pharmaceutical manufacturing plants, it may be necessary to undertake a review of information obtained from the property owner and the industry which will help to:

- Determine past, current and expected production levels.
- Establish capacity utilization.
- Research the industry, establish the profitability of the industry.

More detailed factors to consider in this connection are shown in Part 2 of this Methodology Guide. Many of these factors will be included in MPAC's Market Valuation Report which forms part of the Level 2 Disclosure.

If it is necessary to seek this type of information, assistance from the property owner or operations manager is helpful. Other resources include:

- trade publications
- Statistics Canada data
- industry studies
- reports on similar properties

The objective is to determine whether the cost analysis should incorporate an external obsolescence allowance and/or whether a replacement cost based on a modern facility is warranted.

It follows that, in order to identify the presence of external obsolescence, the assessor needs to study:

- changes in product demand
- changes in the financial performance of companies in the industry
- changes in competition – locational factors

It is also important to gain some understanding of the reason for these changes, (e.g., general economic recession; development of a more efficient manufacturing process elsewhere; etc.) in order to understand the nature (extent and longevity) of the obsolescence condition.

The pharmaceutical manufacturing industry is particularly susceptible to the availability of new drugs which may have an impact on the value of these plants, particularly if they are not flexible enough to be able to change their operations to match changes in demand for their products.

To establish external obsolescence, the assessor has to be satisfied that the causes for any reductions in revenue and profits stem from factors outside the control of the property owner or operator, e.g., general economic recession, or increased competition. Poor business performance does not always imply obsolescence. There are a number of reasons why particular companies may experience reduced revenue and/or profit apart from the impact of external factors.

4. Quantifying Depreciation

Depreciation in total is the reduction in value of the existing improvements in comparison with cost new. There are various aspects of depreciation:

> *"Loss in value of an object, relative to its replacement cost, reproduction cost, or original cost, whatever the cause of the loss in value. Depreciation is sometimes subdivided into three types: physical deterioration (wear and tear), functional obsolescence (sub-optimal design in light of current technologies or tastes), and economic obsolescence (poor location or radically diminished demand for the product)."*
>
> [Property Appraisal and Assessment Administration, IAAO, 1990, page 641]

There are a number of ways to quantify depreciation including:

1. **Market extraction** - determining the typical global amount of depreciation from cost new based on the evidence of properties that have sold.

2. **Age-life approach** - where total depreciation is estimated (usually on a straight line basis) by determining the current life of the property as a ratio of the expected total economic life.

Both these methods are based on the demonstrated sales values of similar properties. Knowing how long a property is expected to last (economic life), and its value at the end and other points of that life, enables the prediction of value from cost new to a point in its life.

These two methods are reasonably simplistic in approach and work well with groups of properties that have common characteristics under typical conditions. They rely on the

appropriate sales and life data being available. Examples of how they may be applied are shown in step 6 where they are used for checking the quantum of depreciation deducted rather than as a method of calculating the amount to be deducted.

As already indicated, there are very few, if any, sales of large pharmaceutical manufacturing plants that might allow either of the above approaches to be used. For that reason, a different approach - the breakdown approach - should be used (see below).

Breakdown Approach

The breakdown approach involves each component of depreciation being identified and quantified separately. The breakdown approach is the most comprehensive and detailed way to measure depreciation as it segregates total depreciation into the three individual parts, i.e., physical deterioration, functional obsolescence and economic obsolescence. It is also cumulative with each step building on the results of the previous step until all forms of depreciation have been considered. In this way the assessor can gain a better understanding of the impact of all forms of depreciation on the pharmaceutical manufacturing plant that is being valued.

The steps in the breakdown approach are as follows:

1. **Estimate Replacement Cost New** - adjust reproduction cost new for excess capital costs, over-building and excess space; this produces replacement cost new.

2. **Estimate Physical Deterioration** - apply depreciation rates from ACS then, if appropriate, calculate the effects of any deferred maintenance and costs to cure to further revise the replacement cost new.

3. **Estimate Functional Obsolescence** - calculate and apply functional obsolescence.

4. **Estimate External Obsolescence** - estimate and apply external obsolescence.

5. **Determine the Depreciated Value** - of Buildings and other Improvements.

As already indicated, the breakdown approach has the advantage of being able to look at, and quantify, the impact of each aspect of depreciation affecting the property. This allows for the quantification of depreciation in abnormal or non-typical situations.

Quantifying the various components of depreciation in the breakdown approach is explained below.

Replacement Cost Analysis

Replacing Construction Materials during Cost New Analysis

There are a number of techniques and materials that can be used to construct the type of buildings and other structures found at pharmaceutical manufacturing plants. There may be a functional reason why one material was chosen over another for the existing property. For example, the need to be able to thoroughly clean the surfaces of a room may require the use of special finishes to the walls, floor and ceiling. Although less expensive materials could be used in a general replacement building, they would not meet the specification for pharmaceutical manufacturing plants; therefore the more expensive building material is used for a reason and would not be replaced by a less expensive option.

On the other hand, some properties may be over-built and would not be rebuilt as they stand. For example, a pharmaceutical manufacturing plant may have once required extensive storage facilities on-site. A move to "just in time" operations may have rendered such storage facilities no longer necessary and therefore they may not add value to the property.

It should be noted that, although replacing existing construction materials might be considered in connection with replacement cost new, this approach should not be taken at the earlier stage of the valuation when considering reproduction cost new.

The following is a list of some of the issues that should be considered by the assessor when evaluating construction materials, techniques and costs.

Layout of Buildings

A pharmaceutical manufacturing operation that has evolved and expanded over time may have a tendency to have disjointed production flows. Evaluating the functionality of such a pharmaceutical manufacturing plant may involve recognizing any inefficiencies caused by the layout of the existing buildings. The assessor should consult the owner or operator of the plant to obtain reliable information about this issue.

Used and Unused Areas

During the property inspection, the assessor should have been able to identify any areas of buildings that are not being used. The assessor should have queried the reason why the space is unused with the owner or operator of the pharmaceutical manufacturing plant and reached a conclusion whether or not the lack of use is likely to be permanent.

Another issue may be any excess height and the unused vertical space in a building. Before the existence of excess height can be determined, the assessor should address the question of why the structure was constructed to its current height and determine if that height or the "extra" area adds value to the property. It should be noted that the critical factor for most large specialized industrial properties is not the actual height of the building but the clear height, i.e., the distance from the floor to the bottom of the roof trusses. However, the assessor also needs to consider whether any unused space, height, land, etc., only relates to the way in which the current operator uses the property and whether another operator within the pharmaceutical manufacturing industry might fully utilize the space available.

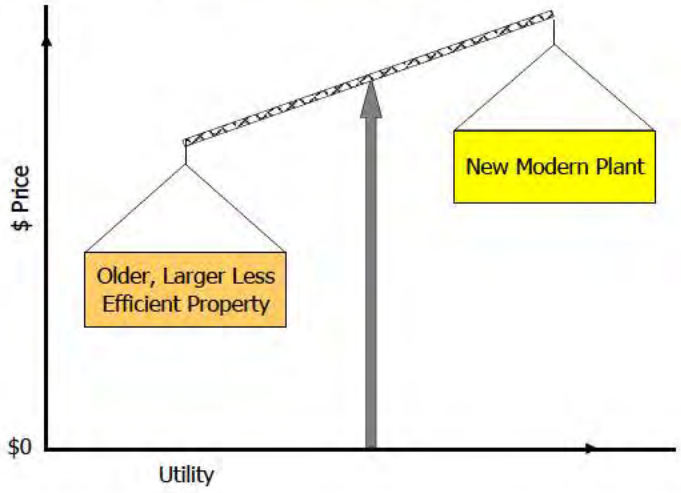
Determining whether there is excess land within the site may be more difficult, but it is usually possible to identify the potential for excess land. This may need to be reflected when the value of the land is being considered later.

Modern Replacement Plant

Designing and costing a modern replacement pharmaceutical manufacturing plant addresses the "buy existing or build new" issue facing a potential purchaser of the subject property. In other words, the decision whether to:

- Build a new pharmaceutical manufacturing plant that satisfies all the functional needs and expectations.
- Purchase an older existing pharmaceutical manufacturing plant with less functionality and lower utility, but at a lower price.

Choice Facing Purchaser - Utility / Price Scale



A reproduction cost new determines the cost to replicate the existing improvements with a new pharmaceutical manufacturing plant of similar functionality.

The “model replacement” plant approach may be used in situations where the existing improvements are significantly over-built in relation to current needs.

The “model replacement” or "green field" approach starts by replicating all the functions and utility present in the existing property, while taking advantage of the advances and technological changes in the field to produce a fully functioning, modern, efficient pharmaceutical manufacturing facility. The analysis should be considered on the basis of a realistic evaluation of the requirements and capabilities of the existing property, and what would be required to replace it. Constraints such as current location, site size and zoning by-laws should be taken into consideration.

If completed properly, the difference between the cost new of this modern facility and the cost new of the existing property represents the excess capital costs - or functional obsolescence - due to the overbuilt nature of the existing property.

By comparing the subject property to a modern facility, it becomes possible to identify and evaluate the following aspects of the existing property:

- functionality
- excess operating costs
- excess construction costs

A replacement model approach takes a significant amount of design expertise to provide realistic detail about the improvements sufficient to enable the completion of a cost analysis and to ensure that all the necessary functionality is present.

The assessor should take into account the views of the owner or operator of the pharmaceutical manufacturing plant when considering whether or not the existing facility would be replaced by a significantly different design and, if so, where information about that type of facility (and the cost to build it) may be found.

Replacement of Building Components

In addition to the overall replacement concept, there will be situations when only part of the property would be replaced. Under this approach, it is possible to go through the pharmaceutical manufacturing plant, component by component, and make evaluations as to

the utility of each element. In this instance, the deduction for depreciation due to super-adequacies would be the summation of the individual calculations.

For example, a pharmaceutical manufacturing plant may have a warehouse that is only 50% used because the operation now uses "just in time" supplies so no longer needs as much storage space as it had when originally constructed. In such instances, the analysis of cost new would be the same as normal apart from the deletion of the old warehouse section and the addition of a warehouse that is 50% smaller (assuming that the "surplus" space in the existing property is permanent and there is no alternative use for it).

Quantifying Depreciation Due to Age and Condition

As already indicated, the ACS system has built-in tables that account for the typical amount of depreciation due to age. Under typical conditions, each building component (e.g., office area, laboratories, security compound, etc.,) is assigned a depreciation rate (% Good) according to the effective build date and the life expectancy.

The assessor should refer to the ACS example (Table 1) to see how the depreciation rate (% Good) is used.

Quantifying Functional Obsolescence

In broad terms, the quantification of incurable physical deterioration and incurable functional obsolescence can be found by deducting replacement cost new from reproduction cost new. However, it is helpful to consider the issues in more detail as set out below.

There are different methods used to quantify the various aspects of obsolescence. Difficulties in quantifying obsolescence arise where there is no established market place which can be used to form comparative judgments either in terms of income potential, market sales values or efficiency benchmarks. In these situations, the losses in value due to obsolescence can generally be identified, but the estimation of the extent of the impact on value is sometimes more difficult.

Another way to consider physical depreciation and functional obsolescence is to examine the excess operating costs that might be incurred from operating a sub-optimal pharmaceutical manufacturing plant.

Capitalization of Excess Operating Costs Analysis

A prudent purchaser will take into account all cash outlays (expenses) when considering the price of a property. If the property creates inefficiencies or increased production costs due to

its layout or building services, then the purchaser will factor these costs into a purchase decision.

Excess operating costs are those costs that arise as a result of the inefficiencies inherent in the real estate used by the existing pharmaceutical manufacturing operation in comparison to a more efficient operation. They negatively impact the value and can be measured by capitalizing the amount of excess costs. Excess operating costs will affect value even after the replacement model approach is considered.

For example, an office building at a pharmaceutical manufacturing plant may have an old HVAC system that results in an additional $25,000 per annum to the operating cost in comparison with a more efficient, modern system. This extra cost makes the subject property less attractive and therefore less valuable than an office building with an efficient system. This additional annual cost can be capitalized and the capital sum deducted as part of the functional obsolescence calculation.

There is a risk of confusion when using replacement costs and it is important that the valuation approach is consistent. If a modern replacement pharmaceutical manufacturing plant is being considered for the purposes of calculating the amount of depreciation impacting the existing plant, the replacement office building will be assumed to have a modern HVAC system. However, that does not alter the fact that the existing office building at the plant being valued has a less efficient HVAC system and the excess operating costs associated with the HVAC system at the existing plant will still therefore need to be deducted.

What Constitutes Excess Operating Costs?

Any excess operating costs or inefficiencies attributable to the real estate (improvements or site) should be considered as a form of depreciation. Costs that relate to the business (labour, management, machinery, etc.), while they may have long-term impacts on the economic viability of the property, should not be considered as part of functional obsolescence in the property valuation process.

Typically, the following factors give rise to excess operating costs:

- Inefficient heating, air conditioning and/or ventilation systems.
- Poor property design or layout causing excess materials handling costs, including extra costs for personnel and equipment.

- Poor property design and/or excess space causing extra maintenance and other operating costs.

Capitalizing Excess Operating Costs

To complete the analysis of the impact of excess operating costs requires knowledge of three elements:

1. The remaining economic life of the property, i.e., how long these excess costs are going to continue to be incurred.

2. An appropriate capitalization rate (generally the cost of funds for that industry).

3. The effective corporate tax rate and whether the property is expected to make profits.

The remaining economic life of the property impacts on how long these excess operating costs are expected to last. The capitalization rate converts the annual cost into a present value and the annual costs are reduced by the effective tax rate because these extra costs reduce profit and, as a result, the company will pay less tax.

There are several ways to rationalize a capitalization rate. Some inference can be drawn from the capitalization rates found in sales transactions in the market for other types of investment such as long-term interest rates for various types of financial instruments; however, a more rational approach is to develop the cost of funds for a typical purchaser (see example below).

Impact of Excess Operating Costs

When studies done during the depreciation identification stage result in confirmation of excess operating costs, their impact is estimated by capitalizing the future costs into a present value. For example, a pharmaceutical manufacturing plant is overbuilt and, as a result, it has two extra employees to perform maintenance work with a total annual cost of $150,000 per year. The owner of a new pharmaceutical manufacturing plant does not have this cost. Noting that the economic life of the pharmaceutical manufacturing plant is expected to last another 5 years, and that the current corporate tax rate is 25%, the impact on value of the excess operating costs at $150,000 per annum may be calculated as shown in Table 4 below:

Table 4

Element	Annual Cost	Tax adjustment	Period (years)	Factor at 8%	Functional obsolescence
Additional cost relating to excess area	$150,000	-25%	5	3.9927	$449,180
Rounded					$449,200

Note: Rates are for illustrative purposes only.

To explain how the above table works, it has been determined that there are excess operating costs as a result of additional employees related to the pharmaceutical manufacturing plant which amount to $150,000 in extra expenses per annum. What needs to be determined is what the discount to the overall value this additional expense would have, since the facility was measured on the cost method and we cannot simply deduct it from an income stream.

If the resulting excess costs are considered to be an income stream, it would be necessary to determine the after-tax cost to the company for hiring those additional workers. If the pre-tax expense is $150,000, and the corporate tax rate (which varies by jurisdiction and company type) is 25%, then the after-tax cost to the company would be (1-.25)*150,000 = $112,500. This is, effectively, the annual amount which an owner would have to pay to maintain an older, inefficient facility in comparison with a more modern facility.

It is then necessary to consider what discount a potential purchaser looking to buy the facility would attribute to this additional expense. A purchaser would effectively reduce the purchase price by the present value of the future outflows of cash; it can be calculated like an annuity. In calculating the present value, two items have to be considered along with the cash flow amount; the life of the asset (how many periods to assume the payment needs to be made for) and the discount rate. The economic life of the facility/asset has been determined to be 5 years, so it is necessary to expect a purchaser to have to pay out 5 additional expense payments. The discount rate has been reviewed by analysis of interest rates, bond rates and sales of similar assets and has been set at 8%.

There are a number of places to find the factor which is used to multiply the cash flow payment in order to determine the present value. This includes present value tables, excel

functions and/or scientific calculators. When the present value tables using 5 years and 8% discount rate is used, a factor of 3.9927 is determined. This factor is multiplied by $112,500 to find that the present value of 5 years of expected cash outflows would be $449,180 (rounded).

It will be seen from Table 4 that the impact on the current value as a result of excessive building area and two extra employees at $150,000 (salary and benefits) has been taken to be $449,200.

As a dollar amount deduction, it becomes important at what point in the process this functional obsolescence depreciation is applied. When a potential purchaser compares two properties with similar functionality, one with excess operating costs and one without, the impact of $449,200 comes after the physical deterioration and replacement issues have been considered, but before any external obsolescence impacts which are beyond the control of the property owner, and which may or may not change in the future. Therefore, it is at that stage in the valuation that an adjustment needs to be made by the assessor for this factor.

Functional Obsolescence when no Excess Cost Information is Available

As is often the case, the detailed cost information needed to calculate the impact of functional obsolescence may not be readily available. In these situations, the functional obsolescence should be recognized by the assessor and a judgment made as to the percentage impact it is likely to have on the purchase price of the property. This type of deduction can be applied as a percentage deduction on a component by component basis, or by a property-wide deduction.

Quantifying External Obsolescence

> *"External obsolescence is a loss in value caused by factors outside the property. It is often incurable. External obsolescence can either be temporary (e.g., an oversupplied market) or permanent (e.g., proximity to an environmental disaster). External factors frequently affect both the land and building components of a property's value. External obsolescence usually carries a market-wide effect and influences a whole class of properties, rather than just a single property. External obsolescence may only affect the subject property when its cause is location - e.g., proximity to negative environmental factors or the absence of zoning and land use controls."*
>
> [*The Appraisal of Real Estate*, 12th edition, Appraisal Institute, page 412]

The key issues producing external obsolescence are:

- Significant change in demand for product.

- Plant not working to capacity.
- Costs of production no longer competitive.

To understand external obsolescence, the assessor needs to understand why these things have happened and if they are happening to other producers. It is important to consider whether the external conditions affecting the property would normally translate into a physical change in the property (e.g., size, configuration, etc.). Alternatively, if property changes do not address the issue, what is the loss in value as a result of this type of obsolescence?

As with the application of the other forms of depreciation, external obsolescence is usually expressed as a percentage of cost new and deducted from the replacement cost value less physical and functional obsolescence.

Methods of Quantifying External Obsolescence

Studying changes in factors like capacity usage ratios and gross margins can assist in quantifying this type of obsolescence, but external obsolescence tends to be industry and property specific in nature. Establishing market (i.e., current) value is best achieved by the assessor assuming the role of a potential purchaser, i.e., a "knowledgeable" purchaser. For properties with a specific highest and best use such as pharmaceutical manufacturing plants, this study will involve research into the industry and recent changes in that industry, a view to the future of that industry, and specific knowledge about the location and other "local" factors affecting the specific property.

Part 2 of this Methodology Guide contains more detailed information about the factors to consider in connection with ascertaining whether there is external obsolescence and, if so, how it may be quantified. It should be noted that MPAC produce Market Valuation Reports for each reassessment as part of its Level 2 Disclosure process; these reports will assist the assessor in reaching a conclusion about whether or not an adjustment needs to be made for external obsolescence and, if so, what the quantum of that adjustment should be.

Where the presence of external obsolescence has been identified, the impact can be quantified using the following steps:

1. First, complete a detailed study of the industry - in this case, the pharmaceutical manufacturing industry - and the economic factors that are affecting it and establish the degree (or range) of the changes taking place in the industry.

2. Then, with the assistance of the owner or operator, analyze the performance of the pharmaceutical manufacturing plant being valued (i.e. units produced, profits or losses, cost per unit, etc.) and compare it to the industry standards. This can identify whether there are more issues concerning the subject property (e.g., operating cost issues, locational issues, etc.) than at other similar pharmaceutical manufacturing plants.

The degree of value loss should reflect the magnitude of the changes in the property. Quantifying external obsolescence in respect of the real estate is sometimes challenging because the conditions invariably also impact on the business value of the operation.

The three traditional methods of quantifying external obsolescence are:

1. Establish total depreciation using market-extraction or other approaches to value then use a "residual" approach to determine how much obsolescence remains after quantification of the other forms of depreciation.

2. By considering stock or other financial measures, determine the magnitude of the loss for the business due to external obsolescence, then "translate" the finding to apply to the real estate component.

3. Find comparative value data for similar properties not affected by the obsolescence and determine the differences in value. This could also be an analysis of "paired sales" data where a property was sold before and after the obsolescence condition, or paired income data where lease rates have changed before and after the obsolescence condition. Where valuation dates are in the past, such "pairing" of data could be forward or backward looking.

More sophisticated approaches may involve a "utilization analysis," a "return on capital analysis," an "equity to book ratio analysis," and/or a "gross margin analysis"; however, these approaches usually require specialist expertise and the assessor may not be expected to undertake these forms of analysis without expert assistance.

An attempt should be made to use one or more methods to quantify the obsolescence. If, because of the lack of comparable sales/value data, this is not possible, the assessor should make a judgment and attempt to support the rationalization. The important point is that the presence of external obsolescence, assuming it exists, has been properly identified and that a reasonable allowance needs to be made for this factor.

The appropriate adjustment for external obsolescence in respect of pharmaceutical manufacturing plants, along with an explanation of the rationale for the guidance, will be contained in the Market Valuation Report prepared by MPAC for the pharmaceutical manufacturing industry as part of its Level 2 Disclosure process.

An example of the adjustment that might be made for external obsolescence, and the reasons for it, is shown in Box 1 below. The figures used are illustrative only and do not relate to any particular industry.

Box 1

To determine if economic obsolescence is present, the assessor should review the economic indices or ratios of the subject property and the industry in which it competes as of the effective date of value.

The review should involve a comparison of the economic indices and ratios as of the effective date against those realized during a period when the subject property and the industry in which it competes were performing as intended.

For publicly traded companies, the economic indices and ratios realized in the past 10 years are readily available for review. The only way to obtain economic information that is applicable to the subject property is via the owner of the subject property.

Example

Year	Economic Ratio
2006	24
2007	22
2008	20
2009	20
2010	23

2011	19
2012	18
2013	15
2014	17
2015	17

The observations from the data contained in the table are as follows:

- The peak ratio in the past 10 years is 24
- The mean ratio of the past 10 years is 19.5
- The mean ratio of the best 3 years is 23
- The ratio as of the effective date (i.e., January 1, 2016) is 17

The assessor must compare the ratio realized as of the effective date (i.e., 17) to the ratio(s) realized when the industry or subject property was performing as intended.

If the assessor concludes that the mean ratio of the best three years (i.e., 23) reflects an era when the industry or subject property was performing as intended the allotment for economic obsolescence would be:

$$\textbf{EO} = \frac{\text{3 Year Mean} - \text{Ratio as of Effective Date}}{\text{3 Year Mean}}$$

$$\textbf{EO} = \frac{23 - 17}{23}$$

$$\textbf{EO} = \frac{6}{23}$$

EO = 0.26 or 26 percent

The assessor should make best efforts to analyze many economic indices and ratios to obtain multiple indicators of economic obsolescence. Each of the indicators should be considered by the assessor before reaching a conclusion as to what the appropriate allotment for economic obsolescence should be.

Judgment

In some instances, obsolescence is easily recognized, but is difficult to quantify. Given a thorough understanding of the property, the nature and condition of its business, the nature and condition of the industry, sometimes the only available method of quantifying the obsolescence is through making a judgment. This judgment should be made with respect to current competitive standards and/or typical operating conditions for that type of property.

However, the determination of obsolescence should be based on facts and as many observations from the market as possible.

Once all forms of depreciation have been identified, quantified and deducted from reproduction cost new, the end result is the current value of the improvements determined through the use of the cost approach.

Adding in the net values of other improvements such as vehicle parking and the value of the land (see step 5 below) produces an estimate of value using the cost approach.

Table 5 provides an example of a typical ACS cost approach valuation summary (including the land value).

Table 5

Municipal Property Assessment Corporation

This Assessment Information was generated from an independent format. Reference your Assessment Notice for current Roll values and coding.

Roll Number: 37-39-020-240-02000	PROPERTY DETAILS - PROPERTY VALUATION
Market Value Base Year: 2008	Selected Valuation Method: ACS
Average Age:	

PROPERTY VALUE SUMMARY	
Total Bldg. Net Value:	$17,992,604
Total Yardwork Net Value:	$391,715
Total Land Value:	$1,080,345
Property Total Value:	$19,464,664
Industrial MAF (Factor):	.00000000
Commercial MAF (Factor):	
MAF Adjustment:	$0
Property Current Value:	$19,464,664
Property Current Val. Rounded:	$19,464,000
Property Value Override:	
Total Prop. Net Rate / SF GFA:	$13.21

VALUATION of BUILDINGS	
Total Gross Floor Area (SF):	1,473,825
Total Int. Finished Area (SF):	159,013
Total Bldg. RCN:	$98,931,794
Functional Obsolescence:	$38,895,225
Life Table Depreciation:	$27,322,743
Bldg. Net Value:	$32,713,826
Economic Obsol. Percent:	45
Economic Obsolescence:	$14,721,222
Total Bldg. Net Value:	$17,992,604
Total Bldg. Obsol. Percent:	54
Bldg. RCN / SF GFA:	$67.13
Bldg. Net Rate / SF GFA:	$12.21

TOTAL LAND VALUE			
Calculated Site Area:			35.760 A
Parcel #	Type	Area	Value
1	Industrial	35.760 A	$1,080,345
Total Land	Value:		$1,080,345

APPORTIONMENTS	
C T $192,880	L T $19,271,120

VALUATION of YARDWORK	
Total Yardwork RCN:	$1,319,417.00
Total Y/W Obsol.:	$659,712.00
Life Table Depreciation:	$267,990
Total Yardwork Net Value:	$391,715

EXCESS LAND	
Land to Bldg. Ratio:	2.50
Site Required:	
Excess Land:	
Excess Land Override:	
Excess Land Value:	

5. Value the Land

At this stage of the valuation, the value of the land on which the pharmaceutical manufacturing plant has been developed needs to be considered. Land is valued using the market sales comparison process.

It is recognized that there may be very few sales of land to be used for a pharmaceutical manufacturing plant in the immediate locality of the property to be valued. For this reason, the assessor may need to look across a wider geographical area and/or look for sales of sites to be used for other large manufacturing plants.

Land Sales Analysis Process

The assessor should collect data on all land sales within the relevant time period in each region, tabulated by property type and zoning. Sales data collected includes:

- property address and legal description
- size of the lot
- infringements (wetlands, etc.)
- type of services to the site

- sales price
- date of transfer
- instrument number
- name and address of vendor and purchaser
- interest(s) transferred
- financing conditions
- zoning information

Sales data should also include improved properties that were bought and subsequently demolished in favour of a new development.

It is necessary to inspect the properties to determine if the sale was of a vacant parcel. Also, the nature of any new development on properties that have been re-developed should be noted.

Land Sales Analysis

More than any other factor, the type and quality of information gathered governs the quality of the final analysis.

Sales data on properties most similar to the subject property in terms of size, zoning, location and time of sale will have the most relevance to the valuation of land relating to the subject property.

Land sales should be verified with the vendor and purchaser to ensure that they are arms-length, open market transactions and that the cash equivalent value is discerned. Ideally, these sales should have taken place as close as possible to the date of valuation. Once comparable sales data has been obtained, land values should be established on the basis of a price per unit of site area.

Issues in the Valuation of Land

Some issues particular to valuation of land may arise as indicated below.

Sales Search Parameters – Location

Location is usually an important factor for pharmaceutical manufacturing plants and is likely to reflect needs in terms of sources of supply (e.g., materials, labour, etc.), transport links, and customer base.

Principle of Consistent Use

The valuation of land is guided by the principle of consistent use, i.e., building values should be complimentary and in accordance with the underlying premise used to value the land.

Sales Search Parameters

When searching for comparable land sales, the assessor should set up search criteria as follows:

- Properties with the same or similar zoning. When reviewing zoning for large industrial properties such as pharmaceutical manufacturing plants, the assessor should look to the uses allowed to ensure comparability.
- Properties of similar size. If there is an insufficient number of sales for properties of similar size, the assessor should attempt to cover a range of property sizes - some larger and some smaller - so that the value of the subject site can be interpolated from the data.
- Land within the same locality. The assessor should look first to sales of sites in close proximity to the subject. It may be necessary to expand the search area if an insufficient number of sales are found.
- Time of sale. Land values change over time, but given enough sales, or some paired sales (i.e., the same property selling more than once), it is possible to determine the change in land value over time.

Time of Sale and Size of Site

It is generally easier to adjust the sale price of land for time of sale and size of site as opposed to location and zoning. However, if an industrial operation such as a pharmaceutical manufacturing plant requires a site of substantial size, it is probably of greater assistance to consider similarly zoned and similarly sized sites located in a larger geographic area, rather than smaller sites located in the immediate vicinity.

Level of Services

The more services there are to a site, the higher its value, all other factors being equal. Sometimes, land sales reflect unserviced land prices (e.g., farmland, bush, etc.). It is challenging to establish the value of a serviced parcel when considering unserviced prices. However, by combining the cost of servicing (sometimes available from published municipal studies) with the unserviced price (plus time adjustment, plus developer's profit), it is possible to arrive at reasonable land value conclusions.

Land Value - Conclusion

The assessor will need to make judgements about the value of the land which has been developed for use as a pharmaceutical manufacturing plant based on whatever sales there may have been for broadly similar use.

Inevitably, the more specialized the use, the greater care has to be taken in the collection of data and the valuation of land.

Finalize Current Value

The final stage in this part of the process is to add the value of the land to the depreciated value of the improvements determined at step 4 to arrive at the overall current value of the pharmaceutical manufacturing plant as of the relevant valuation date.

6. Validate the Results

Checking the Results of the Cost Analysis

The final step in the cost approach is to review all the previous steps and ensure that the approach taken is justifiable, consistent and accurate.

In particular, the results of the breakdown approach to depreciation need to be checked for two issues:

1. That the value derived relates to the expected value of the property if it were to sell on the valuation date; and

2. That the depreciation applied does not "double-count" the impact on value and, as a result, overstate the overall depreciation.

There are a number of steps that can be undertaken to confirm that the estimate of value completed by the cost approach is a "market" (i.e., current) value.

1. Complete an estimate of value using a market sales comparison approach.
2. Complete an estimate of value using an income approach.
3. Complete an age-life study.
4. Complete a market extraction depreciation study.
5. Where sales and other information is limited, check the value against the available sales information.

All these approaches require at least some information on real estate transactions (sales, rents, etc.). In markets such as large pharmaceutical manufacturing plants, the lack of such information makes this checking process challenging.

The assessor should look carefully to see if there are any transactions that can be found which may be of assistance in applying these validations.

The most straightforward forms of depreciation analysis that can be used to check the overall level of depreciation applied to derive the value of the improvements at pharmaceutical manufacturing plants are the "age-life approach" and the "market extraction method".

Age-Life Approach

This approach seeks to establish the typical remaining value of the property at the end of its economic life (if any). For example, if a property sold for 5% of its value at the end of its 50 year economic life, then the total depreciation at the end of its life would be 95% and the depreciation to be applied to a 10 year old structure would be:

95% x 10 / 50 = 19.0% depreciation

The *Appraisal of Real Estate* (Third Canadian Edition) suggests that either reproduction costs or replacement cost could be used with the proviso that the basis for analysis should be internally consistent throughout the valuation.

The accuracy of the age-life methods rests on four conditions:

1. That the expected total economic life of the property can be established.
2. That the effective age and the expected remaining life of the property can be determined.

3. That a "straight-line" depreciation rate best reflects the depreciation occurring at the property.

4. That some further accommodations be made when the property is suffering from abnormal conditions.

Several issues arise in the application of the age-life approach:

- The calculation of expected life can be completed on the basis of chronological age or effective age, but not both. Effective age is a more refined measure, but it requires that the assessor know all the effective ages of the properties studied to create a life expectancy benchmark.

- The simple ratio adopted by the age-life approach describes a straight-line depreciation curve which is not a very sophisticated application of depreciation.

- The age-life method does not do well in predicting depreciation during abnormal economic times. The prediction of overall depreciation would be the same by using this method whether there was a recession or not.

- The age-life approach does best where properties have very similar functionality and comparable size, the effective ages are known, and there are no external obsolescence considerations.

The process requires some adjustment if the conditions are abnormal, or if the property itself is suffering from abnormal depreciation impacts.

The point of the analysis here is to determine whether the depreciation applied in total as a result of the breakdown analysis agrees with the factor arising from the age-life analysis. If there is a large discrepancy, then some further analysis of depreciation should be considered.

A simple example of how the age-life method may be used is shown in Table 6 below:

Table 6

Line Number	Subject Property Details	Formula	Amounts
1	Total economic life of improvements		55 years
2	Effective age of improvements		20 years
3	Age-life ratio	Line 2/Line 1	36%
4	Cost new of improvements		$5,400,000
5	Depreciation amount	Line 4 x Line 3	$1,944,000
6	Depreciated value of improvements	Line 4 – Line 5	$3,456,000

In this example, the depreciated value of the improvements resulting from the application of the breakdown method applied at step 4 should be compared with the figure of $3,456,000 derived from the age-life approach to see if it is broadly similar. If it is not, the assessor will need to review the calculation of depreciation to see if it contains any errors.

Market Extraction Method

An alternative approach to the calculation of overall depreciation is the market extraction method. Like the age-life approach, the method does not differentiate between the various types of depreciation, but uses available market sales data to establish the difference between cost new and market value. The basis of market extraction is a study of the overall depreciation for a property type as set by the market. Knowing the value of a property as new, and the value and the age of the property when it sells, provides an indication of the overall depreciation.

The process requires sales of similar properties and establishes the improvement value at sale by subtracting the land value from the sale price. The difference between the cost new of the improvements (either replacement or reproduction) and the sale price is the total amount of depreciation attributable to improvements. If the sales take place at different dates, then the typical global amount of depreciation per year can be calculated and applied to the subject.

A simple example of how the market extraction analysis works is shown in Table 7 below.

Table 7

	Sale 1	**Sale 2**	**Sale 3**
Sale price	$1,900,000	$2,370,000	$1,880,000
Less land value	-$1,234,000	-$1,409,000	-$934,000
Market value of improvements	666,000	961,000	946,000
Cost (new) of improvements	$1,340,000	$1,658,000	$1,145,000
Total depreciation ($)	$674,000	$697,000	$199,000
Total depreciation (%)	50.3%	42.0%	17.4%
Age (years)	33	27	12
Depreciation per year	1.52%	1.55%	1.45%

From this study, the market extraction method concludes that the total amount of depreciation should be 1.51% per year. Given a 10 year old building at a pharmaceutical manufacturing plant, the total depreciation calculated from the market extraction method should be 15.1%.

By combining a number of such sales information for similar properties it becomes possible to build up a picture of the expected depreciation at a given age.

As a general approach, the market extraction method suffers the same kind of benchmarking issues as the age-life approach. With enough sales, it may be possible to develop overall depreciation curves for various sizes and types of large industrial properties. But the application works best when comparable sales data of similar properties is available, and the results can be adjusted according to differences in the properties.

As already indicated, there may not be sufficient evidence of transactions concerning pharmaceutical manufacturing plants that will enable the assessor to use this method. However, whatever evidence is available should be examined carefully to see whether this type of analysis can be undertaken.

Sales Benchmarks

Another way to check a cost approach result is to find some sales of like properties and determine if the sales results of these properties show the same kind of results as the cost analysis on the subject, e.g., a similar $ per square foot results. This is different from a "full-blown" market sales comparison analysis where the sales values are adjusted to produce a value conclusion for the subject.

This approach may be used where there is limited sales data or where the comparability between properties requires large adjustments. It is not designed to provide a valuation answer, but rather provide a point of comparison to allow the assessor to determine whether the cost approach result for a pharmaceutical manufacturing plant is in line with the market evidence for other similar large industrial properties.

Comparison with other pharmaceutical manufacturing plants

Having completed the valuation and carried out the validation checks outlined above, the assessor should compare the result with the current values of other pharmaceutical manufacturing plants within Ontario.

If the result of the valuation process for the particular pharmaceutical manufacturing plant being valued appears to be out of line with the current values of other similar pharmaceutical manufacturing plants, the assessor should investigate the differences to see whether they indicate that an error may have been made at any of the earlier steps in the valuation.

Ideally, the outcome of the validation and comparison checks will show that the current value of the subject pharmaceutical manufacturing plant derived from the cost approach is correct.

For a simple example of what the completed valuation may look like, along with a reminder of the key steps in the valuation process, see Table 8 below.

Table 8

Reproduction cost new	$1,400,000
Deduct excess capital costs (cost of overbuilt areas)	-$110,000
Replacement cost new	$1,290,000
Deduct cost-to-cure deferred maintenance	$30,000
Sub-total	$1,260,000
Deduct physical depreciation - 30%	-$378,000
Replacement cost new less depreciation (RCNLD)	$882,000
Deduct additional functional obsolescence	-$72,000
Sub-total	$810,000
Deduct external obsolescence - 10%	-$81,000
Depreciated value of improvements	$729,000
Add land value	$486,000
Market value estimate	$1,215,000

Appendices

Appendix A - List of Properties Covered by this Methodology Guide

Roll #	Address	Municipality	Owner	Site Area (acres)	Gross Floor Area (sq. ft.)
190805355000100	1755 Steeles Ave W	Toronto	Sanofi Pasteur Limited	50.29	1,007,761
191904457401201	50 Steinway Blvd	Toronto	Apotex Realty Inc	26.67	767,882
210504009711460	7333 Mississauga Rd N	Mississauga	Glaxosmithkline Inc	60.4	713,345
190801333000600	150 Signet Dr	Toronto	Jinglecroft Enterprises Inc	9.74	411,976
193801001062410	380 Elgin Mills Rd E	Richmond Hill	Apotex Realty Inc	19.72	364,268
190112205000300	30-40 Novopharm Crt	Toronto	30 Nably Court Holdings Limi	12.45	348,782
191903809000600	77 Belfield Rd	Toronto	Bayer Inc	14.98	331,865
210504009822410	2100 Syntex Crt	Mississauga	Patheon Inc	13.92	250,066
230804001719205	890 Woodlawn Rd	Guelph	Johnson & Johnson	54.71	232,133
180904002623500	111 Consumers Dr	Whitby	Patheon Whitby Inc	17.1	222,730
190801344101500	4100 Weston Rd	Toronto	Jinglecroft Enterprises Inc	6.16	211,848
190101231001401	3650 Danforth Ave	Toronto	Eli Lilly Canada Inc	13.39	204,448
194400020545100	5691 Main St	Whitchurch Stouffville	Novopharm Limited	29.09	203,905
290601000724700	34-46 Spalding Dr	Brantford	Apotex Pharmachem	8.38	172,065
193602012322000	575 Hood Rd	Markham	Novopharm Limited	4.85	156,994
190801344300631	200 Barmac Dr	Toronto	Apotex Realty Inc	7.68	148,181
290601000725550	11 Spalding Dr	Brantford	Apotex Pharmachem	11.23	130,044
300615001514125	25 Wolseley Ct	Cambridge	Novocol Pharmaceutical Of Canada	5.94	125,302
190801335101202	150 Ormont Dr	Toronto	Apotex Realty Inc	4.38	57,542
190801333001201	20 Kenhar Dr	Toronto	Apotex Realty Inc	4.91	52,181
190801335000600	400 Ormont Dr	Toronto	Apotex Realty Inc	1.76	47,821
190801335100501	285 Garyray Dr	Toronto	Apotex Realty Inc	2.46	47,230
190801344200100	601 Ormont Dr	Toronto	Apotex Realty Inc	2.45	43,471

190801343000600	440 Garyray Dr	Toronto	Jinglecroft Enterprises Inc	1.36	35,285
190801344101300	465 Garyray Dr	Toronto	Apotex Realty Inc	0.98	30,102

Note: Inventory listing is effective as of February 23, 2015. Listings continue to be reviewed and are subject to change throughout the consultation process.

Appendix B – Glossary of Terms

These definitions are from a variety of sources including Property Appraisal and Assessment Administration, Joseph Eckert, ed. IAAO and The Appraisal of Real Estate, Appraisal Institute, 12th Edition.

Accrued depreciation	The amount of depreciation from any and all sources that affects the value of the property in question.
Actual Age	Sometimes called "historical age" or "chronological age". It is the number of years that has elapsed since building construction was completed.
Age/life method	A method of estimating accrued depreciation founded on the premise that, in the aggregate, a neat mathematical function can be used to infer accrued depreciation from the age of a property and its economic life.
Approaches to value	One or more of three approaches to value, namely (a) cost (b) sales comparison (c) income capitalization. The approaches employed will allow the assessor to determine the value of the property.
Assessment equity	The degree to which assessments bear a consistent relationship to market value.
Assessed value	Assessed value applies in ad valorem taxation and refers to the value of the property according to the tax rolls.
Breakdown method	A method for estimating total depreciation by specifying the amount of each kind of depreciation, often for each major building component, (including physical, functional and external).
Chronological age	The number of years elapsed since an original structure was built. Synonymous are *actual age* and *historical age.* Contrast with effective age.

Comparables, Comparable Sales	Recently sold properties that are similar in important respects to a property being appraised. The sale price and the physical, functional, and locational characteristics of each of the properties are compared to the property being appraised in order to arrive at an estimate of value. By extension, the term *comparables* is sometimes used to refer to properties with rent or income patterns comparable to the property being appraised.
Cost	The total dollar expenditure for an improvement (structure).
Cost Approach	Value as estimated as the current cost of reproducing or replacing the improvements (including the appropriate entrepreneurial incentive or profit) minus the loss in value from depreciation, plus land or site value.
Current value assessment (CVA)	As defined in the Assessment Act Section 1: Current value means, in relation to land, the amount of money the fee simple, if unencumbered, would realize if sold at arm's length by a willing seller to a willing buyer.
Deferred maintenance	Repairs and similar improvements that normally would have been made to a property but were not made to the property in question, thus increasing the amount of its depreciation.
Depreciation	The loss in value of an object, relative to its replacement cost, reproduction cost, or original cost whatever the cause of the loss in value. Depreciation is sometimes subdivided into three types: physical deterioration (wear and tear), functional obsolescence (sub-optimal design in light of current technologies or tastes), and economic obsolescence (poor location or radically diminished demand for the product).
Economic life	The period of time during which a given building or other improvement to a property is expected to contribute (positively) to the value of the total property. This period is typically shorter than the period during which the improvement could be left on the

	property, that is, its physical life.
Economic/External obsolescence	Loss in value to the improvements (relative to the cost of replacing the improvements with one of equal utility) that stems from factors external to the property.
Effective age	The typical age of a structure equivalent to the one in question with respect to its utility and condition. Knowing the effective age of an old rehabilitated structure of a building with substantial deferred maintenance is generally more informative than knowing its chronological age.
Equity	(1) The degree to which assessments bear a constant relationship to market value. Measures include the coefficient of dispersion and the coefficient of variation. (2) The net value of a property after liens and other charges have been subtracted. *See also* horizontal inequity and vertical inequity.
Fixed costs	Costs of fixed resources used by a firm that do not vary with production levels and cannot be changed in the short run.
Functional obsolescence	A flaw in the structure, materials or design that diminishes the function, utility and value of the improvement.
Functional utility	The ability of the property or building to be useful and to perform the function for which it is intended according to current market tastes and standards, the efficiency of building's use in terms of architectural style, design and layout, traffic patterns and size and type of buildings.
Highest and Best Use	The reasonably probable and legal use of vacant land on improved property that is physically possible, appropriately supported, and financially feasible that results in the highest value.
Long-lived items	Building components with an expected remaining economic life that is the same as the remaining economic life of the entire structure.

Marginal utility	The change in total utility to a customer that results from a one-unit change in the consumption level of an item.
Market extraction method	Method of estimating depreciation which relies on the availability of comparable sales from which depreciation can be extracted.
Market value	The most probable sale price of a property in terms of money in a competitive and open market, assuming that the buyer and seller are acting prudently and knowledgeably, allowing sufficient time for the sale, and assuming that the transaction is not affected by undue pressures. See Current Value Assessment
Obsolescence	One cause of depreciation, an impairment of desirability and usefulness caused by new inventions, changes in design, improved processes for production or external factors that make a property less desirable and valuable for continuing use. It may be either functional or external.
Remaining economic life	The number of years remaining in the economic life of a building or other improvement as of the date of the appraisal. This period is influenced by the attitudes of market participants and by market reactions to competitive properties on the market.
Replacement cost	The cost, including material, labour, and overhead, that would be incurred in constructing an improvement having the same utility to its owner as the improvement in question, without necessarily reproducing any particular characteristic of the property.
Reproduction costs	The cost, including material, labor, and overhead, that would be incurred in constructing an improvement having exactly the same characteristics as the improvements in question.
Short-lived items	A building component with an expected remaining economic life that is shorter than the remaining economic life of the entire structure.

Special purpose property	A limited market property with a unique physical design, special construction materials, or a layout that restricts it utility to the use for which it was built, also called special design property.

